# DISBURSEMENTS OF RAILWAYS.

FORMING ONE OF THE TWELVE VOLUMES OF THE REVISED AND ENLARGED EDITION OF

# THE SCIENCE OF RAILWAYS.

BY

MARSHALL M. KIRKMAN.

## DISBURSEMENTS OF RAILWAYS

TREATS OF THE PRINCIPLES AND METHODS GOVERNING THE ORDERING AND BUYING OF MATERIAL, AND THE INSPECTION, CARE AND USE OF THE THE MATERIAL AFTERWARD; ALSO THE DISCIPLINARY MEASURES AND ETHICS THAT ENTER INTO THE SUBJECT. IT ALSO DESCRIBES THE FISCAL REGULATIONS THAT RAILWAY DISBURSEMENTS INVOLVE, THE RULES AND REGULATIONS NECESSARY TO SECURE ACCURACY AND CLEARNESS IN ACCOUNTING FOR MATERIAL AND LABOR AND OTHER MATTERS GERMANE THERETO.

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# INTRODUCTION.

The accompanying volume represents the practical experience and research of the author and those about him, for a period of nearly half a century. In his work he has not sought to create something that was his own so much as he has to develop something of value to railroads and, incidentally, to the commerce of the world. While he has given the subject his best thought all his life, he has at the same time sought to supplement his knowledge and at best limited experience, with that of others. In this he has been, owing to the kindness of those about him and those generally connected with railroads, more fortunate than could have been expected. It is on these grounds that he has written the book and now ventures to offer it to the public.

The first of the two books that make up this volume explains briefly the principles that surround the buying and handling of railway supplies. The subject is one of supreme importance to railroad corporations. The second book further explains the same subject, but is also designed to be used

as a manual by those engaged in the handling of material, labor and other disbursement accounts of railways, including those relating to interest, dividends, sinking funds, taxes, construction and other expenditures of a general and special nature.

The necessity of accuracy and definiteness in the disbursement accounts of railroads is of vital importance to these properties. It matters little how much a railroad earns unless there is careful supervision and faithful accounting in connection with its expenditures. The attainment of these ends is the object of this volume. No one can give the subject thought without being impressed with its vastness and varied and supreme importance. This is better understood now than formerly, and just appreciation of it grows each year, but it will be long before the owners and responsible managers of railway corporations appreciate the subject in all its bearings.

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# BOOK I.

# ECONOMICAL PURCHASE, CARE AND USE OF MATERIAL.

# CHAPTER I.

## RAILWAY KNOWLEDGE AND METHODS.

Everything in life goes forward or backward. There is no intermediary stage. Business is progressive. It sloughs off to-day what was yesterday an integral part. Except for this, progress would cease. It is the secret of the great advances railways have made. This progress will continue as long as a large number of men continue to interest themselves in their affairs. Not longer. And herein lies the danger of adopting a uniform implement of any kind, such as a car wheel, brake, coupler, switch, signal, or method of accounting. Men cease to study the question, settle down to a belief that perfection has been reached. Discoveries that would under other circumstances be made, remain undeveloped in the inventor's brain. He is handicapped by having to compete against a thing that is accepted as the best of its kind. The moment he attacks it he is accused of being an idealist, perhaps a crank. He is looked upon as a disturber. To secure the introduction of his idea requires years of labor, outlay, disappointment, humiliation. This is what it means to attempt to overthrow or change anything that is standard, anything that has been agreed upon as the best. And herein lies one of the principal

objections to government control. It retards progress. Everything a government adopts becomes standard; inviolable; the best of its kind. The instincts, prejudices and comforts of government employes and those they deal with are concerned in perpetuating it. A dull, plodding, mechanical group takes the place of alert owners and ambitious employes. Such is government ownership or government supervision.

The construction of railroads and their progress and development are due to constant experiments and changes; to dissatisfaction with what exists; aspirations for something better; to a love of gain. Except for this spirit, which is not found associated with the mechanical offices of government, we should be traveling in stage coaches of George the Third's time, or, if we had railroads, they would be like those of forty years ago—high priced, cumbersome, insufficient, slow, inadequate. The railroads of to-day, by which the developments of a century are consummated in a decade, are due to the genius of innumerable men; but above all to the genius of proprietorship, the instinct of private ownership, private gain. No one can take the place of the owner. "It is always better that trade and industry should, as far as possible, be left to private enterprise. Government management is almost invariably wasteful and inefficient."*

Nowhere in the world are there men of higher intelligence than those who operate railroads.

*Professor Henry Fawcett.



They comprise so great a number, however, and are so widely separated, that it is necessary to govern them by definite rules. Now, there are two ways of laying down a rule: One says, "You must." This will do, if the master is on hand to see that it is observed; otherwise, it is like firing into the sea. A few conscientious men will observe it from principle; the mass, however, will not regard it except so far as punishment attends neglect. The reason is, not that they are wilfully disobedient, but that they are busied with other matters and, not understanding its importance, neglect it. No one, if left to himself, will carry out an order of which he does not understand the force. The other way to give an order is to accompany it with an explanation of its purpose and necessity. By this means the person addressed becomes a party to the transaction. The order appeals both to his judgment and fidelity. There are, therefore, two reasons for expecting its observance, where there is only one in the first case.

In many instances explanation is impossible in business transactions; no one understands this better than employes. But, generally speaking, co-operative effort cannot be carried on efficiently in corporate life where there is not concurrent knowledge. It is not only necessary to tell men that they must do a particular thing, but to tell them why. This is the purpose of these books. They not only aim to lay down particular rules, but to explain the necessity for such rules.

It is apparent from a perusal of the accompanying books that the subject of railway supplies is worthy of more general attention than it has received. Great progress has been made, but the subject is still imperfectly understood. Practices are still accepted that will not stand the scrutiny of investigation. Many of the defective methods that attend the handling of railway supplies are, however, inherent; the result of want of understanding and proper provision in the laying out of railway shops and grounds in the first place.

The supplies of a railway have been likened to those of an army. They are infinitely greater, but are capable of being surrounded with better checks and safeguards. A quartermaster may square his books by an entry "Lost in battle." But the managers of railroads can be made to account for the supplies they buy to the utmost farthing.

The relation that the articles used by railways bear to each other varies on different lines, according to the nature of property and business. Cost is dependent upon the quantity purchased, proximity to market, the skill of the purchaser, financial ability, etc. The number of articles that a company uses is so great that a schedule of them would fill a volume. I started out to make a list, but found it impracticable. The statistics of many railways give the kinds of supplies used for repairs and maintenance, and the cost thereof. I do not remember, however, to have seen a table giving the aggregate cost of each kind of material



for a road as a whole. It would not perhaps be advisable to go to the expense of such details. They are more interesting than valuable.

The intelligence and fidelity exercised in the purchase, care and use of railway supplies influence directly the cost of construction and operating, and affect, very materially, the profits of owners. To the bulk of railway men the subject is an unknown quantity. It cannot receive too much study.

The amount standing upon the books of a company charged to supplies should comprise the material, both new and old, in store. In pointing out safeguards for the faithful and economical handling of material, I am led to discuss the best means of insuring its careful and prudent use after it passes into the hands of employes, as loss or waste in such cases directly affects supply. This enlarges the subject and enhances its importance.

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A word here in reference to my books on railways. They refer to my life-long business, and therefore have had for one purpose the advancement of the interests of my employer. If he has derived no benefit from them, I have fallen into the mistake made by so many men—of overestimating my services in his behalf.

In reference to the general scope of my writings, they are intended, it is proper to say, mainly for the advancing class among railroad men; for

those who desire to know the subtleties of railroad affairs, yet are prevented by their environment.

The interests of railway companies require the widest diffusion of knowledge among officers and employes, but, unfortunately, there are no present opportunities by which it may be acquired, except as it is picked up piecemeal, here and there. My books are intended, so far as their scope permits, to supply this deficiency. The manager of a railway has no need of information in this direction; his talents, experience and opportunities make his knowledge cosmopolitan; make him a teacher and the natural exponent of railway policy and practice. The knowledge he possesses has a tendency to make its exposition by others appear to him unnecessary. This is the error men fall into whose appetite has lost its elasticity through over-use—the mistake of successful men; of men whose ambition is gratified. They forget that the stale platitudes of to-day were to them the delights of yesterday; that what is common to them, is the source of the liveliest curiosity to their less favored brethren.

I have been more or less criticised for writing on railway subjects. But I have never written a word except to advance the interests of railways, of those who work for them, and those whom they serve. Criticism, whether friendly or not, benefits. While a man must have friends, it is not an unmixed evil to have about him active



enemies. If they should happen to be a little malevolent, so much the better. Men thus surrounded are kept bright and active; their egotism is not allowed to eat up their vitality. Men are spurred on to achieve results quite as much by enmities as by more amiable considerations. In early life I prayed to be delivered from my enemies. Now I feel that I have never had enough of them, or that, if plentiful, they lacked activity and force. I find, in looking back over my life, that I owe much that I have achieved to the efforts of enemies to rob me of some right, or to keep me from doing something I had not thought of doing. My experience is not peculiar. Men are too amiable. They allow themselves to be crowded out by the swine about them. They frequently require incentive—oppression, bitter personal animosity—to spur them on. Every man who desires to become great, or to remain so, should pray to have around him active, energetic and influential enemies. If, therefore, the officials and employes of railroads who fill the departments and bureaus should find themselves surrounded, as they will oftentimes be, by jealous and unrelenting foes, they must not look upon the situation as one devoid of good.

## CHAPTER II.

### HOW MEN ACQUIRE MEANS TO BUILD AND OWN RAILROADS AND TO LOOK AFTER THEIR DISBURSEMENTS AFTERWARDS.

Envy is the curse of our day. If the Commandments were to be rewritten, the sin of covetousness would be the first named instead of the last. Nothing in the history of the Jews reflects more credit upon them than the fact that this sin was esteemed the least of their vices.

Its enormous importance at the present time grows out of a false conception of the relations that men were intended to occupy toward each other. It is partly due to a belief that through "cramming" and other processes the dull and worthless may be made the equals of those upon whom God has stamped the highest attributes. Out of the truism that all men are equal before the law has grown a belief that they are equal in everything. Hence the jealousy and rage of the improvident, the incapable and worthless toward those who through their wisdom or self-denial are able, while supporting themselves, to add to the wealth of the world.

The desire to be rich is laudable; but to desire a thing merely because our neighbor has it is base. The secret of man's happiness is contentment, coupled with an honest desire to add to his position and comfort. Out of these the greatness





of the world has grown. Envy and jealousy have never advanced mankind in the direction of either greatness or goodness. Directly the reverse.

It is the curse of radical teachings that they make men envious. It is fashionable among many to ascribe the rapid advance of the world to radical teachings. On the contrary, it is due to the prosy, conservative, plodding hoarder. It is he who has constructed our telegraphs and railways and had the genius to operate them successfully. Radicalism is a fever—the hectic flush that precedes death.

The wealth of a country is the evidence of the intelligence and thrift of a people; of their disposition to work, and the respect they pay to the rights of others. It evinces, especially, their ability to sacrifice present gratification to future good. Every dollar saved represents a luxury denied. This is true, no matter what the wealth of its owner. The desires of a millionaire and the pressure brought to bear upon him to dispossess him of that which he has, exceed the pressure put upon a poor man, in the proportion that his means exceed those of the latter.

A pleasure does not consist in the thing itself, so much as in the effort it costs us; in the deprivation that it represents; in its rarity, in fact. The banquet that costs a million dollars is not enjoyed more heartily by host or guest, or partaken of with feelings of greater self-esteem, than that experienced by the colored man in the

swamps of the Carolinas, who invites his neighbors to partake with him of sweet potatoes and opossum. Nor is the discontent among those whom the rich man omits to invite to his board greater than among those whom the Carolinian fails to ask to his succulent feast. If, however, we make the latter believe, either through political teachings or otherwise, that he also ought to be able to give a million-dollar banquet, without the expenditure of corresponding intelligence, labor and self-sacrifice, then we shall destroy his happiness and his value as a citizen, without advancing the interests of mankind. This is exactly what many of the political maxims of the present day are doing.

It is a compensating advantage afforded by a general and wise law of nature, that the poor man shall enjoy the luxuries his scant means afford with the same zest that the rich man derives from the expenditure of his wealth. When, therefore, the former is blessed with work and a contented disposition (and a contented disposition is the natural inheritance of every man), it follows that he must be as happy as his neighbor. If, in addition to this, his habits are frugal, he, too, will acquire riches. He will commence by acquiring a competence. This will be his first aim. It is but a step thence to wealth.

Enjoyment is relative. It becomes impossible, however, the moment the spirit of jealousy and envy is interjected into it. Jealousy and envy evince a mean spirit, a narrow comprehension;



an evidence of moral obliquity; of a mind unable to enjoy that which it has, or derive happiness from anything it may attain. It is the curse of our social life; it disturbs the slumbers of the poor man without bettering him, and is a thorn in the side of the rich.

The desires of the envious are not spontaneous. They grow out of the acts of others. They esteem not the comforts they have, but glance with lowering eye at the apparently greater comforts of their neighbors. Happiness, under such circumstances, is impossible. The mind is not soothed by success, by that which God has granted.

Envy is the outgrowth of forgetfulness; of selfishness; indifference to the fact that the thing coveted is the product of a sacrifice equal to its extent. That it represents, moreover, a principle that cannot be disregarded without destroying civilization; without making might the arbiter, and destitution and wretchedness common. There are, of course, instances where wealth has been acquired quickly, through fortuitous circumstances, without special deprivation. Such cases, however, are exceptional and do not at all affect the general principle.

Whoever owns a dollar in money which is employed in reproduction, whoever has a dollar over and above his debts invested in business, is to that extent a capitalist. Capital is represented not alone by the circulating medium of the world, but by the buildings, plant, machinery, supplies,

stock in trade and appliances of manufacturers, merchants, carriers and others. Whoever has a dollar's worth of property is a contributor, to that degree, to the world's wealth. Property represents prolonged thought, economy, self denial. It is born in labor and deprivation; it should be enjoyed in peace and contentment. The material interests of a country afford evidence of its strength of purpose, the grasp of its people. The acquisition and maintenance of property occupy alike the thoughts and purposes of christian and pagan; of those already rich; of those who hope to become so; of those who possess a competence; of those who are struggling to acquire one. Man's struggle to better himself broadens his intelligence and multiplies his ability to help others. The inestimable boon that wealth conveys to the community is the opportunity it affords its possessor to give employment to others. No one who possesses within himself true elements of manhood seeks or desires other aid from his fellows than opportunity to work. This boon granted, he becomes the arbiter of his own fortunes. His progress may be slow, but this will not render it less attractive. The determination of a man to succeed increases immeasurably his value as a worker. His savings, meager at first, constitute the nucleus of a fortune. Once the start has been made, the future is assured. The value of saving is but poorly represented by the amount of money laid by. It is more fitly illustrated in the strengthening of the character of



the person; in giving him a purpose in life; a fixed goal to be reached; in making him self-contained; in filling his mind with ennobling thoughts and lofty aspirations. Thus engaged he has little time, and less inclination, to meddle in the affairs of others; to criticise their failures; to growl over their successes. The man who has acquired the habit of saving sees before him an old age secure from want; a life closing amidst contentment and happiness. He has no incentive to steal. He is not envious of those who have more than he, because he hopes to become their equal. The habit of saving represents industry, contentment, integrity, loyalty, exalted purpose, an honorable life, a green old age.

The avenues through which wealth may be acquired multiply with the thought given to them. Herein lies the secret of rich men. Their capacities are no greater at the start than others, but their purposes are higher, or if not higher, more steadfastly pursued. Their determination is greater and the necessity of sacrificing the present to the future more rigidly adhered to. Riches are the fruit of intelligent purpose; of indomitable perseverance, of prolonged self-sacrifice. Poverty is too often the fruit of present gratification or of wasted opportunities.

Encouragement to save and the preservation of that which has been saved are among the chief duties of the government; are among its greatest and most beneficent functions. Upon the care and wisdom thus exercised depend not only the

present happiness and prosperity of a people, but their future. Such protection encourages those who have to increase their sphere of usefulness. It is also an incentive to those who have nothing, to acquire first a competence, afterward a fortune. A government can have no loftier purpose than this; every other material good follows in its train or is collateral. It represents food, clothing, independence, enlightenment, manliness, contentment, respect for the rights of others.

The tendency of modern teachings is to make material things secondary to mere forms or words; to say that theory is superior to practice; that the world's history does not represent the wisdom of mankind, but its perverted purposes.

No country whose citizens do not aspire to fortune, and which does not possess avenues whereby this aspiration may be successfully pursued, can hope to become great. The first step in the progress toward wealth is by hoarding; by saving something, however small. The insignificance of the sum frequently makes it appear absurd, the outgrowth of a base and mechanical spirit. This view of the subject is mistaken. The act of saving evinces the highest and best qualities of mankind. It is an evidence of self-abnegation; of ability to help others. When once the determination has been made to save, the processes of thought it invokes make men contented. They no longer look to vague and fortuitous circumstances for that which they desire. Their purposes become definite and settled.



They do not look upon the possessions of their brother with the eye of a robber, but with kindly interest, availing themselves meanwhile to the utmost of his experience.

Whatever a man thinks, he becomes. The thoughts of an industrious and saving man look forward to a time when he will no longer be compelled to work. His dream of idleness is Utopian, because work is necessary, God's greatest blessing, and its discontinuance foreshadows decay and death. But the prospect of a competence, the hope of a fortune, the dream of independence, stimulate him to labor and to save. When a mind is once imbued with the acquisition of property, it grows with what it feeds upon, multiplying the usefulness of the man according to his talent and opportunities. The process of acquisition once set in motion, never ceases. On the other hand, the desire to possess without the disposition to labor and to save, is the instinct of a robber, of a common thief. That a person so constituted will, sooner or later, attempt to ply his vocation, follows as inevitably as honor and wealth follow in the case of his more unselfish brother.

The mistake that men make in believing that wealth will bring contentment and happiness without prolonged self-sacrifice, lies in ignorance of the fact that to be fully enjoyed it must be honorably earned. As well might a soldier hope to enjoy as victor the battle won by his comrade, as the possessor of wealth hope fully to enjoy

that which has been earned by another. The history of every self-made man illustrates this, and while his predominating thought of self may detract somewhat from his merit as a social companion, it truly evinces the absorbing delight that the accomplishment of an object long pursued affords. He loves to talk of his achievements; to recount his adventures; his successful schemes—the labor they involved, the empires of industry they gave birth to. The gratification he feels in exhibiting his wealth, his horses, pictures, houses, even his raiment, is the gratification of a child; the gratification that follows an effort long sustained and ultimately successful. We participate in his happiness, are refreshed by its ardor, and while we may not hope to be equally successful, cannot fail to observe that it is the outgrowth of previous deprivations.

Railway property, including money invested in Supplies, represents the accumulated savings of particular persons as much as the coal that is laid away by the widow for her winter's use represents her savings. Except for the saving disposition of mankind, there would never have been any capital with which to build railroads in the first place, or extend them after their success had been demonstrated. Each mile constructed, each new car built, represents money that has been hoarded. It is a material, physical evidence that many persons, instead of spending everything to gratify present wants, have laid aside a portion. To the extent they did this, the



community is better off, enjoys better facilities, greater comfort, greater opportunities for making money. The employes of railroads are especially bettered by it; through it their sphere of usefulness is increased and their number multiplied.

In conclusion, it ought not to be necessary to say that no difference exists between the rights of those who own railway property and the rights of others. But the warfare that has been made upon railway corporations justifies this statement here. They are, equally with other property owners, entitled to protection, to earn a return on their investment. To deprive them of this right is to encourage a spirit of destruction to every kind of property.

# CHAPTER III.

## RAILWAY SUPPLIES; NECESSITY AND VALUE OF HANDLING THEM SCIENTIFICALLY.

The supplies of a railroad are understood to mean new and old material on hand in store, not in use. Incidentally, however, they include property of a portable nature, such as tools in the hands of workmen, the due protection of which is important, as supplies in store must be drawn upon to replace them. I shall, therefore, not only consider the question of supplies, but point out some necessary safeguards in connection with their use.

The supplies of a railway constitute personal property. They are in the nature of a permanent investment. They have a current value in the market, yet are not available as an asset (except in the sense that the right of way of a railroad is an asset), for the reason that a property cannot be operated without them, any more than it can be operated without a track. They are, therefore, to be viewed from the same standpoint as the latter. They cannot be disposed of, and can only be slightly diminished in amount.

The custom in regard to the disposition to be made of supplies in the accounts is not uniform. It is not the practice, for instance, in America, to





capitalize these investments. The reason of this omission doubtless grew out of the fact that the amount in the early history of railroads was small, and the credit of the companies so pinched as not to make it easy to capitalize expenditures of this nature.

The amount of material necessary for a company to keep on hand to meet current wants depends largely on the proximity of markets and the character and extent of the property and the amount of its business.

The value of railway supplies on hand, with the tools and light implements in the hands of employes, represents an average of about two and one-half per cent. of the total amount invested in railway property.

Each year adds to the number of articles that a railway uses. Improvements, new conveniences and luxuries swell the list. Upon some roads libraries, foot baths, barber shops, pianos and organs form part of the paraphernalia of the train and station service. The list will go on increasing until it embraces every article found in the most luxurious home.

Not only are the articles used by railroads multiplying from day to day, but they are also improving in quality. Manufacturers learn how to manufacture better. A car wheel that would average twenty thousand miles was formerly thought to be of high grade. Now wheels average from one hundred and fifty thousand miles to four hundred thousand miles.

Supplies represent cash. It takes cash to replace them. They should, therefore, be guarded with the same care as cash. This is not usual. The reason is that the use rather than the value of the thing is considered. If we lose a package of money, the fact is bemoaned by a whole continent; the Associated Press recognizes its importance; the telegraph resounds with its details; local reporters exert themselves to ascertain particulars. If the employe of a corporation loses it, he is blamed, perhaps disgraced. If money is stolen, myriads of detectives prick up their ears in anticipation of the reward. When the agent of a railroad embezzles a few dollars, the staff trembles with suppressed indignation and no stone is left unturned to secure a return of the money and the punishment of the delinquent. This is the rule with cash; it is not the rule with supplies. The loss or improvident use of material is not known in the majority of cases, even by those immediately in charge. Why? Because of defective methods of handling material.

The amount of material at any designated point on a road is an unknown quantity. Absolute precision, as in the case of cash, is impossible. If there is a surplus or deficiency when the inventory is taken, it is adjusted in the accounts without remark, unless excessive or peculiar. Arbitrary regulations that govern in the case of cash cannot apply to material. Those in charge of material are quite as honest as those who handle cash, but they do not have the same check



upon it; cannot guard it with equal care. This breeds improvidence, carelessness of thought and action, and while any known offense is punished, discovery is not sure, as it is in the case of loss of money. This is demoralizing; it makes men forget that material has the same value to a company as cash, and that its destruction or improper use is equally disastrous.

In order to insure necessary and proper safeguards in the handling of material, we must consider it from the standpoint of value solely. To misappropriate or waste it must be esteemed the same as the misappropriation or loss of money. Its deterioration through lack of proper care must be looked upon the same as any other offense against good business usage. Its loss must be thought the same as the loss of money. It is no exaggeration to say that a cashier who would use a drawer that contained cracks through which more or less money was lost, or who stored his cash on window sills and in public entries, would be considered improvident in his methods of business. The losses that occur in connection with material that are avoidable, within just and reasonable limits, are as inexcusable as the loss of money under the circumstances named.

The disparity that exists between the care of property and the care of money is ludicrous, not only upon railroads but elsewhere. We watch our money with unceasing vigilance; when we receive it we count and recount it, examining it meanwhile with eye and tooth. While it is in

our possession we store it in costly vaults and in safes at once the pride of artisans and the despair of burglars. When we pay it out we count and recount it as before, and at the close of each day particularize our payments and sum up that which we have on hand with the utmost precision, lest a penny should be lost. This care is not exaggerated. It is the result of experience, of necessary precaution. What are the practices of railroads in regard to material? Is the same provision made for it that the merchant and manufacturer practice? Hardly! The purchaser inspects it when it is received, but in consequence of lack of experience and proper facilities, many counterfeits are palmed off upon him. When received, he does not place it in costly vaults or safes, nor even behind oaken doors or carefully barred windows. The smaller articles he places in what he calls a storeroom. This storeroom is, however, in many cases, nothing more nor less than a few shelves loosely constructed in a roundhouse, or a corner partitioned off, perhaps without locks or bolts. If the supply of material is large, a special room is assigned. But this room, in the majority of cases, is much too small, and its internal arrangements ill adapted to the purpose it serves. Whatever its character, it is used only to store small supplies. The great bulk of the material lies scattered about the buildings and yards. Some of it is waiting to be used on the morrow; some of it has been overlooked. It is scattered, because there



is no convenient place for it. It is suffering more or less deterioration; many articles are lost or stolen, while such material as oils impregnate the earth with their drippings and perfume the air with their odors. The picture is not exaggerated. There are, of course, exceptions. I have in mind storehouses constructed recently in the light of experience and known wants that are in every way adequate. These are the exceptions, however.

The blame does not attach to the railroad managers of to-day. It antedates our time. Innumerable causes, however, tend to perpetuate it.

The scant thought given to the subject originally by those who planned our shops and depots of supply strikes the observer with amazement. If, when we paid money into a bank, it were necessary for the teller to crawl over a contiguous counter, through an open window, past a long line of men engaged in various occupations, in order to reach his money drawer, located in a coal cellar, we should say that the bank was poorly planned, if economy in its working and safety in the care of its funds were desirable. Yet the practices in regard to the handling and storage of material, in many instances, are quite as absurd. And what is more remarkable, is that they excite neither surprise nor suggestion.

It is probable that the defective system of railroads for handling material grew, primarily, out of a division of responsibility. It sprung up,

like "Topsy," without method or forethought. Where shops were planned by an engineer, he was not called upon to make provision for supplies, or, if he was, the storehouse was inconveniently located. The rule was to construct such buildings out of remnants; not with reference to convenience of unloading, storing and disbursing, but with a view rather to the utilization of an unoccupied spot

While elaborate provision has been made by railroads for their equipment and machinery, the storeroom for supplies has been forgotten or ignored. Nothing could exceed the convenient character of our machine shops and roundhouses, or the minute care that has been exercised to see that all the parts conform to the use to be made of them. Every device by which economy of labor and the protection of the plant can be secured is carefully considered. The same standard of excellence should be observed in regard to the supply stores. The standard should be the standard of private practice.

It does not require any extended or technical knowledge of railway affairs to teach us that the same care should be observed to protect railway supplies that a prudent and thrifty merchant uses to protect similar merchandise. To the extent this is neglected, we are remiss. The occasion of this remissness may excuse it, but it does not alter the conditions. To say that it is the result of lack of forethought and not of design, of inexperience and not of deliberate intention, does not make the loss any less to railroad companies. We must not expect, however, the high standard of the merchant. In his own business he is personally on the ground to plan, arrange and inspect; moreover, his intelligence is heightened by the instinct of gain, of ownership; an hereditary instinct, the instinct that one merchant hands down to another. Those who operate railroads have not the habits of merchants, nor their personal incentive. This does not imply that they knowingly or wilfully omit any precaution or violate any law of ethics. The standard of morality among them is, probably, quite as high as it is among merchants. It is less effective in its methods, that is all. It approaches the perfection of the merchant only so far as it is supervised by men possessing equal intelligence and interest with the merchant, namely, the owner of the property.



Great progress has been made in handling material. Particular companies have given the matter thought and expression; they are exceptions, however. Proper provision is, in many cases, impossible at the present time. The room is lacking and the arrangement of shop buildings prevents. Originally the cost of storehouses led many companies to get along without them. That such economy was not justified, no one familiar with the subject need be told. In the inception of railroads in America the poverty that enveloped them knew neither time nor utility; it sacrificed, in its improvidence, both

the present and the future. That the saving on the outlay would have abundantly justified the construction of adequate and properly located storehouses, we now know. But criticism cannot remedy the evil. It may, however, prevent similar neglect hereafter. Intelligent study of the subject may do much to ameliorate the situation.

Not the least of the evils that a company suffers from improper methods of storing material is the demoralization it engenders. It does not seem wrong to appropriate what is esteemed so lightly; to improvidently use what apparently has so little value. Thus losses multiply. Moreover, imperfect knowledge of supplies on hand engenders excessive orders. It is impossible to properly inspect or classify material or watch its disbursement with the care that should be exercised, when the facilities are inadequate.

No company can be so poor as to justify neglect to make proper provision for handling its supplies; to protect them from the elements; to throw around them such safeguards as are necessary to prevent their loss or improvident use. For articles that have a current value, such as copper, brass and tools, secure storehouses should be provided. For oils and kindred substances, capacious tanks should be built, in which they should be stored, and from which they may be drawn without waste or labor, as needed. For bulky articles that cannot be carried away surreptitiously, simple sheds are all that is needed.



For old material, room is needed, first, for assorting and afterward for protection. Provision for storing should, in fact, be such as a merchant provides under like conditions. The value is the same; the risk that attends neglect the same; the cost of replacement the same. This is not only true in regard to supplies about the shops and roundhouses, but it is also true in regard to the material scattered along the road, whether new or old. Every section of a line should not only have a place in which to store tools, but a secure place in which to store supplies and worn-out material. It is necessary to prevent loss and depreciation; it is also necessary to enable the foreman to render an intelligent account of the supplies and implements on hand.

The economical use of material is of the greatest importance to a company. To secure it every department of the service should be carefully watched; every device adopted; every expenditure guarded. Valuable material should not be used when inferior grades will answer; good timber should not be used when poor timber will do; in making requisitions for timber the right sizes should be ordered, and in cutting, waste should be avoided; lumber should be covered and so piled as to leave free circulation of air; timber taken from worn-out bridges and other structures should, when practicable, be utilized for heating stationary engines, kindling engine fires, blocking, etc. High-priced lubricants should not be used when cheap grades will answer; no more oil

should be put into the boxes than is necessary; oil cups should be set so as to feed only the amount required to keep the parts lubricated; oil droppings from turning and other machines should not be thrown away, but drained and used again; waste for wiping should be used until its absorbing power is gone, after which it should be utilized to wipe the dirt from wheels and rough machinery; waste taken from truck boxes (when trucks are repaired) should not be thrown away, but used to pack other boxes; fires should not be started with lubricating or illuminating oils; trackmen should see that tools, bolts, spikes and other material are not covered up or lost; blacksmiths should exercise economy in the use of fuel, should see that it is not consumed unnecessarily or thrown away when cleaning their forges; coal should not be lost by overloading locomotive tenders; iron and steel should not be exposed to the weather; finished iron should be protected by paint. These are only hints. The subject is interminable. Every device must, in fact, be exercised in the use and care of material that prudence and wise economy suggest.

The cost of the supplies of a company constitutes in the neighborhood of one-half of its operating expenses. This fact emphasizes the importance of rules and regulations governing them that shall be such as to secure the best results. The subject is too great to be more than summarized by me. The investigations I have



made are such as to show that not enough attention is given the subject; that the waste in this branch of the service is much greater than is known.*

The handling of railway supplies naturally brings up the question of ability to buy cheaply. This involves, incidentally, markets, the ability of the purchasing agent, payment, quantity, place of delivery and innumerable other questions. It also involves the due and proper inspection of material; its care and disbursement, and finally the regard that is paid to it after it has been removed from the storehouse. It also involves the question of distribution of authority; the status of the purchasing agent, storekeeper, operating officer, general management and so on. The greatest diversity exists in regard to the last-named subject. On some roads the material is bought, inspected, cared for and disbursed by the same officer; upon other roads the purchasing agent buys the material and delivers it to the

*Sometime ago one of the greatest railway managers of the United States asked the writer to prepare a code of rules and regulations governing the handling of material. The result is found in the chapter devoted to "Requisitions." In pursuing his inquiries the writer had occasion to investigate the methods of many railway companies, and while he nowhere observed intentional neglect or lack of interest, he everywhere found evidences of the slight thought that had been given the subject. The particular attention of the reader is invited to the chapter on "Requisitions." Under the rules therein laid down, the manager referred to was able to reduce his stock of material on hand twenty-five per cent. while greatly adding to the efficiency of the service.

operating officer; upon other roads the supplies, after having been bought, are turned over to a disinterested department, presided over by the accounting officer. It inspects and cares for the material and disburses on orders from operating officers. It is thus a check both on the person who buys and the person who uses.

Upon some roads local superintendents have no power to order material except through one or more superior officers. Upon other lines they are allowed to order directly from the storekeeper, the management striving in this way to make them sensible of the responsibility of their office; to fasten responsibility directly upon them. The practice is based upon a belief that the superintendent in charge knows better than anyone else the requirements of the service, and however much his requisitions may be scrutinized by superior officers, the latter are, after all, compelled to rely upon his judgment. If his requisitions are withheld or denied, the service suffers injury. No one but the official who personally watches the service on the ground really knows its needs. Where supplies are ordered, the greater the celerity in procuring them and the greater certainty the superintendent has that they will be furnished promptly and as ordered, the greater restraint (economy) he will exercise. Such is the line of reasoning the companies pursue, and upon it they are inclined to put great trust in the officers immediately in charge of the property. Some great and well managed corporations



pursue the method I have described rigidly and systematically; they have found it to work with admirable smoothness and economy. It has been their experience that it builds up the morale of the force; that it also lessens the quantity and cheapens the kind of material they use. To those who criticise their methods they point to the fact that authority delegated to local officers may be withdrawn at a moment's notice if abused. Moreover, while local officers are granted the right to order material directly, their requisitions are always subject to the inspection of higher officials after they are filled, and before if necessary. So that the check is not withdrawn, but is so applied as to increase the responsibility of the local officer and build up in him a sense of dignity and responsibility. No service can be effective that does not keep this thought in view.

When a superintendent is required to secure the approval of those above him before he can get supplies, he is more intent upon getting his requisition filled than he is in restricting it to the lowest possible limit; he shifts the responsibility onto the shoulders of his superiors. All officers do not, of course, do this, but it is in harmony with human nature where the discretion of men is not in accord with their responsibilities.

The questions that surround the subject of railway supplies are too numerous to be more than hinted at here. But the main purpose to be kept

in view is to secure proper accountability in their purchase, care and use; to enforce needed safeguards; to prevent the growth of abuses; to stimulate the intelligence and zeal of every department interested; to be prompt in filling requisitions; to require full, minute and frequent returns; to keep advised, above all, of the quantity of material on hand and its location. The effective handling of material requires that when an article is ordered the department should know the quantity of such material on hand and where it is, so that the request may be filled by transfer from some other part of the road, if possible. It is of the greatest importance that those who buy and care for material should be thoroughly versed in such matters. This I have endeavored to provide for in the provision I have made for handling requisitions.

An important provision in connection with the economical and responsible use of material is that it shall be charged to the account upon which used at the time of its use. In no other way is it possible for a company to keep itself advised of the quantity of material on hand; in no other way can those who look to the accounts for information know whether they have been loaded down in advance, or have been lightened by neglect to charge for the material that has been used. Any other system is apt not only to deceive the owner of the property, but the management as well. Owners of roads look to returns for a true exposition of their affairs—the actual



surplus or deficit; the managers of railroads look to the daily, weekly or monthly returns for knowledge of details; they cannot carry such matters in their heads, and if the system of accounting is not such as to refresh their minds at the proper time and place, they will forget. For an officer to attempt to remember the details of what has passed is to greatly impair his knowledge of what is actually occurring round about him. If material is charged in advance of its use, the management will oftentimes forget that it is still on hand; if not charged when used, it will miscalculate the relation that expenses bear to receipts. Moreover, fictitious balances will be created whereby everybody will be misled—owner, investor, and manager. Material, like money, should be charged when it is expended. So long as it is on hand it should appear as an asset; when used it should be charged to the proper account. Unless these practices are observed, comparative statements lose their value. Material will be charged when convenient, and one of the greatest safeguards connected with the service, one of the greatest checks on the management, will be lost.

In reference to details, no two roads will agree. Differences in organization, in facilities, in location of shops, in methods of buying, in delivery and settlement, will exist. The differences, however, are not important. They will agree, or should agree, in regard to essential matters. There are certain general principles which ought

always to be observed. These I purpose to discuss in this volume and in the attendant volumes that refer to material.*

* In book "Fiscal Affairs, Expenditures" will be found several chapters referring to material. The rules and regulations laid down therein must be observed substantially upon every road where correct methods are followed. The book "Constructing, Financing and Maintaining" also treats more or less specifically of railway material.

# CHAPTER IV.

## THE PURCHASE AND CARE OF SUPPLIES—NECESSITY AND VALUE OF PERFORMING THE WORK SCIENTIFICALLY.

To handle material properly, a company must have a corps of storekeepers, skilled in the knowledge of railway supplies and faithful in the care and disbursement thereof; men who in inspecting are able to determine their character, and who may be trusted to make a true report thereof; men who will guard the property while in their possession and see that it is disbursed only for good and sufficient reasons; men who will, so far as possible, look after its disposition after it has passed out of their hands; men of sufficient judgment and experience to anticipate the wants of the service and direct the delivery of material at the point most convenient for its use. They must not only be trustworthy, but must be miniature merchants, so to speak, with the provident instincts of merchants. They are important factors in the working of a property. They must also be familiar with the material accounts of railroads.*

They must be men of such character and judgment that they can be trusted to look after the

* For details of these accounts, see book "Fiscal Affairs, Expenditures."

interests of their employer without continual spur or special commendation. They must be honest, intelligent, experienced, vigilant. They must, moreover, have such adaptability of manner and disposition as to be able to live in peaceable accord with officials of the company about them, but over whom they have no control and from whom, in many cases, they will receive little or no aid. This involves tact and amiability. A company requires such a man at every supply store. To him subordinates and attendant details should be left; to him responsibility for the receipt, care and disbursement of material should be intrusted. Due efficiency requires that his clerical force and attendant laborers should be responsible directly to him, and that authority over them by others should be exercised through him. It is not necessary that a storekeeper should be intrusted with discretionary power to order material. He should, as a rule, act in such matters in co-operation with the operating officer immediately in charge, unless, perhaps, it be in the case of a general storekeeper, who orders for all.

Men filling places of trust fall readily into a belief that a knowledge of the duties they perform, on the part of others, lessens their importance and loosens their hold. This is true of a mechanical office, or if the occupant is unfit. Not otherwise. It may be set down as true, that the more generally the methods of railways are understood, the more efficiently they will be man-



aged, and the more profitable they will be to their owners. There is nothing about their system of operation that calls for secrecy, and the wider the diffusion of knowledge, the more thoroughly the community will appreciate the magnitude of the subject and the necessity for the work being carried on by owners according to approved methods of business. The importance of officials will not be lessened by publicity, and properties will be benefited.

In reference to the procurement of supplies, details cannot be too minutely pictured. They embrace a knowledge of the peculiarities and artifices of tradesmen, the fluctuations of markets, and the conditions that attend the production, transmission and use of each article. The list of goods that a railway company buys practically embraces every known article used in the economy of life. It is apparent, therefore, that any description must be largely general.

The practice of designating a particular person to buy the supplies that a railway company needs is not universal, though more prevalent than formerly. At one time it was the custom to permit the various heads of departments to buy. The practice was based upon the presumption that their knowledge of technicalities made them especially fit to buy advantageously. The argument was, however, fallacious. It ought not to require demonstration to prove that a person hired for his skill as a blacksmith is not likely to possess the qualities necessary to enable him to

cope successfully with the veteran merchant in purchasing the goods that a blacksmith requires, or in disposing of the *débris* that accumulates about a blacksmith's shop. These duties are commercial and require a trader. It was found, moreover, that when purchases were thus made, the act was looked upon as merely an incident; something in the nature of a perquisite which the buyer was at liberty to avail himself of at pleasure. It resulted that collusion occurred where purchases were not supervised by an alert and trustworthy manager. There was, moreover, enormous waste of material through excessive purchases and duplications of orders, while prices became greatly inflated because of the ignorance and venality of buyers. These disadvantages were aggravated by the fact that much of the material bought and paid for was never delivered, was purely mythical, in fact. This was rendered possible by making the department that purchased the material and the department that received and inspected it, the same; a doubtful practice under any circumstances, and one that should not be permitted unless the agent is a man of the highest integrity and unselfishness. These and kindred practices were not the result of design, but of evolution. No other way was known. It was not supposed that anyone who was lacking in technical knowledge of the uses to which a thing was to be put could buy it. Time has shown the fallacy of this belief.



The element that makes a purchasing agent valuable to his employer is the mercantile instinct. If he has the characteristics of an artisan, he should occupy the office of an artisan; the latter, however great his worth, is not qualified to cope with merchants, and his company will only be worsted in such an encounter.*

An essential requisite in a purchasing agent, and one that he ought to be fully alive to, is promptness. The operations of railroads are imperative, and while there is abundant opportunity to economize by cutting down excessive requisitions and canceling others, this process must not be allowed to interfere with the prompt filling of necessary orders. When it does, the service suffers thereby. The work must be done systematically. A supervisory duty of this kind requires an active, energetic, conscientious man, who has extended knowledge and abundance of time.

No one appreciates so heartily as the operating officers of a railroad the peculiar embarrassments that attend neglect to fill requisitions promptly. Neglect necessitates the use of unfit and expensive substitutes, and, in many cases, stoppage of work or the retarding of important repairs and renewals. Delay in the receipt of material that is needed also involves hurried and imperfect inspection when received, and a disregard of

* For fuller particulars of the characteristics of a good purchasing agent and the duties of his office, see chapter on that official in book "Railway Organization."

economical and responsible methods of distribution afterward. It involves not only loss, but confusion and scandal. Promptness is an essential requisite.

The more the subject is studied the more apparent it will become that, except under peculiar circumstances, the interests of a company will be enhanced by the employment of a particular man to buy its supplies. When they are purchased by many men the manager must, practically, assume the duties of purchasing agent through the minute and unceasing vigilance that he exercises over those who perform the duty. This but few managers have the skill, time or disposition to perform properly.

In order to buy advantageously, it is essential that orders shall be far enough in advance to afford the purchaser abundant opportunity to avail himself of the most desirable market. The field is wide, and requires both time and patience in order to take advantage of its opportunities. Undue haste is quite certain to add to the cost, and in many cases detracts from the value of the article purchased.

In order to buy cheaply, it is also important that the purchaser should be free to buy where he can to the best advantage. His duties require him to scrutinize the sources of supply constantly and intelligently.

In order to buy cheaply, goods must be paid for promptly. The usury that a company suffers for a disregard of this rule is out of all proportion to the benefits derived. A large percentage of the profits of many merchants arises from the discounts they receive or the penalties they enforce. The fact is fully appreciated by purchasing agents. It is not, however, so generally understood by their associates, and it results that this profit is oftentimes lost in consequence. The loss, however, it entails upon railroads is not so great as it would be in the case of small buyers. The purchases of railroads are so large and their credit is so high that they are able to purchase much cheaper than those who have not these advantages. This is especially so when the railroad company observes its obligations in regard to time and method of payment. Under the most favorable circumstances, however, there can be no doubt that the ability of a company to buy cheaply will be greatly enhanced by prompt cash payments.



In buying material the value of inviting bids, whenever possible, is generally recognized and acted upon. The exercise of this practice, when accompanied by careful and unceasing "shopping," has the effect of securing to a company every possible advantage that attends the purchase of large quantities of material in a widely extended market. The value of inviting bids is not dependent upon the quantity of goods bought. The difference in the price asked, even for a small thing, by different merchants and manufacturers, justifies it. Thus, in so small a matter as the purchase of stationery, the solicita-

tion of bids will develop the most wonderful differences in prices; differences so remarkable that the aggregate amount that may be saved by judicious buying in the course of a year would not be believed by those who have not investigated the subject. The same is true of the purchase of lumber and other descriptions of material.

To buy cheaply and advisedly, it is essential that the pulse of the market should be constantly felt. This necessitates extended correspondence and constant personal inspection upon the part of the purchaser. The systemization of railway business that is constantly going on renders it more and more easy each year to anticipate the current needs of a railway. One of the most effective avenues of buying cheaply is to publicly and generally invite bids from manufacturers and others for a considerable period ahead. This requires the preparation of careful estimates in advance, and the granting of considerable time in which to deliver the goods. The evolution in railway practice heretofore has not rendered this practice generally possible. The purchase of rails, ties and kindred staple articles has, however, formed an exception to the general rule. These supplies are of such magnitude and cost, and require so much preparatory labor, that it has, as a rule, been necessary that their use should be carefully anticipated and contracts made long in advance.

Some of the most carefully managed railroads invite bids by public advertisement for a year's



supply of such articles as their known wants enable them to anticipate, without reference to the magnitude of the order. This secures the widest knowledge, and consequently general and active competition among sellers. It is in every way creditable to a company practicing it, and when supplemented or attended by active and unceasing "shopping," secures to the purchaser every possible advantage. While every railway company will derive benefit from the widest solicitation of bids, it is probable those companies remote from an abundant market will be more greatly benefited by such a course than others. Their necessities compel them to keep a large supply on hand, while their restricted market places them at a disadvantage in buying, unless through general and judicious advertising they invite the attention of the world to their needs.*

In conclusion, it may be said that the practices of railway companies in regard to the purchase, care and use of material cannot be severely criticised. The work is generally carried on intelligently by alert and experienced men alive to the requirements of the service. However, the subject is still imperfectly understood by many higher officers of railways, and until it is understood the service will suffer greatly.

* "An essential feature, and one often overlooked by purchasing agents, is the necessity of merchants exercising promptness in filling orders after they have been placed. If storekeepers can depend on having their orders filled promptly, it will not be necessary for them to keep excessive stock on hand in anticipating delays."—*Writer on this subject.*

# CHAPTER V.

## ORDERING SUPPLIES—NECESSITY AND VALUE OF PERFORMING THE WORK SCIENTIFICALLY.

The difference between ordering all the supplies required by a railroad company and those required for one of its shops or divisions is very great. In the former case the storekeeper's knowledge must be supplemented by wide experience, careful inquiry and voluminous records. In the latter, an examination of the shelves of the storeroom and the material piled in the yard will do very well to enable him to make his requisition. In the former case the records must show the material on hand at the commencement of the month, the amount received during the month, the amount on hand, the amount used and for what purpose used. A record of this kind is indispensable. But while showing how much material has been used, it will, in many cases, afford no idea of the amount needed, as consumption is likely to be affected by extraordinary demands for repairs, renewals, construction, etc. For this reason the storekeeper must supplement his book knowledge by constant intercourse with the operating officers who use material.





As nothing that concerns the operating department of a company originates with those who handle its supplies, it results that they know nothing of impending wants, and it is only through those who control the work that they can keep themselves advised. The ability of those who handle supplies to procure this information and the intelligence they display in anticipating current needs are evidences of their fitness. If the methods of a storekeeper are imperfect, it will be observable in his work; his orders will be lacking in perspicuity, and he will find it necessary to supplement stated requisitions with frequent orders to meet unforeseen emergencies; material will have to be bought hurriedly, and at a disadvantage, to meet needed wants or to prevent the collapse of some department of the service.

The difference between a man who possesses executive talent and one who does not is the difference between a good storekeeper and a poor one. The former will anticipate the wants of the service with the same accuracy of judgment that a merchant anticipates the wants of his trade; if, however, he is lacking, his shelves will be loaded down with goods that he does not want, while there will be a scant supply of needed articles. A storekeeper of this kind will be a source of constant harassment to those about him and an expense to his employer.

Proper systemization of work requires that there should be stated periods for ordering material. Upon the majority of railroads a month's

supply is all that is necessary to buy in advance. Too frequent ordering of material is objectionable on many accounts; first, because of the extra outlay it entails in handling the goods, and second, in attendant expense of accounting, payment, etc. Orders should cover such supply as can be conveniently, safely and economically stored, without involving depreciation or unnecessary locking up of a company's resources. No rule can be made. It will depend upon the situation of the railroad, the condition of the market, and storage facilities. If the road is remote, a larger supply will be needed than in other cases, because of inability to replenish the stock at will. If the market is a falling one, a management will confine its purchases to the actual daily requirements of the service. If it is a rising market, or promises to be so, the supply laid in will be such as the resources of the company permit, the nature of the material justifies and the probabilities of the market warrant. It is in such things as these that the management of a road evinces its sagacity. Success is measured by commercial instinct. If acute, it will be able to anticipate results; if dull or inattentive, the storm when it breaks will find it unprepared. It is the old story of fitness, with this added—that the men are not operating for themselves, but for others, and therefore lacking somewhat in self-interest. They are, moreover, not selected, in every case, under the most favorable auspices. They are often chosen hurriedly, and not always



with a knowledge of men. They are also sometimes selected from the standpoint of the agent, rather than from the standpoint of the employer. Such things affect and give color to the organization of governments and corporations.

The organization of different railroads in connection with the handling of material is not the same, as I have frequent occasion to notice. Upon some, requisitions are sent directly from local officials to the purchasing agent or manager; upon others, they are sent to a general storekeeper. This last seems to me to be, on the whole, the more advantageous. The reason is, that the supplies of a company should be concentrated as much as possible. They should be kept at some central storehouse and distributed therefrom as local operating officers require, keeping at subordinate storehouses only the amount needed for the moment. The supplies being thus concentrated, it follows naturally that the custodian thereof will possess a better knowledge of the material on hand than anyone else, and will, therefore, be better fitted than anyone else to tell how much it is necessary to buy, and how much may be procured by transfer between different storehouses.

When a company has a general or central storehouse, I think it would be a good plan to make all requisitions on or through the person in charge thereof. These requisitions may be sent forward by him afterward to the purchaser, with suggested changes. The effect will be to secure

concert of action and tend to prevent purchases in excess of needs. It will remove questions as to supplies from the domain of speculation to a more solid foundation. The general storekeeper is the only one having practical knowledge of the subject. His duties are of such a nature as to give him accurate and early information. He sees the material, and his knowledge is immediate and personal. The greater use, therefore, that a company can make of him, the greater the efficiency likely to characterize the handling of its supplies.

Where there is a general supply store, it is desirable that supplies should be sent there for inspection and distribution whenever practicable.

The best method that can be devised for acquiring accurate knowledge of needed material will be defective. It will, therefore, be found necessary to make requisitions outside of the monthly requisition. Particular days should be set apart for these supplementary orders. They need not be many; say, the first and tenth. On these days all orders that cannot await the usual requisition should be sent in. In addition to these, there will still be extraordinary necessities that cannot wait any formal period. But if storekeepers are alert, these added requisitions will not be frequent. It does not alter the case that the storekeeper is dependent upon others for much of the information upon which he bases his requisitions. His ability to acquire this information is one of the evidences of his fitness. His methods must be such as the circumstances of the case require.



He must use tact and avail himself of every opportunity in attaining the information he needs.

The great supplies of railroads, such as rails, ties and equipment, are of such importance and are governed by so many extraneous influences that but little regard is paid to the orders of storekeepers in reference to such matters. The subject is carefully conned by the manager after patient inquiry, and such purchases ordered as the need of the company and its financial ability render possible.

The amount of material that a company will find it necessary to keep in store will always depend upon the certainty of orders being filled as given and the length of time taken to fill such orders. This fact should be kept in mind. If there is any doubt as to whether an order will be filled or not, or any doubt as to the time when it will be filled, storekeepers will keep a larger supply than they otherwise would. Delay or uncertainty swells the amount. They will provide against contingencies. This means greater outlay, greater waste, greater depreciation.

In ordering material, the supply should not be cut down below reasonable wants. The risk and the special expense that attend a short supply are too great.

Not only is the intelligence of an officer evinced in the methodical preparation he makes for supplying himself with needed material, but also in the nature of such material; in his selecting that

which, all things considered, is the cheapest and best; in his avoidance of that which has only outward show to recommend it for acceptance. Brilliant reputations are, perhaps, not made quickly in the exercise of economies of this nature, but their value to a property is very great, not only in regard to the saving effected, but in the morale they foster. The great and permanent properties of a country are commonplace in appearance and substantial in structure. Strength and durability are prime factors. There is no likelihood that the picturesque needs of railroads will ever be disregarded; there is no danger, consequently, that the use of the commonplace and homely makeshifts possible in their operation will ever permanently disfigure them.

In ordering material, the technical names that attach to articles should be used. All abbreviations should be avoided and descriptions supplemented, if possible, by such reference to cuts, drawings or numbers as may serve to explain more fully what is needed. When the article bought is different in any respect from the article ordered, the person making the requisition should be notified, so that he may inspect it understandingly, and if the change is injudicious, may have opportunity to correct it by subsequent representations.

The wide discretion exercised by managers in filling requisitions for material has a tendency to create confusion and irresponsibility if not carefully regulated. In the first place, those



who order supplies should be made to feel that they are expected to confine themselves to absolute needs; that grave responsibility attaches to them for lack of good judgment. It is only in this way that the growth of the competent and self-reliant men that a great corporation needs can be secured. If we pursue the processes of children with them, we shall only attain the responsibilities of children.

When a requisition or order is changed by the official receiving it, the person making it (no matter what his station) should be notified, and the reason given. Co-operation under any other circumstances is impossible, and both the self-respect of the man who makes the change and the man whose plans are altered will be increased thereby. The exercise of arbitrary power without explanation is always injudicious where co-operative effort is necessary. Every person in his place must be made to feel that his responsibility is co-ordinate and that he is entitled to, and receives, relatively, the same regard as others. Men thus treated attach great importance to their actions, and are careful and painstaking. At once there grows up in them not only the disposition, but the ability, to aid those who look to them. Due consideration of matters of this nature is pertinent to the subject and necessary to its elucidation. Wise managers recognize them, but they are neither known nor recognized by those who view the operations of corporations from a personal standpoint.

There can be no doubt that the nearer those who simply serve are able to consider affairs from the standpoint of those who direct, the better agents they make and the more interested they are. This is the observation of men accustomed to direct the movements of others; of the general, of the politician, of the business man. Its recognition will be beneficial to railroads.

In ordering supplies, due consideration must be given to the cost of handling, but it must not be given undue prominence. While expense may be saved by restricting the work within judicious limits, it should never degenerate into a mere matter of convenience.

In order to secure the greatest economy and efficiency in ordering material, preparatory books should be kept, in which known wants should be entered as they arise from day to day. These books should be furnished to foremen and others, so that every means may be exhausted to ascertain, in advance, needs of the service.

As already intimated, economy suggests that all surplus material should be kept at a central depot. Such a course enables a company to keep the bulk of its supplies under its eye, and permits a discretion not practicable when they are stored at widely separated points.

I will not refer here to details connected with the signing and countersigning of requisitions. Such matters are dependent upon the local practices of a company. They are not material. It does not matter whether a requisition is signed



by the master mechanic, superintendent or storekeeper, so that it is authoritative and the person trustworthy.

In reference to the title of storekeeper, it is intended to designate the person immediately in charge of the material; whose duty it is to see that the supply is adequate; that it is duly cared for and properly disbursed. My purpose is not so much to describe what an organization should be as to lay down general principles. The title of storekeeper refers to a particular man in charge of material at shops and other depots of supply. Foremen in charge of track, bridges, fences, buildings and other branches of the service, who keep on hand a supply of material, whether new or old, little or great, are storekeepers in a certain sense.*

Another and an entirely different class of requisitions from those already referred to is that made upon storekeepers by foremen and others for material for work in progress. These orders, experience proves, must be restricted to immediate and present wants.†

* The significance of titles and the key to them I have explained fully in other books. See chapter "Definition of Titles of Railway Officers and Employes—Key to their Significance" in book "Railway Organization."

† It is the practice, in some instances, for storekeepers to deliver large quantities of material in advance of daily needs, charging the material, when thus delivered, directly to the thing on which it is finally to be expended. This saves the necessity of keeping accurate account of material as disbursed, and insures its being charged to the proper account. The practice, however simple and direct it may be, is not justifia-

Charges against operating accounts are based largely upon the orders of foremen and others. When, therefore, more material is delivered than is needed for the accomplishment of a thing, the excess should be returned to the storekeeper or accounted for.

Economy will be greatly advanced by enforcing stringent rules in regard to drawing supplies from storehouses for current needs. The clerical work of making an order is often looked upon as a disagreeable duty. The disposition, therefore, is to make as few orders as possible, and to make them cover a great deal. The result is to withdraw the material from the care of the storekeeper, where it is looked after with such watchfulness as facilities permit, to a place where it has no care at all, or only cursory supervision at best.

It also follows, where excessive orders are permitted (and they are inevitable, except where constant watchfulness is exercised), that material procured for one purpose is used for another, and, while this may not involve actual loss, it occasions confusion in the accounts and renders it impossible to determine cost. The tendency is bad. Responsibility is evaded, as a company cannot tell whether work is being carried on

ble, no matter how much labor it may save the storekeeper, or how convenient it may be in accounting. Material not actually needed by workmen for immediate use should remain in the jurisdiction of the storekeeper, and should not be formally delivered to workmen, or charged to an account, except as it is actually disbursed for use from day to day.



economically or not. Foremen and others ordering material should be required to restrict their orders to known and immediate wants.

Orders for supplies for use upon trains and at offices and stations, and along the line, differ from those already noticed. They, however, require the same careful and intelligent scrutiny. If the orders are large, those who make them feel the responsibility. But in the majority of cases the amount involved is so petty that due attention is not given it. The necessity of economy is overlooked. Such orders make, in the aggregate, an enormous amount, as the expenditures of a company evince. Due efficiency, therefore, requires that they should be carefully audited before being honored.

Judicious "pruning" of orders for small supplies will not only prevent undue expenditure, but will tend to prevent loss or misappropriation.

It is impossible for anyone not familiar with the subject to appreciate the saving that can be effected by restricting supplies to present wants and by carefully ascertaining, after an order has been filled, whether the supply is made to extend over a commensurate period. Upon some railroads this surveillance extends to minute articles. Its exercise excites, as may be supposed, the most heated controversies between the storekeeper and his natural antithesis—the person ordering; the former accusing the latter of extravagance, and the latter accusing the former of parsimony and

with crippling the service through his pinching economy. Such friction is healthy, if confined within reasonable bounds. It prevents undue penuriousness on one hand and wastefulness on the other.

There is, it is probable, no more ungrateful task connected with the service of corporations than the duty of passing upon requisitions and orders. However absurd or excessive, they are not esteemed so by those who make them, and any change or reduction excites their antagonism and chills their ardor; it is a reflection on their judgment, and they receive the rebuke according to their amiability or the thoroughness with which they have been disciplined, but always with bad grace. But the work is necessary if expenditures are to be restricted within reasonable limits. The examiner must take cognizance of every article used. He must commence with orders for equipment, ties and rails, and follow on down the ever lessening items to the most minute article. Each requisition must receive the measure of attention it merits, without reference to the outlay involved, for the reason that business may be harassed quite as much by the want of a blank as by the absence of a bridge. The supervision must, therefore, be searching and discriminating.

The work must be conducted with judicial fairness; in a manner to invite confidence. The examiner must have a benignant temper; his patience must be equal to the most exacting



requirements; his experience such as to fit him for the duty; his power of application commensurate with the tedious character and ungrateful nature of the work. No single person, it is manifest, can pass intelligently upon all the requisitions for supplies that a company needs. If the property is a large one, a man will have to be assigned for stationery and printing; another for lumber and kindred material; another for shop supplies; another for road supplies, and so on, according to the magnitude of the work. The fitness of a person making examinations is evinced quite as much by his ability to convince those whom he finds it necessary to overrule, of the justness of his action, as in the changes he makes, as it is only thus he can hope to prevent a repetition of the mistake. He must not only be able to wisely curtail expenditures, but to enlist the hearty interest of others in his work. The latter qualification is rare.*

* For more minute reference, see specific rules and regulations governing "Requisitions," embodied elsewhere herein. The chapter in question was prepared after careful study of the subject and investigation of the methods of many railroads. It has had the test of trial, and has been found to answer admirably the purposes intended to be accomplished by it, namely, to reduce the amount of material on hand to the lowest possible point; to make those who order material responsible therefor according to their knowledge and position; to surround the purchase of material with necessary safeguards without encumbering the operations of a road with red tape. Particular reference is also made to the book "Fiscal Affairs, Expenditures," embodying not only rules and regulations relating to material, but also the theory and practices that govern the accounts connected therewith. It also embraces a minute description of the

If the duty of cutting down orders for supplies has a disagreeable side, it also has a bright one. There is, to a zealous man, probably no greater satisfaction than to think that through his unaided action he is saving his employer unnecessary expense. The performance of such a duty seems to measure the value of a man's service better than any other. He can, so to speak, count it in dollars and cents. The tendency, therefore, in him is to exaggerate; to consider the act rather than the office. His power tends to make him short-sighted; also selfish. He does not like to share the credit of his efforts with others. He takes pride in being able to guard his employer's interests single-handed. This feeling is exceedingly human. It is, however, none the less to be deplored; none the less narrow and short-sighted. Whenever it is necessary for an examiner to overrule an associate or subordinate, the part of wisdom is to share the credit with the latter. By doing so he will not only strengthen his purpose, but secure an ally. And allied interests are essential to the good government of corporations. Individual reputations may not be so readily built up in that way, but great properties can only be thus maintained. Permanent results are to be secured only by making a force homogeneous; by making persons subservient to the common

theory and practices connected with the keeping of the time of employes of corporations and how the same may be distributed most economically. Also other rules and regulations necessary to the keeping of the expenditure accounts of railroads efficiently, economically and clearly.



good without destroying their individual interest; by encouraging an unselfish disposition to serve the property; by striving to eliminate envy and jealousy from the service. These last two vices are the curse of corporate life, the natural inheritance of arbitrary men; the outgrowth of fear. They retard growth and render men unfit to exercise offices of trust.

# CHAPTER VI.

## REQUISITIONS—HOW TO REDUCE THE STORES OF A COMPANY, THROUGH SCIENTIFIC ORGANIZATION, TO THE LOWEST POSSIBLE LIMIT.

[EXPLANATORY NOTE.—Requisitions may be divided under two heads: First, requisitions to replenish the supplies of a company; second, orders on storehouses for material for current work. In a broad way they are both called requisitions. This chapter explains the principles and rules to be observed in handling each.

A good form of organization is this: First, a purchasing agent; second, a central storehouse where, so far as practicable, supplies are received, inspected and stored for use and distribution; third, local storekeepers in charge of material at shops and elsewhere.

Requisitions should be made on the official in charge at the general storehouse. He fills them from supplies on hand, if possible. Whenever supplies are needed to replenish the stock of the company, he makes a requisition on the purchasing agent.

However, the accompanying rules and regulations are not dependent for their value upon any particular organization; I merely outline an organization I know to be effective.

Attention is called to the form of the requisition.* It gives the amount required, the amount on hand, and the amount that has been ordered but not received. It places in the hands of the general storekeeper and purchasing agent the information necessary to enable them to act intelligently and quickly. This last is very important, as it may be assumed, without argument, that those who make requisitions for material, if not assured that their orders will be filled quickly, will keep a large surplus on hand to meet such a contingency.

The title of Storekeeper is general; it represents properly all who have charge of the supplies of a company at the shops and

* See Form No. 21, Appendix E.





along the line, or who render returns thereof. It also covers those who keep the time of men and render account thereof. Upon some roads the storekeeper will be the official immediately in charge of a storehouse or the person having charge of the time of men; upon another he will be a master mechanic, upon another a division superintendent, roadmaster, civil engineer, purchasing agent, manager, and so on. So that when the title is used it may mean any one of these officials or all of them together.]

### PRINCIPLES GOVERNING REQUISITIONS.

Upon the efficiency of the rules and regulations governing requisitions depends the difference between economy and extravagance; between order and disorder.

The good of a service will be greatly enhanced if those concerned can be led to interest themselves actively and intelligently in the work.

If all who handle requisitions can be induced to exercise prudence, diligence and intelligence, the most satisfactory results will be attained. But if any considerable number fails to do this, improvidence and waste will follow.

Particular officials cannot make up for lack of interest among subordinates.

A railroad is too big for one man to watch even in a limited department.

There must be general interest.

A manager is able to protect the affairs intrusted to him to the extent that he can enlist the hearty co-operation of those about him. This co-operation is to be attained, first, by selecting good men, and second, by wisely governing and trusting them.

The practices of railroads differ widely in regard to their methods of handling requisitions. Upon one line the requisitions of superintendents, master mechanics and others will be made on a general storekeeper, who honors them, if in his judgment proper, without further approval. If he thinks them unnecessary, wasteful or extravagant, he refers them to the proper officer for his action. It is a merit of the plan that it insures the prompt filling of requisitions. This is of the utmost importance. Officials knowing that their requisitions will be promptly filled cut them down as much as they can. They feel that the responsibility is a personal one, and endeavor to meet it fully. When, however, their requisitions are subjected to long delays and the scrutiny of so-called experts before being honored, the case is different; the responsibility is then transferred to someone else; they are, therefore, less provident; they habitually make requisitions in excess of needs to meet possible reductions and probable delays. The responsibility having been placed upon others, they thrust it from them. While not disloyal, they act as irresponsible people do in every walk of life.

I have found it best that the requisitions of master mechanics, superintendents, civil engineers and other trustworthy local officers be honored as soon as received. Afterward these requisitions may be subjected to the most careful analysis by the general manager and purchasing agent. If it turns out eventually that



improvidence or poor judgment has been exercised in making requisitions, the delinquent may be reproved. If reproof is unavailing, he may be dismissed. Where the local official is a capable man, trusting him will make him better, and it is impossible to tell what he is until he has been trusted. In any event, momentary excesses on his part are as nothing compared with those he will commit if he knows that his requisitions will not be honored promptly, and that through this failure his work may be seriously crippled. Wherever such uncertainty exists, he will strive to provide against it by keeping on hand a much larger supply of material than he would think of doing if promptness and definiteness were the rule.*

Some companies will not allow the requisition of a superintendent, master mechanic, roadmaster, etc., to be filled until it has been scrutinized and approved by one or more general officers. This requires time, and if the approving officer is absent or in doubt, the order lies on his desk

* The reader will notice that I continually return to this particular phase of the subject of supplies; to the fact that if requests are not filled promptly, or if they are not filled as called for and prompt notice of the fact returned to the person making them, the result will be to swell the amount of material that storekeepers will keep on hand. Local operating officers will not run the risk (even if their superiors are willing to) of being left without supplies to work with. Per contra, however, many well managed roads will not permit requisitions for material required for use to be filled until they have been passed upon by the head of the department and the general manager or general superintendent, or both.

for days, perhaps weeks, without action. Such delays are not matters of infrequent, but constant occurrence. The result is most disastrous. In every case the approving officer is more or less ignorant of the local situation. But he is zealous, and in his zeal to prevent waste or extravagance he hesitates, or cuts down the requisition. The result of this procrastination and uncertainty is most unfortunate, as I have already pointed out; it compels those who use material to keep on hand a larger supply than they otherwise would. This is demoralizing to the service, and adds otherwise greatly to its cost.*

It has been the experience of companies that have abandoned the practice of requiring requisitions to run the gauntlet of general officers before being honored that such abandonment tended to secure greater care and economy upon the part of local officers in ordering; that it increased their sense of responsibility. Examinations made by general officers are at best only superficial. They create a false situation by building up responsibilities that cannot be sustained or intelligently enforced. The effect is to break down the *esprit de corps* of a service.

The time and place to enforce economy in the supply of material is when requisition is made on

* When a company requires requisitions to be approved by heads of departments and the general management before the material can be supplied from the general storehouse for use, provision should be made to have the work systematically and promptly performed.



the purchasing agent to buy material; not when material is required for use. A master mechanic or superintendent that cannot be trusted to order supplies from a storehouse is unfit for his place.

The attempt of general officers to exercise personal surveillance over supplies retards business and heightens expense. Of this there can be no doubt. It creates delay and uncertainty; fatal elements in business affairs.

Supervision is all the more effective when enforced indirectly. It makes men self-reliant and trustworthy, and no road can be operated efficiently without such men.

Responsible, capable, self-respecting officers can be made only by trusting men.

The foregoing covers generally a plan that I have found to work well in keeping down the supply of material and otherwise heightening the efficiency of the service. It is very simple. It cuts off all unnecessary circumlocution and fastens responsibility upon those officials who are familiar with the local wants of the property. The trouble with most systems of handling material is that they take too little account of the intelligence, interest and practical experience of local operating officers, whereas they are the only officers who really know anything about minute wants. Their responsibility and interest require to be heightened in every possible way, not deadened.

In reference to details, I would recommend:

First, that every act affecting the procurement or use of material should have the concurrent knowledge and sanction of at least two independent departments.

Second, that all material should be bought by an official designated to perform the duty.

Third, that all material that may be sold should be disposed of in like manner.

Fourth, that the right to order material should be restricted to certain operating officers of the company having practical knowledge of the needs of the service.

Fifth, that the receipt, inspection, care and disbursement of material should be intrusted to storekeepers under the instructions of a general officer of the company.

Sixth, that the principal storekeeper should be designated a general storekeeper and that all requisitions for material should be sent to him.

Seventh, that it should be the duty of the general storekeeper to make requisitions each month for all material that is required to be bought, such requisition to be approved by the general superintendent or general manager, or both.

Eighth, that so far as possible the supplies of a company held in reserve for operating and other purposes should be kept at a general storehouse in charge of a general storekeeper, so that only he need provide against the delays and vicissitudes that attend the purchase and delivery of material.



The effect of this concentration, coupled with the knowledge on the part of storekeepers that their orders will be filled without delay, will keep down the supply of material on hand to the minimum.

The efficiency of the service may further be enhanced by employing an inspector to visit periodically the various supply depots of a company to see that proper care is exercised in inspecting, storing and disbursing, and that no more material is kept on hand than is needed.

In conclusion it may be said that no road can be operated either wisely or economically that does not take adequate measures to keep its store of material on hand as small as possible. In order to do this it is necessary to so simplify the question of the procurement of material that all who use it may know exactly what to expect.

### RULES AND REGULATIONS GOVERNING REQUISITIONS AND ORDERS.*

Material should not be ordered in excess of the amount necessary to operate efficiently and economically.

Supplies should not be piled up to avoid making requisitions or to meet contingencies that may never arise.

Requisitions and orders should state the amount of material on hand, the amount ordered but not received, and the additional amount required.

* Requests for material to be purchased or manufactured are properly called "REQUISITIONS." (See Form No. 21, Appendix E.) Requests for material to be taken from store are properly called "ORDERS." (See Form No. 22, Appendix E.) These distinctions, however, cannot always be observed in the rules and regulations.

Requisitions for material for shop storehouses should be signed by the storekeeper and countersigned by the master mechanic or operating officer in charge.

Requisitions for material for tracks, bridges, buildings and similar purposes along the line should be certified to by the storekeeper in general charge of such material and countersigned by the responsible officer in charge.*

In order to prevent excessive requisitions, and the duplication of material, supplies should, so far as practicable, be kept at the general storehouse.†

Local storehouses along the line should only keep on hand such material as is needed to meet immediate wants—say a month's supply.

In order to concentrate purchases, and for other important reasons, requisitions should, so far as practicable, be restricted to one a month. If, however,

* To keep down the supply to the lowest possible limit, it is suggested that the roadmaster compile lists of tools and materials required to be kept on hand on each section, based on the standard of excellence which it is determined to maintain. This will vary on different parts of a road, but the lists should be as nearly uniform and as small as possible. The supply should be reduced on the sections as experience proves its expediency. Each section foreman should be given a copy of the list of tools and materials which he is required to carry, with instructions to renew his supply from month to month as necessary. At designated points on the road a duplicate of each pattern of frog and switch, and a stock of other material in common use, should be stored; they should be so placed that they may be readily loaded on passenger trains when required; this stock should be as small as possible to meet the needs of the service in cases of emergency. An article taken from the stock should be replaced at once. A rule requiring the return of material not needed, and that scrap be collected promptly and forwarded in due course, should also be observed. Requests for material should be made monthly by track foremen on the proper officer, as in other cases; the latter should examine and consolidate these requests.

† In the event a company does not have a general storekeeper, the accompanying rules and regulations, so far as they specifically name him, are, of course, out of place. The officer, however, to whom requisitions are sent will take his place; that being understood, the rules and regulations will fit any situation and apply to any road.



because of omissions, or for other causes, further supplies are required, they should be ordered as needed.

Requisitions on the general storekeeper should reach him promptly, so that abundance of time may be given him to examine into the wants of the company before making the monthly requisition on the purchasing agent.

The general storekeeper should direct local storekeepers when to make their requisitions. It is not in every case desirable that requisitions should be made on the same date, or should reach the general storekeeper simultaneously.

After the requests for the month have been received and examined, a requisition should be made for such supplies as it is necessary to buy. This requisition should be carefully scrutinized by the proper officers to prevent purchases that are unnecessary or improper; also for the purpose of restricting them to particular kinds of material. It is at this point that supervision is most valuable to a company; to restrict purchases to such kind and quantity of material as may be desirable. After material is bought, the local officers of a company may very well be intrusted with the duty of using it without further supervision.

After a requisition to buy material has been examined by the final approving officer, it should be certified by him to the purchasing agent, with such directions as the circumstances of the case demand.

If it is desired to have an article manufactured at the company's shops, a requisition should be made therefor, the same as if the material were to be bought. Exception to this rule may be made when an article is required to meet a pressing emergency. In such a case approval may be obtained subsequently or dispensed with entirely, as may be thought best.

Requisitions and orders should, so far as possible, be filled from the supply on hand, or by transfer from one storehouse to another.*

* It will sometimes occur that while requests may be filled from the supply on hand, it will require that the material should be transported into a neighborhood where it can be

Requests for material should have the immediate attention of everyone into whose hands they pass, and, when finally approved, the utmost celerity, consistent with good business usage, should be exercised in furnishing the supplies.

In order to insure the maximum promptness and efficiency, a record book may be kept at each storehouse, giving the history of each request received, namely, where from, what for, date received, date filled, cause of any delay and other particulars.

In the event a request of any kind is altered, amended, canceled, or action withheld, immediate notice of the fact should be sent to the person from whom it was received, giving the reason; the intent being that every person interested shall be promptly advised, so that they may act intelligently.*

In order to facilitate the procurement of supplies at points most convenient, requisitions should state, when practicable, where the material is to be used.† To prevent rehandling material in car lots it should be sent directly where needed, if practicable to receive and inspect it at such point.

In order to prevent confusion or misunderstanding, orders for the transfer of material, including scrap,‡ from one storehouse to another should be made by or through the general storekeeper.

bought to good advantage. In such cases it may be desirable to buy the supply at the place where needed. Facts like these require to be carefully considered and acted upon in every case in transferring material, and in making and filling requisitions.

* Neglect to carry out this rule will be unfortunate on many accounts. In order to prevent the piling up of material on a road it is necessary, as I have already intimated, that every person in charge should feel that his orders will be instantly filed or that he will be advised. If he has reason to suppose that there will be any delay or uncertainty, he will keep on hand a supply sufficient to cover the contingency of such delay. The unnecessary accumulations of a company may, therefore, be measured by the delay and uncertainty that occur in the filling of requests.

† The articles covered by this rule will not be numerous; they will be of the more bulky order.

‡ Old or worn-out material.



In the event a local storekeeper or official orders material transferred from one depot of supply to another to meet an emergency, notice of the fact should be sent the general storekeeper.

It is the duty of those who have charge of such matters to see that storekeepers are kept promptly advised of all changes in materials, patterns or designs, or anticipated changes, so that requisitions and orders may be made to conform thereto and also so as to prevent an accumulation of material for which there may not be any future demand.

Notice should be sent to the general storekeeper of material ordered by him but shipped elsewhere.

Subordinates in charge of material at storehouses should keep advised of the supply on hand and promptly notify the storekeeper of any surplus or deficiency.

In order to enable storekeepers the better to observe the disposition of supplies and to afford them a basis upon which to compile their monthly requisitions, they should keep a stock book in which they should record the quantity on hand of each kind of material, the quantity previously ordered but not received, and the quantity to be ordered in their next requisition. The stock book should be written up just before rendering the monthly requisition.

Returns of material on hand should be carefully scanned. The form of requisition affords an inventory of such material. The information is intended to aid in reducing requests to the minimum.

To further this last named purpose, and for other reasons, storekeepers should send their stock books with their monthly requisitions. By examining and comparing the requisition and stock book, the general storekeeper will be aided in disposing of the former. Possession of the stock book will also enable him to inform himself as to different kinds of material on hand, condition, quantity, etc. If the amount is excessive in any instance, he should make such disposition of it as the good of the service requires. It will also enable him to keep track of old material, material no longer in use

and other supplies requiring disposition. It will be seen from this, therefore, that the stock book should be carefully written up, so as to afford a full record of material of every kind on hand.

In addition to this, and in order to render the work complete, the general storekeeper or his assistant should at frequent intervals visit the different storehouses and supply depots of the company, and by personal investigation on the spot keep himself advised of the practical aspects of the case in each instance. Personal examinations of this character, attended by full and free conferences with local storekeepers, master mechanics, superintendents and others who order, care for or use material and fuel, will secure unity of action and understanding of the subject all around.

As soon as the general storekeeper has examined a stock book he should return it. The examination should be made within five days of its receipt.

In the event it is necessary to buy material to meet a pressing emergency, in other than the usual manner upon requisition, a request covering the same should be returned to the general storekeeper by the officer making the purchase, and the fact that the goods have been bought noted on the face thereof; also the account to which the material is to be charged. The bill of the goods thus bought should accompany the request. The general storekeeper should forward the papers to the purchasing agent, by whom the voucher will be made.*

But no material should be bought save by the purchasing agent, in due course of business, upon requisitions properly made, except in pressing emergencies that cannot be foreseen or guarded against, where the interests of the company would suffer by delay.

Should an emergency occur requiring the purchasing agent to buy material without a requisition, he should forthwith notify the general storekeeper of the fact, so that the latter may make a requisition to cover the

* The general storekeeper should also make requisition covering the material thus bought, sending it with the bill to the approving official.



same. The general storekeeper should note on such requisitions "Already bought by the purchasing agent."

Requests for material should not be made by telegraph except in urgent cases. When it is necessary, the telegram should be signed by the persons who would, in the ordinary course of business, have signed the request. A requisition or order, as the case requires, should then be made and forwarded without delay. Across the face of such document should be written "Ordered by telegraph."

Orders of foremen and others for supplies for current use should be restricted to immediate wants, as material can be more effectively protected in store than elsewhere. Only such material, therefore, as is necessary in the actual progress of work should be given out.

Material disbursed for a particular purpose and not used therefor should be at once returned or accounted for.

Requisitions for material covering a considerable period of time, such as rails, ties, posts and timber, should be accompanied by such statements and explanations as may be necessary to enlighten the management.

A record should be retained of each requisition by the person making it.

Material should not be drawn from store except upon a written order made by or under the authority of the operating officer in charge.

Orders should be dated, and should specify in detail the articles required, quantity thereof, where needed, and the purpose for which needed.

Orders should be carefully scrutinized, and in the event they seem to be wrong, should be investigated before being honored.

The ordinary form of order may be conveniently used in ordering brasses and tools. It should give the list of articles, the number of each on hand, the number required and the number returned.*

* See Form No. 22, Appendix E. Brasses and other implements no longer fit for use should be returned to the storekeeper when others are ordered to replace them.

As the orders afford, in the majority of cases, the most convenient means the storekeeper has of writing up the accounts, the price of each article should be noted thereon by the person filling the request.

Requisitions and orders should be preserved and filed away from day to day as filled. They are the authenticated vouchers upon which action is based, and without which it would not be proper.

Rails, Ties and Equipment.—As the purchase of these supplies involves a large expenditure of money, relatively, their procurement is made a matter of especial moment by the management. Rules and regulations governing other material apply only generally here—except that purchases will be made only by the proper officials upon duly approved requisitions.*

Fuel.—The peculiar circumstances that attend the procurement, storage and use of fuel suggest the necessity of particular provision being made for supplies of this kind.

Upon some roads fuel is ordered by operating officers through the general storekeeper, as in other cases; upon other lines it is ordered directly of the purchasing agent.

The importance to a company of not keeping on hand a greater quantity of fuel than is necessary is too apparent to need notice; the importance of not running short is equally clear.

Provision should be simple, definite and expeditious.

A very simple plan, and one that will be found to work effectively, will be to have those in charge of fuel along the line make weekly and monthly returns of receipts and disbursements, so that the official in charge may know how much fuel has been ordered at each point, how much has been received, how much there is on hand, how much has been expended, how much is needed.

A system that will work well on one road will not always work equally well elsewhere. I shall not attempt,

* The goods should be invoiced, as in other cases, to the storekeeper in charge. It is his duty to inspect the same and bring them upon the books.



therefore, to formulate here an arbitrary plan. However, there should be the same co-operation and accord between the purchasing agent and the official who keeps the fuel accounts that there is between the purchasing agent and the general storekeeper, co-operation at once hearty, sympathetic and effective.

Whatever the system of handling fuel may be, returns will be required of fuel ordered, bought, delivered and how used. These are fundamental.*

Stationery, Blanks, Blank Books and Printing.—The necessity of special provisions for handling the stationery of a company is generally recognized by those familiar with the subject. As a rule each company has what is called a stationery supply store, where all blank books, forms and stationery are kept. This depot occupies the same relation to stationery that the general storehouse does to general supplies. Orders are made upon it for whatever is required for current use. They are filled by the stationer without delay, if esteemed proper and within reasonable bounds. The number of different kinds of books, forms and articles of stationery required to be kept in stock by a railway company can hardly be computed. Each one requires room for storage where it can be easily reached and properly guarded. The value to a company of a competent and trustworthy stationer cannot be overestimated. He may save or waste a great deal without the fact ever being known.

So far as practicable the rules governing general requisitions should be applied to this branch of the service.

* The following method of handling fuel has been tried and found to work well. Fuel for use in offices and upon trains is bought upon requisitions made by the superintendents. The stock of fuel for locomotives is kept up by the purchasing agent. His purchases are based on the returns from storehouses, made every ten days, of the amount received, consumed and on hand. He gives directions as to the quantity to be sent to each storehouse. Bills for fuel showing car number, quantity, kind, etc., are sent by him to the general storekeeper to be examined and vouched for before being paid. The general storekeeper checks the bills against returns rendered by those in charge of the depots of supply.

The following general directions may be advantageously followed: Requests should be sent directly to the stationer. But no new blank or form should be ordered by him without referring it for correction and alteration to the department in which it is to be used.

Orders should, so far as possible, cover a month's supply.*

The stationer should decide as to the propriety of honoring orders in the absence of definite instructions to the contrary from the head of the department.

The stationer should make a requisition each month for material to be bought for the succeeding month. It should, so far as practicable, state the amount on hand, the amount ordered but not received, and the additional amount required. In emergencies, however, supplementary requisitions may be made.

In order to meet the special requirements of the service, material ordered by general officers should be bought upon their requisition without further approval.

The usual blank requisition should be used by officers in making requests for supplies required in this branch of the service. Agents and others should use the form specially provided.†

Hotel Supplies.—The peculiar character of the supplies used at dining stations and on hotel cars suggests especial provision. Many of the goods are of a perishable nature, and all of such general use that particular provision should be made for their protection. When

* Upon some roads orders are required to cover a longer period.

† Upon many lines a special form is provided for ordering station and office supplies; every form in use by the company is printed in consecutive order, from one upward. Each book, blank or envelope is given a distinctive number, so that all it is necessary to do in ordering is to insert the amount required opposite the form number of the article needed. The supply on hand is required to be given; also the amount ordered and the amount actually received. Stationery required for use at stations may be conveniently and safely forwarded in boxes provided for the purpose, the boxes being promptly returned to the stationer. For form of stationer's requisition, see Form No. 21, appendix.



the general storehouse of a company is conveniently located, there is no reason why the hotel supplies should not be kept thereat; when this is not the case, it will be necessary to establish a special depot for their storage, so conveniently located that supplies may be procured in small quantities from day to day, as needed.

The usual rules governing requisitions should, so far as possible, apply to this branch of the service.

Requests for supplies should be sent directly to the storekeeper in charge; such orders, however, should not be filled until approved by the operating officer in charge.*

The perishable nature of many articles used in the dining car department necessitates their being bought from day to day; requisitions must conform to these conditions. Outside of such articles, however, supplies should be bought in the usual manner.†

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The foregoing directions may be supplemented by brief details:

In order to insure thoroughness, a record book should be kept at each storehouse of articles needed, so that nothing may be omitted when the time comes to make a requisition or order.

Requisitions and orders should be numbered consecutively, commencing with number one on the first of each fiscal year.

Storekeepers should keep themselves advised of present and prospective wants of the service by constant and familiar intercourse with operating officers; otherwise their requisitions and orders require to be supplemented by frequent and unnecessary requests.

* For convenience, a special form is provided for making orders and requisitions, containing a printed list of the articles used, and reciting such other particulars as the special requirements of this branch of the service demand. See Form No. 28, appendix.

† In regard to supplies used at stock yards operated by railroad companies, reference is made to them in book "Fiscal Affairs, Expenditures."

Old or partially worn-out material, and all other available substitutes consistent with the economical and effective working of the property, should be made use of in order to cut down requisitions and orders as much as possible.

No requisition or order should be made without first examining the supply of material on hand.

As a rule, a month's supply should be sufficient. The smaller the quantity on hand the less the deterioration and the less the cost of handling, watching and inventorying. It should not be forgotten, however, that the demoralization of the service and the extra cost entailed, occasioned by a short supply of material, are too great to warrant such a risk.

In making requests, due consideration should be given to the cost of handling, including packing, loading, unloading and accounting.

The material ordered should be such as is most consistent with intelligent economy and the avoidance of annoying circumstances.

In ordering, the distance from the source of supply, the facilities for storing and the nature of the material should be considered.

The foregoing details cover the more important rules and regulations relating to railway requisitions. They bring up, however, incidentally, all the multitudinous details connected with the handling of railway material. Some of these latter may be properly noticed here.

## FURTHER PARTICULARS IN REGARD TO HANDLING MATERIAL.

It is the duty of the general storekeeper and officials who buy material to keep themselves advised of the stock on hand at the various storehouses.

When the purchasing agent buys material he should send a copy of the purchase order to the storekeeper, so that the latter may anticipate the arrival of the goods.

It is the duty of those who buy material to solicit samples thereof, so that storekeepers may be able to



determine whether the goods delivered are such as are bought.

The result of examinations of material made by chemists or others should be preserved and reported without delay to the general storekeeper for record in his office and transmission, if desired, to the purchasing agent or other officials.

In order to enable storekeepers to render due account of goods received and to charge same on their books according to prices paid, invoices should accompany material or be forwarded in advance thereof. There should be no delay in sending documents of this kind; their absence prevents proper inspection and due and necessary accounting.

No payment for material should be made without the written acknowledgment of the storekeeper that the property has been received, inspected and accepted.

The final disposition of scrap and material no longer in use should be looked after by an officer delegated to perform that duty.

Notice of the sale or disposition of material in store should be sent to the storekeeper in charge, so that he may duly account therefor in his returns.*

In the event yearly or time contracts are made with manufacturers or others for particular classes of material, such as castings, car wheels, etc., the material may, when more convenient, be ordered from day to day, as needed, instead of monthly, as the rule requires in regard to other material.†

Notice should be sent by operating officers without delay to the general storekeeper of material that does not come within the requirements of the contract under which it was bought, or which has failed to accomplish results guaranteed by the vendor. It is the duty of the general storekeeper in such cases to forthwith notify the proper official.

* I assume that old material, scrap, etc., is sold by the purchasing agent or some other officer.

† It should be ordered at such times and in such quantities as the interest of the company requires.

Material sent to shops to be repaired should be consigned to the storekeeper. The request should be signed the same as a requisition. It is the duty of the storekeeper, upon the receipt of the order, to see that no delay attends its execution; that the foreman or official whose duty it is to give the matter attention is notified, and that the article reaches him without delay and, when repaired, is forthwith reshipped. It is the duty of all concerned to see that prompt disposition is made of matters of this kind.

# CHAPTER VII.

## INSPECTING, RECEIVING AND CLASSIFYING SUPPLIES.

The importance of inspecting material properly is apparent. It is not enough that supplies are bought judiciously. Intelligent measures must be taken to see that what is bought is received. The duty of inspecting the material of a railroad requires accuracy, intelligence, and a technical knowledge of the thing inspected. These are not to be found in any one man. Different inspectors will be required, possessing particular knowledge of the thing they inspect. They must be men of a high order of integrity, and of a disposition that cannot be inveigled into describing a thing otherwise than as it is. These qualities are not rare among the employes of railroads, and capable inspectors are not difficult to find, but the qualifications needed must be kept in mind in making selections.

The clashing that is inevitable between seller and buyer as regards quantity and quality of goods delivered is greatly lessened when the office of inspector is worthily filled. He has the confidence of those with whom he deals. They accept his statements. He, however, none the

less avails himself of every incident connected with his duties that will enable him to convince the shipper of the accuracy of his inspection.

It cannot be too strongly impressed upon inspectors that the good of their employer requires that they should be entirely fair in their work. A company's interest can never be advanced by attempts to defraud the seller. Honesty, in this as in everything else, is the only policy and should be the standard. A contrary course quickly creates suspicion, rendering merchants unwilling to sell on as favorable terms as they otherwise would; they will take measures to protect themselves, and will offset the dishonesty of the inspector by unfair means in other directions; quite likely by bribing the inspector himself. Indeed, such attempts may be made without any precipitating cause, but they are not so likely to occur if the company is fair and the inspector straightforward.

The danger, however, that inspectors may be improperly influenced, requires that the greatest care should be taken in selecting them, and in governing them afterward.

Venality in the purchase of supplies not only involves payment for inferior goods, but for goods never delivered. The former is worse than the latter. It is more difficult to detect and involves a chain of disastrous consequences. Thus, by the receipt of an article of oil inferior to that purchased, a company is not only swindled as regards price, but its use injures the machinery,



and perhaps precipitates an accident, to the great pecuniary loss of the company.

These things may not occur, but prudence requires that provision should be made to prevent them; the most effective measure is the exercise of good judgment in selecting inspectors, and their systematic government afterward.

It may be set down as a fact not to be disputed that an inspector who will defraud a seller will also defraud his employer if he can derive benefit therefrom.

The disposition of men to seek opportunity to do an unjust thing on behalf of their employers may be accepted as an evidence of instability.

The safety of corporations depends upon the just action of their servants, and whenever one of them construes it to be his duty to lie or cheat on behalf of his employer, he will, with equal facility, lie or cheat in his own behalf if occasion arises. His virtue will not be able to resist the first onslaught, and his seduction and abandonment are only a question of days or weeks.

The duty of inspecting railway supplies should be performed with the same intelligence and care that it would if the thing inspected were owned by the inspector.

There can be no higher standard than this.

The inspectors must be honest, experienced, discerning; men of resolute character. Their experience and talent must be commensurate with their work. They must be able to resist

insidious attentions and flattery, as well as open bribery.

They must be sufficiently skilled to be able to judge of the qualifying features that attach to the material they inspect.*

Inspectors will be variously tempted. It will not do for them to place themselves under obligation to those with whom they deal; to subject themselves to suspicion is fatal to their usefulness.

The duties of inspectors of track material, timber, fuel and kindred supplies are usually arduous and perplexing; they must be hardy of frame and thoroughly skilled. It is said that there never were two ties or pieces of wood exactly alike. Inspectors must constantly possess a thorough knowledge of such material and the use it is to be put to in order to inspect it accurately; to be able to judge rapidly and correctly as to its class and disposition, and to detect at a glance the tricks of dealers.

They must be men of strong character, with confidence in themselves; even tempered, sober and fearless, doing what is just to the buyer as well as to the seller; what is just and fair as between man and man.

* Thus a knot hole may not be objectionable in a tie if not located under the rail; shrinkage in the face of the tie that might not be objectionable in one place would make it unfit for use in another. They must understand the peculiarities of timber embraced or implied under the heads of shakes, wanes, cracks, splits and other attendant conditions; the peculiarities of metals, varnishes, oils, paints, fuel, etc.



As regards details of inspection generally, if material is deficient in any way, either as regards quantity or quality, the fact should be entered on the invoice; or if this document is not at hand, the particulars should be noted elsewhere with a view to their final insertion on the invoice.

The practice observed, when material does not conform to the purchase, is not uniform. In some cases it is returned; in others it is held to await further correspondence. Sometimes such use is made of it as the exigencies of the service allow. The only safe course is to insist upon the delivery of that which is bought; any other entails confusion and possible loss. Circumstances will, however, arise where articles will be delivered unintentionally by the seller that do not meet the requirements of the purchase, that can be used in some other way without detriment. In cases of this kind they should be laid aside and the facts reported to the proper official for decision. If favorable, the exact nature of the material should be noted, and the record book and the invoice made to conform thereto.

A large proportion of the material that is bought requires that a sample should be sent to the storekeeper, to enable him to inspect it intelligently. This practice should be observed. It is only by such a course that sellers can be held to a rigid accountability. The great difference in the kind of goods furnished by different men, or the same men at different times, renders accurate inspection impossible without samples.

While care is always required to be exercised in inspecting and receiving material, it is manifest that greater responsibility attaches when the material is received from a seller than when received from a company's storehouse. Mistakes or omissions in the former case may involve loss in many directions, and are certain to breed demoralization if not discovered and corrected, whereas if the material is simply transferred, the circumstances attending its receipt and inspection are not so important. However, efficiency will be promoted if the work is intelligently and methodically performed in all cases, and all discrepancies carefully noted and reported.

In receiving goods it is desirable, where the name of the manufacturer or seller is not plainly branded on the article, that some mark shall be placed thereon that will facilitate its identification afterward, in the event it should prove to be defective or otherwise than as agreed upon. In the case of round iron, this may be done by painting the end or a portion thereof with some distinctive color. It will never be difficult for the storekeeper to find some simple and effective way to mark material, so that it may be afterward identified.

The practice of accepting material before it is unloaded is not a good one.

Material should be inspected in detail, as it is unloaded and placed in the storehouse. It will frequently be necessary for the inspector to ask



the advice of foremen and others having practical knowledge of the articles he receives. Judicious use of such information, in doubtful cases, cannot but redound greatly to the efficiency of the work.*

Details in regard to inspecting material can only be generally referred to. Each class of material possesses characteristics peculiar to itself which must be taken into account by the inspector. To attempt to define the duties of the examiner in detail would, in many cases, require an accurate technical description of the article used—an absurd and impossible task.

One or two practical illustrations of details connected with the purchase and inspection of material may, however, be inserted here for illustration. Thus, bids for ties:

"All ties must be well and smoothly hewed or sawed out of sound, straight, thrifty timber; must be eight feet long, exclusive of the kerf; must be uniformly six inches thick between the faces; each face side to be six inches wide or upward at the narrowest place, inside the bark, and the faces to be straight, truly lined and parallel with each other. If ties are sawed or split from large timber, they must not be less than eight inches wide on face side, and free from wane, shakes or unsoundness of any kind. The ties to be delivered on ground at or above the grade of the railway track, and within thirty feet of same, subject to the inspection and

* It has been suggested that where a company's supplies are not delivered at the storehouse, it should have a room in charge of a storekeeper, so as to facilitate inspection under the eye of both seller and purchaser; a thing impossible when a company does not accept material until its arrival at an interior point.

count of the purchasing agent, or any authorized agent of the company, whose action in counting and receiving or rejecting the ties offered shall be final and conclusive; inspection will be made once a month, or oftener if required, and payments will follow within thirty days thereafter; station agents will furnish, upon application, the necessary blanks for making proposals. All persons desirous of furnishing ties on the above named terms and conditions will make application through the inspector, who will issue permits; no person will be allowed to place any material on the right of way of the company without special permit to do so."

And for wood:

"All cord wood to be well manufactured out of sound, straight, thrifty timber; to be cut four feet in length, measuring half the kerf, to be well corded in single or double ranks, six feet or eight feet high, the ranks not to be over two hundred feet in length, a space to be left at the end of each rank of at least eight feet before commencing another pile; the wood to be piled on longitudinal sticks sufficient to keep it from the ground, and in all cases to be piled on the ground at or above the grade of the railway track; the end of each rank to be substantially stayed by a good abutment; a space three feet wide to be left between the ranks, if piled in single ranks, or the same space between every two double ranks, if piled in double ranks, so that a man may pass conveniently through for the purpose of inspecting and measuring the same; no round wood to be delivered that is more than six inches in diameter, or less than three, and no split wood that exceeds nine inches in greatest through measurement; no wood to be piled within one hundred feet of a crossing. The said wood to be delivered subject to the inspection and measurement of the purchasing agent or any other agent of the company, duly authorized to inspect and measure the same. The decision of the said purchasing or other authorized agent, in regard to the inspection and acceptance of the wood delivered, and the measurement



of the same, or in regard to the rejection of the whole, or any part thereof, for non-compliance with these specifications, shall be final and conclusive. Hard and soft woods must be piled separately. Measurements will be made monthly, and, until measured, the wood will remain at the risk of the owner."*

In receiving merchandise at stations, consigned to merchants and others, the goods are compared item by item with the way bills as they are unloaded from the car, and all marks and references to excesses, deficiencies, damages, etc., noted. This practice has been found to work well, and it would seem to be a safe plan to follow in receiving material, except that the invoices are used instead of the way bills.

Discrepancies are more likely to be noticed, and accurate account taken thereof, if goods are compared with the invoice as received and tally marks and notations indelibly marked thereon at the time; the number of the car and date received should also be inserted.

If the invoice has not come to hand when the material is received, the record of the requisition may be used. There should be entered on this record the date of receipt of goods, the number of car and the name of the party from whom bought. Afterward, when the invoice has come to hand and been receipted and returned, the fact should be noted on the record. All these details should be inserted on the record in any

* Railway companies usually have special inspectors for ties; fuel, etc. The subject of Inspection is referred to more at length in the book "Fiscal Affairs; Expenditures."

event. They will prevent the certification of duplicate invoices and other irregularities.

The absence of the notations on a record, moreover, will be an indication at all times that the material has not been received or has not been invoiced.

The use of original sources of information of this kind saves clerical labor, and avoids dangers likely to occur when copies are used.

Too great care cannot be exercised to surround the recording and signing of the invoice with proper safeguards, as this instrument forms the basis of the voucher used in paying for the goods. I would not only note the particulars of the invoice, and the signing thereof, as described above, but also further record the fact in the Material Book, thus rendering it doubly impossible to sign unwittingly a duplicate invoice.

I also attach great importance to the use of the original invoice in receiving and inspecting goods. Its possession enables the inspector to devote his whole time to the examination of the goods, whereas, this duty becomes much clouded and in many instances of secondary importance if he must at the same time perform the clerical work of entering the details of the goods in a blotter as he receives and inspects them.*

The value of the invoice to the inspector renders it important that it should reach him at

* A receiving book may also be used and is in many cases. It facilitates the designation of particular lots received from teamsters, etc.



least as soon as the goods; no delay should occur in forwarding it. It should be made on or before the loading of the goods for shipment, and should be sent forward forthwith by passenger train. Its receipt by the consignee is thus assured simultaneously with or before the arrival of the goods. In the event the invoice is not received in time for use in receiving and inspecting the material, the details of the latter should be entered in the blotter and Material Book, of which record notice should be inserted on the requisition record as pointed out.

To facilitate the receipt of material at points away from storehouses, the original invoice should be sent to the place where the material is to be delivered, so that it may be used in inspecting and receiving, as in other cases. A duplicate should be sent to the storekeeper against whom the material is to be charged. When the original is thus forwarded for use in inspecting, there will be no necessity for a memorandum book being kept at the point of delivery. It must be impressed upon the foremen and others receiving material under the circumstances named, that the utmost care must be observed in inspecting and counting, as imposition is much more likely to be practiced under such circumstances than in other cases.

While material must be personally inspected in every instance, it is only by comparisons frequently, that its nature can be determined. The method of comparison is suggested by the

article. Thus, different varnishes and paints may be placed side by side on the same structure. Such comparisons are simple and effective. There can be no escape from their conclusions.

Each day the work of inspecting railway supplies is being simplified by the use of laboratories and other devices. They not only prevent imposition being practiced, but relieve operating officers of much mechanical work that at one time devolved upon them. In the early history of railways, superintendents and others were called upon continually to decide scientific questions without preparatory knowledge. It is needless to say that their decisions were uncertain and unsatisfactory. The organization of testing laboratories has measurably relieved them. Speaking of the duties and value of this new departure, a committee of master mechanics, selected to consider the subject, says:*

"The organization and conduct of a laboratory for testing material is one of the most delicate specialties connected with railway work, and it is possibly owing to this fact that the growth of the testing department idea has been slow. The degree of benefit to be derived from the department depends directly upon the ability both in theory and practice of the men put in charge. Since the investigations required are both chemical and physical, scientific and practical, it will be seen that the chief must be somewhat versed in all these branches. It is not desirable that he should be a specialist, but rather a man with good theoretical and practical education, trained to accurate reasoning and of sound

* Committee of Master Mechanics' Association, composed of Messrs. George Gibbs, David L. Barnes, George W. West and L. S. Randolph.



judgment; he should have had broad experience and be able to generalize from the reports of his subordinates in such a shape that his statements will relieve his superior officers from the necessity of going into details. He must be able to plan methods of testing and experimenting and see that they are properly carried out. . . Much valuable time has been frittered away in testing laboratories by the practice of taking up work which would, of necessity, not give satisfactory practical results, or which, when obtained, are insignificant in value to that of the time wasted in arriving at them. . . . A list of the subjects which can, in our opinion, be profitably undertaken and which will produce results of practical value, embraces: First, routine—physical and chemical work; testing shipments of material kept in stock and bought under definite requirements; second, special work—such as tests of the efficiency of machines, fuels, improvements in mechanical construction and patented devices (whether conducted on the road in actual trial or in laboratory); trials of water purification; tie preservation methods, and others. In the field of 'special work' are embraced those subjects which admit of professional opinion without actual experiment, and for such the experts connected with the department draw upon their knowledge of the engineering practice of the day. . . . The first matter of importance which will engage the attention of the head of such a department is establishing standard specifications for material bought regularly and in quantity. It is a matter requiring the greatest delicacy and knowledge of all conditions in the use as well as the manufacture and market from which the supplies are drawn. . . . The first aim in framing specifications should be to obtain completely the requisite standard for quality, neither more nor less, and in so doing to encroach as little as possible upon the freedom of the purchasing department in obtaining as wide a market as practicable to buy in. . . . A careful study of the method of manufacture of a material will often suggest some simple means of compelling adherence to the best

methods. After establishing the requirements thought necessary, the views of the purchasing agent and the leading manufacturers should be obtained as to their practicability and influence upon market supply. A standard specification should in no sense be considered final, but must be subject to alteration from time to time, as the market supply varies and as service reveals weak points. In receiving materials bought under specifications, samples must be taken representing a certain definite percentage of shipment and acceptance made subject to sample under test. This percentage taken will vary with the nature of the material and a consideration of the chances of error introduced. In buying under specifications, the purchasing agent should maintain a close consulting relation with the testing department as to the uniformity and reliability of the material from different manufacturers. The head of such a department, keeping a close watch of the material under test and under all conditions of manufacture and use, should be able to draw valuable conclusions, to be obtained in no other way. The relations between the purchasing and testing (inspecting) departments of a railroad should be close and cordial."

The practices of English railways in regard to handling supplies are generally the same as in the United States. An officer known as the general stores superintendent ascertains the wants of the service and the best channels of supply. He negotiates the purchase of material and fuel; also the sale of old material. The terms and conditions of purchase or sale are submitted by him to a committee of the board of directors for its decision. When it approves the purchase or sale of material, he issues the order and sees that contracts are observed. Coal, coke and other supplies, not subject to frequent fluctuations in



price, are bought under contract. For convenience of storage and distribution, the material department is divided into four or more principal sections, namely, locomotive and carriage, traffic department, way and works department, and stationery. The sections are further subdivided when necessary. When material is received it is carefully inspected by examiners as to condition, quality and price. It is then ticketed. The tickets show description of goods, from whom received and price; the latter is in cipher.

# CHAPTER VIII.

## CARE AND USE OF ROAD MATERIAL.

Much of the material of a railroad lies scattered along its track, away from the observation and care of storekeepers. It is always more or less of an unknown quantity. Its supervision and custody must be intrusted wholly to others; to men having, to them, more important duties to perform. Of this kind of material, that used in the track is the first I will notice.

The supplies required for the repair and maintenance of track are ordered by the various section foremen. These orders are sent to the inspector or roadmaster and by him forwarded to the officer agreed upon, who further passes upon them.

The limited facilities section foremen have for storing material renders it especially desirable to restrict the amount as much as possible. They need enough to meet current wants and extraordinary emergencies. They should, however, not carry over a month's supply, and in many cases their stock may be replenished oftener than this.

Track supplies should be kept, with other material, at a central storehouse, and should be





sent from thence to the sections as needed. There is no necessity for a separate supply depot for track or other material.*

The greater the concentration, the less the cost of handling, the greater the intelligence in disbursing, and the less the stock required to be carried.

Undue multiplication of storehouses should be carefully avoided.

Storehouses are required at the various centers where equipment and tools are repaired, but there is no necessity for more than one storehouse or one storekeeper at any particular point. If the storekeeper performs his duties, orders upon him will be filled with the same intelligence and promptness that they would if made upon a subordinate immediately responsible to the person ordering. If he does not so fill them, he is unfit. The remedy lies in his dismissal or admonition; not in the creation of another storehouse. It is just as proper to have two superintendents for a division, or two master mechanics at a shop, as to have two storekeepers at the same place. If there is more than one storehouse, one storekeeper should take charge of the whole, the others acting in subordination to him. Such concentration will permit the full utilization of the force, and such concert of action in

* In construction work, or where special gangs are employed, the person in charge should be held responsible for the return to the storehouse of all tools such as tamping and lining bars, etc. The fact that they are in use does not mean that they will be worthless when the work in hand is completed.

regard to the stock carried as to prevent unnecessary accumulations.

Material forwarded to a track section should be charged thereto, the same as if it were a storehouse. The storekeeper who has general charge of track supplies in the hands of foremen should open an account with each section ; the debit to all the sections will make the total amount of material charged against him on the general books.

Foremen of sections should acknowledge the receipt of material and make returns the same as other storekeepers; their returns should exhibit the amount received, amount used, for what purpose and amount on hand. Such a system of returns is easy to maintain.* It renders a thorough supervision of track supplies possible.

The lack of clerical skill upon the part of section foremen is so well known that it was the custom at one time not to require any returns from them of material received, used or on hand. It was assumed that they could not make a return and so the material sent them was charged directly to the operating or construction account, as the case might be. This was a very simple and expeditious way of getting it off the books and into the accounts, but it had a tendency to encourage wastefulness. The books did not show any material on hand. The result was general ignorance, extravagance and excessive accumulations.

* See book "Fiscal Affairs, Expenditures."



The section foreman's lack of clerical skill is partly real, partly imaginary. An extended statement is difficult for many of them to make, but they can set down figures, and if the names of the articles are printed and they are only required to enter the quantities opposite in columns provided therefor, they can carry on a system of accounts that will answer very well for data for those at headquarters.

There are different methods of accounting for track material and labor. One was introduced by the writer several years ago and has worked very well. It does not contemplate any bookkeeping on the part of the section foremen. They are required to make returns of material received, used and on hand; and in regard to labor, of the hours worked, rate, and so on, the forms are printed and provide in a simple way for describing the work in hand.*

The disposition of those in charge of track to order more material than is needed is not greater than in other departments of the service. Nevertheless, economy will be increased by careful scrutiny of requisitions and returns.

The exigencies of the track department require that each section should be supplied with such tools and supplies as are necessary to meet ordinary and extraordinary emergencies; common repairs and renewals, and the exigencies of storms and accidents. This necessitates certain flexibility not necessary elsewhere. But the disposition to

* See book "Fiscal Affairs, Expenditures."

exaggerate, without knowing it, the wants that these special emergencies give rise to, will be apparent and must be met by attentive and careful oversight.

Track material requires to be constantly looked after. Tools and supplies of all kinds must be so guarded as to prevent loss, misappropriation or damage. Old material, except rails, should be collected daily and stored in some convenient and safe place.

More or less loss is suffered, in the majority of instances, because of lack of storage facilities. In some cases no provision whatever is made. In others, proper use is not made of the falicities provided. Care is not taken to store new material, and old material, instead of being collected, lies scattered along the line. Economy and efficiency require that wherever storage facilities are lacking, the evil should be corrected so far as possible, and where they are provided, that due use should be made of them.

It is not necessary to refer to the inspection of track material here. It requires the services of experts, and in order to enforce responsibility on the part of sellers, much of the material must be watched long after it is put in the track. "The inspection of track material is important; angle bars, by reason of worn rolls, will come in such shape that they cannot be fitted to the rail; rails will be defective; track bolts will fall short of the required length, and split bolts will have only the semblance of a split and will, consequently,



be unfit for use. Track material needs a good deal of careful watching if a company expects to get what it pays for and receive what it wants."*

To simplify the ordering of material by track foremen, they should be supplied with a printed list of the articles they use, so that all they need do will be to enter the quantity opposite the article. The point to be aimed at in track accounts is to reduce the clerical labor of section foremen to the minimum. This can be done by using printed forms.†

Many of the conditions that attach to the custody and use of track material apply to supplies for bridges, culverts, fences and buildings.

They are so widely scattered as to render it exceedingly difficult for the storekeeper to locate their whereabouts or ascertain the uses to which they are put. He is aided in this by returns from foremen and others.

His labors will be facilitated by opening a separate account with each lot of material located along the line. This will require that he should have almost as many accounts on his books as the storekeeper in charge of the track supplies of a division.

The returns rendered him by foremen, while not as accurate as could be wished, will afford him the information he requires, and if lacking

* Writer on track inspection.

† I beg to invite the attention of the reader to the forms embraced in Appendix E.

will give him a hint of what is going on, so that he may make disposition accordingly.

Among other embarrassments, he will experience one common to every department of the service, namely, difficulty in securing accurate information of the disposition of material left over after the completion of work in progress. This is a most prolific source of error in railway accounting.

Material ordered for the construction or repair of structures is always in excess of the amount needed. The amount of the surplus and its disposition the storekeeper must know in order to keep his books accurately. But his necessities will not be regarded by those who carry on the work; and unless he is constant and minute in his inquiries, the information will escape him. The omission may not involve actual loss to a company, but it will involve irregularity in accounting, and invites extravagance and irresponsible practices. Moreover, if not reported, one account will be debited with more than it should, and another will be charged with less than it should, if no greater harm ensues. This is an evil in itself, as responsibility cannot be enforced where cost is unknown.

The difficulty of protecting supplies used in connection with buildings, bridges and similar structures is too apparent to need reference here. The utmost protection possible to afford is more or less imperfect. However, care will be more likely to be exercised if the facts are kept before



the eyes of those responsible; if an accurate account is kept of each lot or article of material scattered along the line, no matter where located or how trifling its value or importance. It will serve as a constant reminder, and will prevent material being overlooked or forgotten. This is about all the storekeeper can do. He should require frequent returns from foremen and others of each lot of material, giving location, condition, quantity, value, proposed use, etc.

# CHAPTER IX.

## INSPECTION, CARE AND USE OF OILS AND SIMILAR SUPPLIES.

The losses railway companies have suffered from neglect to provide adequate facilities for handling material have nowhere been so marked as in connection with the use of oils. Wherever facilities are inadequate, the loss is constant and out of all proportion to the cost of correction. This fact is as apparent to the passer-by as it is to experts. The losses railroad companies have suffered in this direction would afford a large dividend on their share capital.

In nothing was the inefficiency of civil engineers and managers so conspicuous in the early history of railroads as in their neglect to provide storage and other facilities for oils, paints and kindred supplies.

The practice of allowing oil to stand in barrels in the open air until used was general. About these receptacles the earth was sodden, while the air was laden with offensive odors. Annual losses were greater than the total cost of providing permanent, ample and secure accommodation would have been. The neglect arose partly from the fact that railroads did not originally contemplate the use of oils in the shape and to the extent that





they subsequently employed them. Absence of provision in the first instance led to neglect to provide for it after the want was known. Conditions have, however, changed somewhat in this respect. Wherever neglect to provide facilities still exists, it is either an oversight or the matter is held in abeyance, awaiting other developments. Nevertheless the waste is going on and is as much a loss as if the company interested were to take gold out of its vaults and throw it into the sea.

Facilities should be provided for oils that will prevent leakage or evaporation. Where justifiable, a separate fire-proof building should be provided for storing. Tanks in which oil is kept should be sunken so that they may be easily and quickly filled and the risk from exposure reduced. Oils thus stored may be drawn by pump as needed; or, if intended for reshipment in large quantities, more convenient means may be provided. If the quantity used does not justify a large reservoir, small tanks conveniently located in the storehouse or in an adjoining apartment may be used.

Oil should be unloaded without delay. If facilities are lacking and it must be stored in barrels, they should be kept moist, especially those containing kerosene. Many railway companies store oils under such circumstances in their waterhouses, where the dampness will keep the packages tight, and so prevent leakage or evaporation.

Under no circumstances should oil be left in barrels exposed to the sun. The most meager accommodation is better than this, and the small expense that a rude shed involves cannot excuse neglect to provide it.

Where facilities are inadequate, the supply of oil should be reduced to the minimum; where adequate, it is probable a month's supply at least may be kept on hand to advantage.

The cost of oil is great or small, relatively, according to the intelligence and care exercised, first, in buying; second, in storing; third, in disbursing, and fourth, in using. Much careful thought has been given the last. However, notwithstanding this, the ties and roadbed of many lines are black with the oil that has been spilled from overloaded journal boxes, or because of careless handling.

The saving that may be effected by the economical use of oils for lubricating and lighting is much greater than would be supposed. It requires constant and intelligent effort. It will be found advantageous in this connection to reward those who are provident and admonish those who are not.

Those who use oils are required to be conscientious. They must possess experience and good judgment. If reckless or lacking in discretion, they will use them in excess lest mishap occur. They will use a quart when a pint would do, for fear of the possibility of a journal becoming heated. The happy mean is the least



quantity that will answer the purpose without risk.

The lack of uniformity in the quantity of oil necessary to be used upon different machines (generally alike or of identical pattern) is well known to practical machinists; improper alignment, defective bearings and inferior quality of metal increase the consumption of oil. These differences lessen the value of statements exhibiting the comparative use of oils by machines performing the same kind of work, and require to be kept constantly in mind.

The superior utility of high priced oils makes them universal favorites. The determining factor, however, all things considered, should be cost. Ease in handling, or convenience and cleanliness, while important factors, should be held subordinate to this.

That kind of oil which, all things considered, is the cheapest, is the kind that should be used.

In disbursing oils for use on locomotives, the amount should not generally exceed the requirements of a round trip. Stations should be restricted to a month's supply; local depots for lubricating cars, supply trains, etc., to immediate needs, not exceeding a month's supply in any case.

The less the stock of oil carried (without transgressing the limits of safety) the more economical its use and the less the waste.

Frequent and limited disbursements also enable the storekeeper to scrutinize use much more

carefully than he otherwise would. Oils are not so likely to be used to kindle fires and for other extravagant purposes under such circumstances.

The economical use of oils should be encouraged in every way. This is one of the objects of locomotive statistics. Among other valuable information, they give the consumption per mile run, and while this is dependent upon the weather, the load and the engine, still they afford generally a valuable indication of the relative economy exercised. Saving may be further encouraged by daily or monthly bulletins showing those who are careful and those who are not. Comparisons of this nature should be published promptly, otherwise they lose their interest.*

In order to make such exhibits, it is necessary that account should be kept of the oil each employe receives. Upon some roads tickets are used for this purpose; different tickets being provided for different quantities and kinds of oil. When a supply of oil is furnished, a ticket representing the quantity is left with the storekeeper; this affords the basis for his charge. The plan works very well, but a better system, perhaps, is to use printed slips upon which the different kinds of oil, tallow, waste and kindred appliances are printed in order. The quantity that the person receives is entered on this slip opposite the kind delivered him.

* These records should be registered from month to month, and form a part of each engineer's permanent record.



Foremen should be required to approve requisitions for oil. It will tend to prevent extravagance and wastefulness. They know better than the storekeeper the needs of the service, and if they perform their duty intelligently, instead of perfunctorily, their supervision will prove highly beneficial. Such approval is not possible (and perhaps not necessary) with engineers, and may be dispensed with. The slips for ordering oil, referred to, are also adaptable for use at stations and elsewhere.

The best manner of supplying stations and buildings with oil is an interesting question. It is generally furnished in cans. The cans are sent backward and forward. The loss entailed through destruction of the cans and the spilling of the oil is a constant source of expense. A feasible substitute for this plan is much to be desired. One method suggested is to equip a car with oil tanks and run it over the road once a month, filling the receptacles at different buildings directly from the car by a flexible tube. The plan is practicable, and it is probable would prove economical. It would save the expense of hauling the cans backward and forward, the loss of oils spilled in transit and cost of maintenance.

The storage of oil should be carefully looked after. No combustible material should be placed near it, and danger from fire should be carefully guarded against.

The person immediately in charge of the oil supply, in common with others who handle such

material, should be subject to the direction of the storekeeper. It should be the duty of such employes to fill the lamps, lanterns, torches, etc., and attend generally to disbursements.

The proper inspection of oils cannot be explained here. It requires thorough acquaintanceship with the nature of oils and the best methods of testing. In some cases primary tests are conclusive; in others they are not. Thus kerosene may be accurately tested, while valve, car and engine oils must be submitted to actual use to determine quality. The observation and experience of the men who use the oils must be systematically sought, practical experience being, here as elsewhere, superior to theoretical demonstration or speculative knowledge. A practical storekeeper, speaking of the manufacture of oils and their inspection, says:

"Many things must be considered. Thus, the quality of lard oil must be determined by chemical analysis; it is only in this way that we can detect when it contains cotton seed oil, or is made from the fat of hogs that have died of disease, or from overcrowding; its burning quality depends upon its being made from the fat of healthy hogs killed for use; machine oils must be tested by actual use and analysis, the evidence of those who use them being necessary to determine their quality. Oils used by us, except car and engine oils, come in barrels. Car and engine oils come in tank cars. Car oil is not to be distinguished from engine oil except by its fluidity, the color, weight and appearance being the same.



On receipt of kerosene oil, a sample is taken and tested in the following manner: We heat the oil in an open cup over a spirit lamp, the bulb of the thermometer being submerged in the oil; after a space of about forty minutes a lighted taper is passed over the oil to ascertain the flashing point, and again afterward, at a higher degree of temperature, to ascertain at what degree it will burn. If it ignites at a lower degree than it should, the shipment is returned; we consider kerosene good only when it will stand the fire test at 150 and 175 degrees. Seal oil must stand the test at 300 degrees We draw our car and engine oil from the tank cars into large vats under the oil house, and pump it from thence by stationary engines into tanks above, from which barrels and cans are filled for shipment to shops, storehouses, stations and elsewhere, as needed. We manufacture our signal oil from lard oil and kerosene or mineral seal oil. I do not know that it is cheaper, but we are more fully assured of the quality when we make it ourselves. We have recently adopted the practice of manufacturing our own valve or cylinder oil; whether it is more economical to manufacture than to purchase, I do not yet feel certain, but we are better assured of its quality; it is manufactured from tallow oil or lard oil, with an equal amount of oil called cylinder stock. The latter is the last product of the retort in refining crude petroleum. Tallow oil and lard oil are the liquid product of crude tallow and leaf lard respectively, pressed at a cold temperature; valve oil is made by placing the two in a tank and thoroughly mixing and heating them to a certain degree of temperature by means of steam coils placed inside of the tank.

In making signal oil for winter use, lard oil and kerosene are used; in making it for summer use, lard oil and mineral seal (at 300 degrees test) are used."

Great progress has been made in the preparation of lubricants for railroads. The process of manufacture has assumed the importance of an industry, and employs extended laboratories and an army of laborers, instructors and inspectors.*

In addition to the chemical tests of oil, various mechanical devices have been invented for determining comparative excellence. While these devices measure the amount of friction and wear and tear, they are far from satisfactory, results obtained varying greatly under apparently similar circumstances. Thus in a series of experiments, ten thousand revolutions were obtained in one case, while in another sixty-four thousand were obtained with the same lubricant, the friction, temperature and speed being apparently the same. "Practical differences of durability of lubricants depend not on any differences of inherent ability to resist being 'worn out' by rubbing, but upon the rate at which they flow through and away from the bearing surfaces.

* The instructors are engaged in explaining the best method of using lubricants, while the inspectors are occupied in seeing that the instructions are carried out, as quite as much depends on the proper use of oils as on their quality. Careful statistics are also kept of results; of the average mileage of journals and such other data as may be necessary to enable railroad companies to determine the kind of oil, all things considered, that is the most economical for them to use.



The conditions which control this flow are so delicate in their influence that all attempts thus far made to measure durability of lubricants may be said to have failed to make distinctions of lubricating value having any practical significance."*

In further reference to storage houses for oil for local use, inexpensive buildings or separate rooms are sufficient, a raised shelf or platform being provided on which the barrels may be placed and tapped when tanks are not provided. If large tanks are used, provision should be made for hoisting the barrels to the top to be emptied. Tin receptacles should be used for catching the drippings from faucets. Oil storage houses for large stocks should be fireproof, one story and basement, the tanks being placed on the lower floor. The second floor should be on a level with the floor of the car. Thus a barrel may be rolled directly over the tank and readily emptied. Light oil shipped in tank cars may be withdrawn with a siphon if necessary. A pump should be provided for each tank for drawing the oil; provision should be made for the drippings to run back into the tank. The second story of the storage building may be utilized for storing oil in barrels, tallow and kindred supplies.

Subsidiary oil houses should be placed in the yards for the convenience of oilers and others,

In cold weather oils must be heated, so that they will run freely. In small houses a carefully

* Professor Denton.

guarded stove may be used for this purpose. Steam heat is, however, better and safer, the coils being placed according to the degree of heat required.

Every precaution should be observed to guard against fire. Oil houses should be kept clean. Open lights should not be allowed. The lighting should be done by electricity, or if that is impracticable, by carefully guarded stationary lamps.

# CHAPTER X.

## HOW FAR RAILWAY COMPANIES MAY PROFITABLY CARRY ON MANUFACTURING—SAFEGUARDS AND METHODS TO BE ADOPTED.

Railway corporations cannot manufacture as cheaply as private parties. The latter are not more discerning in the selection of agents, but more exacting afterward; more energetic, more economical, more quick to reward merit, more quick to discover incompetency.

The supervision of the Owner is immediate, personal and exacting. Moreover, the spur of competition and self-interest heightens the intelligence and intensifies the interest of the manufacturer. He is more careful in selecting the object of manufacture, and in keeping down cost. These facts are well known, and are the reason why railway companies buy from private parties rather than attempt to manufacture goods themselves.

There are, however, articles it is possible for them to manufacture to advantage. But the list is exceedingly small. It is only where the work is carried on as an accessory to something else that it can be done to advantage.

It oftentimes happens in the operation of railroads that the service of a given number of men

is required in a shop for a particular purpose, not sufficient in itself to give them work all the time. If special work is not provided, the force is not fully employed, thus preventing the company from securing the class of workmen it needs or necessitating payment for idle time. Under such circumstances the manufacture of articles may be carried on to advantage, and while the cost may be greater than a company would have to pay on the street, still it will, as a whole, represent saving. Except under such circumstances, a corporation is not justified in manufacturing articles when it can buy in the open market.

There are more or less special, non-competitive articles that railway companies can manufacture economically; articles peculiar to them; devices used on their equipment and machinery; patterns that are not kept in stock by merchants and are not competitive. These articles have grown out of changes and improvements in railway appliances. Thus, nearly every locomotive requires a particular pattern for some portion of its machinery; in other respects it may be of standard construction. Such patterns can, as a rule, be repaired or replaced more quickly and advantageously by the railway company, at the place where needed, than in any other way. The patterns multiply with the development of railroads. The attention that must be given them grows each year. They require a more or less extensive manufacturing plant upon every road.



In some cases railways rigidly restrict their work within the limits pointed out; to accessory work and the maintenance of articles that must be kept upon the ground to prevent the plant lying idle. This is the true basis of railway manufacture. The pressure, however, to extend its scope is constant. It is the outgrowth of widely different causes.

Manufacturing necessitates the employment of a greater force and greater plant than would otherwise be required. This aggrandizes localities and increases the importance of those in charge. The pressure, therefore, to multiply the uses of a shop is constant and pressing. There is nothing inconsistent in this with good faith on the part of the officials and operatives of a company. They felicitate themselves on their increased sphere of usefulness, and do not dream that it is at the expense of their employer. They do not know what the articles they manufacture cost; they know approximately, but not accurately. The methods of accounting in force upon railroads do not generally permit it. To determine it, the latter must take cognizance of every ounce of material used, whether new or old, and of every minute of time expended. Also all accessory items of cost, including transportation, superintendence, wear and tear of machinery, interest and kindred items. This involves an elaborate system of accounts, not necessary or of especial importance if a company restricts its work to those articles that it must manufacture, for reasons already given.

Accurate information is necessary in reference to the cost of every article manufactured. Private manufacturers possess this. No one can afford to manufacture an article without knowing whether he can do so as cheaply as others; whether he can do so at a profit or not. This is the test. Railroads rarely, if ever, possess this information. Their system of accounting is not devised for such purpose; not adapted to it. It takes no note of accessory or collateral items of cost. It takes reasonable account of the disposition of material and the time of men; its main purpose is to secure responsibility; prevent misappropriation or waste of material; prevent time being allowed employes in excess of that actually worked. It is not particular as to fractions of cost. Not only is this so, but the weakness is aggravated by the disposition of foremen and others to reduce cost by fictitious means. There are many ways of accomplishing this, but the one commonly practiced is by using old material in the manufacture of new articles without accounting for it. No particular harm is done by this deception if it is practiced only in connection with articles that railways must manufacture, whether the cost is great or small. But when practiced under other circumstances, it has the effect both to deceive and rob the owner; to encourage him to carry on a system of manufacture that involves loss while apparently benefiting him. It is very difficult to prevent undercharges of this character, for they are thought to



be harmless by those who practice them. Yet the habit must be totally uprooted wherever a company enters into the manufacture of goods. But this latter should not be permitted except within necessary bounds. It may, perhaps, be carried on profitably under particular men or conditions for a time, but the practice will, ultimately, be unfortunate. The safe way is the best way, namely, to restrict manufacture to peculiar articles or work that is carried on as an accessory to something else.

The list of articles that a railway company may manufacture to advantage will depend upon the nature and extent of its property. Also, somewhat upon location. But it will be great in any event.

If locomotives, cars and the appurtenances of railroads were uniform, it would not be necessary for them to manufacture a single article. Their efforts would be confined wholly to repairs. Dealers would keep the market supplied. But lack of uniformity compels each company to provide facilities for repairing and renewing articles peculiar to it, without delay and where needed. It might keep duplicates of each article in stock to prevent machinery lying idle. But this would be impracticable. The number would be infinite and the cost prohibitory. Repair shops must, therefore, be located along the line so as to be quickly and easily accessible, where breaks may be repaired or simple articles renewed when necessary. They must be general in their use. This suggests an embarrassment.

In corporate affairs it is the disposition of every department to provide for its own wants rather than combine with other departments for common needs. This tendency on railroads, if unrestrained, evinces itself by a repair shop for locomotives, another for cars, another for track implements, and so on. One, however, is sufficient for all, except in the case of construction shops.

By restricting the number of shops and enlarging their usefulness, greater economy of labor and efficiency of service are secured than is possible otherwise. An objection is that the work of particular departments is not attended to as promptly as if carried on by a subordinate department. This criticism is not tenable. The trouble does not lie in concentration, but in lack of general interest on the part of the person in charge. The remedy lies in disciplining the delinquent, not in duplicating him.

The repair shops along a road, when systematically regulated, are graduated in importance from the petty shed with a blacksmith's bellows and forge to the central shop where all repairs and renewals, so far as the convenient and economical working of the system will permit, are carried on. The small shops in their order are the avenues that lead those in charge to positions of greater importance, and teach them and stimulate their ambition. The necessity of harmony and subordination is imperative.

Each shop should be held subordinate to the



one immediately above it and wholly so to the general repair shop, where all new work and general repairs should be done, so far as possible. Without constant watchfulness, the tendency, however, of each shop will be to make its usefulness general; to grow from an accessory into a system.

A great deal of thought has been given by manufacturers to means of ascertaining cost. No one appreciates so fully as they the importance of this. It is necessary among other things to enable them to put a price upon their goods. In its furtherance they have availed themselves of every device that the ingenuity or experience of men could suggest.

These devices should be carefully studied by storekeepers and accountants, and when a company attempts to do more than manufacture and repair articles peculiar to it or necessary to its convenient and economical working, measures for accurately determining cost should be vigorously enforced.

Those in charge of accounts owe it to their employers to prevent any concealment of the cost of an article. Every opportunity should be taken to make it known to the management. It is the basis of responsibility. The duty is not discretionary, but imperative.

In the manufacture of goods, more or less material is ruined or damaged. The fact should not be concealed, but such disposition made as circumstances suggest. The practice of English

roads in regard to damages arising from neglect of duty or awkwardness upon the part of operatives is much more severe than in America, as their regulations evince.*

In the manufacture of articles it will greatly facilitate accounting if each article or group of articles is given a particular number.

When a workman is credited with what is due him for labor, the number upon which he has labored is charged therewith.

The use of numbers will save a great deal of writing.

The name of the article or group of articles numbered is kept in the office of the storekeeper for reference and final use.

When the work of manufacturing is completed, measures should be taken to ascertain and make known the average cost. Comparison should, if possible, be made with similar articles. If the cost is excessive, or is thought to be so, the material used should be carefully scanned and the men engaged in the work interrogated, if need be. The investigation may not serve any useful

* "Any workman making any article of wrong dimensions, or finishing work in an inferior or unworkmanlike manner, must make good such work, and pay any extra expense that may be incurred, he being allowed the value of old material for such work spoiled. Any workman injuring a machine, or other article, through carelessness or neglect, shall pay the amount of the damage, and be fined two shillings and sixpence. Any workman knowingly making use of materials which are imperfect or otherwise unfit for the intended purpose, to pay all expenses incurred thereon, after the discovery of the defect."—*English Rule.*



purpose at the time, but will have the effect to suggest greater economy in future, if there has been extravagance. The value of supervision of this nature to a company is very great. It will restrain extravagance and bring to the notice of the management those who are efficient or otherwise.

Private manufacturers discover efficiency intuitively. Great corporations discover it more generally through the mechanical processes that exhibit results; through the accounts. These processes consequently are of especial value to them and should be regulated accordingly. If neglected, experience, capacity and faithful service will oftentimes remain unknown and unrecognized.

# CHAPTER XI.

INSPECTION, CARE AND USE OF BRASSES, BABBIT METAL, AND SIMILAR MATERIAL — FISCAL METHODS.

The great value of brass and the general market that exists for it add to the difficulty of protecting it. In shipping from one point to another it is necessary to lock and seal the cars or otherwise surround the material with especial safeguards. Brass in store must be guarded as carefully as silver. The danger of loss is constant and imminent, not so much from employes as from others.

Methods, at once varied and ingenious, have been adopted to prevent the loss or careless handling of brass and similar material; aside from the rule requiring it to be carefully guarded, the rule that those who make requisitions for such material shall return the worn-out or broken articles, has been the most effective. It is very simple. But it makes everyone particular. Thus, when an accident occurs, the person in charge collects every article that has to be replaced. Without it he is sure to experience more or less trouble in replenishing his stock. Its possession facilitates the exchange; renders his task easy.





This system of exchanges is a constant reminder to engineers, car repairers and others that in order to replenish their stock they must preserve worn-out and broken articles; must not allow them to be lost or carried off. Such exchanges are constantly going on.

An account should be opened with each person to whom a brass is given, charging him with the number. When the article is returned worn out or broken, a new one is given in exchange. The original charge need not be disturbed. When, however, a person leaves the service, the account should be closed.

In the event the supply in the possession of an employe is lost or diminished, the books should be changed accordingly. The English companies are very strict; if satisfactory account cannot be given of a missing article, its custodian is held responsible, the value being deducted from his wages. This is generally fair and cannot prove a hardship, while its enforcement will prevent many irregularities and losses.

Brasses in the hands of workmen should be inventoried monthly, or oftener, when those having them in charge leave the service.

It is impossible to prevent occasional loss of a brass, but the circumstances attending the loss can be explained. The interests of the service require that this explanation should be promptly forthcoming in every instance.

In addition to orders for brasses and kindred articles to replace those worn out or broken, there

will be a demand for such supplies to form new stock; original orders, in fact. In such cases there is, of course, no old material to give up. The storekeeper should satisfy himself that the order is necessary and equitable. If the issue is for construction purposes, or immediate use, the charge should be made accordingly. If it is to be held in reserve, it should be charged to the person holding it.

The number of different forms of brass castings that a railway company uses is much larger than would be commonly supposed. The care of patterns and the protection of the material before and after manufacture require ample provision. Wherever possible, a separate room should be provided. When the supply does not justify this, a secure cupboard or other inclosure should be used.

It should be remembered, in this connection, that it is oftentimes more important to protect the raw material or scrap than the manufactured article. This is so when the latter has a mark or stamp upon it by which it may be identified. However, guardianship must in all cases be incessant and intelligent.

In distributing brasses, the rule observed in the case of other material, that the supply shall not exceed actual needs, should be rigidly enforced.

Not only must articles in store and in use be carefully looked after, but all equipment passing to and from other roads must be inspected at the



time of transfer, and articles worn out, damaged or missing properly noted and return made thereof. The importance of this examination has suggested to the car department of railways the necessity of co-operating in the work and of having it carried on systematically by skilled inspectors.

In reference to forms of accounting, they should be such as to render the work easy, simple and thorough. The blank for ordering articles should have printed thereon the different kinds used. It should contain a column for entering the number on hand; also the number returned. If an article has been lost, there should be a place for explaining the loss. If an employe is responsible for the loss, the English companies, as already pointed out, require that he should pay the value of the article. Orders for brasses should specify the purpose for which they are to be used, and in the event they are not thus used, immediate notice of the fact should be given the proper official.

The loss of brasses, babbit metal and similar articles suggests others entirely different. Take the item of stationery, for instance. Everywhere employes use the stationery of their employers as their own. The universality of the practice excuses and justifies it. It has its counterbalancing considerations. The practice is more common with the employes of private individuals than with those of corporations. The use of the paper, envelopes and stationery of the employer is recognized as a perquisite of the employe.

Abstractly considered, the practice is indefensible. As a matter of fact, the employer does not suffer at all, or only in a minute sense. The use of his stationery advertises him, while it assists those under him to eke out a slender income. So long as it is thus restricted, no harm is done. In all other things, however, the property of employers should be scrupulously respected. When it is not, the act is indefensible; this is especially the case if the appropriation is for purposes of gain.

The benefits that employes derive from the concessions and courtesies of employers are much more general and valuable than is commonly supposed. They are none the less valuable because the employer does not always suffer from them. Thus, the passes given employes are of enormous value to them, while the loss to the company is very small, if it suffers any loss at all.

In the majority of cases those who use the passes would not travel without them, and in other cases the employer is recouped by the increased loyalty of his servants, and by their ability to work for less wages. I might greatly extend the list of mutual benefits. It is, however, unnecessary. I refer to the subject simply to illustrate the beneficent relations that exist between employer and employe, and the general disposition of the former to aid the latter.

# CHAPTER XII.

## COLLECTION, CARE AND UTILITY OF OLD MATERIAL.

There are two classes of old material: that which has no value except to the junk dealer, commonly called scrap, and that which may, with slight repairs, be used again.

In the hurry of business more or less material that might be used again finds its way to the scrap heap.

Old material should be examined, first at the place where it is collected and afterward at the general depot. This double inspection will prevent material being sold that may be used again.*

It is probable there is as little waste on a railroad as elsewhere. But there will always be such instances. It does not matter whether it arises from ignorance, thoughtlessness or indifference; the monetary loss is the same. Instances, while not common, are frequent. Thus, switch chains, frogs, bolts, injectors, cylinders, cocks and similar implements that might be used again, are thrown aside as worthless. In order to prevent the losses their sale would involve, it is necessary that old material should be inspected by men capable of

* "Any person putting material upon the scrap heap which is otherwise valuable, or carelessly wasting material in any other way, will be punished as the case may deserve."—*Extract from Rules of English Road.*

determining that which is usable from that which is not; and who, moreover, will call the attention of officials to persistent cases of neglect.

After usable material has been separated from the other, the latter must be assorted according to its value. This is very important. Iron, steel and brass, for instance, must be kept separate and classified according to value. To mix the different kinds and classes is to lessen their value.

The promptness and thoroughness with which old material is collected, assorted and stored is an evidence of efficiency.

Neglect breeds demoralization, besides the direct losses it engenders. It is frequently excusable, because of other and more urgent duties. It is a question of values. For a busy man to leave his work and go out of his way to collect old material of less value that is in no immediate danger of loss or misappropriation, is not economy. But if risk may be avoided by placing convenient receptacles for old material about the various buildings and along the track of a railroad, where it may be deposited by men otherwise occupied, then, undoubtedly, neglect to do so is inexcusable. The work of removing the material from such receptacles is not important. It may be carried on at such time and in such manner as may be most convenient. Wherever provision of this nature is neglected, the loss of old material will be constant. It will be covered up with cinders, dirt, weeds, brush and grass; will be hidden away behind buildings and under



platforms and stairways, or stolen by the thieves that lurk about every railroad yard.*

The old material that accumulates about particular stations, offices or buildings is oftentimes so small as hardly to merit attention. It possesses, however, in the aggregate, an enormous value and its care merits the same attention as other matters.

Another class of old material should be noticed, namely, the papers and books that accumulate about the stations and offices of a company. They are of sufficient value to make them worthy of attention.

The separation of the papers and books that it is desirable to retain from those which may be sold requires to be conducted with the greatest care. The work must be performed by those experienced in such matters, and able to distinguish at a glance that which may be safely disposed of from that which must be kept. The assortment of papers must, in the majority of cases, be made at the place where the papers have accumulated. No rule can be laid down except, perhaps, in reference to traffic papers and books at stations.

The great bulk of papers at the headquarters of a company must be kept, practically, forever. They may not, indeed, be necessary to protect

* "Each foreman should be responsible for collecting any coupling chains, hooks, pins, iron, or other material which may be found on the line, and for having them conveyed to the nearest station weekly."—*Extract from Rules of English Road.*

the company, but no one can tell when they may be necessary to protect the good name of some officer or employe.

In regard to accumulations at stations and local offices, it is a good rule to require that no book or paper shall be disposed of except under the direction of the authorized officers and inspectors of a company.

Traffic papers must be retained until the expiration of the period of limitation fixed by statute. This period varies in different states, and in order to cover interstate business the records must be retained for the longest period of time which the statute of limitation covers in any particular state. When no claim against the carrier for loss, damage, overcharge, or other purpose, as represented on such papers and records, can be prosecuted, they may be sold.

It should be the duty of inspectors and traveling auditors, when visiting places where old records and papers accumulate, to personally superintend the waybilling and shipment of the same to the sales agent or general storeroom. The waste paper that accumulates about offices should be preserved and shipped with the records, as stated above; or if it is inconvenient to retain it until such time, it may be shipped separately.*

* I think it would be a good plan for every company to have a central storehouse, conveniently arranged, for keeping their old books, records and papers until such time as they may be sold.



Old material should not be sold, except under the direction of an authorized officer. The necessity of limiting this power is manifest. Such sales are commercial transactions and require commercial skill and knowledge. They should be governed by the markets of the country and with due reference to transporting from one point to another, including cost of handling. In this way material will be disposed of in the place where it accumulates, if it can be sold there to advantage, thus saving the company the risk and cost of transportation and rehandling. The seller must possess a general knowledge of markets in order to get the highest price. Only those who make a specialty of such knowledge possess it.

When old material is shipped directly to a rolling mill, or elsewhere off the line, without weighing, the agent of the company on the ground or at some intermediate point should weigh the same and certify the weight to the storekeeper making the shipment; also to the proper officer of the company. At the close of each month, moreover, such agent should make a report to the officials named of all cars thus weighed, specifying the date, number, kind of scrap, consignee, weight, and such other particulars as are necessary to enable the company to keep accurate and full account of the same.

Much of the old material that accumulates cannot be identified. This will be so in regard to the filings, drillings and borings that accumulate about a shop. It has been suggested that a

good way to dispose of such amounts is to place them to the credit of a general account, and apportion them afterward to the different maintenance accounts (with which the shop keeps account) on the basis that the amount expended on such accounts bears to the total amount of material expended. Thus (if it is a locomotive shop), the credits would be apportioned to the various locomotives according to the total amount charged to them during the month. The same rule should be followed in regard to cars and machinery. If it is a shop where all kinds of work is done, the apportionment must be general, to the extent that work is general. Whenever the amount of accumulated old material justifies it, a division may be made on the basis of particular classes of material; thus, credits for old cast iron would be based on the amount of charges for cast iron; credits for old car wheels on the new wheels used; old wrought iron on the wrought iron charged, and so on. By devices of this kind each storekeeper will, according to his intelligence and interest, be able to arrive at an accurate disposition of the credits that arise from old material.

# CHAPTER XIII.

## ACQUISITION, CUSTODY, PRESERVATION AND USE OF TOOLS.

Railways require to exercise care in guarding their tools and hardware. Every company loses more or less of such articles. They are coveted by some because of the price they will bring; by others for their use simply. The latter is the more frequent occasion of loss. Indeed, the number who purloin to sell is so small as to hardly merit attention.

Tools of common use, such as saws, hammers, files, hatchets, also lamps, are so convenient about a house that they offer constant temptation to the unthinking. To buy would be a hardship, perhaps an impossibility. Moreover, acquisition without purchase enhances the satisfaction of ownership; makes the thing doubly valuable. Such is the perversity of human nature. Many articles of hardware are also taken for like reasons.

There is something very attractive about new tools and hardware to a mechanical man. They possess a glossy, cheerful look, that suggests many uses. The sight of them creates a desire to own. They are to him what a piano, or clock, or vase is

to a town lady; an assortment of choice household utensils to her rural sister. But what is singular is that the taker does not associate the idea of stealing or wrong-doing with the act of taking. The personality of the owner is so vague that he is entirely forgotten; his rights not considered.

Indeed, the distinction between owner and employe is often lost sight of by those who work for corporations. Not that the latter are dishonest; they are not. But the spades, axes and shovels that lie scattered here and there seem to have no owner; seem to be quite as much the property of one man as another, except that they have much less relative value to the owner than to those who work for him.

What more natural, then, than that the shining implements the thrifty householder needs should sometimes be borrowed by him and that their return should sometimes be overlooked and finally forgotten? Such practices are not general. On the contrary, they are exceptional, and those who indulge in them (small as the number is) would be horror stricken if told they were committing a crime. The act is not criminal except when committed by criminals. It is the result of thoughtlessness growing out of the neglect of the owner to properly guard his property. It is, however, none the less to be discouraged. The losses it engenders, while they do not seem to affect anybody, really affect the fortunes of individual people, as real and *bona fide* as the employe himself.



The indefensible acts of the few necessitate rules and regulations governing the many. Such is the origin of the law. It holds in check the upright and strong, as well as the vicious and thoughtless. The same is true of the rules and regulations of railroads, more particularly those looking to the protection of property.

Strict rules are necessary to prevent the loss of tools, or their abandonment, while still serviceable.

Many tools, that might still be used with a little repair, will be cast away if care is not exercised. Improvidence will also characterize their use. I have heard it stated (whether truthfully or not I do not know) that the wear and tear of a company's tools in the hands of mechanics amounted to fifty per cent. per annum, while in those cases where the tools were owned by the operatives themselves, it was not over twenty-five per cent.*

The propensity to appropriate or ill use property belonging to others must always be guarded against. A means of guarding the supplies of corporations in the hands of employes is to restrict disbursements to actual needs.

The disposition of employes to order more than

* On the other hand, as a set-off against this apparent loss, it is stated that where employes use their own tools the result is not satisfactory. To use the words of my informant: "There is a question as to the advisability of employes using their own tools; they will work with them just as long as possible, and the consequence is that they will not do good work, and will take too much time for that which they do."

is needed, and to fail to properly guard the surplus, is natural and unavoidable.

It is difficult to build up economical habits in employes.

It is easy to build up extravagant habits in employes; the latter are aggravated by loose methods of government.

Frequent changes of managers are demoralizing. They breed uncertainty. One official will enforce the most careful economy in the use of tools; another will not give the matter any consideration at all.

Rules and regulations should be uniform and consistent—such as not to harm anyone honestly desirous of fulfilling his obligations, but sufficiently strict to reach the thoughtless, the improvident and vicious, taking hold of the latter, indeed, with iron hand. The English railroads are very strict in this respect, and much more methodical in their measures of government than we are. Some of their regulations will be found embodied further on in this chapter. Many of them sound very queerly to us; they have a smack of frankness and good sense about them that is refreshing to Americans, who durst not, for their lives, call a thing by its old-fashioned Saxon name, if it refers in any way to the populace, more especially the voters, who, in our lofty sentimentalism, we agree in designating by the euphonious title of "wage workers."* If the

* When I worked upon a farm, I labored; was called a *Laborer*, was a *Laborer*. Since then, however, the word has apparently become offensive, as we no longer hear it. Under similar circumstances I should doubtless now be called an "Industrial Agent," "Soil Cultivator," or "Wage Worker."



wage worker, however, be a man who has accumulated a little money, a few shares of stock, by his industry and saving habits, the case is different. In such event it is fashionable to call him a thief, monopolist, gold bug, speculator, a grinder of the faces of the poor, and so on. If we want a vote, this will help to get it, and none of us knows when we may want a vote. We all of us have a weather eye for the offices, and a soft side for the voter! We are very tender of him in the aggregate; very neglectful of him individually.

In giving out tools, an account should be opened with each employe, charging him with those he receives and crediting him with those he returns or accounts for.

No tool should be given out, except in exchange for an old one; save when an original stock is created. Those who have tools should be required to return them before getting new ones. This rule is so simple that anyone may understand it, and so comprehensive that its observance will protect a company from carelessness and theft. Of course there will be exceptions to the rule. Articles will be lost or stolen without anybody being to blame. In such cases it would manifestly be unjust to compel the employe to make them good. Exceptions, must, therefore, be made. But the utmost thoroughness

and frankness should be observed in scrutinizing losses and in looking after property in the hands of employes. This will not injure anyone, and will benefit all.

No specific rule can be laid down for guarding articles in the hands of employes. It must be such as circumstances require. Thus, rules that are practicable for implements used by mechanics about a shop would not answer for those used by train, station and road men.

Where a storehouse is in immediate proximity to a shop, it should be made the receptacle for storing tools at night or when not in use. In other cases, different provision must be made, but it should be of the same general nature.

The more simple and economical the method of keeping a record of the tools in the hands of employes, if it accomplishes the purpose, the better. It has no value except for the moment. It does not invite elaborate bookkeeping.*

When tools are delivered for use away from the storehouse, a receipt should be taken and a special charge made against the employe. A duplicate of the receipt should be kept by him, so that he may always have a record of the article charged against him. A very good way to treat such accounts is that observed by banks with their bills receivable account. Thus, when a charge is made, the credit line opposite is left blank until required to offset the debit. The

*See chapter "Care of Material" in book "Fiscal Affairs; Expenditures."



blank lines on the credit side always show the number of bills unpaid. With charges for tools, the number of blank lines opposite the charges would represent tools outstanding in the hands of workmen, and a casual glance would inform the storekeeper of the status of each account.*

The tools and devices of a company should, so far as practicable, be stamped with its name. Articles in the hands of employes should bear their private mark.

In order that due responsibility may be enforced on the different lines of a road, a record of the tools used must, under certain circumstances, be kept by a particular storekeeper; all other storekeepers must report to him. If a trainman can procure tools at different storehouses, the charges therefor should be summed up by the general storekeeper and the recipient held responsible for the aggregate number he receives. To enable this to be done, each storekeeper must report to the central storekeeper daily the articles he delivers. If an old article is returned in exchange, the fact must also be reported, so that credit may be given. This concentration of accounts is unnecessary, except in the case of employes who procure tools at two or more storehouses. When they are supplied by a particular storekeeper, such storekeeper can exer-

*The form of return described in connection with the distribution and use of station and train supplies is, perhaps, superior to this method.

cise the supervision that the central storekeeper exercises in the other case.

Not only should old tools be returned before new ones are issued, but the rule should apply to other articles, such as paint brushes, brooms, lanterns, feather dusters, pails, switch chains, jackscrews, wheelbarrows, crowbars, etc. It should apply to every article which, when no longer needed, may be returned as evidence that it has not been misappropriated or lost through neglect or otherwise. The list comprises an enormous number of articles of small value; superficially, a record of them will appear unnecessary and extravagant. But this looks only to the act, and not to the effect; considers only the value of particular articles (which is not great), rather than the aggregate value, which is enormous.

Orders for tools (except when old tools are exchanged for new ones) should be approved by an official conversant with the needs of the person making the order. This duty requires experience, firmness and tact.

If tools cannot be delivered to the storekeeper at night, as described, secure boxes should be furnished in which to keep them. The rule should be to place it within the power of every employe to protect the property intrusted to him, so that if loss occurs, the presumption will be that it is because of neglect.

An inventory should be taken at frequent intervals of all tools in the hands of employes.



When an employe leaves the service, or has no further use for tools, they should be delivered up or accounted for before paying him his wages.

An inventory of articles in the hands of employes will serve to discover any not needed. If articles are found not charged, it will indicate lack of efficiency in disbursing or accounting. The inventory will also call attention to the condition of property in the hands of employes; the care they exercise, etc. It emphasizes the necessity of guardianship.

Tools used on locomotives should be issued by storekeepers on orders from foremen. So far as practicable, enginemen should get their supplies and tools from one place. For example, an engineer running between Boston and Albany should procure what he needs from the Boston shop, getting at the Albany shop only such tools as are indispensable for his trip to Boston. The master mechanic can regulate the furnishing of tools to enginemen by instructing them where to procure what they need, and by giving the foremen at different shops instructions as to what runs they shall supply. In this manner the different foremen can keep posted and will know if an engineman is careful in the handling of his tools or not.* Engineers, as a rule, are careful. They like to feel sure when they start out that they

* If the rule required that all tools disbursed should be reported to a central shop, this requirement would be more easily enforced than in the manner stated here.

are not going to run short of anything, and as they do not like the trouble of going over their stock at the commencement of each trip, they keep their tools under lock and key.

A plan for keeping account of locomotive supplies, that has been attempted, is worthy of notice. It has been found to work very successfully. It is this: Engineers are furnished a record book, in which the articles used on locomotives are printed in alphabetical order. When supplies are required, this book, with the necessary order for supplies, is presented to the storekeeper, who enters therein the quantity furnished and the date. At the close of the month the engineer signs and dates the record and sends it to the master mechanic, in this way furnishing a statement of supplies issued to him during the month. Excessive orders, if any, are noted by the master mechanic, and the value of the supplies issued and the average cost per mile run during the month ascertained. Engineers working under similar conditions are grouped together and a statement compiled showing the cost of supplies furnished each, the number of miles run and average cost per mile, which is posted monthly. The result of each engineer's work for the month is made a part of his personal record, and is taken into consideration when men are to be advanced to more desirable positions. It is believed that this practice results in a more economical use of supplies. The engineers are thrown into more active competition with each other, and by carefully



grouping those running under similar conditions, a fair comparison can be had.

Orders for tools for use on trains should be made on the storekeeper by the conductor, but should not be filled by the storekeeper until approved by the superintendent or some authorized person.* Trainmen are inclined to be careless with tools, if all that is necessary to obtain new ones is to make an order on the storekeeper. But if the order must bear the scrutiny of the superintendent, they will be more careful.

The storekeeper should be empowered to refuse to fill an order if he sees anything out of the way. For instance, if he should know that a conductor had recently had a number of tools similar to those called for by an order, he would be justified in referring the requisition back to the superintendent for further consideration. As a rule, an order that a storekeeper would not fill would never be taken back to the superintendent. Tools on trains, unless carefully looked after and guarded by the crew, are very liable to be stolen. The most effective way to make a crew take care of their tools is to hold them responsible.

The distribution and care of tools is more or less complicated under the most favorable circumstances. No two persons will agree, it is probable, as to the best method. The plan I have outlined, however, is both efficient and economical. An experienced railroad man, referring to the subject, says: "A new system ought

* Except in the case of the exchange of new tools for old.

to be instituted for the delivery of tools and supplies. I would supply each engine, way car, coach, section foreman—in fact, every person and everything—with a complete outfit. Every article to be stamped with the name, as 'Coach 95,' 'Engine 236,' 'Section 5,' and so on. I would make the person immediately in charge responsible, and when a new article was wanted, would let him understand that the old one must be returned or a satisfactory explanation given. Every day, lanterns, wrenches and hammers are lost or stolen, or some mishap of a like nature befalls, which would not happen to one's own property. To start such a system would cause trouble and annoyance, but when once established would more than pay for itself in the saving effected. Many of the houses in this frontier town have lanterns that belong to the railroad company, which have no right there, and no doubt numerous other articles which cannot be identified have found their way to private houses in the same manner."

The enforcement of the rule requiring the return of the old article before issuing a new one will prevent the depredations he refers to. He exaggerates the difficulty of adopting the system. All that is required is that an inventory shall be taken of the articles in the hands of employes, and that the same shall be specifically charged to them.

The system should not be restricted to tools, but should be applied to articles of every kind, lanterns, brooms, axes, etc.



When tools are shipped away, a receipt should be returned by the receiver, so that the sender may be sure that the property has reached its destination.

In sending tools back and forth for repairs, no formality is necessary, except such as may be needed to insure their reaching their destination quickly. Many devices are employed for this purpose. Sometimes the property is waybilled; in other cases it is checked like baggage; again a tag is attached. It depends on the nature of the material. A good plan for a single article shipped by baggage car is to attach a metal check with the address of both sender and receiver; thus, the token may be used in both directions and for many times.

More or less care is required to be exercised to prevent loss of tools in passing back and forth. My attention has been called to a device for track tools that is highly recommended for its simplicity and effectiveness: "Each section foreman is provided with a strong iron ring, made so that it can be bolted together; to this ring is attached a copper tag stamped with the number of section and name of station. The section foreman strings his tools on this ring when he desires them to be repaired and sends them to the shop. A small attachment enables him to send his wrenches on the ring. For crowbars a strong brass band, stamped in the same manner, is provided. This is a much better way than sending the tools tied together with string." The same

person suggests a rack fixed upon springs in which to ship lamps and lamp globes back and forth on the line without the labor of packing or risk of breaking. The devices for shipping implements and tools would fill a chapter.

The methods enforced by the English companies for insuring faithfulness and care in the use of tools are very sweeping. I cannot do better than embody the most pertinent here. They are worthy of careful study. They are as follows:

"Every mechanic must be provided with such tools as are usual in his trade, and his chest will be examined by the foreman when the workman leaves the service. Every man will be required to see that each of his shop tools bears the initials of the company and his own private mark. Every man borrowing tools from another must be careful to return them immediately they are done with. A list of each man's tools will be kept. When any workman requires a new tool, he must apply to his foreman for it, who, if it be necessary, will either supply it or give instructions for it to be made. All new tools must be given to the men requiring them by their foreman, who will receive those they are intended to replace, and no tools must be made or obtained without such authority. Any man using taps, dies, rimers, gauges or templates must see that when done with, they are immediately returned in the same condition as when received to the person appointed to take charge of them. His not calling the attention of that person to any defects or damage at the time he receives them, will be considered a sufficient proof that they



were then in good order; and if any of them should be lost, the man to whom they were delivered will be held responsible. Private tools are not allowed to be made in the shops, under penalty of instant dismissal. Any man on leaving the service of the company will not be paid his wages until he has delivered up to his foreman the key of his drawer or tool chest, and the quantity of tools charged against him, to the satisfaction of the person authorized to receive the same.

"A lock and key will be supplied to each man's tool box and drawer, in the first instance, which must be kept in a proper state of repair afterward by the person to whom it is given up. Any person losing the key of such lock must replace it at his own expense; and any man breaking open another's man's drawer, box or lock of any kind will subject himself to dismissal. No workman will be allowed to take out of the works any tools or materials, unless they are specified by his foreman upon the pass, and the number of pieces stated. All passes must be left with the gatekeeper, who is required to take an account of all material of any kind which passes from the works through his gate. All tools and implements required for the repair of the line must, when not in use, be kept locked up in a building, or in boxes, for the security of which each foreman or ganger on his own length of line is responsible. When a man leaves the service he must immediately deliver up his uniform and all other articles belonging to the company. Any money that may be due for wages to any man leaving the service will not be paid until the clothing, book of rules, lamps, flags, tools, detonators, and all other articles the property of the company, which may have been

supplied to him, shall have been delivered up. If not delivered up, or if any article be missing or damaged by improper use, the cost of such article or the repair of such damage shall be a debt due from the man to the company, and may be deducted from any pay then due, and if such pay be found insufficient to meet the claim, will become a debt recoverable at law. As regards the engineering department, the tools used by platelayers are in charge of the various way inspectors, and must be replaced, when required, in accordance with instructions. Stock must be taken at the end of each half year, when each ganger must give an account of the tools in use on his length, which report must be certified to by the permanent way inspector and sent to the storekeeper. With respect to tools supplied to workmen employed in the permanent way shops, each workman is provided with a drawer or cupboard, with lock and key; the drawer and key must be numbered, and all the tools used by the man to whom the drawer or cupboard is appropriated must be marked with the same number and stamped with the name of the company. The man will be held responsible for all such tools, and in case of loss, the amount will be deducted from his wages. With regard to the locomotive department, each man engaged in the working of engines, etc., receives a proper equipment of tools, and is held responsible for the care and custody of the same. When an engine is sent into the shops for repairs, the driver must hand in the tools, etc., and if they are found to be complete and in good order, a receipt will be given by which he can claim the tools when the engine is again ready for work. If any irregularity is discovered, the case will be



dealt with by fine or otherwise. The regulations in force in connection with the tools supplied to workmen employed in the locomotive shops are similar to those which apply in the shops belonging to the engineering department. Permanent way materials are supplied through the chief storekeeper. As soon as they are delivered on the ground, they are in charge of the permanent way inspector of the length where delivered. Each inspector is charged from the divisional office with the material supplied to him. He is also credited with all that is used, a daily record of which must be kept by the gangers under him, and sent to the divisional office fortnightly. Stock of all material must be taken every six months, and by comparing the stock on hand with the amount charged, the slightest difference will be detected, if any, in each inspector's stock. In the case of small stores, they must be kept in the small stores depots, of which there are three on each division, and requisitions for daily consumption, as required, must be sent by the inspector to the storekeeper. Stock must be taken of these small stores every six months, and the amount on hand checked with the book balances. With respect to tools supplied to workmen, they must be supplied by the storekeeper upon an order from the inspector. Stock must be taken of all tools every six months, so that it may be ascertained if any are not accounted for. Workmen must make good any tools intrusted to them which they may lose."

# CHAPTER XIV.

## KINDS OF FUEL: THEIR UTILITY, ACQUISITION, CARE AND USE.

[NOTE.—In railway phraseology material is designated separately from fuel. However, when I speak of material or supplies I also include fuel.]

The deterioration of wood commences as soon as it is seasoned after being cut. Each day thereafter detracts something from its heat producing qualities. The process of decay is not the same with all woods. Moreover, it is great or small according as they are exposed to the elements or not.

Coal has greater heating capacity than wood. Alexander Watt says that the heat disengaged during consumption is double that of wood. He does not, however, tell us the quality of coal used in making his tests or the kind of wood. Without this information, his figures are more interesting than valuable.

Some woods have double the heating capacity of others.

The rapid and general use of coal for locomotives has made the value of wood as a fuel largely speculative in most localities. However, many roads still use wood.

In Mexico, the hardy, scraggy mesquite is used where it can be procured. It is also better for ties than any other wood in that country.





Some of the roads operating in the great timber districts of the United States still use wood for fuel. The cost per cord delivered on the track is very low. But to this must be added the expense of sawing, transferring, piling, etc.

Valuable woods for heating purposes are hard maple, hickory, beech, hemlock, ash, oak, and so on.

Maple may be used to advantage before being entirely seasoned.

The resin in hemlock makes it a desirable fuel.

Hickory is one of the best of woods, but unfortunately is rare.

Desirable wood can be procured only in limited quantities. It is necessary to eke out the supply with inferior qualities.

Some woods are so affected by moisture that a heavy dew renders them unfit for use until they have had time to dry.

Certain kinds of wood dry so slowly that, when corded, the outer layers decay before the interior of the pile is seasoned.

Swamp elm will not cure at all.

Many kinds of wood have little more heating capacity than paper, and are thrown aside by firemen, as is the slate found in coal.

The substitution of coal for wood, while it has not reduced cost in every case, has much simplified the question of fuel supply, rendering it possible for the bulk of our railway companies to procure what they require from day to day. They need only keep on hand over and above

current wants, such supply as is necessary to meet the contingencies of blockades, strikes, delays, and other accidents of business. The amount will vary. Some companies find it advantageous to lay in a winter's supply in advance; others a more limited amount. Practices are not uniform.

Where wood is used, a large supply must be kept on hand, as the cost of cutting and hauling is much cheaper at one season of the year than another, while a considerable time is required to season it for use.

All kinds of bituminous coal commence to deteriorate in heat-producing qualities as soon as mined. The loss varies according to quality and climate. If properly protected, depreciation is generally slow; in some cases merely nominal for a considerable period.

Coal contains more or less moisture. It is not absorbed from the atmosphere, but is inherent.

Some kinds of coal are so damp when taken from the ground as to be unfit for use until dried.

In high altitudes, where the weather is warm and dry, the disintegration of bituminous coal is so rapid as to destroy its value within a few weeks after being mined. Throughout the greater part of the United States and Europe, however, disintegration is comparatively slow. In fact, the length of time soft coal may be preserved depends largely upon the care taken to protect it.

When the mass is sufficiently great to preserve the interior from atmospheric action, the deterioration is still less.



If bituminous coal is left exposed to storms, the deterioration is immediate and rapid, multiplying in intensity with the lapse of time. A gentleman thoroughly familiar with its use writes me as follows:

"Opinions differ in regard to the depreciation of bituminous coal, even among those who handle it daily, and when called upon to state the percentage of depreciation, the most surprising differences are noticed. Much depends upon the weather. If in midwinter the air is dry and steadily cold, the loss will not be so great as it would be if there were light snow or rain with occasional sunshine. In summer, rain and sunshine accelerate destruction. I was inclined at first to say that the loss of coal for one month, if properly sheltered, would be nothing during the summer season. This is not true, however. There is a loss sustained, even during so short a period, not so much from atmospheric depreciation, however, as from handling. It is first thrown from the cars into the stock shed. If the shed is one-half full or more, it must then be thrown to the back side of the shed. When needed for use, it must be shoveled into a bucket before being thrown into the tender. Under this handling the coal rapidly disintegrates, and the result is that more or less of it crumbles into dust. I place the depreciation of bituminous coal at eleven per cent. for six months when exposed, and at eight per cent. when not exposed. Recently, in cleaning up a coal shed, I found the loss to be as stated. The coal was badly slacked, and when used went through the fire box and flues like so much chaff. The harder an engine

is worked, the more difficult it is to keep the slacked coal (dust) in the fire box. In many cases it does not ignite at all, or ignites as it is passing through the smokestack, or even after it has left the latter. The heating capacity of such fuel is merely nominal under the most favorable circumstances." *

As he states, the ratio of depreciation is a subject of dispute. No two agree. I am inclined to think that he under, rather than over, estimates the loss. However, his experience and observation make his estimate of value. If the table could be continued, it would be found that depreciation was much more rapid after six months than before.

When we consider the relation that cost of fuel bears to total cost of operating a railroad, the importance of the loss from depreciation becomes manifest. It is a constant reminder to the officials of railroads of the necessity of keeping the supply on hand as small as possible, and

* He submits a table in which he estimates the weather waste of bituminous coal at Chicago as follows: M. M. K.

| TIME. | SUMMER. | | WINTER. | |
|---|---|---|---|---|
| | EXPOSED. | UNDER COVER. | EXPOSED. | UNDER COVER. |
| One month. | Two per cent. | Very little. | Three or Four per cent. | None. |
| Two months. | Three and a half per cent. | Two per cent. | Four and a half per cent. | Very little. |
| Three " | Four and a half per cent. | Three and a half per cent. | Five and a half per cent. | Two and a half per cent. |
| Four " | Six per cent. | Five per cent. | Six and a half per cent. | Four per cent. |
| Five " | Eight " " | Six and a half per cent. | Seven and a half per cent. | Five " " |
| Six " | Eleven " " | Eight per cent. | Ten per cent. | Six " " |



of throwing around the stock every possible safeguard.

In reference to the qualities of coal and their condition under different circumstances, the following communication* affords much interesting information:

"In regard to the weathering or depreciation in value of coal after it is mined, there is but a small amount of reliable information. To carry on such an investigation as would yield accurate results requires a great deal of time, and but few chemists have ever undertaken the task. Most of the investigations, the results of which have been published, were carried on by German chemists at the German universities. By the term weathering or weather waste of coal is meant the deterioration in value which coal undergoes when exposed to the air under various circumstances. This deterioration is due to the action of the oxygen of the air upon the carbon and hydrogen of the coal, and also to the decomposition of the impurities of the coal, chiefly iron pyrites, which are always found in greater or less quantity mingled with the coal.

"The composition of bituminous and anthracite coal varies greatly.† When coal is exposed to the air, the chemical changes which take place

* From G. M. Davidson, Analytical Chemist (for which I am much indebted).

| † | BITUMINOUS. | ANTHRACITE. |
|---|---|---|
| Carbon | 75 to 80% | 90 to 94% |
| Hydrogen | 5 to 6 " | 1 to 3 " |
| Nitrogen | 1 to 2 " | 1 to 3 " |
| Oxygen | 4 to 10 " | 1 to 3 " |
| Sulphur | 0.4 to 3 " | ..... |
| Ash | 3 to 10 " | 3 to 4% |

are as follows: The coal absorbs oxygen from the air. A portion of this oxygen combines with a portion of the carbon of the coal, forming carbonic acid gas; another portion of the oxygen unites with part of the hydrogen, forming water; another portion of the oxygen combines with various organic parts of the coal and the remainder is used by the iron pyrites, and forms oxides of iron and sulphuric acid. This acid at once unites with any lime, clay, etc., which is present, and is soon washed out if the coal is exposed to the weather, but appears as white streaks if the coal is kept under cover. The effect of weathering is to diminish the carbon and hydrogen and increase the oxygen in the coal. The organic or combustible part of the coal is decreased, and the ash or inorganic part is increased. The heating power of the coal, and consequently its value, is thereby diminished, and when the coal contains more than a trace of iron pyrites, disintegration or slacking takes place owing to the fact that the products of the oxidation of the pyrites occupy greater space than did the pyrites, and in a short time the value of the coal is very much diminished. The deterioration of coal due to the action of the oxygen is increased by elevation of temperature, and takes place even when the coal is dry. The deterioration due to the oxidation of pyrites requires the presence of moisture. Hence the greatest deterioration of coal occurs when it is exposed to the action of the weather during the hot months, and the least deterioration when it is under cover during the cold months. Prof. Grundmann, of Tarnowitz, by analyzing coal before and after exposure to all conditions of weather, in a pile of about three hundred tons,



found a loss of volatile matter of 58 per cent. in nine months. Another sample of the same coal protected from rain and snow lost 43 per cent. in nine months. Both samples lost their power of cokeing in two to three months. He found that the decomposition takes place in the middle of the pile the same as on the surface, and that the rate of deterioration reached its maximum about the third or fourth week, and that one-half the total oxygen absorbed was absorbed during the first fourteen days. He also states that coal poor in oxygen absorbs it most rapidly. Coal which he examined when freshly mined and found would make good coke, after exposure either would not coke at all, or made a very poor quality of coke. Prof. Varrentrapp, of Brunswick, found by his investigations that the oxidation of coal takes place rapidly at ordinary temperatures when moisture is present. He found the weather waste in some cases amounted to 33 per cent., and in one instance decreased 45 per cent. in gas yielding qualities and 47 per cent. in heating power, while the same coal kept under cover lost in the same time 24 per cent. for gas purposes and 12 per cent. for heating purposes. These experiments were made with German bituminous coal. In regard to the weathering of anthracite coal, I find that the general opinion of chemists is that it is but very little if at all affected by exposure to the weather. Lumps of anthracite have been examined which have been exposed to the weather for thirty years and found to be first-class fuel. In regard to the effect of the weather on bituminous coal, nearly all varieties deteriorate to a great extent when exposed to the air. This deterioration is greatly favored by high tempera-

ture and, in coals which contain iron pyrites, by moisture. In coals free from iron pyrites this deterioration seems to be as rapid when the coal is dry as when it is wet. It is always increased in all kinds of bituminous coal by increase of temperature, and is more energetic when the coal is in dust or slack, especially when it is accumulated in large heaps which are without ventilation and so retain nearly all the heat which is developed."

The quality of coal from no two mines is alike; nor, indeed, from different parts of the same mine. These differences destroy, to a certain extent, the value of tests made of a particular coal, so far as they apply to other coals.

Differences in the quality of bituminous coal are more marked, probably, than with most other materials. Engineers tell us that coal from a particular district burns easily and uniformly, and is a good steam producer; that another is fair, but not so good; that another contains too much sulphur; that another is lacking in vitality; that another has so much slate as to be worthless; that another is too damp, and so on.

The great value of the practical knowledge that engineers and firemen have of the fuels they use is well known by railway companies, and is taken advantage of to the utmost in buying and using.

Many railway companies make systematic efforts to instruct their enginemen in the scientific use of fuel; in the laws of combustion; in the economical generation of heat; in the



effective use of fuel in making steam. They are repaid for their efforts by material reductions in the cost of fuel per unit of service.

Coal is more destructive to the fire box of a locomotive than wood, because of the sulphur and gases it contains. The gas is greater in hard than in soft coal.

The peculiar features that attend the use of different kinds of fuel, and the fact that no two kinds possess the same heating capacity, make their use a matter of experience and study. If the adaptability of a fuel is not known, wastage will occur as a matter of course.

When the kind and quality of fuel is the same, differences will arise on account of differences in the ability and disposition of firemen. It is estimated that there is thirty per cent. difference between a good and a poor fireman in the fuel used. It will be seen, therefore, how important it is that a company should have good firemen, should be able to distinguish between good and poor firemen.

Those familiar with such matters assert, and truly, that each engine has peculiarities that must be observed in firing, if efficiency and economy are to be secured. This is impossible, it is manifest, if firemen are constantly changed from one machine to another. Not only will they not possess requisite knowledge of their work, but power to hold them responsible will be lessened, and in many instances totally wanting. Moreover, under such circumstances men will not feel

the interest in their work that they would if it were carried on more systematically and with a more intelligent view of increasing their knowledge and sense of attachment.

In order to secure the highest results obtainable in the use of fuel, scrupulous observance of every necessary detail must be practiced. The fireman must be familiar with the fuel he uses; also the peculiarities of the locomotive he fires.

The performances of firemen should be studied and their efforts compared, not generally and cursorily, but exhaustively and minutely. As this work increases in extent by the growth of a road, there will be a disposition to neglect many details. It must not be forgotten, however, that a company will be the loser thereby.

The multiplication of engineers and firemen upon a railroad should be attended by the multiplication of methods of supervision. Upon a small road the work may be done by the manager or master mechanic, but when the time of these officials is otherwise fully occupied, the duty must be delegated to others and must keep pace with its volume and importance.

More or less of the heat energy of fuel escapes. This must be prevented so far as possible. The economical use of fuel depends on men and machines. A storekeeper whose opportunities of observation are extensive, writes me in regard to the use of fuel, as follows:

"A vast quantity of fuel is wasted through imperfect knowledge of the art of firing. How to



teach men to extract the greatest amount of heat from the least amount of fuel, and put in practice such knowledge, is a thing that suggests itself to every railroad manager. I would suggest the appointment of an officer who understands the principles of combustion, and who is endowed, moreover, with the faculty of teaching and influencing others. It should be the sole duty of this man to instruct employes in the use of fuel and oil; to make the work his exclusive study. Not only should men be verbally instructed in the use of fuel, but they should be provided with a concise formula setting forth the principles. These formulas should not only be learned by those who actually perform the work, but by those whose duty it is to employ such men or supervise their work."

In the economy of fuel the engineer plays a part as important as the fireman. His method of using steam economically, feeding the water to his boiler, and so on, have a marked effect on the amount of fuel used. The fireman, to be efficient, must understand the principles of combustion; must appreciate the importance of a proper supply of air to his fires; must be careful not to allow the grates to become choked with cinders and clinkers. So important are these facts that some railroads have adopted a regulation by which half of the saving in fuel effected by the care of the engineer and fireman is divided between them. The amounts thus paid are considerable. Not only are the results arrived at valuable, but an incidental advantage is also secured, namely, the abatement of the smoke

nuisance, which is largely the result of imperfect firing.*

Fuel is the most difficult of all material to care for; its general use by the community makes its possession a matter of common concern. But if it were never stolen except by those actually suffering, its loss would be less aggravating. Unfortunately this is not the case. From the time it leaves the mine until used, it is subject to the depredations of pilferers. It is thrown from the cars while en route, and is surreptitiously taken from the yards, storehouses and locomotive tenders. Nowhere is it safe for a moment except within secure inclosures. These facts are thoroughly understood, but lack of proper facilities for storing renders it impossible to avoid loss in many cases.

When wood was more generally used, the poverty of the companies and the enormous supply required to be kept on hand rendered it impossible to place it within secure houses or yards. Better provision is possible for coal. A certain percentage of loss occurs, however. This loss is sufficient in many, perhaps the majority of cases, to warrant the construction of secure storehouses or the employment of watchmen.

The general disposition evinced to erect secure buildings where only sheds and open yards before existed, is an evidence of the appreciation of the subject by railway companies.

* The duties of firemen are more fully referred to in another volume.



The fuel supply of a railroad should be quite as inaccessible to the public as its other material. The annual expense for maintenance and interest on buildings that this will involve will be slight compared to the losses that will occur where precautions are neglected.

Coal has many advantages over wood besides those I have mentioned. It is, as a rule, cheaper; is not so subject to the danger of fire; is more compact, and simpler to account for.

Wood involves exceptional expenses for inspection, supervision, depreciation, handling, accounting, etc.

The cost of fuel forms a large percentage of the expenses of a railroad. It is increased or lessened according to the intelligence and fidelity exercised in purchasing, caring for and using. Much thought has been given its use. Employes have been stimulated in every way to exercise economy. In many cases rewards are offered for those who show the greatest intelligence and care.

In order to determine the measure of economy exercised by employes, careful comparisons should be made of fuel used on different locomotives for the same month and for the same line and for different lines. Comparisons should also be made of the consumption of the same locomotives for different months. Similar comparisons should be made for the fuel used at stations, in cars and elsewhere; wherever, in fact, conditions are similar or the zeal of operatives may be increased thereby.

The method of buying and handling fuel varies according to the experience, talent and prejudices of men. Thus, upon some lines it will be handled wholly by operatives; upon others, the work will be done wholly by contract. Both methods have their advocates, and are successful according to the measure of intelligence and energy exercised.

In reference to the custodianship of fuel: that at stations is very generally intrusted to the care of the agent; at shops and elsewhere, to the storekeeper. The supply of fuel that a company must keep in stock will depend upon circumstances. If necessary to lay in a supply ahead, requisitions should be made far in advance, so that provision may be made for buying and shipping to the best advantage. A greater stock of fuel should never be carried than circumstances render necessary. The loss from depreciation, if nothing else, would render such a course the best.

# CHAPTER XV.

## REGULATIONS ATTENDING THE STORAGE AND DISBURSEMENT OF MATERIAL.

Material should be disbursed only on orders properly signed.

Disbursements should take cognizance of the article, quantity, time, manner and use.

The higher the degree of intelligence and interest evinced by the disbursing agent, the greater the care in ordering and using.

Orders should be filled under the direction of a particular person.

Orders, like bank checks, should be filled up solidly, no blank spaces being left for subsequent additions.

Orders should be delivered before the material is taken from the store. An English rule provides that "any workman desiring material of any description, including deals, planks, battens, timber or scantling, and taking them out of the yard without first making application for them at the office, will be discharged."

Orders should specify the name of the person to whom the material is to be delivered, and, if possible, the name or number of the workman who is to use it. An effort should be made to

particularize the transaction; to make all concerned feel the responsibility that attaches to their actions.

Orders should be signed by the foreman and, if possible, countersigned by an official having cognizance of the facts; they should be definite as regards articles and quantity; thus, they should not read for "nails," but should specify the kind and quantity. Such things seem trifling, but they are important, and matters of every-day occurrence.

Orders should specify the use to which material is to be put, and the account to which it is to be charged. This information is necessary for writing up the accounts. It is also necessary to enable the storekeeper to judge of the expediency of an order, as regards quality and quantity.

Orders should be carefully filed and preserved by the storekeeper; they form the basis of his accounts, and justify his action.

In distributing material, that which is oldest or most likely to decay should be used first; this is especially necessary with lumber, timber, fuel, and similar supplies.

Those having charge of disbursements should be familiar with the stock. They should also be experienced, if possible, in the needs of the service, so that they may not only anticipate its wants, but judge of the interest and care that is exercised by those who order and use material. It is desirable that a particular man should be assigned steadily to this work. If it is not



sufficient to give him constant employment, he may be assigned other duties, but this should take precedence of everything else.

The person making disbursements should be skillful. He should not only be familiar with the use of material, but know how to load it into cars, and pack it into boxes and otherwise arrange it. When such work is performed by an inexperienced person, damage is likely to occur from imperfect loading or packing; it is also unnecessarily costly. In loading goods reference should be had to unloading; the total cost should be considered.

Orders for material should be carefully scrutinized by those experienced in such matters. They should be reduced to the minimum in every instance.

When disbursements are in excess of needs, it encourages careless handling and improvident use. When the amount delivered is only sufficient to cover the work in hand, economical use is necessary; if in excess, a margin is left for waste.

The duty of storekeepers, as already intimated, does not end with the filling of the order; with the delivery of the material. Their duties require that they follow it into the workshop; into the hands of workmen; to see that it is used as stated; to take note of those who use it extravagantly; of those who use it prudently. They must remember, too, that it is as necessary that the latter should be recognized as that the former

should be punished. Raw supplies disbursed for use in the manufacture of goods remain especially under the supervision of the storekeeper. It is his duty to look after them; to watch their disposition; to see that they are accurately accounted for.

In shipping supplies, ingenuity must be exercised to do so at the least expense and inconvenience to the company. Thus, if goods, in small quantities, are to be shipped by freight train, they should be taken to the station and waybilled the same as freight; if in car lots, they may be loaded at the storehouse if more convenient.

When material is shipped to local points in small quantities, it should be forwarded in the baggage car or as way freight; the impolicy of using a car in such cases is apparent. It is, however, frequently done, because of the fact, probably, that the property belongs to the company.

The prudent use of a company's equipment is all important and must never be lost sight of.

In order to facilitate petty shipments of supplies, storekeepers should provide themselves with suitable boxes and appliances. These they may use over and over again.

Orders for material should not be made greater than necessary to save the labor of frequent shipping. The economical use of material will be better assured if the supply is so small that the person using it is constantly reminded of the



scantiness of the store and the necessity of its being carefully husbanded.

The number of storehouses should be restricted as much as possible.

The small supplies used at isolated roundhouses, local car repair stations, and similar places, can be accounted for to the nearest storehouse, and returns to headquarters made therefrom. There is no occasion for establishing petty depots for such material.

Undue disbursements of material prevent accurate knowledge of the amount on hand, and have therefore a tendency to swell the same.

Material is nowhere so safe as when in charge of a storekeeper.

It is the same as money; when received, it should be inspected with care; when in store, it should be watched with vigilance; like intelligence should attend its disbursement.

Neither too much nor too little should be given out. A cashier knows that if he pays money not called for by his voucher, or if he loses the latter or neglects to record it, his cash will not balance. This is also true of the storekeeper, except that in the case of the cashier his balances tally to a cent if proper care is exercised, while in the case of the storekeeper discrepancies are inevitable, because of differences in prices, measurements, averages, etc. But if he exercises care the amount of the discrepancies will be trifling.

In disbursing material the charge should be on the safe side, i. e., it should be enough, but not

excessive. A comparison of the inventory at the close of the year with the balance standing to the debit of a storekeeper, will (after making allowance for differences in prices, measurement, etc.) afford a very fair indication of the care and intelligence he has exercised.

Every company should, if possible, have a general storehouse from which material may be supplied to lesser storehouses as needed. It will also serve as a local depot. Its judicious use will render it possible to reduce the supply of material to the minimum. In the absence of such a depot, the disposition will be general for every storehouse to multiply its necessities. But if the orders of local storekeepers can be filled at a moment's notice from a central store, such storekeepers can be made to restrict their orders to current needs. They will not only have no motive to increase their stores unnecessarily, but will be encouraged to decrease them so as to save labor and responsibility.

In reference to the disbursement of supplies for local use at night, or in the absence of the storekeeper, a capable and trustworthy person should be selected to perform this duty. He should be governed by the rules and regulations applicable in other cases. If proper forethought is exercised there will, however, be very little demand for such supplies. But in order to meet unavoidable cases provision must be made. Lubricants and tools for locomotives will be most in demand at such times. A good plan, in the latter case, is



to provide a cupboard in the roundhouse in which to keep an assortment of tools for use as required, but which may not be disturbed without the return of the old tools, or compliance with the rules governing in the case.

To facilitate the easy shipment of stores, it is desirable that there should be a track on each side of the storehouse, but it is of even greater importance that the floor of the storehouse should be on a level with the floor of the car. One man can, under such circumstances, perform as much labor as two men under other conditions.

# CHAPTER XVI.

## CARE AND STORAGE OF STATION AND TRAIN SUPPLIES.

Many of the articles furnished employes are of so little value that, considered apart, they do not seem to justify the cost of watching over them, of counting and inspecting, of keeping a record of their disbursement and use.

Nor are the benefits of such watchfulness at first apparent. It is, however, both necessary and valuable. Experience has proven this.

We must take cognizance of every article disbursed. In some cases, notably that of stationery, the value of the article, considered by itself, seems not to justify it. But the aggregate value, coupled with the necessity of supplies being prudently used and carefully guarded, warrants it, even if the spirit of economy it inculcates does not. This is true of the blanks of railways as much as it is of more costly articles.

In distributing articles to replace others, such as water buckets, glasses, dippers, lanterns, brooms, inkstands, erasers, cuspidors and kindred property, the old article should be returned, as required in the case of tools and brasses described elsewhere.

The rule is a valuable and necessary one.





It should be observed wherever the return of the old article will prove that it has not been lost or misappropriated.

The rule of exchanges is a simple, inexpensive and practical one; one that everybody can understand and easily live up to. Its enforcement will ever prove instructive and valuable.

To make the supervision of train and station supplies effective, an account should be opened with each person to whom they are furnished.

Orders for supplies should be scanned to judge of the economy that has characterized the use of preceding disbursements, as well as the propriety of the present request.

An account in dollars and cents need not be opened with each employe, but a record of the articles should be kept. To facilitate comparisons, blanks, instead of books, may be used if thought better. It is not necessary to go into elaborate bookkeeping. The method of keeping the account should be made subservient to the purpose it is designed to serve, namely, to see that orders are restricted within reasonable limits, and that supplies are carefully husbanded and used. The record is of no value further than this, and the simpler it is, the better.

An employe should not be able to order articles such as we are treating of from more than one storekeeper. Such restriction will simplify supervision and heighten responsibility.

If allowed to order from different storehouses, storekeepers should be required to report their

disbursements to a particular official, so that somewhere a full account may be kept of the supply furnished each individual. The same rule, in fact, should be observed as that suggested elsewhere in connection with tools.

Orders for station and office supplies should cover a month's needs.

In the case of stationery, three months' supply may be ordered to advantage except when the consumption is great.

Orders should be restricted to the amount that can and will be carefully cared for and economically used.

Careful comparisons of supplies consumed should be made.

In the case of fuel, oil and similar supplies, the known needs of the person making the order will guide the storekeeper in making disbursements.

Excesses of every kind should be promptly repressed or investigated.

Reference has been made elsewhere to a plan for supplying stations monthly with oil, from a tank car sent over the road for that purpose. It has been suggested that station and office supplies may also be distributed from a car sent over the road monthly, thus completing within a day or two at slight expense what otherwise would require weeks. The car could be fitted with compartments adapted to its use. Such a plan would, in many cases, save packing, and by providing racks for lamp chimneys and kindred



articles the necessity of boxing, as at present, would be avoided. It is believed that considerable expense might be saved in this way.

The value of articles, tools and other appliances in the hands of agents and conductors is so great as to warrant the designation of a person to look after them. This is especially true of large stations, wrecking trains, and dining and sleeping cars.

In the case of car tools and applicances, the frequent changes among trainmen make it difficult to fix responsibility for property of this nature. It is frequently overlooked or unavoidably left behind in the case of accidents and detentions and is liable at all times to be stolen without anyone being to blame. It is exceedingly difficult to follow the use of train tools or trace their loss. But reasonable responsibility may be secured by inventorying the supply at the end of each trip. In case of loss, the burden of proof rests on the person in charge. This will compel him to examine the supply turned over to him by his predecessor and to watch it while in his hands. Both of these things are as necessary to the safety of the public as they are to the careful husbanding of a company's property.

The value of careful accounting and a rigid enforcement of the system of exchanges I have described, applies to all classes of appliances; to the cooking utensils, crockery, silverware, napery, and other appurtenances of dining cars; to the food, cigars and liquor with which they are

stocked; to the blankets, linen, toilet articles and other appliances for sleeping, drawing room and business cars; to the tools and accessories of wrecking cars; to the fuel, oil, stationery, trucks, and tools in use about stations; to the implements in the hands of trackmen; to the axes, saws, hammers, coal buckets and lanterns of passenger and baggage cars; to the switch ropes, jackscrews, wrenches and other implements of caboose cars; to hammers, files, chisels, oil cans, packing hooks and other articles of locomotives; to the tools of carpenters and machinists; to every kind of portable property, in fact, in the hands of employes. The number of articles would fill a volume.

I shall not attempt to describe minutely methods of accounting. I design simply to lay down the principles that should govern and indicate generally their method of application. However, it must not be forgotten that methods must adapt themselves to cases. Thus, a system of returns that will prevent loss or misappropriation of tools in the hands of machinists would require considerable elaboration to encompass the needs of dining cars, where the utensils are much greater in number, value and general adaptability.

# CHAPTER XVII.

## ARRANGEMENT OF SUPPLY DEPOTS, INCLUDING YARDS FOR CONSTRUCTION MATERIAL — COLLECTING, STORING AND DISBURSING.

[NOTE.—Many of the suggestions contained in this chapter are applicable to common storehouses and yards, and, in so far as this is so, should govern.]

The facilities a construction supply depot will require will depend upon the amount of material to be handled and the length of time the depot is to be used. If it is temporary, and the quantity of material small, the facilities may be simple and inexpensive.

In many things depots for construction supplies are the same as those for handling operating material. The regulations governing the latter are also, generally, applicable to them.

In arranging a depot for construction material, the office and storeroom for small supplies should be located so that the work may be generally overlooked by the storekeeper in charge.

As the storehouse and office will be only temporary, they should be constructed with that view, and with the least possible damage to the material used in its construction.

In arranging tracks for distributing material, the upper end of the first siding may be used for storing material for buildings; further on for rails; still further on for track fixtures, arranged and classified, with a view to being loaded on the cars with the rails. The second side track should be used for ties; this track, and those beyond, if the amount of material to be handled is small, need only be connected with the main track at one end; when the space between the first and second siding is filled with ties, the track may be crowded over and another rank laid, and so on. Afterward, as fast as a rank is loaded and shipped, the track may be crowded toward the center again, and thus the material may be reloaded without the necessity of being carried far.

Each kind of tie should be kept separate.

Switch material, including frogs, stands, rods and headblocks, should, so far as possible, be kept together for use simultaneously.

Rails, for convenience and economy, may be piled on racks made of ties; the foundation must be solid and level.

If the amount of bridge material is not large, it may be stored at the lower end of the first siding, where it can be put in shape for use before leaving the yard.

In storing material, different dimensions, sizes and kinds should be assorted and piled by themselves; thus, boards or rails of unequal length, or timbers of different dimensions, or ties intended



for different purposes or locations, should not be piled together, but so separated that each may be conveniently reached when needed.

If sidings incline slightly in the direction cars are to go after being loaded, it will facilitate moving them without the aid of locomotives and cheapen cost of handling.

If the depot is located at a point where sidings are not sufficient for switching empty and loaded cars, it will be necessary to make special provision; in such case, a track may be laid parallel with the main track and between it and the first siding.

In shipping such material as ties, rails, switches and track fixtures, the exact quantity required may be determined, unaided, by the storekeeper in advance. Material for bridges and buildings, however, will require specific orders in each instance as regards kind and quantity, otherwise waste will ensue; my attention has been called to an effective means of handling this material: the engineer in charge furnishes the storekeeper with a list of the material required for particular kinds of structures; with this he deposits a sketch of each kind and class of structure, showing it when completed; when he requires material, he designates the diagram of the structure wanted. This plan enables the storekeeper to fill the order without error or waste, and consequently at the minimum cost; to send timber of the right length and dimensions, and in the right quantity; boards of the right kind and amount,

and so on; each structure is, in fact, shipped complete, supplies tallying exactly with the wants of the builder.*

Orders for material should be addressed to the storekeeper. He should also be furnished with copies of requisitions when made; should know when supplies will be needed; the probable time of their receipt, and so on. He must also know whether they are to be unloaded in the yard or sent to the front as received. He must, in fact, with the engineer, understand all the details connected with the material to be used, so that he may make needed arrangements in advance.

The necessity for forethought and energy on the part of a storekeeper is very great. He must insure the arrival of material in due season and prevent its being received and shipped to the front without inspection and entry on his books.

He must see that material is unloaded with a view to economy in handling; that in loading, due thought is given to the easy and rapid movement of material at the front.

Orders on the storekeeper must be given in advance, so that material may reach its destination at the right moment.

Orders for material must state explicitly for what the material is to be used.

In unloading at the front, all empty packages

*The reader is referred to the book "Constructing, Financing and Maintaining," and chapter "Construction and Classification" in book "Fiscal Affairs, Expenditures," for details of construction not embodied herein.



should be reloaded and returned to the storekeeper for future use or disposition.

Material should be inspected as in other cases, except that greater care must be observed if possible.

Upon receipt of invoices, they should be compared with requisitions to see that orders have been properly filled; for this purpose, invoices should, if possible, be sent in advance of the goods.

When material is sent to the front without being inspected, instructions must be given accordingly, and it is the duty of the storekeeper to see that the work is performed subsequently by a trustworthy person.

In forwarding construction material to the front, the storekeeper should give the order to ship to the foreman of the yard; it should be explicit as to the thing required, name of consignee, place, purpose, etc. The foreman of the yard should carefully measure and inspect the material and furnish the data required for waybilling.

Each shipment should be waybilled, and the name of the conductor inserted on the bill. The bill should be receipted by the person to whom the goods are consigned, and the purpose for which the material is to be used stated thereon by him. The bill (or a copy thereof) should then be sent to the forwarding storekeeper to afford him the data he needs for his accounts, and determine the thing to be charged.

The yard should be under the direction of a general foreman. When the amount of material warrants it, the force should be divided into sections and classified, each section having a foreman.

The wages of foremen need be but little, if any, greater than those of laborers. They should perform the work of laborers. The authority they possess will serve to enforce greater discipline and responsibility than could be otherwise attained at equal cost. Such disposition will also prevent jealousies. It will make men skillful in handling particular kinds of material and otherwise facilitate work.

Fire precautions should be redoubled in the case of construction depots.

Sufficient force must also be maintained to guard the property.

A storekeeper should be appointed to take charge of construction supply depots. He should be experienced and should give his undivided attention to the work.

The duty of receiving, inspecting and caring for construction material is a thing in itself. The keeping of the time of men and the making of construction pay rolls, including the giving of discharge certificates, forms a part of the work.

Concentration is necessary to secure responsibility, thoroughness and promptness.

Attempt to blend the construction forces of railways with their operating forces is generally harmful. Construction work is something apart



and requires peculiar talents and facilities, including those relating to accounts.

Construction storekeepers labor under disadvantages compared with those who handle operating material. Their facilities are generally limited and crude, while their assistants are, in the majority of cases, unskillful. At the same time the work must be conducted with the utmost dispatch and care.

A person of considerable experience as a storekeeper, and familiar with the methods of railroad builders, writes as follows :

"The handling of large quantities of material makes it imperative that the supply yard should be arranged with a view to economy in receiving and forwarding, as well as for convenience in handling. Under ordinary circumstances, and where there is sufficient room to admit of its being done, the yard tracks should be so laid that the more bulky supplies can be piled on separate tracks, having but one class of material to each track, and so grouped that the loading and making up of supply trains may be accomplished with convenience and dispatch. As ties constitute the greater bulk of construction supplies, they should be so piled as to insure the greatest economy of labor in unloading and reloading, and secure protection against fire at the same time. Convenient handling may be secured by putting the ties in long parallel ranks, leaving occasional intervals of about fifty feet; the ties to be laid adjacent to and at right angles with the track, and as soon as a rank is completed for the full distance required for the tie piles, the

track should be thrown over sufficiently to admit of the construction of another rank. Where this plan is adopted, however, the track can only be connected at one end, leaving the other free to be swung. By this system, ties, in either unloading or reloading, need not be carried for a much greater distance than their length. Another plan which admits of the use of both sides of the tie track for storage, and which allows a track connection at both ends, thereby making this class of material more accessible, is to arrange the piles in groups extending back to one-half the distance to adjoining track and with fifty-feet openings longitudinally at intervals of about one hundred and fifty feet. Ties in these groups should be arranged with the rank next to the track built up to the height of the car floor. The other ranks should extend back to the required distance and at right angles to the first rank, but carried to a greater height. This plan, as compared with the former one, admits of a short parallel track being used, the advantage of which is that ties coming in box cars at the time track laying is in progress, can be transferred to flat cars (which, from their capacity for greater loads, should be used in construction) with less labor than would be necessary were they put off on the ground, thus saving their handling a second time. In addition to the force required to handle the material, the yard, if a large one, should have a good car repairer, who should have charge of all supplies for the repairs of cars and the delivery and shipment of oil and waste for train and other service. He should make a daily report to the storekeeper of all material used by him. The supply yard should be in charge of a



general foreman, who should have supervision and control over the switch engine, and should be accountable for the general efficiency of the force, including the filling of orders, the general arrangement of supplies, and the proper inspection of piling ties, rails, bridge timbers, etc. He should be assisted by a clerk, whose duties should be to check all supplies as unloaded or forwarded, and enter in detail the contents of each car on the yard book, and make a daily report of the same to the storekeeper. It should be the duty of this clerk to keep the time of men in the manner and form prescribed by the storekeeper."

Many of the foregoing details are well understood by those versed in railway construction, but they are not appreciated generally by railway men. Indeed, the handling of supplies is so little understood that particulars are eagerly sought by all.

In building railroads, freight, whether consisting of construction supplies or not, should be waybilled, and passengers should be ticketed; this will prevent confusion and insure accountability.

In closing construction depots, the amount of material left over, including the amount on hand along the line and elsewhere, should be inventoried and invoiced to the storekeeper, or storekeepers, who will have charge of it, so that its disposition may be watched afterward.

It is impossible to prevent errors and omissions creeping into construction accounts. The

result is, in some cases, a surplus; in others, a deficit. Whatever the balance may be (in closing supply depots) after deducting the value of the material on hand, it should be credited or charged, as the case requires, to the different construction accounts, in the proportion that the amount of material expended on each bears to the total amount expended.

When a construction supply depot is continued from season to season, an inventory should be taken at the close of the business year, or oftener if necessary, and the accounts made to conform thereto.

# CHAPTER XVIII.

## METHODS IN REGARD TO CHARGING FOR THE TRANSPORTATION OF MATERIAL AND EMPLOYES.

The bulk of the supplies used by a company must be transported by it for a greater or less distance over its own line. Very little material is delivered at the point where it is required for use.

The number of miles supplies must be hauled will vary. The average will never be the same upon any two lines. Consequently the expense will never be the same. Circumstances dictate the place of purchase. One company will be able to buy ties in the neighborhood where needed, another will have to buy at a distance; one company will be able to procure its fuel along its line, another will have to move it further; one company will be able to buy lumber and timber near where needed, another will have to seek them at a distance.

The supplies of greatest bulk that must be transported for a greater or less distance are fuel, ballast, rails, ties, machinery, rolling stock and material for bridges, buildings, fences, platforms, etc.

The quantity of material to be transported depends somewhat upon its durability. This depends upon climate, quality, the use to which it

is put and the care taken. Poor rails must be renewed oftener than those that are good, and a track subjected to the wear and tear of a heavy traffic must be renewed oftener than a track not subjected to such a strain.

Climate and soil have much to do with durability. Wood will not last as long in a hot climate as in a cold climate, and ties embedded in a damp soil will require to be renewed more frequently than in dry soil. The more frequent the renewal the greater the quantity of supplies to be transported; the greater the expense. The interest attaching to the subject is heightened by the practice of charging for hauling supplies.

I do not know where it originated. I know, however, that while the custom is not general, its advocates are sufficiently high in authority to have secured its adoption by many important and well managed lines. The very conservative railway commission of Massachusetts (an authority the railway commissioners of other states defer to in many things) in 1878 directed that fuel and material (except gravel) hauled for a company's use, should be credited to freight earnings at fourth class rates and should be charged to the proper accounts, and included in the tonnage.*

A practice having such backing cannot be passed over lightly. I can only notice its more salient features.

* Eighth annual report of Board of Railroad Commissioners, Mass., p. 87.



The practical effect of charging for the carriage of supplies is to increase the nominal earnings of a railroad and to enhance correspondingly the price of every article used, thus swelling the expense account. The rate charged is incorporated at once with the freight receipts of the line, and added to the cost of supplies on hand. When the supplies are used, the gross cost is charged to the account the material is expended upon. But until the material is used the supplies appear in the accounts as an asset. So that the effect is to swell the income and increase the assets by a like amount, thus apparently conferring a double benefit.

When supplies are used, operating expense and other disbursement accounts are debited, and thus, finally, the gain to income is set off by a charge. But the latter, unfortunately, never appears in the accounts simultaneously with the gain. Months may intervene.

A company must always keep on hand a large quantity of material. Whatever the amount is, the local earnings thereon appear as an asset, whereas they are really an expense. The accounts are thus misleading. A fictitious asset, dependent upon the amount of supplies a company uses, the distance they are hauled and the rate charged, is made to do duty as so much property, while legitimate operating expenses are shrunken by a corresponding amount.

When the earnings of a company are increased by charges on its own material, it is necessary to

swell the tonnage correspondingly. Thus, commercial operations are magnified and distorted. Moreover, if the rate at which material is carried is fixed at a low price, as in Massachusetts, it lessens in the returns the average rate, generally, the company receives for doing its paying business, thus further misleading.

If the practice of charging for the transportation of material were universal, the harm would be lessened somewhat, because generally understood. Until it becomes general or is abandoned, the amounts that thus accrue should be stated separately in the returns, for the information of owners and investors.

Other objections to the practice suggest themselves. Charging for the carriage of material adds to the cost of accounting. It magnifies details. Thus, material must be weighed at the freight house and the charge extended. When it reaches its destination, the charge cannot be paid in cash as in other cases. Before the accounts of the agent can be relieved, the charge must be formally examined and passed upon by the accounting officers, and a voucher made and audited. The earnings upon the material must also be systematically followed up and recorded at headquarters and at the storehouses, so that they may be disposed of when the material is finally used. This involves clerical work and increases the force, besides adding other expenses.

If the practice of charging for the carriage of supplies is to be incorporated in railway



practice, it is clear that a fixed rate should not be charged for all kinds of material. Cost varies. Moreover, uniformity is repugnant to established practices, and is demoralizing and misleading. Charges should be based on the ordinary tariffs of a company. They are the product of men skilled in the subject. Although crude in many respects, they exhibit infinite labor, and are the result of acute observation and thought.

While the transportation problem is a science still imperfectly understood, we are sufficiently versed in its mysteries to know that an arbitrary rate is a commercial impossibility.

Moreover, if it is right to charge for wood, coal, stone, ties, iron, fencing, and other material, as the Massachusetts commissioners suggest, why should ballast be excepted? The latter is an indispensable article and one of great importance, and exceedingly costly to handle. Its omission is clearly not justified. Its incorporation as earnings with other material, at fourth class rates, would quadruple the receipts of many lines. But whatever the increase might be, any benefit arising from the practice would be more than counterbalanced by increased cost of stationery, accounting, etc. It would also still further destroy the relation that operating expenses bear to earnings, making the former in many cases more than the latter.

The subject is prolific of suggestions. If it is right for a company to charge for transporting its material, then it is clearly right to charge for

the carriage of its employes. It is not only right but necessary. The employe handles the supplies; without him they are valueless.

The charge for transporting material is made for the purpose of ascertaining outlay at the point of use, so that we may know the total cost of a structure or thing.

But if the principle is right, why stop with material? To make the information complete we must also include the cost of transporting the operative who uses the material.

To charge for the transportation of employes would greatly increase passenger receipts. It would swell correspondingly the disbursement items affected.

The cost of keeping account of the movements of operatives and the debits and credits resulting therefrom would be considerable, but not greater relatively than for material. The two would warrant the formation of a special bureau of accounts.

Under a system of charging for supplies and operatives, earnings would no longer indicate profits or be dependent upon cash collections. They would depend upon the quality of a company's material, its durability, where it was purchased, the industry and enterprise exercised in moving it from point to point, the number of employes, and, finally, the celerity with which the latter traveled from place to place. All that would be necessary when times were dull and receipts light, or when it was desirable to exhibit



large earnings, would be to load half a dozen or more trains with operatives or supplies and haul them such distance as might be necessary to make up the volume required. Such a system would be popular with receivers who get a percentage of earnings for their services!

But seriously, the fictitious element which the practice of charging for the transportation of supplies and operatives injects into the accounts of a railroad renders it unadvisable, even if it did not increase expenses. Under it railway reports would no longer be trustworthy. We should ever be in doubt as to what was real, what was fictitious; how much of the property was *bona fide*, how much assumed. Our examination would resemble our examination of Jupiter—we should be forever striving to ascertain how much was solid, how much gaseous.

In many states taxes are based upon gross earnings; to charge for the transportation of supplies and men would add to the embarassments of the subject, a subject already too complicated.

In conclusion, I may say I cannot enumerate the number and serious character of the objections that suggest themselves to me in connection with the practice of charging for transporting supplies and men. I have said enough, however, to cause those who are interested to give the matter careful investigation before coming to a final decision regarding it.

What I have said, however, it should be understood, does not apply to construction material,

or men engaged upon construction work. In the opening of new lines and for additions, equipment and work properly coming under the head of construction, it is important that the whole cost should be known. Hence, it is not only proper, but necessary, that a charge should be made for material and men carried in connection therewith.

Operating expenses are of an evanescent nature. Construction is something permanent. Upon the latter owners are entitled to a return forever. Hence the necessity of knowing the full amount. Other reasons suggest themselves why it is desirable that the exact cost of construction work should be known. However, each company should, I think, be left free to act in the matter as it thinks fit.

## CHAPTER XIX.

### INFINITE NUMBER OF ARTICLES USED BY RAILWAYS—ECONOMICAL VERSUS EXTRAVAGANT GOODS.

A description of the articles consumed in the operations of a railway would embrace substantially every class of material known to the world of trade. This statement will seem like an exaggeration to those who are accustomed to look upon the track and completed train as embracing practically all there is of a property. It is, however, substantially true.

Many of our railroad companies are large manufacturers. They purchase the raw material in the market, and use it as they require. Thus they procure copper and tin in ingots, and from these make the brass journal bearing used upon their engines and cars. From the scrap collected along the line, or purchased in the market, they manufacture axles for cars. The articles of tinware used by them they are frequently able to manufacture at a profit over dealers' prices. Many of the fixtures and much of the furniture used in their offices and buildings they manufacture.

Some companies construct and furnish their own buildings, build their own equipment, repair the rails in their tracks and manufacture the car

wheels and castings they require. They make and erect their own bridges, mine their own coal, cut their own wood, build their own fences, construct their own telegraph lines, manufacture their own paints and, in fact, perform all the functions of manufacturers on a varied and extended scale.

The repair and maintenance of railway property require constant outlay. Everything belonging to a railway company deteriorates unless carefully looked after. Many companies, while they are unable, or deem it inexpedient to enter the field as manufacturers, nevertheless perform the work of repairing and maintaining their property. Thus, while they will not construct a locomotive, yet when once it is their possession, they attend to its preservation and renewal.

Supplies are required by railways for three purposes—construction, maintenance and current operations. It is impossible to enumerate the articles. They embrace every species of material, from building stock to the ink used in transcribing the accounts.

All the articles of merchandise that find a place in warehouses or on the counters of our stores are more or less in demand by railroads. Their purchase interests all kinds of producers; every species of industry. The jeweler finds in railway companies users of his chronometers.* Each station and ticket office must be supplied

* These are used for regulating the watches of conductors, agents and others.



with accurate timepieces. Jewelers discover in employes trustworthy and never-failing customers for their watches. The vendors of diamonds find in railroad companies a market for their wares.* They are also steady and profitable customers of the gold beater.† A railway is a large consumer of silver and nickel, which it uses for plating lamps, window and door fastenings and the interior decoration of its cars. It uses bronze for gilding in its offices and upon its equipment. Its bells, car and switch locks, steam fittings and journal bearings are made of brass. It uses copper for the manufacture of flues and injector pipes.

It uses great quantities of tin for solder and the construction of buildings, rolling stock, oil reservoirs, cans and lamps.

It buys lead in pigs, in sheets, in pipes, and ceruse.

It consumes babbit metal, and requires, in its operations, cadmium, zinc, mercury and platinum.

Its track is made of steel and iron. They also form an important element in the construction and maintenance of locomotive boilers, crossheads, tires, crankpins, smokestacks and tender springs, bridges, track connections, frogs, tools and other implements.

The number of articles in which steel and iron

* They are used by glaziers, miners, etc.

† The gold is used in ornamenting the panels and headlinings of passenger coaches, in lettering and sparingly in adorning the company's offices.

enter is as great, proportionately, upon a railroad, as in other enterprises. They outrank all other kinds of metal. A railway is a liberal purchaser of merchant iron and steel. It uses these metals in connection with wheels for locomotives and cars, steam cylinders, steam chests, furnace grates, brake shoes, drawbars, switches, bridges, trestles, axles, bolts, shafting, turntables, trucks, engine boilers, tanks, flues, smokestacks, stoves, pipes, and other objects.

In attempting to enumerate the articles used by a railroad, we find the most considerable number under the head of hardware. Its use for this class of material embraces substantially all the articles to be found in stores devoted to the sale of such goods. Under this head are many curious things; thus, railways use over one hundred different kinds of files, each having a separate designation and purpose in the economy of shop work. They use over four hundred different kinds of screws, one hundred and fifty different kinds of rivets, seventy-five different kinds of augers, a like number of locks, a hundred different kinds of bolts, and so on.

Under the head of hardware, railways use pitchforks, garden rakes, spirit levels, closet hooks, oil stones, pincers, matchsafes, nails, spikes, files, keys, hooks, axes, anvils, hinges, bolts, tools for carpenters and machinists, springs, trimmings for houses and cars, grindstones, handles, and all the multitudinous articles to be found in a hardware shop.



Turning to another branch of the service, a railroad requires wagons and horses for the active and economical conduct of its business. The disbursements on this account are exceedingly varied, extending from an ordinary cart to a closed carriage, and involving, directly or incidentally, all the paraphernalia of the wagon and harness maker.

A railway company uses everything that a stationer has for sale—journals, ledgers, letter-presses, paper, blanks, forms, pencils, pens, inks, erasers, weights, and other articles of the counting house.

It requires for its engineering corps transits, levels, compasses, drafting instruments, chains, tape lines, leveling rods, ruling pens, barometers, stencils, and the accessories thereto. Its laboratory contains every useful scientific appliance.

The disbursements of a railway are not confined to articles of plebeian use. Coaches and sleeping cars glisten with rosewood and walnut; they are adorned with resplendent mirrors, rich upholstery and brilliant curtains of satin and gold. Rare Indian rugs and costly carpets cover their floors. In the offices and waiting rooms and upon the common cars are furnishings but little less costly.

The varied necessities of railroads make them liberal patrons of dry goods and jobbing houses; thus, they require cloths and linens of various kinds in the manufacture of bedding, car cushions, linings, curtains and for other uses.

They use wood in vast quantities. No other enterprise compares with them in this. Many great companies still use wood on their locomotives. Until the introduction of metal structures, fences in the United States were constructed wholly of wood. Their ties are still manufactured almost wholly of wood. Their buildings and other structures are also constructed largely of the same material.

In some instances little regard is paid to the quality of the material purchased. Thus, light and soft woods are sought in preference to those of a more durable character, not because they are more economical, but because they can be bought for less.

All the higher grades of wood are used by a railroad: oak for frames and sills; rosewood, walnut, maple and cherry for the interior of cars, coaches and offices; hickory for the handles of tools; ash for track gauges, and so on.

Railways vie with the merchant marine in the purchase of hemp, manilla and wire rope for their depots, shops, trains and wrecking cars.

They are vast consumers of oil for lubricating and cleaning their equipment and machinery; for mixing their paints and for lighting purposes.

They use glue and other adhesives in connection with their equipment, buildings and furniture.

They require for cleansing and polishing, emery, emery cloth, emery wheels, kriolite, oils, acids, waste and other substances.



They use rubber for air brakes, steam heating and many other purposes.

They are consumers of stone, brick, lime, cement and asphaltum.

Their hotel cars, eating houses and lunch rooms require for their operation all the varied necessities of a public house; they need the furniture peculiar to hotels and restaurants. They must be stocked with tobacco and cigars, and with native and foreign wines; tender and juicy meats; rare game; rich sauces; pungent spices; salmon from the Columbia; blue fish from the great South Bay; trout from the cold waters of Mackinaw; breadstuffs; succulent vegetables and delicate fruits.

In the operation of the telegraph, telephone and other electrical appliances, railroads consume large quantities of material peculiar to these undertakings; plain and insulated wires; poles upon which to string them; cables; vitriol; acids; mercury; platinum; zinc; magnets; relays; sounders; registers; insulators; switches, and so on.

The successful and economical operation of a railroad require it to make use of every appliance whereby time and expense may be saved. Thus it employs the telegraph, telephone, papyrograph, electric pen, hektograph, lithogram, typewriter, etc. It uses the best machinery; the latest appliances.

For the working of its quarries and mines it requires the tools and applicances peculiar to

such industries; also powder, nitroglycerine, and other explosives employed.

For the protection of its pay cars and offices it possesses the most approved pattern of fire-arms and explosives.

In preserving and adorning its buildings, bridges and equipment, and in connection with its signals, machinery and tools, it is a constant consumer of all kinds of paints, oils, varnishes, and like substances.

In connection with the construction, repair and maintenance of its furniture, bedding, carpets, matting, cushions, curtains, etc., it requires needles, thread, thimbles, beeswax, hooks and eyes, pins, buttons, etc. It keeps in its storehouses photographic appliances, fans, silver pearl rouge, rat poison, washing powder, sulphur, soap, toweling, mirrors, dustpans, mousetraps, black manganese, molasses, torpedoes, stove polish, salt, candles, nippers, bung borers, garden rakes, hoes, porcelain washbowls, wheat, bran, mops, brooms, baskets, sprinkling cans, calfskin, webbing, gimp, curled hair, napkins, blankets, mattresses, tablecloths, counterpanes, tea, coffee, sugar, beans, rags, slates, slate pencils, candles, filters, fire extinguishers, bunting, canton flannel, prepared chalk, soda, sal ammoniac, sieves, chamois skins, libraries, Bible racks, pumice stone, cotton cloth, carpet tacks, antimony, plumbago, rotten stone, tripoli, mica, seagrass lines, windmills, tents, maps, atlases, directories, counterfeit detectors, mailbags, carpet sacks, trunks,



and many other things that no one would expect to find.

It is apparent from the foregoing that the material of a railway comprehends an infinite number of things. I have not attempted to enumerate them; merely to point out some of the more varied and prominent articles by way of illustration.

# CHAPTER XX.

## PERMANENT MATERIAL AND STRUCTURES—INCIDENTS OF RAILWAY LIFE AND EXPERIENCE.

Much of the material used in the construction of railways is indestructible. Ages hence it will be found in its present shape. This is especially so in regard to the foundations of bridges and buildings; also with more or less of the roadway. These are the features that have come down to us from antiquity; have preserved to us the methods of the ancients. Thus, the highways constructed by Rome in the plenitude of her power remain to-day substantially as she built them. This is true also of the foundations of many of her great structures. But the magnificent tombs, rich in marble and statuary, wherein she laid her dead, have long since been torn down and rifled. The palaces where her people lived, the temples in which they worshipped, her public buildings and playhouses, have crumbled into dust. The monuments erected by her in commemoration of her triumphs, and intended to carry down to the latest generations of mankind the story of her greatness, lie broken and discolored beneath the accumulated debris. History recalls her





magnificence, her wealth and barbaric splendor. But her highways alone remain to tell their own story. Along these we may yet trace the march of her armies, the route of the vast caravans that supplied her with food.*

The great roads of antiquity are no longer things of current use. Once the focus of bustling life and commercial activity, they have shrunken into cow paths and grass grown avenues—the playgrounds of children. They no longer possess more than a neighborhood importance. In their place we have the railway; the creature of to-day, permeating every nook and crevice of industry and profit, it wraps the globe in its iron embrace.

Two thousand years from now, when the railway has, in its turn, given place to something better, or when, in the evolution of time, civilization has again lapsed into barbarism, the habitant of that distant day will view with wonder and awe the countless roadways and viaducts of the nineteenth century. He will trace these arteries of civilization in every quarter of the globe and in every field, over deep morasses,

* The famous Appian Way is buried by the accumulated dust of ages, some feet under ground. Portions of it have been opened and exposed to view. It was paved with hard trap or porphyritic rocks of irregular or accidental dimensions; they have a flat surface, and look like, and may have been, cracked boulders from the bed of the Tiber. Some of them were more than a foot in diameter. These were laid first, and the interstices were filled in with smaller stones, so that the joints were broken in all directions.

across trackless deserts, through impenetrable jungles, darkened tunnels and rugged cañons, by pathways cut in the solid rock; over foaming torrents and towering mountains. He will find no spot too high, no place too deep, no chasm too wide.

The railroads that lie like countless seams upon the face of the earth, with each year's use take deeper root, become with each succeeding train more indissolubly blended. Who can foretell their future; who estimate their effect upon mankind? Radiating like scintillations of light, they promise to become general in presence and usefulness.

We cannot compare the few great highways of Rome with the railroads of to-day. The former were indestructible. Ours promise to become equally so. Rome built of imperishable stone. Our process is more simple, more economical. We force the material we need, by slow and imperceptible processes, deep into the earth, piling broken rock and enduring gravel, layer upon layer, until a roadbed is secured, dry, elastic and indestructible.

The process is interesting.

An embankment is first thrown up. The inequality of the ground sometimes requires that it should be higher, sometimes lower. In a flat country it is only a few inches in height. It answers several purposes—it drains the track; admits of easy gradients, a level surface and holds the tie in place. Upon this embankment the



sleepers are laid. Upon them the rails are placed. To secure the requisite firmness, the ties are imbedded in the ballast. Now, common soil, rich in productive capacity, is too compact to make a good roadbed. It is not sufficiently porous. It retains moisture. It holds the tie as in a basin. The impingement of the train causes the surface of this basin to harden. Water lies in it as in a cup. The tie absorbs the water and, absorbing it, rots. But what is quite as important, the track is heavy; its cohesiveness is quickly destroyed. It does not possess sufficient power to withstand the weight of the train, and so is swallowed up as in a bed of quicksand. The defect is fatal, except upon roads little used. To obviate this, broken stone, coarse gravel, cinders, even sand, are employed to buoy up and ballast the track. It is spread in layers over the whole surface of the roadbed. It slopes outward from the center, where it sometimes reaches two or three inches above the tie. It is forced underneath and about the tie. For this purpose thin, wedge-shaped tamping bars made of iron or steel are used. The water quickly filters through the ballast, leaving the track dry, compact, elastic. But while this is important, it is quite as important that the bed upon which the ballast rests should also be freed from water. To permit this the embankment upon which the ballast is placed is so high that the water seeps out at the sides and is carried away in ditches or drains.

The ballast I have described possesses little

more elasticity than common black soil or loam, but it is not so compact. Broken stone, perhaps, makes the best ballast. Next comes coarse gravel and cinders. Fine gravel and sand do not possess sufficient body to hold the ties; moreover, they create dust. This dust envelopes the locomotive, fills the cars, permeates the machinery, and finds its way into the journal bearings of the train, cutting and destroying them like millions of revolving diamonds.

The action of frost upon a track is peculiar. When the ground freezes, the roadbed and its adjuncts are forced upward. Not uniformly, but in some places more than in others. When the frost disappears, the bed recedes, but as it recedes the ties become loosened and remain nearer the surface. The track is irregular. To remedy these defects, it is necessary from time to time to add new ballast, to tamp it around the tie, and level the surface as in the first instance. A roadbed thus constructed becomes in time practically impervious to water, and so raised above the surrounding earth as to be quickly drained. There being nothing to freeze, it is not affected by frost.

Such a track is as indestructible as the earth in which it is imbedded, and so long as the world revolves, and the action of heat and cold are the same as to-day, it will remain an imperishable monument of our time.

Everything connected with railroads is still in process of evolution. Early experience gave



slight indication of their perfected methods and universal use.*

The discoveries of to-day in railway appliances are discarded to-morrow. Such is our progress.

The principles governing the business of railroads are only beginning to be generally understood. The laws of political economy, when applied to their affairs, have been looked upon as encroachments, and necessary police regulations have been viewed with suspicion. Classes have sought to confiscate their rights under guise of regulating their affairs, while adroit politicians have made them the stepping-stone to ambitions purely personal.

The creation of yesterday, railroads possess neither history nor prestige. A necessity to the community, they have been made the plaything of legislatures. No traditions endear them to the people. Giants in strength, a Liliputian is

* Thus, to cite a few instances among many, the first railroad of South Carolina ran only one train a day. At other times the engineer, upon application, made excursions into the country for a consideration. Among its regulations was one that dogs might be admitted to passenger cars if travelers did not object; another that firearms should be discharged before the person carrying them entered the cars; another that no way bill should be made for less than six and one-half cents. The doors of freight cars were in the end. One day the boiler exploded because of the fireman holding down the valve to prevent annoyance from escaping steam. Afterward a flat car loaded with cotton was placed between the passenger cars and the engine to protect the passengers. When a train was behind time, the people in the towns were notified of its approach by the display of a flag from the church steeple.

sufficient to hold them in check. The spirit that animates them is but little understood.

The extent of a railway company's power is unknown, and, like everything unknown, it is feared. It was necessary to the accomplishment of political ends that this fear should, in certain sections, be cultivated. It turned into hate. Adventurers made use of it. That their depredations have not been more general, we owe to the good sense of mankind.

The beneficent aims which railroads serve will, in time, rescue them from those who seek to use them for purposes of political aggrandizement.

If, as I have shown, a railway is sometimes the cause of much unnecessary apprehension, it is also sometimes the occasion of much genuine pleasure. This is so in the case of those so fortunate as to participate in its hospitalities.

What attention can there be more insidious than that of a great corporation? It adds much to such hospitality that it is of rare occurrence. Enjoyments that are seldom participated in are held in especial favor.

Those who have been tne guests of railway companies never forget its pleasant memories. No one, not even a veteran railway manager, can wholly withstand the circumstance and pomp of a special train. Its delights, its excitement, its animation, its social enjoyments, its luxurious cars and attentive waiters, are things that do not pass from the memory. Long afterward they are recalled with delight. We remember every



incident; the waiting crowds at the stations, as the train plunged past with a rush and a roar, that made the dead leaves and bits of paper dance and skip like boys playing leap frog; the staid old switchmen, standing at their posts as the train flew by; the sunburnt faces and old-fashioned costumes of the trackmen; the bustle of trainmen, waiting on the sidings, the engineer leaning out of his cab, the fireman standing by, the conductor signaling to go ahead, the trains slowly pulling out as we disappear in the distance. Nor do we forget the officials on board. They were, in all things, attentive and kind. We shall remember forever the look of settled gloom with which some of them regarded the track from the rear car; how intently they gazed backward at the bridges, as if they expected to see them detach themselves from their fastenings and set out in hot pursuit of the flying train. Again we watch them as they point with languid interest at the growing crops; hear them talk in monosyllables of the coming avalanche of business. This anticipated crash, we remember, caused them to shrug their shoulders, to laugh lightly, as if it were more than probable that they would be crushed under its weight. We remember the look of settled melancholy upon the faces of some as they passed through the cars, a look of responsibility that hinted darkly at impending dangers; a look such as an old captain might wear upon a stormy night on some unknown coast. We remember the many secret confer-

ences they held in unfrequented parts of the car; the reams of paper that were consumed in communications afterward destroyed; the mysterious communications a junior official wildly flung from the train as stations were reached and passed. We remember the abruptness with which certain officials addressed those subordinate to them, and how deferentially they approached those above them. We remember the careworn expression and look of anxiety upon the faces of the younger officers, as if they would like to get away from their superiors for awhile and have a quiet time in the baggage car. And the conductor! He whom we had all our lives seen coming and going with stately freedom, where was he? We found him, toward night, in a disheveled condition, on the engine, talking in a disjointed way with the engineer. More fortunate than the youngsters on board, he had a place of refuge. The incidents were many and varied. We remember particularly that whenever we stopped to take fuel or water, one high official, with large hands and legs of great strength and thickness, rushed wildly into the depot, looked hastily around with clouded brow and lowering eye, and then as hurriedly returned to the train. Other officials meanwhile carefully scanned the waterhouse and fuel sheds as if they thought seriously of taking them down then and there.

We cannot tell half the many delightful things we saw. But we love to remember them and grow garrulous over them on occasion. All of



us have been upon at least one excursion, or, if not, some dear friend, more fortunate than we, has described its every detail, not forgetting what the great officials said to him, and what he said in reply.

One of the notable things connected with a railroad is its business car. This vehicle is at once a drawing room, boudoir, dining room and kitchen—a domestic establishment on wheels. It is a necessity on every railway. It is the manager's home. He spends weeks at a time on the road looking after business and inspecting the property. To the world at large these journeys are delightful excursions, but to him they are dull and uneventful. However, certain state attends them. The progress is swift or slow, direct or circumscribed, as circumstances require. They are restful. After weeks of dull, monotonous office work, the pure air and quiet of the country are invigorating. The usefulness of railway managers is greatly prolonged by these journeys. Their business car is their fortress. In it they escape the importunities of the greedy and the drudgery of detail. It is as snug and cozy as a lady's boudoir. Its easy chairs suggest comfort and a good cigar after dinner. A cozy table in the center hints at whist, when the car is whirling through the country, or is laid up for the night in some quiet town. Railway managers do not travel alone; they go in groups. Each inquires into the needs of his department. In this way they are kept advised of the wants

of patrons and the needs of the company. After a trip they return to their desks refreshed; many important matters have been attended to; business has been accelerated; they have become better acquainted with the property, and their ability to work has been increased by what they have seen and heard.

# BOOK II.

# FISCAL AFFAIRS, EXPENDITURES.

# CHAPTER I.

## ANCIENT AND MODERN DEVICES OF BUSINESS.

Many of the devices used in business to-day were suggested in the age of Crœsus, the Lydian king, when the art of coining money was yet new and the practice of buying and selling at retail still in its infancy. The merchants of Babylon used blank forms answering the same general purpose as those contained in the appendix of this book. The goods transported upon the backs of camels across the deserts of Syria or the vast steppes of Central Asia three thousand years ago, involved fiscal methods similar to those practiced to-day. The carrier of that remote age exercised watchfulness as we do over the goods he handled. Nor were the revenues derived therefrom less important to him than to us. Merchants marked their goods with care, were particular to procure the acknowledgment of the carrier, and looked with closeness to questions of overcharges, losses, damages and delays. Human nature is the same now as then. The forms in use to-day are more numerous and complicated than formerly. They are also more easily destroyed. We use paper. The Chaldeans used tablets of clay; they were not elaborate, but, like ours, adapted to particular uses. Instead of a pen, they used a style;

instead of letters, cuneiform characters. The form of draft in use to-day is a device of these ancient people. We have simply enlarged its use.

The methods by which business is facilitated have, it is probable, been extended more during the last fifty years than during the whole period of man's previous history. Our fiscal affairs, among other things, have been greatly improved. Forms that were at one time laboriously written out one by one are now printed by hundreds of thousands. This is necessary to meet our multiplied transactions. The merchant of Sidon embraced, in one consignment of purple, the product of a year's work. We produce corresponding results in an hour. This unexampled development of facilities is in the main the outgrowth of better transportation facilities.

Compared with the stable acquisitions of business, those of other callings sink into insignificance. Other vocations give scope to particular characteristics; may and do develop in man an idealized personality. But none of them, nor, indeed, all of them combined, afford the substantial benefits of a great and varied business. Here is man's greatest field of usefulness. The business man, the man of affairs, is the king of men. His knowledge of human nature is superior to that of all others, while the facility with which he adjusts himself to ever-changing conditions evinces his versatility and genius. Wherever



the influences of business men are felt the effect is beneficial. Fluctuations and uncertainties ever characterize societies not fostered by such associations.

The business of the world has its special votaries; its subdivisions, departments and bureaus. What one class creates, another handles; another utilizes. The intermediary element, that between the producer and consumer, forms an innumerable throng, a vast army. The common carrier belongs to this class. His work is subdivided into innumerable departments and bureaus. This book treats of one of these bureaus, that relating to certain phases of expenditures. Its object, while also explanatory, is intended to add to the effectiveness and economical working of the service.

## CHAPTER II.

### FISCAL AFFAIRS CONNECTED WITH MATERIAL AND LABOR—LIMITATIONS OF KNOWLEDGE.

The railway science is so new and covers a field so vast that experts in particular departments are ignorant of the requirements of other departments. This will continue to be the case, as the evolutions of railway management are so rapid that the greatest industry upon the part of particular men is not sufficient to enable them to keep advised of its progress.

Inability to supplement the practical knowledge of individuals with the extended knowledge of groups of men exercises a retarding influence in the management of corporations. With more extended experience in the art of governing large bodies of men we shall be better able to concentrate and utilize the knowledge of the force as a mass. An obstacle at present is the lack of initiative; of individual freedom and interest; also the presence, more or less, of personal jealousies. As we progress in the art of governing, groups will be able to act as a unit with the singleness of purpose of individuals.

The operations of railroads evince each day the necessity of more definite knowledge of their workings. We discover this want in the relations





of the railroads to the government; to each other, and to other industries. We discover it especially in their internal workings. The questions that present themselves continually in the management of these properties are: What do we know about this thing or that? Wherein is our knowledge of it correct; wherein incorrect? What is the best disposition to make of it? We are met everywhere by unknown quantities. This is so in reference to the fiscal affairs of railroads quite as much as in regard to their physical aspect. What are their limitations? What value attaches to exhibits professing to show details of earnings, operating expenses and construction? These exhibits represent things of the greatest importance, both of a private and public nature; the measure of income and outgo; the value of a property to the proprietor; its usefulness to the public; the relation of cause and effect; the gross and tare. If the information we derive is true, then our conclusions are intelligent; if not, not.

In considering the value of fiscal data, we are struck with the importance of that which enables a company to determine the cost of particular things. If it rebuilds a bridge, or constructs a building anew, or improves a particular section of track, or reconstructs a locomotive or car, it should know the cost. Not exactly, perhaps, because there will be small discrepancies; supplies for instance, are not measured for use with mathematical accuracy; the divisions of labor

are not always exactly accurate; other petty discrepancies will creep in. Absolute accuracy of statement will thus be prevented, but the differences will be so small that no material interest will be affected thereby. These differences, it must also be remembered, arise mainly out of our economical methods; out of efforts to secure efficiency rather than theoretical perfection, when the latter entails added cost. A company must know all its items of expense with approximate accuracy. Here definite knowledge ceases. It would be valuable to know precisely the expense of operating particular parts of a road; the cost of the passenger business; the expense of the freight traffic, and many other impracticable things. If managers could determine the prime sources of outlay I have named, they would be able to act knowingly in some cases where they now act only upon shrewd conjecture. But they cannot. The extent of these outlays is largely surmise.

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Theory and practice are not farther apart than the means by which railways arrive at an understanding of their affairs through the medium of their returns. While the aim is substantially the same in every case, the *modus operandi* of reaching the end sought differs. But so carefully and ingeniously have the various systems been thought out and applied, that it is oftentimes impossible to discover which is the best,



which has the greater advantage. They are all meritorious. Each will excite the wonder of those able to comprehend the infinitude of thought and labor it involves.

To the mere looker-on it would seem as if the owners of railroads would find this diversity of method cumbersome and expensive; that the public would find it burdensome. Such is not the case. Both the stockholder and the public have been benefited by it through the interest the subject has excited and still excites among the vast army of men employed. The saving in cost and time effected by their inventions and devices cannot be computed. And when we remember that every dollar expended in accounting is unproductive, we may form some idea of the value to the community of these cheapening processes. The subject, however, is still in its infancy.

Cost of accounting is dependent upon many things:

1. Cost of labor will depend very much upon the location of the property and the number of years the company has been in business.
2. Cost of supplies will depend upon ability to buy in the cheapest market, and as needed.
3. Upon the number of accounting divisions into which a property is divided.
4. Upon the skill of the officers and employes.
5. Upon the method of accounting.

In this connection it should not be forgotten that the cheapest form of accounting (i. e., the

accounting department that is run at the least cost) may be the most expensive to a company, because of the inefficiency and irresponsibility it engenders; because of the absence of reliable details of administration. A system may, moreover, engender dishonesty by its failure to provide proper checks and safeguards. Thus it is a fact that the unsuspected depredations that go on where methods of accounting are inefficient greatly exceed those that are found out; that the unknown pilferings greatly exceed the known defalcations Thus, an imperfect or cheap system of accounts may involve many times its cost in losses never known to owners or managers.

In reference to the fiscal systems outlined in this and the accompanying volumes, they are believed to be effective and economical.

The diversities that exist in railway accounting are not confined to any particular branch of the service. They are noticeable in both disbursements and receipts and in all the thousand and one things that grow out of them.

Methods for keeping disbursement accounts are not all equally good, yet all have many favorable points. The capacity of those in charge is important. A system that would work admirably under one man would not work well under another, in the same sense that a sword one man could wield effectively another could not lift.

Uniformity in accounts is not to be expected or desired, any more than uniformity in business. Railway affairs are too diversified, too complicated, too changeable; the talent, experience and interest of those in charge too dissimilar. We are indebted for the advances that have been made up to this time to the interest of individuals; to men of genius and research; to the open field they have had. We must still look to them. The uniformist ignores this class. Uniformity in business methods means the subjection of ideas to a dead level. The returns of railways to the government should be uniform. But their appliances and methods may well be as diverse as the character of the country they traverse or the measure of ability of those in charge.*



In publishing this and other treatises on fiscal affairs, I wish it to be understood that I do not attempt to discuss the subject exhaustively. Nor do I claim that the methods I suggest are the best; I give them simply for what they are worth; for the information of those concerned. Of course, I think them as good as any, or I would

* My attention was first called to the subject of a uniform method of *keeping* accounts by a railroad commissioner, a lawyer and a gentleman of the highest distinction. His position and the persistence with which he urged the matter dignified the subject. I have accordingly referred to it in my recent books. A uniform method of keeping *railway* accounts appears to me very much like having our hats, boots, breeches, shirts, men and horses of a uniform size. It is an admission that progress is practically at an end. Its immediate effect would be to benumb the intelligence and interest of a hundred thousand men connected with railway accounts in the United States alone, and substitute therefor the interest, experience and intelligence of a very limited number of men.

not publish them. There is nothing unreasonable or egotistical in this. When, therefore, in my books I speak definitely or authoritatively, the reader will understand that I aim only to be precise in reference to the particular thing referred to, not that I think my way is the only way, or necessarily the best.

In reference to the fiscal regulations governing Labor and Material, there are so many things that tend to render systematic and effective accounting difficult that the subject invites the most exhaustive inquiry. Those who have studied it find their labors never ending.

Definiteness in accounting for Material and Labor may be secured approximately, but not absolutely.

The service requires the enforcement of arbitrary regulations that will prevent omissions, errors and improper practices; that will enforce responsiblity; that will secure authoritative returns; that will not allow the accountant to run into extravagance and dilettanteism.

Extravagance in accounting cannot be too severely condemned. On the other hand, pinching economy that fails to recognize and enforce responsible methods, merely to keep down the pay roll, is infinitely worse than extravagance. This fact cannot be too strongly impressed upon owner and manager.

The diversity that characterizes the practices of railroads in connection with their fiscal affairs and in their methods of management is noticeable in the systems they have severally adopted for handling the Material they use. Upon many roads the purchasing agent has entire charge of everything relating to material. He buys, receives, inspects, cares for and disburses. His powers are autocratic. No check is placed upon him. He is trusted implicitly. Upon other roads his jurisdiction is restricted. A check is placed upon him, as it is upon the treasurer; his authority is only concurrent. He makes the purchases, while some other department, perhaps the master mechanic, superintendent or engineer, cares for and disburses. Upon still another line he simply buys, while the accounting department receives, cares for and disburses the material under orders from the operating department. Under this last named method the concurrence of two (and in some cases three) independent departments of the service is secured. This insures a check in harmony with the principles governing corporate accounts.



The diversity that characterizes the keeping of material accounts is also noticeable in connection with those relating to Labor. Upon some roads the time of employes is kept by the operating department, master mechanics, superintendents and others. Some companies have timekeepers especially appointed to perform that office. The methods by which the Labor accounts may be kept are infinite. However, the method is not nearly so important as that it shall enforce accuracy and truthfulness; that the time of

employes shall be correctly kept and faithfully charged to the thing upon which expended.

The keeping account of the Wages of men and the distribution of the same to the accounts affected cannot be left to chance or to the hazards that attend irresponsible methods, any more than a company's traffic or its money can safely be left to chance. We must know that the men have worked and that the rate allowed is right, otherwise the crowding of the pay roll with fictitious names, while it may not become a matter of universal occurence, will be frequent. To enforce accuracy in keeping account of the wages of men, the time must be kept under the direction of persons acting independently of the person who hires or the official who directs. In fact, the principle of corporate accounting must be observed, namely, that the persons who manage shall not also act as their own auditors.

Mechanical devices, while important, may be safely left to the ingenuity of those in charge.

There are two methods of keeping the Material and Labor accounts of railroads; one in which only Results are known at headquarters; another in which all the Details are known. The accompanying book provides for the latter. Thus, if twenty thousand dollars are expended in constructing a passenger depot, the items that make up this sum are accurately, *and without extra cost*, known to all interested.

I consider it of the utmost importance that every detail of expenditure, no matter how far



away from the general office the expenditure may have been made, should be known to the operating officers and those in charge of accounts at headquarters. Some who admit the desirability of this, object to it on the ground of cost. Cost does not cut any figure. The information may be known without the expenditure of a dollar. Not only this, but the details may also be known to all local officers without extra expenditure. In explanation I respectfully refer the reader to the chapters on Labor and Material. It is very simple. The details of these accounts as written up by those in charge along the line of a road should be transcribed on forms prepared for the purpose. At the end of the month, when the accounts are closed, an impression is taken of the returns, after which they are bound in book form and sent to headquarters, and in being sent to headquarters are sent through the intermediary local offices. Thus everyone interested is kept informed.

The chapter on Material relates to receiving, inspecting, caring for, disbursing and using supplies.

The chapter on Labor refers to the manner of keeping the time of men, certifying thereto and charging the same to the account upon which they work, making the pay roll, etc.

The volume contains still other chapters.

The chapters on material and labor are short and so simple that a school boy may understand them without difficulty. I invite attention to

them, not because I believe they describe the only, or the best way, perhaps, but as helps. They treat of mechanical methods. They also explain the necessity of clothing those who have the care of material and labor with proper authority. They point out the value of well balanced systems. They are impersonal. They do not aim at the aggrandizement of any particular department. They look only to the efficiency of the service—only to its good.

The accompanying book does not attempt to do more than describe the manner of keeping account of disbursements for material, labor and other purposes. It does not attempt to treat the subject exhaustively—one volume would not be sufficient for that.*

The accompanying book may be used as a manual. It aims to secure fullness of information, insure efficiency, and prevent irregularities; to secure the maximum of efficiency at the minimum of cost. It is applicable alike to a road ten thousand miles long or to one only ten miles long. The principles it lays down and the rules and regulations it specifies are as necessary to the one

* Those who desire to study the best method of handling the material railway companies use in their operations, I would refer to the book "Economical Purchase, Care and Use of Material." I there discuss the subject from the standpoint of the manager, as to what is best for a company to do in order to attain the great possible efficiency in the purchase, inspection, care and use of material. The *expenditures* of railways for *construction* purposes and the various questions that affect *cost of construction and operation* I discuss in still another book, "Constructing, Financing and Maintaining."



as to the other, and relatively as beneficial. It may be used as a manual just as it is, without the change of a word or a comma.

The chapters on labor and material are preceded by a description of primary conditions. This description is essential to a proper understanding of the subject. Its purpose is to secure co-operative effort and impress those in charge with the responsibility that attaches to their acts.

In regard to the manner in which the disbursement accounts shall be kept, the returns that shall be made, forms and other particulars, reference is made to the headings covering these details throughout the book. These headings explain themselves better than I can explain them here and cover the whole panorama of railway expenditures, both from the standpoint of the expert and the student.*

The accompanying book is not written for experts alone. It is intended to be useful to students and beginners. It is explanatory, not delphic.

I do not attempt to explain herein, except briefly and incidentally, the method of treating returns after they reach the general office, i. e., the method of spreading them on the general books. That is not immediately germane to the subject; it concerns, in fact, an entirely different class of readers. Those who compile the disbursement accounts along the line of a road have little or nothing to do with handling them at head-

* See "Table of Contents."

quarters. This phase of the subject is therefore treated apart.*

The manner of keeping material and labor accounts at shops and elsewhere must be fully thought out in advance. Upon it depend faithful service, efficiency, reliability, economy of expenditure, or the reverse. Upon it depend whether the supply of material on hand shall be kept down as much as possible, whether material shall be carefully inspected when received, shall be carefully guarded afterward, shall be disbursed only so far as the service requires, and shall be protected after being disbursed; upon it depend whether the time of men is accurately kept, whether the wages are right, whether men have worked as represented; also, whether the pay roll is charged to the accounts upon which the labor was expended. These are vital things and upon them depend whether a company shall have an efficient or inefficient management; whether there shall be economy or extravagance, energy or sloth, honesty or trickery, responsibility or irresponsibility.

The accompanying system, while far from being perfect, is sufficiently comprehensive to protect with reasonable fullness the company using it. It is in the right direction. From its study and that of other systems something better will grow. It shows under what heads disbursements are to be charged and a careful division of Operating and Construction accounts is given. These

* See book "General Fiscal Affairs."



classifications are those officially promulgated by the United States government. They are not the result of any particular man's labor. They represent what may be called the accretions of years. They are practically perfect in this, that they embody the more specific things that such distributions should contain. They will not, however, it is probable, please everyone. Some will require that the divisions be more minute; others that they be not so minute.

The enumeration of items that enter into each operating and construction account, as given in detail herein, was first collated by the writer many years ago. To the casual observer it does not seem important, but to practical accountants its value is apparent. It is only by such minute designation that we can hope for a uniform classification of disbursements. It enables storekeepers, timekeepers and others to charge exactly the same thing to the same account everywhere and at all times and under all circumstances; without it they could not do this.

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For many years after the introduction of railroads they were governed by word of mouth—largely by tradition. But as they grew in extent and employes multiplied, these loose methods became more and more unsatisfactory. This is how I came to write my first book on railway subjects.

Wherever two or more men are expected to co-operate intelligently, without clashing or contention, they must be governed by well understood rules. There is the same necessity for such rules in the government of railways that there is for general laws. Each road, however, requires rules and regulations peculiar to itself, just as states, cities and towns require laws peculiar to themselves; just as businesses alike in nature, but carried on by different men or under different circumstances require different methods of administration.

The accompanying book is intended to give in detail some of the more important practical rules and regulations governing labor and material. It explains certain methods found by practice to be efficacious. The attention of the reader is invited to the forms used. The value of these will grow upon him as he becomes more familiar with them. Seemingly dry and unimportant, it is no exaggeration to say that the gross revenue of railroad companies would not be sufficient to pay for keeping their accounts if they followed the old method of bookkeeping that our forefathers observed. The money now divided in the shape of dividends and paid out in interest would not be enough to pay for clerk hire and stationery. But while economy is sought, the necessity that exists for accurate and scientific accounting in connection with the operation of railways is not for an instant lost sight of; the methods devised, while cheaper



than those of merchants and bankers, are even more carefully constructed, even more secure, even more effective in their operation.

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The accompanying book shows how the time of men is kept; how it is charged to the thing upon which expended; how the pay roll is made; the kind of returns that are sent to headquarters, who makes them, when and how they are made.

It explains the duty of those who order material, inspect it, disburse it, charge it to the account upon which it is used; the kind of returns that are made for material, who makes them, when and how they are made.*

It also enumerates all other classes of disbursements incident to the operation of a railroad, how they arise, what they are, how they are accounted for.

It enumerates the various headings under which operating, construction and other accounts are kept.

It points out how operating expenses may be apportioned to the several divisions of a railroad.

It describes in detail and as a whole, disbursements for operating, taxes, interest, rentals, dividends and kindred items.

* In connection with the disbursement of labor and material is incidentally described the method of accounting for *material sold or traded, labor performed for others, accounts against persons and corporations, etc.* ("See Various Persons' Accounts.*)

The volume is intended, as its name implies, to afford the reader an accurate and concise description of the disbursement accounts of a road, what they are, how they are kept, and how they are grouped. I have not attempted anywhere to discuss the subject except from the practical standpoint, the standpoint of those who desire to know concisely and accurately what the subject covers, what is requisite to be done in order to provide necessary facilities for keeping the disbursement accounts of a road and surrounding them with needed safeguards.

# CHAPTER III.

## DEFINITION OF TITLES OF RAILWAY OFFICERS AND EMPLOYES—KEY TO THEIR SIGNIFICANCE.

As titles seldom have the same meaning upon different roads, or a like meaning for any length of time on the same road, it is necessary, in any discussion of matters affecting railroads generally, to avoid the confusion their use would occasion. This may be done by using only those of a general character. This is the rule I have tried to observe in my books. Thus when I refer to the "treasurer" I mean the financial officer in charge; on one road he may be a treasurer; on another a vice-president, comptroller, cashier, paymaster or clerk. The title "accounting officer" is used in the same way; under that general head all officers who have authority in connection with the accounts are grouped, and when reference is made to the accounting officer it means the particular officer whose duty covers the thing in question, whether performed by a chief clerk, ticket accountant, freight auditor, auditor, comptroller or vice-president. In the same way the title of "storekeeper" represents the person who has charge of the supplies of a company at the

shops and along the line of a road, or who renders returns thereof. Two distinct officials may perform these duties. The title of storekeeper also appropriately covers the person who keeps the time of men and renders account thereof, because he generally has charge of material as well. Upon some roads the storekeeper will be the master mechanic, upon others the foreman, division superintendent, civil engineer, stationer, clerk, timekeeper, and so on.* The title of "agent" naturally covers those in authority at stations;† it includes the agent, ticket seller, cashier, clerk and other attaches. The title of "counsel" covers those connected with the legal department; "traffic manager" those having charge of the traffic; "division superintendent" the official having charge of the operating department of a division, including the civil engineer of a division, although the latter may be an independent officer. The title of "manager" is used in a general sense to designate the officers collectively who manage the property. The title of "general manager" means the highest known managing officer; he may be a president, general manager or superintendent.

With this explanation the general application of titles, in the sense I use them, will be understood. When I find it necessary to use a title of

* Indeed, all of these officials have more or less to do with material and labor accounts. I suggest the title of "storekeeper" because it applies more generally than any other.

† The title of "agent" is also sometimes used to designate every person in the employ of a railroad.



any kind I use that which seems most appropriate, not as expressing an opinion, directly or indirectly, as to what a particular title should be, or what the official possessing that title should do in all cases.

# CHAPTER IV.

## MATERIAL — PRACTICES GOVERNING THOSE WHO ORDER, BUY, CARE FOR, DISBURSE, OR ACCOUNT FOR MATERIAL.

[NOTE.—REQUISITIONS AND ORDERS. For rules and regulations governing Requisitions, Orders and Requests for material, see chapter devoted to that subject in book entitled "Economical Purchase, Care and Use of Material." The chapter in question contains the most exhaustive study ever given the subject, and to any railway company or great corporation whose material accounts have not been thoroughly systematized on the basis of practical experience and needs, the chapter in question is invaluable, worth to it, in fact, many hundred times the value of this whole series of books.]

Before taking up specific rules and regulations governing the purchase, care and distribution of material, let us examine the philosophy of the subject. It is only thus we can understand it in its entirety, or judge of the necessity for specific rules.*

The material accounts of a company concern all its operating officers, but more particularly those who order, buy, receive, inspect, care for, disburse and use material.

The measure of responsibility and extent of knowledge required of those in charge of material is not the same in all cases—they differ just

* I wish to refer here to what is said at the commencement of the chapter on Labor in this book. Its perusal will enable the reader to understand Material accounts better.





as they do in other departments of the service—but it is essential that the theory and practice of accounts governing material and labor should be understood by everyone, otherwise they will not be able to act harmoniously, and the service will suffer from inefficiency, extravagance and contention.

In the conduct of material and labor accounts the design should be that each storekeeper and timekeeper should have his particular sphere of duty; that he should be respected therein; that those about him should co-operate in every way with him to increase his usefulness, and that he in his turn should be particular not to infringe upon the duties and responsibilities of others; and, finally, that all should act harmoniously for the common good.*

At many points on a line the care of material is a mere incident, the value and quantity on hand neither necessitating nor justifying a storekeeper. Nevertheless, the material should be looked after with the same intelligence and

* Those who have charge of the receipt, care and disbursement of material and are charged with the responsibility of accounting therefor, are, for convenience, designated herein as "storekeepers." This title applies alike to the person in charge of the material at a shop, or storehouse, or fuel supply depot; to a division superintendent, civil engineer, roadmaster, stationer or other person *who is charged with the responsibility of receiving, caring for and disbursing material and rendering returns thereof.* Those occupying a less responsible position, who handle material, are designated by some other title, so as not to confound the duties or responsibilities exercised by them respectively.

faithfulness that petty cash collections are looked after at small stations. The amount of cash is never a matter of consideration in providing for its safety; everything necessary to protect it is studied in advance and rigidly enforced. A loss of cash, no matter if it does not amount to more than a few shillings, is not looked upon as excusable. The same principle should govern the care of material. It should be protected everywhere and under all circumstances, without reference to the quantity or particular value, so far as it is possible without incurring expense out of proportion to the risk involved.

Those with whom the duty of looking after material is an incident only should still take accurate account of the material they receive and expend, should guard the supplies intrusted to them with unceasing vigilance, and while they may not possess the discretion of division and shop storekeepers, it is their duty to report any act or impression connected with the handling of material whereby the service may be benefited. The interests of all are alike in this regard.

At the shop storehouses of a company the extent of the work requires the employment of a particular person to take charge of the accounts and supplies. He is called a storekeeper. He must be especially versed in his business; it is necessary that he should understand not only the theories but the practices connected with material accounts; he should also be familiar with the kinds of material that the company uses, and



with each article thereof, so that he may be able to judge of its merits. This last is necessary to enable him to inspect it properly and determine whether it corresponds with that paid for by the company. He should understand the question of supplies in general and in particular. Unless this is so he will be unable to avoid embroiling his company in disputes with merchants as to the merits and value of articles received from them that might otherwise be avoided. The storekeeper must not only be experienced, faithful and observing, but he should be obliging, courteous and frank.

The storekeeper's association with and dependence upon others require that he should possess tact and patience. While exercising the utmost watchfulness to see that his company receives that which it pays for, he should not under any circumstances or pretense attempt by direct or indirect means to wrong a person from whom material is bought, or deduct anything from that which is really his due. The storekeeper is a custodian, and is bound to report the facts exactly as they exist, neither omitting nor adding anything. This is the duty of the accountant everywhere and under all circumstances. He is a historian merely of that which occurs about him.

It is the duty of the storekeeper to see that that which he receives is genuine; to carefully husband it, and to disburse it only upon authenticated orders.

The duties of the storekeeper, no matter how great or how small the amount of material intrusted to him, require that he should take the best possible advantage of the facilities at his command; that he should so arrange his storehouse and dispose of his material as to most conveniently receive, inspect, watch and disburse that which passes through his hands. This will require him to study his resources carefully and make the most of them. He should so arrange his material as to prevent its being taken without his knowledge, or, if otherwise obtained, that the abstraction may at once be called to his attention. This duty is extremely difficult where the material is scattered, as it necessarily is at many shops. Nevertheless, it should be so arranged as to be under his inspection from day to day, if not actually under lock and key. He should, so far as he can, devise means to protect the supplies from the weather, and to so arrange them as to save labor in handling, and reduce the cost of inspecting and inventorying to the minimum. His duties are what his title implies. Whether he is a good storekeeper or a poor one will depend upon the measure of his talent and industry. There are both good and bad storekeepers in mercantile life. The former are those who study the situation and take advantage of its opportunities. The same rule holds good with the storekeepers of a railway company. The one who gives his duties the most thought and attention will be the best, and his reward in the long run will be the greatest.



The material that a company uses in its construction and operating work covers every article known in the mercantile world. Not all of these, however, pass through the hands of every storekeeper; their duties are varied according to the location and particular purpose of the storehouse; thus, a construction storehouse is opened for new roads built or old ones extended; a storehouse for material used at shops and roundhouses; for track material; for bridge and building material; for stationery and blank books; for supplies for dining and business cars and lunch rooms, and so on. Some of these may be consolidated. Those in charge require to be especially versed in the duties of their office. Notwithstanding this practical knowledge, the good of the service requires them to seek hearty and active co-operation of those about them who are more familiar than they by actual experience with material, more especially those likely to render them good advice. The storekeeper should combine the intelligence of those about him with his own, and not seek to stand alone. In no other way can he keep himself advised or familiar with the value and purposes of material or the changes that occur from day to day. The changes in this branch of the service are more important and more frequent than in any other department of industry in the world. In every field railway appliances are in a transition state. They are not perfect in the machinery department, the track department, the train department, the

station department or accounting department. Betterment is the watchword in every branch of the service. It is the duty of storekeepers to keep themselves advised of these changes as they occur. Otherwise they cannot handle intelligently the material they receive.

The duties of storekeepers, as will be seen from the foregoing, require something more than involuntary or mechanical service. And while they may have no discretion in regard to the quality of material bought, cannot add a jot to the facilities they possess for handling supplies, nor be able to say that material may or may not be used, they, nevertheless, possess wide discretion, and have ample scope in which to exercise intelligence and display business ability. Their knowledge of the uses of material, acquired by handling it, renders them of great assistance in determining the kind and amount required. It also enables them to discover any surplus on hand or any old or new material not needed, or that has become obsolete. This knowledge is of great value in preventing the unnecessary accumulation of material, and of disposing of that which a company no longer needs.

The value of a storekeeper's services to officers and others, in connection with the ordering and use of material, adds greatly to his usefulness. But his value in this regard, it may be observed, will be measured by the intelligence, zeal and tact he displays in communicating his knowledge to those who have practical use for it.



The duty that devolves upon storekeepers of looking after supplies while in their hands, should not cease altogether after the material has passed into the possession of others. Their jurisdiction, so far as they are able to exercise it, requires them to see that material is not misappropriated or lost afterward; and in the event it is, to require reparation therefor. This duty is especially urgent in the case of brasses, tools and utensils of common use. It is within the discretion of storekeepers to require, in making disbursements, that the old or worn-out article that is to be replaced should be returned or duly accounted for. This duty is very far reaching in its application. It extends not only to the tools used by carpenters, machinists, blacksmiths, painters and others about shops and roundhouses, but to the implements that are used upon trains, upon the tracks, and at stations, watersheds, fuel-houses and yards; everywhere, in fact, where the return of the old article will prove that it has been properly used. In many cases the articles thus returned will have no value, or but a nominal value at best. However this may be, the application of the rule will be useful in enforcing care in the use of a company's property. Moreover, in many cases articles thus returned may be repaired and re-used with little expense, that would otherwise be thrown away as useless. No one except those who are familiar with the purchase and handling of material can judge in such matters. Many articles that apparently

have no value whatever may, with the expenditure of a trifling sum, be made serviceable, or may be made to realize something in the market. It is the duty of storekeepers to keep themselves advised in regard to matters of this kind; it is in their power to add greatly to the economical use of supplies, and to realize, through their zeal, experience and tact in the use of tools and other implements and the return thereof, vast sums of money which under other circumstances would be lost without anyone suspecting the fact or realizing the amount.

One of the reasons why the original outlay and expense account of corporations is greater than that of private concerns is because of the increased cost of petty things. It is possible, by the exercise of minute and salutary rules, to correct this evil in many respects.

The proper disposition of material passing through a storehouse is of the greatest importance to a company, from whatever point viewed. The exact measure of discretion, however, that may be allotted storekeepers, in order to derive the greatest benefit from their services, can only be approximately determined. It cannot, however, extend absolutely beyond the inspection, count and custodianship of the goods. The right to watch over their use, after they have passed from their hands, they must exercise with others. It is primarily the duty of the operating officer, into whose hands goods pass, to see that they are expended economically and in good faith.



The measure of discretion that the storekeeper will be able to exercise outside of his defined duties, it is apparent, will depend upon his industry, experience, faithfulness and ability to work harmoniously with those about him. The call for his services will depend upon the possession and exercise of these qualities. As the recipient of material bought, the storekeeper is practically the auditor thereof; his record of material disbursed forms the basis of all charges on such account.

The precautions to be observed in the care of material, it is manifest, depend very much upon its nature. Many articles do not offer temptation or facility to pilferers. On the other hand, the list of those having an immediate appreciable value is very great. These require to be watched with the same care that a cashier watches money in his drawer. They comprise oils, brasses, tools, hardware and portable articles of a general nature that the company uses in its service. There is still much to be learned in regard to the best manner of protecting property of this kind; but that which has been found most simple and efficacious is the system of exchanges, namely, the requiring of the return of the old article when a new one is needed to replace it. Its enforcement does not require elaborate accounting; it is very simple and inexpensive. Its immediate effect is to emphasize the relative care exercised by those who use material of this description. If they are careful

it is at once apparent; if negligent, the fact can not be long withheld. The great value to a company of the system of exchanges in the case of brasses has long been determined; its introduction in one instance at once cut down the cost to the company of such material one-third.

The necessity of returning an article when through with it suggests the necessity of protecting it meanwhile. The enforcement of a rule requiring the return of old or broken tools and other utensils, it is believed, will be quite as salutary as in the case of brasses. It will emphasize the fact of ownership in a company, and the return of the old implement will serve as a voucher for the procurement of another to replace it. The pride that men feel in caring for property intrusted to them, and the further fact that such care is known and appreciated, will intensify their interest.

In carrying out the principle of substitution, elaborate bookkeeping is not necessary. An account should be opened with the person to whom articles are given; when they are returned the storekeeper may run his pen through the entry or a mark may be set opposite showing that they have been returned and new ones issued in their places. The method of accounting is unimportant, except that it should be simple and inexpensive, and yet comprehensive enough to accomplish the purpose desired. As often as once a month a general inventory should, if practicable, be taken of articles thus outstanding. At



shops an inventory should be taken much oftener; indeed, it would be well that tools should be returned at night and redistributed in the morning.

While the discretion of storekeepers in regard to the disbursement of material is restricted, nevertheless in the event any order they receive should seem to be ill timed, excessive or improper, their privilege and duty require them to call the matter to the attention of the responsible operating officer immediately in charge. A faithful cashier, when he receives a check that while technically right seems yet to be wrong, will, before acting upon it, take measures to ascertain its accuracy; in the same way storekeepers will consult freely and fully with the officers in charge in reference to matters of interest or concern about which there are any doubts.

The duties of the storekeeper concern not only supplies awaiting use, but extend also to scrap and other old material. Every ounce of material of this kind possesses a value that is no more to be disregarded than the small change that finds its way into a ticket seller's cash drawer; it should be looked after carefully, should be accurately weighed—so far as facilities will permit—and should be brought upon the company's books with as much concern as if it were of inestimable value. The duty of looking after the scrap of a company and securing due return thereof is one of extreme difficulty, and invites the earnest attention and forethought of everyone.

While the duties of storekeepers in reference to the care of material have been thus fully defined, it should not be forgotten that the duties of operating officers in the premises are even more imperative. They should be active in every direction to prevent the extravagant use or misappropriation of a company's supplies. And in order that discipline and concurrence of knowledge may be secured everywhere, and at all times, it is made the duty of operating officers at shops and elsewhere to see that those who have the custody of material, whether as storekeepers or foremen, exercise prudence and faithfulness in the performance of their duty, and that they carefully guard the supplies in their charge and enforce such measures of precaution and economy as may be necessary. This supervisory duty is an important one, but is not onerous from the fact that the presence of the official in charge, on the ground, renders the task easy. His duties and those of the storekeeper are reciprocal.

The supplies of a company represent cash. They cost cash. Their waste, improvident use or loss is the same to the company as the loss of cash. The same principles should, therefore, govern. A storekeeper is the same as a cashier. His implements are different, that is all. It is his duty to see that that which he receives is genuine; that the count is full; that the goods are faithfully protected and guarded; that they are disbursed only on properly authenticated



vouchers; and, finally, that full and complete records and returns are made.

In order to secure harmony and efficiency, the duties of different departments (and, as nearly as possible, of different officials) should be defined as accurately as circumstances will admit, so far as they relate to the handling of material. The service should be impersonal; those concerned should co-operate heartily with each other without transgressing the limits of their particular duties. The great quantity of material and the widely separated territory over which it is handled render this necessary

Material must not be charged to an expense or construction account until actually used. An exception may, however, be made in the cases of petty supplies sent to stations for actual use, where the cost of accounting would be considerable and the measure of information furnished of no practical value. But in regard to supplies stored at shops and other depots and centers of supply, or in the hands of trackmen or men engaged in repairs and construction of bridges, culverts, buildings, fences and platforms, it is intended that they should be charged when brought to the person responsible for their custody and proper distribution, and this person should not, under any circumstances, charge them to an account until they are expended thereon. Those in charge of track, buildings, bridges, culverts, shops, roundhouses, fuel depots, as well as storekeepers proper, are required to

make return of material taken from store for actual use; also the amount of material and scrap on hand. In this way a company is kept advised, not only of the gross amount of material on hand, but the amount at different places, also the particular kinds of material. This positive knowledge enables officials to act intelligently and to prevent the unnecessary accumulation of material that would occur if the company's measures did not enable it to determine, at a glance, exactly the material on hand, and the quantity, location and value thereof.*

Generally speaking, the method of business that accomplishes results with the least expense and friction is the most desirable for business purposes, and the one that experienced and practical men will most readily accept and carry out. This is the method sought to be embodied herein; its purpose is to achieve results by the simplest and least expensive means consistent with necessary safeguards. Observances are held subordinate to practical results. The forms used are the best

* It was formerly the practice to charge much of the material used directly to the account upon which it was to be used, when bought. This was especially so in regard to road material. The practice grew out of the difficulty of securing effective accounting. This difficulty has been largely overcome, and measures are so perfected in this direction, at the present time, as to enable a company to keep in many respects as intelligent and effective account of its supplies as that kept by a merchant or manufacturer. These methods, however, are not by any means perfect, and all concerned in the handling of material should keep in mind the necessity of further perfecting them.



and cheapest that experience suggests; they will require to be modified or enlarged from time to time, according to the vicissitudes of business and experience. For this reason those in charge of material accounts should not allow the glamour of forms or practices to take too firm a hold upon them; they should keep themselves unprejudiced, so that they may view the work of the accounting department with the same cynicism that those about them observe. They are expected to pursue practical things; to avoid the purely ideal; to weigh forms and devices by the benefits derived therefrom. Any method that does not have a present or prospective value over and above its cost, is extravagant, wasteful and demoralizing.

Material may not be ordered by a storekeeper except to meet actual demands, based on the expressed wants of others, nor can he disburse it except upon orders from the official in charge, or his duly accredited representative. These orders are his vouchers, and he should preserve them with the scrupulous care that a banker preserves drafts that he has paid.

The routine of bookkeeping, as it affects material, is very simple. Each transaction, however, involves a special phase of accounting.

When material is received by a storekeeper he compares it with the invoice and duly records the quantity, price and total value on his books and in his accounts. He re-embodies this information in the returns which he makes of material

received. This latter forms the basis for making the charge against him and for crediting the official who bought the material or the storekeeper by whom it was shipped. When material is disbursed, the storekeeper should have an order therefor, which he files away. If material is shipped, an invoice accompanies or precedes it. Material disbursed is charged to the account upon which expended. If it is shipped to another storekeeper, it is charged specifically to such person. If it is used for construction or operating, it is charged thereto. Each storekeeper enters the disbursements he makes, like receipts, in due order in his returns. The amount he disburses is credited to him. All this information is needed by the accounting officer or person who audits the accounts of storekeepers; it may be rendered in separate statements or all embodied in a consolidated return; the latter plan is the one suggested herein. A detailed and separate statement is made by each storekeeper of the material he receives, ships away, sells, exchanges, otherwise disburses, or uses; at the end of the month he takes an impression of these statements, after which he binds them together in the form of a book and forwards them through the proper channel to the officer whose duty it is to finally examine and place the results they disclose on the books of the company. The plan is simple, cheap and effective.*

* For a more detailed description of it, see what is said in reference to the "General distribution of material book."



In accounting for material scattered along a line, the following provision has been found effective: Petty supplies distributed by storekeepers for current use or supply at places having no clerical facilities are accounted for by the storekeeper making the disbursement. The same rule is followed in reference to station and train material. Track supplies for each line are accounted for by the storekeeper for such line; in some cases he is the superintendent, in others a storekeeper proper, in others an engineer. Material used by gangs of men engaged in repairs of buildings, bridges, culverts, fences, stockyards, platforms, etc., for each line or division is accounted for by a central storekeeper.

The rules and regulations for handling the accounts contained herein are such as experience suggests. The central idea is to make the writing up of the records at the initial point on the line answer the varied purposes of all officials who have occasion to keep themselves advised. Thus the records written up at the storehouses for material are sent forward through the offices of the various operating officials interested in such matters. Before these returns are forwarded, an impression copy is taken of them by the storekeeper as already stated.* In this way all the

* In the event the sending of the distribution of material book through the offices of operating officials would engender too much delay or occasion inconvenience, an extra impression of these returns may be taken by the storekeeper and forwarded to the operating officer in charge, and through him in turn to all others interested. (In copying way bills as many as six or

operating officers interested have an opportunity to inspect the returns in detail without the company being put to the expense of retranscribing them in their several offices. In the event officers at any time require details of an account, they may quickly and easily obtain them by reference to the office where the record was originally written, or where it is finally lodged. The official who becomes custodian of the returns uses them as vouchers. He need not retranscribe them in detail upon his books; only the footings need be posted. Thus the records of storekeepers, superintendents, civil engineers, roadmasters, bridge and building foremen, stationers and others who perform the duties of storekeeper, no matter what their titles may be, will be finally lodged in one office and form the basis of the company's report of disbursements.

The system of accounts provided for herein contemplates a minute classification of disbursements as between operating expenses and construction; in the event of doubt or dispute, the matter is to be referred to the proper accounting officer for decision. It is not the province of a storekeeper (or timekeeper) to favor one account at the expense of another. It is his duty to record the facts exactly as they occur. This is one of the objects sought to be attained through the system embodied herein. It is a vital matter. In the event a storekeeper is also responsible for the expenditure—in other words, where he acts both as principal and accountant—he must still render unprejudiced returns. In such cases it is his duty to appoint a competent person to sake charge of the accounts of his office and act as storekeeper; the latter should be unimpeded in the discharge of his duties; he should apportion expenditures exactly as they occur, in accordance with the facts, without reference to how the showing affects the official in charge. Thus, those in charge of track accounts will not attempt to debit to construction, expenditures that properly belong to operating, or *vice versa*. Unless the accountant (be he who he may) is impartial in the discharge of his duties, the deception the company risks and the losses to which it may be subjected in consequence will readily suggest themselves; they as readily suggest the necessity of putting the accounts in the hands of those who will render impartial returns thereof.

Impartiality is one of the objects sought to be attained in suggesting that storekeepers at shops be relieved from immediate responsibility to those who buy or use supplies, all incentive to act prejudicially being thus avoided. Not being responsible for the purchase of material, it follows naturally that they will render true returns thereof; not being responsible for expenditures of material, it follows correspondingly that they will make true returns thereof. They occupy the

eight impressions are taken, and there is no reason why two or more impressions should not be taken of the distribution of material book; also of the distribution of labor book).

same relation to the operating department that the commissary occupies to the quartermaster's department of the United States army. One buys; the other audits.

Such is, in general, an outline of the system embodied herein. But in order that so far as possible there may be absolute unanimity in the handling of supplies and the conduct of accounts, formal rules and regulations become necessary. Those that occur to me I give below. They should be carefully studied by those interested, not only in relation to particular things, but in the relation they bear to the method of handling supplies as a whole. These rules, like those contained elsewhere in this book, apply to everyone, and should not be disregarded except special and particular reason exists therefor, of which the official in charge of material accounts should be the judge.

## ACCOUNTING FOR MATERIAL.*

[NOTE.—In explanation of the terms "Debit" and "Credit" it may be said that all material (including fuel) that is reported as received in store is a charge against the recipient; all material (and fuel) that is included in the returns as being disbursed, sold, or shipped away, is a credit to the person making the report and a charge against the thing upon which it is disbursed; in the final entries on the books of the company made from the summaries of returns, debits and credits have this basis. Thus, material embraced on one side of a return is the same as a charge, while if included in the other, it is tantamount to a credit. This principle is observed throughout the material and traffic accounts.]

* Embracing all kinds of material *not in use*, such as shop supplies, scrap, miscellaneous track material, rails, ties, brasses, tools, utensils of common use, stationery, dining car supplies, fuel, etc.



The material accounts of a company represent supplies in store. They also include scrap on hand.

Material should be debited to the storekeeper having it in charge. An account should be opened with each storekeeper.

Material should be charged to the person who purchases it. Afterward such person should be credited upon its being reported as received by a storekeeper, the latter being charged.

As a rule, payment should not be made for material until its receipt has been acknowledged by a storekeeper. In this way responsibility will be secured and risk avoided.

Vouchers audited in advance of the acknowledgment of the receipt of material by a storekeeper should be charged to the person certifying to such voucher, and should remain thus charged until material is reported as received.

No material should be charged to a storekeeper until he reports it in his returns.

In the case of transfers of material, the person receiving it should be charged and the person forwarding it credited.

Storekeepers should be charged with all scrap (old material) that accumulates; they should take up such property in their returns in the month in which it accumulates.

The following rules and regulations, in the absence of instructions to the contrary, will govern:

Material disbursed each month by storekeepers, as shown in their returns, should be credited to them in the month in which the return is made. The account upon which material is disbursed should be simultaneously charged, provided such charges are found to be correct. It will not be difficult, therefore, for a storekeeper at any time to ascertain from his books the balance that stands to his debit on the general books of the company.*

* The balance of material on hand may be arrived at by adding to the last inventory the gross amount of material received,

In order that the accounts upon which supplies are expended shall show the full cost thereof, it is desirable, so far as practicable, that the cost of handling should be added thereto. In the case of material, this should include the wages of storekeepers and men engaged about storehouses in handling supplies; in the case of fuel, it should include the cost of loading, unloading into store, arranging, inspecting, watching, sawing and piling wood, and, finally, the expense incurred in preventing and putting out fires.

The wages of storekeepers and their assistants while engaged in handling and disbursing material and fuel should be charged to the accounts upon which they are engaged.

When several accounts are affected, the amount should be apportioned among them at the end of the month on the basis of the amount of material charged each.

Material should be charged at invoice price, plus subsequent charges. If it has been carried forward from a preceding year, it should be charged at the last inventory price.

The diversity in material, and the different uses to which it is put, and the fact that officers of a company are not equally interested or responsible for the various kinds, coupled with differences in handling and accounting, render it desirable to classify the material account upon the general books. Thus, while all supplies that a company uses, including its scrap, are embraced under the general head of Material, they should be subdivided upon the books, in order to secure responsibility, under the heads of "material," "wood," and "coal."

While this classification is all that it is necessary to observe on the general books, storekeepers will effect a more minute separation. Thus, they should open an account with "rails," "ties" and "miscellaneous track

no matter from what source, and by deducting the total amount of material disbursed, sold or shipped away. The balance represents material on hand. A balance of this kind should be struck monthly by every storekeeper.



material," so that any deficiency or surplus in either may be placed where it belongs, and the accounts adjusted accordingly.

In the event a company manufactures supplies of any kind, an account should be opened by the storekeeper with each kind, so as to ascertain the exact cost thereof. In his returns, however, he should embrace all charges of this character under the general head of "manufactured material." Labor expended in handling a particular kind of material should be charged thereto, so that when it is finally disposed of the account upon which expended may be charged with actual cost.

Fuel sent to shops and roundhouses for heating and stationary engines should, for convenience in accounting, be charged to the storekeeper at such shop as "material."* This fuel the storekeeper should thereafter account for and charge to the thing upon which used, the same as other shop material; at the end of the year any such fuel on hand should be inventoried, the same as other material. In this way fuel consigned to shops for use thereat, for the above purpose, will be transferred from the fuel to the material account. Fuel used by blacksmiths, including Blossburg coal, coke, charcoal, etc., should be charged directly to material when purchased.

No material should be charged to an account until it is taken from the storehouse to be used.

Material shipped to points on the road where there is no storekeeper should be accounted for by the storekeeper who ships it.

In the event the person to whom material is shipped possesses facilities that will enable him to account for it

* If a storekeeper has both a material and fuel account, he will transfer from the latter to the former fuel taken for the purposes designated. One reason for classing such fuel with material is that the blanks for fuel returns are comparatively simple, as the number of accounts upon which fuel is used in the general operation of a road is very small. But fuel used at shops for the purposes indicated, it may be necessary to charge to innumerable accounts. Hence, it needs the same facilities and flexibility of bookkeeping that material proper does.

in detail as it is used, it should be charged to him by the storekeeper making the shipment. It is the duty of the latter in such cases to see that he is kept advised of the quantity used each month, and that the amount thus reported is incorporated in his returns for such month.

Petty supplies forwarded to stations and offices, and delivered to trains for current use, should be charged when shipped to the account upon which they are intended to be used.

### TRANSPORTATION CHARGES ON MATERIAL.

Advanced charges on material for a company's use received from other lines should not, in the absence of instructions to the contrary, be waybilled forward. At the end of the month a statement of such charges should be rendered to the proper official, with a view to having a voucher made therefor.*

When there are local charges on material, the station agent should deliver the receipts (expense bills) thereof to the storekeeper with the goods; the latter, after satisfying himself of the receipt of the goods, should write or stamp across the face of the instrument "material received," signing his name thereto. On the last day of each month the agent should forward these receipts to the freight auditor, who should make voucher in favor of the agent. This voucher, when made, should be forwarded by the freight auditor to the storekeeper interested. The latter should immediately compare the same with his books of record and, if correct, should enter the total amount of the voucher on his distribution book. He should then forward the voucher to the final approving officer. No delay should occur in connection with vouchers of this nature, as it is desirable that they should be audited before the accounts for the

* This rule is necessary to enable a company to see that payment of freight is not made on goods that should be delivered free, or that payment of a different rate of freight is not made from that deducted by the shipper from the invoice rendered by him.



month are closed, so that the agent may receive due credit and the proper accounts corresponding debit.

Advanced and local charges on material, except in those cases where the charges are afterward reimbursed by the seller, should be added to the original price, so that when the goods are used they will be charged at cost with the charges added. Exception is made to this rule, however, in the case of local charges on material designed for the construction of new lines; such charges should be debited in a separate sub-account directly to the cost of the line on which the material is used.

Storekeepers should be debited with transportation charges on construction material and they should keep a book in which to record the same as the material arrives at their storehouses. They should open an account with each class of material received, as say "transportation of ties," and so on. When the material thus covered by an account is used, the transportation charges thereon should be entered on the distribution book to the debit of the account affected, as say "transportation of material for blank extension." Thus, as the material is disbursed, the line upon which used will be charged with its exact proportion of transportation and the storekeeper's account will secure credit.

Under the above method of treating transportation, it will result that all charges of that nature will be debited to the storekeeper the same as the cost of the supplies, and will remain thus charged until accounted for on his distribution book as described.

All errors in waybilling material, corrections of weights and mistakes of every nature, should, so far as possible, be rectified in the month in which they occur; and it should be the duty of storekeepers and others to accelerate this work and make it as thorough as possible.

Errors not corrected before the voucher for transportation is audited, should be reported by the storekeeper to the freight auditor, so that reclamation may be made or correction otherwise effected on the books of the company.

All transportation or other charges on material consigned to a storehouse for contractors and others should be charged to them forthwith on the storekeeper's books, and a "various persons" bill made as in other cases. It is desirable, however, when practicable, that all material of this nature should be consigned directly to the party concerned, and that such party should settle the charges thereon with the agent; but where it is necessary to consign the material to a storekeeper, and charges thereon cannot be settled by the owner directly with the agent, it should be treated as above.

## INVOICES.

An invoice is a statement or account accompanying or preceding the goods, containing a full description thereof, including quantity, price and other particulars necessary to be known by the person receiving the property. For the purpose of railway accounting, two kinds of invoices are used, viz.: an "invoice of material purchased"* and an "invoice of material transferred between storehouses."† The former is made by the person who sells goods to the company, and the latter by the storekeeper who sends supplies to another storehouse along the line, or to any person for use on account of the company. The "invoice of material purchased" specifies the name and address of the person of whom the goods are bought; where the supplies are sent; particulars of the requisition under which they were purchased; date of shipment; description of articles, prices, items and total value thereof. The "invoice of material transferred" shows the place from whence the goods are forwarded; the point to which sent; request number; date of shipment; description of articles, prices, items and total value thereof.

The invoice is intended to afford the recipient a complete history and description of the goods. The following specific rules and regulations govern its use:

* See Form No. 23, Appendix E.

† See Form No. 24, Appendix E.



An invoice should accompany or precede each consignment of material, whether such material is purchased from a merchant or is transferred from one storehouse to another, or shipped to a station, section house, office, or other place.

On receipt of an invoice by a storekeeper, whether of material purchased or transferred, he should carefully compare it with the check book written up by the storeroom foreman at time of receipt of goods.

If variations, deficiencies or errors are discovered in articles, quantity, quality, price or amount, they should be plainly noted on the face of the invoice. The receiving storekeeper should then stamp on the face of the invoice the month in which he takes it up on his books and returns.

Storekeepers should embody in their returns the details of "invoices of material purchased," while they need only give the totals for "invoices of material transferred." The reason for this distinction is obvious.

In case of delay in the receipt of material or in the adjustment of differences, an invoice may be carried to the account of the following month. An invoice should never be taken into the accounts until everything connected with it has been satisfactorily adjusted.

No charge should be made in the returns against a storekeeper until he has acknowledged (by signing and returning the invoice) the receipt of the material.

Invoices should never be receipted until they have been compared with the requisition or order on which they are based.

When an invoice has been receipted, the date it is receipted should be noted on the copy of the request.

When the receiving storekeeper is through with an invoice, he should receipt it and return it to the sender; it is the duty of the latter to compare it with his record of material forwarded and note thereon its return and also any corrections that may have been made by the receiving storekeeper.

Invoices should be carefully labeled and filed away for convenient reference.

INVOICES OF MATERIAL PURCHASED.*—Invoices of material purchased should be sent to the purchasing agent by merchants; he should forward them to the storekeeper who receives the goods.

On receipt of an invoice, the storekeeper should enter it on the blank provided therefor; this blank forms a part of his distribution of material book; as fast as these blanks are filled, an impression of them should be taken in a tissue book. This impression book will constitute the office record of material received.†

Before receipting invoices of material purchased, storekeepers should see that any advances that may have been made for freight or other purposes, chargeable against the seller, are noted on the invoice and deducted from the price of the goods.

INVOICES OF MATERIAL TRANSFERRED.‡—A particular form is provided in this connection. It should be filled up by the forwarding storekeeper in accordance with its provisions. It should state upon its face the month in which it will be charged to the receiving storekeeper. It should be sent forward by passenger train.

Upon receipt of the invoice, the receiving storekeeper should take an impression of it in a tissue book provided for the purpose. As already mentioned, this book constitutes his record of material received.‖

* See Form No. 23, Appendix E.

† Where the system of accounts on a line does not render it possible to keep a record of material received by taking impressions of invoices in the manner described, a detailed statement of material received will have to be written in a record provided therefor, as a "record of material received" should be kept at every shop or storehouse.

‡ See Form No. 24, Appendix E.

‖ It will be noticed from the foregoing that the receiving storekeeper's record is made by taking an impression copy of the invoice sent him by the forwarding storekeeper. In order to do this it is necessary that the forwarding storekeeper should not take such an impression. How, then, does the forwarding storekeeper keep a record of invoices that he sends out? The following provision is made for this purpose by the writer: By the use of carbon sheets the forwarding storekeeper, when making the invoice, fills up at the same time two other blanks, namely, the instructions to the station agent to bill the freight and the record that the storekeeper preserves of the material forwarded. When these three documents are filled up (as they are at one writing) the forwarding storekeeper detaches the invoice and sends it forward, and as it is written in copying ink or indelible pencil an impression copy may be taken of it by the receiving storekeeper. In this way a great deal of clerical work is saved. This device forms a part of the writer's Multiplex system of accounts, which has long been in use.



Storekeepers should be particular to see that invoices of material forwarded near the time for closing the returns reach the shop or storehouse to which consigned before the storekeeper at such place has closed his accounts.

In order to prevent delay in closing the accounts, all material transferred between storehouses or storekeepers after the 25th of the month should be embraced in the succeeding month's accounts; the invoices in such cases, however, should not be dated ahead. Storekeepers will understand, without this being done, that the invoices are to be carried forward.

Each storekeeper is required to send on the 25th of each month to every other storekeeper to whom he has forwarded material, a statement thereof for the latter to examine and return; this statement should describe in detail each invoice. If it agrees with the books of the receiving storekeeper, the fact should be noted and the statement returned; if it does not agree, the points wherein they disagree should be noted. This interchange of statements is to enable storekeepers to harmonize their accounts before sending in their returns.

In making corrections on an invoice, care should be taken to see that the notation is shown distinctly on its face; also on the impression copy.

When material is shipped to a point where there is no storekeeper, an invoice should be sent to the place where the material is to be delivered; it will be required for use in inspecting and receiving the property. In case the material is to be taken up on the books of another storekeeper, a duplicate invoice should be sent to him.

In invoicing material, the exact facts are required to be embodied; the quantity of material and the condition thereof should be accurately stated; the price should be neither more nor less than its cost as represented upon the books of the person making the invoice. Nothing can be more reprehensible than any departure from this principle.

Invoicing Scrap.—In invoicing old material (scrap), the following should be observed: A memorandum invoice describing the material should be sent by the person forwarding it. Upon receipt of the material, the receiving storekeeper should make an invoice therefor, specifying the various kinds of material received, the actual weight of each kind, and the market value thereof. This invoice he should copy in his material received book as if it had been made by the forwarding storekeeper; the original he will send to the forwarding storekeeper, who should paste it in his record book of material forwarded.*

## RECEIVING AND INSPECTING MATERIAL.

The duty of receiving and inspecting material is one of the most important that devolves upon the storekeeper and his assistants. Clerical skill and honesty in this respect, while absolutely essential, are not alone sufficient. In order to perform the work effectively the receiver should understand the nature of material. Not only this, he should exercise also the greatest watchfulness, to detect irregularities, omissions, errors or subterfuges. He should be sufficiently versed in clerical matters to be able to record accurately and clearly that which he observes, to note fully and perspicuously the details of each consignment, including the quantity, price and amount. The work that he performs affects

* This variation from the ordinary practice pursued in invoicing material transferred is rendered necessary by the fact that the forwarding storekeeper seldom has the means at hand for accurately classifying the material, weighing it, or stating the market value thereof. When he does, the customary rules and regulations should be observed.



not only the company, but the person from whom the material is bought; the seller is, in some respects, at the mercy of the storekeeper, and if the latter is unskillful, inexperienced or disposed to take unfair advantage will, for the moment, suffer at his hands.

It is not the duty or office of the storekeeper to discriminate for or against that which he receives. It is his business to report the facts exactly as they occur; to state truthfully the nature of material, its condition and quantity, and to faithfully record the same upon his books. He should possess the confidence of the company and, reasonably, of the seller. In order to do this he should be honest, experienced and capable. To the extent that he is deficient in any of these qualities, he is lacking in usefulness.

In connection with the duty of inspecting material, it may be assumed that there will be many and repeated efforts to deceive the company in regard to the quantity and quality of material sold and delivered to it. The manner in which deception will be sought to be practiced will vary according to surrounding circumstances and the ingenuity of the seller. No specific rule can be laid down except that of unremitting vigilance. Efforts to deceive will not be advertised in advance. Every storekeeper should, therefore, at all times be on his guard, and should approach the discharge of his duty in this respect with the utmost circumspection.

The following, among other necessary rules, should be specifically observed:

Storekeepers should inspect material with the same care that they would if it belonged to themselves.

Breakages or defects of any kind, or variations from the specifications under which it was bought, should be noted and forthwith reported in writing to the proper official. Defective material should be kept apart, awaiting directions as to its disposition.

It will be understood in this connection that no greater latitude should be allowed in receiving material from storekeepers of the company than from merchants, although in the former case it is merely a transfer,

while in the latter it is the receipt of new material, the acceptance of which and the price to be paid depend upon the inspection.

Whenever possible, the price of the article should be marked or painted thereon when received, so that it may be easily and quickly determined afterward. In the case of castings and other heavy material, the weight or quantity should also be noted for the same reason. It is also desirable, in many cases, where the name of the manufacturer or seller is not plainly branded on the article, that some mark should be placed thereon that will facilitate its identification afterward, in the event it should prove defective or otherwise than as agreed upon. In the case of round iron this may be done by painting the end or a portion thereof with some distinctive color. It will never be difficult for storekeepers to find some simple and effective way to mark material, so that no matter where it may be used afterward, it may be identified.*

In receiving oils it is especially necessary to exercise the greatest care to see that they are up to the required standard. Samples of all oils received by purchase should be tested, unless otherwise directed, and a report of the quality thereof made to the storekeeper.

In the case of valve, car, engine and other oils, where the chemical analysis is not conclusive, the quality of the article must be judged by actual use, and the observation and experience of those who handle it systematically sought to determine its character and worth.

It is in many cases impossible to determine by inspection whether articles come up to the standard claimed for them or not. An accurate account should be kept of the date of the receipt of such material, when put into use, time in use, conditions of use, and such other details as may be necessary to determine its character.

It is the duty of storekeepers and others, whenever necessary or practicable, to invite the advice of foremen and others having practical knowledge of material, so

* A record should be kept in the office of all these distinguishing marks.



that the company may receive the benefit of their information and experience.

An accurate description of material should be made in a blotter (check book) as it is inspected and checked at the storehouse door. Afterward, the description thus made should be compared with the invoice; after this comparison the entry in the blotter should be stamped or marked to indicate that it has been compared with the invoice and that the invoice has been signed and returned.

In receiving and inspecting material at points remote from a storehouse, it cannot be too particularly impressed upon foremen and others that the utmost care should be observed, as imposition is much more likely to be practiced under such circumstances than in others.*

As it is impossible that storekeepers should in all cases be able personally to receive material delivered at points remote from their offices, they will require that the foreman or other person who receives such material should make an accurate return thereof to them; and, as in some cases such material may not be accompanied by an invoice, the foreman will in such case embody the particulars of the receipt of the material in a memorandum or book, which he should send at the close of the month to the storekeeper interested.

Ties—Inspecting the Same.—The duties attending the inspection of material of this kind are different from those in connection with other supplies and are conducted under much greater disadvantage; there is, moreover, a greater liability of the company being defrauded in the count and kind of material and in the sale of the same article to the company over and over again. Those who have charge of the duty of receiving

* This has been especially noticed in the case of bridge and switch ties and timber delivered at points along a line, and it has been found necessary, in consequence, in some cases, to send an inspector to receive them as they were loaded for shipment, when not practicable to inspect them at the place of destination.

and inspecting ties are therefore required to be men of fidelity and experience. They should be thorough in their methods, careful in the records they make and methodical in putting the mark of the company on all they buy.

The method of procuring ties varies upon different lines. Upon some they are delivered at points along the road; upon others they are delivered at some central point. The difficulties in handling those delivered along the line are greater than where they are received at a central point, and the labor of inspecting and the necessity of watchfulness also much greater. The measure of concern that should be exercised in each case should be commensurate with the work, and such as may be necessary to protect the company's interests absolutely.

The following rules and regulations in reference to the receipt and inspection of ties suggest themselves. They should be supplemented by such further measures as the circumstances of the case require:

In the inspection of ties each and every tie should be carefully examined and the returns made in accordance therewith.

To accomplish the work effectively, the ties should be inspected as delivered, or if piled in ranks should be removed, one by one, for examination.

Ties are purchased by agreement or special contract.

The ties that answer fully the specifications under which they are bought, as to quality, width of face, length, thickness, place of delivery, etc., should be piled together in tiers by the inspector as first class.

Those that do not come up to this standard, but are of good quality, suitable for sidings, or meet certain clearly defined specifications, should be arranged in separate ranks; they are termed "culls." *

Ties not fit to be classed as culls should be wholly rejected and directions given for their removal by the owner.

* This is on the supposition that the buyer agrees under certain circumstances to accept "culls." If he does not, they should be rejected.



The end of each tie accepted should be distinctively marked with paint, by the inspector, so that the same tie may not be submitted a second time for inspection.

Ties inspected at isolated and remote points should be marked as described, on both ends.

Storekeepers are charged with the ties located upon the territory under their charge. When shipped away they should invoice them, as in the case of other material.

An account should be kept with the ties at each place, namely, the number received; also those shipped or used.

It is sufficient to show in this account the number and kind of ties separately, without regard to valuation.

The storekeeper will, through these accounts, obtain a valuable check upon the business, necessary to verify the inventories and to correct errors or omissions in reporting the disposition of ties on the part of employes.

The return* of the official whose duty it is to inspect the ties purchased should give: First, the name and address of the person from whom ties are purchased; second, the exact location of the ties on the road (viz.: the place, side of track, distance from track, etc.); third, the exact number of ties furnished of each quality, specifying the kind of wood by name; fourth, when both hard and soft wood ties are furnished by the same person, such ties should be separately enumerated and classified in the return.

As payment for ties is based upon these returns, the greatest care should be exercised to insure correctness and reliability.

Each inspector should number the returns made by him, commencing with number one at the beginning of each fiscal year.

Returns of inspectors should be entered in a record book in detail in the order in which they are numbered, for preservation and convenient reference.

After inspection and acceptance, and not before, a voucher should be made.

* See Form No. 25, Appendix E.

The material should be debited, as in other cases, to the storekeeper in charge.

The following suggestions in regard to the purchase and delivery to the company of wood, ties, piles, lumber, etc., are based on practical knowledge:*

1. Contracts should expressly state in detail the kinds of wood that will be accepted; the various sizes, length, thickness and manufacture; the time and place of delivery; the manner of piling the same, in detail; the length and height of piles. Contracts should specify that each kind of material shall be piled in separate places on land designated by the company's agent at or above the grade of the railway track; that it shall be inspected and accepted by the company's agent, such inspection and acceptance being final and conclusive between the parties; that all material not accepted shall be taken from the company's ground on notice. It is the duty of the company's agent to designate the place of delivery and to watch the deliveries to know that the material bought is of the kind wanted, well manufactured and suitably piled, it being always understood that the seller will furnish as poor material as the inspector will accept, it being the aim of the former to make money out of his contract. A company should not allow poor material to be piled on its ground, but insist on the delivery of suitable material, well manufactured and well piled. A little care here will save much contention in the end.

2. The inspector stands between the contractor and the company. He should be a man well versed in the details of his business, have experience, knowledge and common sense. He should spare no time to get at the facts, honestly, and without prejudice between the parties, keeping accurate account of his work and making a report thereof to each party, being ready to verify the same by facts. The office of inspector or agent of the company is of importance and the incumbent should be a man of ability and integrity.

3. Every inspector should divide his territory for receiving material into sections, numbering them and making a diagram of the same. Each pile of wood, ties, or other material, should be marked on the diagram to show the place of delivery; it should be numbered and the number plainly marked thereon. The company's private mark should also be put in various places on the same, together with the date of inspection; also the length, height, etc., so that from the office record an order can be made for each and every pile of material on the track sufficiently accurate to enable trainmen to find the same.

4. Material should be charged to the division storekeeper where and when received; he should have an invoice of each and every pile of material, showing the number, kind, amount, place, and where delivered. This description should correspond with the numbers on the pile. Material should be moved only on his order, and an accurate account should be kept by him of the same when moved. No material should be allowed to be moved except on a written order and full returns thereof.

* I am indebted for them to H. E. Southwell, a gentleman of the highest probity and of long experience in such matters.



In those cases where sellers deliver freight at isolated places along the line, and also load the same for shipment, as frequently occurs in the case of bridge ties, switch ties and timber, it will be found advisable, as a rule, to send an agent of the company to inspect the property as it is loaded. The facilities for performing this work at the receiving place are not, in every case, adequate, and in the event a company does not have an agent on the ground to receive the property and see that it is shipped, deception may be practiced; in some cases the goods will not be delivered at all, in others there will be a deficiency in quality or count, the seller hoping to escape detection through the inability of the company to properly inspect the goods at the receiving point. The necessity of inspecting at the shipping point will not, of course, operate in those cases where the goods bought are forwarded to a person competent to receive and inspect them, but goods loaded by the seller to be delivered at bridges, culverts, sidings and other places along the line away from the inspection and care of storekeepers should, as a rule, be inspected and counted when loaded. There can then be no question, either as regards the delivery, quantity or quality, and all cause of misunderstanding or dispute will be avoided.

## MATERIAL RECEIVED BOOK.

The manner in which this book is compiled has been referred to elsewhere in connection with "invoices." When an invoice for material purchased is received by a storekeeper, it is copied on a blank forming a part of the "distribution of material book." When the blank is filled an impression of it is taken in an impression book. This impression book is the "material received book." The object of pursuing this plan is to save the

cost of writing up the material received book. Moreover, exact conformity of record is thus secured.*

The foregoing refers to material purchased; for material transferred between storehouses, the invoice made by the forwarding storekeeper is written in copying ink; an impression of this invoice is taken by the receiving storekeeper in the material received book.

Thus, a full record is arrived at of all material received, both that bought and transferred.

The pages of the impression book as fast as filled should be footed and the footings carried forward.†

The material received book is necessary to preserve a consecutive history of material. Its object is to afford the storekeeper a record of each consignment, from whom received, number of requisition, date of receipt, articles, quantity, price and amount.

From it may be gleaned in detail every article of material received for which the storekeeper is responsible. Taken in connection with material on hand and material disbursed, as shown on the distribution book, the exact status of each storehouse may at any time be determined and the measure of accuracy that has been observed in handling and accounting for particular articles ascertained. This research may be made by the storekeeper himself. By comparing the articles on hand and those that have been charged to different accounts with those received, he can determine whether anything has been taken from the storehouse that has not been embraced in the returns rendered by him. This *resumé* of affairs is recommended to each storekeeper as a means of determining the measure of accuracy exercised by him in caring for, disbursing and accounting for material. If the balance standing on the company's books at the end of the year to his debit differs from the amount of his inventory, it will explain to him the reason why; he will see that this difference does not arise so much from change in prices as from clerical errors and omissions, and from the taking of articles from the storehouse without the storekeeper's knowledge.

In order to prevent the possibility of receipting invoices in duplicate, the fact that an invoice has been receipted should in every case be noted on this book opposite the particulars of the consignment.

* The "distribution of material book" referred to is described elsewhere herein. Loose blanks adapted to the various requirements of this book are provided each storekeeper. When the month's business is written up, these blanks are bound in book form and so constitute the book.

† At the end of the month the amount of material purchased, also the amount received from each storekeeper, should be ascertained, separately, for insertion in the Recapitulation of the "distribution of material book." These amounts added together should correspond with the total footings of the material received book.



### CARE OF MATERIAL.

Defects in arranging for handling and storing material, dating back, in the majority of instances, to the original construction of the road, prevent in many cases its being handled economically or effectively. The remedying of these defects naturally enlists the attention and intelligent effort of all who are concerned in this department of the service. This interest should not be allowed to lag, and every advantage should be taken of the situation that experience and thought suggest.

In storing and caring for material the methods of merchants should be observed, namely, to place it so that it will be protected from misappropriation, so far as possible, and from damage by the weather, and at the same time be most convenient for receiving and disbursing. The necessity of arranging it so that the storekeeper may discover at a glance, as he passes through the storehouse and yards, material no longer needed, or that is in excess of the demand or that falls short thereof, will naturally suggest itself to those in charge.

Method and order should characterize everything that is done about a storehouse.

In the care of supplies the necessity of special watchfulness in regard to particular articles of material will

suggest itself to storekeepers. In many cases no danger of misappropriation attends the custody of articles, no matter where placed. This is so in regard to heavy castings, car wheels and kindred articles. They may therefore be left in the yards or in open sheds without danger, except to see that they are accounted for as used. In the case of many articles, however, great care should be exercised to prevent their being taken improperly, or used without the knowledge of the storekeeper. The particular articles that come in this category will suggest themselves to every storekeeper. They embrace, among others, oils, tools, brasses, articles of common use, hardware, etc. Secure provision should be made in such cases. Where it does not already exist it should be provided as soon as possible, as there can be neither economy nor wisdom in a condition of affairs that fails to protect the supplies of a company with all reasonable effectiveness against misappropriation, either casual or predatory.

In relation to much of the material disbursed, especially brasses, tools and implements in common use, the supervision of the storekeeper is expected to extend beyond the delivery of the article. He should watch over it, so far as he can, until it is no longer fit for use, or no longer needed, when it should be returned to him. In the performance of this duty all those who have supervision over employes, including the employes themselves, are expected to co-operate; indeed, it is mainly to them that the company must look, as storekeepers' duties in this connection are necessarily circumscribed.

It is the duty of storekeepers so far as possible to see that material is used for the purpose designated by those to whom it is delivered, and in the event it is not, to secure accurate and full returns thereof, so that no account may be charged with more than belongs to it, and the disbursements of the road may be accurately and properly apportioned.

The following specific rules should be observed in the care of material. They should be supplemented by all



needful regulations wherever it is necessary; the purpose being, here as elsewhere, not so much to form a perfect code of rules, as to suggest, by giving those of a more salient nature, the others that are required:

The first thing that suggests itself as necessary in the care of material is to deny access to it to all not directly concerned in its manipulation. Supplies should be placed, so far as possible, in a manner most likely to protect them from misappropriation and damage.

Approaches to supply depots should be restricted, and should, so far as possible, be under the immediate eye of those responsible for the material.

Every article should have a place assigned to it, so that its location may be accurately known, and access to it easy and systematic.

If possible, the storehouse should be divided into sections, each section being lettered.

The classes of material that each division contains should be catalogued, and the section in which it is placed numbered.

Racks should be provided, suitable for the purpose, for different kinds of sheet and bar iron, and should be located conveniently for use and in such a manner that the quantity can be determined at a glance.

Articles similar in appearance but differing in value and utility should be kept separate.

Oils, varnishes and other liquids should, if facilities allow, be kept in cans or tanks so arranged that they may be filled at the minimum cost, and from whence supplies may be taken as needed, without loss and at the lowest expense.

Dry paint and material such as emery, including powders of all kinds, should, if possible, be kept in bins.

Shelves should be so arranged that the contents of the various compartments may be ascertained at a glance.

Material that cannot be put in the storeroom should be placed in sheds, and if this is impossible, should be so arranged that only the minimum amount of damage will accrue from exposure.

Supplies should be arranged with a view to their use, those which are most frequently in demand being placed in the most accessible place for delivery.

Articles such as locks should be carefully tied in packages, so as to prevent the parts becoming separated.

Patterns should be arranged in order and catalogued, and so systematized that when one is removed a record of its disposition will be put in its place as a convenient reference and constant reminder of its absence.

Lumber and timber should be classified and piled with the care and method that is observed in lumber yards.

Storerooms should be kept clean and orderly, and such expedients and devices used as the best knowledge in regard to handling material suggests.

If the facilities are not adequate for the storage of coarser articles, such material should be concentrated in particular places as much as possible.

The place in which supplies are kept should be located as near as possible to those who use them, but the protection should in every case be such as to prevent material being taken except under authorized rules.

Such provision as is possible should be made for preventing fires, and for extinguishing them should they occur.

In the operation of business it will be necessary in many cases to forward material to isolated points on the road, either for particular or general purposes. In many cases it will be neither practicable nor desirable to charge such material to an expense or construction account when thus shipped. In such cases a separate account should be opened with each lot thus distributed, and frequent returns should be required from foremen and others in charge, of the uses made of it, quantity on hand, etc.

In the case of oils, storekeepers are required to exercise the utmost care, and to adopt every possible means that ingenuity suggests to prevent leakage, evaporation and loss.



Oil should be unloaded immediately on arrival and forthwith placed in the tank or other receptacle provided therefor. In the event there is no tank provided for its storage, or the amount received is greater than the capacity thereof, care should be taken, if possible, to see that the barrels are kept wet or that they are stored in a damp place, so that the loss from evaporation and leakage may be reduced to the minimum.

Under no circumstances may oil be left in barrels exposed to the sun.

The greatest care should be taken to see that oil is not stored in proximity to combustible material, such as waste, etc. Danger from fire should be carefully guarded against at all times.

The person in charge of oil supplies, also those whose duty it is to fill lamps, lanterns, torches, etc., should be, so far as their duties in that direction are concerned, under the direction of the storekeeper, and he should be held responsible therefor.

Rails.—The inspection of these supplies should be as rigid as the circumstances will permit; but as this inspection, in the first instance, is largely superficial, it should be supplemented by careful and minute records of their duration and worth in practical use.

As a rule, material of this kind is bought under contract, stipulating that it shall last a certain length of time.

A record should be kept of the date rails are laid, from whom bought, when taken up, character of injury, etc., so that if bought under contract it may be enforced and the seller held to his agreement. But the record in question should be kept even if rails are not bought under a time contract.

So far as practicable, rails should be inspected when received. They should be carefully counted and their weight determined. They will not be treated in the accounts differently from other material; they should be invoiced when shipped, and should be charged to the person to whom they are sent.

When charging rails to repairs or renewals of track, the credit for old rails taken up should be made coincidently; in the event the wear and tear of the latter is very great, allowance should be made therefor. In debiting rails to track, the total value should be charged; the same rule should be observed as to credits in the case of old rails taken up.

As a general thing, no definite rule can be made in regard to the place where rails will be received from the seller. Whenever practicable, they should be forwarded to the general storehouse for inspection and disbursement as required; but this rule will not be observed (if other provision can be made) when attended with expense.

In order to facilitate accounting, however, all rails should, in the absence of instructions to the contrary, be charged to the general storekeeper. If the rails are delivered at some other point, they should, nevertheless, be invoiced to him, and he should take them up in his account of material received. It is his duty to invoice the rails to the storekeeper in whose charge they are. It is believed that this plan will secure more authentic accounting than any other, and it should be observed when other provision is not made.*

The great value of rails and the necessity of the management being constantly advised in regard to the quantity on hand, both old and new, suggested the form of monthly return† appended for furnishing this information. It shows the rails at each mill, also those passing to and fro; also the rails, both old and new, not in use, on hand at storehouses and along the line of road; it specifies the number of tons and lineal feet of each kind of rail. It is intended to be full, accurate and

* The general storekeeper cannot be held responsible for the inspection or count of material not received immediately by him or by an inspector under him. When, therefore, material which is charged to him is delivered elsewhere, a competent storekeeper should be delegated to receive it and to make a report thereof to him.

† See Form No. 26, Appendix E.



comprehensive, and should be made as of the last day of the month.

The regulations governing old rails are provided for in connection with scrap.

Tools, Implements of Common Use, Utensils, Brasses, Personal Property, Etc.—The especial need of care in the storing and use of these articles is frequently referred to elsewhere. Their value, and the fact that they are easily disposed of, or are of general use, adds to the difficulty of guarding them. The danger of loss after passing from the hands of the storekeeper is greater than when in his possession, as they are thereafter less carefully guarded, unless especial effort is made in this direction. The most feasible method of securing proper care that has been suggested is to require the possessor to return the old article in every case when a new one is needed to take its place. This system of exchange has been found to work admirably in the case of brasses, reducing the consumption thereof one-third. It should be enforced by storekeepers in every direction where it is practicable, in the case of tools and articles of common use in the hands of employes of a company. When a new article is required to be given out in exchange, the old one should be returned, or a satisfactory explanation given for not returning it.

In the event articles cannot be returned or accounted for, or they are injured through the neglect or carelessness of the employe, the official of the company immediately in charge should fix the amount of compensation, if any, to be paid by the delinquent.

In the event an employe who has property of a company in his possession leaves the service, it should be formally turned over to his successor and a receipt taken therefor, which latter should be forwarded to the storekeeper, so that he may transfer the charge on his books. This is the plan that would be observed with a cash working fund; personal property is the same as cash to a company.

Property no longer required for use should be promptly returned to the storekeeper, and the charge upon the books canceled in accordance therewith.

Employes using tools, implements and utensils should be required, so far as possible, to order uniformly of a particular storekeeper.

Tools used at shops should be under the care of the storekeeper, or some person designated by him; he should, so far as practicable, distribute them in the morning and receive them back at night. Where the facilities allow, and the number of tools in use justifies the expedient, a place should be set apart for storing the tools, a compartment therein being assigned to each workman. When the tools are distributed originally to the men, a receipt should be taken therefor; on the return of the tools at night, this receipt should be given up to the employe; when the tools are required again in the morning, the receipt should be delivered again to the storekeeper, or custodian of the tools, and placed by him in the compartment in lieu thereof, and so on.

Articles in use by trackmen, or by isolated gangs of men, should be in the care of the foreman thereof, whose duty it should be to see that every tool is accounted for, or the fact duly reported and adjusted.

Articles used at stations should be in the care of station agents.

Articles used on trains should be in the care of conductors.

In distributing brasses, tools and articles of common use, a duplicate of the receipt taken therefor should be retained by the person receiving the property, so that he may have accurate account of the articles charged to him.

Separate compartments should be provided for the storage of these supplies, or, if the supply does not warrant this, a cupboard, or other secure inclosure, should be made (especially in the case of brasses) which may be securely locked.

A special return* and inventory of brasses is required to be made at the end of the month, showing the number

* See Form No. 27, Appendix E.



of each kind on hand at the commencement of the month, the number received during the month and the number on hand at the end of the month. It should also specify the number of old brasses shipped or sent away during the month, and the number on hand on the last day of the month.

The rules and regulations governing personal property in the hands of employes may be summarized as follows:

When personal property is given an employe or officer for temporary use, a record of the fact should be kept by the storekeeper or official making the disbursement; it is his duty to see that the property is returned or duly accounted for when its use is no longer required. To enable him to do this intelligently he should keep a record book in which to enter transactions of this nature, giving in all cases the final disposition of the property. The material should be charged to the account upon which it is used when it passes into the possession of the employe; when returned it should be credited at its then cash value, to the account to which it was originally charged. The effect of this will be to bring it back into the material account of the company to the debit of the storekeeper into whose possession it passes. Thereafter it should be treated the same as other material.

Dining Car Supplies.—The great number of articles used in this branch of the service, and their especial value and adaptability to the needs of everyone, render it especially difficult to surround their care with adequate safeguards. They require to be guarded at all times with the same watchfulness and intelligence that a vendor of groceries displays in protecting his goods. Access to them should be forbidden except to those concerned in the handling of the goods. The account that is kept of them should be full and minute. When disbursed for use, account should be kept with each kind of material in detail.

Storekeepers should open an account with each dining car.

Each conductor of a dining car is responsible for the utensils and supplies furnished his car. It is his duty to see that any breakages or losses that occur are accounted for in accordance with the instructions of the official in charge of the department.

An order* should be made by conductors for the supplies they require. This order should be addressed to the storekeeper and should be certified by the superintendent in charge.

At the close of each trip the conductor should render to the superintendent in charge an itemized return of all cooks' supplies, pantry supplies, liquors, cigars, chinaware, kitchen equipment, etc., on hand at the date of the last return; the number received since; the number delivered up; the number destroyed or lost; also, the number on hand. This return should be carefully compared with the previous return and afterward filed away for reference. At least once a month the return should be verified by personal inspection by the storekeeper.

The storekeeper is required to keep an account showing an itemized statement of linen furnished each car. At the close of each trip the conductor should deliver to him all soiled linen and receive in exchange therefor corresponding pieces of clean linen.

The quantity of linen on each car should be verified by the storekeeper at the close of each trip to see that it agrees with the articles charged.

To facilitate accounting, a blank is used by conductors in making requisitions, containing a printed list of articles; opposite each article the conductor notes the quantity on hand, also the quantity he requires. Following this he notes the quantity received of the storekeeper in answer to his requisition; also the quantity that he finds it necessary to buy on the line and, following, the balance on hand at the close of the trip. The difference between the amount of material received and the amount on hand at the end of the trip represents the supplies consumed. This return affords a clear

* See Form No. 28, Appendix E.



account of each article. It should be filed at the close of the trip with the storekeeper in charge of dining car supplies. It is his duty to examine it with the utmost care; after doing this, he should insert the cost in the column provided opposite the articles. This cost he embraces in his distribution of material book where it belongs.

Method of Treating the Dining Car Service Accounts.—Collections on account of this service are not properly creditable to earnings. In many, perhaps the majority of cases, they are more than offset by debits. They may be called receipts, but not earnings. A proper disposition of them suggests that they be apportioned pro rata at headquarters and among the various dining car accounts named below and the balances added to or deducted from the proper operating expense accounts.

In order to properly exploit the accounts, they should be kept by storekeepers under appropriate headings—say those named below. Accordingly a separate account should be opened with each car under each head. Thus the receipts and expenditures of every car will be accurately known. At the close of the accounts thus severally classified, a recapitulation, showing the amount charged each car, should follow.

"Repairs of dining cars."—Under this head, the cost of all *ordinary* renewals and repairs of dining cars and furniture, and fixtures appertaining thereto, should be included, the same as directed for "Repairs and Renewals of Passenger Cars," including repairs of the cooking range and utensils, cupboards, tables, etc.

It does not embrace, however, renewals of china, glassware, cutlery, plate, table linen, etc., these items being chargeable to "Dining Car Supplies," as hereinafter described.

"Dining car service."—This account includes the wages of the person in charge of dining cars and his assistants, and of the conductors, stewards, waiters, cooks and other employes in the operating department of the service, including storekeepers.

"Dining car supplies."—This account includes the cost of meats, fish, vegetables, fruits, flour, groceries, wines, liquors, cigars, fuel for heating and cooking purposes, oil for lighting and lubricating,* crockery, china, glassware, silverware, cutlery, table linen, napkins, and other supplies furnished the cars. The cost of washing the linen used in the cars, including the aprons, caps and jackets of the cooks and waiters, is also chargeable to this account.

SCRAP.—(OLD MATERIAL—MATERIAL NO LONGER USABLE.)—The care of scrap requires the constant watchfulness of all who are in any manner responsible for it.

Scattered along the road and about the yards of shops, it especially invites the attention of those thievishly inclined. This fact should be kept in mind and every practicable measure taken to reduce the risk to the minimum. This will not be difficult if given due attention and systematically prosecuted.

Not only must the scrap be duly guarded, but it should be carefully assorted and reassorted with a view to discovering any articles that may be used again, or have especial value, and with a view to classifying it in such a manner as to secure the best price, which latter cannot be obtained if sold in the aggregate.

In order that scrap may be collected at points most desirable for disposition and sale, it is made the duty of the official who is to sell it to designate such point or points. All orders of this nature, however, should be forwarded through the general storekeeper, so that perfect concert of action may be maintained. In the absence of specific instructions in regard to the disposition of scrap, as fast as a carload is obtained it should be forwarded to the general storehouse, where it should be weighed and a return made without delay to the consignor.

* Oil used in lighting dining cars, and oil, waste and tallow used in lubricating dining cars, should be charged to "Train supplies and expenses." "Dining car supplies" should be charged with its proportion of the foregoing expenses on the basis of the relation that the mileage of dining cars bears to the total mileage of passenger cars.



Scrap (except old rails) should be collected daily and assorted with a view to determine that which is usable from that which is not.

Scrap should be protected and cared for with the same intelligence and vigilance as the other supplies of a company.

In the breaking up of buildings and other structures, the material that is capable of further use (i. e., usable scrap) should be carefully separated from the other and taken into stock and placed with supplies of a like nature.

When the facilities will allow, storekeepers should arrange to collect the scrap in stalls or bins arranged to accommodate the different classes thereof; these receptacles should be convenient for collecting, watching and shipping.

Storekeepers should keep a record book in which the daily accumulation of scrap should be entered, the amount being shown in detail; also the source from whence derived. This will enable proper credit to be given. Particulars of all scrap shipped away should be entered in this book.

Brass scrap requires to be especially guarded; it should be kept under lock and key, and when shipped should be similarly treated.

Old engine material should be collected by some person especially designated to perform that duty. He should weigh the same and designate the account to which credit should be given.

In order that due advice may be had of scrap, a monthly return* should be made to the general storekeeper of the quantity at the various storehouses, amount disposed of, how disposed of, and such other particulars as he may require. These returns he should forward to the official in charge of scrap, after he is through with them.

It is the duty of storekeepers to see that all old material is turned over to them as fast as it accumulates, in order that it may be duly accounted for on the books

* See Form No. 29, Appendix E.

while the facts are known, and loss or improper use thereof prevented.

The bulk of the scrap accumulates about the shops and along the track. The difficulty of collecting the former is not great, as it is restricted to narrow limits, and is, moreover, under the immediate eye of a storekeeper whose business it is to look after such matters. The disposition of old track material is more difficult and the liability to loss greater.*

In shipping scrap it will frequently occur that it will not be convenient for a particular storehouse or division to await the collection of a carload of old material. To prevent cars being only partially loaded, the accumulations of several depots should, if possible under such circumstances, be grouped together. The scrap should be invoiced to some local storekeeper, who should take it up on his books and add it to the scrap that has accumulated about his own storehouse; when there are no facilities for accurately weighing old material thus transferred, the weight may be estimated as in other cases and credit given on the basis of such estimate. In the final disposition of the scrap it should be invoiced to its destination, there to be reweighed and correct returns made to the shipper.

The method of forwarding scrap outlined in the foregoing rule will apply only in cases of partial carloads and is designed to avoid the added cost of shipping

* The following method should be observed when a more convenient and practicable method does not suggest itself: "Each section foreman should have a platform for storing scrap picked up along the road. He will pick up every piece of scrap and put it on the pile at his tool house daily. Any article too large to be placed on his car he will remove on his dump car, or else have a way freight train stop long enough to permit him to load it. In this way the scattered scrap will be taken care of and saved from loss. Each month the roadmaster should start a car on some way freight train for the purpose of gathering up scrap at section foremen's houses and at depots, and ship it to some central point where it may be assorted, and such articles as are fit for use separated from the others; the latter being sent away, while the former is redistributed for use."—*H. G. Burt.*



small lots, when by bulking the accumulations of two or more storehouses full carloads may be secured.

When practicable, cars on their way to the shops to be repaired should be used in shipping scrap.

The old books, papers and records of a company, when no longer required, will be treated as scrap and disposed of for the benefit of the company; they should be forwarded (under the direction of the proper officer) to the general storekeeper, as in other cases, and treated in all respects by him the same as other scrap.

Scrap should be credited to the account to which it was charged as material in the first instance. Thus the value of old wheels or trucks removed from cars should be credited to the repair of the class of cars from which taken. If the particular thing from which the scrap accrues is not renewed or replaced (in other words, is abandoned like a track taken up) the value of the scrap should be credited to construction or the thing originally charged. Thus, if a car is broken up and is not replaced, the scrap which accrues therefrom should be credited to rolling stock rather than to repairs. This rule is general in its application.

In reference to old rails and other scrap, it is the duty of the storekeeper to whom it is finally consigned to weigh each shipment and make return thereof to the person forwarding it; also to give due credit for the amount. A weekly return should also be made by him to the official who has charge of scrap, giving the particulars, such as the date of receipt, kind of scrap, number of car, who from, quantity, etc.*

No scrap should be sold or exchanged without being weighed in advance, or intelligent and proper measures being taken to secure accurate returns thereof.

A return† of deliveries to rolling mills should be made monthly to the proper officer, specifying the particulars of each shipment. As it is not always possible to ascertain in advance the weight of such scrap, measures should be taken to secure correct weights from the mill.

* See Form No. 30, Appendix E.
† See Form No. 31, Appendix E.

In reference to the method of bringing scrap upon the books of the company, the most simple and economical plan that suggests itself is for the storekeeper to deduct the value thereof from his charge for the current month for new material disbursed; thus, scrap properly creditable to "repairs of freight cars" should be deducted from the charge for the month to that account, and so on. In this way by reducing his credit the storekeeper will, in effect, be charging himself from month to month with the amount of scrap received by him, as only the net amount charged by him for current expenditures is credited by the accounting officer. In this way the value of the scrap will be brought upon the books without any special entry therefor.

In the event there is nothing chargeable against a particular thing for which there is a credit, an account may still be opened with it, and the amount of the credit duly posted thereunder.

Scrap, after being brought upon the books, should be treated in all respects the same as other material. For instance, if it is forwarded to another storehouse, it should be invoiced and charged in the same way as new material. Or if it is used for any purpose, it should be charged to the account upon which it is used, the same as if it were new.

The price at which scrap is to be entered on the books should be based on the current market rates for such old material.

When this price is not known, application should be made to the proper official for the rate.

Storekeepers should consult with heads of shops and foremen in charge where scrap accumulates and use every precaution to see that no errors occur in keeping the record; that it is duly brought upon the books; is charged when used, sold or traded, and is invoiced as in other cases when shipped.

The difficulties that attend the care of and accounting for scrap are very great. They are embarrassing to the accountant because of the difficulty of ascertaining the exact quantity and price. It is only after it has reached



some central place that the quantity can be accurately determined. Nevertheless, it is intended to make the accounting in connection with scrap as correct and comprehensive as in the case of new material.

## DISBURSING MATERIAL.

The duties of storekeepers in disbursing material correspond with those of a bank teller. They are at all times responsible and onerous.

The storekeeper should see: First, that the documents upon which supplies are issued are authentic; second, that the persons to whom they are delivered are authorized to receive them; third, that the amount issued is reasonable and such as the use to which it is to be put requires.

In the event high priced or expensive articles are ordered for any particular purpose where cheaper material would do, the attention of the official in charge should be promptly called to the matter.

The storekeeper exercises an office of trust. His duties are also inquisitorial.

He should take cognizance of everything connected with the handling and use of material; after its delivery by him it is his business to look after its proper use and safety, so far as practicable.

He should observe the purposes to which it is put and collect the remnants left in connection with every piece of work, or see that they are duly accounted for.

He should see that goods are accurately weighed or counted when disbursed, and, in order to facilitate easy delivery, they should be arranged with this view.

The quantity of material of each kind on hand should be adequate to the needs; a happy mean should be observed, avoiding extravagance on one hand, or undue risk on the other, by too great a reduction of the supply.

In the event supplies are not promptly furnished upon requests, the fact should be forthwith reported to the proper officer in writing.

The good of the service requires that the storekeeper, in disbursing material, should exercise the utmost watchfulness and intelligence; that his work should be performed with methodical accuracy and promptness.

He should not only take cognizance at all times of the use to which material is to be put, but consider the probable needs in that direction.

He should be especially watchful and painstaking in those cases where material is sold or exchanged.

He should remember, in such cases, that neglect or omission on his part to make the necessary charges will occasion loss to the extent of such neglect.

He should see that material sold is charged, item by item, as delivered, and that the record thereof is maintained inviolate until finally returned to headquarters under the rules and regulations governing such matters.*

The duties and responsibilities of storekeepers in connection with the disbursement of material cannot be adequately defined by explicit rules. Some that occur as being fundamental are given here. Storekeepers should, however, supplement them by such further requirements as the necessities of the service demand.

Storekeepers should charge material to the account upon which it is used, at the time it is used, even if no invoice has been received for it.

When it is necessary to disburse supplies at night or in the absence of the storekeeper, a capable and trustworthy person should be selected by him to perform the duty. But the storekeeper will remain responsible, as in other cases, for the proper performance of the duty.

In order that the disbursement of train and station supplies may be intelligently accomplished, storekeepers should open an account with each person to whom they

* The same rule applies in regard to labor performed for others. Accurate account should be kept of it and charge made to the utmost farthing. It is not generally the policy of railroads to encourage the practice of performing labor at shops or elsewhere for others, nor to sell the material of the company; when exception is made to the rule, the utmost care should be observed to see that the person indebted is duly and properly charged.



are furnished, recording therein the dates and quantities of the supplies furnished. This will enable storekepers to see that such orders are restricted within reasonable limits and that supplies are carefully and economically used. A similar rule should also be observed in connection with stationery, books, blanks, etc. Employes should order train and station supplies from a particular storekeeper; they should not change from one storekeeper to another.

Material delivered for use in the company's foundries should be accounted for by a person especially appointed for the purpose. Material should be issued by such person only upon orders properly signed. A debit and credit account should be kept by storekeepers with each foundry, charging them with the cost of material and labor used and crediting them with the product thereof.

An account with a foundry should be of the same general nature as an account with articles in course of manufacture, described elsewhere.

When the nature of the work in paint and upholstery shops renders it necessary that a stock of material should be kept in such places, it will be the duty of the foreman in charge thereof to keep a record of the same, and report daily to the storekeeper the amount disbursed. A debit and credit account should be kept of such material to prevent neglect or improper use.

In disbursing material, that which is oldest or most likely to deteriorate should be used first.

In shipping material it is desirable to economize as much as possible in the use of cars. Thus, when material is shipped in small quantities it should, if practicable, be forwarded as way freight. Under ordinary circumstances material should be taken to the station and waybilled the same as other freight. If shipped in carloads it may be loaded directly at the storehouse, if facilities permit. Full particulars should in every case be given agents for billing.

Care should be exercised in loading material to render its unloading and inspection as easy as practicable.

A memorandum or order* for use of subordinates should be used in preparing material for shipment. It is convenient to handle, and specifies the articles, date, destination and other necessary details.

All material should be plainly marked or tagged with the name and address of the person to whom shipped. Should way bills become lost or separated from the cars, the mark or tag will identify the material and secure its being sent forward. The careful marking or tagging of material is especially necessary in cars going to different points, where the material is liable to be misappropriated. If it is impracticable to tag each article, a tag should be placed upon one of the articles, and should show the number of articles in the lot.

All material requiring it, should be weighed, and the weight entered by the person performing the work, on the request or order opposite the name of the article; the number of the car in which material is shipped should also be inserted thereon, and a distinguishing mark placed opposite the name of each article as it is loaded.

Cars containing company's material should be sealed and plainly marked by card, with their destination.

In disbursing oil especial care should be exercised to see that it is not extravagantly used; if for use on a locomotive, the amount delivered should not generally exceed the requirements of a round trip; if for use at a station, a month's supply should be the maximum amount furnished.

Local supply depots for lubricating cars, supplying trains, etc., should be limited to current needs.

Storekeepers are required to see that the supply of oil is restricted to the minimum, without transgressing the bounds of safety, so that by frequent and limited disbursement its use may be carefully scrutinized.

To avoid the additional cost of shipping small lots of scrap, and in order to secure full carloads for shipment,

* See Form No. 32, Appendix E.



the accumulations of several storehouses should be grouped together by arrangement between the storekeepers, as directed elsewhere; in furtherance of this, scrap should be invoiced to a designated storekeeper, who should take it up on his books and add thereto such scrap as has accumulated about his own storehouse.

Scrap should, if possible, be weighed before shipment; it should also be reweighed by the receiver, and, if necessary, the invoice corrected by the latter.

For convenience in disbursing material, the blank orders of foremen and others on storekeepers should be printed and bound in small books convenient for the pocket.

Orders on storekeepers should, in every case, specify the kind and quantity of material, and the purpose for which it is needed.

Orders for tools should be approved by the official superior to the person making the order.

In exchanging old tools for new, an order should be procured, as in other cases. This is necessary as a voucher for the storekeeper.*

No material should be disbursed by storekeepers except upon an order properly signed.

Orders should be scrutinized to see that they are not excessive, and, in the event they are thought to be so, the matter should be referred to the proper official.

When an order has been filled, the price of the article should be inserted thereon, and the order used in writing up the accounts.

Orders should be carefully filed for preservation and future use.

Classifying Expenditures of Material—Distribution of Material.—The charging of material to the thing upon which it is used is of the utmost importance. The great amount of material used and the diversity of

* For additional rules and regulations governing the disbursement of tools, brasses and articles of common use, see reference thereto.

things upon which it is expended render a systematic classification of expenditures necessary, and unless this classification is governed by minute rules, the purpose of an expenditure can only be surmised, and all statements and accounts will be rendered practically valueless for purposes of comparison.

This last is of the greatest importance, as comparative statements form, in a measure, the basis of all reliable inquiry and investigation by railroads.

The classification, moreover, should be in sufficient detail to enable a management to fix responsibility upon those immediately responsible and afford at the same time an accurate and intelligent history of a company's affairs.

It should be so minute that the cost of a thing and the relative economy exercised may be analyzed and judged.

Furthermore, such subdivisions should be made of standard accounts as the enlightenment of officials and employes requires.

In opening accounts, the nature of the disbursement should be accurately indicated thereby; also the place or location of the expenditure. The details throughout should be so explicit that they have only to be studied in order that the scope and purpose of the expenditure may be accurately understood.

So far as the exigencies of accounts will permit, without undue expense, it is designed that everything that enters into the cost of a thing should be charged thereto. Thus, the cost of handling material, the outlay for the construction or repair of a building, platform, yard, fence, bridge, culvert, engine or car should so far as practicable be charged thereto. When, however, the expense of accounting is greatly increased by too minute a subdivision of expenses, and the value of the information thus obtained is not commensurate with the outlay, it should not be attempted.

Accounts should in every case be based on their value as a source of information and their necessity as



a check; they are justifiable only so far as they are necessary; anything outside of this is wasteful, extravagant and unjustifiable.*

In addition to the expenditures of a company for operating, construction, manufacturing and similar outlays, more or less work is performed for others for which a company is entitled to receive pay. Accounts are required to be kept of all such expenditures, so that they may be brought to the notice of the accounting and financial officers of a company, in order that the same may be duly and clearly recorded and the amount collected.

In order that all these things may be successfully accomplished without confusion or failure, it is of the greatest importance that those who have the handling of and accounting for material should be familiar with the various classifications of a company, and the machinery by which they are carried into effect; also the general and specific objects that such classifications and accounts are designed to accomplish. This requires that they should not only study the mechanical appliances but the theory and principles that the blank forms are intended to carry out. This study will enable them to perform their work intelligently and will sharpen their appreciation of its needs, so that better knowledge of the conduct of accounts and greater efficiency therein will grow out of it.

In order to classify the expenses systematically and preserve a clear and permanent record of the same, dis-

* It is the design of the system of accounts embodied herein, as explained elsewhere, to reduce the expense of accounting to the minimum; to make the primary clerical work necessary to be expended in compiling returns for labor and material answer the purposes of all the various offices, departments and branches of the service interested therein; to avoid duplication of clerical labor in the different offices and departments through which information flows; to afford the maximum amount of information at the minimum cost; to reduce the cost of accounting, in fact, to the last cent compatible with accuracy and permanency of record, and such classification of accounts as the interests of a company and the necessities of managers require.

tribution books are provided.* Accounts are to be opened in these for each expenditure having a separate identity in the classified list, such accounts being entered in their due order and sequence, care being taken in every case to use the designation prescribed by the rules governing the same.

In writing up the accounts, the record throughout should be so clear an exposition of the subject that it may be fully understood and analyzed without correspondence or further reference to the person making it. Thus, the items of each account should be given, including description of material disbursed, quantity or weight, price and amount for each separately; also the total cost or aggregate of all the items.

In giving the name of an account, especial care should be taken to make it so explicit and clear that it may be easily identified, and details of cost easily collected from the various books in which it is mentioned.

In classifying expenditures, it should be understood that the work is not to be performed at random in any instance, but according to preconceived rules and regulations; if the disposition of an expense is not known or not clearly indicated by an analogous account, information should be asked of the accounting officer; this will not only insure uniformity, but will also enable the company to supply omissions or correct inaccuracies in its classification.

In the majority of cases material and labor disbursed are chargeable to a particular thing. It will frequently occur, however, that the disbursement must be distributed among several accounts; this should be done according to the benefit derived. This division will be necessary in the case of the wages of timekeepers, storekeepers and their assistants, laborers employed upon general work about shops and others. Common expenditures of this nature require to be apportioned according to the specific benefit they confer. Thus, if for a given

* These distribution books are written up by the person who disburses the material, or in the office of the official to whom returns thereof are sent, as specifically directed in each case.



amount of labor or material a particular account derives benefit therefrom equal to sixty per cent. of the cost of such labor or material, and another account forty per cent., the apportionment between them should be on that basis. When the exact degree of benefit cannot be ascertained, the division should be such as is practicable and in harmony with the facts.* Specific reference may be made here to a few particular supplies. They will illustrate the whole. Thus, for Blossburg and furnace coal and coke used at shops for various accounts, an estimate should be made of the amount thus used per hour by each furnace, forge or steam hammer, and the expenditure debited on such basis to the work in progress; when coal is used by a particular person it should, if possible, be prorated among the accounts upon which he is engaged, upon the basis of the time occupied by him.†

In attempting to apportion common expenses to particular engines, cars and other accounts, the most equitable basis, in the absence of definite instruction, should be used.

The foregoing will suffice in this place. The subject is so extended that it is impossible to do more than generalize. Expenditures are so variable that they cannot be named in detail. Provision should be made, based on the peculiar exigencies of the case. Only general principles can be laid down for the guidance of those who have charge of matters of this kind. Good sense, fairness and practicability must govern.

General Distribution of Material Book.‡—This is a history of the material received and disbursed by him

* Reference is not made here to expenditures to be divided between two or more divisions of a road, but to disbursements that affect two or more operating or construction accounts, which require to be apportioned among all the accounts that have derived benefit therefrom.

† A debit and credit account should be kept at shops with coal and coke, in order the more accurately to determine the disposition thereof.

‡ See Form No. 33, Appendix E. The word "distribution" will be understood to mean the charging of an outlay to the

during the month, which the storekeeper returns to the accounting officer.

It is an account in detail, written upon the ground by the person who receives, cares for and disburses the material.

It is at once simple, comprehensive and inexpensive.

It contains all the details, under specific heads, of material received and shipped away; also details, under classified heads, of material expended, including that used in the manufacture of articles; also accounts with those to whom material is sold or traded. Finally, all the accounts are summarized and recapitulated at the close, so that they may be scanned at a glance, and the aggregates posted upon the general books at the headquarters of a company.*

The questions attending the economical and proper use of material are of the greatest importance, and in order that they may be understood and intelligently studied, accounts are so classified as to afford an accurate and intelligent digest of disbursements in the aggregate and in detail. The distribution of material book is intended to facilitate this; it is written up from day to day, as each expenditure occurs.

It is intended to embrace a faithful record of material received, sold, shipped, manufactured and disbursed.

It is required to be sent to the accounting officer by each storekeeper at the time specified after the close of the month. A distribution book is also returned by the purchasing agent, embracing all material purchased by him and material invoiced by him to storekeepers; another return is rendered, being a summarization of vouchers in favor of individuals, and so on.

thing upon which it was expended. Thus, a distribution book is a book in which charges are made against various things, according to the facts.

* The accounts on this return are written up on loose blanks by storekeepers. At the close of the month these blanks are arranged in the order prescribed, and are then bound together by a simple device, thus constituting a book. An impression is taken of each sheet by the storekeeper before binding the sheets together.



In order that the method of writing up the distribution of material book shall be uniform, and that clearness shall be observed and the utmost economy exercised consistent therewith, accounts should be opened in it in the order hereafter designated. They are intended to come in their natural order, and it is designed that the history of each should be so clear and minute as to enable the officials of a company to understand fully each account without referring back to the person writing the book; this will not be difficult if care is displayed.

The accompanying rules and regulations, it is to be observed, are not intended to be exhaustive, but, like others contained in this book, are designed rather to stimulate the ingenuity and skill of those interested than satisfy them with their completeness.

So far as rules are laid down they should be observed, but they are intended to be supplemented by the minute appliances and devices that occur in the experience of each storekeeper, and that help to make his work simple, clear and cheap.

In reference to details, the date of the receipt, shipment or use of material is, in every case, to be inserted in the body of the account.

Under the head of "material received," the date of each invoice is to be given; also the name of the firm or storehouse from which the material was received.

In entering invoices the amount thereof should be given in the first money column; only the aggregate amount of all invoices should be carried into the second money column.

Accounts should be opened in the order named.

"Material received from purchasing agent."*—Under this head should be entered, in detail, all invoices of material purchased, charged to the storekeeper rendering the book.

"Material received from storehouses."—Under this nead should be entered all invoices of material received from the storehouses of a company, an account being

* Or the official who makes purchases.

opened with each storehouse from which material has been received.

"Material forwarded to storehouses."—Under this head should be entered all invoices of material forwarded to storehouses of a company, an account being opened with each storehouse to which material has been forwarded.

Precautions will be adopted to make the account of material reported forwarded to any given storehouse agree exactly with the amount of material received by such storehouse. To insure this the storekeeper who forwards the material should notify the receiving storekeeper on the evening of the twenty-fifth day of the month of the amount of material invoiced and charged to him. If this is done, abundance of time will be given for re-examining and correcting the books before they are sent to headquarters, in the event it is found that the accounts of the forwarding and receiving storekeepers do not agree.

"Vouchers chargeable to storekeepers."—All vouchers that emanate from superintendents, civil engineers, storekeepers and others who keep a distribution of material book, they should enter upon such book under this head. The amount of the vouchers thus entered are a debit to the material account of the storekeeper returning the distribution of material book, and the total amount of same should be carried to the final recapitulation under the head of "Material—Vouchers" in red ink. All vouchers entered as above should be apportioned on the distribution book to the accounts to which they belong.* All vouchers entered on the distribution book should be stamped by the storekeeper. This stamp† is an evidence to the auditing officer that

* Thus, if to pay for a cow killed, the amount would be entered under the head of "Vouchers chargeable to storekeepers"; also under the head of "Damage to property and cattle."

† ENTERED IN
July, 18...
Storekeeper, Western Div.



the storekeeper has entered the voucher, and is his authority for charging the same to him under the head of "Material—Vouchers," thus offsetting the credit given that account through the distribution book.

Following the foregoing, the accounts upon which material has been disbursed should be arranged in the distribution of material book in their order.*

Under the operating or construction account to which a disbursement is chargeable, a sub account should be opened for each bridge, culvert, viaduct, building, dock, wharf, ferryboat, locomotive, stockyard or dining car embodied in it.

"Various persons accounts."—A separate account should be opened under this head with each individual, firm or corporation against whom a charge has been incurred. The amounts thus entered should be deducted from the accounts entitled to credit therefor. The amount charged to various persons account should, in conclusion, be carried to the final recapitulation under the head of "Material—Various persons" as a debit, in black ink. Each bill entered should be stamped by the storekeeper; this stamp is an authorization to the auditing officer to credit the storekeeper under the head of "Material—Various persons."

In order to distinguish credit entries at a glance, they should be made in red ink; if deductible from any account they should be made from the total thereof, only the balance being carried forward into the recapitulation.

In case a credit exceeds the debit, the credit should be carried into the recapitulation in red ink and deducted therefrom.

* 1. Operating expense accounts in their order. 2. Rebuilding accounts, the different classes of structures of this kind being entered in the order in which they are named in the list of operating expenses. 3. Construction accounts in their order. 4. Material manufactured by a company. 5. Coal. 6. Wood. 7. Various persons accounts. 8. Miscellaneous accounts. 9. Recapitulation of material received and forwarded. 10. Final recapitulation.

The amount entered as the total footing of the recapitulation will be the difference between the debits and the credits, and constitutes a net credit or debit, as the case may be, to the material account of the storekeeper returning the distribution book.

Oil, Waste and Tallow.—Material distributed to foremen to be used in lubricating cars, locomotives and machinery, should, as a rule, be charged to the proper expense account at the time it is issued, as it is impossible to keep track of it thereafter.

In order to facilitate the apportionment of oil, waste and tallow to the several locomotives using the same, accounts will be kept with that view.

Orders for oil, waste and tallow should be entered daily on what is known as a "Daily record of oil, waste and tallow delivered to locomotives." *

For convenience in accounting, the numbers of engines should be entered on this form in consecutive order.

In the case of oil, waste and tallow delivered to locomotives, the actual amount used by each engine is charged to it.

This is not practicable in the case of waste delivered to wipers; in order to determine this, it is assumed that the amount consumed by each locomotive bears the same proportion to the total cost of waste used that the number of times each engine is wiped bears to the total number of times all locomotives are wiped.† In order to obtain this information, a return should be made to the storekeeper of the number of engines wiped daily.

At the end of the month the waste used by wipers should be apportioned to the several engines on the basis mentioned. The record should then be footed and the totals carried to a monthly statement which is a recapitulation of the daily record of oil, waste and tallow delivered to locomotives.‡ The footings of this last named statement should be carried to the distribution of material book and there treated as other material.

* See Form No. 34, Appendix E.
† This is, of course, a mere supposition.
‡ See Form No. 35, Appendix E.



Oil and waste used in repairing locomotives is charged directly to such repairs.

After the storekeeper is through with the daily record and monthly statement of oil, waste and tallow delivered to locomotives, they are used in compiling the locomotive report.

Stationery and Printing and Station Supplies.—The multitudinous number of items embraced under these heads, many of which amount only to the fractional part of a cent (when charged in detail, as the consumption occurs), together with the great expense that would attend any attempt to charge each item as consumed, renders it advisable to adopt a different method of accounting from that in force for other material.

The cheapest and simplest method that suggests itself is to charge disbursements of this kind as they are audited for payment directly to the item of expense that they affect, and at the end of the year charge or credit such account as the inventory (for this class of material) shows the balance to be over or under the amount on hand at the commencement of the year. This course should accordingly be followed, except in the case of stationery forwarded to shops, which should be invoiced the same as other material to the storekeeper thereof, and taken up by him on his books and distributed the same as other material.

The cost of oil for lights at stations, also miscellaneous supplies sent them, should be charged to the account upon which they are to be expended at the time the material is forwarded by the storekeeper.

The petty supplies taken out of store for maintenance and operation of telegraph should also be charged to the account upon which expended in the month in which such supplies are withdrawn from store.*

Articles Manufactured by a Company.—An account is required to be opened upon the record book at store-

* There is no objection, except the cost of accounting such method would involve, to treating stationery, lights at stations and petty station supplies the same as other material, i. e., charge it to operating expenses, only when actually consumed.

houses with articles manufactured at the shop connected therewith.

An account should be opened with each article or group of articles; it should be charged with all labor, material and expense incurred, so that the actual cost may be known.

In order that the company may not be deceived in regard to its ability to manufacture cheaply, the utmost care should be taken to see that every species of material or scrap that enters into the cost of a thing, every expense incurred on account of it, including transportation, handling, etc., also expenses for superintendence, wages of storekeepers, timekeepers, laborers, etc., are properly computed and charged.

If machinery and tools used in the manufacture of articles are bought for such purpose, and are not used for any other purpose, then the wear and tear of such machinery and tools should be added to the cost of the article manufactured; when, however, the manufacture of an article is incidental merely (to economize time and the use of machinery), the wear and tear of the latter will be charged as in other cases.

As directed, a separate account should be opened with each article or lot manufactured. At the end of the month these amounts should be entered in detail upon the distribution of material book, under the general head of "articles manufactured by the company." The storekeeper thus making return should not be credited by the accounting officer with the amount, as he is in the case of other expenditures; the effect would be to add the amount, whatever it might be, to the debit balance of the storekeeper. He should therefore take up the articles manufactured into his stock when completed, the same as articles purchased, and when using or shipping the same be particular to see that the full cost is charged, as in other cases.

The number of accounts that will arise in connection with the manufacture of material cannot be told. More or less work of this nature will be unavoidable, as in the case of material purchased by a company and requiring



to be adapted to its wants before being used, such as fitting wheels to axles, etc. In the latter case the expenses incurred in adapting the article to the use to which it is to be put should be charged as a part of the cost thereof.

The following details should be observed in accounting for material manufactured by a company:

Requests for the manufacture of articles should be made by or through the storekeeper.

The request should be made in quadruplex form.

Two copies should be sent to the head of the shop; one of these he should retain, the other he should approve and deliver to the foreman who has charge of the work. The other two copies should be used by the material clerk and in the storekeeper's office, respectively.

A lot number should be assigned to each article or group of articles manufactured.

When the article is manufactured, the head of the shop should notify the storekeeper that it is at his disposal. Any surplus material that may have been charged to the account should be entered in detail on this notice.

The order to manufacture should have the lot number inserted.

All expenditures should be charged to this number; this will save much clerical work

When work is completed, the order given to the foreman to perform the same should be returned.

The date of the return of this order should be stamped thereon.

A proper charge should be made in every case for wages of storekeepers, timekeepers, fuel, etc., as already explained.

A debit and credit account should be opened with articles in course of manufacture and an inventory taken thereof each month, and the account adjusted thereto.

Contrary to the rule requiring articles in course of manufacture to be embraced on the distribution of

material book under the head of "articles manufactured by the company," an exception should be made in the case of equipment; a separate account should be opened with each locomotive, car or group of cars constructed or rebuilt; also with each building or structure that is being constructed or rebuilt. If the account is an operating expense, it should be transferred at the close of the month to the general account covered by it, as already directed elsewhere; if it represents a construction item, it should be so designated.

The class of material to be grouped under the general head of "articles manufactured by the company" on the distribution of material book is intended to embrace portable articles, pieces of machinery, castings and implements for use about shops, stations, trains, etc., in contradistinction to locomotives, cars, buildings, bridges and kindred structures.

TRACK MATERIAL—(MATERIAL AND LABOR.)—The conditions under which roadway and track material is stored and disbursed differ so greatly from other disbursements that different forms are required. In accounting for material at storehouses the returns are made by practiced accountants, while in the disbursement of track labor and material the returns are made by track foremen. The meager facilities that the latter possess render it necessary to simplify the methods employed as much as possible and reduce the labor connected therewith to the lowest possible point.

Each track foreman is required to make return of the labor he employs and the material he receives and disburses.

It is designed that these returns should be sent to some central office on each line or division (say, the superintendent's) to be there examined and aggregated.

The person who thus groups these accounts is termed the storekeeper.

He is charged with all material that he makes return of, whether for track or for bridges and buildings, and receives credit for all that he disburses.



He is expected to make the same returns as other storekeepers.

He also uses the same form of distribution book for labor and material that is used by storekeepers at shops.

The books used by track foremen, from which the storekeeper compiles his returns, are very simple; the labor book, as explained elsewhere, contemplates a careful classification, and is so arranged as to reduce the clerical work to the minimum and yet afford all the information that is necessary to a full and complete understanding of track work.

The distribution of material book used by track foremen is also very simple.* The articles are printed in the book so that all the foreman has to do is to insert the quantity received, used and on hand opposite the name. The name of the account to which material is chargeable is also provided for, so that it does not need to be written in; all that it is necessary for him to do is to enter the amount of material consumed, under the proper head.

In the event, however, articles are expended upon objects outside of the track department, it is necessary to formally insert the name of the account.

The distribution of material book used by track foremen, like the distribution book for track labor, contains all the directions necessary to be observed; it provides specifically for material received, material expended on repairs of roadway and track and for rails and ties; also for construction of sidings, for material shipped away, and for material and tools on hand at the end of the month. It is complete and embraces all the accounts with which foremen are likely to have anything to do.

In order to sum up the account of track material in the hands of section foremen, it is necessary that the storekeeper in charge should keep a record book, in which he should enter the material received upon the division and the number of the section to which forwarded. The purpose of this book is the same as the record book kept at the storehouse; at the close of the

* See Appendix D.

month it should be compared with the details of material received by the various section foremen and in this way verified. From it the storekeeper should be able to secure the prices needed. In further explanation of this book it may be said that its purpose is to enable the official in charge to keep himself advised of all material he receives and to whom it is shipped, the quantities of each kind of material on hand and where located, and the quantities that are used from month to month, and upon what used. He thus possesses all the information necessary to enable him to exercise a wise supervision over these disbursements, and to curtail them so far as accurate knowledge of accounts permits.

Material shipped to a division for use in the track should be invoiced to the storekeeper of such division. Any expense incurred in repairing track tools for a division should also be invoiced to the storekeeper thereof. Nothing should be charged to track expenses except through the storekeepers in charge thereof.

Fuel.—The necessity of exercising the utmost intelligence and watchfulness in the care of the general supplies of a road to prevent their waste or misappropriation, suggests itself with redoubled force in connection with fuel.

The universal use of this article makes its proper protection exceedingly difficult. The theft of fuel from a particular station or train may not be great, but the aggregate on the road thus filched is enormous unless the most painstaking and intelligent effort is made at all times to prevent it and to punish those who practice it.

The duties of the storekeeper in this direction are arduous and at all times unsatisfactory, because of the difficulty of enforcing necessary safeguards without incurring expense out of proportion, frequently, to the object attained.

These difficulties attending the care of fuel suggest the necessity of isolating it as far as possible and of preventing access to it of all except those who use it for the company; this is rendered less difficult than formerly on account of the appliances that have been



introduced for storing and handling supplies of this nature, but until fuel (while in process of transportation and in store) can be placed under lock and key, the danger of its being stolen will be constant, and will need to be met with watchfulness on the part of those who have it in charge.

Fuel is the most difficult of all material to care for, and the magnitude of the sum involved (about fourteen per cent. of the expenses of a company) demands that the accounting connected therewith should be characterized by such intelligent and far-reaching methods as will secure the most satisfactory results.

The deterioration in quality of both wood and coal is continuous from the time it comes into the possession of a company until used. The extent of this deterioration depends largely on the manner in which it is stored; if exposed to the influence of the weather, deterioration will be marked and rapid. This fact should impress upon those who have charge of fuel the importance of keeping the supply on hand as small as is consistent with safety, and of exercising the greatest care possible in storing.

Not only should care be exercised to prevent misappropriation of fuel and its waste by improper care or unnecessary exposure, but every practicable device consistent with good business usage should be at all times enforced to secure the economical use thereof.

In furtherance of this purpose, careful comparisons should be made of the fuel used on different locomotives for the same month, and for the same line and for different lines. Comparisons should also be made of the consumption of the same locomotive for different months. Similar comparisons should be made of fuel used at stations, in cars, and elsewhere; wherever, in fact, conditions are similar, or the zeal of employes is likely to be increased thereby.

The following specific rules and regulations suggest themselves in connection with fuel. They do not cover the ground in detail, and are intended to be supplemented by those in charge with such further

rules and regulations as the circumstances in each case require:

Two accounts should be kept by the company for fuel: one for coal and one for wood; charges should be made in accordance therewith.

Fuel should be charged with the first cost, the cost of transportation to the point of delivery on the line of a company (when there is any charge on such account), the cost of loading, unloading into store, arranging, inspecting and watching; the cost of sawing and piling wood; and, finally, the expense incurred in preventing and putting out fires.

Fuel brought forward from a preceding year, and appearing in the inventory for such year, should be charged, when expended, like other material, at the price at which it appears in such inventory.

The cost of unloading fuel into chutes (for transfer to the engine tender) should, in the absence of instructions, be charged directly to fuel for locomotives.

The following rules in reference to coal accounts are necessary:

Parties from whom coal is purchased should render the official who purchases daily invoices of deliveries, showing date, car number, actual weight, where delivered, and the cost for each car of coal.

These invoices, or copies thereof, should be sent daily by the purchasing agent to the general storekeeper or official who keeps the fuel account, to be by him compared with the statements of receipts rendered by agents; afterward they should be entered in the fuel received book, signed and returned to the purchasing agent.

A statement should be required at the end of every month from all who furnish coal; it should give the particulars embraced in the daily reports, and should include all coal delivered or shipped during the month; also shipments brought forward from the preceding month, not accounted for in such month. The bill for the coal should accompany this report.



Coal not actually received on the evening of the last day of the month should be carried forward into the succeeding month's bill.

In waybilling fuel, the quantity in tons or cords should in all cases be inserted so as to afford everyone interested the necessary data for making returns thereof, and otherwise keeping the accounts correctly.

For the purpose of keeping the officer in charge of fuel advised of the supply on hand, etc., agents at stations where contractors make their delivery should report daily the disposition made of the coal, i. e., the points to which shipped, quantity, etc.

On the last day of each month agents who receive coal directly from contractors should make an itemized return* of all coal received during the month. It should specify the date of receipt, name of contractor delivering, number of car, and amount of advanced charges, if any. If the coal is weighed by the agent (and it should be where there are track scales) the weight, as ascertained by him, should be inserted; if not weighed by him, the weight as advised should be reported. The return should also specify the name of the station to which each car was forwarded.

Agents at stations where coal is kept in store for future use or present distribution should make a detailed return† each month of all coal received by them. It should specify the date of receipt, number of car, weight of coal and where from.

The monthly accounts returned by contractors should be verified by careful comparison with the monthly returns made by agents. The correctness of these returns should, in turn, be confirmed by the monthly returns from other agents of coal received by them, by the amount of coal consumed at the point of delivery, and, finally, by the balance on hand at the point of delivery less the amount brought forward from the previous account.

* See Form No. 36, Appendix E.
† See Form No. 36, Appendix E.

The following rules and regulations should be observed in regard to wood, in the absence of instructions to the contrary:

Cord wood delivered to a company should be piled in conformity with its official specifications.

After inspection, the number and length of the rank (pile) should be plainly marked with paint upon each end of the tier by the inspector.

The ends of several sticks in the rank (say three or four to each cord) should also be plainly marked with paint with the number of the rank.

Ranks should be numbered consecutively, commencing with No. 1 for each station, and so on to the next station.

At the time of inspection the inspector should note accurately in his record book: First, the name and address of the person delivering the wood; second, the exact location of the wood, i. e., the place, which side of the track, and how far from the track; third, the number of the rank; fourth, the length, height and width of the rank, also the dockage, if any; fifth, the number of cords of wood in the rank; sixth, the kind of wood, as hard or soft, specifying it by name in each instance.

Fuel inspectors should make a return* to the purchasing agent of wood measured by them; a duplicate of this should be sent to the general storekeeper, or official who keeps the fuel accounts, to be used by him in verifying invoices for wood purchased, and in compiling the accounts. The fact that payment for wood is based upon these returns should insure the utmost care upon the part of inspectors.

The specifications under which wood is purchased should be critically complied with.

If a rank is not of full height, or not cut the full length, or not compactly piled as required by specifications, inspectors should take cognizance of such discrepancies, returning only the actual amount.

* See Form No. 37, Appendix E.



If the size, manufacture or quality of the wood is not fully up to the requirements, or if piled with intention to defraud the company, the owner should be compelled to assort the wood and repile it.

Agents at stations where wood is inspected should be made accountable for it after inspection. They should, therefore, be on hand at the time of inspection to verify it, generally, as to quantity, etc.

An account should be opened by the general storekeeper with each rank, in the form and manner described above for the inspector's report.

A fuel record book should be kept, in which the reports of inspectors should be minutely transcribed before being placed on file. In this way clearness and continuity of statement are assured.

When a rank or part of a rank is transferred, a report* of the removal should forthwith be made to the general storekeeper by the person in charge. This report should specify the date of its removal, the number of the rank, or if only moved in part, what particular part was taken. It should also show the number of cords and the point to which shipped; these should agree with the waybilling.

The number of cords and the place of delivery should also be shown upon the monthly fuel return.†

Agents should embody in their fuel accounts all fuel received at their stations, reporting the same in the manner provided when used, shipped, or, if wood, when sawed.

To be able to render a correct account of wood sawed, it is of the utmost importance that a faithful account should be kept of the quantity of unsawed wood located at the different points on the line of a road.

Agents are, therefore, required to make a special report each month, of the quantity of wood sawed at their several stations.

When the wood that is sawed is taken from the ranks, as originally inspected, the number of each rank and

* See Form No. 38, Appendix E.
† See Form No. 39, Appendix E.

the amount sawed should be reported; when the whole rank is sawed in the same month, the compensation of the wood sawyer should be based on the original measurement of the inspector. When the wood is not arranged in ranks (as inspected) but is piled indiscriminately (as unloaded by the wood train gang) agents should make an approximate report of the quantity sawed. When the sawing is completed, if the whole amount on hand has been sawed, the amount that has been reported sawed should be deducted from the total amount on hand at the station; the balance will be the amount that should be embraced in the final report for wood sawed.

The actual amount of wood sawed should always be reported when the same can be ascertained.

Estimates should be made only for such quantities as cannot be definitely known until the completion of the work.

Seasonable notice should be given whenever wood located between stations is to be sawed, so that an agent or inspector may be on the ground to make a report of the quantity sawed, etc.

A voucher should be made by the general storekeeper (to be verified by the purchasing agent) in favor of wood sawyers for wood sawed by them; but the same should conform to the amount as shown by the record kept in the office of the former. Errors and inconsistencies should, in every case, be located and corrected before vouchers are passed for payment.

Where wood is located on the line at a point remote from stations, it should be charged to the station most convenient to it, and the agent, at that point, should take it into his accounts, and make returns for it when it is disbursed or moved away.

Fuel Returns.—Peculiar circumstances arise in connection with the accounting for fuel not noticeable in connection with other material. The latter is stored at a few central points under the charge of storekeepers, who attend to its receipt, care and disbursement, and who make return of the same as described elsewhere.



Their facilities for performing the work are easy, convenient and simple. The keeping of the fuel accounts, on the other hand, is performed by men, in most instances, who are occupied largely with other duties. The result is that the same thoroughness and accuracy is not observed in the one case as in the other. It is a fact, moreover, that fuel cannot be measured with the same accuracy as other material; this renders it still more difficult to secure satisfactory accounting.

The blank forms for reporting fuel are adapted to the particular circumstances under which such accounts are rendered, especial effort being directed to their simplification; to make the work as light as possible, and at the same time afford an accurate digest of fuel received and disbursed. It is not necessary to enter into any description here of the particular accounts that are to be opened of fuel disbursed on the general fuel report. They should harmonize with the list of operating and construction and other necessary accounts; in other words, the returns for fuel disbursed should be apportioned under proper headings, so that the recipient of these returns may from them charge the accounts upon which the fuel was expended, commencing with the operating accounts in their order and following on to the end.

It is designed that the general fuel report* should give the source from which fuel is received, and the quantities thereof. This will require to be compared afterward, by those who audit the fuel accounts, with the amount reported as forwarded to such place. In the event they do not agree (and in many instances they will not, because of the use of fuel en route and for other reasons), the occasion of the difference should be investigated and adjustments made in accordance with the circumstances of each case. On the credit or disbursement side of the general fuel report, a statement of the amount of fuel disbursed is required to be entered. In order to do this with accuracy, the amount

* See Form No. 39, Appendix E.

taken should be ascertained; this will involve the careful auditing of tickets and receipts taken from engineers and others for fuel delivered them; the fuel taken for use on trains and elsewhere should in like manner be ascertained from the receipts or other evidences of delivery. Each account upon which fuel is consumed should be stated. Afterward the amount shipped away, points to which shipped, quantity, etc., should be given.

The general fuel report is intended to afford a history of the fuel received and expended each month. The principle of the report is the same as that of the distribution of material book, except that it is simpler and of different form, the aggregate amount of each kind disbursed being given instead of each item.

Fuel in store at shops for use on stationary engines, for lighting, heating, blacksmithing, tinsmithing, boilermaking and kindred purposes, is to be charged directly to material proper (i. e., to the storekeeper in whose charge it may happen to be), and is to be taken up on his distribution of material book. It is treated thereafter as material.

Fuel held in store at roundhouses and shops for general use on locomotives, cars and for other purposes in connection with the operation of a road, apart from shops and storehouses, is to be embodied in the general report* for fuel.

A precise subdivision of accounts of fuel, as between fuel and material, is not a matter of special importance, so that due account of receipts and disbursements is rendered.

In order to facilitate the keeping of an accurate account of fuel consumed by locomotives, and to simplify the work as much as possible, tickets are supplied to enginemen.† The tickets are in the shape of small coupons numbered from 0 to 199 and bound in book form, with a place for the engineer's name on the cover. Each coupon calls for one ton of coal, and the engineer detaches a coupon for each ton of coal received,

* See Form No. 39, Appendix E.

† See Form No. 40, Appendix E.



writing the number of the engine and date of delivery on each coupon. At the end of the month the engineer turns in the book with the unused coupons. The missing numbers (those used) show the number of tons he has received during the month. The tickets he has issued are used in making the charge against the engine. The book can also be used to figure the engineer's individual record.

When fuel is delivered to enginemen, it should be in quantities represented by these tickets or multiples thereof, and it is the duty of engineers to return to the person thus delivering fuel a ticket for each ton received. Under no circumstances is fuel to be taken by an engineer without leaving a ticket or receipt therefor at the time of the delivery.

It is the duty of the person delivering fuel to see that the ticket or receipt received corresponds with the quantity delivered. Any attempt to procure fuel without the delivery of a ticket or receipt should be forthwith reported to the proper officer.

For fuel disbursed for other purposes, a receipt should be taken in the absence of tickets.

ast as tickets are collected for fuel delivered they should be entered on the daily record book of fuel delivered to locomotives. This record should show the amount of fuel issued to each locomotive each day. After the tickets are recorded, they should be locked up in a box to be provided for that purpose.*

At the end of the month, the daily record book of fuel delivered to locomotives should be footed, and the total quantity for each locomotive and for the aggregate ascertained. The aggregate amount of fuel delivered to locomotives, also the amount of fuel delivered for other purposes, should be entered on the general fuel report, which, when complete, should be forwarded, with the fuel receipts and tickets for fuel delivered for other purposes, to the official in charge of fuel accounts. The daily record book of fuel delivered to locomotives, also

* In the absence of tickets, a blank order may be used by the engineer.

the collateral tickets, should be forwarded in a box provided for the purpose, to the storekeeper designated to summarize the locomotive fuel disbursements of the division; this box should be securely locked.

Upon receipt of the book and the tickets and receipts, it is the duty of the storekeeper to promptly audit the account. He should then enter the quantities of fuel charged during the month to each locomotive at the several fuel stations on a form provided for that purpose, known as a monthly recapitulation of fuel furnished locomotives. This he should forward to the official in charge of fuel accounts. He should then return the box and book to the sender.

As soon as the foregoing returns have been received and verified by the official in charge of fuel accounts, he should cause a summary to be made of fuel consumed, specifying the quantity of each kind, price thereof and amount, entering the accounts to be charged therewith in their order; this statement he should forward, after the close of the month, on the day specified, to the accounting officer for use in writing up the general books. This summary is required also for use in compiling the locomotive reports and for other statistical purposes. The total amount of this summary should agree with the aggregate amount shown on the general fuel returns.

Any errors, inaccuracies or omissions found in the returns of fuel should be reported at once by the person making the discovery to the one in error.

It may be made the duty of the general storekeeper to receive and audit the fuel accounts.

## STOCKYARDS.

The more diversified a company's affairs become, the greater the necessity for adopting devices to meet particular exigencies, preserving, however, the same general principles of accountability. The methods of handling freight receipts are such as are adapted to that particular branch of the service; the same is true in regard to passenger, express and mail business. Miscellaneous earnings require special provision for different kinds of receipts, such as extra baggage, car service, etc. Another class of business to be provided for is that which arises at stockyards operated by a company. The measures necessary to be taken in connection with receipts thus arising are very simple.



The purchase of supplies needed at such stockyards requires especial provision. The most simple method of treating them is that devised for the common supplies of a company at shops. The foreman of the yard (or person immediately responsible) should be charged with all supplies and should be credited with all disbursements.

Each stockyard foreman should keep a record book * in which he should enter the particulars of stock fed at his yard and the charges connected therewith. This record should show date, consignor, consignee, origin and destination of stock, way bill number, date, car number, number and kind of stock, charges collected or to be entered on way bill, and particulars of the seal record.

All supplies purchased by or sent to the foreman of the yards should be treated in the accounts the same as those handled at storehouses; thus the foreman will be charged with feed purchased by or shipped to him; also with all incidental expenses incurred in connection with the stockyard, including the pay roll thereof.

In view of the fact that the payment of cash for feed at stockyards is necessary in many cases, the foreman of the yard or person authorized to make purchases will (unless otherwise ordered) buy upon this basis, viz.: he will deliver to the seller an acknowledgment for the goods.† This acknowledgment will recite name of seller, articles bought, price, date purchased and amount due the vendor. The foreman should personally vouch for

* See Form No. 41, Appendix E.
† See Form No. 42, Appendix E.

its correctness; this voucher the seller should present to the station agent, who should pay the amount on presentation and take a receipt in the place provided on the face of the acknowledgment.

This receipt the agent should carry as cash on hand until a voucher is made in his favor to reimburse him; this voucher should be made in form as follows: On the first day of the month the foreman or official making the purchases should make a voucher in favor of the agent who paid the bills covering the amounts paid by him during the preceding month; he should note in the body of this voucher, beneath the items, "Paid as per receipts held by the above agent;" a similar notation should be made on the back of the voucher, beneath the filing. The voucher should state the date of each purchase, from whom purchased, article, quantity, price paid and amount. This voucher should be forwarded without delay to the proper officer for his certification.

When finally approved for payment the voucher should be sent to the agent; he should attach to it the receipts in his possession and remit the whole as cash. In this way he will get credit for feed bills paid by him.

As vouchers in favor of agents, described above, for supplies paid for by them include only the material paid for up to the close of the month, each foreman should (for the information of all concerned) make a special entry in his report of supplies received and expenses incurred for "Supplies bought but not included in agent's voucher." This account should embrace a detailed statement of all purchases made for which an order has been given on the agent, but which has not been presented at the close of the month. This information will be required in adjusting the foreman's inventory with the balance charged against him on the company's books.

In reference to incidental expenses at stockyards, the same urgency does not exist for paying cash that there does for feed. Payment should therefore be made as in the case of other debts incurred by a company. A voucher should be made in favor of the person to whom



the amount is due. This voucher * the foreman should certify to; after it is spread upon the books and returns it should be forwarded to the proper officer for his certification, to be paid in due course.†

The foreman of each yard should be required to make a "return of supplies received and expenses incurred"‡ (through the office of the superintendent) on the first day of each month; it should include all expenses of the yard, viz.: feed purchased, bedding, tools, veterinary services, shoeing, incidental expenses and pay roll. It should specify the date, name of payee, description of the expense, quantity (if for feed), price and amount. The amount of this return should be charged to the foreman of the yard.

The return is the same, in one respect, as the distribution of material book made by storekeepers.

The return for supplies received and expenses incurred should be accompanied by an inventory of supplies on hand at the end of the month.

A general time book should be kept by each foreman of the force he employs; it should be closed and sent forward to the proper officer on the first day of the month. Before sending it, however, the foreman should

* If not made by the foreman of the yard, it must be sent to him to enter and stamp, as it should be charged to his account.

† While the foregoing method of treating material used at stockyards has been found to work well in practice, it may be varied, if thought desirable, thus: Instead of the foreman of the stockyard purchasing supplies, as provided, he may be required to make requisition, through the division superintendent, upon the purchasing agent, the superintendent certifying to the requisition and sending it to the general manager for his approval, the latter, in turn, forwarding it to the purchasing agent. If, in case of emergency, it becomes necessary for the foreman to buy feed, he should make a requisition covering the same, noting on the face thereof the fact that the material has already been bought; this requisition should be forwarded, with the bill for the goods, through the customary channel. Or, if thought more desirable, the plan outlined in the foregoing paragraph may be varied by having the stockyard foreman forward his requisitions to the general storekeeper, the same as other storekeepers, to be treated in the same way.

‡ See Form No. 43, Appendix E.

enter the amount on his "report of supplies received and expenses incurred."

The amount should be charged against the yard.

Material required in repairs, such as lumber, nails, hinges, etc., should, so far as possible, be ordered of storekeepers at a company's shops; tools requiring repairs should also be sent to the storekeeper, accompanied by an order to that effect.

All repairs at stockyards should be performed by a company's force, as in other cases, so far as practicable, and all material needed should be furnished from a company's supplies, so far as possible.

An invoice should be sent foremen for all supplies shipped them, or charge made against them.

STOCKYARD COLLECTIONS.—All charges due a company for feed, services or expenses should be collected at the time, or provision made on the way bill for collecting elsewhere.*

Each stockyard should be credited at the headquarters of a company with all collections made on its account for feed, care and other purposes.

A record book† should be kept by each foreman, in which collections made by him should be entered, giving full particulars in each case.

Each foreman should make a "report of stockyard charges;" ‡ it should include all charges of every name and nature (without reference to who makes the collection), including those for feeding, sale of pelts and carcasses, and receipts from other sources. It should be

* A way bill should be made for all stockyard charges. The amount should be entered thereon in the "miscellaneous unpaid" column, noting on the face of the way bill why the charge is made; all charges collected at the billing point should be entered in the "miscellaneous prepaid" column of the way bill. A separate way bill should be made for charges accruing at stockyards, or on account of stock en route; the way bill should read from the station where the charge accrues. When a way bill of this kind is made, the agent should note on the original way bill for the stock, "For balance of charge, see way bill No. ...., from ....., dated ....., 18...."

† See Form No. 44, Appendix E.

‡ See Form No. 45, Appendix E.



sent (through the office of the superintendent) on the first day of the month; it should show date of charge, whom the charge was against, what for, car number, quantity (if for feed), price and amount.

All collections at a yard should be turned over to the station agent on the day on which they are collected; or, if this is not convenient, other arrangements made.*

## INVENTORIES.

A yearly inventory of supplies is required to be made. It should be taken as of the last day of the fiscal year. Preparation should be made for it in advance, so that it may be taken with celerity and accuracy. Nothing should be omitted. The articles should be arranged in alphabetical order and should embrace each and every article not in use at the time it is taken.

The inventory affords the basis of a new departure, in this, that the amount charged on the general books to the respective storekeepers is made to harmonize with it.†

An important purpose intended to be accomplished by the inventory is to bring the question of stores on hand under the immediate eye and to the particular attention of every storekeeper.

If he has material in excess of his needs, or possesses articles for which he has no use, suitable disposition of the same should be made forthwith.

Storekeepers should not, however, wait until the end of the year to do this. They are expected to keep down the amount of material on hand to the actual requirements of business, and to notify the general storekeeper forthwith in the event they have any articles on hand they do not need.

* Amounts received or collected by agents on account of stock or yards should be entered by them on their cash book and remitted with their other collections for the day.

† Any deficiency or surplus is charged or credited at headquarters, as the case requires, among the expense accounts to which material has been debited during the year, on the basis of the amount that has been charged to each.

It is considered an especial merit in a storekeeper if he performs this work efficiently, and an especial demerit if he does not.

The duty of keeping down the supply of material on hand to the actual needs of the service, and the prompt disposal of all articles for which the company has no further need, is dependent upon the skill and faithfulness with which storekeepers perform their duties in connection therewith; they are expected to act promptly in such matters, and no excuse, it is apparent, can compensate the company for neglect or lack of interest in this regard.

The inventory, if accurate and reliable, affords a fair index of the thoroughness that has been exercised by each storekeeper in caring for and disbursing material.

If the amount of the inventory differs greatly from the amount charged to a storekeeper on the general books, it indicates a lack of method somewhere, either in caring for material or in charging it when disbursed. He is culpable in either event; he should exercise such method in his business as may be necessary to prevent any great deficiency or surplus.

It is not possible that the inventory should exactly balance with the amount charged to the storekeeper; changes in prices and petty differences that are unavoidable in disbursing many kinds of material will prevent this, but, as changes and differences are as likely to be one way as another, the books should vary but little in consequence.

Material or supplies that have been charged to an account, and that are in course of being used, or that are awaiting use, should not be inventoried.

The inventory should be based on prices current at the time it is taken. When the prices are not known they should be obtained from the general storekeeper; the latter will obtain prices from the purchasing agent.

Inventories should be signed by storekeepers and sent forward after the close of the fiscal year, on the date designated.



Material in transit at the time of taking the inventory, accompanied by invoices bearing prior date, should be embraced in the inventory of the receiving storekeeper.

But as all material invoiced after the twenty-fifth of the month between storekeepers is embraced as of the subsequent month, such material for the last month of the fiscal year should be embodied in the inventory of the storekeeper who forwards it, as it is not charged to the receiving storekeeper upon the general books of the company until the next year.

Material invoiced after having been inventoried should be forwarded as of subsequent date.

Material embraced in the inventory, when disbursed, should be charged at the price inventoried.

Material or scrap charged on the books against a particular storekeeper should not be taken up in the inventory of any other storekeeper. In the event the storekeeper who should make return of it is likely to omit it from his inventory, the storekeeper cognizant of the fact should notify him of it.

In taking an inventory the work should commence at an initial point and be followed up in due order, taking all classes of material as they come.

The description of each article or class of articles entered in the inventory should be full and comprehensive.

Any exceptional circumstance in connection with an article or class of material, such as that it is in bad order, not needed, or has ceased to be usable, should be noted conspicuously on the inventory.

In case it is impossible to ascertain the actual weight or quantity of any kind of material or scrap, a careful estimate of the same may be made; the fact that the weight or quantity is estimated should be noted on the inventory.

The form for making monthly requisitions is adapted for taking the inventory of material at storehouses. The name, quantity or weight, rate and value of each article or class of articles should be given in every instance.

New and usable articles should be named first in all inventories; following these the scrap (including what is sometimes termed old material) should be specified, giving the quantity or weight and value of each kind in detail, in alphabetical order.

Inventorying Shop Supplies.—Five days before the close of the fiscal year, if necessary, clerks and foremen at storehouses should be assigned sections of the storehouse of which, with requisite assistance, they are expected to make an inventory. Each should be provided with scales (if needed) and a hand-book, wherein the particulars of material on hand, as it is counted, may be jotted down. At the close of the day, and before going home (as the inventory progresses), the entries on this book should be so arranged that they can be drawn therefrom onto the inventory blanks.

Material in course of manufacture, scattered about the shops, yards and elsewhere, should be inventoried under that head.

Storekeepers should obtain from the heads of their respective shops such assistance as they may require to enable them to take the inventory promptly and accurately.

As fast as inventoried each article or class of material should be marked distinctively to show that it has been taken into account. This will prevent its being counted twice and will lessen the embarrassment attending the disbursement of material during the time the inventory is being taken.

Track Inventory.—An inventory is required to be taken of track material in the middle of each fiscal year as well as at the end thereof. Inventories should be taken for rails and ties separately from other track material.*

The track inventory should not include any track material or tools actually in use. It should embrace all other material, including scrap.

* One purpose in taking a separate inventory for rails and ties is that any surplus or deficiency in connection with either of these accounts may be credited or charged to them respectively.



Old tools and other property not in use having a marketable value should be embraced under the head of scrap.

The track inventory should include all ties, iron, lumber, posts and other material belonging to a company on the line of the various divisions charged to the storekeeper making the inventory, no matter whether such material is to be used on the division where stored or is to be shipped elsewhere.

Track material at rail mills or en route thereto should be included in the inventory of the storekeeper in whose charge such material may be.

Articles should be enumerated separately in the track inventory, giving the quantity or weight, rate and value of each.

The inventory of track material is not only intended to embrace that scattered along the line chargeable to the storekeeper thereof, but it should embrace all material in his charge, no matter where located. Track material at shops in charge of storekeepers thereat should only be inventoried at the close of the year and should be embraced in the regular inventory for such storehouse.

Upon the completion of the half yearly and yearly track inventories, a balance sheet should be made by the storekeeper in charge. This balance sheet should embrace the receipts and expenditures since the date of the last inventory, including the amount brought forward, and should give the balance. In it the storekeeper should charge himself with the gross amount of the last inventory, also with such material as he may have received since, including scrap that has accumulated. Upon the other side of the account he should take credit for material that has been used, shipped away or sold. The difference between these represents the balance to his debit. If the balance harmonizes with the inventory that has just been taken, no further action is required; but if it differs in any way, the storekeeper should increase or diminish the amount of track material used in the month just closed by the amount

of such difference; in adding to or deducting from the charge for rails, ties or miscellaneous track material, so as to make the accounts thus harmonize with the balance on hand, the difference should be added to or deducted from the account particularly affected, namely, rails, ties or miscellaneous articles.

Only the aggregate quantity of each kind of material, for the whole territory under the storekeeper, need be embraced in the inventory. The price should be given for each kind.

Each storekeeper should balance the articles expended and on hand with those he has received; thus, the number of axes on hand, as per inventory, should be the balance remaining after charging the number brought over from the previous inventory, with all additions since that time, less the number used, shipped away and sold. Other articles should be treated in the same way.

Stationery Inventory.—A separate inventory should be taken for stationery, so that any surplus or deficit that may arise in connection with this kind of material may be credited or charged to the specific accounts affected.

Dining Car Supplies Inventory.—A separate inventory should also be taken for dining car supplies, so that any surplus or deficit that may arise in connection with this kind of material may, in like manner, be credited or charged to the specific accounts affected.

An inventory of the supplies on each dining car should be taken as often as once a month.

An inventory should, moreover, be taken of the linen in each dining car at the end of each trip; first, of the unsoiled articles; afterward of those that have been used. The latter should be turned over to the storekeeper, or person delegated, and will serve at once as an inventory and a record against the laundry.

Brasses and Tools Inventory.—An inventory is required to be taken of all brasses in the hands of workmen at the close of the month; also when those having them in charge leave the service of the company.



The foregoing rule is also intended to be enforced in connection with tools and implements in the hands of employes charged against them specifically.

Brasses in the hands of employes awaiting use, also tools similarly situated, should be embraced in the yearly inventory.

Closing Storehouses.—An inventory is required to be taken whenever a storehouse or construction or other supply depot is closed.

Stockyards Inventory.—A separate inventory should be made for supplies at stockyards, so that this particular branch of the business may be credited with any surplus or debited with any deficiency that arises in connection with it.

Fuel Inventory.—Separate inventories are required for coal and wood respectively.*

It is the duty of the general storekeeper or official by whom the details of fuel received, on hand and disbursed are kept, to take charge of the inventory and to furnish those in charge of depots of supply with prices to be used, instructions, blanks, etc. The inventory should be taken as in other cases, and should give in detail each class of fuel, its price, and the total value thereof. It should be forwarded promptly after the close of the fiscal year, on the date required.

In consequence of the great shrinkage in fuel, and the special risks that attend its care, an inventory should be taken of it (as in the case of track material) in the middle of the fiscal year and at the end of the year. As a rule fuel inventories should be taken by the agent in charge where the fuel is located. When the supply is

* Fuel at shops and roundhouses for use of stationary engines, heating offices thereat, shop buildings and storehouses, and for use of blacksmiths, tinsmiths, boilermakers and kindred purposes, is intended to be embraced in the inventory of material. The inventory of fuel is intended to embrace all other fuel. All the inventories of a company are finally consolidated at the general office under the three heads into which the material accounts are divided, namely, "material," "wood" and "coal."

great, however, the division superintendent should delegate a representative whose business it is to personally examine into the facts of the case and see that the inventory is correctly made; he should also certify, with the agent, to its correctness.

The same rule should be observed in regard to the inventory for fuel that is required in other instances, namely, that the description shall be accurate and such as to enable those in charge to determine the quantity, kind, condition, location and value.

If fuel is in bad order, or not relatively up to standard, a separate item should be made of it in the inventory.

As soon as the inventories of fuel on hand have been received they should be recapitulated by divisions, showing the amount on hand at each fuel station; afterward the amount on hand upon the whole road. The latter should be certified to by the accounting officer. After the value of fuel on hand has been thus ascertained, the amount standing to the debit of fuel on the general books should be made to harmonize therewith by charging the deficiency or crediting the surplus (as the case requires) to the accounts to which fuel has been charged during the year, on the basis that the relation of the amount charged to each bears to the whole amount charged.*

* For method of handling material and keeping account thereof, proposed by the standing committee on disbursements of the Association of American Railway Accounting Officers under date of May 1, 1892, see Appendix A hereto. The method it proposes agrees substantially with the foregoing, which I introduced first in 1869.

# CHAPTER V.

## LABOR—PRACTICES GOVERNING THOSE WHO EMPLOY LABOR OR WHO KEEP THE TIME OF, OR ACCOUNT FOR, THE LABOR OF EMPLOYES.

Before taking up specific regulations necessary in handling the labor of a great corporation, it will be well to inquire, briefly, into the theory of the subject. By such a course we will be able to understand the subject better and better fit ourselves to judge of it in detail.*

The amount that a railroad expends for labor is so great that the rendering of accurate returns in connection therewith, including the making of true and faithful pay rolls, is a matter of the utmost importance.

Wherever men are engaged, whether at shops, roundhouses, yards, warehouses, storehouses, depots of supply, upon the track, at stations, upon trains, or at any other place, intelligent provision must be made for keeping accurate account of the time they work, whether the work is done by the hour, day, month or piece. Otherwise it cannot but follow that injustice will result, either to the employe or to the company.

* The reader is here referred to what is said at the commencement of the chapter on material in this book. Its perusal will enable him to understand matters affecting Labor better.

It must be remembered, moreover, in this connection, that any neglect to keep the time of men clearly and accurately involves something far beyond the amount a company may lose through particular errors or omissions. It means the demoralization of the force ; it means dissatisfaction with a company if an employe loses through negligent methods; it means the building up of an improper spirit if he gains something that does not belong to him.

In order to keep the time of men accurately, the clerical labor connected therewith should be performed by a person on the ground, who notes the time worked from day to day as it occurs. Afterward these details are consolidated and the wages computed. Whoever keeps the time is, generally speaking, the most fit person to make the pay roll. Practices, however, will not be uniform in this regard.

Those who have charge of labor accounts, including those who keep the time of employes, by performing their duty faithfully, may protect a company's interest in various ways: first, by preventing the introduction or growth of irregular or improper practices; second, by affording the management accurate information of the extent and purpose of expenditures for labor, and the measure of economy that has characterized such expenditures.

The number of employes, the diversity of work in which they are engaged, and the extent of territory over which they are scattered, render



the duty of keeping their time a work of extreme difficulty, requiring the exercise of skill, fidelity and patience. The same causes render it difficult to obtain an authentic distribution of labor, i. e., an account of the thing upon which the labor is expended.

To attain these important and necessary objects, various devices, blanks, books and accounts are provided: first, for taking the time; second, for computing the same in dollars and cents, and third, for rendering an accurate and classified return thereof.

Methods for keeping the time of employes should be especially designed to secure them justice; to insure their being paid all they earn; to prevent their losing, either purposely or otherwise, a moment that they have worked. At the same time methods should be such as to protect the company against laxity or unfair advantage. In order to secure this double purpose, it is essential that the time men work should be kept with the utmost punctuality; that timekeepers should know exactly their duties and should perform them intelligently and without hindrance from anyone. In this way a company will know every person who works for it, how long they work, the rate they receive, the amount due them, and upon what they work, while the employe will receive the utmost farthing that is his due.

The securing of these objects requires watchfulness, fidelity, experience and accuracy.

In reference to time worked, the employe, being personally on the ground, looks out for himself. The company, on the other hand, is compelled to look to the timekeeper and the officials in charge to protect its interests. Their responsibilities, therefore, call for indefatigable watchfulness and the exercise of skill and integrity of purpose.

Those who have charge of the time of employes should make prompt and full returns thereof. At the same time they must be upheld in the exercise of the prerogatives of their office. The office must not be made an appendage to something greater or entirely foreign to it. Its occupant must be especially skilled in his duty, and must be able to go ahead untrammeled in the performance of it; everyone should co-operate with him therein in every proper and reasonable way. Any attempt to evade or obstruct his work cannot be too severely censured. But while this respect and co-operation must be extended to him by officials and others, it is the duty of those responsible for the employment of labor to see, by inspection and otherwise, that every timekeeper performs his work promptly, accurately and faithfully; that he enforces every proper safeguard necessary to insure the keeping of the time correctly, and the rendering of true returns therefor; that he is scrupulous to see that the instructions of a company are complied with; that the rate of wages allowed by him is such as has been agreed upon; that the time allowed is



in accordance with the facts, so far as correct methods of accounting can secure this; that while observing the instructions and interests of a company he is careful not to take advantage of his office to do injustice to any employe, either personally or otherwise. In this last named respect the timekeeper should keep constantly in mind that the interests of the employe and the company are identical, that one cannot be harmed without injury to the other, and that there is not, and cannot be, any real antagonism between them.

In order so far as possible to insure accuracy and concurrence of knowledge, pay accounts should be certified to by all who are personally conversant with the facts they recount. And it should be remembered, in this connection, that the certification of two or more disinterested persons, conversant with the facts, is a higher evidence of the correctness of a pay roll than the certification of any number of people who have only a general knowledge of the matter they subscribe to. It is impossible that the higher officials of a company, especially those having general supervision of its affairs, should know the particulars of the pay roll from month to month. But the foremen and timekeepers know these details; the latter the name of each man and the number of hours he has worked; the former whether the men whose names as entered really worked for the company or not, the rate they should receive and, generally, how

long they worked. The foreman, therefore, as well as the timekeeper, should certify to the correctness of the returns for the forces under him. Their doing so will reduce to the minimum the likelihood of improper practices or errors.

The principle to be observed in rendering accounts of labor is the same as that observed in other financial transactions of a corporation. Each account should be certified to by at least two independent persons in order to establish its validity. Thus, the certification of an agent or foreman will substantiate the return of a timekeeper. This rule of verification should be carried to its utmost limit. After the local officials have certified to the returns, the returns should pass on to the higher official in general charge of the work. He may not know all the details, but he is familiar with the general circumstances of the case, and whether the time returned has been authorized; also the objects upon which it has been expended. His certification, therefore, will be specific assurance that the returns are authorized, and are generally faithful and accurate. From this official the returns will pass on in due sequence to the next higher official, and so forward until they reach the officer whose duty it is to approve for payment.

The immediate duty of keeping the time and wages of employes, and the distribution thereof, should be intrusted to persons especially delegated to perform the duty. Where the amount of work at any particular point justifies it, a



timekeeper should be designated, whose especial duty it should be to look after this branch of the service.

At shops and storehouses this official may also be intrusted with the duty of receiving, inspecting, caring for and distributing material. This aggregation of work will permit of greater economy than would otherwise be possible. For convenience I designate him a "storekeeper." When, therefore, reference is made herein to a timekeeper, it will be understood to mean the employe in question.

In many cases the clerical work is so great that it necessitates the employment of clerks to take the time of employes and otherwise assist. When this is so, their certification to the accounts should also be attached, as well as that of the storekeeper in charge; but they should be subordinate to and act under the direction of the latter.

At stations, the duty of keeping account of the time and rendering returns therefor is generally intrusted to the agent.

For employes engaged on the line, erecting bridges, buildings and fences, repairing the track, or otherwise employed, the foreman in charge should render account of the time and certify thereto.

Conductors keep account of the time of train forces and render returns thereof.

At isolated points or places of the road, the official or person immediately in charge is necessarily held responsible for accurate returns of

time worked and wages due therefor; returns are rendered by him.

The duty of keeping the account of time worked and rendering returns thereof should, in every case, devolve on an official on the ground, conversant with the facts. It should be his duty to enforce the rules and regulations governing such matters. In the event they are inadequate in any respect he should supplement them by needed regulations.*

In some cases the pay roll is made at the headquarters of a company; in others by local officials, who keep the time and are conversant with its details. The latter plan is for some reasons to be commended, as it affords those who are responsible for the employment of labor opportunity to retain the accounts in their offices longer than they otherwise would for examination, at a time when the information is of the greatest value to a company.

The possession of the pay roll by local officials also enables them to certify to its correctness upon its face, thus giving it an additional stamp of authenticity.

Not only is it well to require the pay roll to be made by local officials, but it should pass, in due sequence, on its way to the paymaster, through the hands of all who are in any way concerned in it.

Not only this, but the details (distribution) of each man's time should also pass through the

* Of which due notice should be sent the proper officer.



hands of the local officials. These details are shown in the time book; this book should accompany or follow the pay roll. In this way every person having anything to do with the roll, or who is in any way responsible for it, will be afforded the benefit of all the information it contains promptly, accurately and concisely. This information is of the greatest value to officers, and greatly heightens their usefulness.

All returns connected with the disbursement of labor should, so far as practicable, pass from the person who compiles them, through the offices of the various officials responsible for the employment of labor, to the officer designated to finally receive and store them at headquarters. In this way the expense of an embryo accounting department in each official's office is avoided, as they may severally make such record of the returns passing through their hands as is needed for use and reference. In the event they wish the details of an account at any time, it is to be found in the office where the returns were first compiled or in the department where finally lodged.

In the absence, therefore, of instructions to the contrary, the pay roll should, in every case, be made in the office where the time book is kept; or, in the event the pay roll is made by consolidating two or more time books, then in the office where such consolidation occurs.

Still other benefits are secured by requiring the pay roll to be made where the labor is performed by those who keep the time, viz.: it insures the

work being done by competent persons, familiar with the facts and having all the sources of information at hand for use or reference; it affords, as already suggested, the officials immediately responsible for the work more time to inspect the accounts than would otherwise be possible; moreover, the roll being made at the initial point, follows, in due sequence, the route of procedure and responsibility on its way to the paymaster. Thus, every safeguard possible is made use of to secure clerical accuracy, while affording the officials interested in the labor accounts the best opportunity possible to inspect them.*

Each shop roll should be made by the timekeeper thereof, and should include all subsidiary forces that come within his cognizance. The pay roll for the station force, track force, bridge and building force, and other distinct departments of labor, or isolated gangs, should be made by the official immediately responsible therefor, to whom the time books are sent by those who compile them.

This division of labor, while in all respects the most economical that can be devised, affords operating officers an opportunity to acquaint themselves with the labor accounts of their several departments. But their examinations should be carried forward with celerity, so as not to

* Many roads make their rolls at headquarters. The practice has many things to commend it. Who shall say definitely it is not the best?



delay auditing the accounts or the payment of the roll. No one into whose hands a roll passes should retain possession of it beyond a specified time—say six hours.*

In keeping account of the time and wages of men and the distribution thereof, it is apparent that the forms and devices used must adapt themselves to the peculiar circumstances of the case, to the number of men, the place where employed, the kind of work, and the facilities for keeping accounts. The elaborate devices that are necessary at a great shop or other spot where an army of men is employed are not necessary where only a small force is engaged. In one case a timekeeper is required to keep the accounts; in the other the keeping of the time is a mere incident. The forms used must also be adapted to the nature of the work; thus, at shops and elsewhere

* In reference to the plan of making the pay roll where the time is kept: There can be no objection, it is apparent, to making it at the general office, except the more limited facility such practice affords operating officers to familiarize themselves with its details, and the additional expense that such concentration of work in one office, at a particular time in the month, would possibly involve. By apportioning the duty among many offices, the work is not believed to be felt materially, and may be pursued leisurely and with due reference to the mechanical and critical skill required in its performance. Moreover, the roll itself, passing afterward under the eye and receiving the certification of those familiar with it, must receive more general and careful scrutiny than would be possible under circumstances less favorable. However, as I have already intimated, the practice of making the pay roll at the general office has many things to commend it, and no one can perhaps say definitely that it is not the best plan.

where machinists and carpenters are engaged, the multiplicity of things upon which they work requires the use of more comprehensive forms to distribute the labor under proper heads than at stations, yards, warehouses and water tanks, where the wages are in the main charged wholly to a particular account. In providing a form its particular use has, therefore, always to be considered. This is especially noticeable in connection with the time books used by track and building gangs; the facilities they enjoy for performing clerical work are very meager at best; the blanks they use, therefore, must be such as are easily handled and easily understood. Matters of this nature require always to be remembered and observed, as any neglect to do so will occasion unnecessary outlay, and will greatly harass those who have the work to perform, and prevent its being conducted with efficiency.

Such is, briefly, a hurried outline of labor accounts. Let us now take up the subject in detail.

How the Time of Employes Should be Taken.—Various methods of taking and recording time suggest themselves. Those that are suitable, convenient and economical in one instance are cumbersome, inappropriate and expensive in another. Where a few men are engaged, the system of recording their time may be very simple and in some respects personal. Where a large number of men is employed nothing should be trusted to memory; the system should be thorough and impersonal and such as to secure accuracy and fullness under all circumstances. Various methods have been suggested and are in vogue for keeping the time of men at



shops and other places where large numbers are engaged in a body. Of all the methods recommended to me, that which I have found in all respects the most satisfactory is what may be termed the "Check" system, i. e., each man is given a check when he goes to work, the possession of which is evidence that he went to work at the proper time, and so on. The system is as follows:

Time is taken when the men go to work in the morning and again after dinner. It should also be taken in the middle of the forenoon and again in the middle of the afternoon; this middle period is called "quarter" time.

When the time of a large number of men is to be taken, a check room should be arranged for use by the timekeeper.

The clerk whose duty it is to take the time should be in his place ten minutes before the commencement of work.

Each man should, in the morning, and after dinner, pass before the window of the check room.

Each man should be designated by a number.

When he passes before the window he should be given a metal check corresponding to his number.

Separate checks should be prepared, those for the forenoon being marked "A. M." and those for the afternoon "P. M."

Checks should be given only to those to whom they belong, and only when the person presents himself before the timekeeper at the check room.

Checks should not be given to one person to deliver to another.

No checks should be distributed after the time for commencing work, as indicated by the blowing of the whistle or otherwise.

In order to facilitate the distribution of checks, and for other purposes, a check board should be prepared for use by the timekeeper. This check board should be divided into squares, each square being numbered, commencing with No. 1; on these squares should be hung metal checks, corresponding with them in number; the

number of checks hanging on the board should correspond with the number of men employed.*

When a man goes to work in the morning he should be given the check corresponding to his number. The number of checks not called for will thus represent the number of men that have not gone to work. A list of these should be made.†

This list should be given to the person whose duty it is to take quarter time, so that he may know how many men did not report for duty.

In taking quarter time the clerk should not take the same route from day to day, but commence at different points, i. e., at one place in the forenoon, at another in the afternoon, and so on; this will have the effect of varying the hour at which the time of particular men will be taken.

As the clerk visits each man he should take up the check given him at the commencement of work.

Those who have no checks should only be allowed such time as may be returned for them by the foreman or official in charge.‡

Only those who actually deliver checks or slips, who appear in person before the timekeeper, and are at work and designate the character of such work, should be allowed time.

When the timekeeper takes quarter time he should note upon the blotter§ the kind of work each man is engaged upon. This information is required for use in distributing the labor. He should be particular to designate in clear and precise terms the name of the account or thing upon which each man is at work.

* Check boards, with checks, should be supplied upon application, stating the number of checks required and the shape of the board that will be most convenient.

† The sheet upon which this list is made is called an "absent sheet." See Form No. 5, Appendix E.

‡ Such time should be reported by the official in question on a blank which is called a "late slip." See Form No. 6, Appendix E.

§ See Form No. 13, Appendix E.



In the event an employe should absent himself between the time of commencing work and the taking of quarter time, or between quarter time and the time for quitting, the official in charge should notify the timekeeper of the particulars on the late sheet, so that the necessary deduction may be made.

In order to prevent confusion or possible loss, arrangement should be made for locking the check rooms and for preventing access to them by unauthorized persons.

As many check rooms should be prepared as the exigencies of the service require.

In the event a check is lost, the person who loses it should pay the cost of replacement.

The foregoing method of taking time is particularly adapted to shops, large stations and other places where a great number of men is employed, and should be so applied.

It is simple, expeditious and thorough, insuring absolute accuracy in the account of time worked and reducing to a minimum the inconvenience and expense that attends the keeping of such account.*

At small shops, stations and other places where only a few men are employed, a simpler plan for taking time should be followed.

But the rules embodied in the foregoing in reference to special reports by foremen, and other matters germane to the keeping of the time of employes correctly, should be carefully observed everywhere.

* The key to the check system, it is apparent, rests upon the delivery by the employe of the check when quarter time is taken. It is only then that record is made on the blotter and the employe credited with his time; the possession of the check is evidence that he was present when work commenced. The delivery of the check (and the fact that he is present and at work when quarter time is taken) is the evidence upon which the timekeeper bases his record. In the event a check should be secured improperly, it would be of no use, and its value, even if full credit for it were secured, would be infinitesimal only; but as the checks are kept securely locked, and are delivered only to the owners (a record being kept of those not called for), improper possession of them is rendered impossible.

Instead of using checks and check boards at places where only a few men are employed, the timekeeper should provide himself with a time book or blank* in which the name of each employe is written. At the proper time (as already indicated) he should station himself at a convenient place for the men to pass before him before commencing work. All employes should so report.

As the men appear in the morning, he should make a check mark on the blank in the date column on the line opposite their names.

At quarter time, if the men are present, he should make a counter check.

This should be repeated again in the afternoon.

These marks and counter marks will thus denote who are present, and will afford the basis for computing the time worked.†

By reference to the time book embodied in the appendix, its particular adaptability to the purpose for which it is intended will be seen.

Provision must be made everywhere for keeping accurate account of overwork and of work performed at night, Sundays, holidays, and at other times when the timekeeper is absent. The person who performs these duties should act under the instructions of the timekeeper and the latter should designate who shall perform the work, whether the foreman or someone else; whoever does the work should render an accurate return of the time, giving the name of the person, number of hours worked, upon what engaged, and such other particulars as the timekeeper may require.‡

For the purpose of verifying the time books, a record of the working hours an employe is absent should be kept. This will be called an "Absent time" record. It

* See Form No. 1, Appendix E.

† In the event anyone is absent at an intermediate period, provision should be made for having the fact reported to the timekeeper, late and absent sheets being used for this purpose.

‡ It is called "Report of overtime." See Form No. 7, Appendix E.



should be written up daily from the "Late slips" and "Absent sheets." At the end of the month the hours each employe is absent should be footed and deducted from the total number of working hours in the month; to this should be added any overtime the employe has made. The time thus arrived at should agree with the amount allowed the employe.

So far as possible, the time book return by a station agent should embody the whole force employed at the station, including agent, clerk, baggageman, foreman, laborer, yardman and switchman; also men engaged in fuel sheds and at water stations.

Time books should be returned for forces entered on different rolls; in other words, men who appear on different pay rolls should not be grouped together on the same time book.

A special form of time book designed to meet the purposes of track foremen in keeping the time of gangs employed by them should be used in such connection.*

A special form is also required for keeping the time of carpenters at work on the line.†

It is intended that the time of trackmen and carpenters engaged along the line shall be entered daily at the close of work. This rule should be rigidly carried out. Its observance will insure accuracy in the time allowed and in the distribution thereof under the various headings.

The basis for compiling the wages of engineers and firemen is not the same in all cases, but changes from time to time as the exigencies of the service necessitate. Whatever the instructions may be at the time, they should be carried out by the storekeeper under the authority of the master mechanic or foreman in charge.

Special forms for keeping the time of engineers and firemen are also needed. The basis upon which their wages are computed necessitates this.

* See Form No. 2, Appendix E.

† See Form No. 3, Appendix E.

The time book for engineers and firemen* should show the particulars of the service of each engineer and fireman, and at the same time afford the statistical information required in compiling statements needed by the locomotive department.

The time of engineers and firemen is written up mainly from reports† returned by engineers at the end of each trip. These reports give the terminal points, number of engine, train number, date, name of engineer and fireman, and other particulars required by the timekeeper.

At the close of the month the figures thus compiled are further verified by comparison with the monthly returns of the engineer.‡ This shows the points run from and to each day, also the distances and other particulars. This form should be used by engineers engaged in switching and other miscellaneous work, making such changes in the blank as the nature of the service requires.

In order to verify the accuracy of the engineers' returns and for other purposes, the train dispatcher should send to the timekeeper each day a statement§ of trains run, giving particulars and names of the engine crew.

When delayed or overtime is claimed, the engineer's time slip therefor should be sent to the division superintendent for verification. The time slip for men engaged in switching service should be sent to the agent or official in charge for verification, to be forwarded by him to the timekeeper.

A register should be kept at each roundhouse of the arrival and departure of locomotives.‖ It should state the time of arrival and departure and the names of the engineer and fireman in charge. The pages of this book should be used alternately for arrivals and departures. This register will be useful in verifying the returns, and should be carefully consulted by timekeepers before making the pay roll or certifying to the time books.

* See Form No. 4, Appendix E.
† "Trip reports." See Form No. 8, Appendix E.
‡ See Form No. 9, Appendix E.
§ See Form No. 10, Appendix E.
‖ See Form No. 11, Appendix E.



In order to facilitate the keeping of the time of trainmen, conductors should forward to the superintendents of their respective divisions a daily statement of the time made by their crews, respectively, and the number of miles run.*

This return should be compared by the superintendent with the record of trains operated, after which it should be retranscribed on a general time book; or in the event wages are not based on the number of hours worked, but upon the number of miles run or other conditions, such time book may be modified or changed if necessary to meet the conditions attending the case. The pay roll should be made from the last named record.

At the end of the month conductors should forward a detailed statement of service for such month, using for this purpose the general time book of the company. Superintendents should compare the record kept by them with this supplementary return.

Conductors of construction and working trains should keep a general time book, and forward same to the superintendent, properly certified, on the first day of each month; or, if more convenient, they may use a track time book. A general time book should, however, be used, if not inconvenient, as it furnishes greater facilities for keeping accurate account of time worked.

Method of Computing Wages.—The basis for computing wages varies according to the particular arrangements under which the service is performed. Wages are paid by the hour, day, week or month. In some instances it is based on piece work or specific performance, as in the case of engineers, whose pay is largely based on miles run.

In computing wages, the agreement or understanding under which the labor is performed should be scrupulously observed.

* See Form No. 12, Appendix E.

In the absence of any understanding, agreement or direction, the customary number of hours should be considered a day's work, and wages should be allowed only for actual time worked.

In determining the amount due employes who are paid by the month, or fractional parts of a month, wages should be computed on the basis of the total number of days they are required to work; thus, if an employe works on Sundays or holidays, the amount of his wages should be divided by the total number of days in the month he is required to work, in order to ascertain the rate per day. If he does not work on Sundays or holidays, the amount of wages he receives per month should be divided by the number of days he is actually required to work, in order to ascertain the rate per day.

Fines, if any, for failure to be on hand for work, or for any other reason, should be fixed by the official in charge.

In order to save labor and secure greater accuracy, wages should not be computed from day to day, but in the aggregate for the whole or part of the month worked. Thus, if paid by the hour, the aggregate number of hours should be ascertained and the gross amount of wages due therefor inserted in the columns provided for such information.

Time Books.—By reference to the various forms used in keeping time their simplicity will appear; also their cheapness; also the great economy of labor required to keep them, compared with older and more elaborate forms of bookkeeping. It may be said, indeed, without exaggeration, that these time books are as simple as it is possible to make them, and are arranged with all the skill now known to secure results at the least cost, with the least labor, with the least time, and with the greatest certainty.

A careful study of the time books embodied in the appendix to this volume will illustrate, better than any description, their several purposes. They are intended not only to afford accurate information in reference to the time each man works, but contain a history thereof.



While the duty of keeping the time of men should be intrusted to storekeepers at shops, and persons in charge at other places, such trust does not preclude operating officials immediately in charge from making such frequent examinations as may be necessary to enable them to know, with reasonable certainty, that the names, as entered on the pay roll, are *bona fide*, and that the amounts paid are such as have been agreed upon. In order to make this effective, such officials should require the foremen in charge of the various gangs to carefully scrutinize the pay rolls before certifying to the correctness of the same. An especial and particular value attaches to the certificate of the foreman, for the reason that he knows each man personally, and has knowledge of the time he has worked. The value of this information cannot be overestimated in auditing accounts, and timekeepers and officials of the company should avail themselves of it to the fullest extent.

There is nothing of a confidential nature about the pay accounts, so far as those officers of the company are concerned who have charge of labor; officials in charge and foremen should, therefore, have access to them at all times, and it is their duty to carefully and minutely examine the same.

In reference to the details, the work of entering the names in the time book should, so far as practicable, be performed before the commencement of the month. The names of the officials in charge should be entered first; afterward, those of the office force. Following these, the names of the other employes should be entered in alphabetical order. If the force be divided into gangs, each gang should be entered by itself, following the name of its foreman. Names should be classified uniformly, according to the occupation, grouping each gang of trackmen, machinists, carpenters, station employes and trainmen by itself, all being marshalled under their respective foremen.

The time books should be written up from day to day. The prompt payment of the force is dependent upon the prompt rendering of these books. Thus, on the last

day of the month time should be taken as early as possible in the afternoon, and the time at once posted into the time books. As soon as all the returns of time worked for that day have been received and entered, the time books should be closed and the cross extensions made, and the total footings and extensions entered and balanced with the detailed amounts. The time book is then ready for use in making the pay roll.

In writing up the time book and in making the pay roll, the time and rate should be entered in the columns provided, strictly in accordance with the agreement or understanding under which the employe was hired. If he is employed by the month, day or hour, his time should be entered in the "time" column, and his rate per month, day or hour should be entered in the "rate" column, thus:

| NAME. | OCCUPATION. | TIME. | RATE. | AMOUNT. |
|---|---|---|---|---|
| Smith, John.... | Watchman.... | 1 month | $50 00 | $50 00 |
| Doe, John..... | Laborer..... | 28 days | 1 00 | 28 00 |
| Roe, Richard.... | Coal Heaver.. | 260 hours | 15 | 39 00 |

At shops and other places where a pay roll is made, the time book should be held until the roll is completed; it should, in fact, be sent forward with the roll, if possible, or, if not then, as soon after as the distribution of labor is completed.*

At stations and elsewhere where no pay roll is made, the time book should be sent forward on the morning of the first day of the month, so that those who make the

* A particular purpose had in view in having this book follow the same channel as the pay roll is, as stated elsewhere, to afford opportunity to those who are responsible for the employment of labor to obtain full information in regard to its disposition. Thus, although they may not keep the time, or know anything about the details thereof during the month, the time book will afford this information to the fullest extent, so that no one will be unadvised of the particulars of work for which he is responsible.



pay roll and the distribution of labor may not be delayed.

The correctness of each time book should be formally certified to by the timekeeper (i. e., the person who makes it) as follows: "I hereby certify that this time book is correct."

This certificate should be signed not only by the person who actually takes the time, but by the official who is immediately in charge; thus, at shops it should be signed by the general timekeeper and by the timekeeper subordinate to him; at stations, by the agent as well as the timekeeper. In fact, all who are personally conversant with the particulars of the time book should be required to sign the certificate as to its accuracy.

If the time book is kept by the foreman, he should sign the certificate; if it is kept by someone else, the foreman should sign a certificate similar to the above, immediately following the record of the force under him.

When, however, the pay roll is made at the place where the time book is kept, only those who are immediately responsible for keeping the time correctly and rendering accurate return thereof need certify to the time book. In such cases the certificate of the foreman and officials should be made to appear on the face of the pay roll.

At the larger shops it may be desirable, for convenience in making the distribution and to expedite work in other directions, to provide a time book for each of the various departments or shops and for outlying points. These time books should be numbered consecutively and otherwise designate the department or shop they refer to.*

*When more than one time book is thus used, the information they contain should be posted into the distribution book in such a manner that they can be added separately therein, and the totals drawn off for verification; the total of each time book should agree with the footing of that portion of the pay roll covered by it. The total footings of all the time books should agree with the total footings of all the pay rolls.

Special forms of time books, in addition to those described, should be provided when greater economy or efficiency can be secured thereby.

General Time Book.*—The general time book is made up of loose leaves which are designed to be bound together in book form at the end of the month, after an impression copy of the same has been taken in the office where the time is kept. When only one or two leaves are required for keeping the time of men at a particular point, they need not be bound in book form. At all other places they should.

The general time book is designed for general use. Track forces, bridge and building gangs and engineers and firemen have special time books provided for keeping the time and distributing the same, as described elsewhere herein.

At places where the check system (see "manner of taking time") is not in use, the spaces in this form for noting the presence of employes at quarter time should be used.

The number of hours worked each day should be copied from the blotter onto the time book.

At the end of the month the total columns should be filled in accordance with the headings.

It is from this book that the pay roll is made.

The occupation of the person should be inserted opposite his name in the column headed "how employed."†

Under the head of "remarks" should be noted opposite the employe's name any deductions to be made from his wages; when a time ticket is issued, "time given" should be written in this column.

If an employe is likely to be engaged upon numerous classes of work during the month, sufficient space should be left below his name to describe the same; these details are copied from the blotter; the work should be done daily. At the end of the month the gross sum thus distributed should be posted into the "general distribution of labor book" under the proper headings.*

*See Form No. 1, Appendix E.

†Thus, "machinist," "carpenter," "blacksmith," "assistant blacksmith," etc., designating generally his duties.



Track Time (and Distribution) Book.†—This book is especially designed to meet the difficulties that attend recording the time and classifying the work of trackmen. It affords an intelligent history of the different kinds of work performed and the extent thereof, such as general repairs of track, laying ties, laying rails, ditching, freshet repairs, ballasting, clearing track, repairing fences, watching track and bridges, repairing bridges, construction, etc. It is especially designed to relieve the foreman in charge of clerical work that he has not the time nor the facilities for performing, while it affords him all the information required to classify the labor accurately and fully.

The foreman is required to furnish essentials; all else may be done at headquarters. Thus, the foreman

* The general time book, it will thus be seen, not only embraces a correct record of the time worked, but contains the details necessary for an accurate classification of the same for entry in the general distribution of labor book. There are two reasons for entering these last named details on this book. In the first place, one line or space on this form is sufficient to keep accurate account for a month of the work performed by an employe on any particular object. Thus, if he is engaged on engine No. 10, the number of the engine is entered in the column headed "how employed;" the hours the employe works on this engine each day are inserted in the column opposite; at the end of the month the total number of hours thus worked is entered; this total is afterward entered in the general distribution of labor book and the amount extended. If these details were entered from the blotter directly on the distribution of labor book, it would necessitate a separate entry being made on the latter for the work performed each day by the employe in question on engine No. 10, thus magnifying work and multiplying details. Another important object in specifying the distribution of labor on the time book is that it serves to verify the latter in many ways, and as the pay rolls are written up from this book the necessity of this verification is apparent.

†See Form No. 2, Appendix E. The word "distribution" will be understood to mean the charging of an outlay to the thing upon which it is expended. Thus, a distribution book is a book in which charges are made against various things according to the facts.

should enter the total number of hours worked by an employe, and should note in the column provided the kind of work he was engaged upon. This he is required to do at the close of each day. From this data the clerk at headquarters may fill out the amounts. The time book provides columns for the various classes of work upon which the men are engaged; the number of hours worked on each are carried into these columns; they may be footed at the end of the month by the foreman in charge, when he is able to do so, or the work may be performed in the office where the pay roll is made.

Whatever the wages of the employe may be, the amounts charged to the various accounts upon which work is expended should agree with such wages. The agreement, in a measure, verifies the accuracy of the whole.

A miscellaneous column is provided in which should be entered deductions on account of board bills, name and address of the person or persons to whom such deductions are due, etc. When a time ticket is issued, "time given" should be written in this column. It is also intended to be used to explain the character of any unusual work that may have been done; also for giving information necessary to a correct distribution of the time.

The book should be signed by the track foreman and forwarded promptly by the roadmaster, superintendent or other official, as may be directed, on the morning of the first day of each month.

No unnecessary delay should occur in sending the book forward as directed, as such delay prevents the completion of the pay roll and will, perhaps, prevent the payment of the roll at the proper time. Those whose duty it is to compile the accounts and make up the monthly statement are also embarrassed.

To facilitate work, the timekeeper for each division of a road should make a consolidated time book for his division. The distribution of labor book used at shops, described elsewhere, should be used for this purpose.



In it should be entered a classified statement of the cost of labor for each subdivision, so that the cost for the various lines may be studied separately. It should show also the aggregate number of hours worked on such subdivision. From the data thus furnished, the average number of men per mile of track may be ascertained.*

Bridge and Building Time (and Distribution) Book.†—This book is especially designed to facilitate the keeping of time (and distribution thereof), by the foremen in charge of gangs of carpenters and others, engaged in repairs and renewals, and in miscellaneous construction work along a line, connected with bridges, buildings, fences, etc. Columns are provided in the blank for the various classes of work upon which the men are likely to be engaged, so that all that is necessary is to enter the number of hours therein. Care should be taken, however, in every case, to locate the work accurately. Much of the information required at headquarters in making up statements of the cost of particular buildings or structures is ascertained from

* In order to be able to compare the cost of track labor for different portions of a road effectively, each division should be divided into sections of from twenty-five to fifty miles, and a statement made of the cost per mile for each of these sections. It should show the number of men per mile of track. The total for each division should agree exactly with the aggregate footings of the track, gravel pit, work train, and other pay rolls embracing track accounts. The system of accounts, in connection with track labor contemplated herein, provides for a careful classification of the work of trackmen and working trains, under the following heads: General repairs of roadway and track, laying ties, laying rails, ditching, freshet repairs, track watchmen necessitated by repairs, ballasting, clearing track of snow and cutting weeds and grass, repairs of fences, road crossings and signs, flagmen at crossings, bridge and track watchmen, bridge watchmen necessitated by repairs, repairing bridges and culverts, repairing cattle guards, reloading cars, getting cars on track, etc., station labor, repairing telegraph, unloading coal, watching piling and hauling wood, including time of wood trainmen, construction of sidings, etc. It is designed to show the cost on each of these accounts for each subdivision of road.

† See Form No. 3, Appendix E.

this book. It is, therefore, of the utmost importance that it should be correctly kept, and that the designation of the structures upon which the expense is incurred should be so clear that it will not be necessary, in any case, to refer back to the bridge and building department for information. The book is very simple and easily kept, and furnishes the maximum amount of information with the least possible labor to the person who keeps it. Its requirements should, therefore, be carefully complied with.

This book provides for inserting, from day to day, the number of hours worked by each person; also for distributing the labor to the account upon which expended. These duties should be performed at the close of each day. The total time worked on the various accounts should be noted at the bottom. These added together agree with the gross time worked, and serve in a measure to verify the latter.

Under the head of "remarks" should be entered deductions on account of board bills, the name and address of the person or persons to whom such deductions are due, etc. When a time ticket is issued, "time given" should be written in this column. It is also intended to be used to explain the character of any unusual work, also for giving information necessary to a correct distribution of the time.

This book should be signed by the foreman and forwarded to the shop timekeeper, superintendent of bridges and buildings, or other person designated, on the first day of each month.

The pay roll is made directly from this book by the person designated to perform such duty. No delay, therefore, should attend its transmission.

Time Book for Engineers and Firemen.*—This book is especially adapted for keeping the time of engineers and firemen. It is also intended to afford statistical information needed in compiling the locomotive report, and for other purposes.

* See Form No. 4, Appendix E.



It is made up of loose leaves, which are designed to be bound together in book form after an impression copy of the same has been taken in the office where the time is kept.

Care should be taken by those who write it up to give all the information that the form requires, the various classes of information being inserted in the places or columns provided therefor. Care should also be taken not to omit any deductions to be made from employes' wages. When a time ticket is issued, "time given" should be noted in the proper column. The "remarks" column is intended to be used to explain the character of any unusual work that may have been done, such as construction, care being taken in every instance to give location, etc.

This book is designed to be kept at the principal shops for each division by the timekeeper in charge.

At the end of the month all the subsidiary books kept on a division should be forwarded to the principal shop of such division, where the pay roll is made, or where the time and wages of engineers and firemen are consolidated preparatory to making the roll.

This preliminary work is rendered necessary by the fact that an employe's time, in many instances, appears on two or more books; this time should be consolidated at the central shop, so that the name will appear but once on the roll. In order to effect this consolidation properly and otherwise prevent duplications and omissions, it will be necessary, in the generality of cases, to consolidate the information embraced in all the time books in one particular book; or, in other words, to make one time book for the whole division. When possible, the time books written up at subordinate shops should be incorporated with that written up at the principal shop, without retranscribing.

In order to accelerate the work of consolidating the time at the central shop, tissue copies of time books should be sent to each shop on the fifteenth of each month, by timekeepers of subordinate shops, so that the

information may be copied in advance on the consolidated book.*

To facilitate the keeping of this book, and for other purposes, each engineer should be required to return a daily trip report† exhibiting the particulars of his service. At the end of each month he should supplement this with a return showing consecutively the work he has performed.‡ Supplementary to these the timekeeper should be supplied by the train dispatcher with a statement‖ of trains run. These various returns will afford, with the assistance of the engine house register, the data required in writing up the book.

When engineers or firemen work in the shop or elsewhere off their engines, the fact that they are so employed should be entered in the miscellaneous column of the engineers' and firemen's time book, provided they have made any running time during such month. *Per contra*, when shop men have made running time, such time should be entered on the shop time book, provided they have worked in the shop during the month. [NOTE.—The object of this rule is to prevent the names of the employes referred to appearing on more than one pay roll. In order to accomplish this, the wages of engineers and firemen for shop work will be entered on the engineers' and firemen's pay roll for the amount due them for running time, provided they have made any running time during the month. If they have not, the wages will be entered on the shop pay roll. Contrariwise, the wages of shop men who have running time will be entered on the shop pay roll, provided they have shop time during the month; if they have not, the wages will be entered on the engineers' and firemen's pay roll.]

* In some cases the pay roll is made at the principal shop of a division; in others it is made elsewhere. But the rule in regard to consolidating the wages of engineers and firemen on a particular time book, for a whole division, it is well to observe in all cases.

† See Form No. 8, Appendix E.

‡ See Form No. 9, Appendix E.

‖ See Form No. 10, Appendix E.



The distribution of work performed by engineers and firemen when off their locomotives should, for convenience of accounting, be kept by the timekeeper upon a separate book. At the end of the month this book should be sent to the office where the pay roll is made.

The time allowed locomotive dispatchers (if kept on the engineers' and firemen's time book) should be entered in the "miscellaneous" column, their wages being inserted on one of the blank lines provided, so that it may not be confused with the running time of engineers.

LABOR BLOTTER.*—This form occupies an important place in the keeping of the accounts of labor. It is a common day book; a memorandum, rather than a record. It is designed for convenient use about shops. In it should be inserted the name of each employe. It should be used in taking quarter time in the middle of the forenoon and again in the middle of the afternoon. It is also used to designate the hours worked by each employe, and the account or accounts to which such work is chargeable.

Afterward, this information is entered on the general time book.

The inconvenience of distributing labor under several heads on the general time book renders the use of the blotter at shops especially convenient. When, however, the total time of a group of employes is chargeable to a particular thing, the blotter may be dispensed with, as the distribution may be designated opposite the names of the employes on the general time book. The blotter is especially convenient where labor is chargeable to a variety of accounts, or where the number of hours worked from day to day by employes varies; also in those cases where the book used in taking quarter time becomes much soiled by use.

CLASSIFICATION OF LABOR—DISTRIBUTION BOOKS.—In order to understand accurately the questions attending the employment of labor, its extent and purpose must

* See Form No. 13, Appendix E.

be known. This, when the labor is diversified, requires that it should be systematically classified, the sudivisions being so minute as to afford an accurate and intelligent digest of the whole.

The subdivision should not only specify the nature of the work, but its location and cost, being altogether so explicit in regard to details that it only remains to study the same in order to understand the full scope and purpose of each expenditure.

It is largely for this purpose that operating expenses are carefully subdivided; that disbursements for construction are minutely classified; that accounts are opened with each article or group of articles manufactured, and for other purposes. The classification should permit of the details of cost being accurately known, so that by analysis and comparison the relative economy exercised may be judged.

So far as the exigencies of accounts will permit, without undue expense, it is designed that everything that enters into the cost of a thing shall be charged thereto. Thus, the cost of handling material, the outlay for the construction or repair of a building, platform, yard, fence, bridge, culvert, engine or car should so far as practicable be charged thereto. When, however, the expense of accounting is greatly increased by too minute a subdivision of expenses, and the value of the information thus obtained is not commensurate with the outlay, it should not be attempted; the design should be to make the method of accounting subordinate in every case to the value of the same; never in any instance to incur expense that is not justified by the use made of it.

So far as agreed upon, the subdivisions of expenditures should be scrupulously observed, in order that returns may not be misleading as regards cost of particular things, or otherwise lose their value for purposes of comparison.

In addition to the expenditures of a company for operating, construction, manufacturing and similar outlay, more or less work is performed for others for which a company is entitled to receive pay. Accounts



are required to be kept of all such labor, so that it may be brought to the notice of the accounting and financial officers of a company, that the same may be duly and clearly recorded and the amount collected.

In order that all these things may be successfully accomplished without confusion or failure, it is of the greatest importance that those who have the keeping of time of employes (and the distribution of material and expenses as well) should be familiar with the various classifications of a company and the machinery by which they are carried into effect; also the general and specific objects that such classifications and accounts are designed to accomplish. This requires that they should not only study the mechanical appliances, but the theory and principles that the printed forms are intended to carry out. This study will enable them to perform their work more intelligently and will sharpen their appreciation of its needs, so that better knowledge of the conduct of accounts and greater efficiency therein will grow out of it.

In order to classify the expenses systematically, and preserve a clear and permanent record of the same, distribution books are provided.* In these, accounts are to be opened for each expenditure having a separate identity in the classified list, such accounts being entered in their due order and sequence, care being taken in every case to use the designation prescribed by the rules governing the same.

In writing up the accounts, the record throughout should be so clear an exposition of the subject that it may be fully understood and analyzed without correspondence or further reference to the person returning it. Thus, the items of each account should be given, including names of employes, how engaged, rates and amounts for each separately; also the total cost or

* These distribution books are written up by the person who keeps the time, or in the office of the official to whom the time books are sent, as specifically directed in each case; they may be used at the general office as journal vouchers, the totals only being entered on the general books.

aggregate of all the items. In giving the name of an account, especial care should be taken to make it so explicit and clear that it may be easily identified wherever referred to, so that the details of cost affecting any account may be collected from the various books in which it is mentioned.

In classifying expenditures for labor (and for material expenditures as well), it will be understood that the work should not be performed at random in any instance, but according to preconceived rules and regulations; if the disposition of an expense is not known or not clearly indicated by an analogous account, information should be asked of the accounting officer; this will not only insure uniformity, but will also enable a company to supply omissions or correct inaccuracies in its classification.

In further explanation it may be said that in no case should the distribution of the labor of an employe, or class of employes, be governed by general duties, but should be specific in each instance; thus, the wages of engineers, when engaged in shops, should not be charged to the account known as "engineers and firemen," but to the thing upon which they are engaged in the shops, the same as machinists and carpenters. This rule also applies to every branch of the service, care being taken to classify the work according to the particular thing done, and not according to the general duties that the employe performs. This is necessary in order to enable a management to understand clearly the cost, relatively and otherwise, of each thing for which money is expended.

The General Distribution of Labor Book.*—The distribution of labor is designed to be kept on loose sheets; it is quite as convenient in this way as it is to keep it in a book; at the end of the month an impression copy is taken of each of the sheets by the timekeeper. In this way he is put in possession of a perfect record at little cost. Afterward, the sheets are bound

* See Form No. 14, Appendix E.



in book form. They then constitute the "distribution of labor book."

A separate account should be opened in this book with each account upon which labor has been expended. It will thus show not only the source of the expenditure, but the details thereof, and the aggregates as embraced in the recapitulation. It is posted from the time books.

As explained elsewhere, it is found desirable, in some cases, to provide printed forms for distributing labor, so as to reduce the clerical work to the minimum. This is so in regard to track labor, and for men engaged in repairs and renewals of bridges, buildings, fences, crossings, platforms and yards; the number of men engaged does not justify the employment of a timekeeper. The classification of such labor is comparatively simple, and may be condensed to a greater extent than is possible in case of machinists and carpenters engaged about a shop; the great number of the latter, and the widely diversified work upon which they are engaged, require, comparatively, elaborate bookkeeping. The general distribution of labor book is designed to meet such cases. It is also convenient for use in consolidating the special forms of distribution books and time books used in connection with the track, buildings and bridges, and other departments. It possesses, like a journal or ledger, adaptability other forms do not.

The general distribution of labor book is designed for use in writing up the general books of a company. It should, therefore, be forwarded to the accounting officer. Those who compile it should not keep it in their possession longer than is necessary; the utmost celerity should be exercised. It should be sent forward from small shops and where the work is slight on the third of the month; at larger shops and for divisions as early as the tenth.

It should be remembered, in this connection, that the value of statistics of this kind is largely dependent upon their early compilation. The earlier the details are known, the more valuable they are to a management. This requires that everyone who has anything to do

with the distribution of labor or the examination of the accounts should act promptly and expeditiously.

A general distribution of labor book should be returned by each shop. Such a book should also be returned by those having charge of the general accounts of the several divisions. Thus, the time books of the track forces should be consolidated and copied into a general distribution of labor book; the same rule should be enforced in regard to the time and distribution books for bridge and building department, engineering department, etc. The distribution of station labor and train forces on each division should also be consolidated in one general distribution of labor book.

As a rule, all the track time books for a division are sent to some central office for examination and for use in making the pay roll; the same practice is generally observed in regard to time books used by gangs at work upon bridges, buildings, fences, platforms, etc.; it is also observed in regard to the engineering forces scattered over a road; to the station and train forces of a division, and so on. The official to whom these books are sent should consolidate the information they afford in one general distribution of labor book.

The distribution of the time of engineers, firemen and dispatchers should be inserted in the general distribution of labor book for the shop at which the pay roll of engineers, firemen and dispatchers is made.

Labor should be charged to the account upon which it is expended, in the month it is expended.

Accounts should be opened on the distribution of labor book in the order prescribed by the accounting officer;* a recapitulation of the whole should be given at the end.

In opening accounts, sufficient space should be left to accommodate all the items for each account for one month.

A separate distribution of labor book need not be rendered for each pay roll. Several pay rolls may be grouped in one book, but the aggregate amount of pay

* For list of accounts, see Appendix B.



rolls thus entered should agree with the total amount of the distribution book.

The distribution of labor book should in every case specify the name of the time book or books from which it is compiled, so that it may be compared with the same in detail.

Under headings embracing such items, a sub-account should be opened for each bridge, culvert, viaduct, building, dock, wharf, ferryboat, locomotive, stockyard and dining car for which expense is incurred.*

A separate account should be opened with each individual, firm or corporation against whom a charge is incurred. It is the duty of the person returning a book embracing accounts of this kind to attend personally to the proper recording and rendering of bills against such persons.

The wages of employes engaged in the manufacture of material should be charged to the cost of the material upon which they are at work.

Much of the information contained in the distribution of labor book may be written up in advance of the closing of the accounts for the month. Thus, the headings may be inserted, and the name or number of employe, kind of service, folio of time book, and rate. These details may be gathered from the distribution book for the preceding month and from the time book of the current month. If inserted in this way in advance, work will be greatly facilitated, and it will be possible to complete the distribution of labor book earlier than would be possible if the whole had to be written up after the close of the month.

Deductions From the Pay of Employes—Garnishments.—It frequently becomes necessary to make deductions from the pay of employes to cover amounts, such as garnishments, amounts for board, accident insurance premiums, payments on account of watches, uniforms,

* The several charges under the respective heads as noticed should be summarized and the total of each carried to the final recapitulation at the end of the book. For directions as to the manner of making these recapitulations, see Appendix C.

commutation tickets, fines, deductions, and other things, where the interests of the employe are especially benefited by this intervention of a company on his behalf, or the law enforces it, as in the case of garnishments.

However, the full amount due the employe should be entered on the pay roll. The amount to be deducted should be noted opposite his name. Great care should be exercised at all times not to neglect to make this notation. It should be noted in the column for deductions on the pay roll and in the miscellaneous column in the time book.

When practicable, entries of this kind on the time book should be made in red ink, so as to make them as conspicuous as possible; in any event the entry should be made prominent, so that it will not be overlooked when making the pay roll or when giving a time ticket or letter of advice.

Deductions from the pay of employes should be made in the current month, unless special provision is made to the contrary.

No one should promise, or bind a company by making promises on its behalf, that it will collect debts due by employes. When desirable, a company should assist in undertakings of this kind, but it cannot bind itself to make good an amount, if through any neglect on the part of its employes the debt is not collected. However, in the event of loss through failure to note on a pay roll or time ticket that a deduction should be made, or in the event of failure to deduct the same from the wages of the payee afterward, the person to blame should be held responsible.

No one should be authorized to make deductions from the pay of employes on account of sums due by them, even when requested to do so by the employe (except in the case of amounts due the company or for garnishment), unless instructed to that effect by the proper officer, as it is not desired that the company shall intervene in such matters except in cases of particular emergency where the convenience of the employe and the interests of the company are alike advanced thereby.



In every case where a company undertakes to make collections, an immediate record thereof should be made in the office where the time of the employe is kept, also where the pay roll is made.

When a great many deductions are to be made, a blotter should be kept on which the particulars should be entered as they occur. Afterward, an alphabetical list of the same should be compiled for use and reference in making the pay roll. The aggregate amount of this list should agree with the total footings of the blotter.

A summary of the amounts due to particular persons or corporations on account of deductions should be inserted on the first page of the pay roll, so that the amounts and the names of persons to whom due may be seen at a glance.

Garnishments.—In reference to garnishments against the pay of employes or for other sums due by a company, immediate notice should be sent by the legal department, or official conversant with the facts, to those whose duty it is to issue certificates of indebtedness, such as time tickets or vouchers, of all suits of this nature. Notice should also be sent the treasurer and paymaster.

Upon receipt of notices of this kind, a reply should forthwith be returned to the sender notifying him of the amount due the employe, whether the employe is married or not, and other necessary particulars.

When the pay of an employe is garnished, the total amount of wages unpaid on the roll at the time should be withheld until the settlement of the suit. In the event the payee has given orders against his pay, or a portion of it is set aside for any other purpose, such claims should not be paid until formal notice of the withdrawal of the suit or its settlement has been given by the proper official.

No time ticket or voucher should be made in favor of a person who is garnished, or, if made, should be canceled by noting the word "Garnished" across its face. A company after being garnished cannot pay the sum

covered thereby except after adjudication by the court or abandonment of the suit, without its becoming responsible for the debt.

At the end of the month a statement should be made by the paymaster of wages garnished, giving the name of the person, his occupation, place of residence, and gross wages. In the absence of instructions to the contrary, this statement, together with the gross wages thus garnished, should be turned over to the treasurer, who should thereafter give the matter attention. The utmost care must be taken not to pay wages that have been garnished, except under due process. A time ticket should never be issued without first carefully searching to ascertain whether the person's wages have been garnished. Nor should the paymaster ever pay anyone without knowing whether his pay has been garnished or not.

Pay Rolls.*—Their Payment.—The pay roll is the most important voucher that a company has. It is made up of innumerable petty items and embraces the result of a vast network of accounting and preliminary clerical work. The utmost care is required to be exercised in its compilation, first in keeping the time of employes, afterward in determining the wages due them, and finally in making the roll.

As the pay roll frequently embraces many time books, it becomes necessary to designate, in every instance, the person who is to make it.

The pay roll is intended to show in detail each man's service, his name, what he does, where employed, the time he has worked, the rate he receives, the gross amount of wages he has earned, the amount (if any) to be deducted from his wages, to whom the deduction is payable, the balance due the employe and finally the receipt or evidence of payment by the company.†

* See Form No. 15, Appendix E.

† Many companies divide their pay rolls into two classes, namely, those who work and those who do not—"active" and "disabled." The disabled embraces those that are pensioned (if any), those who have been injured in the service, are sick, or are carried on the pay roll for any other special reason. The plan is an excellent one. It shows at a glance the extent of its expenditures in this direction; the division, moreover, facilitates acccounting.



Wages should be entered on the pay roll for the month in which the service occurs.

The amount of each roll should agree with the footings of the time books from which it is copied, and these in their turn should agree with the distribution of labor sheet or book. Each serves as a check upon the other, and in a measure proves the accuracy of the whole.

The natural divisions of the service should be observed in making the pay rolls. Only such employes should be grouped together on a roll as the local officials, who are required to certify to the correctness of the same, are personally able to vouch for. This will necessitate a separate roll for each division for roadway and track; for engineers and firemen; for each shop; for bridge and building gangs; for the station force; for trainmen; for extra or special gangs of men; also for the general office and for employes of particular departments stationed off the line.

The rolls for small shops on a division may be bound together in one book to lessen clerical work. In such cases, provision should be made for inserting the approval of the general officers on the last sheet in such book instead of upon each roll.

When the pay rolls of several shops are bulked together in the above manner, a recapitulation should be attached to the last sheet showing the amount of each pay roll and the amount of the whole.

When the accounts of a small shop or roundhouse are kept under the supervision of some central shop on a division and there are only a few names to be entered on the roll, such names may be incorporated on the pay roll at the central shop.

Pay rolls should be made on or before the fifth of the succeeding month. They should not be delayed in any office through which they pass. If the official in charge

is unable to certify to them immediately, owing to absence or other cause, his assistant or clerk should act for him without delay. The date upon which each certificate is attached should be entered opposite the signature of the person certifying. Rolls should not be detained in any office to exceed six hours. Any dilatoriness in completing or forwarding the rolls retards the work of others and may result in delaying payment and other serious injury to the service. Promptness should, therefore, be the rule in all cases.

In order to anticipate, so far as possible, the labor of making the pay roll, it may be commenced before the close of the month at shops and other points where a large number of men is employed. But only the names and the rates paid may be entered in advance. This will serve to divide the work and lessen the amount at that particular period of the month when the rush is greatest.*

The name of each and every employe should appear upon the pay roll, and no employe's name should appear upon more than one roll (except in case of transfer of employment to another department of labor, or from one division to another, during the month) or in more than one place upon any roll.

When an employe is transferred from one department to another, his name should appear upon the pay roll for each department for the amount due him.

When employes run in common over two or more divisions, the whole pay should be returned on the roll of one of the divisions, the portion belonging to the other division being charged in the distribution of labor book under the proper operating or construction account to such divisions. This rule embraces employes at

* In the event the roll is made at some central shop, a memorandum of the names and rates paid may be sent by subsidiary shops the latter part of the month to the person who makes the pay roll, so as to anticipate the labor as much as possible. This rule should be especially observed in regard to the engineers and firemen, where the pay roll of such forces is made at some central point.



the junction of two or more divisions, employes running over two or more divisions, and others similarly engaged. A statement of the amounts thus charged should be rendered monthly to the debtor division by the official making the charge.

When an employe works in common for two or more departments on a division, the whole amount of his pay should be entered on the roll of one of the departments interested. The storekeeper of the department returning the time should ascertain the distribution for the other department, and should include it in his distribution of labor book.

The following rule should govern in reference to transfers within the same department of service on a division: When the place of employment is changed during the month, say from one station to another, or from service under one conductor to another, or from one track section to another, the name of the person thus transferred should be entered on the roll at each place or under each head where engaged. But the amount due for services should only be extended opposite the last place where employed; at this place a recapitulation should be made on the roll giving his name, the various places where he worked, separately, occupation, time, rate and wages; following and opposite this recapitulation the total sum due him should be carried into the "amount" column. At each of the places (under each of the heads) where engaged during the month, the name should be given, also occupation, time and rate; opposite this should be noted "transferred to page number .....," giving page and amount of wages transferred. The observance of this rule will keep the record of service intact, and at the same time prevent a name appearing on a roll more than once for payment. The rule applies only to transfers in the department of labor covered by a particular pay roll. If an employe in the train service of a division should be transferred to its track service, the name and wages due for the respective kinds of work should appear on the roll for each, and so on. An exception to this rule is

made in the case of engineers and firemen having shop time, or *vice versa*, as provided herein.

Amounts to be deducted from the pay of employes should be entered opposite their names in the column "paid on account" on the pay roll, giving the name of the payee in each case, also the reason for the deduction.

On the first page of the pay roll should be shown the aggregate amount due each payee for deductions from employes. This statement should be headed "deductions from the pay of employes." It should be footed and the total should agree with the gross amount of the column for deductions from the pay of employes. The receipt of the payee for such sums should be taken by the paymaster at time of payment, as in other cases.

In the event a time ticket has been issued, the words "time given" should be noted in the column headed "received payment," opposite the name of the employe. The person who makes the roll is responsible for the insertion of notations of this nature on the roll.

In the event the pay of an employe is garnished, the fact should be noted in the same way opposite the name of the employe on the pay roll by the official to whom the notice is sent. When the garnishment is released, or the suit settled, the date and particulars thereof should also be noted on the pay roll.

If an employe dies, the pay roll should be marked, opposite his name, "deceased."

All gratuities allowed (i. e., amounts for which no work has been performed) should be noted on the pay roll in red ink, so that the extent of such allowance may be seen at a glance. In order to facilitate this, such entries should also, so far as practicable, be made in red ink on the time books.*

The sheets of each pay roll should be numbered consecutively, in the upper right-hand corner, commencing with number one.

* In entering gratuities on the pay roll, they should be noted in short, with the balance due, thus:

| | |
|---|---|
| Regular | $69.80 |
| Gratuity | 4.70—74.50 |



In making the pay roll, the name of the official or officials in charge should be given first, then the clerical force, if any; afterward the names of the employes should be arranged in alphabetical order, and following the name of the foreman of each gang.

In entering the names on the pay roll, the surname should be given first; afterward the Christian name in full; the initials also, if any, thus: "Howard, Peter C." This rule should be carefully observed, as in the multiplicity of names that appear it is unavoidable that the same name and initial will frequently occur, the only manner in which they can be distinguished being by the Christian name. In some cases this also is the same; when this is so, a distinguishing number should be inserted opposite each, so as to distinguish between them.

In order to facilitate payment, and for other reasons, the employes on each pay roll should be numbered; the number may be entered at the left of the name.

In making the engineers' and firemen's pay roll, the number of miles run should (in order to facilitate comparison) be entered. A special column should be provided for this purpose on the roll. A memorandum should also be made opposite each name of shop time. Also the amount of any bonus or extra time allowed. In this way a *résumé* of the whole may be quickly grasped.

In order to prevent the names of employes appearing on more than one pay roll, the wages of engineers and firemen for shop work should be entered on the engineers' and firemen's pay roll for the amount due them for running time, provided they have made any running time during the month;* if they have not, the wages should be entered on the shop pay roll. Contrariwise, the wages of shop men who have running time should be entered on the shop pay roll, providing they have

* Thus:

| | |
|---|---|
| Running time | $60.70 |
| Shop time | 4.70 – $65.40 |

Note "switching" opposite, if engaged in such service, etc.

shop time during the month; if they have not, the wages should be entered on the engineers' and firemen's pay roll.

The names of locomotive dispatchers may, if more convenient, be placed upon the engineers' and firemen's pay roll.

As soon as a roll has been completed, the official whose duty it is to render the distribution of labor book therefor should notify the treasurer of the total amount; he should also send a comparative statement of the pay roll to the division superintendent interested, so that the latter may have early advice of the extent of the expenditure incurred.

Each pay roll should be bound with a good, substantial paper cover, in the office where it is made, the name and amount of the roll being legibly written thereon. Covers for pay rolls should be kept in stock by the stationer, so that they may be uniform and suitable.

Pay rolls should not be folded, but should be sent forward under strong tin covers provided by the stationer.

In making the pay roll and in certifying thereto, no intermediate or blank lines should be left.

The certificates of the correctness and authenticity of the pay roll should be made on the last sheet, and should be signed by all those who are conversant with the facts or in any way responsible for the labor.

At shops the roll should be certified as follows:

First, by the foreman. If there are two or more foremen, each should certify immediately after the names of the gang under him. Second, by the clerk or clerks who take the time. In the event there is more than one clerk, their certifications should follow immediately after the last of the names of the employes of which they keep the time, respectively. Third, by the storekeeper, or head timekeeper, who is responsible for the general correctness of the account. Fourth, by the official in charge of the shop or shops. In the event there are two or more officials, their certifications should



follow immediately after the last name of their respective forces. Fifth, by the master mechanic or superior official immediately responsible for the labor as a whole. Sixth, by the division superintendent, general superintendent, general manager, and finally by the official who approves for payment.*

When a pay roll reaches the paymaster, he should cause the extensions and footings to be carefully re-examined, and when he has made such examination and corrected all errors, should append his certificate to that effect.

In cases where employes located at different points are grouped in one pay roll, say for station, train, track, yard, and other scattered forces of a division, the rules that require the local officials in charge to certify to the correctness of the pay roll may be dispensed with, as such certification would require that the roll should be sent to them. This would occasion both delay and inconvenience, possibly loss. The certification of such officials should be attached to the time books or sheets from which the roll is made; these accompany or follow the roll and serve to verify it.

The duty of certifying to the pay roll, it should be remembered, is not a mechanical one, but one of vital

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* The general form of certification to be attached to each pay roll is as follows:

I certify that the foregoing men were employed as stated.

....., Foreman.

I hereby certify that this pay roll is correct.

....., Time Clerk. ....., 189..
....., Storekeeper. ....., 189..
....., General Foreman. ....., 189..
....., Master Mechanic. ....., 189..
....., Supt. M. P. & M. ....., 189..
....., Division Supt. ....., 189..
....., General Supt. ....., 189..

Approved:

....., General Manager, ....., 189..

Approved for payment:

....., Auditor of Expend'rs. ....., 189..

Extensions and footings examined and all errors corrected:

..... Paymaster. ....., 189..

consequence to a company. It should be done intelligently and with a due understanding of the responsibilities that attach to such certification.

Each one who certifies to a roll is responsible to the extent of his knowledge and discretion. This is especially true in regard to the local officials who make the pay roll, or who have personal knowledge of the facts it contains. Thus, the foreman should never, in any case, certify to the correctness of a roll until he has carefully examined the list of names, also the rates paid and the time each man has worked. The certification of the foreman, it may be said, should have the effect to prevent material inaccuracies, as he knows personally the name of every employe. His certification affords the best evidence possible that the figures of the timekeeper are substantially correct.

The certificate of the time clerk should, manifestly, be correct in every respect, as he is personally conversant with the name of each man, the actual time he has worked and the amount of wages due him. The certificate of the general timekeeper or storekeeper should be equally valuable, because his measures should be such as to enable him to know that the time has been correctly kept and is accurately described on the pay roll. The certificate of the general foreman or official in immediate charge of the shop or place is also of great value as a means of verifying the names given and the rates paid, for the reason that he knows generally each man, and in the event of errors or inaccuracies should be able to discover the fact; this is also true in regard to the certification of the master mechanic or person in charge, the general supervision that he exercises over affairs being such as to assure him that the accounts are substantially accurate or otherwise.

When rigid formulas are not observed in recording the time of employes from day to day, errors are more likely to occur than is supposed. Thus, where no record is made of the time of an employe who works by the month until the end of the month, the names of those who have left the service are liable to be copied



from the preceding month's roll inadvertently. On the other hand, employes engaged at isolated points are liable to be omitted entirely from the roll under such circumstances. Moreover, inaccuracies and errors will be of constant occurrence in connection with rates allowed, time worked and other details. These and other considerations render it necessary that a daily record should be kept of the time of each person, no matter whether he works by the hour, day, month or otherwise. Also, that everyone who has personal knowledge of the names that appear on the roll, and of the time they have worked and the rates they received, should certify to the same, but only after making a thorough and intelligent examination of the roll. If these precautions are observed, it is impossible that errors or inaccuracies should occur without being discovered and corrected.

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In reference to payment of the force, payments may be made by certificates (time tickets) to those who leave the service of a company or are transferred from one division of the road to another, but all others should be paid by the paymaster; also amounts due to parties for deductions from pay of employes.

Employes should not be allowed to give orders on a company for their pay except for good and sufficient reasons, as explained elsewhere. It is impossible to surround such orders with necessary safeguards. Every company provides a particular way for paying its employes, a way especially designed to meet the convenience of employes and its own necessities. This way, whatever it may be, should be lived up to to the letter.*

A particular time is designated by every company for paying its force, according to the labor required in examining the accounts, completing the pay rolls and

* In my judgment there is but one safe way and that is to require each employe to appear personally before the paymaster or his deputy. In the absence of instructions to the contrary, it is a safe rule to follow.

making other and necessary preparations. It will vary according to the exigencies of the service. Employes are expected, however, to wait for their wages until the company is ready to pay them. However, when a person leaves the service of a company and cannot await the usual course of payment without inconvenience or hardship, or is disclined to do so and there is no reason for withholding his pay, the officer who made the roll should communicate with the paymaster in reference to the matter, so that he may proceed to make the payment.

Whenever a gang of men is discharged, the paymaster should be notified in advance, so that he can arrange for its payment. It is desirable to avoid the issuing of letters of identification or time tickets under such circumstances, if possible. Risk may be avoided and the men accommodated by the paymaster giving the matter attention.

No one in the service of a company should be allowed to traffic in the wages of employes or to discount their pay. A company should pay all wages due promptly and without rebate, and meet every reasonable and proper requirement in this direction without the intervention of others. It is the experience of railroads that they do this generally and fully.

TIME TICKETS *—ISSUING SAME—PAYMENT OF WAGES.—A time ticket is a certificate of wages; a statement of the amount due the person in whose favor it is made.

The utmost circumspection should be exercised by those who are in any way concerned in issuing these important documents; the same care, in fact, that would be exercised in issuing a check on a bank, or making payment in any other manner.

In no case should a time ticket be signed or countersigned until the persons who perform such duty have assured themselves that the ticket is correct in every particular, and in accordance with the facts, and that the service has been performed as stated.

* See Form No. 17, Appendix E.



For the better protection of a company and the employe, and to obviate any doubt as to the terms and conditions upon which every time ticket is issued, the following form of agreement is printed on the back of the ticket. This agreement the payee is required to sign at the time the ticket is delivered to him:

AGREEMENT UPON PART OF PAYEE.

This time ticket, upon which payment for wages is made, accepted by me in full payment for services of every name and nature for the.....Railway Company, or companies owned or controlled by it, up to and including the time specified herein.

It is accepted by me subject to the rules and regulations of of the company on whose account it is issued. I agree not to negotiate it, or attempt to collect it through any bank or collection agency, but to present it in person to the paymaster of the company, or such agent as may be authorized to pay it.

It is also understood and agreed to by me, as witnessed by my signature hereto, that in the event I should lose this ticket, or it should otherwise pass out of my hands, and in consequence the amount called for should be paid to a wrong person, I will not hold the company responsible for the amount.

.....
Signature of Payee, i. e., person to whom this ticket is issued.

Witness.....

Title.....

Another and an important purpose that will be served by the foregoing agreement which the payee signs, is that it will enable him to secure the sum due him with the minimum amount of trouble. It will facilitate his identification in presenting the ticket for payment. It renders it unnecessary for him to hunt up witnesses. The payee must personally sign his name to the agreement. If he cannot write, he must make his mark. This must be done at the time the ticket is delivered to him, and in the presence of the person issuing it, who must sign as a witness. In those cases where the person issuing the ticket does not personally deliver it to the payee, the agreement must be signed in the presence of, and must be witnessed by, the official who does deliver it. The signatures of those who act as witnesses must

be known to the paymaster and agents of the company who may be called upon to pay time tickets.

When a time ticket is delivered to the payee, and before he signs his name, his attention must be called to the agreement printed on the back, so that in signing it he will do so understandingly.

Instances will be of repeated occurrence, however, where it will not be possible or practicable for the employe to appear personally before those who sign and countersign time tickets. This will be so in the case of persons employed at stations and upon the track, and at places scattered along the line away from headquarters. When such employes leave the service, a request for a time ticket is sometimes issued and sent to headquarters by the local official. This request should be signed by the person responsible for the labor, countersigned by the person who kept the time, and indorsed by the person to whom granted at the time of delivery to him. Upon requests thus made time tickets are issued.

Requests for time tickets should not be made except in the cases mentioned. It is desirable that time tickets should be issued directly if possible. In the majority of cases it will be practicable, when employes remote from headquarters leave the service, to send a blank time ticket to the official in charge to be signed and countersigned and sent to headquarters to be approved for payment.

It should be the duty of the stationer, under the advice of proper officials, to furnish blank time tickets to such agents and others as have occasion to use them. They should not be furnished promiscuously, but only to those who have employes under them, who are coming and going, and require to be paid when they leave the service; at other places a blank time ticket should be furnished only when occasion to use it requires.

Requisitions on the stationer for blank tickets should be approved by a responsible officer before being honored.

A careful record should be kept by the stationer of the persons to whom blank time tickets are issued.



Time tickets should be numbered consecutively by the printer, and no two tickets should bear the same number.

A time ticket should not be issued except to those who have left the service of a company, or who have been transferred to another division of the road.

In order to minimize the risk a time ticket should not be issued for any sum exceeding $150.

A time ticket should show the name of the employe, the time worked, rate, occupation, place and amount.

The reason for issuing a time ticket should, in every case, be stated on the face thereof. Thus, if the payee is no longer in the employ of the company, it should be marked "left the service;" if he has been detailed to another division, it should be marked "transferred to ..... division," and so on.

In order to enforce responsibility, insure the preservation of the record of each ticket issued and insure the proper notation thereof being made on the pay roll opposite the employe's name, it should be required that each ticket be signed by the responsible officer in whose department the employe works.

It should be countersigned, in every case, by the timekeeper or timekeepers.

Tickets issued at shops should be signed by the master mechanic or official in charge, and should be countersigned by the storekeeper.

Tickets issued to employes at stations, upon trains and in connection with the track and bridge and building service should be signed by the official who makes the pay roll for such forces, and should be countersigned by the person or persons who keep account of the time and make return thereof.

It should be the duty of the person who makes the pay roll to see that it is marked "time given" opposite the name of every employe to whom a ticket has been issued. Neglect to do this should entail personal responsibility for any loss the company may suffer in consequence thereof.

A time ticket should not be delivered to the payee until it is both signed and countersigned. If this precaution is disregarded, the payee will very likely neglect in many instances to have the ticket perfected and will be put to much delay and inconvenience in consequence, as no ticket can be paid where these formalities are not observed. In the event an emergency should arise rendering it necessary to disregard this rule in respect to signatures, the ticket should be inclosed in an envelope, sealed and addressed to the person who is required to sign it, and the payee specifically directed to go to such person and obtain his signature, otherwise payment will be refused. Such an emergency will sometimes arise, it is proper to say, when the persons who sign are located at different points and the necessary signature cannot otherwise be procured without greatly inconveniencing the payee. In all ordinary cases, and where the parties are located near each other, all the signatures should be attached to the ticket before it is delivered.

In filling up a time ticket ink should be used, or other device impossible to be changed or canceled without detection.

The time ticket should be filled up in exact accordance with the requirements of the blank.

No alterations or erasures should be made on the face of a time ticket. When an error or inaccuracy occurs which necessitates an alteration or erasure, the ticket should be canceled by being punched and the signatures destroyed. The ticket thus destroyed should be left in the book in its proper place.

A time ticket should never contain the name of more than one person, i. e., a time ticket should be made for each person, except as provided for below. When a large number of men leaves the service in a body, involving the labor of making a considerable number of time tickets, a time ticket pay sheet blank may be substituted for the time ticket. It will permit the insertion of a large number of names on one sheet. It is, however, a time ticket to all intents and purposes, and should be governed by the same conditions. Names and other



particulars should be entered in appropriate places and a receipt taken of the payee in each instance in the column provided. Time ticket pay sheets thus paid should be stamped by the agent or person paying them on the date they are paid.*

In the event it becomes necessary to settle the estate of a deceased employe before the pay roll is returned, a time ticket may be issued for the amount. The fact that the employe is dead should be written across its face. A ticket should then be forwarded to the official of the company having charge of matters of this kind, who will see that it is not paid without a proper release being secured.†

A time ticket should not be issued after the pay roll has gone forward, without first advising with the proper officer and receiving a written reply that he has marked the roll "time given." After such reply, and not before, a ticket may be issued.‡

Time tickets should not be given to persons whose pay has been garnished, except by permission of the proper officer.

They should not be issued to anyone whose pay is for any reason withheld.

When employes are transferred from one division to another, a time ticket may be given, under the rules, at date of transfer, for the wages due to that time. The wages of employes transferred should be computed (on the division to which they are transferred) only from the date of transfer.

When an employe leaves the service before the pay roll has been sent forward to headquarters, a time ticket

*It should be remembered in this connection that when a time ticket pay sheet is used for a time ticket, the amount entered in the column "paid on account" is to be withheld by the person paying the ticket. See also Form 15, Appendix E.

† Care should be taken in every instance in paying the wages of deceased employes and minors to see that payment is made to the right persons and that a proper release is secured.

‡ In order to expedite work all references to names upon pay rolls should give the number of the employe, his name, and also the name of the roll.

may be given him (under the rules) for the amount payable to him at that time.

Before issuing a time ticket, care should be taken to see that the amount of any order which may have been given on account of the company, or in which it is interested, or for which it is responsible, or for which the payee is properly responsible, is first deducted. In such cases, the amount of the deduction should be noted on the time ticket, also on the pay roll.

Every precaution should be adopted to prevent overpayment.

Whenever anyone who handles the funds, stores or other property of a company leaves its service, such portion of their pay should be retained until their accounts can be audited, as may be necessary to protect the company against loss.

When the accounts of such persons have been audited, it should be the duty of the proper officials to see that any balance of pay to their credit is remitted to them as soon thereafter as possible, unless there should be some reason for withholding the amount still further. In the majority of cases the withholding of any portion of the wages of an employe causes him inconvenience, and is sometimes a severe hardship; no unnecessary delay should, therefore, under any circumstances, attend payment.

When an agent leaves the service, or is transferred to another division, a time ticket should be sent to the traveling auditor making the transfer, for all wages due the retiring agent, except twenty-five dollars, which latter amount should be withheld, awaiting the final auditing of his accounts. If the traveling auditor finds the affairs of the agent to be satisfactory, he should deliver the time ticket to him; otherwise he should note across its face "to be credited in account," and remit it to the treasurer to be credited to the agent, pending the settlement of his accounts.

The whole or a portion of the pay of a conductor who leaves the service should be withheld until his accounts are examined and balanced and the property in his



possession turned over to the company. No conductor should be paid by time ticket or otherwise (or at most only for a part) until advice has been received from the proper officer that the property in his possession has been accounted for and his accounts balanced. As soon as the accounts of a conductor have been audited, any balance to his credit should forthwith be sent him.

When a time ticket is issued for a part of the pay of an agent or conductor, as indicated, the roll should be marked "time ticket issued for $.....," noting the sum. In reference to the balance of pay due, the roll should be marked "hold balance subject to settlement of account."

In order further to prevent misunderstanding or loss to a company, it would be well if everyone who handles its funds or securities should be required to sign an agreement permitting the company to withhold their pay or a portion thereof, upon their leaving its service, until their accounts are audited and their indebtedness accurately determined. This will frequently prevent suit being brought against a company under such circumstances. The form of agreement should be as follows: "It is hereby agreed that is case the employe whose name is attached hereto shall quit the service of the Blank company or be discharged therefrom, the said company shall have the right to withhold any sum which may be due him, until after his accounts have been examined and audited, and in all cases until the regular pay day of the company."

Request for a Time Ticket.*—This form is provided for use of foremen at shops and other places where large numbers of men are employed. It is intended to be given by the foreman to employes entitled to a time ticket. The employe presents it to the person whose duty it is to issue the time ticket. After it has been complied with it should be canceled and the date of the time ticket noted in ink across its face. It should then be filed away conveniently for future reference.

* See Form No. 16, Appendix E.

The request is also designed for use in those cases where the officials who sign and countersign the time ticket are located at a distance from each other. It is intended for agents, trackmen, conductors and similar employes who are required to make requisition on a division superintendent or other officer for a time ticket. It is desirable, in cases of this kind, however, that the time ticket itself should be used when practicable. When the time ticket is used in such cases it should be filled up in due form and countersigned by the timekeeper and agent, conductor, roadmaster, or other person or persons who keep the time or are immediately responsible therefor. The ticket thus made and countersigned should be forwarded by express or other secure means to the official who is to sign it; when signed by him, and the necessary record of its issuance made for entry on the pay roll, it should be returned to the person issuing, by express or other secure means.*

It is the duty of every person who signs a request, or who honors a request, to assure himself that the service has been performed as stated.

Payment of Time Tickets and Wages.—Time tickets issued in accordance with the regulations of a company governing such matters should be payable by agents and other authorized officials, after being properly indorsed.

Agents should only pay time tickets issued by authorized officials having jurisdiction over the division upon which their station is located, unless special requisition is made upon them to do so by a responsible official of the company.

The same care should be exercised, so far as possible, in the payment of time tickets that is enforced by banks and other institutions in the payment of checks, drafts and similar evidences of debt.

The person who pays a ticket should be assured in every instance that it has been issued by authorized officials, and that it conforms in all respects to the requirements of a company.

* This matter is referred to in connection with Time Tickets.



When a time ticket is presented for payment, the person paying the same should require it to be indorsed by the person presenting it. If the indorsement conforms to the signature of the payee written at the time the ticket was delivered to him, it will afford corroborative evidence that the ticket is presented by the proper person. If the payee cannot write, he should be required to make his mark, which mark should be witnessed by some disinterested and responsible person before the ticket is paid. [Note.—The witnessing of the cross, as provided for above, is not designed to be so much an identification of the payee as it is of the fact that the amount has been paid by the paymaster, or other agent of the company, in good faith.] The indorsement of the payee on the back of the ticket, as provided for, is a sufficient receipt for the payment thereof.

In no case should a time ticket be honored unless presented by the person in whose favor it is made.

As the rules and regulations under which time tickets are issued by a company cannot be known except to its officers and employes, it is impossible that such documents should be dealt in by banks and others without great risk. They should, consequently, not be encouraged to traffic in them. This may be prevented effectually by enforcing the rule that no time ticket or evidence of wages due shall be paid except to the original payee. This fact should be printed plainly on the face of each certificate. The certificate would then be invalid in the hands of anyone else.

No one in the service of a company should be permitted to buy or discount the pay of an employe.

Wages of deceased employes should be paid through the general claim agent.

In the cases of deceased agents, cashiers and conductors, payment should not be made until their accounts in the treasurer's office have been finally audited.

When a time ticket is presented to an agent who cannot pay the same, the person holding the ticket should be referred to some agent who can pay it, or the matter should be referred to the treasurer or paymaster.

Whenever the receipts of a station are not likely to be sufficient to pay the wages of men leaving the service of a company, payable at such station, the treasurer or paymaster should be notified in advance, so that the necessary funds may be provided to meet the emergency.

The prompt payment of time tickets is especially desired by a company, and all who hold them should be requested to present them, without delay, for payment, and every reasonable and proper facility should be extended to those who hold them to get their pay.

It is desirable that men who leave the service of a company (on whose account time tickets are issued), should be paid, without delay, on the division where they worked.

Time tickets issued in the vicinity of the office of the treasurer or paymaster (and in other cases when practicable and convenient) should be presented for payment directly at such offices, by the persons in whose names they are drawn.

Whenever discharged men are sent to headquarters or elsewhere for their pay, they should be furnished with specific instructions as to where they are to get their pay, of whom, amount, etc.

The person who pays a time ticket cannot act as a witness to the indorsement thereon.

When there is a deduction, for any reason, from the wages of an employe, only the net amount should be paid him. Any amount that may be due for board, or for any other purpose (as per deduction upon time ticket), should, in the absence of instructions to the contrary, be settled directly by the paymaster or treasurer.

After a time ticket has been paid by an agent, it should be stamped with the station stamp on its face, also on its back underneath the indorsement of the payee. It should then forthwith be remitted.

In order to avoid loss, agents and others who pay time tickets should keep themselves advised in regard to those who are authorized to issue time tickets, the names that should be attached, and other particulars.



In order to further this purpose, superintendents should notify agents, in writing, of the names of persons who are authorized to sign time tickets for their divisions respectively.

In the event an employe, whose pay is garnished, should be given a time ticket through mistake, it should not be paid; but the person to whom it is presented should write the word "garnished" across its face, and should then take it up and return it to the official who signed it.

Time tickets should be made invalid if not presented for payment within thirty days from their date. The fact should be printed on the face of each blank. The provision should be rigidly enforced. It is especially desirable that tickets should be presented for payment without delay, and especial provision should be made to accomplish such result without inconvenience or expense to the holder.

In no case should wages be paid on the roll when a time ticket has been given without the presentation of such ticket, or unless it has been duly and properly canceled, except in the event of loss of a ticket, as provided for below.

In the event a time ticket is lost, notice should be sent forthwith (by the official who signed it) to all agents and officials authorized to pay the same, directing payment to be stopped. As it is extremely difficult and inconvenient to keep a record of documents of this kind, and as the danger is always great that they may be paid inadvertently, the utmost care should be taken to prevent loss. In furtherance of this, tickets in being sent back and forth on a line should, in every case, be forwarded by express, or in some other way equally secure. When a time ticket is lost, the person losing it should be required to file with the treasurer a good and sufficient bond of indemnity before a duplicate should be issued.*

In the event a time ticket is presented that has expired by limitation, as provided in a preceding paragraph, notice of the fact should forthwith be sent to the

* See Form No. 20, Appendix E.

treasurer, giving him the name of the payee, his present address, the kind of service performed for which the ticket was issued, amount due the payee, and the names of the persons issuing and countersigning the ticket and the date of issuance thereof. But the ticket should not be paid without a special order to that effect from the treasurer. Such tickets may, however, be paid at the discretion of the treasurer if *bona fide* in their nature.

It should be kept in mind constantly by those who pay time tickets that no one except the person in whose name a time ticket is drawn is authorized to indorse the same, unless he does it as an administrator, legal guardian, or possesses a power of attorney, in which case the authority should be pinned to the ticket. Any indorsement of a ticket by an unauthorized person is fraudulent and renders the person making it liable to prosecution; no credit can be allowed anyone for paying such a ticket.*

Letter of Advice and Identification.†—This letter is a simple notification to the treasurer or paymaster that there is a certain amount due the bearer on the pay roll. It is both a letter of advice and identification. It is intended to be used in notifying the treasurer or paymaster in those cases where the pay roll has left the hands of the person signing the letter; it is intended to serve as a letter of introduction and the holder should be instructed to guard it carefully, as its loss may involve the loss of the whole sum, as it is good to bearer. It should never be used in those cases where a time ticket has been issued.

It is of especial value in the case of laborers and others who have left the service and are required to be identified before being paid.

It should recite name and number of employe and name of pay roll.

* This rule should apply also to vouchers, drafts, checks and other instruments requiring the receipt or indorsement of the payee.

† See Form No. 18, Appendix E.



A letter should never be given to a person whose pay, or any portion thereof, is to be withheld for any reason, unless the amount to be withheld is plainly noted thereon.

A record should be kept of all letters issued.

A letter should not be delivered to the payee until it is both signed and countersigned. The regulations governing time tickets in this connection should be observed.

Whenever access to the pay roll can be secured, it should be marked "letter given" before the letter of identification is delivered to payee. In the event this is done, the fact should be duly certified to in the place provided on the face of the letter.

When a letter of identification is issued, the officials signing and countersigning it should require the person to whom it is given to indorse his or her name on the back of said letter. This should be witnessed by the official signing or countersigning the ticket, or by some disinterested person known to the officers of a company. Afterward, when it is presented for payment, the disbursing officer should require that it be again indorsed by the person presenting it. If the two signatures are the same, it will afford corroborative evidence of the identity of the person. If the payee cannot write, he should make his mark, which mark should be witnessed by a creditable person; the person signing or countersigning the ticket cannot act as a witness.

Letters, whether indorsed by mark or otherwise, should be presented by payee personally.

Order on the Paymaster.*—This is an order on the paymaster, signed by the employe, directing that the wages of such employe be paid to the bearer or to some particular person. The interests of a company require that the use of this form should be discountenanced.

The safety of every company requires that it should insist upon its employes appearing personally before

* See Form No. 19, Appendix E.

the treasurer or paymaster for their wages.* There may be cases where this is impossible (in the case of sickness), or will entail great hardship or suffering. When this is so the paymaster may, after assuring himself of the facts, deliver to a third party the wages of the employe, upon the receipt of a properly authenticated order. In such cases the pay roll should be marked "order given."

In the exceptional cases where it may be necessary, or the interests of a company render it desirable to facilitate the issuing of an order by an employe for his pay, the officer immediately superior to the said employe should forward it, with a statement of the facts, to the paymaster, who should, after investigation, mark the pay roll "order given."

Orders on the paymaster should not be recognized as negotiable paper. No one in the service of a company should be allowed to traffic in them. The exceptional circumstances under which orders are issued prevent their being recognized as commercial paper.

Orders should be drawn on the blank provided therefor.

The giving of an order is not a matter that a company can control; it cannot, consequently, guarantee their payment, nor assume any liability for them whatsoever.

No order should be accepted or countersigned by any officer or agent of a company except the treasurer or paymaster, and then only in the exceptional cases specified above, and after the pay roll has been marked, opposite the person's name, "order countersigned."

When it is impossible for an employe to present himself personally before the paymaster for his wages, payment thereof should be made by check or draft

* This rule, as well as others herein of like tenor, will, of course, be changed to suit the occasion when rolls are paid by check, the check being forwarded from the general office by the paymaster.



drawn to his order. Practices of this kind will be rendered necessary in the case of watchmen who cannot appear before the paymaster during working hours without losing their rest; in the case of those who are sick or who are unavoidably absent on furlough or otherwise; of those whose place of business is not visited by the paymaster; also of those who are missed by the paymaster when paying the force. The issuing of drafts of this kind to an employe obviates the necessity of his giving an order and is altogether preferable. The practice, therefore, of issuing orders in such cases should be discountenanced. In fact, the issuing of an order or the recognition of one, except in cases of necessity, should be avoided, and the vital regulation requiring that everyone appear personally before the paymaster should be rigidly enforced.

Cancellation of Time Tickets.—In order to limit responsibility and for other necessary reasons, time tickets not paid within thirty days of their issuance are, according to the express terms of the instrument, made void. Therefore, when they remain in the hands of agents and others unpaid after the expiration of thirty days, they should be canceled and forwarded to the paymaster. The form of cancellation should be by noting "canceled; not called for" across the face of the document. This certification should be dated and signed by the person making it.

Upon its receipt the paymaster should erase the words "time given" from the pay roll and note thereon the date the ticket was canceled by him, as say "time ticket canceled May 31st, 18—;" he should furthermore mark across the face of the ticket "canceled May 31st, 18—," and sign his name thereto.

He should then destroy the signatures to the ticket and forthwith return it to the person who made it. It is the duty of the latter to make a notation on the records to that effect.

Afterward, in the event the person in whose name the ticket was made calls for the same, he should be referred to the paymaster, who will adjust the account.

# CHAPTER VI.

## ACCOUNTS AGAINST PERSONS FOR MATERIAL SOLD, LABOR PERFORMED, ETC.

[NOTE.—They represent accounts against individuals, firms and corporations for material sold, labor performed, expenses incurred, and for other special things, including proceeds from sale of unclaimed and damaged property, carcasses of animals killed, hides, pelts, and similar items. On some roads these accounts are called "Various persons accounts." The name is not material. They embrace all accounts save those for freight charges, tickets, express, mail, car service, and other traffic. They are embodied herein because they are more or less mixed up with the material and labor accounts, and concern, more or less, the officers and employes who handle material and labor.]

There are, in connection with the receipts of railroads, certain kinds of collections of a special nature. These collections are not uniform or regular in their recurrence, like those connected with the transportation of passengers, freights, mails, express and excess baggage. The regular traffic earnings of a company fall within the domain of particular departments, and particular and fixed methods and forms are provided for handling them. But this is not the case in regard to special collections; in one case the latter will be for old ties, in another for the pelt of a steer killed, in another for the breaking of a station window, for damage to a car, for the sale of old material, a blank book, a strip of right of way,





a tax rebate, a worn-out horse, a piece of chamois skin, a barrel of oil, work performed by a company's employes, an expense incurred in behalf of someone, a remittance to the conscience fund, and so on. Each case as it arises is in a measure special in its nature, and new to the person interested. In the majority of instances the person who makes the collection is not one of the regular agents or collectors of a company, and, as a rule, no ledger account is kept with him by the company. To open such an account would be to fill the books with a multitude of names without securing either clearness or responsibility; there are various ways of avoiding this dilemma. The way is not particular. That suggested here is to require the person who makes the collection to remit to the credit of the chief of the department in which the collection is made; thus, collections made in the land department are remitted to the credit of the official thereof; in the tax department to the chief thereof; in the departments presided over by division superintendents and others, to the chiefs thereof; and so on. All collections made at shops are remitted to the credit of the storekeeper thereof. Afterward, a bill is made against each official for the amount of the various collections remitted to his credit. In order to advise such officials, a statement of each collection is sent him by the person making it. These statements, moreover, enable him to note the merits of each case, also whether any collection is omitted or not. It is made the

duty of officials to look after these collections in their several departments, also to see that bills are made to cover them.

The difficulty that has been experienced in handling such accounts as I refer to is to group them so as to fix the responsibility; to assign to particular officials the duty of looking after them. Thus, if John Smith, a track foreman, collects $1.30 for the sale of an old gate, it must be made the duty of someone to see that he remits the money and otherwise accounts for it. Who shall do this? The treasurer? Or accounting officer? Neither. Because neither of them has any facilities for knowing that a gate has been sold or that money has been collected for it. Who is the proper person, then? Manifestly the officer of the company who is familiar with the transaction, whose duty it is to know of it. In this particular instance it would be the roadmaster or division superintendent. Such being the case, it is made the duty of this officer (under the accompanying instructions) to see that the money collected for the gate is remitted to the treasurer, and that at the end of the month this collection, with all others remitted to the credit of the officer, are incorporated in a statement of account against him, also in a bill against him for the gross sum. The various persons accounts of a company are made up largely of occurrences similar to the sale of the gate by Smith. They must be protected the same as the collection of freight and passenger charges are protected.



With this explanation of the theories and practices that attend the operation of various persons accounts, the subjoined rules will be more clearly understood than would otherwise be the case.

No uniform name has been devised for designating the special accounts under consideration; they are termed here "various persons" accounts.

All cash collected on account of various persons should be remitted directly to the treasurer.

It should be the duty of the official who has immediate supervision of the various persons accounts of any department or storehouse to see that an itemized monthly return is made to him of the same by the persons making the collections.

It is not intended, however, that the money shall be remitted through him to the treasurer; it should be remitted directly.

Remittances should not be sent by the hand of an employe, but by express directly to the treasurer or deposited personally at his office.

A cash slip or statement of account should accompany each remittance, giving the name of the person or official to whom (under the rules) it should be credited, what the collection is for, date collected, from whom, etc. It is the duty of the treasurer to send a receipt forthwith to the person to whose credit the amount is placed; in the event this is not done promptly, inquiry should be made for it.

Whenever practicable, collection should be made at the time the charge is incurred.

In making the collection (and in making the charge as well) care should be taken to add the authorized percentage of profit (if any), also amount (if any), to cover the wear and tear of tools, machinery, etc.; the amount of this extra charge should be credited on the distribution book to premium account.

Heads of departments who direct a collection to be made on account of various persons, or within whose

department a collection is made, should have the money remitted to their credit; in this way the collections of each department of a road will be grouped and the number of accounts restricted, as already described.

All charges for fuel sold should be embodied in the general fuel report of the person making the disbursement, and the same details given in connection with such charges that are required for other various persons accounts.

Collections for fuel made by those in charge thereof should be remitted to the credit of the officer against whom the charge (in such case) is made in the monthly fuel report. It is the duty of this officer to make an itemized bill against himself monthly for the amount thus remitted to his credit.

In issuing instructions to agents and others in reference to a collection to be made to the credit of someone else, care should be taken to give the name of the person to whom the money is to be credited, and to ask in each instance that the sender shall advise when the remittance is made.

When money is remitted by one person to the credit of another, the person making the remittance should inform the person entitled to credit forthwith by letter, so that he may take up the same in his accounts and may know that the money has been remitted.

In opening an account with himself on a distribution book, and in making bill against himself for various persons accounts, the storekeeper or official should give each charge, viz.: name of person from whom the money was collected, and all other details incident thereto, such as date, place, what for, amount, by whom remitted, etc.: thus, if fifty collections are made in a department or at a particular storehouse during a month, for material, labor, hides, pelts, tallow, carcasses of animals, etc., the persons making the collections should remit them to the credit of the storekeeper or official in charge. Each official should open an account on his distribution book with himself, in which he will specify in detail the accounts collected; it being understood that all charges for material sold or labor performed on account of various persons, taken cognizance of by those who render a distribution book, should be embraced therein.



The regulation requiring that collections made on account of various persons shall be remitted to the credit of department officers or storekeepers should not apply to various persons bills collected by the treasurer. In such cases the charge will be made directly against the individual, firm or corporation and a bill made accordingly. All charges, moreover, that originate with officers who do not render a distribution book should be made in this way unless otherwise directed; in such cases a certified bill will be made in duplicate by the officer conversant with the transaction; these he should forward to the accounting officer.

In order to restrict the number of charges as much as possible, a storekeeper should make only one bill monthly against a person, firm or corporation, unless it is requested or is advisable to make collections oftener.

At the end of each month, or sooner if an account is closed, a bill* should be made in duplicate for each various persons account. This bill should be sent to the purchasing agent or other officer designated to receive it. A summary† of various persons accounts should also be sent this officer on the last day of the month; in the event there are no accounts, a blank summary should be sent him.

Accounts due a company should receive immediate attention from all through whose hands they pass. Bills should be made, verified, entered and approved without delay. Immediate attention should also be given to their collection; delay in collecting bills is to be deplored. It evinces lack of appreciation of proper business methods, and sooner or later occasions loss.

It is made the duty of all who are in any way responsible for various persons accounts to see that so far as possible no bad debt is incurred or loss occasioned

* See Form No. 46, Appendix E.
† See Form No. 47, Appendix E.

through neglect to collect promptly. In furtherance of this, collections should be made at the time if practicable; in other cases prompt notice should be forwarded to the treasurer when any risk is incurred, so that he may act advisedly.

In reference to accounts against various persons that spring up in connection with the duties of employes along the line of a road, such as trackmen, bridge and building men, station and train employes, etc., they should be required to render prompt notice to the officer through whom the returns are made, of any debt incurred, so that no unnecessary risk may be run.

Collections for scrap or old material sold by a company should be made by the treasurer under direction of the officer who effects the sale, so that the labors of the latter may not be embarrassed in any way.

In order to facilitate the collection of accounts against various persons, every detail likely to assist in this direction should be given; such as the name of the person who ordered the material or authorized the labor, to whom the material was delivered, etc.

When deductions are made from pay rolls (for account of a company) coming under the head of various persons, a bill should be made by the official conversant with the transaction against the treasurer (whose duty it is to collect) to cover the deduction. The bill should give full explanation of cause of deduction. The amount of this bill should be noted on the first sheet of the pay roll, as directed.

Bills against railroads and other carriers should be formally certified as correct by the official directing the same. It is desirable in case a charge is liable to be disputed, that the amount and correctness of the account should be accepted by the company interested before it is formally brought upon the distribution books or into the accounts, and in cases of this kind satisfactory results are more likely to be achieved if the correspondence connected with the claim is carried on by the official immediately conversant with the facts, than if conducted by the treasurer. For this reason no charge



should be made on the distribution books against any carrier (when there is a possibility that such charge will be disputed), until correspondence has been had in regard thereto with the company interested, by the operating officer conversant with the facts. But no charge that is right and proper should be waived if the result of the correspondence does not secure its admission by the company interested. The object in withholding doubtful charges is to prevent the books from being encumbered with disputed and uncollectible accounts, and at the same time not to waive any collectible claim.*

Bills against railways should be made in triplicate and so marked in red ink across the face. The original and triplicate should be sent as in other cases; the duplicate should be sent by the local official to the company against which the charge is made. In making bills the full name of the road should be inserted.

In order to define as nearly as possible the course of certain various persons accounts, the following specific rules should be observed, viz.:

Moneys collected by agents, trackmen and others for hides, pelts, tallow, carcasses of animals, road material,

* The following method is suggested for collecting charges for repairs of rolling stock belonging to other companies or individuals: On the first day of each month, or as soon thereafter as possible, a detailed statement should be sent to the proper officer of a company or individual concerned, of all labor and material used or expense incurred during the preceding month on account of rolling stock in use belonging to such company or person. This statement should give the number of car, name of owner, items and cost. Whenever there is any doubt as to the justness of a charge of this kind, or as to whether it will be paid or not, correspondence should be opened with the company or individual interested in reference to the charge before making a bill or rendering a statement of the expenditure. To further simplify the accounts, all labor and material used, or expense incurred on rolling stock belonging to other companies or individuals, should be charged in the distribution books the same in all respects as if the rolling stock belonged to the company or individual making the repairs. Returns of repairs of equipment belonging to other companies or individuals should give full particulars, so that the officer or person to whom sent may be able to act intelligently

old ties, damage to the company's property and kindred charges occurring on the line, should be embodied in the returns of the division superintendent or other official in charge of the accounts for the road (i. e., the person who authorizes the collection and within whose department the transaction occurs), and the money should be remitted to his credit.

Moneys collected on account of the sale of damaged, over or unclaimed freight should be remitted, with a detailed statement of the same, by the person making the collection, to the credit of the official in charge of claim accounts. If there are charges on the property thus sold, the amount of such charges may be deducted from the proceeds of the same before remitting the money. In making the bill, however, at the close of the month, the gross collection should be shown, less the deduction.

Moneys collected on account of the sale of damaged, over or unclaimed baggage should be remitted, with a detailed statement of the same, by the person making the collection, to the credit of the official in charge of baggage accounts. If there are charges on the property thus sold, the amount of such charges may be deducted from the proceeds of the same before remitting the money. In making the bill, however, at the close of the month, the gross collection should be shown, less the deduction.

Moneys collected in connection with the land department, for lands and town lots, should be remitted to the credit of the land department, with a detailed statement of the same, by the person making the collection.

Moneys collected for rents, sale of old houses and kindred property, should be remitted to the credit of the official in charge.

No one, except those regularly authorized, may collect money on account of a company, or receipt therefor.

A formal receipt is required to be given in every case when money is collected for or on account of a company; it should be given at the time the money is collected; it



should be dated and signed, and should state specifically the purpose for which it is given. This rule applies to every officer connected with a company, as well as to every employe. Its rigid enforcement is in accordance with good business practice, and serves to protect a company, the person who gives the receipt and the person who receives it.

For all material sold or labor performed for other than carriers, an invoice of the same should be forwarded to the person in debt at the time the charge is incurred; in the case of carriers, statements should be rendered monthly, or as may be most conducive to quick and amicable settlements.

In reference to "conscience money" received by a company, when not remitted directly to the treasurer, it should be turned over to him, with all the attendant facts. A various persons bill should be made for each amount remitted.

If the name of the person making the remittance is known, the bill should be made in the name of such person. If not known, it should be made in the name of the person to whom the money is remitted by the sender. This will preserve a perfect record of the transaction, and is preferable to the method of crediting the cash directly to the account that had originally suffered (when known) from the act of the remitter. Bills for conscience money should be credited to the specific account affected when indicated by the sender; in other cases it should be credited to miscellaneous earnings.

The following details should be observed in entering various persons accounts on the distribution books for material and labor, viz.: It may sometimes occur that it is not possible or practicable to make the charge in the month in which the transaction takes place. Indeed, it may not be known, at that time, to be a various persons transaction. In that case the amount would manifestly be charged to some other account. In cases of this kind the account that was originally charged should be credited when the transaction is finally entered and returned in the monthly statement. It is

desirable, however, for obvious reasons, that, whenever possible, the charge against various persons should be made on the books in the month in which it occurs. Charges for labor should be entered on the distribution of labor book; charges for material should be entered on the distribution of material book. Whenever a charge occurs for material that does not stand charged against the storehouse or department making the return, like the sale of old ties, sand taken from pits, hides, pelts, broken windows, or damage to the property of the company, the proper operating expense account, or the account originally charged with the thing for which collection is made, should be credited on the distribution book. Thus, if a division superintendent were to collect money for damage to a passenger station, he should enter the amount on his distribution of material book under the head of "various persons," as already directed, and deduct it from the amount charged during the month to "repairs of buildings." In this way the various persons account would be charged, and the proper account credited. In the event there should be a credit to an account for which there is no charge, say, for right of way, a special account should be opened on the distribution book for right of way, and the amount to the credit of such account duly stated therein.

Whenever it is desired to group in one bill charges against a particular individual or carrier, the officer who authorizes the charges, or under whose authority they occur, may designate who shall make the bill, notifying all others to invoice their charges to him, so that he may sum up the whole in one account. This rule is not imperative. It is intended to meet those cases where a company is carrying on experiments for others in the operation or construction of machinery, or where it is necessary to group together the charges in order that they may pass under the immediate supervision of some official. But it is not intended to alter the rule requiring charges against various persons or railroads to be reported to the accounting officer monthly, so that



the same may be charged as they occur on the general books.

If instructions are carefully observed, loss will rarely, if ever, occur in connection with the various persons accounts. It is designed that no material or other property shall be sold, labor performed or expenses or obligations incurred for anyone, except under direction of an authorized officer of a company;* that care shall be exercised not to incur bad debts; that accounts shall be collected at the time the indebtedness is incurred, and, finally, that all collections shall be transmitted to the treasurer upon the day on which they are received, or, if this is impossible, then upon the succeeding day.

A ledger account should be opened for all charges against various persons. A journal and double entry ledger should be kept by every storekeeper who has such an account. The expense this will engender will be slight compared with the safety it will insure. The object sought is to secure a record that must be formally closed in every instance and that cannot be overlooked or forgotten.

A ledger account should therefore be opened when labor is performed, material sold, or expense incurred for an individual, firm or corporation. The parties against whom the account occurs should be formally charged on this ledger. When the work is completed, and the charge has been finally and properly disposed

* The following should be observed in this connection, viz.: No material or supplies should be delivered or shipped from a shop or storehouse (except for the use of a company) until an order to that effect, signed by the storekeeper and countersigned by the master mechanic or foreman in charge, has been made and filed with the delivery clerk. It is also the duty of both the storekeeper and master mechanic to see that a charge is made on the distribution books to cover all material or supplies shipped away or sold. Similarly, no labor should be performed for anyone but the company, except upon the joint written order of the storekeeper and master mechanic or foreman in charge. When labor is thus performed it is the duty of both the officials in question to see that a charge is made for it on the distribution books.

of,* the ledger account should be closed. In making this closing entry or entries at storehouses, particular care should be taken to give the month and folio of the distribution book in which the account is returned to headquarters or otherwise disposed of. This method of treating various persons accounts will prevent the possibility of a charge against anyone being overlooked, a thing likely to occur in case an account ran through two or more months, or if the rendering of it was not coincident with the debit. Generally speaking, accountants everywhere will find it to be a wise precaution to open a double entry ledger account wherever an account against anyone occurs (that might otherwise be lost or overlooked), closing it only when the account is paid or finally disposed of. There is always danger otherwise of charges of this nature being lost. It is the peculiar merit of double entry bookkeeping that it prevents such lapses; it is the only thing that does. Through its operation every account stands till formally closed, and attention is called to it each month when the balance sheet is drawn off, so that if an account is overlooked at one time, it is sure to secure attention at another. No book or system ever devised as a substitute for double entry bookkeeping secures this. Thus, if a car is to be rebuilt that may require several months, or an account is opened that may not be closed for some time, this ledger will pick up the several fragments of the account as they arise and bring them together in one place, so that when the whole is completed the storekeeper cannot avoid reviewing the same to see whether it has been settled or formally disposed of.

When an order is received at a shop or storehouse by which a charge is to be incurred against an individual or corporation, a record of the matter should be made forthwith, so that it may not subsequently be forgotten or omitted. For the purpose of this preliminary record,

* In the case of storekeepers this would be when it had been returned to headquarters in the manner prescribed; at headquarters it would be when the account was paid or otherwise formally disposed of.



a common blotter or day book may be used. When the account is formally opened on the ledger, this preliminary entry should be canceled as an evidence thereof; until so canceled it should not be overlooked or forgotten.

All various persons bills are entered at headquarters upon a register.* They are numbered therein. Afterward they are forwarded to the approving officer, and so on to the treasurer.

Accounts originating at shops, storehouses or road departments, where a distribution of material book is kept, should be credited, when entered on the register, to the storekeeper under the head of "Material—Various Persons." Accounts originating with other officials of a company, who have no occasion to render monthly distribution books of labor and material, should be credited on the register to the operating or other account, whatever it may be.

In speaking of credits in connection with bills (charges) against various persons, it will be understood that in railway accounting there must be a credit for every debit. Thus, if there is a debit against an individual for material sold him, a bill is made against him which constitutes a charge; the amount of the bill is credited to the account affected. Thus, every bill against various persons implies a corresponding credit; and so every voucher to the credit of anyone (for sums due by a company) implies a corresponding charge against some account.

One reason why various persons bills are credited to the storekeeper in the above manner upon the register at headquarters, instead of to the account directly affected, is because the latter is not always known at the time; also, because the storekeeper himself is entitled to credit if the thing disbursed is material or labor, as he stands charged with the gross amount of these. Still another reason is that by this method the credits arising from various persons bills entered by each department are bulked on the distribution book

* See Form No. 4, appendix, book "General Fiscal Affairs."

rendered by such department, thus minimizing the clerical work of posting. The credits for various persons bills are in turn credited by storekeepers to the accounts to which they belong. The same is true in a corresponding sense in regard to vouchers. Storekeepers should be advised of any debits or credits affecting them.

The register of various persons bills should not be closed until the tenth day after the end of the month, when the results as entered thereon should be summarized for entry upon the general books. So far as practicable, all accounts should be entered in the month in which they belong.

At the end of the month a summary should be made of the various persons register, showing the total amount of bills entered and the things to which it is creditable, giving the name and amount of credit to each account. A similar summary is required to be rendered for the register of audited vouchers.* These summaries may be copied into one journal,† the entries for various persons being a history of amounts due a company; the other a history of amounts due by a company. The two statements being thus brought together, only the balance or difference between them need be posted on the general books.

Cancellation of Various Persons Bills.—Up to the time the general books are closed for the month, a voucher may be canceled, destroyed or the amount changed. Afterward, this will be impossible; the voucher and amount must then stand as entered.

When it is desired to cancel or change a voucher before the books are closed, it should be referred back to the various officials upon whose books it appears, so that they may cancel or change the entries thereon.

In the event it is desired to cancel a various persons bill, or an account, or an item in an account, due from an individual, firm or corporation, on the general books of a company (after the same have been closed for the month

* I. e., bills due by a company.

† See Form No. 5, appendix, book "General Fiscal Affairs."



in which the account originated), satisfactory reasons therefor should be written on the face of the bill or statement of account, or should be attached thereto. The statement should be signed by the officials certifying to the authenticity of the original account. This statement forms the basis for correcting the account on the general books of a company, and should be filed as a voucher for such change. This does not apply to traffic accounts, which may be corrected at any time by the officials in charge.

In canceling various persons bills, or items in such bills after the books have been closed, the amount should be charged to the account originally credited.

When various persons bills which have been credited to material are canceled, an entry should be made on the distribution book of the storekeeper who accounted for same, in the following manner: The amount of the various persons bills canceled should be deducted from the total amount of "Various persons accounts" for the month, and the operating or other accounts which were first credited should be changed with the amount.

Specific reference should be made in the distribution book to each various persons bill canceled, and the reason for cancellation given. Notice should be given by the accounting officer monthly of all bills to be canceled, and no cancellation entries should be made on the distribution books other than for the bills reported by the accounting officer.

# CHAPTER VII.

## GENERAL REGULATIONS.

Storekeepers should, at all times and in all places, exercise a watchful and intelligent care over the interests of the company employing them. Any irregularities of an improper character which they may discover, and which they cannot rectify, they should forthwith report to their superior officer.*

In accounting for items of expense not specifically provided for, the practices followed in analogous cases should govern. In the event of doubt, the matter should be referred to the proper officer.

In writing up the account of disbursements a company is, in the main, dependent upon the information which it gathers from the books and statements received from those who write the material and labor accounts; it is, therefore, of the utmost importance that storekeepers should at all times be painstaking and vigilant in the discharge of their duties.

It is their duty to keep themselves fully advised, by careful observation and intelligent inquiry, in reference to the nature, character and scope of each and every account to which material and labor are charged.

Storekeepers should see that storerooms are kept clean and orderly, that the supplies under their charge are compactly and systematically arranged, so that they can be got at conveniently and the amount on hand easily ascertained, that the cost price is plainly marked

* In order that responsibility may be enforced, and that there may be due subordination and harmony of action, it is desirable that the forces occupied in connection with the material and labor accounts at shops and storehouses and depots of supply should be immediately subordinate to the storekeeper.





upon each article or lot of material, and that the material in the yard and outhouses is arranged so that it can be protected and watched over to the best advantage.

All returns, statements and pay rolls required of storekeepers by the officers of a company should be carefully and promptly made, and should be sent forward without delay.

All profits accruing from the sale of material, or from labor performed by employes, should be credited to the premium account.*

In order to distinguish quickly, all credits in the various account books connected with disbursements should be entered in red ink and all debits in black ink.

The names of officials of a company should not be signed by their clerks to certifications, receipts or orders, unless duly authorized, notice of which should be filed wherever such signatures are to be accepted as authentic. The name of the clerk should be signed in full; thus, if a division superintendent's clerk signs for him, the signature of such clerk should be given in full underneath the name of the superintendent. This rule applies to vouchers, various persons bills, pay rolls, time tickets, letters of advice, requisitions, invoices and kindred documents, and should be rigidly observed in order to avoid delay and embarrassment.

In order to expedite work, books should be, so far as practicable, opened before they are needed, i. e., before the accounts for the preceding month are closed. This will expedite the work and lessen the labor of the office at the time when it is particularly pressing. Thus, the bulk of the headings likely to appear in the distribution books for labor and material may be inserted in advance.

The papers and records of a company should be kept written up and carefully filed from day to day, so that in the event of accident or sickness to employes, the work can be clearly and intelligently taken up and carried forward by new men.

* The accounting officer will make final disposition of the items thus credited.

An impression should in each and every case be taken in the copy books of all letters, telegrams, invoices, requisitions, pay rolls, statements, distribution books, etc.

When a stub or record is attached to any document, it should be written up at the time in every instance, as contemplated, so that an account of the document may may be on file in the office where it is issued, for use or reference when required.

No bill or account should be accepted as correct until it has been examined. This examination should be particular, including rates, extensions and footings. In the event of error, correction should be made and the maker of the document notified.

The books, papers and records of a company are required to be kept so long as they may be useful or are needed to protect the interests of a company, or to elucidate the affairs of those who manage its interests. When no longer needed they should be forwarded to the general storehouse. The material thus received should be brought upon the books the same as other old material at its value; a full description of the same, including the name and address of the person from whom received, should be given in every case. Its value should be credited to the account originally charged.

Storekeepers should not absent themselves from their business without the permission of their superior officer. Their duties require their presence continually at their storehouses, and they should not absent themselves therefrom without provision being made for the performance of their duties.

Any request from public authorities or otherwise, for information in regard to matters connected with material, labor or other affairs of a company, should be referred to the head of the department in interest for instructions.

In view of the fact that it is impossible to wholly separate expenditures from matters of a general nature, storekeepers and others interested will find it necessary to study the rules and regulations governing other departments of the service.



In reference to the disbursements and expenses of a company along its line and at shops and storehouses, traveling auditors should see that the rules of a company governing its disbursements are faithfully and fully observed. To enable them to do this intelligently, it is necessary that they should familiarize themselves with the duties of storekeepers and timekeepers.

They should make an examination of the affairs at each shop or storehouse in their territory as often as once every three months, and a report* of such examination should be forwarded to headquarters.

* See Form No. 50, Appendix E.

# CHAPTER VIII.

## FISCAL REGULATIONS CONNECTED WITH VOUCHERS AND OTHER PAYMENTS, INCLUDING INTEREST ON BONDS, SINKING FUNDS, ETC.

[NOTE.—As this chapter directly concerns disbursements, it finds an appropriate place here. Much of it concerns the station agents of a company, who have little to do with expenditures generally. I have accordingly incorporated the bulk of it in the book "Fiscal Affairs; Collection of Revenue," which relates almost wholly to the duties of agents.]

VOUCHERS.—A voucher is a certificate of indebtedness issued by a company, giving the name and residence of the payee, the particulars of the claim, and the amount thereof.

Each voucher should recite the name and address of the payee, and should give a detailed statement of the purpose for which it is made, and the date and amount. It should show upon its face, or in the place designated under the filing, the account or accounts to which it is chargeable.

All papers or correspondence that belong to or are in any way necessary to explain the reasonableness or authenticity of a voucher should be attached to it. All the facts in relation to it should be explained either upon its face or in the papers that accompany it.*

A voucher† is required to be made for material purchased; for service performed for a company when not

Many companies make a copy of the original voucher; the copy they use in making the payment; the original they file away with the papers attached. There are many things in favor of this plan. I have, however, always been accustomed to use the original voucher in paying, and that is the plan outlined in my books.

† See Form No. 48, Appendix E.





embraced in the pay roll; for amounts due for injuries, damages, property bought or expense incurred on the company's behalf. Vouchers should be made in favor of the person, firm or corporation to whom the company is indebted. In case of amounts due the national or state governments, counties, cities, townships, villages, and the like, vouchers should be made impersonally in favor of the official entitled to receive the money, thus: Treasurer of the United States; Treasurer (or Collector) of Greene County, Iowa, etc.

Vouchers for material should give the items in detail, and the prices for each, the date of purchase being specified. Vouchers for labor should contain a statement of the time worked, the place, rate and date. Vouchers for expenses should give each item, date and place, so far as possible.

In paying vouchers it is not always convenient or practicable to read the papers attached; consequently transfer orders may be overlooked, unless a notation is made on the back of the voucher calling attention to them. In the event, therefore, that an order is attached, the fact should be noted by the person making the voucher.

Vouchers should, so far as possible, be embraced in the month in which the debt is incurred.

Errors in name or initials of payee, place of residence, description of claim or amount thereof, cause much inconvenience, and are the occasion of expense and delay in the payment of the account. They are also liable, at any moment, to involve a company in loss if not discovered and corrected in time. Mistakes of this kind are frequently the result of ignorance or inadvertence upon the part of the maker of the voucher, but more often the result of carelessness. It is highly important, therefore, that especial care should be exercised in making vouchers to see that the name of the payee as given is technically correct, and, if necessary, vouchers should be withheld by the maker until satisfactory inquiries in this respect can be made.

Accounts against a company should receive immediate attention from all through whose hands they pass. Vouchers should be made promptly; should be entered on the day received, and should be approved for payment without being held longer than necessary to verify their accuracy. Finally, they should be paid on the day on which they reach the disbursing agent of a company, unless business reasons prevent. The greatest promptness should characterize the making, auditing and paying of bills; delay in such matters evinces lack of attention or proper business methods; it inconveniences and, in many cases, seriously embarrasses the parties in interest. If for any reason those whose duty it is to certify to or approve vouchers should withhold their signatures, they should forthwith notify the official or agent of the company with whom the voucher originated, so that the embarrassments to the service likely to be occasioned by absence of such knowledge may be avoided.

Each voucher should be given a number. It should be entered at the headquarters of a company.*

Cases will sometimes arise of such urgency as to require money to be paid in advance of the auditing of a voucher to cover the same. When this is done the money thus advanced should be charged to the official of the company who receives and disburses it, but no

* I would suggest a register for this purpose. See Form No. 3, appendix, book "General Fiscal Affairs." Vouchers should be entered in consecutive order. The register on which they are entered should contain a brief account of each bill, number, name of payee, character of claim, amount, and the thing to which it is chargeable. At the end of the month a statement should be drawn off from this register, showing the total amount of vouchers entered and the things to which they are chargeable, giving the name and amount of each charge. A similar statement is required to be drawn off from the various persons register. These statements may be entered in one book (see Form No. 5, appendix, book "General Fiscal Affairs"); one, the entries for vouchers, being a history of debts incurred for material and other things; the other, a history of credits. The two statements being thus brought together in one book, only the balance or difference between the debits and credits need be posted on the general books.



payment should be made in advance of auditing except under rules and regulations established beforehand by the proper officer.

In the event any portion of the money advanced under the foregoing rule is reconveyed into the treasury, it should be credited to the account charged.

For such portion of it as may be disbursed, a voucher should be made by the official making the disbursement in favor of the person or persons to whom it is paid; the receipt of such person or persons should be attached to such voucher.

Vouchers made on account of money advanced should be credited to the person charged with the advance. On the face of all such vouchers the person making the same should note in red ink that it has been paid, giving the name of the person by whom paid, thus: "Paid by Charles Murray, Sup't." A similiar notation should be made on the back of the voucher, underneath the filing. The notations should be plain and conspicuous, so as to prevent duplicate payment.

In entering on the "journal of audited vouchers" a bill that has already been paid, the fact of its having been paid should be noted on the journal in every case, giving the name of the person by whom paid; this will enable the accounting officer to prevent duplicate payment in the event the fact that the voucher has already been paid should be overlooked by the treasurer.*

Paying Vouchers.—Vouchers are required to be approved by the proper officer before being paid.

In order to systematize the payment of local expenditures connected with the working of the property, including the paying of vouchers, pay rolls, claims and balances of every kind, such payments are made directly from the office of the treasurer or under his direction.

* The foregoing refer more particularly to disbursements of cash by officers of a company in settlement of claims and similar matters, and must not be confounded with the rules and regulations governing bills paid by station agents in advance of vouchers being made therefor, given further on.

Before paying a voucher or delivering a check, the payee should be called upon, whenever practicable, to state specifically the amount and nature of his claim. His ability to do so will serve in a measure to identify him and is, moreover, corroborative evidence of the correctness of the account. It will, in addition, enable a company, without the knowledge of the payee, to correct any mistake that may have occurred in auditing whereby too much may have been allowed, either through duplication of the account or otherwise.

Vouchers payable at or near an agency are oftentimes sent to the agent to pay in currency. When the amount is large, or beyond the ability of the agent to pay out of the receipts for one day, it is better to send the money with the bill. If, however, an agent should be inadvertently asked to pay a voucher that the proceeds of his station do not render possible without waiting to accumulate cash (and thus discontinue his remittances), he should advise the treasurer of the facts in the case and await his instructions and not hold his collections.*

Vouchers sent agents to pay and not called for or paid within thirty days should be returned to the treasurer, with a statement of the reason why not paid, except when checks or drafts are sent with vouchers, in which case they should be returned within ten days.

When more than one voucher is sent to an agent at one time, they should be paid as fast as the receipts of the station will permit and should be remitted from day to day, as fast as paid, without waiting for the whole lot to be disposed of.

Vouchers should be remitted by the first express after they are paid.

In the event vouchers are sent to the wrong agent to pay, they should be returned forthwith by express.

The signature to the receipt at the bottom of a voucher should be exactly the same in every particular as the

* One reason for this, and a good one, is that to hold his receipts would be to break the line of remittance, whereas I have always believed that the gross sum collected each day should be remitted daily.



name of the person or persons to whom the voucher is payable; unless this is the case, credit cannot be allowed the agent for paying the same.

Vouchers should be receipted by the person or persons to whom they are payable, or by someone known by the agent to be authorized to collect the amount and receipt therefor. In paying vouchers to persons holding orders, agents should see that vouchers are receipted by the person or persons to whom the order is payable, attaching the order to the voucher in every case. Agents are held strictly responsible for vouchers paid to unauthorized persons.

It will sometimes be necessary for the treasurer to pay money to an attorney or other agent of a company, to enable such attorney or agent to satisfy some claim decreed by the courts, or otherwise. In such cases the disbursing officer will take the receipt of the attorney or agent for the money thus paid. This, however, is merely preliminary. When the money is finally paid by the attorney or agent to the person or persons to whom it belongs, a receipt therefor should be taken. This receipt should be filed with the one already rendered to the disbursing officer by the attorney or agent. When a receipt from the person or persons to whom the money is finally paid cannot be secured, as sometimes occurs when money is paid to the officers of the courts, then all the facts connected with the payment should be recounted and placed on file in lieu of a receipt.

When the payee of a voucher cannot write, the agent or cashier of a company cannot act as witness if the voucher is paid by him.

Duplicate receipts, if any are attached to a voucher, should be receipted, dated and returned with it.

Agents should not permit papers attached to vouchers to be detached. Such papers are necessary to the completeness of the voucher and should not, therefore, be disturbed. They are, moreover, as a rule, confidential in their nature, and should not be inspected or read by the payee of a voucher, except when attached for his information.

After paying a voucher, the agent should stamp it in a plain, legible manner (on the same date) with the station stamp, directly under the filing on the back of the voucher. This is evidence that it was paid by him.

In the event a voucher or check is lost, a company should require in every instance a good and sufficient bond of indemnity to be filed by the payee before issuing a duplicate. Great care should therefore be taken to protect vouchers and checks.

No unaudited voucher or account should be paid except upon the authority of the treasurer, and not then except in extreme cases, to meet the emergencies of business.

Great trouble and risk are sometimes experienced in the payment of vouchers in consequence of their not being made in favor of the right person or persons. In some instances the initials of the payee are wrong; more often, however, the name is given incorrectly; in case of corporations and firms, names are transposed, or the vouchers are made in the name of individuals. When an error of this kind is discovered, payment should be stopped until the voucher can be corrected. Money should never be paid except to the person or persons named in the instrument.

When it is found that an error has been made in the amount or name of the payee of a voucher or check sent to an agent to pay, such voucher or check (or both) should be returned to the treasurer unpaid, with a statement of the facts in the case, so that the matter may be corrected.

Under no circumstances is it permissible for an agent to change or deface a voucher or check in any way.

If, for any reason, payment is not to be made to the person in whose name a voucher is made, the fact should be noted on the face of the bill, also on the back of the voucher underneath the filing, giving the reason therefor and the name of the person to whom the money is to be paid. This indorsement (except in the case of transfer orders attached) should be signed by the person



or persons certifying the voucher and should be satisfactory in every respect to the treasurer, otherwise payment should be withheld awaiting satisfactory explanation.

In paying vouchers to persons holding orders, the order should be attached to the document in each instance, and the person holding it made to sign in lieu of the principal. But it should not be forgotten that a company is averse to accepting orders save for good and *bona fide* reasons. It prefers to treat directly with the principal.

Gas Bills.—In order that a company may avail itself of the advantage arising from the custom of illuminating companies of discounting their bills on condition of prompt payment, the following expeditious method of providing for their settlement is suggested:

Bills that accrue at shops, stations and department headquarters should be certified to and forwarded immediately to the division superintendent for approval. He should enter them in his distribution book under the head of "Vouchers chargeable to storekeepers," and charge the proper operating expenses. He should then stamp and forward them without delay to the agent most conveniently located, for payment. After they are paid by the agent they should be stamped on the back with his station stamp on the date paid, and forthwith remitted to the treasurer as cash.

When no discount is allowed for immediate payment, such accounts should be treated the same as other bills. Officials in charge should see that bills are paid promptly and that the company receives the benefit of the discount allowed.

The treasurer may (to avoid a multiplication of bills) bring together into one voucher all bills of the foregoing nature paid in any one month.

Payment by Agents of Bills Due by a Company before they are Audited and Approved.—No agent should be authorized to pay any bill, voucher, certificate of discharge, or other evidence of debt against a company, except under established rules, on accounts duly audited and approved.

In the event, however, it should become necessary in the course of business for an agent to pay money in advance of the approval of the document, it may be done upon the written direction of the treasurer, or, in an emergency, on the written order of a general approving officer of a company.

In such cases the agent should be directed to make the payment and take a receipt therefor, holding the latter, with the order directing the payment, until a voucher can be audited relieving him of the charge.

This voucher should be prepared without delay, in the department in which the claim originated, and should be made in the name of the person to whom the money is paid.

This voucher should pass through the same channel as other vouchers, and be treated, so far as the methods of approving and auditing are concerned, as if unpaid.

On the back of said voucher, however, under the proper filing, the maker should plainly note in red ink, "Paid by Blank agent at Blank station," a similar notation being made on the face of the voucher.

When money is paid in this way, the receipt, taken by the agent should describe the purpose of the payment.

This receipt should be technically legal in form.

Afterward it should be stamped with the station stamp.

When the approved voucher reaches the agent, the receipt should be attached thereto by him; also the order.

The voucher should then be remitted without delay, as the rules prescribe.

Whenever a payment is directed to be made otherwise than by order of the treasurer, the latter should be forthwith notified of the fact; but no such order should be issued except in the absence of the treasurer, and to meet an exceptional and imperative necessity.

Cancellation of Vouchers.—Up to the time the books are closed, and the statement of audited bills entered upon the general books, any error in the amount



of a voucher may be corrected, or the voucher itself may be canceled and withdrawn from the register of vouchers by simply canceling the entry on such register. Afterward, no correction is possible; if an error has been made in the amount, the instrument should be formally canceled and a new voucher made.

When it is desired to cancel a voucher after the books are closed, it should be forwarded to the accounting officer, so that the cancellation may be made on the books in due form.

Vouchers requiring to be canceled after the books are closed should never be torn up or destroyed, as they are required for filing.

In the event it is necessary to cancel a voucher, the request therefor should be noted on the back, underneath the filing, with the reason given. This should be signed officially.

In case a new voucher is required, the person making the original bill should, if practicable, be called upon to make the same.

In canceling vouchers, the amount should be credited to the account originally charged.

When vouchers which have been charged to "material" are canceled, an entry should be made on the distribution book of the storekeeper who accounted for same, in the following manner: The amount of the vouchers canceled should be deducted from the total amount of "Vouchers chargeable to storekeepers" for the month, and the operating or other accounts first charged with the vouchers should be credited.

When it is desired to cancel or change a voucher before the books are closed, it should be referred back to the various officials upon whose books it appears, so that they may cancel or change the entry thereon.

Specific reference should be made in the distribution book to each voucher or various persons bill canceled, and the reason for cancellation given. Notice should be given by the accounting officer monthly of all vouchers and bills to be canceled, and no cancellation

entries should be made on the distribution books other than for the vouchers or bills reported by the accounting officer.

TAKING RECEIPTS — HOW INDORSEMENTS SHOULD BE MADE AND RECEIPTS SIGNED.—Receipts to vouchers, acknowledgments for money, property, or other consideration, and all indorsements on the back of time tickets, orders, drafts, checks, etc., should correspond in every particular with the name of the principal or person or persons in whose favor the instrument is made. For instance, if a document is made in favor of "James Carcliff," a receipt or indorsement cannot be accepted signed by "James Carkliff." The practice of the United States Government in the case of vouchers, drafts and checks is founded on correct methods, and should be observed in connection with all such documents. It is as follows:

"The name of the payee, as indorsed, must correspond in spelling with that on the face of the warrant; no guaranty of an indorsement, imperfect in itself, can be accepted. If the name of a payee, as written on the face of a warrant, is spelled incorrectly, the warrant should be returned for correction."

Vouchers may be paid upon the presentation of an order properly drawn by the payee or by the legal and binding representative of such payee. The authority should in every case be securely attached to the voucher.

Documents in favor of corporations should be signed by the duly authorized agent or officer of such corporations, the name and title of the person being given in full in every instance.

Signatures should be witnessed in all cases by some responsible person when the payee is not personally known.

Indorsements by mark cannot be witnessed by an agent or cashier if the acknowledgment is for moneys paid by him.

When a payee cannot write he should make his mark in legal form in lieu of a signature. This mark should



be witnessed by some responsible person personally knowing the payee.*

Checks, drafts, notes, bills of exchange and kindred documents, should in all cases be indorsed by the payee. Orders cannot be accepted in such cases.

Those who make payments are held strictly responsible for the *bona fide* character of the receipt or acknowledgment and the payment of the money to the proper person or persons.

Drafts or checks cashed by agents or accepted by them should be indorsed according to the rules and regulations made especially for such cases.

Checks and drafts received by agents in the regular course of business, which are to be remitted, should be indorsed payable to the order of the bank to which they remit, in form, as follows:

"Pay to the order of
.....Bank.....
.....Railway Co.
By.....Agent, Rochester."

This indorsement should be made immediately upon receipt of the document, so that, in the event it is lost, it cannot be misused.

Checks and drafts should be drawn to the order of the collecting agent (as an agent), and before being remitted should be stamped as directed and formally indorsed by him.

In the event an agent should, in the regular course of business, accept checks or drafts not drawn to his order as agent, or made payable to his order, they should nevertheless be indorsed by him, as above, so that his responsibility may always appear, and the misuse of checks prevented.

Indorsements made on time tickets, checks, drafts or other paper remitted by agents, should give the name of the station at which the agent is located.

* In form as follows: his
Richard X Roe.
mark.
Witness: John Smith, Chicago, Ill.

Indorsements should, if possible, be made by the agent, and not by his clerk; exception will be made to this rule when the cash is practically or formally in charge of a cashier.

Indorsements should be technically and legally perfect.

All time tickets, vouchers, gas bills, freight bills and similar documents remitted by agents should be stamped by them with the station stamp on the date they are paid.

The foregoing rules and regulations apply more particularly to receipts to vouchers and indorsements on checks, drafts, notes, time tickets and kindred documents. They are equally applicable, however, to receipts of consignees for freight and for advances made by a company, and for transactions of every kind wherein the public is concerned; also to receipts given by agents and others for charges on freight and collections of every description.

Signatures should never be inserted with a stamp. Some distinguishing mark or name should be written with pen and ink.

It should be remembered that the signing by one person for another is not binding unless duly authorized, and whenever a person signs for another, the name of the person signing should be given. If a person having power of attorney signs, he should attach to his signature "Attorney in fact;" if he signs as trustee, administrator, agent or otherwise, the fact should be duly stated beneath his signature. It is the duty of the agent or official who accepts such signature to satisfy himself at the time that the person signing is duly qualified.

It should be kept constantly in mind by all who pay money that while it is easy for them to assure themselves of the creditability of those to whom they pay before the transaction occurs, it is often difficult or impossible afterward. Men are ever willing to substantiate their right to receive money, if required to do so before the transaction. Afterward they are indifferent in many cases, and the burden of proof rests with the payer instead of the payee.



METHOD OF ACCOUNTING FOR INTEREST ON BONDS—HOW COUPONS SHOULD BE TREATED WHEN PAID; HOW FILED—METHOD OF ACCOUNTING FOR INTEREST ON REGISTERED BONDS.

The method of accounting for interest payments on registered bonds is very simple compared with the methods devised for recording the payment of interest on coupon bonds.

In the former case the financial officer makes a certified statement of his disbursements for this purpose, and the accounting officer, after satisfying himself as to the authenticity of the same, allows the necessary credit.*

While there are numerous methods of accounting for coupons redeemed, the following may safely be observed:

When a coupon is paid, the officer paying it should cancel it by punching it at least twice; this will prevent the possibility of its reappearance upon the street.

As a rule coupons reach a company through the various local banks and collecting agencies. All the coupons presented by each party or agent should, after cancellation, be inclosed in a separate envelope, and upon the face of this envelope should be written the name of the payee, the date of payment, the names of the mortgages from which the coupons have been detached, the number of coupons presented for each mortgage, the gross amount of such coupons, and, finally the total amount paid. A history of each transaction will thus be preserved temporarily in its entirety for reference. This information, as may readily be supposed, will be invaluable afterward in adjusting accounts, verifying payments and satisfying inquiries.

* In many cases he has countersigned the checks with which the interest was paid.

After payment is made all the envelopes containing coupons, together with a detailed statement of the same, should be turned over to the accounting officer for examination and record. Upon their receipt the latter officer should proceed to verify the contents of the different packages and satisfy himself of the correctness of the accompanying statement in which the aggregate payment is given. The foregoing facts being determined, he should file away the various coupons received. A good plan for this is as follows: A record book is provided for the coupons of each class of bonds; the filing upon the back of the book specifies the name of the mortgage; the first page corresponds to bond number one, and so on through the book. The amount of the bond is specified at the head of the page. Each page is divided into as many squares, or blanks, as there are coupons attached to the bond; the blanks also correspond in size to the coupons. Each blank space on the page is numbered, and if the bond has fifty years to run, and the interest upon it is payable semi-annually, there are one hundred blanks provided—two for each year. The coupon maturing first is pasted in blank number one, the second in blank number two and so on. The blanks in the book that are unoccupied represent at a glance the coupons that are outstanding. The aggregate of the outstanding coupons is the amount of the company's liability for unpaid interest on its past due coupons. It is thus not only easy to ascertain precisely the aggregate liability, but it can also be determined readily for the different classes of coupons.

The plan is simple, economical and effective. The financial officer delivers up the canceled coupons before receiving credit for their payment. After his accounts are verified the canceled coupons are pasted in the book by the accounting officer, in the manner described, and in such form and with such system that reference can be made in an instant to any particular coupon that has been paid.

Under this method of accounting any attempt to foist a spurious coupon upon a company could not possibly remain undetected, no matter how perfect the counterfeit might be, for the reason that when the time came for filing it away the person performing this duty would find the place allotted to that particular coupon already filled; or, if the spurious coupon were paid before the genuine, then it would occupy the place of the latter in the file. In either case the counterfeit would be quickly detected.



The foregoing method of accounting for paid coupons affords, in the multitude of checks it enforces and suggests, the maximum amount of security attainable at the least possible cost.

There should be no connection between the person who pays the coupon and the person who audits the account of the payor and pastes the coupon in the record. The person who draws off the balance sheet of outstanding (overdue) coupons and balances it with the company's books so incidentally verifies the accuracy of the statement that every coupon claimed to have been paid has actually been paid.

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## SINKING FUNDS—ACCOUNTS TO BE OPENED ON THE BOOKS THEREFOR.

In the first place, specific accounts should be opened on the general books of a company with each particular sinking fund, and to such accounts should be charged or credited, as circumstances require, each particular installment.

In order that the exhibits of a company may show a full and clear record of the sinking funds, the following rules are suggested:

When sinking fund installments are charged against revenue they should be embraced in income account in the month in which they accrue without reference to when they are paid, and such amounts should be carried on the credit side of the balance sheet under the head of "Accruing sinking fund installments." This item will of course disappear when the installments are paid.

The amounts so paid should be shown on the balance sheet as an asset under the head of "Amount deposited with trustee of sinking fund;" and on the opposite side of the balance sheet an account should be opened with "Sinking fund installments paid;" the former account representing the amount of cash or bonds, as the case may be, in the hands of the trustee, and the latter the amount of income used for paying such sinking fund installments.

When sinking fund installments are not charged against revenue, the aggregate amount of the sinking fund will appear on the credit side of the balance sheet under the head of "Past due sinking fund installments;" on the opposite side of the balance sheet an account should be opened to be known as "Unpaid sinking fund installments." Both of these items will disappear with the payment of the sinking fund, and the amount so paid will appear upon the debit side of the balance sheet as an asset under the head of "Amount deposited with trustee of sinking fund."

When bonds that are paid into a sinking fund, or bonds of a company owning the sinking fund which are purchased with cash payments to said fund, remain uncanceled, such bonds should appear upon the credit side of the books and in the accounts as "Live bonds in the hands of trustee of sinking fund;" these latter should of course be withdrawn on the books and in the exhibits from bonds outstanding.

When bonds paid into the sinking fund, or bonds of a company owning the sinking fund which were purchased by the trustee with cash payments to such fund, are canceled, the outstanding bonds should be reduced upon the books and in the accounts by a corresponding amount, and no canceled bond, whether in the sinking fund or elsewhere, should be embraced as an asset or liability upon the books or in the accounts.

When it is desired to recapitalize bonds that have been purchased for the sinking fund and canceled, the process, so far as the accounts are concerned, should be the same as when the securities were first issued, viz.: the amount of the bonds or stocks issued should be credited as outstanding, cash being charged with the proceeds of same.



When bonds paid to satisfy sinking fund requirements, or bonds purchased with cash payments to said sinking fund, remain uncanceled and continue to draw interest, the trustee should be charged with all such interest received under the head of "Trustee of sinking fund account accretions from investment of installments;" and on the opposite side of the balance sheet an account should be opened, to be known as "Accretions from investment of sinking fund installments."

When sinking funds are paid in cash or uncanceled bonds, the amount of such cash or bonds appears, as described above, as a debit until the obligation for which the sinking fund is credited is finally retired. When this event transpires, the accounts "Amount deposited with trustee of sinking fund" and "Trustee of sinking fund account accretions from investment of installments" should be credited, and "Live bonds in hands of trustee of sinking fund" charged with that portion of the sinking fund represented by bonds of the issue for the benefit of which the sinking fund was created which the trustee cancels and returns the company. The balance of the sinking fund, if any, represented by bonds of other classes or cash, or both, as the case may be, being returned to the company by the trustee, should be added to its assets, the amount being credited in the same manner as stated above for canceled bonds returned by the trustee, i. e., to the accounts, "Amount deposited with trustee of sinking fund" and "Trustee of sinking fund account accretions from investment of installments."

In the event the payments made to the sinking fund were charged to income, the amount of same, together with all accretions from their investment, should be transferred back to income account from "Sinking fund installments paid" and "Accretions from investment of sinking fund installments," respectively. These entries close the different accounts.

By accounting for sinking funds as described, the exhibits of a company will always show at a glance the amount of all funds in the hands of the trustee belonging to the sinking fund; how much of same represents respectively payments made to the fund and accretions to it from investment of such payments; and also what amount of payments, if any, were charged against income.

# CHAPTER IX.

## RAILWAY CONSTRUCTION AND CLASSIFICATION.

Construction properly embraces the original or first cost of a property; all disbursements, expenses, costs, commissions, salaries and debts incurred in connection therewith or incident thereto; the accruing interest on the amount invested while the property is in course of construction and before it is opened for business; all disbursements and losses suffered in the sale or disposal of bonds, shares, securities, or assets, the proceeds of which are used in its purchase or development; all expenditures on account of its rights, franchises and appurtenances. These constitute the first cost of a property.*

In the event of the abandonment of any portion of a property, the amount derived from its disposition or sale is a credit to construction.

* There can be no difference of opinion as to what constitutes railway construction; as to what is properly chargeable to construction and what is properly chargeable to operating expenses. The practices of railways, however, differ in such matters, and for good cause. Items that one railway will charge to construction and capitalize, another road will charge to operating expenses and pay for out of income. The reasons for these practices are founded upon the necessities of the case and good business judgment. The rules that animate railway managers in such matters are too complex to be discussed here; I have referred to them at considerable length in the book "Financing, Constructing and Maintaining."

After a property is opened for business, nothing can properly be charged to construction except additions or betterments. No structure, work or addition should be embraced under the head of construction, except to the extent that it adds to the original, the said structure or work being in the nature of an accession, and not intended to replace something of a similar nature, worn out or destroyed at the same place or in the immediate vicinity; thus, if it is intended to erect a building where no building before existed, all labor, material and money expended thereon is properly chargeable to construction, and so on for new platforms, stockyards, fences, grounds and other outlays. Additions, enlargements, improvements and necessary changes, also all improvements, additions, extensions or accretions that add to the first cost of a property constitute construction. These embrace the implements and utensils used as well as realty and other property. If, for instance, it should be found necessary to increase the capacity of a coal house by making the building longer, wider or higher, the building would be just so much more valuable, and the cost of enlarging the same would be a proper charge against construction. The same principle holds good in reference to new tools and machinery, new side tracks built, additional yard grounds acquired, new buildings, platforms and fences erected, and so on.

The cost of remedying any defects in consequence of a property not having been constructed in a first-class



manner in the first place, is a proper charge against construction.

In charging construction with the cost of additions, enlargements or betterments, it should be kept in mind that only that which adds something to what before existed is thus chargeable. It may cost more to repair or renew a structure than the original cost, nevertheless, the whole cost thereof should be charged to operating expenses, unless the structure has been improved or enlarged in the process. If in renewing a pile bridge or culvert, the structure is lengthened, the added length is a legitimate charge to construction, although the structure may not be of a more permanent character than the one originally constructed. But in determining what amount shall be charged to construction in such a case, the cost of the thing replaced should be first deducted; thus, if the added length of a bridge is charged to construction, the cost of the roadbed it replaces should be deducted from the charge to construction.

The principle which should be observed in all cases is not to charge to construction more than the added cost that may be incurred in the betterment of a property, or the adjustment of the same to the varying necessities of business, or the correction or remedying of structural changes caused by the vicissitudes of weather or climate.

The cost of removing an old structure, preparatory to the erection of a new one, is a proper charge against construction in the event the removal is precipitated by the necessity of enlarging or improving the structure. If the removal is because of its being worn out, or is in the nature of necessary repairs and renewals, the expense of removal should be charged to operating expenses, even though an enlarged or improved structure is erected in its place.

The value of the improvements to a property, if in the process of improving no additional expense is incurred, should generally be charged to operating expenses. Thus, if in the manipulation of a property a superior

article of metal is used and it does not cost more than that which it replaces, it is not customary to charge anything to construction.*

After a property has been opened for business, the cost of working the same and the wear and tear attending its operation (including all repairs and renewals) are chargeable to operating expenses. But so long as a property is not formally opened for business, or is only used in the handling of construction material, all the expenditures attending its operation are chargeable as a part of the cost.

### CLASSIFICATION OF CONSTRUCTION ACCOUNTS.

The following classification of construction accounts describes the various sources of expenditure that enter into the construction of a railway, and the additions, enlargements and betterments that attend its operation after being opened for business.

Great care is required to be exercised in the classification of construction accounts to see that charges are entered under their proper headings. The classification given below describes the general accounts into which the items that make up the construction account are merged. For the uses of railroads, however, it is required that an account should be opened with each second track, building, platform, bridge, fence, siding, or other piece of construction work. At headquarters, charges to these sub-accounts are merged

* This rule, while generally observed, will be understood to be nominal only. A company has the same right to the value of its improvements, and to derive advantage therefrom in increased income, that an individual has whose property is heightened in value and earning power by the improvements he make.



into the general construction accounts in which they belong. The location and identity of work should be accurately described in every instance by the local accountant, and the details of each charge given in order that such charges may be properly distributed to the general construction accounts.

The general construction accounts of railroads are as follows:

Ballasting.—This item covers the cost of ballasting, including material and labor, embracing, incidentally, such items as cost of loading and unloading ballast alongside of track.

Block Signals.—To this account should be charged the cost of electric appliances and other material for block signals; also the labor performed and expenses incurred in placing same in position.

Board of Construction Force.—This item is intended to cover expenditures on account of the board of men engaged in construction work, not otherwise provided for. It includes expenses on account of boarding cars, camps and houses, and the bedding, groceries, provisions and material and supplies used therein; also the wages of cooks, helpers and others. Collections for board or lodging that are a proper set-off against amounts charged to this account should be credited to it.*

Bridges, Trestles and Culverts.—This account embraces the cost of material used, labor performed and expense incurred in the construction of all bridges and trestles erected to carry tracks over streams, ravines, streets, or other railroads, and culverts, both substructure and superstructure. This account should include abutments, piers, supports, draw and pier protection,

* For method of accounting for these collections, see rules and regulations in chapter on "Miscellaneous Accounts Against Persons."

machinery to operate drawbridges, masonry ends and wing walls for culverts, cost of inspection of bridge material, either at shop or site of structure, cost of tests, cost of wing dams, cribs, or ice-breakers for the purpose of regulating the current of a stream or breaking up ice jams before reaching a bridge; also labor and material used in painting structure.*

In case "false work" is furnished by the company for erection of bridge superstructure, the cost of same should be charged to this account, and when removed the value of the material removed should be credited to this account and charged to the account benefited.

Buildings, Furniture and Fixtures.—This account includes material used, labor performed and expense incurred in the construction of buildings.

In order to comply with the requirements of the classification adopted by the Association of American Railway Accounting Officers, charges to this account should be classified under the following sub-headings, viz.:

(*A*) Station Buildings and Fixtures.—Includes all station buildings, platforms, sidewalks, excavation, foundation, drainage, water, gas, and sewer pipes and connections, steam heating apparatus, stoves, electric light and power fixtures, including wiring for same, grading and putting ground in order after building has been finished; electric bells, elevators, and all other material, furniture, or fixtures used to complete the building; wells for water supply of stations, also salaries and expenses of engineers and architects.

Note.—This account should include the cost of similar buildings on docks, wharves and piers, when used for station purposes.

(*B*) Shops, Roundhouses and Turntables—Includes all buildings to be used as shops (including transfer

* The different classes of structures covered by this account and the principal articles of material used in their construction are set forth in detail under the analogous operating expense account. The account known as "road crossings and signs" should not be confounded with this.



tables), or roundhouses (including cinder and drop pits), and turntables; plants for heating the buildings; platforms, sidewalks and outhouses in connection therewith; oil houses, sand houses, storehouses for company's material, scrap bins; also the cost of preparing grounds before and clearing up same after construction, foundations, painting, excavation for and lining turntable pit and of cinder or drop pits inside or outside of roundhouses; foundation for turntable; loading, unloading and placing turntable in position, levers and stops for handling turntable; sewerage system, connection with water supply system, shop wells, architects' fees for drawing plans, supervision of construction by engineering department or others; and all incidental expenses. This account does not include the cost of tracks laid in connection with these buildings.

(*C*) Water Stations.—Includes water stations for the purpose of supplying locomotives with water, also windmills, pumps, boilers, pumphouses, tanks, tubs, tank foundations, track tanks or troughs, engines and all fixtures and pipes, standpipes or penstocks and connections, wells, dams, and reservoirs or cisterns in connection therewith; also engineering expenses and tools used in the work. This account does not include waterworks, wells, etc., exclusively for supply of stations, hotels, tenements or section houses, which should be charged to the appropriate accounts.

(*D*) Fuel Stations.—Includes coal platforms, coal sheds, coal pocket chutes, woodsheds and racks, and all machinery or appliances necessary to equip them for service. It also includes inclines at fuel stations (except the cost of track laid thereon), tipple cars, buckets, cranes for handling same, elevating machinery, gasoline or other engines for operating same, dumping machinery, all appliances for weighing coal in pockets and opening coal pockets, architects' fees, engineering, etc.

(*E*) Grain Elevators.—This account includes the cost of ground on which elevator is located, cost of foundations, elevator building, conveyors, fixtures, and

machinery complete. This account does not include the cost of small storage elevators at way stations, which are considered to be station buildings.

(*F*) Storage Warehouses.—This account includes the cost of ground on which storage warehouses are located, and cost of buildings, machinery, etc., complete

The buildings herein referred to are not the ordinary freight warehouses or stations where freight is received for shipment, etc., but warehouses in which merchandise is stored, and which the railway or others operate as warehouses.

(*G*) Miscellaneous Structures.—This account includes structures of every character, which are permanent or a betterment to the property and enter into the cost of road, and which are not otherwise herein particularly referred to, and for which no account has been provided; the object being to designate one general classification, to which may be charged the cost of all minor superstructures, and in this way avoid increasing the number of general accounts.

Clearing and Grubbing.—This account includes the cost of preparing the right of way for grading, including the removal of trees, brush, shrubbery, boulders and similar matter.

Construction Supply Depots.—This account is intended to cover the cost of handling construction supplies after their purchase. It includes the wages of storekeepers, assistants, timekeepers, watchmen and laborers employed in this connection; it embraces the cost of loading, unloading, watching and handling material at depots of supply, the cost of unloading the same on the line, and the cost of temporary side tracks, platforms and storehouses required in the handling of construction material.

The cost of handling material after being unloaded at the point where designed for use is chargeable to the object for which unloaded.

Construction Trains.—This account embraces the expenses of construction trains, including wages of engineers, firemen, wipers, dispatchers, conductors, brakemen and other trainmen; also cost of temporary water stations, fuel sheds and engine houses; charges for use and repairs of equipment, cost of fuel, oil, waste and other supplies used on locomotives and cars employed in construction trains.



Discount.—To this account should be charged discounts suffered from the sale of securities, the proceeds of which are used for construction purposes or which have been acquired in connection with construction work; also discount suffered in the disposal of securities issued to take the place of those used in the construction of a property.

Reversely, any premiums derived from the sale of securities, such as those described, should be credited to this account.

Docks and Wharves.—This account includes the cost of docks and wharves, landings and appurtenances thereunto belonging, such as piling, sheet piling, wale timbers, cap timbers, bracing, filling, dredging, planking, paving and the labor and expense incident thereto. It does not, however, include the cost of track appurtenances, rails, ties, spikes, etc., laid on docks and wharves.

Electric Light Plants.—This account includes the cost of all labor and materials used to put in operation either arc or incandescent light plants, such as dynamos, engines or running dynamos, wire constituting lines, glass globes, carbon or arc lights, carbonized filament for incandescent lights, poles, hangers for lights, insulators, and every expense incidental to the erection of the plant. When it is necessary to erect a building for an electric light plant, the entire cost of the same, including ground, should be charged to this account.

Electric Motive Power Plants.—This account includes the cost of ground on which electric power stations are located, and the cost of erection of power houses and car sheds, including all expenditures for labor and material, stationary engines, boilers and machinery, pumps, condensers, foundations and settings

for steam plants; generators, foundations and settings; switchboard and lighting apparatus for electric plants; current conductors, including poles, wires and labor for overhead work, third rails, fastenings for same and labor laying same, with cost of inspecting, loading and unloading; feed wires, track-bonding and grade-crossing cut-outs; and all other expenditures connected with the installation of plants intended to generate and distribute electricity for motive power.

Engineering.—This account includes the salaries and expenses of engineers and their assistants engaged in surveying, locating and attending to the construction of new lines and extensions, including camp expenses, board bills paid by the company, etc.

Exchange.—This account embraces expenditures for local and foreign exchange and charges appertaining thereto on account of funds used for construction purposes.

Fences.—This account embraces the cost of all material and labor used in constructing board, wire, rail, hedge, stone, or other fences along the right of way or limits of roadbed. Fences constructed around stock yards, fuel stations, station grounds, shops, and on other properties outside of right of way, should be charged to their appropriate accounts. The cost of permanent or portable fences for protection of tracks from snow should not be charged to this account, but to "Miscellaneous Structures."

Frogs and Switches.—This account includes the cost of all frogs, switches and switch material, including switch stands (throw or lever), frog guard rails, crossing frogs and timber, bolts, etc., used in foundations or base for same.

Gas-making Plants.—This account includes the cost of all labor and material, used to put into operation a gas-making plant complete. The cost of ground on which plant is located should also be charged to this account.

Grading.—This account includes expenditures for grading the track, yards and station grounds, including



wages of excavating gangs, cost of ditching, and opening and widening cuts, etc. It also includes the cost of stone, brush, or other material used to protect the track; also cost of labor performed in riprapping and all expenses incidental to this account.*

Interest.—This account embraces interest accruing on the securities of a company, or on moneys used by it for construction purposes, up to the date the property is opened for business.

Interlocking Switches.—This account includes the cost of interlocking switches and appurtenances; also labor performed and expense incurred in placing the same in position. An account should be kept with each group, i. e., with the system worked from a particular switch tower.

Legal Expenses.—This account includes the amount of all attorneys' salaries, fees and expenses, and all other incidental legal expenses incurred during the process of construction of a road, except when the expenses can be charged directly to the account for which it is incurred.

Miscellaneous Expenses.—This account includes expenses on account of construction, not otherwise provided for herein.

Miscellaneous Track Material.—This account includes the miscellaneous material used in the track (not including rails and ties) not otherwise provided for herein, embracing angle bars, chairs, bolts, fish and tie plates, mile posts, nails, nut locks, padlocks, spikes, staples, tool houses, whistling posts and boards, guard rails for switches, etc.

It also includes the tools of track and gravel train men, hand cars, dump cars, scrapers, ditchers, etc.†

* Where riprapping occurs in connection with the construction or protection of a bridge, culvert, or wharf, it should be charged accordingly.

† In the event the cost of side tracks is kept separately from the cost of main tracks, a separate account should be opened for sidings. A similar rule should be followed in regard to other accounts.

Rails.—This account embraces the first cost of iron and steel rails, including cost of inspecting.

(Mem.—Rails laid in sidings are merged in the cost thereof.)

This account also represents the difference in cost between metals of different degrees of quality or weight, according to the general rules governing construction. Thus, if a heavier quality of metal is inserted in the track in place of lighter metal at an added cost, or if metal of a higher quality is inserted at an added cost, construction may properly be chargeable with the difference.

Reversely, if lighter or poorer metal is inserted in the track, construction should be credited with the difference in cost.

Real Estate.—This account includes the real property purchased or acquired by a company for other than right of way, station, or terminal grounds, or other specific purpose, including all expenses connected therewith.

"Real Estate" will be understood to mean land not immediately connected with a property, or essential to it, or the handling of its traffic; off the line of road; occupied by general or other offices; land which a company has abandoned, or which it does not need or will not need; property separate from the road and not essential to its operation.

Right of Way.—This account includes real property purchased or acquired for right of way purposes, including legal and other expenses in connection therewith, and will be understood to mean the ground upon which the track is laid, including that on either side thereof; also grounds occupied by stations, yards, sidings, shops, roundhouses, water stations, fuel depots, warehouses, elevators, docks, wharves, etc.; and land used in connection with the operation of a property or necessary to the handling of its traffic, not otherwise specifically provided for by this classification.

Road Crossings and Signs.—This account includes the cost of material used, labor performed and expense



incurred in the construction of public and private highway crossings, whether said crossings are made at grade or above the track; also all the special expenditures attending the conveying of a highway under the track, or rendered necessary thereby.

Expenditures on account of cattle guards should also be charged to this account.

It also includes the cost of erecting gates and signs at road crossings, or incidental thereto.

Rolling Stock.—This item includes the cost of locomotives and cars; also the cost of improving the equipment of a company, such as the substitution of Westinghouse brakes and Miller platforms for common brakes and platforms; also the addition of vestibules, air signals and steam heating apparatus to passenger cars, and automatic couplers and air brakes for freight cars, and similar charges, except as otherwise provided for herein.

The value of furniture, fixtures and tools used upon rolling stock should be included as part of its cost—everything, in fact, needed to fit the locomotive or car for actual service.

Shop Machinery and Tools.—This account embraces shop machinery and shop tools, including tools used in roundhouses.

Sidings.—This includes the cost of ditching, filling, grading, ballasting, track material (including rails and ties), the laying of the latter; also the cost of bridges, culverts, cattle guards, and all expenses connected with the construction of sidings and the yards appertaining thereto, including the connecting of the track with the main line.

Note.—In order that the charges to "Sidings" may be distributed according to the classification adopted by the Association of American Railway Accounting Officers, referred to below, it will be necessary that all such charges be kept in detail under the respective construction accounts provided in this classification.

Stationery, Bonds, Shares and Other Forms.—This account includes the cost of stationery, blanks, books,

forms and similar matter necessary to equip a property; also the cost of engraving and printing bonds, indentures, certificates of shares, scrip, checks, notes, and other obligations or evidences of debts used in raising or handling money for construction purposes, or that under the rules is chargeable to construction; also payments to trustees and others for services in signing, registering, recording, etc., and for all other expenses connected with the things covered by this account.

Stock Yards.—This account includes the cost of stock yards and the buildings, gates, fences, flooring and fixtures that appertain to such yards.

Telegraph.—This account includes the cost of telegraph and telephone lines and cables, and all appurtenances thereto belonging, including instruments and plants; also any accretions or betterments that may occur, subject to the rules governing construction charges.

Ties.—This account includes the first cost of road, bridge, switch and other ties, including cost of inspecting same and amounts paid for stripping off the bark, etc.

The same principle in regard to construction charges applies in this as in all other cases. Thus, if metal ties or creosoted ties should be substituted for others of an inferior quality at an increased cost, such increased cost would be a proper charge against construction.

Tracklaying and Surfacing.—This account includes the cost of handling track material after it is unloaded on the ground for use, including the laying of the ties, the placing of rails thereon, spiking, splicing, labor putting in frogs and switches, cost of putting in ballast, surfacing and lining track, and other work attending tracklaying.

Transportation of Material—This account includes transportation charges on construction material.*

*It is customary to add all charges paid to other companies by a company buying the material, to the price of the goods. "Transportation of Material" should, therefore, only be debited with the charges from the point where delivered to the company buying the same. The customs of railroads differ in regard to adding local freight charges to cost of construction.



Transportation of Men.—This account embraces charges for the transportation of men employed in construction work.*

Tunnels.—This account embraces the cost of tunnels, including the digging, boring and arching, and the brick, stone, cement and other material used in connection therewith, including draining; but it should not include track material, ballasting, etc.

Contra—Construction Earnings.—What a company earns while its property is in course of construction, and before it is formally opened for business, should be credited to construction, if the cost of conducting the traffic has been charged to construction. It is not proper if the expense has not thus been charged.

The foregoing classification is such as in the opinion of the writer the practical needs of railways require in their everyday operation. However, differences arise here as elsewhere in matters of this kind. The Interstate Commerce Commission, desiring to enforce a uniform classification throughout the United States, asked the Association of American Railway Accounting Officers to prepare such a schedule. The result of their work is given below. It differs in some respects

Upon some lines transportation is charged on all construction material; on others it is charged only on material used in the construction work of new lines and extensions. The question is fully discussed in the book "Economical Purchase, Care and Use of Material," in which the practices in vogue are fully set forth and the effect thereof stated.

*The customs of railroads differ in regard to charging for transportation of men engaged in construction work. Upon some lines transportation is charged for men engaged on all construction; on others it is charged only for forces employed on the construction work of new lines and extensions. The question is fully discussed in the book "Economical Purchase, Care and Use of Material", in which the practices in vogue are fully set forth and the effect thereof stated.

from the classification shown above, but the difference is more apparent than real, as one may be merged in the other. The classification devised by the Accounting Officers is admirable, and, so far as information is required by the government, perfect. I have made provision for subdividing it, not because it is not clear or perspicuous, but simply to afford railroad owners and officers a more minute itemization. The classification adopted by the Accounting Officers is as follows, viz.:

1. Engineering.
2. Right of Way and Station Grounds.
3. Real Estate.
4. Grading.
5. Tunnels.
6. Bridges, Trestles and Culverts.
7. Ties.
8. Rails.
9. Track Fastenings.
10. Frogs and Switches.
11. Track Laying and Surfacing.
12. Ballast.
13. Station Buildings and Fixtures.
14. Shops, Roundhouses, and Turntables.
15. Shop Machinery and Tools.
16. Water Stations.
17. Fuel Stations.
18. Fencing Right of Way.
19. Crossings, Cattle Guards, and Signs.
20. Interlocking or Signal Apparatus.
21. Grain Elevators.
22. Storage Warehouses.
23. Docks and Wharves.
24. Electric Light Plants.
25. Electric Motive Power Plants.
26. Gas-Making Plants.



27. Miscellaneous Structures.
28. Telegraph Lines
29. Legal Expenses.
30. Interest and Discount.
31. General Expenses.

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### DETAILS OF ACCOUNTING IN CONNECTION WITH CONSTRUCTION WORK.

When a new line or extension is completed, the construction material that remains unused along such line or appertaining to it, with the transportation charges that have accrued thereon, should be carefully inventoried by the storekeeper in charge, after which he should invoice the same in detail to the local storekeeper assigned to take charge of it. The amount thus turned over should be credited to the account originally charged.

Construction accounts should be designated on distribution books and vouchers in the manner best likely to indicate their character and location, as say: "Construction of Blank depot, Blank division," or "Enlarging Blank coalhouse, Blank division," or "Extending platform, Blank station, Blank division," or "Improving depot grounds, Blank station, Blank division," or "Enlarging stock yards, Blank station, Blank division." In every case the designation should be so full and clear that the character of the charge may be accurately understood at headquarters, including location and other details, without further research or inquiry.

A separate account should be opened with each sidetrack constructed.

When sidings are constructed in common with the main line, and the cost of each cannot be separately determined, it will be understood to be the average of the whole, after taking into consideration any special charges that may characterize the cost of either.

Upon old lines it would be well to keep a record of the actual number of lineal feet of new sidings laid and

taken up each month, so that, at the end of the fiscal year, or whenever desired, an accurate report may be rendered by the person having charge of such accounts, of the total number of lineal feet laid in excess of the number of feet taken up, or *vice versa*.

An account should be opened with each locomotive or car constructed at a company's shops, as say, "New locomotive, No. 510, in course of construction."*

When a lot of locomotives or cars is in course of construction at the same time, and material and labor are being expended in common upon them, an account should be opened with the lot, as say, "New box cars, Nos. 982, 984, 986, in course of construction."

When a locomotive or car is completed, written notice of the fact should forthwith be sent to the accounting officer, giving the particulars and cost corresponding with the amount charged on the distribution books.

Each construction account that it may be necessary to open should not only be charged with the material, labor and other expense directly expended upon it, but it should also be charged with all expenditures incident to it, not otherwise provided for.

A separate account should be opened with each structure in the following cases, viz.: For each building, bridge, culvert, viaduct, dock, wharf, fence, group of interlocking switches, piece of real estate or right of way; for each locomotive, car, siding, telegraph and tunnel.

In order to enable the accounting officer to keep himself advised of construction work in progress, and to distinguish between expenditures that should be charged to operating and those that should be charged to construction, a monthly return* of all new work should be made to him; if a new building is in course of construction, the fact should be stated; if it is being added to, improved, enlarged or rebuilt, the facts should be precisely given. The report should give the estimated cost of the proposed work; if it is to replace another structure, the original cost of such structure should be given, or if not known, the estimated cost thereof, with the name of the person making the estimate. If the work is an enlargement, improvement or addition, the nature of the betterment should be stated and what proportion of the same (if any) should be charged to operating expenses.

The greatest care is required to be exercised at all times to prevent charges being made to construction that belong in operating expenses, or *vice versa*.†

* Inasmuch as rolling stock is seldom completed in the month in which the construction work is begun, the accounting officer should charge the expenditures monthly to a suspense account named "Rolling stock in course of construction," giving in detail the charges on each lot. Upon the completion of each lot he should transfer the total expenditures on the same from "Rolling stock in course of construction" to "Rolling stock."



* See Form No. 49, Appendix E.

† In order to avoid the confusion and labor that attend the opening of a construction account for petty additions, enlargements or improvements, and for other reasons, no charge is made to construction upon many lines for expenditures for merely nominal sums, all such improvements, additions, extensions and enlargements being charged as an operating account. The petty construction items that are treated in this way are those that are incurred subsequent to the original outlay, upon an old or completed line; thus, if after the lapse of a considerable period some slight addition, improvement, extension or enlargement is made to a building or other belonging of a company, it is charged as an operating expense. In the construction of new lines and extensions, however, charges are made to construction without reference to the amount.

# CHAPTER X.

## OFFICIAL CLASSIFICATION OF OPERATING EXPENSES.

The accompanying classification is the work of railway officers and the various railroad commissions of the United States. It is Official. It took effect July 1st, 1894. It is the outgrowth of twenty years' agitation. The Interstate Commerce Commission pledges itself that, so far as it is concerned, it is final. This is a great point gained. A poor classification is much better than a good one that is all the time being tinkered. Changes not only prevent comparisons, but the expense they entail is out of all proportion to the advantages they afford.*

The operating expenses of a road include the cost of working a property and maintaining the same; they embrace the wages of men engaged in conducting the

* The particularity that is observed in specifying exactly what belongs under the various accounts or headings that follow is due largely to the railway commissioner from Michigan; the author of this book prepared for him the classification, substantially, as embodied herein. Its official adoption and recognition by him made its adoption general. The great amount of research and labor that attended this exposition is amply repaid by the uniformity of accounts that it insures, as every storekeeper, timekeeper and official connected with the expenditures of railroads knows, by reference to it, exactly where every item of expense should go in the accounts.





business, including cost of repairs and renewals and all expenses incident to the operation and maintenance of a property. They should be divided under the subjoined heads in the order given.

Charges should be entered in the month in which they occur. When this is impossible, then as soon afterward as the amount can be ascertained.

In the event the classification of an expenditure is not known, it should be charged under an analogous head.

The utmost care should be exercised in classifying and apportioning expenses. If improperly done, the management is misled and the property suffers; if, on the other hand, it is accurately performed, it affords a reliable basis for intelligent investigation and comparison, and the correction of irregularities and extravagances.

The classification of expenses is as follows:

### MAINTENANCE OF WAY AND STRUCTURES.

Repairs of Roadway.—This account includes all expenditures for account of the roadbed and track (except cost of rails and ties), cost of loading and distributing rails and ties along the track, labor expended in cutting, slotting and drilling (when done by trackmen), laying rails, ties and other track material; sloping cuts, blasting rocks and widening embankments, gathering old rails and scrap material, repairing and keeping tunnels in order, clearing track of snow and ice, cutting and removing weeds, brush and grass from a company's right of way, plowing fire guards along track; proportion of salaries and expenses of civil engineers, superintendents of tracks, resident or division engineers, their clerks, draftsmen and other attendants, use and repairs of instruments (when not chargeable to construction), and wages of roadmasters, their clerks, section foremen, track laborers, track watchmen, gravelpit men, work-train engine and trainmen, and men employed in operating steam shovels, scrapers and piledrivers, and ditchers while engaged in track renewals and repairs; also cost of fuel, water and

other supplies used on work-train engines and cars; and cost of oil, tallow and waste used on track (except oil used in switch lamps, which should be charged to "Station Supplies").

It includes cost of ballast of all kinds; preparing, delivering and putting same into track; also quarry, gravel and sand pit rights and privileges (except cost of land), fixtures, tools and other articles used in connection with the track, rail fastenings, semaphores, switch stands and fixtures, "block" and other systems of road or track signals, interlocking plant, grade crossings of electric and steam railways (provided they are not street railways), signals and other appliances pertaining thereto; tools and implements of trackmen and gravel pit men; fuel and light, water, ice and other supplies used in connection with the track, or in section houses, tool houses, watch houses, work trains while engaged in maintenance of roadway, etc., not otherwise provided for; riprapping, piling and piers (except around bridges and buildings), retaining walls, dykes and breakwaters made to protect track, and labor and material used in protecting river banks and keeping track clear in cases of freshets and washouts; cost of boarding men at washouts; snow sheds and snow fences, and also the cost of filling trestles with earthwork (except when properly chargeable to construction).

When a track is taken up, the labor expended therefor should be charged to this account, whether another track is laid to replace it or not.

The following is a list of the more important articles used in connection with repairs of roadway, viz.:

Adzes,
Adz handles,
Axes,
Ax handles,
Augers,
Ballast,
Base plates,
Bolts,
Braces and bits,
Brooms,
Brush hooks,
Bumper posts,
Cable wire,
Cant hooks,
Chains,
Chairs,
Chisels,
Claw bars,
Crow bars,
Curbing hooks,
Dippers,
Drawing knives,
Drills,
Fish or angle plates,
Fish or angle plate bolts,
Flags,
Frogs,
Gravel,
Grindstones,
Hammers,
Hand trucks,
Hatchets,
Hoes,
Jack levers,
Lanterns and fixtures,
Levels,
Lining bars,
Lumber,
Nails,



Nippers,
Nuts,
Nut locks,
Oil,
Oil cans,
Padlocks,
Picks,
Pike poles,
Pinch bars,
Plows,
Punches,
Rail braces,
Raising bars,
Ratchet drills
Riprap,
Rope,
Saws,
Scrap boxes,
Scythes,
Semaphores,
Shovels,
Sledges,
Spades,
Spikes,
Spike mauls,
Spot boards,
Splices,
Squares,
Staples,
Stone,
Stone drills,
Stoves and fixtures,
Straightening machines,
Switches, fixtures and appurtenances,
Switch ropes (when used in repairs of roadway),
Tamping bars,
Tapelines,
Tie plates,
Timber,
Tongs,
Tool boxes,
Torpedoes used by track repairers,
Track gauges,
Track jacks,
Velocipedes,
Vises,
Washers,
Washer irons,
Water barrels,
Water kegs,
Water pails,
Wheelbarrows,
Whetstones,
Wire,
Wrenches, etc.

Renewals of Rails.—This account includes the cost of rails, laid in main track or tracks, sidings, spurs, gravel and repair tracks; in tunnels, depots, shop and other yards, shops and other buildings; on turntables, piers, wharves, track scales, inclines, bridges, trestles and culverts; to and from coal chutes, coal pockets, fuel or water stations, etc., less the value of the old rails taken up; also the cost of inspection and transportation. Cost of guard rails should be charged to this account.

Renewals of Ties—Operating.—This account includes the cost of cross and switch ties laid in main track or tracks, sidings, spurs, gravel and repair tracks; in tunnels, depots, shop and other yards, shops and other buildings, etc.; on turntables, piers, wharves, track scales, inclines, bridges, trestles and culverts; to and from coal chutes, coal pockets, fuel or water stations, etc.; also the cost of inspection and transportation.

Repairs and Renewals of Bridges and Culverts.—This account includes all expenditures for account of repairs and renewals of bridges, trestles and culverts, both substructure and superstructure; it should include cost of all bridges built to carry the tracks over any valley, stream, road, street, or other railroad; expenses of locomotives, work trains, pile drivers, etc., also cost of tools used while engaged in making such repairs;

cost of repairs and renewals of piers, abutments, retaining walls, drain pipes, riprapping, dykes, etc., necessary to protect or strengthen bridges and culverts against ice, water, etc.; and the cost of cleaning the channel under bridges and culverts.

It includes also the wages of supervisor of bridges, expenses of his office, bridge foremen, bridge watchmen, bridge tenders, etc.; supplies used in operation of bridges, such as brooms, lanterns, oil, oil cans, pails, tallow, waste, water barrels, etc.; and fuel for stationary engines at drawbridges. The cost of removing old bridges preparatory to the construction of new, and the cost of temporary or false work used in repairs or renewals of bridges and culverts are chargeable to this account.

The following are the principal classes of structures coming under this account, viz.:

*Bridges.*—Steel, iron, wood (Howe truss, combination, trestle or pile).

*Culverts.*—Stone or brick, arch; iron; earthenware, iron or ordinary piping; open culvert.

The following is a list of the more important articles of material used in connection with bridges and culverts, viz.:

Bolts,
Brick,
Cables (iron and hemp),
Castings,
Cement,
Dowels,
Iron,
Iron braces,
Iron hangers,
Iron thimbles,
Iron rods,
Lag screws,
Lime,
Lumber,
Nails,
Nuts,
Paints,
Piles,
Riprap,
Sand,
Spikes,
Stone,
Timber,
Wood screws,
Wrought washers, etc.

Repairs and Renewals of Fences, Road Crossings, Signs and Cattle Guards.—This account includes all expenditures for account of repairs and renewals of right of way fences, street railway and road crossings, overhead bridges for streets, roads, other railroads, street railways or any other purpose, roadways running under track, viaducts (foot and wagon), crossing drains, all signs (except station signs), whistle posts, slow boards, stop boards, mile posts, etc.; crossing gates, cattle



guards, hedges, street repairs or sewers for which a company may be assessed or become responsible (excepting crossings within the limits of station and shop grounds, which are chargeable to "Repairs and renewals of buildings and fixtures"), and tools used by employes in making such repairs and renewals.

Repairs and Renewals of Buildings and Fixtures.—This account includes all expenditures for account of repairs and renewals of all *buildings* used in connection with the operation of a road.

It includes wages or proportion of wages of the officer in charge of repairs of buildings, expenses of his office, cost of excavation, foundations, drainage, water, gas and sewer pipes, and stationary fixtures, appertaining thereto; heating and lighting plant, apparatus and fixtures; fences around station grounds, stock and fuel yards, shops and other buildings; cisterns and wells for station and other buildings; grading, sewerage, laying out and improving grounds around stations, shops and other buildings, paving yards adjacent to buildings, street paving and repairs for which a company may be assessed, when such repairs are on streets adjacent to stations, shops and other buildings (otherwise such repairs should be charged to "Repairs and renewals of fences, road crossings, signs and cattle guards"); also the expense of removing old buildings, preparatory to the construction of new.

The following is a list of the structures referred to above:

Baggage rooms,
Boarding houses for section men,
Breakwaters for protection of buildings,
Dry houses,
Dwelling houses,
Eating houses,
Elevators,*
Engine houses,
Express buildings,
Fire engine houses,
Fuel houses,
General offices,
Grain cribs,
Grain warehouses,
Hand car houses,
Ice houses,
Inclines for fuel and other purposes,
Oil houses and tanks,
Outhouses,
Permanent signal station buildings,
Platforms,
Rail mills,
Roundhouses,
Sand houses,
Scrap houses,
Section houses,
Shops of all kinds,
Shop and Station grounds and yards (draining, filling, etc.),
Sidewalks,
Stables,
Stationary engine houses
Station houses (passenger and freight),

* Except elevators, the net earnings of which are excluded from Freight Revenue.

Stock pens,
Storehouses,
Switch houses,
Telegraph Offices,
Turntables,
Warehouses,
Watchhouses,
Water stations.

The expense of repairs and renewals of *furniture* and *fixtures* used in buildings included under this head, not otherwise provided for herein, should also be charged to this account. Some of the more important of these items are as follows:

Awnings,
Carpets,
Chairs,
Clocks,
Coal boxes,
Counters,
Cranes (steam, hand and mail),
Curtains,
Derricks,
Desks,
Ice boxes,
Lighting fixtures,
Looking glasses,
Mats,
Matting,
Office railings,
Pigeon hole cases,
Racks,
Safes,
Scales (track, warehouse and platform),
Settees,
Shelving and other fixtures,
Signs at stations,
Stationary engines,
Stoves and stove furniture,
Tables,
Ticket cases, etc.

Expenditures for the following items, when used in repairs or renewals of water stations, should be charged to this account, viz.:

Boilers and machinery for pumping engines, cisterns, hydrants, pipe lines, pipes, ponds, pumping engines, pump fixtures, pumps, springs, tanks, towers, tubs, wells, windmills, etc.; also the expenses of protecting pipes and of prospecting for water supply.

Expenditures for the following items, when used in repairs or renewals of buildings used for fuel houses or sheds, should be charged to this account, viz.:

Chutes, coal bins, coal buckets, cranes, derricks, pockets, screens, wood racks, etc.; also dumping, hoisting and other machinery, and the necessary tools in connection therewith.

Repairs and Renewals of Docks and Wharves.—This account includes all expenditures for account of repairs and renewals of docks, wharves, piers and inclines thereto, jetties, etc., and of repainting the same; also the expense of operating pile drivers, tugs, barges, floats, dredges, mud scows, etc., while engaged in making such repairs and in dredging to preserve proper depth of water.

Repairs and Renewals of Telegraph.—This account includes all expenditures for account of repairs and renewals of the telegraph and telephone lines owned by a company, or for which it is responsible, including poles, wire, insulators, instruments, battery jars, switch boards and appurtenances, telegraph signs, telegraph tables, climbers and all other appurtenances in connection therewith forming a part of the plant; also the wages of employes engaged in keeping the line in working condition, the cost of their tools, and proportion of the salary and expenses of superintendent and assistant superintendent of telegraph, clerks and expenses of their offices.



Stationery and Printing.—This account includes all expenditures for stationery, stationery supplies and printing, including books, blank forms, etc., used in connection with "Maintenance of way and structures."

Other Expenses.—This account includes incidental expenditures only; that is to say, such expenditures in connection with the "Maintenance of way and structures" as are not properly chargeable to any of the foregoing accounts.

### MAINTENANCE OF EQUIPMENT.

Superintendence.—This account includes the salaries and expenses of the superintendents of motive power and car departments, auditor of motive power and machinery, master mechanics, master car builders, general foremen and their clerks, and attendants; also incidental expenses of their offices, such as fuel, light, etc.

Repairs and Renewals of Locomotives.—This account includes all expenditures for account of repairs and renewals of locomotives, tenders, snowplows (when attached to locomotives), and furniture, loose and movable tools, and supplies used in connection therewith.

It also includes the cost of locomotives, tenders and appurtenances thereunto belonging, built or purchased to make good the original number charged to construction or equipment, including royalties for patents, steam and other power brakes and brake fixtures, less the value of old material, insurance or repayments from other roads.

The following is a list of the more important articles used in connection with repairs and renewals of locomotives, viz.:

Air brakes,
Air brake fixtures,
Arch pipes,
Arm rests,
Ash hoes,
Ash pans,
Ash pan rods,
Bar (buggy),
Bar (pinch),
Bar (plugging),
Bar (slash),
Bells,
Bell bases,
Bell cords,
Bell cord hangers,
Bell yokes,
Blower cocks,
Blower pipes,
Blow off cocks,
Boilers,
Bumpers,
Bumper blocks,
Bumper sheets,
Brakes,
Brake shoes,
Branch pipes,
Brasses,
Brooms,
Cab angle irons,
Cab brackets,
Cab curtains,
Cab cushions,
Cab fronts,
Cab handles,
Cab lamps,
Center castings,
Center pins,
Chafe irons,
Check castings,
Check chambers,
Check valves,
Clocks,
Coal grates,
Counter balances,
Coupling bars,
Crank pins,
Cross heads,
Cross head pins,
Crown bars,
Crown bar braces,
Crown sheets,
Cylinders,
Cylinder casings,
Cylinder cocks,
Cylinder cock rods,
Cylinder heads,
Cylinder rings,
Dampers,
Damper handles,
Decks,
Domes,
Dome casings,
Dome covers,
Drag irons,
Drag pins,
Drawbars,
Drawbar castings,
Driving axles,
Driving boxes,
Driving box brasses,
Driving box collars,
Driving box wedges
Driving wheels,
Dry pipes,
Eccentrics,
Eccentric rods,
Eccentric straps,
Equalizing levers,
Equalizing springs,
Exhaust pipes,
Expansion clamps,
Extension front ends,
Feed pipes,
Feed pipe cocks,
Feed pipe hangers,
Feed pipe hose,
Feed pipe shaft,
Fire boxes,
Fire box doors,
Fire box grates,
Fire bricks,
Fire pumps,
Flagstaffs,
Flues,
Flue sheets,
Footboards,
Frames,
Frame braces,
Front ends,
Front end doors,
Front end rings,
Front end timber,
Gaskets,
Gauge cocks,
Gibs,
Glands,
Glass gauges,
Gongs,
Goose necks,
Grate bars,
Grate shakers,
Guide bars,
Guide blocks,
Guide braces,
Guide yokes,
Hammers (hard and copper),
Hand hole plates,
Hand rails,
Hand rail pedestals,
Headlights,
Headlight brackets,
Headlight fixtures,
Headlight pedestals,
Heater cocks,
Heater pipes,
Hose,
Hose jackets,
Hose reels,
Injectors,
Injector nozzles,
Inclines,
Jacket bands,
Jacket lagging,
Jacks,
Jack screws,
King pins,
Lamps (steam and water gauge),
Lazy cocks,
Levers,
Link blocks,
Link lifters,
Lubricators,
Oak packing,
Oil can stands,
Oil cups,
Oil house cups and brasses,
Oil pipes,
Packing hooks,
Packing iron,
Packing rings,
Pet cocks,
Pet cock rods,
Petticoats,
Petticoat pipes,
Pilots,
Pilot braces,
Pilot draw castings,
Piston follower heads,
Piston heads,
Piston packing pumps,
Piston rods,
Pokers,
Pump barrels,
Pump cages,
Pump chambers (top and bottom),
Pump plungers,
Pump valves,
Quadrants,
Quadrant stands,
Reach rods,
Reverse latches,
Reverse levers,
Rocker arms,
Rocker boxes,
Rods (main and connecting),
Rod keys,
Rod straps,
Running boards,



Running board braces,
Safety beams and castings,
Safety chains,
Safety hooks,
Safety levers,
Safety valves,
Sand boxes,
Sand box bases,
Sand box casings,
Sand box covers,
Sand box pipes,
Sand box rods,
Seat boxes,
Sledges,
Slide valves,
Slide valve rods,
Slide valve yokes,
Smoke arches,
Smoke arch braces,
Smoke arch rings,
Smokestacks,
Smokestack bases,
Smokestack cones,
Springs,
Spring balances,
Spring hangers,
Spring saddles,
Stay bolts,
Steam brakes,
Steam chests,
Steam chest covers,
Steam chest hangers,
Steam gauges,
Stop cocks,
Stuffing boxes,
Swing bolsters,
Tee heads,
Tenders,
Tender brake hangers,
Tender brake hanger boxes,
Tender brake shoes,
Tender brake wheels,
Tender cocks and rods,
Tender frames,
Tender wheels and axles,
Throttle levers,
Throttle pipes,
Throttle valves,
Tires,
Tool boxes,
Torches,
Trucks,
Truck axles,
Truck boxes,
Truck braces,
Truck cellars,
Truck jaws,
Truck wheels,
Tumbling shafts,
Water gauge cocks,
Wheel guards,
Whistles,
Wire netting,
Wrenches (common, packing, air brake, spanner, rod, set screw, eccentric and injector), etc.

Repairs and Renewals of Passenger Cars.—This account includes all expenditures for account of repairs and renewals of passenger cars of all classes, including woodwork, axles, brake fixtures, brakes (hand, air and other), brasses, buffet fittings, fixtures and appurtenances, heating and light apparatus, links and pins, oil boxes, springs, trucks, wheels, windows, window fixtures, repainting, and other expenditures of a like nature; also proportion of wages of car inspectors and cost of tools used in lubricating and inspecting cars at stations and elsewhere; proportionate cost of tools used by car repairers at repair stations for making light repairs, such as jackscrews, sledges, wrenches, and other expenditures of a like nature; also repairs made to cars of other lines for damage, or payments made for their cars wrecked or destroyed on a line; furniture and fixtures of passenger cars built or purchased to make good the original number of cars charged to construction or equipment; and also the cost of passenger cars replacing those worn out or destroyed, less the value of old material, insurance or repayments from other roads.

Passenger cars may be classified as follows, viz.:

Baggage,
Business,
Chair,
Combination (passenger and baggage),
Dining,
Express,
Emigrant,
Mail,
Milk,
Officers',
Parlor (drawing room),

| | | |
|---|---|---|
| Passenger (all classes), | Sleeping, | Other passenger train cars. |
| Pay, | Smoking, | |
| Postal, | Tourist, | |

The following is a list of the more important articles of passenger car furniture and fixtures, viz.:

| | | |
|---|---|---|
| Bell cord, | Cuspidors, | Matting, |
| Bell cord hangers, | Drawheads, | Racks, |
| Carpets, | Ice boxes, | Seats, |
| Chairs, | Keys, | Stoves, |
| Check boxes, | Lamps, | Stove furniture, |
| Coal boxes, | Lamp fillers, | Toilets, |
| Coal hods, | Lamp fixtures, | Wash basins, |
| Curtains, | Lamp shears, | Water tanks, |
| Cushions, | Linoleum, | Window fixtures, etc. |

Repairs and Renewals of Freight Cars.—This account includes all expenditures for account of repairs and renewals of freight cars of all classes, including woodwork, axles, brake fixtures, brakes (hand, air and other), brasses, double decking cars for stock, grain doors, links and pins, oil boxes, springs, trucks, wheels, repainting and renumbering; proportion of wages of car inspectors and cost of tools used in lubricating and inspecting cars at stations and elsewhere; proportion of cost of tools used by car repairers at repair stations for making light repairs, such as jackscrews, sledges and wrenches, and other expenditures of a like nature; repairs to cars of other lines for damages, or payments made for their cars wrecked or destroyed on the line; furniture and fixtures for cabooses; and the cost of freight cars replacing those lost, worn out or destroyed, less the value of old material, insurance or repayments from other roads. It also includes all expenditures for repairs and renewals of loose or movable furniture and fixtures belonging to caboose cars.

Freight cars may be classified as follows, viz.:

| | | |
|---|---|---|
| Box, | Fruit, | Refrigerator, |
| Caboose, | Furniture, | Stock (including palace), |
| Coal, | Oil, | Water and tank (when used as commercial cars). |
| Dump (commercial, coal or stone), | Ore, | |
| | Platform, | |

Repairs and Renewals of Work Cars.—This account includes all expenditures for account of repairs and renewals of work or service cars; repairs and renewals of woodwork, repainting, axles, brakes (hand, air and other), and other fixtures, brasses, heating and lighting apparatus, links and pins, oil boxes, springs, trucks, wheels, windows, window fixtures, and other expenditures of a like nature; repairs of commercial cars when assigned to and in service of "Maintenance of way and structures" department, including cost of changes made in such cars to fit them for this service; and the expense of refitting them for commercial service.



Work and service cars may be classified as follows, viz.:

| | | |
|---|---|---|
| Boarding, | Painters, | Rail saw, |
| Bridge, | Pile driver, | Snowplows (when not attached to locomotives) |
| Derrick, | Plow and scraper, | Steam shovels, |
| Ditching, | Push, | Tool, |
| Dump, | Other work cars, | Water, |
| Gravel, | Outfit, | Wrecking. |
| Hand, | Rock crusher, | |
| Iron Shovels, | | |

Repairs and Renewals of Marine Equipment.—This account should include all material and labor necessary to maintain marine or floating equipment in efficient working order, including repairing (both ordinary and that made necessary by wrecks or accident), hull, deck, cabins, masts, rigging, sails, and other parts of steamships, steamboats, ferryboats, transfer boats, vessels, tugs, barges, car, and other floats, scows, etc.; also for repairing boilers and engines, wood foundations, bearings for machinery, wheels, rudders, shafts, steering gear, ventilators, electric plants, steam and hot water heating fixtures and appurtenances, and royalties paid for use of patents on improved machinery, raising sunken boats, etc.

The following is a list of the principal items of furniture and fixtures used in repair and renewals of marine or floating equipment, viz.:

| | | |
|---|---|---|
| Axes, | Chairs, | Desks, |
| Barometers, | Charts, | Engine furnishings, |
| Beds and bedding, | Clocks, | Fire extinguishers, |
| Blocks and tackle, | Compasses, | Flue cleaners, |
| Capstan bars, | Copying presses, | Gang planks, |
| Carpets, | Counters, | Hatchets, |

Hooks,
Life preservers,
Lines,
Linoleum,
Logs and log lines,
Matting,
Oil cans,
Pianos on passenger boats,
Pokers,
Racks,
Railings,
Safes,
Scales,
Scrapers,
Settees,
Shovels,
Splice bars,
Spyglasses,
Stoves and stove furniture,
Tables,
Ticket cases and fixtures
Tool boxes,
Tools,
Wrenches, and other analogous articles.

REPAIRS AND RENEWALS OF SHOP MACHINERY AND TOOLS.*—This account should include all expenditures for account of renewal, repairs and maintenance of boilers, stationary engines, scaffolds, shafting, belting, and other appliances for running machinery; furnaces, forges, and all machinery in car and locomotive shops, and all tools and fixtures used in connection therewith; and oil, tallow and waste used in lubricating and cleaning tools and machinery.†

STATIONERY AND PRINTING.—This account includes all expenditures for stationery, stationery supplies and printing, including books, blank forms, etc., used in connection with "Maintenance of Equipment."

OTHER EXPENSES.—This account includes all expenditures for account of gas, torches and lamps used in machinery department, shops, roundhouses, and offices, and the oil and material for the same; proportion of labor and material for the proper operation and repair

* This account may, if thought desirable, be subdivided under the following heads: "Repairs of machinery and tools," "Oil, waste and tallow used on tools and machinery."

† Small hand tools used by mechanics and soon worn out, also wages of persons in charge of same, should be charged to the account mostly benefited by their use; the expense of engine and train crews used exclusively for switching cars to be repaired, and transporting employes to and from repair shops, and the wages of engineers and firemen operating stationary engines in shops, also wages of sweepers, cleaners, roustabouts and other unskilled laborers employed on general work in and about locomotive, machine, boiler, copper, sheet iron, tin, smith, car, carpenter, paint, pattern and other shops, fuel for forges and other analogous items, should be apportioned between the different "Maintenance of equipment" accounts, on basis of relative amount of work done for the account of each.



of electric lights used in connection with other departments; cost of fuel used in heating shops, offices and stationary boilers in machinery department (other fuel used in shops being charged into the cost of manufactured material); wages paid watchmen engaged in watching machinery department shops; and all "Maintenance of equipment" expenses which cannot be properly classed under any of the foregoing heads.

### CONDUCTING TRANSPORTATION.

SUPERINTENDENCE.—This account includes all expenditures for account of salaries and expenses of general superintendents (when engaged exclusively in the operating department), assistant general superintendents, division superintendents, assistant superintendents, superintendents of transportation, masters of transportation, superintendents of car service, car accountants, train masters, traffic managers, assistant traffic managers, general freight agents, assistant general freight agents, general passenger agents, assistant general passenger agents, general ticket agents, assistant general ticket agents, general baggage agents, superintendents of express, or other officers engaged exclusively in the transportation department, their clerks, porters and attendants; also incidental expenses of their offices, such as heating, lighting, ice, water, rent, express charges, etc., provisions and other expenses of special cars when in use by such officers; the expenses of Car Service Associations should also be included in this account.

ENGINE AND ROUNDHOUSE MEN.*—This account includes wages of all engineers and firemen while engaged in running locomotives (except as otherwise directed herein), also the wages and traveling expenses of traveling engineers, and the wages of callers, watchmen and employes engaged in wiping, cleaning, firing

* This account may, if thought desirable, be subdivided under the following heads: "Engineers and firemen," "Wipers and dispatchers," "Other roundhouse laborers."

up, dumping, boiler washing, cleaning fire boxes, watching and dispatching locomotives, and all other roundhouse employes, such as smokestack inspectors, roundhouse cleaners, clinker pit cleaners (at roundhouses or on line of road), clinker dumpers, operators of turntables, etc.

Fuel for Locomotives.—This account includes the cost of fuel consumed by locomotives engaged in traffic and switching service, including freight charges on same and the wages of fuel agents, their clerks and employes engaged in handling and accounting for the same; also tools, such as wheelbarrows, shovels, picks, brooms, axes, saws, forks, oil cans, stoves and lamps; also coal and wood for heating, oil, tallow, etc., for lighting fuel stations.

Water Supply for Locomotives.—This account includes the cost of water furnished locomotives engaged in traffic and switching service, including the cost of labor and material required in operating, heating and lighting water stations; oil, waste and other supplies for operating pumping machinery; tools, etc. (when not chargeable to "Repairs of buildings and fixtures"), and amounts paid to other companies for water furnished to locomotives, water rights and privileges.

Oil, Tallow and Waste for Locomotives.—This account includes the cost of oil, tallow, waste, wool, grease, rags, etc., used in lighting, cleaning and lubricating locomotives engaged in traffic and switching service.

Other Supplies for Locomotives.—This account includes the cost of furniture, tools and other movable articles and supplies required to fully equip locomotives engaged in traffic and switching service, such as chisels, files, lampblack, packing material, sand, soap and switch keys; also axes, brooms, brushes, crowbars, flags, frogs, hatchets, jacks, lantern globes, lanterns, links and pins, matches, metal and other polishes, oil cans, picks, scoops, shovels, shunting poles, switch chains, switch ropes, tallow buckets, tin boxes for flags, torpedoes, water buckets, etc.



Train Service.*—This account includes the wages of conductors, train agents, ticket collectors, baggagemen, brakemen, train porters (not on private cars), water carriers and other trainmen.

Train Supplies and Expenses.†—This account includes all expenditures for account of heating and lighting cars, including the cost of supplying or pumping gas into cars, and oil and wicking for lanterns of trainmen; uniforms and badges for trainmen when paid by a company; laundry work for cars, icing refrigerator cars, etc.; miscellaneous supplies furnished to cars for the purpose of protection against accidents and fires, and for keeping the cars clean; bedding for stock cars; wages of car cleaners and car oilers; provisions and supplies for snowbound trains or trains delayed by washouts; trackage paid to other roads during washouts, transfer of passengers on account of defective track or bridges; also oil, tallow, waste, wool, grease, sulphur, sponges, rags, packing hooks and irons, dope buckets and other supplies used in cleaning and lubricating cars.

It also includes all expenditures for miscellaneous supplies furnished trains necessary to fully equip them for service. The following is a list of the more important train supplies, viz.:

| | | |
|---|---|---|
| Axes, | Hatchets, | Shovels, |
| Bell cords, | Ice, | Sledges, |
| Brooms, | Jacks, | Soap, |
| Brushes, | Jackscrews, | Straw and sawdust, |
| Bull's-eyes, | Lanterns, | Switch chains, |
| Candles, | Lantern fixtures, | Switch ropes, |
| Chains, | Matches, | Tallow buckets, |
| Cold chisels, | Oil cans, | Torpedoes, |
| Conductors' punches, | Packing hooks | Train tool boxes, |
| Fire buckets, | Pails, | Water buckets, |
| Flags, | Punches, | Wrenches, etc. |
| Frogs, | Saws, | |
| Hammers, | Scoops, | |

* This account may, if thought desirable, be subdivided under the following heads: "Passenger conductors," "Passenger baggagemen," "Passenger brakemen," "Freight conductors," "Freight brakemen."

† This account may, if thought desirable, be subdivided under the following heads: "Passenger train supplies," "Freight train supplies," "Oil, waste and tallow used on passenger cars," "Oil, waste and tallow used on freight cars."

SWITCHMEN, FLAGMEN AND WATCHMEN.*—This account includes the wages of yardmasters and clerks, yard foremen, yard switchmen, switch tenders, callers, watchmen and detectives, station policemen, signalmen, crossing gate keepers, crossing flagmen and track flagmen (when the service is performed in connection with "Conducting transportation").

TELEGRAPH EXPENSES.—This account includes all expenditures for account of operation of telegraph and telephones, such as rent paid for use of telegraph and telephone lines; salaries of train dispatchers, clerks, telegraph operators and messengers; traveling expenses of division and extra telegraph operators; cost of chemicals, copper, zincs and other supplies for charging batteries; fuel, light and other supplies for telegraph offices, and proportion of salaries and expenditures of superintendent and assistant superintendent of telegraph, their clerks and attendants, and miscellaneous supplies and expenses of their offices.

When an employe connected with the telegraph service also acts as station agent, clerk or in any other capacity, an apportionment of his wages should be made to these and other accounts on the basis of service rendered.

STATION SERVICE.†—This account includes salaries of freight and ticket agents in charge of stations, assistant agents, depot or station masters, assistant depot or station masters, station passenger agents, station baggage agents, assistant station baggage agents, and other officials occupying analogous positions; wages and traveling expenses of extra station agents; wages of cashiers, clerks, collectors, ticket examiners, ticket collectors and ushers, station foremen, baggagemen, station gatemen, employes in package and

* This account may, if thought desirable, be subdivided under the following heads: "Switchmen," "Flagmen," "Watchmen."

† This account may, if thought desirable, be subdivided under the following heads: "Agents," "Clerks at stations," "Laborers at stations."



parcel rooms, men attending electric lights, janitors, porters, warehousemen, freight house foremen, freight callers, tallymen, deliverymen, car sealers, weighmasters, truckmen and other laborers, employes at coal dock terminals, teamsters, messengers, scalemen, coopers, cleaners, enginemen for stationary engines used for heating and lighting purposes; also employes engaged in carrying and weighing mail, loading, unloading, bedding, feeding and watering stock; labor at stock pens and stock yards when used only as station facilities for receiving and shipping stock or feeding same while in transit, payments for transferring freight by contract or otherwise, and other analogous expenses.

STATION SUPPLIES. — This account includes all expenditures for account of heating and lighting depots, waiting rooms, freight and passenger offices, and other station buildings; supplies used for station and yard signals, switches, etc., and supplies and implements for handling freight; payments for water, sprinkling about stations, uniforms and badges for employes when paid for by a company; drayage, horses, feeding and shoeing horses, bedding, feed and water for stock at stock pens; premium on bonds of agents and other station employes, when paid by a company and other analogous items.

The following is a list of the more important articles included under station supplies, viz.:

| | | |
|---|---|---|
| Axes, | Cuspidors, | Keys, |
| Baggage checks, | Date stamps (office), | Lamps, |
| Baggage crates, | Dippers, | Lampblack, |
| Baggage trucks, | Dusters, | Lamp fittings, |
| Brooms, | Electric lights, | Lamp supplies, |
| Brushes, | Electric light supplies, | Lanterns, |
| Bulletin boards, | Extinguishers (hand), | Lantern fittings, |
| Candles, | Files (document), | Letter boxes, |
| Car seals, | Fire buckets, | Locks, |
| Chairs, | Flags, | Looking glasses, |
| Chair cushions, | Freight trucks, | Mail bags, |
| Chalk, | Gas, | Marking brushes, |
| Check boxes, | Hammers, | Marking pots, |
| Coal hods, | Hatchets, | Marline, |
| Cold chisels, | Harness, | Mats, |
| Copying presses, | Hooks, | Matches, |
| Counter brushes, | Hose, | Measures, |
| Counter scales, | Hose couplings, | Nails, |
| Cups, | Ice, | Newspapers, |
| Cupboard catches, | Ice chests, | Oil, |
| Curtains, | Ice tongs, | Oil cans, |

| | | |
|---|---|---|
| Pails, | Sponges, | Twine, |
| Platform trucks, | Sprinkling cans, | Wagons, |
| Reflectors, | Stools, | Warehouse trucks, |
| Rubber hose, | Stove black, | Wash basins, |
| Saws, | Switch chains and ropes, | Waste, |
| Scoops, | Switch keys, | Water barrels, |
| Scrubbing brushes, | Tacks, | Water bowls, |
| Shovels, | Tarpaulins, | Water cans, |
| Skids, | Ticket stamps, | Water coolers, |
| Sledges, | Tongs, | Water pails, |
| Soap, | Torpedoes, | Wheelbarrows, |
| Spades, | Towels, | Wrenches, etc. |

Switching Charges—Balance.—This account represents the net balance paid to other companies for switching cars or locomotives.

Car Mileage—Balance.* — This account represents the net balance paid to other companies, firms or individuals for use of cars interchanged on a mileage basis.

Hire of Equipment.—This account includes all payments made for use of equipment other than that accounted for under account "Car mileage—Balance."

Loss and Damage.†—This account includes charges for loss, damage, delays or destruction of freight, parcels, express matter, baggage and other property intrusted for transportation (including live stock received for shipment), and all expenses directly incident thereto; cost of repacking and boxing damaged freight and baggage, feed for delayed stock (except when delayed in wrecks), etc.; wages and expenses of employes engaged either as adjusters or otherwise, and payments for the detection of thieves; charges for damages to or destruction of crops, buildings, lands, fences, vehicles or any property other than that intrusted for transportation, whether occasioned by fire, collision, overflow or otherwise; also expenditures for account of cattle and other live stock killed or injured by locomotives or trains while crossing or trespassing on the right of way, removing and burying the same; also wages and expenses of employes and others while engaged as witnesses in cases of suit.

* This account may, if thought desirable, be subdivided under the following heads: "Mileage of passenger cars—balance," "Mileage of freight cars—balance."

† This account may, if thought desirable, be subdivided under the following heads: "Damage and loss of freight and baggage," "Damage to property and cattle."



Injuries to Persons. — This account includes all charges on account of persons killed or injured, such as gratuities and compensation paid to injured or disabled persons, their guardians, heirs, relatives and attorneys; salaries and expenses of chief surgeons, assistant surgeons, division surgeons, attendants, etc.; fees and expenses of doctors, coroners, undertakers, witnesses and others (except lawyers' fees and court expenses); nursing and hospital attendance, medical and surgical supplies, funeral expenses, railroad fares when sending injured persons home or elsewhere, and expenses of attendant when necessary; payments made for ejectment from trains, bills for board, wages and expenses of employes and others engaged as witnesses or otherwise; also wages and expenses of others occupied in connection with the adjustment of claims coming under this head.

Clearing Wrecks. — This account includes all expenditures for account of clearing wrecks, cost of labor and material required to replace wrecked equipment upon the track, and the attendant expenses of wrecking trains and wrecking tools used in connection therewith; building temporary track around wrecks reloading or transferring freight, baggage, mail, etc.; provisions, board, etc., for men clearing up or watching at wrecks, meals or board for passengers delayed on account of wrecks, feed for stock delayed in wrecks, and other analogous expenses.

Operating Marine Equipment.—This account includes all expenditures for account of the operation of steamships, steamboats, vessels, ferryboats, transfer boats, tugs, barges, car and other floats, scows, etc. (excepting boats while in use on construction work), such as fuel and supplies therefor, wages of officers, crews and all other employes rendering service on marine or floating equipment; dockage when not loading or discharging cargoes, canal lock and basin dues, rental of boats, labor pumping out boats laid up, cost of transferring cargoes in case of accident, steamboat inspection, license, customs dues, health inspection,

clearance dues, payments for towage, lighterage, etc., and any other miscellaneous expenses of a similar nature not properly chargeable to "Repairs and renewals of marine equipment."

The following is a list of the principal items of supplies chargeable to marine or floating equipment, viz.:

Axes,
Bed linen,
Binnacle lamps,
Commissary supplies,
Cooking utensils,
Flags,
Grease,
Handspikes and other tools,
Hose,
Ice,
Lamps,
Laundry,
Oil,
Planks,
Provisions,
Rags, etc., for lighting and lubricating purposes,
Shovels.
Stores,
Tablecloths,
Tableware,
Tallow,
Trucks,
Waste,
Water,
Wool, etc.

This account includes, also, all expenses for account of miscellaneous service, supplies and expenses in connection with the operation of wharves and docks, such as wages of port captains, port stewards, agents, their clerks and attendants, baggage agents, check clerks, porters, coopers, warehousemen, laborers, watchmen, longshoremen, roustabouts and other labor at wharves and docks engaged in handling freight, operating steam or other power for handling freight, etc., payments for the use of power (not furnished by a company) in loading and discharging cargoes, and all expenditures incident to lighting and heating in connection with the operation of wharves and docks.

The following is a list of the principal items used in connection with the operation of wharves and docks, viz.:

Axes,
Block and tackle,
Brooms,
Brushes,
Bulletin boards,
Chalk,
Clocks,
Coal hods,
Cold chisels,
Coopers' tools,
Crowbars,
Electric lights,
Fire apparatus,
Fire buckets,
Freight hooks,
Gas,
Hammers,
Hatchets,
Hose,
Hose couplings,
Ice,
Ice chests,
Ice tongs,
Lamps,
Lanterns,
Marline,
Marking brushes,
Marking pots,
Matches,
Measures,
Nails,
Oil,
Oil cans,
Pails,
Ropes,
Salt,
Saws,
Scoops,
Shovels,
Skids,
Sledges,
Soap,
Spades,
Sprinkling cans,
Stools,
Tacks,
Tarpaulins,
Towels,
Trucks,
Twine,
Waste,
Water,
Water barrels,
Water cans,
Water coolers,
Wheelbarrows, etc.



Advertising.—This account includes salaries and expenses of traveling passenger and other advertising agents, bill posting, etc.; cost of printing and publishing passenger time tables for general distribution, printing of advertising matter, advertising in newspapers and periodicals (excepting notice of stockholders' meeting, election of directors, publishing reports in newspapers, and other corporation and financial notices of a general character), bulletin boards, cards, cases, cords, display cases, dodgers, folders, glasses, handbills, maps, pamphlets, photographs, posters, racks and frames, tacks, views, postage and express charges on advertising matter; also premiums and donations to fairs and stock shows, immigration boards, and other analogous expenditures for attracting traffic.

Outside Agencies.*—This account includes all expenditures for accounts of salaries and expenses of agents engaged exclusively in the procurement of competitive business and employes of their offices, traveling agents and solicitors, when located on or employed off the line of a road; furniture supplies, stationery, rents, office expenses and other disbursements of a similar nature, on account of such agencies; also expenses of fast freight lines, traffic associations and other analogous items.

Commissions.—This account includes all payments to agents of other companies and outside parties, not employes of a company, in the form of commissions for services appertaining to either freight or passenger business; but should not include commissions paid to a company's own agents in lieu of salary, such being chargeable to "station service" or "outside agencies," as the case may be.

Stock Yards and Elevators.—This account includes wages, supplies and all other expenses incurred in the operation of stock yards or elevators, except stock yards

* This account may, if thought desirable, be subdivided under the following heads: "Outside agents" and "Expenses of traffic associations."

and elevators, the net earnings of which are excluded from freight revenue.*

RENTS FOR TRACKS, YARDS AND TERMINALS.—This account includes rents paid for lease of track, yards and terminals.

*Tracks.*—Under "tracks" are included all payments to other lines for rent or use of their tracks for running trains, whether by a fixed charge per month or per year, proportion of interest on valuation and expenses incurred in maintaining such track, or on a train mileage basis (not including temporary use of track, such as trackage paid to other roads in case of wrecks, washouts, snow blockades, defective bridges, etc.).

*Yards.*—Under "yards" are included all payments for use of high and low tracks, delivery tracks, repair tracks and other side tracks at points other than terminals.

*Terminals.*—Under "terminals" are included all payments for use of facilities at terminal points, including main tracks, side tracks, delivery tracks, repair tracks, freight house facilities, and proportion of payments for handling freight, union depot facilities, etc., at terminal points.

RENTS OF BUILDINGS AND OTHER PROPERTY.—This account includes all payments for rent of buildings and other property when such property is used in connection with the operations of a road, such as depot grounds and buildings, general offices, union depots, offices, docks, wharves, ferry landings, elevators, stock yards, shops, fuel yards, etc.

STATIONERY AND PRINTING.—This account includes all expenditures for stationery, stationery supplies and printing, including books, blank forms, employes' time tables, train order blanks, telegraph blanks, tariffs, tickets, way bills and other analogous items, when used in connection with "conducting transportation."

* By "stock yards," as used in this account, should be understood fully equipped stock yards operated by railroad companies, where stock is stored, fed, watered, reshipped or sold, usually at junction or terminal points.



The following is a list of the more important items chargeable to the several accounts of "stationery and printing," viz.:

| | | |
|---|---|---|
| Arm rests, | Indexes, | Pen racks, |
| Blank paper, | Ink, | Pins, |
| Blank tablets, | Inkstands, | Postage, |
| Blank cards, | Invoice books, | Pounce, |
| Binders, | Legal cap paper, | Printed cards, |
| Blotters, | Letter paper, | Printed tablets, |
| Blotting paper, | Manifold paper, | Punches, |
| Calendars, | Mimeographs, | Rubber bands, |
| Caligraphs, | Mucilage, | Rubber stamps, |
| Carbon paper, | Mucilage brushes, | Rulers, |
| Cards, | Neostyles, | Ruling pens, |
| Cardboard, | Notices, | Scrap books, |
| Circulars, | Numbering stamps, | Sealing wax, |
| Classifications, | Oil paper, | Seals, |
| Copy (impression) books, | Orders, | Shears, |
| | Paper, | Shipping tags, |
| Copying brushes, | Paper baskets, | Shorthand books, |
| Cyclostyles, | Paper clips, | Sponges, |
| Dating stamps, | Paper cutters, | Sponge cups, |
| Delivery tickets, | Paper fasteners, | Stylographs, |
| Electric pens, | Paper files, | Tape, |
| Envelopes, | Paper weights, | Tissue (impression) paper, |
| Eyelets, | Papyrographs, | |
| Eyelet punches, | Pencils, | Typewriters, |
| Erasers, | Pencil erasers, | Waste baskets, |
| Fuel tickets, | Pens, | Water holders, |
| Hektographs, | Penholders, | Wrapping paper, etc. |

OTHER EXPENSES.—This account includes incidental expenditures only; that is to say, such expenditures in connection with "conducting transportation" as are not properly chargeable to any of the foregoing accounts.

## GENERAL EXPENSES.

SALARIES OF GENERAL OFFICERS.—This account includes the salaries of general officers. The following is a list of such officers: Chairman of board, president, vice-presidents, general counsel or general solicitor, assistant general counsel or general solicitor, secretary, general manager and assistant general manager, chief engineer, general superintendent (when in full charge of operations of a road), comptroller, assistant comptroller, general auditor, auditors, assistant auditors, freight auditor, passenger auditor, purchasing agent, general storekeeper, stationer, treasurer, assistant treasurer, local treasurer, land commissioner, and receiver's fees.

Salaries of Clerks and Attendants.—This account includes salaries of paymasters, treasurer's cashiers, tax agent, traveling auditor, clerks, attendants and other employes in and about general offices; also wages of porters, cooks, etc., for special cars while in use by general officers and by general office employes, etc.

General Office Expenses and Supplies.—This account includes all expenditures for account of heating and lighting the offices of the general officers; expenses of general officers, their clerks and attendants; also all expenses incident to the care and supply of the general offices, including expenses and supplies of pay car and special cars while in use by general officers and general office employes. [The wages of engine and train crews should not be included in last item, this expense being properly chargeable to respective conducting transportation accounts.]

Insurance.—This account includes all expenditures for account of premiums for insuring property of a company, and property which is intrusted to it; also for insuring passengers and others, and employes, against accident or death.

Law Expenses.—This account includes the salaries and expenses of solicitors, attorneys, their clerks and attendants, and all expenses of their offices, such as law books, printing briefs, legal forms, testimony, reports, etc.; also fees and retainers paid for services of attorneys who are not regular employes of a company, and amounts paid to arbitrators for settlements of disputed questions, cost of suits, special fees, notarial fees, expenses connected with taking depositions, and all legal and court expenses of every kind not otherwise provided for herein.

Stationery and Printing (General Offices).—This account includes the cost of printing annual reports, blank books, blank forms, contracts, leases, bonds, stock certificates, paper, stationery, stationery supplies, etc., used only in general offices and not chargeable to other accounts.



Other Expenses.—This account includes incidental expenditures only; that is to say, such expenditures in connection with the "General expenses" as are not properly chargeable to any of the foregoing accounts; also cost of publishing notice of stockholders' meetings, of election of directors, annual reports in newspapers, of dividends, and of other corporation and financial notices of a general character; and fees and expenses paid to directors, etc.

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The official classification of operating expenses of the government of the United States and of the several state governments, given in detail in the foregoing, may be recapitulated in brief as follows:

I. Maintenance of Way and Structures.
   1. Repairs of Roadway.
   2. Renewals of Rails.
   3. Renewals of Ties.
   4. Repairs and Renewals of Bridges and Culverts.
   5. Repairs and Renewals of Fences, Road Crossings, Signs and Cattle Guards.
   6. Repairs and Renewals of Buildings and Fixtures.
   7. Repairs and Renewals of Docks and Wharves.
   8. Repairs and Renewals of Telegraph.
   9. Stationery and Printing.
   10. Other Expenses.

II. Maintenance of Equipment.
   11. Superintendence.
   12. Repairs and Renewals of Locomotives.
   13. Repairs and Renewals of Passenger Cars.
   14. Repairs and Renewals of Freight Cars.
   15. Repairs and Renewals of Work Cars.
   16. Repairs and Renewals of Marine Equipment.

17. Repairs and Renewals of Shop Machinery and Tools.*
18. Stationery and Printing.
19. Other Expenses.

III. Conducting Transportation.

20. Superintendence.
21. Engine and Roundhouse Men.†
22. Fuel for Locomotives.
23. Water Supply for Locomotives.
24. Oil, Tallow and Waste for Locomotives.
25. Other Supplies for Locomotives.
26. Train Service.‡
27. Train Supplies and Expenses.§
28. Switchmen, Flagmen and Watchmen.‖
29. Telegraph Expenses.
30. Station Service.**
31. Station Supplies.
32. Switching Charges—Balance.
33. Car Mileage—Balance.††
34. Hire of Equipment.

* Railroad companies may for their own use subdivide this account as follows: "Repairs of shop machinery and tools," "Oil, waste and tallow used on tools and machinery."

† Railroad companies may for their own use subdivide this account as follows: "Engineers and firemen," "Wipers and dispatchers," "Other roundhouse laborers."

‡ Railroad companies may for their own use subdivide this account as follows: "Passenger conductors," "Passenger baggagemen," "Passenger brakemen," "Freight conductors," "Freight brakemen."

§ Railroad companies may for their own use subdivide this account as follows: "Passenger train supplies," "Freight train supplies," "Oil, waste and tallow used on passenger cars," "Oil, waste and tallow used on freight cars."

‖ Railroad companies may for their own use subdivide this account as follows: "Switchmen," "Flagmen," "Watchmen."

** Railroad companies may for their own use subdivide this account as follows: "Agents," "Clerks at stations," "Laborers at stations."

†† Railroad companies may for their own use subdivide this account as follows: "Mileage of passenger cars—Balance," "Mileage of freight cars—Balance."



35. Loss and Damage.*
36. Injuries to Persons.
37. Clearing Wrecks.
38. Operating Marine Equipment.
39. Advertising.
40. Outside Agencies.†
41. Commissions.
42. Stock Yards and Elevators.
43. Rents for Tracks, Yards and Terminals.
44. Rents of Buildings and Other Property.
45. Stationery and Printing.
46. Other Expenses.

IV. General Expenses.

47. Salaries of General Officers.
48. Salaries of Clerks and Attendants.
49. General Office Expenses and Supplies.
50. Insurance.
51. Law Expenses.
52. Stationery and Printing (General Offices).
53. Other Expenses.

* Railroad companies may for their own use subdivide this account as follows: "Damage and loss of freight and baggage," "Damage to property and cattle."

† Railroad companies may for their own use subdivide this account as follows: "Outside agents," "Expenses of traffic associations."

# CHAPTER XI.

## APPORTIONMENT OF OPERATING EXPENSES TO THE DIVISIONS OF A ROAD.

A classification of railway expenses about which there shall be no question, about which disputes will not arise, is an impossibility. Differences may not be material. But they will occur. When we attempt to apportion expenses between particular parts of a road, we encounter still graver questions, difficulties at once inherent and insurmountable.

The suggestion that the cost of operating parts of a road might be determined separately from the whole had its origin in the practice among railway companies of making an approximate division of this kind, for the purpose of ascertaining the relative economy exercised by local officers in reference to expenses within their control. But no one advised of the situation ever attempted a division of this kind for any other purpose, or indeed for such purpose, unless based on the natural geography of a property. Companies do not, and cannot, draw imaginary lines across their roads, and apportion expenses within such lines upon an equitable basis, no matter what the object of the division may be.





Railways attempt a division of their expenses, as stated above, for purely local reasons. To do this they apportion to particular divisions on an arbitrary basis items common to all, after ascertaining that which is actual. They do this to ascertain the relative economy exercised by officers in matters which they individually control. This is the extent to which railway companies attempt to estimate the cost of operating particular parts of their properties. As, however, the question of the practicability of making an accurate division of such expenses is constantly proposed by those not possessing practical knowledge of the subject, it is well here to give some of the reasons why such a division cannot be made.

The first obstacle that confronts us in attempting a division of expenses is the impossibility of apportioning the cost of management equitably among the several divisions of a road. The item is both a large and an important one; it covers the guardianship of the property. We will take the stationery and other supplies used at headquarters as an illustration. They serve no valuable purpose in themselves — have no earning capacity; add nothing to the original enterprise. The essence of value in a railroad is its transportation facilities, the parts that earn money, its trains, traffic warehouses, buildings, tracks and employes who handle its business. All other expenses are accessory, artificial; contribute nothing to the essential conditions of the enterprise. Yet they must be considered. General office

expenses cannot be accurately apportioned among the divisions of a road, because the benefit conferred is too vague, too indefinite, too fluctuating.

In all attempts to determine the cost of operating particular divisions of a road (for the purpose of fixing local responsibility) expenses of a general character beyond the control of the officers are apportioned to divisions on a basis common to all. Local expenses are charged where they belong. Under these two methods, partly fictitious, partly actual, the responsibility of local officers is in a measure determined. For the purpose for which the information is used, it does very well.

The common expenses of a railroad are not divisible. As soon might we attempt to determine the relative amount of nourishment that we derive in the economy of life from particular kinds of food, or determine the comparative amount of wear and tear that our bodies sustain from various classes of labor, as to attempt to determine to what particular division many of the expenses of a railroad are chargeable. The sources of information are too much covered up, the tracing of cause and effect too remote, the results too subtle to enable us to determine their force or measure their effect.

Only information in reference to the expenses of a railway property, as a whole, is worthy of credit. Any attempted separation of cost as between divisions can only be approximately



true at best, and to furnish it to the public is, therefore, to mislead, and, in so far as this is the case, it is more likely to injure than benefit.

The cost of operating a particular line or section of road is the material, labor and expense disbursed. The most ingenious and patient efforts have been made to devise a system whereby these expenditures might be correctly apportioned, but without success.

To determine the cost of operating particular portions of a road requires information that does not exist; it presupposes information in reference to things that are in their nature indefinite or so surrounded with qualifications and conditions as to preclude the obtaining of accurate data. In order to ascertain the cost of any particular thing we must determine the proportion of common expenses chargeable to it, and to make the allotment accurate we must apportion these expenses, not upon any agreed or arbitrary basis, but upon the basis of facts. To each particular thing about which we wish to know we must assign the actual outlay incurred on its behalf. This means that we must take cognizance of the expenditure of time in connection with it of every official; must follow his thoughts and measure their cost to the carrier. His expenses must be divided with equal care. We must follow this minute espionage into all the ramifications of the service wherever an outlay is incurred. This must be done not only in regard to the officials of a company, but it must be followed out with equal

conscientiousness with all operatives engaged in duties affecting two or more divisions.

The difficulties of the situation are not generally known and are lightly appreciated in the majority of cases by seekers after knowledge of this character. They would too often supply lack of information by arbitrary formulas. These substitutes are more or less absurd according to the intelligence of the compiler and the amount of time and money expended in making the compilation. They never possess any real value. The compiler, as he progresses in his labor, discovers at every step, if he is intelligent, that the bulk of the common expenses of railroads must be apportioned to divisions (if apportioned at all) on arbitrary and, therefore, fictitious grounds. If those who use such information know how it was compiled, they will not attach any value to its conclusions. They know that material and wages are oftentimes charged to an object on the basis that the gross income of such object bears to the gross income of some other object, or on the basis that its physical proportion bears to the physical proportion of something else, without any reference to the real merits of the case.

It is not difficult to apportion an expense where it belongs exclusively to some particular part of a property, but the moment that it becomes common between two or more divisions, that moment the determination of the relative cost belonging to each becomes impossible. Money expended in attempting such division of cost is not only



unworthily bestowed, but is a menace to the company interested and to the community as well. The conclusions reached mislead, and for that reason are no more to be encouraged than a watchman of a railroad should be encouraged to display a neutral signal when one that indicated danger should be used instead. To publish such matter is to disseminate false information; to commit not only an indiscretion, but, in many cases, a misdemeanor, for the reason that the information may, at any time, be used by honest men as well as dishonest ones to predicate actions that may ruin those it affects. Thus, upon information not in any respect reliable, not in any way worthy of regard, rates may be based and other fundamental acts performed. It is this particular feature of the case that renders every intelligent and experienced railway manager loath to have information made public that is not irrefutable in its conclusions, and so simple, so frank, so manifest in its purpose, that no one, whether honestly inclined or otherwise, can be misled by it, or make improper use of it.

No one can be more sensible than those filling positions of responsibility, whether under a government or otherwise, that matter embodied in exhibits, whether as information or otherwise, may at any moment be made the basis for determining grave responsibilities or forming the basis of accusations alike unjust and unwarranted. This is especially and markedly so in reference to everything that affects the interests of corporate

properties or that throws light upon their operations. These interests are the subject of the unremitting and jealous regard of the people and the objects of constant and malevolent attack upon the part of the ignorant and the designing. Thus a table professing to furnish information in reference to the economic working of a railroad, compiled perhaps to satisfy the passing curiosity of an official, or under the mistaken belief that its conclusions where just and defensible, might be made the means of retarding a prospective industry, or crippling an enterprise in which millions of capital were embarked. It is this aspect of the case that makes the owners of railways hesitate to furnish information not absolutely of a reliable character.*

In the operation of railroads the mere convenience of accountants or the necessities of statisticians are not regarded. The only question considered is that of expediency. The adoption of measures such as may enable the property to be handled effectively with the least outlay. This is the true business basis. It results from this economy of outlay that merely ornamental sta-

* When, however, speculative information of this nature is furnished, there should be stamped across its face the statement that it is only an approximation, a guess, a shot in the dark. Such information should never be published unless there runs parallel with each line the reiterated statement that its conclusions are professions only; that they have no reality in fact; that while they may, in some instances, approximate the truth, yet those instances are not determinable and the information they profess to give is consequently not trustworthy.



tistics, merely speculative data, are carefully eschewed. No money is used in a merely speculative way or to gratify speculative people.

The impossibility of apportioning expense of maintaining equipment and machinery affords a good illustration of the obstacles that beset an attempt to divide expenses between different divisions of a road. There is no basis for apportioning this expense. The wear and tear of equipment and machinery, and the outlay attending its operation, are directly and in a marked manner dependent upon the use made of it; upon the character of the road over which it passes; the nature of the track, its alignment, grades, ballast, ditches, rails, ties, splices, elevation, the speed of trains, the weight of traffic, climatic changes, and finally the intelligence, faithfulness and experience of the men in charge. These are the factors that determine cost, and they never exist in the same ratio upon any two sections of a road, or upon any two roads. Consequently it needs no illustration or subtle argument to demonstrate that to divide the cost of maintaining equipment operated indiscriminately over two or more sections of a road upon the basis of its carrying capacity, the number of miles run, the mileage of the road itself, or other arbitrary basis, is only to delude ourselves. The cost of wear and tear must be charged, to make the statement of value, to divisions, not upon a hypothetical basis, but according to actual damage sustained. But as the track upon no

two divisions is relatively the same, nor kept up to the same standard, nor subject to the same conditions, it necessarily follows that the wear and tear of equipment is always different. For the temporary and unimportant purposes which railroad companies make use of so called divisions of expense it is the general practice to divide the cost of maintaining equipment upon the basis of miles run. But such a division, however plausible, is totally inadequate to determine the relative expenses of different divisions of a road. Under its operation, sections or divisions of a line that are operated at a loss from year to year might show a net profit and properties utterly worthless be made to rank in productiveness with those really valuable.

What has been said in regard to the impossibility of dividing the cost of maintenance of equipment (about ten per cent. of the gross expenses) applies also to expenditures for advertising, foreign agents, and similar contingencies, comprising perhaps five per cent. of the expenses. It is impossible, in the majority of instances, to apportion these expenses to particular lines. They are general in one sense, and yet do not affect different parts of the property alike. It would perhaps satisfy the statistician's purpose to apportion these disbursements arbitrarily over the whole property on the basis of earnings, or mileage, or relative expenses, yet such a division would be fallacious because the value of a property and its responsibilities are not determinable



by what we may say it earn or expends, but by what it does actually earn or expend. We must be careful not to clothe railroad enterprises with attributes they do not possess. While it may be convenient for us to say that we will apportion the cost of advertising or stationery on the basis of earnings or expenses, yet as a matter of fact we have no right to apportion such outlay except upon the basis of actual outlay; or if we do apportion them otherwise it should be done with a full knowledge of the error committed.

Continuing the inquiry in reference to a separation of expenses between the divisions of a road, upon what basis should the wear and tear of cars used on other lines be apportioned? How are we to determine the extent of this wear and tear? Again, how shall we apportion the use of other companies' cars? On the basis of the traffic earnings of each car? Undoubtedly. But this method of division is impossible because it would cost many times the original outlay. Innumerable cases of a similar nature might be cited.

A large proportion of the telegraph expenses (amounting to some two per cent. of the gross expenses) are of a general nature. A separation of them can never be more than approximately correct, for the reason that the machinery of this department involves every division. Any apportionment of cost of operating, to be worthy of regard, must take cognizance, from hour to hour, of the actual outlay of time and material

of each unit of expense. This is manifestly not practicable.

This is equally true in regard to the wages of employes at junctions of different divisions, of the trainmen who run over two or more divisions, and the expenses of such trains as well. It does not require any extended inquiry to satisfy the inquirer that these expenses cannot be apportioned accurately to the divisions to which they belong. Ninety per cent. of the time of these employes will perhaps be occupied in connection with traffic that does not net as much to the company as business discharged upon another division during the remainder of their time. The earnings (derived from their labor) would afford a safe basis for apportioning the expense, but this labor is so interwoven that its accurate separation is impossible without infinite labor and outlay. What is said of employes at junctions applies also to the material consumed at these points and upon lines operated in common by two or more divisions. It is true of trainmen running over two or more sections of a road; the number of miles they run can never be the real basis of their wages. They are paid for the work they perform and for the number of hours they are occupied, but the primary purpose of their employment is their ability to earn money for their employer, and this is the true basis for determining the apportionment of cost to the different divisions of a road over which they run. It cannot be done truly on the basis of *aggregate*



earnings. The particular earnings in which they appear as factors is the true basis. Thus, the expenses of trainmen operating over two or more divisions should be charged to such divisions on the basis that the earnings of the train on each division bears to the earnings of the whole train. In order to apportion expenses of this nature much of the clerical work must be performed at the time and on the ground, and no matter how painstaking and exhaustive it may be, the result will only approximate correctness.

Apportionment of many common expenditures must be upon the basis of the purpose they serve from the standpoint of earnings. Manifestly this is not to be ascertained except after the most intelligent and far-reaching inquiry. And while it may be determinable in some instances, it cannot be in others. To attempt to decide it out of hand or on the basis of something thought to be generally near the mark is to beg the question, is to deceive ourselves and mislead those who make use of the data under the mistaken belief that it affords a correct basis.

Considerable sums of money that every corporation pays annually for losses and damages connected with traffic cannot be accurately apportioned. The carrier knows that the property came into his possession, and that when delivered it was in bad order, or that it was not delivered at all. He knows he is responsible for the damage or loss, but is unable to say where the damage or loss occurred. In attempting to

apportion the disbursements he must fix it arbitrarily upon some division, or divide it among several divisions upon a basis that he thinks fair. This disposition of the case is all right if he seeks simply to find a hole in which to hide the expense. But to say seriously that a particular piece of property may be burdened with such an outlay merely to satisfy the necessities of accounts is to attach an exaggerated importance to a thing of no consequence in itself; to create fictitious values or responsibility; to do business upon a false basis; to make bookkeeping superior to events.

It is possible that, in the evolutions of railway science, means may be found for overcoming some of the obstacles I have pointed out, but until such period all statements professing to exhibit the cost of working particular portions of a property operated in common with other portions are false.

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So much may be said in reference to the attempt to apportion expenses between several divisions of a road. I do not attempt to exhaust the subject. A division may be made that will be of value to a company, as already explained, for purposes of determining the relative economy exercised by local officers in matters coming wholly within their control. I have attempted to outline such a division below. It has no other purpose. The object sought is entirely different



from one having actual division of cost in view. In the former instance it serves as a help in fixing responsibility for outlays; in the latter, it may mislead as to the value of a property.

Many expenses may be charged with absolute accuracy to a particular line or division. The work of the accountant, in such cases, is easy. In those cases where the disbursement is not apportionable upon an entirely equitable basis (because of the variableness of the service or the peculiar circumstances that attend the case), we must determine in advance, for each particular kind of expense, what basis will be used in dividing whenever it becomes necessary to make such a division.

In order to arrive at the information we seek and fix the responsibility sought, all expenditures that particular managers are not responsible for must be charged to divisions on a common basis. This will place managers on an equal footing.

In the accompanying rules it is designed that the storekeepers, road accountants and others shall open an account with each division for each class of expense incurred on its behalf. When the amount chargeable to a division is known, it is to be charged under its appropriate head, thus: "Renewals of rails—Central division." When it is not known, the charge will be apportioned at headquarters. In such cases the entry made on the distribution book by the storekeeper or accountant would be "Renewals of rails—Common" or "Renewals of rails—

Central and Eastern divisions," or such explanation made as may be necessary to enable the accounting officer to understand the matter.

With these explanations I proceed to point out, in detail, exactly how each expense account should be apportioned to the different divisions, or should be entered in the distribution book for division afterward at headquarters by the proper officials.

MAINTENANCE OF WAY AND STRUCTURES.

REPAIRS OF ROADWAY.—When a track is used in common by two or more divisions, the basis of apportionment, unless otherwise directed by the accounting officer, should be agreed upon by the superintendents of the divisions affected. In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision.

RENEWALS OF RAILS.—When the charge affects two or more divisions, the basis of apportionment, unless otherwise directed by the accounting officer, should be agreed upon by the superintendents of the divisions affected. In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision.

RENEWALS OF TIES.—When the charge affects two or more divisions, the basis of apportionment, unless otherwise directed by the accounting officer, should be agreed upon by the superintendents of the divisions affected. In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision.

REPAIRS AND RENEWALS OF BRIDGES AND CULVERTS.—When structures are used in common by two or more divisions, the basis of apportionment, unless otherwise directed by the accounting officer, should be agreed upon by the superintendents of the divisions affected.



In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision.

REPAIRS AND RENEWALS OF FENCES, ROAD CROSSINGS, SIGNS AND CATTLE GUARDS.—When fences, road crossings, signs or cattle guards belong in common to two or more divisions, the basis of apportionment, unless otherwise directed by the accounting officer, should be agreed upon by the superintendents of the divisions affected. In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision.

REPAIRS AND RENEWALS OF BUILDINGS AND FIXTURES.—The apportionment to the several divisions of the cost of repairs of general offices, general shop and supply depots should be based on equipment mileage. In reference to cost of repairs of buildings at the junction of two or more divisions, the basis of apportionment, unless otherwise directed by the accounting officer, should be agreed upon by the superintendents of the divisions affected. In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision.

REPAIRS AND RENEWALS OF DOCKS AND WHARVES.—When docks and wharves are used by two or more divisions, the basis of apportionment, unless otherwise directed by the accounting officer, should be agreed upon by the superintendents of the divisions affected. In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision.

REPAIRS AND RENEWALS OF TELEGRAPH.—When the expense is common to two or more divisions, the basis of apportionment, unless otherwise directed by the accounting officer, should be agreed upon by the superintendents of the divisions affected, in consultation with the superintendent of telegraph. In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision. When such expenses are common to

the whole road, an account should be opened as follows, viz.: "Repairs and renewals of telegraph—Common." Charges of this description should be apportioned to the several divisions of a road by the accounting officer on the basis of equipment mileage.

Stationery and Printing.—When the expense is common to two or more divisions, but not common to the whole road, a basis of apportionment, unless otherwise directed by the accounting officer, should be agreed upon by the superintendents of the divisions affected. In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision. When the charge is common to the whole road, an account should be opened as follows, viz.: "Stationery and printing—Common." Charges of this description should be apportioned between divisions by the accounting officer on the basis of equipment mileage.

Other Expenses.—The apportionment between divisions of charges on this account should be made as directed for "Stationery and printing."

### MAINTENANCE OF EQUIPMENT.

Superintendence.—When the expense is common to two or more divisions, a special basis of apportionment, unless otherwise directed by the accounting officer, should be agreed upon by the official in charge of the department and the superintendents of the divisions affected. In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision. When such expenses are common to the whole road, an account should be opened as follows, viz.: "Superintendence—Common." Charges of this description should be apportioned to the several divisions of a road by the accounting officer on the basis of equipment mileage.

Repairs and Renewals of Locomotives.—The apportionment of charges between divisions on this account



will be made by the accounting officer on the basis of locomotive mileage.

Repairs and Renewals of Passenger Cars.—The apportionment of the charges for "Repairs and renewals of passenger cars," to the several divisions of a road, should be made by the accounting officer on the basis of passenger car mileage.

Repairs and Renewals of Freight Cars.—The apportionment of the charges for "Repairs and renewals of freight cars," to the several divisions of a road, should be made by the accounting officer on the basis of freight car mileage.

Repairs and Renewals of Work Cars.—When work cars are used in common by two or more divisions, the basis of apportionment, unless otherwise directed by the accounting officer, should be agreed upon by the superintendents of the divisions affected. In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision.

Repairs and Renewals of Marine Equipment.—When marine equipment is used in common by two or more divisions, the basis of apportionment, unless otherwise directed by the accounting officer, should be agreed upon by the superintendents of the divisions affected. In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision.

Repairs and Renewals of Shop Machinery and Tools.—When shops are used by two or more divisions, the basis of apportionment, unless otherwise directed by the accounting officer, should be agreed upon by the superintendents of the divisions affected. In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision. When the expense is common to the whole road, an account should be opened as follows, viz.: "Repairs and renewals of shop machinery and tools—Common." Charges of this description should be apportioned to the several divisions of a road

by the accounting officer on the basis of equipment mileage.

Stationery and Printing.—When the expense is common to two or more divisions, the basis of apportionment, unless otherwise directed by the accounting officer, should be agreed upon by the superintendents of the divisions affected. In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision. When the expense is common to the whole road, an account should be opened as follows, viz.: "Stationery and printing—Common." Charges of this description should be apportioned to the several divisions of a road by the accounting officer on the basis of equipment mileage.

Other Expenses.—The apportionment between divisions of charges on this account should be made as directed for "Stationery and printing."

### CONDUCTING TRANSPORTATION.

Superintendence.—When the expense is common to two or more divisions, a special basis of apportionment, unless otherwise directed by the accounting officer, should be agreed upon by the general superintendent and the superintendents of the divisions affected. In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision. When such expenses are common to the whole road, an account should be opened as follows, viz.: "Superintendence—Common." Charges of this description should be apportioned to the several divisions of a road by the accounting officer on the basis of gross earnings.

Engine and Roundhouse Men.—When enginemen run in common on two or more divisions, their wages should be apportioned to the several divisions of a road on the basis of the number of miles run on each by said enginemen, or as may be agreed upon by the superintendents of the respective divisions. The wages of



wipers engaged upon locomotives running over two or more divisions should be apportioned to such divisions upon the basis of the number of miles the locomotives ran on each division. The wages of wipers and dispatchers at terminal stations, common to two or more divisions, should be apportioned according to the number of locomotives belonging to each division that have been wiped during the month. When the wages of other roundhousemen are common to two or more divisions, the basis of apportionment, unless otherwise directed by the accounting officer, should be agreed upon by the official in charge of the department and the superintendents of the divisions affected. In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision.

Fuel for Locomotives.—The wages of employes engaged in supplying locomotives with fuel should be apportioned to the divisions upon which the locomotives supplied actually run. Where fuel is supplied to locomotives of two or more divisions, the expense will be charged to each division on the basis of the quantity of fuel issued to its locomotives during the month.

Water Supply for Locomotives.—When the expense is common to two or more divisions, the basis of apportionment, unless otherwise directed by the accounting officer, should be agreed upon by the superintendents of the divisions affected. In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision.

Oil, Tallow and Waste for Locomotives.—No division of the charges for "Oil, waste and tallow used on locomotives" should be made by storekeepers, the gross charges being apportioned between divisions by the accounting officer on the basis of locomotive mileage.

Other Supplies for Locomotives.—The apportionment of charges between divisions on this account should be made by the accounting officer on the basis of locomotive mileage.

Train Service.—Wages of trainmen should be charged to the divisions upon which they run. When they run in common, upon two or more divisions, the several divisions should be charged on the basis of the number of miles run on each, or as may be agreed upon by the superintendents of the respective divisions.

Train Supplies and Expenses.—No division of the charges for "Train supplies and expenses" should be made by storekeepers, the gross charges being apportioned between divisions by the accounting officer on the basis of car mileage.

Switchmen, Flagmen and Watchmen.—When the expense is common to two or more divisions, the basis of apportionment, unless otherwise directed by the accounting officer, should be agreed upon by the superintendents of the divisions affected. In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision.

Telegraph Expenses.—When the expense is common to two or more divisions, the basis of apportionment, unless otherwise directed by the accounting officer, should be agreed upon by the superintendents of the divisions affected, in consultation with the superintendent of telegraph. In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision. When such expenses are common to the whole road, an account should be opened as follows, viz.: "Telegraph expenses — Common." Charges of this description should be apportioned to the several divisions of a road by the accounting officer on the basis of gross earnings.

Station Service.—When the expense is common to two or more divisions, a special basis of apportionment, unless otherwise directed by the accounting officer, should be agreed upon by the superintendents of the divisions affected. In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision. When such expenses are common to the whole road, an account should be opened as follows, viz.: "Station service—Common." Charges of this description should be apportioned to the several divisions of a road by the accounting officer on the basis of gross earnings.



Station Supplies.—Station supplies should be charged directly to the division upon which the station is located, except in the case of joint stations; in the latter case, the basis of apportionment, unless otherwise directed by the accounting officer, should be agreed upon by the superintendents of the divisions affected. In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision.

Switching Charges—Balance.—The apportionment of charges for "Switching" to the several divisions of a road should be made by the accounting officer on the basis of freight car mileage.

Car Mileage — Balance. — The apportionment of charges between divisions on this account should be made by the accounting officer on the basis of car mileage.

Hire of Equipment.—The apportionment of charges between divisions on this account should be made by the accounting officer on the basis of car or locomotive mileage, as the case may be.

Loss and Damage.—When the expense is common to two or more divisions, a special basis of apportionment, unless otherwise directed by the accounting officer, should be agreed upon by the superintendents of the divisions affected. In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision. When such expenses are common to the whole road, an account should be opened as follows, viz.: "Loss and damage—Common." Charges of this description should be apportioned to the several divisions of a road by the accounting officer on the basis of earnings.

Injuries to Persons.—When the expense is common to two or more divisions, the basis of apportionment, unless otherwise directed by the accounting officer,

should be agreed upon by the superintendents of the divisions affected. In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision. When the expense is common to the whole road, an account should be opened as follows, viz.: "Injuries to Persons—Common." Charges of this description should be apportioned to the several divisions of a road by the accounting officer on the basis of locomotive mileage.

Clearing Wrecks.—When the expense is common to two or more divisions, the basis of apportionment, unless otherwise directed by the accounting officer, should be agreed upon by the superintendents of the divisions affected. In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision.

Operating Marine Equipment.—When ferryboats, tugs, etc., are used in common by two or more divisions, the basis of apportionment, unless otherwise directed by the accounting officer, should be agreed upon by the superintendents of the divisions affected. In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision.

Advertising.—The apportionment of charges for "Advertising" to the several divisions of a road should be made by the accounting officer on the basis of earnings.

Outside Agencies.—The apportionment of charges for "Outside agencies" to the several divisions of a road should be made by the accounting officer on the basis of earnings.

Commissions.—When the charges affect two or more divisions, they should be apportioned on the basis that the earnings on which commissions were paid were divided.

Stock Yards and Elevators.—These expenditures should be charged directly to the division upon which the structures are located, except in the case of joint structures; in the latter case the basis of apportionment, unless otherwise directed by the accounting officer,



should be agreed upon by the superintendents of the divisions affected. In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision.

Rents for Tracks, Yards and Terminals.—The apportionment between divisions of charges on this account should be made as directed for "Stationery and printing."

Rents of Buildings and Other Property.—The apportionment between divisions of charges on this account should be made as directed for "Stationery and printing."

Stationery and Printing.—When the expense is common to two or more divisions, but not common to the whole road, a basis of apportionment, unless otherwise directed by the accounting officer, should be agreed upon by the superintendents of the divisions affected. In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision. When the charge is common to the whole road, an account should be opened as follows, viz.: "Stationery and printing—Common." Charges of this description should be apportioned between divisions by the accounting officer on the basis of gross earnings.

Other Expenses.—The apportionment between divisions of charges on this account should be made as directed for "Stationery and printing."

## GENERAL EXPENSES.

Salaries of General Officers.—The salaries of general officers should be apportioned to the several divisions of a road by the accounting officer on the basis of gross earnings.

Salaries of Clerks and Attendants.—The salaries of clerks and attendants should be apportioned to the several divisions of a road by the accounting officer on the basis of gross earnings.

General Office Expenses and Supplies.—The apportionment of charges to the several divisions of a road should be made by the accounting officer on the basis of gross earnings.

Insurance.—An account should be opened with each division of a road for which expense is incurred, when the same is known; when common to two or more divisions, but not common to the whole road, a basis of apportionment, unless otherwise directed by the accounting officer, should be agreed upon by the officials interested. In all cases of disagreement or doubt as to the correctness of apportionment, reference should be made to the accounting officer for his decision. When the charge is common to the whole road, an account should be opened as follows, viz.: "Insurance—Common." Charges of this description should be apportioned between divisions by the accounting officer on the basis of gross earnings.

Law Expenses.—The apportionment between divisions of charges on this account should be made as directed for "Insurance."

Stationery and Printing (General Offices).—The apportionment of charges to the several divisions of a road should be made by the accounting officer on the basis of gross earnings.

Other Expenses.—The apportionment of charges between divisions on this account should be made by the accounting officer on the basis of gross earnings.

# CHAPTER XII.

## SUMMARY OF RAILWAY DISBURSEMENTS, INCLUDING THE ITEMS CHARGEABLE AGAINST INCOME.

The disbursements of a railway may be classed under two heads—Permanent and Temporary. Permanent expenditures embrace those known as construction; temporary expenditures those we place in the scales against earnings, i. e., expenditures paid for out of earnings. All other disbursements are of a transitory nature merely, i. e., book accounts settled in cash or in kind; they do not come under the head of disbursements in the sense we use the word throughout this book.

A summary of railway disbursements is appropriate in this place and will fitly close the subject. It is as follows:

Construction.—This account is described elsewhere; it properly embraces the original or first cost of property; all disbursements, expenses, costs, commissions, salaries and debts incurred in connection therewith or incident thereto; the accruing interest on the amount invested while a property is in course of construction and before it is opened for business; all disbursements and losses suffered in the sale or disposal of bonds, shares, securities or assets, the proceeds of which are used in its purchase or development; all expenditures on account of its rights, franchises and appurtenances. These constitute what is known as construction account.

Operating Expenses.—The operating expenses are described elsewhere in detail; they embrace the cost of working a property and maintaining the same, including the cost of repairs and renewals and all expenses incident to its operation and maintenance.

Taxes.—This account is a proper charge against income or revenue. It embraces taxes on real estate, right of way, buildings, equipment and other property, real or personal, also taxes on capital stock, earnings, dividends or interest, and for all other purposes whatsoever.

Interest on Bonds.*—This is also a charge against income or revenue. It embraces interest on the funded debt of a company and all premiums paid on gold or currency, or for any other purpose rendered necessary to satisfy the obligation of this account, also amounts paid for exchange used to meet interest payments.†

Interest on Floating Debt, Discount and Exchange.—This account is also an offset against income or revenue. It includes interest on floating debt, and discount suffered in sale of current paper or disposal of kindred accounts; also balance of amounts paid for exchange on drafts, checks, notes, bills of exchange, etc., not otherwise provided for.

Rentals.—This account is also an offset against income or revenue. It includes amount of rentals for

* The practice in regard to entering interest charges upon the books of companies differs. In some cases the charge is not made until the interest becomes due. Thus if the interest is payable on the 1st of July, the amount of the interest accruing is brought upon the books in July; upon some roads it would be brought upon the books as of the last day of the preceding month; still other roads charge up the interest from month to month as it accrues. This last named plan is a most excellent one; the books thus show always the gross amount that is chargeable against income and the utmost possible liability of the company for interest.

† In those instances where it is necessary to buy exchange to pay interest, as in the case of an American road having its interest payable in Amsterdam, the cost of exchange should be charged to "Interest on bonds."



leased lines, bridges, ferries, steamboats, rolling stock and other purposes not included in operating expenses.*

Dividends on Stock.—This account is also an offset against income or revenue. It includes dividends on capital stock or evidences of the latter, or substitutes therefor.†

* In the absence of instructions to the contrary, rentals should be charged upon the books from month to month as the rent accrues. Rent of tracks, buildings, yards and terminals are charged as an operating expense, as they appear, under the head of "Outside agents," or "Rents of tracks, buildings, yards or terminals."

† The amount of a dividend should be brought upon the books in the month in which it is declared and should appear in the returns for such month.

# CHAPTER XIII.

## PRACTICES OF ENGLISH RAILWAYS IN ACCOUNTING FOR MATERIAL AND FUEL.

For the purpose of account keeping, stores are classified under three heads, viz.: coal, general stores and permanent way stores. Orders for material required are sent to the tradesmen, signed by the general store superintendent; on the back of the orders are printed the conditions on which the material will be accepted. An account is opened with each tradesman from whom goods are purchased. At the end of the month tradesmen's accounts are checked with the invoices and entered into day books or invoice journals and posted therefrom to the debit of the respective stock accounts on the stock ledger. A list of accounts is then made, certified to by the general stores superintendent and submitted to the general stores committee of the board for approval. The accounts and lists are then sent to the accountant of the company for payment.

Goods received at stores are entered into "goods received" books, which are sent to the stores superintendent's office to be compared with the invoices. The stores examiners are not allowed in any case to have access to the invoices, but after the goods have been checked price lists are furnished for the guidance of the superintendent's assistants in pricing out the materials to the consuming departments. Requisitions for stores and stationery for the traffic department are made monthly and countersigned by the general manager. They show the quantity on hand, date and quantity of last supply, and quantity required. The quantities sent out are recorded in detail against each station in order to compare the supplies of one period with another. Requisitions





for stores for the locomotive, carriage, and way and works departments are made as the material is needed. They show the quantity and description of each kind of material ordered and the purpose for which it is required.

From the requisitions the stores porters get out the goods and the clerks make out the delivery notes showing the articles, quantity and value, which are copied into an "issue book," but the money portion is torn off before they are sent out. Each consuming department is, however, provided with a price list. The traffic department is charged with the gross monthly purchases for that department, and not for detailed supplies sent to each station; any variations in stock are adjusted half yearly or yearly. The press copies of the delivery notes for material issued to the locomotive, carriage, and way and works departments are checked every week and the amounts entered into an "issue summary book," a separate book being used for each consuming department. From these books the several stock accounts on the stock ledger are credited. From the issue summary books a statement of stores issued is made each week and forwarded to the accountant. This shows the total value of material issued during the week to each consuming department. On receipt of the goods by the consuming departments the goods are checked with the copies of the requisitions by the stores foreman who has charge of the material, and the delivery notes are receipted and returned to the stores department.

Material cannot be obtained from the stores foreman without a written order signed by the works manager or foreman of the shop. The order states for what purpose the stores are required. From the requisitions and orders weekly statements are made by each consuming department, showing the quantity and value of material chargeable to the several expense accounts. These statements are forwarded to the accountant and should agree in total with the weekly statements sent him from the stores department of material issued to each consuming department. The accountant charges

the expense accounts with the material used in accordance with the distribution returns furnished him by the several consuming departments.

Coal is sent directly from the colliery to the station where it is to be used. Colliery advices, after being entered by the general stores superintendent, are forwarded to the stations where the coal is sent, to be certified to by the receiving agent. The weights shown are checked and the advices returned to the general stores department. After ascertaining that the amounts are correct, the stores superintendent reports on his statement of issues to the accountant the actual monthly purchase. Coal is weighed out to engines receiving it at stations and the returns thereof are sent to the locomotive superintendent, who sends a statement to the accountant showing the total weight of coal issued each week.

An inventory is taken periodically and compared with the stock ledger, the books being adjusted to the actual by debit or credit entries, as the case may be. The books and inventories of the stores department are checked with the actual stock by the accountant's staff. The administration expenses of the stores department are apportioned to the various consuming departments at the end of each year.

# CHAPTER XIV.

## PRACTICES OF ENGLISH RAILWAYS IN KEEPING THE TIME OF EMPLOYES.

The time of men employed in the way and works department is kept by the gang foremen. They are provided with two time books (one for each alternate week), in which they enter daily the time worked by themselves and the men under them. At the end of the week each foreman sends his book to the inspector of the circuit in which he is located. The inspector makes up his book therefrom. It shows the time, rate and amount due each man, the works on which they were engaged, and the total amount payable at each station in his circuit. He certifies to the correctness of the returns and forwards with the foremen's time books to the district superintendent to be examined, summarized and forwarded to headquarters for the pay bills to be prepared.

The time of men employed at stations is kept by the station clerk or goods agent in charge, who keeps an accurate daily record of the time made by each servant of the company under his control. At the end of the week pay bills are made and sent to headquarters.

The time of engineers and firemen is kept by the locomotive foremen or their clerks, who enter into a day book the number of hours on duty and miles run. The engineers and firemen are required to sign their names in a book and enter the exact time when going on or off duty, stating the due time of train and engine number.

The time of shop men is made up from the workings of their checks. These checks, which bear the men's

registered numbers, are deposited in the time office by the workmen on entering, and are returned to them on leaving the premises, morning, noon and night. The time is entered up in the check and time books by the clerks. At the end of the week the time worked by each man is transferred to gate time sheets, which show the rate. These are sent to headquarters. Shop time sheets are filled out by the shop foremen, who enter the time the men are employed on each description of work during the day. These sheets, at the end of the week, are also sent to headquarters. The time, as reported on the shop time sheets, is then compared with the gate time sheets, and the pay bills are made. After the pay bills have been made at the headquarters of the several departments, they are forwarded, with the time books, time sheets and distribution reports, to the accountant.

# APPENDIXES.

# APPENDIX A.

## MATERIAL ACCOUNT—SYSTEM OF ACCOUNTING FOR MATERIAL PURCHASED AND DISBURSED, RECOMMENDED BY THE STANDING COMMITTEE ON DISBURSEMENTS OF THE ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.

"It is believed that the essentials of a correct system will be found in the following general outline:

"The purchasing agent to furnish the storekeeper with all standards and copies of all contracts, agreements and specifications for material to be purchased and to forward him promptly all invoices received. All materials purchased to be placed at once in the custody of the storekeeper, who should inspect the same and certify to the correctness of the invoices as to quantity, quality and price; examine extensions and footings; take up the amounts in his material account; prepare vouchers certifying to the correctness thereof and forward them to the purchasing agent, who will examine prices, certify to their correctness and forward to the manager for approval. After being approved by the manager they should be transmitted to the accounting department, where, if found correct, they should be charged to the storekeeper and approved for payment.

"All material issued by the storekeeper will be upon properly approved requisitions. When material is issued an invoice of the same will be forwarded to the division or department to which it is issued; the division or department, after checking material received against the invoice and finding the same to be correct, will mark the invoice 'correct,' and file until the end of the month; if incorrect in any particular, the question will be taken up at once with the storekeeper for adjustment.

"At the close of each month's business the storekeeper will forward to the divisions and departments a summary of invoices made and charged against them during the month; the amount so charged to be taken up by these divisions and departments in their accounts for the same month. The summaries of invoices forwarded should in all cases be accompanied by legible impression copies of the same, such impression copies to be retained by the divisions or departments against which the invoices are made, the 'originals' to be certified to by the heads of such divisions or departments and sent to the accounting department with their monthly reports or accounts current. The ad-

justment of all differences arising from non receipt of invoices or other causes, and all errors, except errors in footings of summaries, should be made in the succeeding month.

"The same rule will apply throughout between divisions and departments covering material transferred between themselves.

"The storekeepers and heads of divisions or departments will render to the accounting department a monthly report or account current in which shall be shown, under the proper headings, the amount of material (as well as labor) received and disbursed during the month.

"When the annual inventory is completed, the balance of material on hand, as shown by the books of the storekeeper, and those of each division and department should be adjusted to conform thereto, and the discrepancy between these balances and the proper value should be distributed to the expenses of the current year.

"To insure correct accounting for material it is important to have competent foremen to report material used or taken out of track, structures or equipment, as well as competent accountants at storehouses and at division and department headquarters; and where these accountants are not under the immediate direction of the accounting department it is well to have a representative of that department visit the various division headquarters, shops and roadway departments from time to time to see that material is being properly accounted for.

"Prices at which the new material is charged out by the storekeeper to include freight paid to other roads, and may include the salary and expenses of the store department, prorated on the value of materials invoiced each month.

"The prices at which second hand material should be taken up, charged out or invoiced should be fixed from time to time by the purchasing agent.

"Divisions or departments releasing material from the track, structures or equipment of the railway should take the value of the same up at once in their material account, even though the material should be used and charged out again in the same month.

"In the shops of the company labor expended upon material in process of manufacture or upon unfinished equipment should be charged to the material account until the finished article is charged out to 'Repairs,' 'Equipment' or 'Construction.' Provision should be made in the material report blanks for the debit, under proper heads, of all material received and taken from the track, structures or equipment of the road, for credits on account of material transferred to other divisions and departments or sold to individuals and companies, and for credits on account of material used, under the proper general heads, in detail. There should accompany this report a list of vouchers taken into account, and a list of individuals and company bills for which credit has been taken."

# APPENDIX B.

## GENERAL DISTRIBUTION OF LABOR BOOK.

### ORDER IN WHICH ACCOUNTS SHOULD BE OPENED ON THE GENERAL DISTRIBUTION OF LABOR BOOK.

Operating expenses in their order.

Rebuilding accounts in their order.

Construction accounts in their order.

In connection with "Repairs and renewals of bridges and culverts" or "Bridges, culverts and viaducts," a separate account should be opened with each bridge, etc.

In connection with "Repairs and renewals of buildings and fixtures," or "Buildings, furniture and fixtures," a separate account should be opened with each building.

In connection with "Repairs and renewals of docks and wharves" or "Docks and wharves," a separate account should be opened with each dock or wharf.

In connection with "Repairs and renewals of locomotives," a separate account should be opened with each engine.

In connection with "Repairs and renewals of floating equipment," or "Expenses of barges, floats, tugs and ferry boats," a separate account should be opened with each ferry boat, etc.

In connection with "Repairs and renewals of shop machinery and tools," or "Shop machinery and tools," a separate account shonld be opened with each shop.

Labor charged to material.

Labor invoiced.

Articles manufactured by the company.

Coal account.

Wood account.

Various persons accounts.

Miscellaneous accounts.

Final recapitulation

# APPENDIX C.

## RECAPITULATIONS.

For statistical purposes a separate operating or construction account should be opened with each building, bridge, culvert, viaduct, dock, wharf, ferry boat, stock yard, dining car and locomotive for which expense is incurred, but the amount entered in the final recapitulation of expenditures, and carried to the general books, should be the aggregate amount expended under the head of each operating expense or construction account. Therefore, in order to bring together under one heading the amount to be carried to the final recapitulation, and also in order to post readily therefrom to the statistical accounts, a sub-recapitulation of the several operating and construction accounts is required, in the following manner, viz.:

*Recapitulation of "Repairs and renewals of buildings and fixtures," or "Buildings, furniture and fixtures."*

In making the recapitulation the following should be observed:

1. The recapitulation should specify the building charged in such a manner that its identity can be determined therefrom with certainty.

2. The buildings should be entered in the order of geographical location upon the line.

3. The recapitulation should show the amount charged to each building and the number of the page of the distribution book on which the account may be found.

4. In case credits appear in the recapitulation, the footing to be shown should be the difference between the amount of the debits and the amount of the credits.

5. A separate recapitulation should be made for each division chargeable in "Repairs and renewals of buildings and fixtures," and the total of each should be carried to the account and division chargeable in the final recapitulation of expend-





itures. In "Buildings, furniture and fixtures," no apportionment of charges to divisions should be made.

*Recapitulation of "Repairs and renewals of bridges and culverts" or "Bridges, culverts and viaducts."*

The recapitulation should commence with the bridge having the lowest number, the others following in numerical order, and in case of "Repairs and renewals of bridges and culverts," closing with the general account. Otherwise the form and purpose of the recapitulation for bridges and culverts are the same as prescribed for buildings.

*Recapitulation of "Repairs and Renewals of Locomotives."*

The recapitulation should commence with the locomotive having the lowest number, the others following in numerical order, closing with the general account.

In repairs of locomotives, no apportionment of charges to divisions should be made.

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The same course will be pursued in the case of docks, wharves, ferry boats and stockyards as is prescribed for buildings.

---

On the general distribution of labor book the accounts named below should be recapitulated and the total amount of the same carried to the final recapitulation at the close of the book under the head of "Manufactured material." The accounts referred to are:

Labor charged to material,
Labor invoiced, and
Articles manufactured by the company.

*Final recapitulation of expenditures. (Labor.)*

A recapitulation of all the accounts in the general distribution of labor book should be made at the end of the book. In opening the recapitulation the following information should be given, viz.:

1. The names of the operating expense accounts, in order.

2. The pages of the book on which they are to be found, and lastly, the total amount of labor chargeable; for example: "Repairs and renewals of buildings and fixtures, blank division, page 12, $126.30," and so on with the other accounts.

3. The final footing of the recapitulation should agree exactly with the amount of the pay rolls distributed.

4. A summary of pay rolls, showing the amount of each and the total of all pay rolls distributed, should be shown on the page immediately preceding the final recapitulation.

5. No accounts should be entered in the final recapitulation of expenditures except those designated, or those specially authorized by the accounting officer.

6. Bridge and building rebuilding accounts, also addition, enlargement and improvement accounts, should be merged in the operating expense or construction accounts to which they belong, as the case may require, and the combined amount should be carried to the final recapitulation.

7. But one entry should be made in the final recapitulation of expenditures to any one account.

Following the recapitulation, the distribution book should be signed by the storekeeper or official in charge, the signature being attached to the subjoined certificate, viz.: "I hereby certify that the above recapitulation is a correct record of all labor performed."

*Recapitulation of material invoice accounts.*

A recapitulation of the invoice accounts should be made on the general distribution of material book at the end of the month, the same to be arranged in the order in which the accounts are directed to be opened, viz.:

1. Total material received by purchase or from other supply stores and shops separately.

2. Total material forwarded to other supply stores and shops separately.

This recapitulation should be entered immediately before the final recapitulation of expenditures, and should not be footed.

*Final recapitulation of expenditures.* (*Material.*)

A recapitulation of all the expenditure accounts should be made at the end of the general distribution of material book. The accounts should be entered in their order, commencing with the operating and ending with the construction and miscellanetous accounts. The page on which the details of each accoun may be found should be given in the column provided. The recapitulation should be footed.



In case credits appear in the recapitulation, the footing to be shown should be the difference between the amount of the credits and the amount of the debits.

As a matter of convenience, and to insure accuracy, credits entered in the recapitulation should be made in red ink.

Except as otherwise provided, the form and purpose of this recapitulation are the same as those provided for labor accounts.

Following the final recapitulation, the distribution book should be certified by the storekeeper or official in charge, the certificate being as follows, viz.: "I hereby certify that I have carefully examined the extensions and footings as entered in this book, and find the same correct."

_____ *Shop.*

*Accounting Officer's Folio*_____

*Folio of Distribution Book*_____

## RECAPITULATION OF MATERIAL.

*Month of*_____ *18*____

(INVOICE ACCOUNTS.)

| Eyelet. | | FOLIO. | AMOUNT. | | |
|---|---|---|---|---|---|
| | *Material Received from* ---------- | | | | |
| Eyelet. | *Material Forwarded to* ---------- | | | | |
| Eyelet. | | | | | |



_____ *Shop,*

*Accounting Officer's Folio*_____

*Folio of Distribution Book*_____

## RECAPITULATION OF_____

(EXPENDITURES.)

*Month of*_____ *18*____

| Eyelet. | NAME OF ACCOUNT. | FOLIO. | AMOUNT. | | |
|---|---|---|---|---|---|
| Eyelet. | | | | | |
| Eyelet. | | | | | |

This blank should be used for recapitulating either Material or Labor.

# APPENDIX D.

SECTION FOREMAN'S

## DISTRIBUTION OF TRACK MATERIAL,

*for month of* _____ *18*__

*Section No.*_____ _____ *Division*

MATERIAL RECEIVED BY SECTION FOREMAN.

| From whom Material was Received. | CAR NO. AND INITIAL. | ARTICLES. | NUMBER OR QUANTITY. |
|---|---|---|---|
| | | | |





MATERIAL USED BY SECTION FOREMAN FOR

## "REPAIRS OF ROADWAY AND TRACK."

(Write the names of articles used when they are not printed.)

| ARTICLES. | Number or Quantity. | ARTICLES. | Number or Quantity. |
|---|---|---|---|
| Axes, Chopping, | | Lanterns, White, | |
| " Hand, | | " Red, | |
| Axe Helves, | | Lantern Globes, | |
| Adzes, | | " Tubes, | |
| Adze Handles, | | | |
| Angle Bars, New, | | | |
| " " Usable, | | | |
| | | Matches, Boxes, | |
| Base Plates, | | | |
| Brooms, | | | |
| Bolts, (Specify kind and size) Pounds, | | | |
| Bolts, (Specify kind and size) Pounds, | | Nut Locks, Number, | |
| | | Nuts, Pounds, | |
| Chairs, Switch, Single, | | | |
| " " Double, | | | |
| Crowbars, | | | |
| Clawbars, | | Oil, Car, Gallons, | |
| Cold Chisels, | | " Kero. " | |
| | | " Signal, " | |
| | | " Cans, | |
| Dippers, | | | |
| Drills, | | | |
| | | Posts, Cedar, Number, | |
| | | " Oak, " | |
| | | Picks, | |
| | | Pick Handles, | |
| Fish Plates, No. | | | |
| Flags, White, | | | |
| " Red, | | | |
| Frogs, New, | | | |
| " Repaired, | | Striking Hammers, | |
| | | Stone, Yards. | |
| | | Spikes, R. R., Pounds, | |
| | | " Boat, " | |
| | | " Cut, " | |
| Hand Car Brasses, | | Shovels, " | |
| Hammers, | | Sledges, " | |
| Hand Saws, | | Sledge Handles, | |
| | | Spike Hammers, | |
| | | Spike Hammer Handles, | |
| | | Spades, | |

(Continued on next page.)

MATERIAL USED BY SECTION FOREMAN FOR

## "REPAIRS OF ROADWAY AND TRACK."

(Write the names of articles used when they are not printed.)

| ARTICLES. | Number or quantity. | ARTICLES. | Number or quantity. |
|---|---|---|---|
| Scythes, | | **TIES ("For Renewal of Ties.")** | |
| " Snaths, | | Oak, | |
| Scoops, | | Cedar, | |
| Switches, (specify kind) | | Hemlock, | |
| Switch Stands," " | | Ash, | |
| " Plates, | | Culls, | |
| | | Switch, | |
| | | Bridge, | |
| | | Head Blocks, | |
| Torpedoes, | | | |
| Tamping Bars, | | | |

| RAILS ("For Renewal of Rails.") | | | New. | Usable. |
|---|---|---|---|---|
| Steel, | lb., | Feet. | | |
| | lb., | " | | |
| | lb., | " | | |
| | lb., | " | | |
| | lb., | " | | |
| Iron, | lb., | " | | |
| | lb., | " | | |
| | lb., | " | | |
| | lb., | " | | |
| | lb., | " | | |
| | lb., | " | | |

| ARTICLES. | Number or quantity. |
|---|---|
| Washers, Pounds, | |
| Water Kegs, | |
| " Pails, | |
| Waste, Pounds, | |
| Wheelbarrows, | |
| Wrenches, | |
| Wicking, | |
| Whetstones, | |

## MATERIAL USED BY SECTION FOREMAN FOR OTHER PURPOSES.

| What material was used for. | Description of articles used. | Quantity used. |
|---|---|---|
| | | |



## MATERIAL SHIPPED AWAY BY SECTION FOREMAN.

| TO WHOM SHIPPED | Car No. and initial. | ARTICLES. | Number or quantity. |
|---|---|---|---|
| | | | |

## SECTION FOREMAN'S REPORT OF MATERIAL AND TOOLS ON HAND AT END OF MONTH.

(Write names of articles when they are not printed.)

| ARTICLES. | QUANTITY OF New material and new tools on hand not in use. | QUANTITY OF Old material and scrap on hand not in use. | ARTICLES. | QUANTITY OF New material and new tools on hand not in use. | QUANTITY OF Old material and scrap on hand not in use. |
|---|---|---|---|---|---|
| Axes, Chopping, | | | Frogs, Boss, | | |
| " Hand, | | | " | | |
| Axe Helves, | | | Fencing, Lumber, Feet | | |
| Adzes, | | | " Barbed Wire lbs. | | |
| Adze Handles, | | | " " " Fastn'rs | | |
| Augers, | | | " " " Tight'rs, | | |
| Auger Handles, | | | Fence Boards, | | |
| Anvils, | | | Files, | | |
| Angle Bars, New, | | | | | |
| " " Usable, | | | Gauges, | | |
| Boring Tools, | | | Grindstones. | | |
| Brooms, | | | | | |
| Buck Saws, | | | | | |
| Braces and Bits, | | | Hand Cars, | | |
| Board Rules, | | | Hand Car Wheels, | | |
| Brands, | | | " " Axles, | | |
| Brick, | | | " " Handles, | | |
| Bellows, | | | " " Brasses, | | |
| Bridge Wrenches, | | | " " Chains, | | |
| Bolts, Sq. Nut, lbs. | | | Hammers, | | |
| " Hex. Nuts, | | | Hatchets, | | |
| Brush Hooks, | | | Hand Saws, | | |
| Cant Hooks, | | | Hinges, | | |
| Chairs, Single Switch, | | | Hoes, | | |
| " Double " | | | | | |
| " Step, | | | Iron, lbs. | | |
| Chain, lbs. | | | | | |
| Crowbars, | | | | | |
| Clawbars, | | | Jack Screws, | | |
| Cross-cut Saws, | | | | | |
| Cold Chisels, | | | | | |
| Clamps, | | | Lining Bars, | | |
| Cement, Bags. | | | Levels, | | |
| Castings, lbs. | | | Leveling Rods, | | |
| Chisels, | | | Lanterns, White, | | |
| Crossing Signs, | | | " Red, | | |
| " " Posts, | | | Lantern Globes, | | |
| " Plank, | | | " Tubes, | | |
| Chalk, | | | Locks, Chest, | | |
| Car Links, | | | " Padlocks, | | |
| " Pins, | | | Lumber, Oak, Feet, | | |
| Dippers, | | | " Pine, " | | |
| Drills, | | | | | |
| Draw Knives, | | | Marking Pots. | | |
| Dump Cars, | | | " Brushes, | | |
| Fish Plates, No. | | | Mile Posts, | | |
| Flags, White, | | | Monkey Wrenches, | | |
| " Red, | | | | | |
| Frogs, Crossing, | | | Nails, lbs. | | |
| | | | Nut Locks, Number, | | |

(Continued on next page.)



SECTION FOREMAN'S REPORT OF MATERIAL AND TOOLS ON HAND AT END OF MONTH.

(Write the names of articles when they are not printed.)

| ARTICLES. | QUANTITY OF New material and new tools on hand not in use. | QUANTITY OF Old material and scrap on hand not in use. | ARTICLES. | QUANTITY OF New material and new tools on hand not in use. | QUANTITY OF Old material and scrap on hand not in use. |
|---|---|---|---|---|---|
| Nuts, lbs. | | | Sledge Handles, | | |
| Nippers, | | | Spike Hammers, | | |
| | | | " " Handles, | | |
| Oil, Car, Gallons, | | | Spades, | | |
| " Kero. " | | | Scythes, | | |
| " Signal, " | | | " Snaths, | | |
| " Cans, | | | Scrapers, | | |
| | | | Scoops, | | |
| Pinch Bars, | | | Screws, Dozen. | | |
| Pike Poles, | | | | | |
| Paint Brushes, | | | Tape Lines, | | |
| " Pots, | | | Tongs, | | |
| | | | Timber Trucks, | | |
| | | | Torpedoes, | | |
| Pumps, | | | Tamping Bars | | |
| Posts, Cedar, Number, | | | Tool Boxes, | | |
| " Oak, " | | | | | |
| Picks, | | | Vises, | | |
| Pick Handles, | | | Velocipedes, | | |
| Post Augers, | | | | | |
| Punches, | | | Washers, lbs | | |
| Piles, Feet, | | | Water Kegs, | | |
| Pitchforks, | | | " Pails, | | |
| Raising Bars, | | | Waste, lbs. | | |
| Rail Forks, | | | Wheelbarrows, | | |
| Rakes, | | | Wrenches, | | |
| Ratchet Drills, | | | Wicking, | | |
| Rivets, lbs. | | | Wire, | | |
| Rollers, | | | Whetstones, | | |
| Rope, lbs. | | | | | |
| Screens, | | | TIES. (on hand not in use.) | New. | Worn Out |
| Striking Hammers, | | | Oak, | | |
| Shears, | | | Cedar, | | |
| Squares, | | | Hemlock, | | |
| Stone, yds. | | | Ash, | | |
| " Hammers, | | | Culls, | | |
| Switches, Single, | | | Switch, | | |
| " Double, | | | Br dge, | | |
| " Split, | | | Head Blocks, | | |
| Switch Frames, | | | | | |
| " Rods, | | | | | |
| " Stands, | | | | | |
| " Lamps, | | | | | |
| " Plates, | | | RAILS. (on hand not in use.) | New. | Usable. / Scrap. |
| " Houses, | | | Steel, lb., Feet. | | |
| " Ropes, | | | lb., " | | |
| Spikes, R. R., lbs. | | | lb., " | | |
| " Boat, " | | | lb., " | | |
| " Cut, " | | | lb., " | | |
| Shovels, | | | Iron, lb., " | | |
| Straightening Machines, | | | lb., " | | |
| Spot Boards, | | | lb., " | | |
| Sledges, | | | lb., " | | |
| | | | lb., " | | |

FORM 1.
(Size 9½ x 14 in.)

## GENERAL TIME BOOK of Men Employed at _____

*in Month of* _____ *18*___

| No. | Name. | How Employed. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | Detailed Hours Worked. | Total Hours Worked. | Rate. | Detailed Amount. | Total Wages. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | + | + | + | + | + | | + | + | + | + | | + | | | + | | + | + | + | | + | + | + | + | + | + | | + | + | + | + | | | | | | |
| | | | + | + | | + | + | | + | + | + | + | + | + | | | + | + | + | + | + | | + | + | + | + | + | + | | + | | + | + | | | | | | |
| 1 | Doe, John | Machinist. | 10 | 10 | 5 | 10 | 10 | S | 10 | 10 | 10 | 10 | 5 | 10 | S | | 10 | 5 | 10 | 10 | 10 | S | 10 | 10 | 10 | 10 | 10 | 10 | S | 10 | 5 | 10 | 10 | | 240 | .20 | | $48 00 | |
| | | Pass. Eng. No. 3. | 2 | | | | | | 5 | 1 | | | | | | | 5 | | | | | | | | 5 | | | | | | | 1 | | 19 | | | 3.80 | | |
| | | " " " 6. | 3 | | | 5 | 2 | | | 4 | | | | | | | | | | | | | | 3 | | 7 | 5 | | | 2 | | | 7 | 38 | | | 7.60 | | |
| | | Frt. " " 8. | 5 | 5 | | | | | | | | | | | | | 3 | 5 | 2 | | 10 | | 5 | | | | | | | | | | | 35 | | | 7.00 | | |
| | | " " " 9. | | 5 | 5 | | | | 3 | | | 5 | | 2 | | | | | | | | | | | 1 | | | | | | | 4 | | 25 | | | 5.00 | | |
| | | " " " 8. | | | | 5 | 3 | | | 2 | | | | | | | | | | | | | 2 | | | 3 | 1 | | | 4 | | | 2 | 22 | | | 4.40 | | |
| | | Pass. Cars. | | | | | 5 | | 2 | | | 5 | | | | | | | | | | | 3 | 2 | | | | | | | | | 1 | 18 | | | 3.60 | | |
| | | Frt. Cars. | | | | | | | | 3 | 10 | | | | | | | | 8 | 10 | | | | | 4 | | | | | | | 2 | | 37 | | | 7.40 | | |
| | | Pass. Eng No. 7. | | | | | | | | | | | 5 | 5 | | | | | | | | | | | | | 4 | 5 | | 3 | | | | 22 | | | 4.40 | | |
| | | " " " 4. | | | | | | | | | | | | 3 | | | 2 | | | | | | | | | | | | | 1 | 5 | | | 11 | | | 2.20 | | |
| | | Frt. " 80. | | | | | | | | | | | | | | | | | | | | | | 5 | | | | 5 | | | | 3 | | 13 | | | 2.60 | | |

[NOTE.—Loose sheets of the form and style of the above should be furnished to all who are required to keep the time of men. The object of furnishing the blank in loose sheets instead of in book form is to enable the person who writes it up to take an impression copy before it leaves his hands; thus the clerical work that would otherwise be required in making a written copy is avoided, the impression answering for local uses, while the original copy is forwarded with the pay roll.

It will be noticed that the sheets are eyeletted; these eyelets are to enable the person making the return to collect the sheets together and bind them in book form before they leave his hands. The covers for the books are similarly eyeletted. Tape and covers should be furnished with the blanks.

Where checks are used in taking time, the marks noted above (+) will not, of course, be entered. See rules and regulations governing "manner of taking time."

Where the blotter is used in taking quarter time, the marks will be noted on this sheet only when the employe commences work in the morning and afternoon. The number of hours worked will be entered hereon in such cases.]

FORM 2.
(Size 5½ x 8½ in.)

## TRACK TIME (AND DISTRIBUTION) BOOK.

*Work performed in the month of* _____ *18* , *by* _____

*Occupation* _____ *Rate, $* _____ *per* _____

| DATE. | Total time worked. | "REPAIRS OF ROADWAY AND TRACK" | | | | | | | | "Repairs of Fences, Etc." | "Flagmen." | "Watchmen." | "Repairs of Bridges and Culverts." | | "Repairs of Cattle guards" | "Laborers." | | "Maintaining Telegraph." | "Construction of sidings." | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Gen'l repairs of track. | Laying ties. | Laying rails. | Ditching. | Freshet repairs. | Track watchmen necessitated by repairs. | Ballasting. | Clearing track of snow and cutting weeds and grass. | Repairing fences, road crossings and signs. | Flagmen at crossings. | Bridge and track watchmen | Repairing bridges, etc. | Bridge watchmen necessitated by repairs. | Repairing cattle guards. | Reloading cars, getting cars on track, etc. | Station labor. | Telegraph repairing. | | |
| 1 | | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | |
| and so on to 31 | | | | | | | | | | | | | | | | | | | | |
| Total number of hrs. | | | | | | | | | | | | | | | | | | | | |
| Total amt. of wages, | $ | | | | | | | | | | | | | | | | | | | GRAND TOTAL $.... |

FORM 3.
(Size 5¼ x 8⅛ in.)

## BRIDGE AND BUILDING TIME (AND DISTRIBUTION) BOOK.

*Work performed in the month of* _____ *18* , *by* _____

*Occupation* _____ *Rate, $* _____ *per* _____

| DATE. | Total Time Worked. | LOCATION, NAME AND DESCRIPTION OF OBJECT UPON WHICH WORK IS DONE. | Number or date of order authorizing work. | Repairs of roadway and track. | Repairs of bridges and culverts. | Rebuilding bridges and culverts. | Construction of bridges and culverts. | Repairs of buildings, docks, etc. | Rebuilding buildings, docks, etc. | Construction of buildings, docks, etc. | Repairs of fences, road crossings, signs and cattle guards | Miscellaneous. | Remarks. | DATE. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | | | | | 1 |
| 2 | | | | | | | | | | | | | | 2 |
| 3 | | | | | | | | | | | | | | 3 |
| 4 | | | | | | | | | | | | | | 4 |
| 5 | | | | | | | | | | | | | | 5 |
| 6 | | | | | | | | | | | | | | 6 |
| 7 | | | | | | | | | | | | | | 7 |
| 8 | | | | | | | | | | | | | | 8 |
| 9 | | | | | | | | | | | | | | 9 |
| 10 | | | | | | | | | | | | | | 10 |
| 11 | | | | | | | | | | | | | | 11 |
| and | | | | | | | | | | | | | | and |
| so | | | | | | | | | | | | | | so |
| on | | | | | | | | | | | | | | on |
| to | | | | | | | | | | | | | | to |
| 31 | | | | | | | | | | | | | | 31 |
| | | Total number of hours. | | | | | | | | | | | Grand total, | |
| | | Total amount of wages. $ | | | | | | | | | | | $..... | |



FORM 4.
(Size 10¾ x 10½ in.)

## ENGINEERS' AND FIREMEN'S TIME BOOK (FOR RUNNING TIME).

Eyelet.

.....*Engineer. Month of*....., *18*.....

(Number of miles run must be based on distances as shown by Time Tables.)

| Name of Fireman. | Date. | Miscellaneous time. | Running time. | Engine No. | From. | To. | MILES RUN ON | | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Pass'ngr. | Fre'ht. | Gravel. | Switching. | |
| | 1 | | | | | | | | | | |
| | 2 | | | | | | | | | | |
| | 3 | | | | | | | | | | |
| | 4 | | | | | | | | | | |
| | 5 | | | | | | | | | | |
| | 6 | | | | | | | | | | |
| | 31 | | | | | | | | | | |
| Totals ..... | | | | | | | | | | | |

Eyelet.

Hours allowed for Road service.....at.....cts..$.....
" " " Switching ..... " ..... " .....
" " " ..... " ..... " .....
" " " ..... " ..... " .....
Total,.....hours. $.....

Eyelet.

[NOTE.—Loose sheets of the form and style of the above should be furnished to all who are required to make returns of engineers' and firemen's time. The object of furnishing the blank in loose sheets instead of in book form is to enable the person who writes it up to take an impression copy before it leaves his hands; thus, the clerical work that would otherwise be required in making a written copy is avoided, the impression answering for local uses while the original copy goes to headquarters.

It will be noticed that the sheets are eyeletted; these eyelets are to enable the timekeeper to collect the sheets together and bind them in book form before they leave his hands. The covers for the books are similarly eyeletted. Tape and covers should be furnished with the blanks.

This form should also be arranged for keeping the time of firemen.

This record should be written up daily. The pay roll should be made from this record at the close of the month.]

FORM 5.
(Size 4½ x 7½ in.)

## ABSENT SHEET.

_____ *Shop,* _____ *18*

*The following employes were not present this* _____

| No. | No. | No. |
|---|---|---|
| | | |

_____
*Checking Clerk.*



FORM 6.
(Size 6x2½ in.)

## LATE SLIP.

| STUB. | |
|---|---|
| .....*18* | .....*Shop,*.....*18* |
| | .....*Occupation*..... |
| *Occupation*..... | |
| *Commenced work this date, at*.....*M.* | *Commenced work this day at*.....*M.* |
| | .....*Foreman.* |

FORM 7.
(Size 6x3½ in.)

## REPORT OF OVERTIME.

_____ *Shop.* _____ *18*____

_____ *Foreman.*

| NAMES. | OCCUPATION. | TIME WORKED. | | EMPLOYED ON. |
|---|---|---|---|---|
| | | FROM | TO | |
| | | | | |

(NOTE.—Report of time worked by operatives at other than regular hours or in absence of timekeeper, to be certified to storekeeper.)



FORM 8.

## LOCOMOTIVE ENGINEER'S TRIP REPORT OF TIME WORKED

(TO BE SENT TO TIMEKEEPER AT END OF TRIP.)

*Month of*_____*18*____

| ENGINE NUMBER. | NAME OF ENGINEER. | NAME OF FIREMAN. |
|---|---|---|
| | | |

| Time Called For. | Train Number | DEPARTED. | | ARRIVED. | | RILES RUN AS PER TIME TABLE. | | | HOURS WORKED. (Particulars must be given on back of this report.) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TIME. | FROM. | AT. | TIME. | Pass. | Frt. | W. Frt. | Work Train. | Switching. | Over Time. | Delayed Time. |
| | | DAY. M. | | | DAY. M. | | | | | | | |
| | | DAY. M. | | | DAY. M. | | | | | | | |
| | | DAY. M. | | | DAY. M. | | | | | | | |

REMARKS _____

NOTE.—When overtime or delayed time is claimed, the Timekeeper will send this report to the Superintendent for verification.

[NOTE.—This is one of two forms, namely:
Locomotive Engineer's trip report of time worked.
Locomotive Engineer's daily record of time worked.
Under the multiplex system of accounts these forms are written simultaneously. On the back of above forms provision is made for entering particulars of hours worked.]

FORM 9.
(Size 8½x14 in.)

REPORT OF MILES RUN in the Month of _____ 18

*By* _____ *Engineer.*

| Name of Fireman. | Date. | Engin'rs Time. | Engine Number. | From. | To. | MILES RUN ON | | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Pass'ngr. | Freight. | Gravel. | Switching. | |
| | 1 2 3 4 5 6 7 8 9 and so on to 31 | | | | | | | | | |
| | | | | | Total..... | | | | | |

(NOTE.—This report is filled out by engineers, and should be compared with the time book.)



FORM 10.
(Size 8½x14 in.)

TRAIN DISPATCHER'S REPORT OF MOVEMENT OF TRAINS.

*To Storekeeper* _____ _____ *18*

*The following engines have been run this day.*

_____ *Train Dispatcher.*

| Eng. No. | Train No. | Engineer. | Fireman. | From. | To. | No. Miles. | Route. |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

FORM 11.
(Size 8¼x10½ in.)

## ENGINE-HOUSE REGISTER.

*Engine-House,* _____ *18*____

DEPARTURES. (OR ARRIVALS.)

| Number of train. | Number of engine. | Kind of train. | Destination. | Engineer. | Fireman. | Time of departures. |
|---|---|---|---|---|---|---|
| | | | | | | |

(NOTE.—The page opposite this in the register is the same form as the above, and is used for "*Arrivals.*" This book is useful for reference in keeping the switching time of engineers and firemen.)



FORM 12.
(Size 10 x 3 in.)

## CONDUCTOR'S REPORT

OF TIME OF TRAIN CREW FOR DATES NAMED.

..... *Conductor.*

| NAME OF EMPLOYE. | TITLE. | NAMES OF STATIONS BETWEEN which he ran. | No. of Train (going West or North, odd numbers.) | Date. | No. of miles run. | No. of Train (going East or South, even numbers.) | Date. | No. of miles run. | Rate of Wages. |
|---|---|---|---|---|---|---|---|---|---|
| | Conductor. | and | | | | | | | |
| | Brakeman. | " | | | | | | | |
| | " | " | | | | | | | |
| | " | " | | | | | | | |
| | Baggage'n. | " | | | | | | | |

(NOTE.—There must be entered only the numbers of the trains upon which the employe has run.)

FORM 13.
(Size 9½x14 in.)

## BLOTTER FOR TAKING QUARTER TIME.

DISTRIBUTION OF TIME OF *Men employed at* _____ *Shop*

*for week ending* _____ *18* _____

| | 1st, | 2nd, | 3rd, | 4th, | 5th, | 6th, |
|---|---|---|---|---|---|---|
| NAMES OF EMPLOYES. | Name of account upon which labor was expended. | do. | do | do. | do. | do. |
| "DOE, JOHN" | 5 Locomotive No. 28,<br>3, Repairs frgt. cars,<br>2, Repairs pass. cars, | | | | | |

(NOTE.—This book is used for taking the time of employes engaged by the day or hour, in shops, storehouses and yards, but not including those engaged in the departments of track, bridges and buildings, for which special forms of time books are provided.)



FORM 14.
(Size 9½x14 in.)

*Accounting Officer's Folio* _____

_____ *Shop,*

*Folio of Distribution Book* _____

GENERAL DISTRIBUTION OF MATERIAL BOOK for the Month of _____ 18

*Charged to* _____

| Eyelet. | | | | | | |
|---|---|---|---|---|---|---|
| Eyelet. | | | | | | |
| Eyelet. | | | | | | |

(NOTE.—Loose sheets of the form and style of the above should be furnished to all who are required to make returns of material. The object of furnishing the blank in loose sheets instead of in book form is to enable the person who writes it up to take an impression copy before it leaves his hands; thus the clerical work that would otherwise be required in making a written copy is avoided, the impression answering for local uses, while the original copy goes to headquarters.

It will be noticed that the sheets are eyeletted; these eyelets are to enable the person making the return to collect the sheets together and bind them in book form before they leave his hands. The covers for the books are similarly eyeletted. Tape and covers should be furnished with the blanks.)

FORM 15.
(Size 14x8½ in.

# PAY ROLL.

(Form used when Payee appears personally before the Paymaster.)

*Received from the.....RAILWAY COMPANY, the sums set opposite our respective names, for Labor for the month of.....18..., and in full for services of every name or nature for said Company, or Companies owned or controlled by it, up to the close of the month named.*

| No. | Name. | Occupation. | Time. | Rate. | Amount. | Paid on account. | Amount Due | Received payment in full. | Witness. |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

NOTE.—The Pay Roll for engineers and firemen and trainmen is the same as the above, except that it contains a column for the "number of miles run," inserted after "occupation."

The pay roll blank of a railway will also answer very well for a time ticket on which to group several names when a number of employes leaves the service simultaneously at a particular point and requires to be paid off: when thus grouped, the clerical work of making out a time ticket for each is avoided. Some railway companies have a special form for this purpose. It is not noticeably different, however, from the pay roll blank (except in unimportant particulars), and so, therefore, it is not necessary to give a separate form of this kind here.

For description of pay roll adapted to those cases where the company pays by check, see the form succeeding this, No. 15½.



Form No. 15½.

# BLANK RAILWAY CO.

(Form used when Payment is made by Check. The Check being forwarded by the Paymaster.)

PAY ROLL: STATEMENT OF TIME WORKED AND WAGES EARNED BY THOSE NAMED BELOW, WITH DETAILS OF PAYMENT AND OTHER PARTICULARS, FOR MONTH OF.....189..

| No. | Name. | Check to be sent to | Occupation. | Time | Rate | Amount. | Deductions. | Balance. | Deductions made by Paymaster. | Balance to be paid Employe. | HOW ROLL IS PAID. By Time Ticket If time ticket has been Issued write "Time Given." | By Check No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |

NOTE.—The pay roll for engineers and firemen and trainmen is the same as the above, except that it contains a column for the "number of miles run," inserted after "occupation."

FORM 16.
(Size 6¾x3¼ in.)

## REQUEST FOR TIME TICKET.

(Not transferable or negotiable or assignable.)

_____ 18____

*To*_____ *At*_____

*This is to Certify* that.....

is entitled to a Time Ticket for work performed by him at.....for.....days

in the month of.....18.....at the rate of.....

per....., amounting in all to.....Dollars ($.....)

less.....Dollars ($.....)

to be deducted on account of.....

Kind of work performed .....

This requisition must be presented to the person to whom it is addressed before the time roll is sent in and before the pay roll is made (so that they may be properly marked), otherwise it will not be honored, but should be taken up and destroyed.

.....

.....



FORM 17.

## TIME TICKET.

This Certificate is **Not Negotiable** and is **Void** unless certified to and countersigned by authorized officials of the Company. When thus authorized and properly endorsed it will be paid (subject to the conditions printed on the back hereof*) by Paymasters and AUTHORIZED Agents of the Company having the necessary funds on hand. It is **Invalid** if not presented and paid within THIRTY days from date hereof. If not delivered to the Payee within thirty days, there should be marked across its face, "CANCELLED—NOT CALLED FOR;" it should then be forwarded forthwith to the Paymaster for cancellation. The amount named herein is subject to any claim against the Payee. This ticket is not good for any sum exceeding $150.00.

**Before paying Tickets, agents and others must carefully study the rules and regulations governing their payment.**

.....*Station*,.....*18*....

*No*..... **Certificate of Wages in favor of**.....

*for services as*.....*at*.....*for*.....*days in the month*

*of*.....*189*..*at rate of $*..... ....*per*.....*amounting in all*

*to*.....*Dollars* ($.....)
100 100

*From this amount deduct*.....*Dollars* ($.....)
100 100

*on account of*.....

*leaving balance due him*.....*Dollars* ($.....)
100 100

*Why this ticket is issued*.....

*Countersigned:*
.....
.....

*I hereby certify the above to be correct:*
.....
.....

[NOTE—This is one of two forms, namely—Time Ticket—Record of Time Ticket Issued.
Under the multiplex system of accounts these forms are written simultaneously.]
*For conditions printed on back of ticket, see next page.

FORM 17—CONTINUED.

[BACK OF TIME TICKET.]

**Agreement upon the part of Payee.**

---

This Time Ticket, upon which payment for wages is made, is accepted by me in full payment for services of every name and nature for the Railway Company, or companies owned or controlled by it, up to and including the time specified herein.

It is accepted by me subject to the rules and regulations of the Company governing its issue. I agree not to negotiate it or attempt to collect it through any bank or collection agency, but to present it in person to the paymaster of the company, or such agent as may be authorized to pay it.

It is also understood and agreed to by me, as witnessed by my signature hereto, that in the event I should lose this ticket, or it should otherwise pass out of my hands, and in consequence the amount called for should be paid to a wrong person, I will not hold the Company responsible for the amount.

.....

*Signature of Payee, i. e., person to whom this ticket is issued.*

*Witness:* .....

*Title,* .....



FORM 18. LETTER OF ADVICE TO PAYMASTER IDENTIFYING EMPLOYE.

**CONDITIONS OF PAYMENT.**—This letter is void and of no account unless certified to and countersigned by authorized officials of the Company, and duly endorsed by the person in whose favor it is made. When thus made, the wages it specifies to be due will be paid, if still unpaid (subject to the conditions printed hereon*), by the general cashier or paymaster. It is invalid if not presented and paid within thirty days from the date hereof. The amount named herein is subject to any claim against the payee. This letter is not good for any sum exceeding $150.00.

**TO WHOM THE LETTER IS TO BE PRESENTED.**—Before this letter can be honored by the payment of the wages it specifies, it must be compared with the pay roll, and if found correct, and the amount unpaid, the roll must be marked "letter given" and the fact certified hereon in the place provided. If the pay roll is not in the hands of the paymaster, he must refer the bearer to the official of the Company in whose posession it is, who will certify to it. In the event the paymaster or official who certifies to the letter is not in a position to pay it, he will refer the payee to the officer who is.

*No.* .....

.....*18*.....

*To THE PAYMASTER:*

**This is to Certify** *that the Bearer,*

.....*whose signature is endorsed hereon, appears on the*

.....*Pay Roll for*.....*189*.., *No*.....*Occupation*.....

*at*.....*and that there is due him after making all deductions,*

.....*Dollars.* ($.....)
100

*Why this letter is issued*.....
100

*Countersigned:* { *I hereby certify the above is correct and that no time ticket has been issued:*

.....

.....

.....

[NOTE—This is one of two forms, namely:
Letters of Advice to Paymaster Identifying Employe.
Record of Letter of Advice to Paymaster Identifying Employe.
Under the multiplex system of accounts, these forms are written simultaneously.]

*For conditions of endorsement printed on back of letter, see next page.

*I certify that the Pay Roll has been marked "Letter Given."*

**FORM 18—CONTINUED.**

[BACK OF LETTER OF ADVICE.]

**Agreement upon the part of Payee.**

This letter of advice, upon which payment for wages is made, is accepted by me in full payment for services of every name and nature for the Railway Company, or companies owned or controlled by it, up to and including the time specified herein.

It is accepted by me subject to the rules and regulations of the Company governing its issue. I agree not to negotiate it or attempt to collect it through any bank or collection agency, but to present it in person to the paymaster of the Company, or such agent as may be authorized to pay it.

It is also understood and agreed to by me, as witnessed by my signature hereto, that in the event I should lose this letter, or it should otherwise pass out of my hands, and in consequence the amount called for should be paid to a wrong person, I will not hold the Company responsible for the amount.

.....

*Signature of Payee, i. e., person to whom this letter is issued*

*Witness :*.....

*Title :*.....



FORM 19.
(Size 8 x 3½ in.)

ORDER ON PAYMASTER—NOT NEGOTIABLE.

The company upon whom this order is drawn will not be responsible for its payment. It is subject to any claim against the maker upon which Process of garnishment has been issued and served upon the said railway company. This order must be certified as correct by some well-known and trustworthy person in the employ of the company, who is conversant with the facts and personally acquainted with the signature of the drawer. It will be honored only when drawn for the full amount of the month's pay.

*Station,*.....*18*.....

**TO THE PAYMASTER:**

*Pay to bearer the amount due me for services as*.....

*at*.....*on Company's pay roll, for Month of*.....*18*.....

This order will not be paid by the company, unless the amount shall be found due by it to the drawer on the next pay day, and unless said order is presented at the proper time and place for paying the wages of the person issuing it.

*I have marked the pay roll. "order given."*

}
}.....*Treasurer.*

.....

*This is to certify that I am personally acquainted with the maker of this order, and am witness to the authenticity of his signature. I know, moreover, that he was employed by the company, as stated.*

FORM 20.
(Size 14x8¾ in.)

## BOND OF INDEMNITY TO BE FILED WITH THE COMPANY IN CASE OF LOST VOUCHERS, TIME TICKETS, CHECKS, DRAFTS AND SIMILAR DOCUMENTS.

KNOW ALL MEN BY THESE PRESENTS, That we.....of.....as principals, and.....of.....and.....of.....as sureties, are held and firmly bound unto the.....Railway Company, in the penal sum of.....Dollars ($.....) lawful money of the United States, to be paid to the said.....Railway Company, its successors and assigns, for which payment well and truly to be made we do bind ourselves, our heirs, executors and administrators, jointly and severally, firmly by these presents.

Sealed with our seals, and dated this.....day of.....A. D. 18

The conditions of the foregoing obligation are such, that, whereas, on the.....day of..... A. D. 18....., the said.....Railway Company, did, by.....its.....issue its.....No.....for the sum of.....Dollars,.....cents, payable to.....

AND, WHEREAS, it is claimed that said.....has been lost, stolen or destroyed, and cannot now be produced by said.....and payment thereof has been stopped,

AND WHEREAS, at the request of said.....and upon his promise to indemnify and save harmless the said railway company in the premises, and to deliver said..... when found, to said railway company, to be canceled, the said railway company is about to issue a duplicate of said.....for the said sum of.....Dollars and.....cents, ($.....) payable to the order of said.....

**Now, therefore,** if the above bounden obligors shall well and truly indemnify and save harmless the said.....Railway Company, its successors and assigns, from and against said original.....and any and all damages, costs, charges and expenses, and all actions or suits, whether groundless or otherwise, by reason of said original.....or the loss or destruction thereof, and also deliver or cause to be delivered up the same, when and as soon as the same shall be found, to be cancelled, then this obligation shall be void; otherwise the same shall remain in full force and effect.

Principal will sign here ..... [SEAL.]

Sureties will sign here { ..... [SEAL.]
..... [SEAL.]

FORM 21.
(Size 8½x7¼ in.)

## REQUISITION FOR MATERIAL.

_____ 18

_____ *No.* _____

_____

*Dear Sir:*

**REQUISITION** *is hereby made for* **MATERIAL** *called for below. Please send without delay to*_____*at*_____ *and send the invoice to*_____*at*_____

NOTE.—In the event the material asked for is not granted, or the quantity is changed, or the purchase delayed, immediate notice of the fact will be sent to the person making the requisition, so that he may act intelligently.

*Signed,*_____

*Approved,*_____

| QUANTITY OF MATERIAL. | | | KIND OF MATERIAL. | REMARKS. |
|---|---|---|---|---|
| Now on hand. | Not yet rece'd on previous requisitions. | Additional quantity wanted. | | |
| | | | | |

FORM 22.
(Size 7½x6 in.)

## ORDER ON STOREKEEPER FOR SUPPLIES.

*To Storekeeper at* _____ _____ *18*

*Dear Sir:—Please deliver to* _____

*at* _____ *without delay, articles as specified below:*

**PLEASE NOTE THOSE RETURNED, AND ACKNOWLEDGE RECEIPT THEREOF.**

| Quantity on hand. | Quantity returned.* | DESCRIPTION OF ARTICLES. | Quantity hereby ordered. |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| Charge to | | | |

*These articles were returned
_____ *18*
_____ *Car No.* _____ } *Signature,* _____

NOTE.—The form used in ordering brasses is similar to the above, except that the names of the different kinds of brasses are printed in order, in the column headed "Description of Articles."



FORM 23.
(Size 8½x7 in.)

N. B.—Number of order MUST be given in all cases, and invoice mailed on day of shipment.

## INVOICE OF MATERIAL PURCHASED

*of* _____ *at* _____

*For the following supplies sent to* _____

*per requisition No.* _____ *issued by* _____

*18* _____ *Shipped in* _____ *Car No.* _____

CORRECT.

ORIGINAL.

TO STOREKEEPER.—This invoice must be returned, dated and signed, on receipt of material.

Prices examined and found correct.

*Received and entered the above* _____ *18* ... } _____

(NOTE.—Merchants and others from whom goods are purchased should be supplied with this blank. Before receipting for the goods as required above, care must be taken to note, in ink, upon the face of the invoice, any errors or inaccuracies there may be. If the articles called for are of inferior quality, deficient in quantity, or if any attempt is made to deceive the company in reference to them, or if not fully up to the standard required, the facts must be fully and explicitly noted, in ink, upon the face of the invoice.)

FORM 24.
(Size 8½x14 in.)

## INVOICE OF MATERIAL

*Forwarded from* _____ *for* _____

*at* _____ *on account of request number* _____ *shipped*

*in* _____ *car, number* _____ *: chargeable to* _____

NOTE.—An invoice is required to accompany or precede all supplies purchased or shipped from any storehouse or other place.

The person to whom the material is consigned must examine it immediately upon its arrival and in the event of error or omission, or in case there is any variation or deficiency either as regards quality or quantity, the subjoined account must be corrected accordingly. As soon as the articles are received, this invoice must be receipted and returned to the office from whence it came.

| Date of Shipment. | | DESCRIPTION OF ARTICLES. | Quantity. | Price. | | Amount. | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |

*Received the above this day:*

.....18.....

.....

.....
**Storekeeper.**

.....
**Storekeeper.**

This is one of three forms, namely:
Invoice of material transferred.
Shipping instructions to agent.
Record of material shipped.
Under the multiplex system of accounts these forms are written simultaneously.



FORM 25.
(Size 8½x14 in.)

## INSPECTOR'S REPORT OF TIES INSPECTED _____ 18

*at* _____ *for* _____ *of* _____

_____ *Inspector.*

| KIND OF TIES AND NUMBER. | LOCATION. | | |
|---|---|---|---|
| | Place. | Side of track. | Distance from track. |
| No. of ..... Wood Ties ..... | | | |
| " ..... " " ..... | | | |
| " ..... " " ..... | | | |
| " ..... " " ..... | | | |
| " ..... Cull " ..... | | | |
| " ..... " " ..... | | | |

*Remarks* _____

FORM 26.
(Size 10¾x11½ in.)

## RAILS ON HAND, on _____ 18

### BELONGING TO OPERATING DEPARTMENT.

| | Number of Lineal feet. | NUMBER OF TONS OF EACH CLASS OF METAL. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Lbs. Per Yard. | Lbs. Per Yard. | Lbs. Per Yard. | Lbs. Per Yard. | Lbs. Per Yard. | Lbs. Per Yard. | Lbs. Per Yard. | Lbs. Per Yard. | Lbs. Per Yard. | Lbs. Per Yard. | Miscellaneous. |
| New Steel Rails, | | | | | | | | | | | | |
| Usable " " | | | | | | | | | | | | |
| Scrap " " | | | | | | | | | | | | |
| New Iron Rails, | | | | | | | | | | | | |
| Usable " " | | | | | | | | | | | | |
| Scrap " " | | | | | | | | | | | | |

### BELONGING TO CONSTRUCTION DEPARTMENT.

| | Number of Lineal feet. | NUMBER OF TONS OF EACH CLASS OF METAL. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Lbs. Per Yard. | Lbs. Per Yard. | Lbs. Per Yard. | Lbs. Per Yard. | Lbs. Per Yard. | Lbs. Per Yard. | Lbs. Per Yard. | Lbs. Per Yard. | Lbs. Per Yard. | Lbs. Per Yard. | Miscellaneous. |
| New Steel Rails, | | | | | | | | | | | | |
| Usable " " | | | | | | | | | | | | |
| New Iron Rails, | | | | | | | | | | | | |
| Usable " " | | | | | | | | | | | | |

(NOTE.—This report must be made monthly by superintendents, and must be sent to the accounting officer on or before the 15th of the succeeding month. It must embrace all rails on hand on the last day of the month, including rails at the various rail mills, or going to and coming from such mills. It must also include, as far as possible, other rails en route to the various divisions on the last day of the month. Rails at the general storehouse, or en route thereto on the last day of the month, will be reported by the general storekeeper. Lineal feet of scrap is not required.)



FORM 27.
(Size 14x8½ in.)

MONTHLY REPORT OF CAR BRASSES from _____ Shop,

For the Month of _____ 18____

_____ Storekeeper.

| DEBIT. | Patterns of brasses used on passenger cars. | Patterns of brasses used on freight cars. | Total. |
|---|---|---|---|
| Balance on hand last report, | | | |
| Received from the general storehouse, | | | |
| " " | | | |
| " " | | | |
| Total No. accounta ble for, | | | |

| CREDIT. | Patterns of brasses used on passenger cars. | Patterns of brasses used on freight cars. | Total. |
|---|---|---|---|
| Old brasses sent to the general storehouse to be exchanged for new, | | | |
| New brasses on hand by actual count last day of month, | | | |
| Old brasses on hand by actual count last day of month, | | | |
| Total No. accounted for, | | | |

(NOTE.—This blank is used for reporting monthly the number of car brasses of each pattern on hand at the different shops and storehouses.)

FORM 28.

## DINING CAR CONDUCTOR'S TRIP REPORT.

***Dining Car Conductor's report of supplies on hand from last trip, furnished from storehouse, purchased on line of road, on hand at end of trip, and quantity and value of supplies consumed.***

*Requisition for Supplies*

*For Car*.....
*From* .....
*To*.....*and return.*
*Date*.....
*Approved:* .....
*Superintendent Dining Cars.*

| Supplies Required. | ARTICLES. | On Hand from Last Trip. | Supplied from Storehouse. | Purchased on Trip. | On Hand at End of Trip. | Consumed on Trip. | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Quantity. | Value. | |
| | Meats.....(In detail.) | | | | | | | |
| | Poultry..... " | | | | | | | |
| | Game ..... " | | | | | | | |
| | Fish and Oysters. " | | | | | | | |
| | Fruits ..... " | | | | | | | |
| | Vegetables ..... " | | | | | | | |
| | Butter, Milk, etc. " | | | | | | | |
| | Bread, Flour, etc. " | | | | | | | |
| | Miscellaneous.... " | | | | | | | |
| | Wines and Liquors " | | | | | | | |
| | Cigars etc..... " | | | | | | | |

This blank is so arranged that under the multiplex system of accounts, the requisition and a portion of the report is written simultaneously, thus saving the clerical work of rewriting, and insuring absolute accuracy and conformity between the different documents

The above blank and the one on following page are bound together, forming a complete report of the business of each trip.



FORM 28—CONTINUED.

## DINING CAR CONDUCTOR'S TRIP REPORT—Continued.

### DINING CAR CONDUCTOR'S INVENTORY OF EQUIPMENT.

| ARTICLES. | On Hand Supplied from Last Trip | On Hand Supplied at Store House. | On Hand at End of Trip. | BROKEN ON TRIP. | |
|---|---|---|---|---|---|
| | | | | Quantity | Value. |
| Chinaware...(In detail) | | | | | |
| Silverware... " | | | | | |
| Glassware... " | | | | | |
| Kitchen and Pantry Equipment, (In detail) | | | | | |
| Miscellaneous Equipment, (In detail) ..... | | | | | |

### SUMMARY OF TRIP.

| SUPPLIES CONSUMED. | VALUE. |
|---|---|
| Meats ..... | |
| Poultry ..... | |
| Game ..... | |
| Fish and Oysters ..... | |
| Fruits ..... | |
| Vegetables ..... | |
| Butter, Eggs, Etc..... | |
| Bread, Flour, Etc..... | |
| Miscellaneous ..... | |
| Wines and Liquors ..... | |
| Cigars, Etc..... | |
| Breakages..... | |
| Total..... | |

| RECEIPTS. | AMOUNT. |
|---|---|
| For Wines and Liquors..... | |
| " Cigars..... | |
| .....Meals served at..... | |
| .....Trainmen served at ..... | |
| .....Lunches served at..... | |
| Total..... | |

REMARKS.

.....
Conductor.

FORM 29.
(Size 8x10 in.)

MONTHLY RETURN OF SCRAP ON HAND AT _____ *Storehouse,*
_____ *18*

| TONS. | SHOP, BRIDGE AND BUILDING SCRAP. | TONS. | TRACK SCRAP. |
|---|---|---|---|
| | WROUGHT IRON. | | IRON. |
| | No. 1 Wrought. | | Old Rails. |
| | Boiler. | | Angle Bars and Plain Splices. |
| | Tank. | | Bolts, Nuts, Spikes, &c. |
| | Turnings, Axle. | | Frog Plates. |
| | " Greasy. | | ---------- |
| | " Dry. | | ---------- |
| | " Mixed country. | | ---------- |
| | Old Axles. | | ---------- |
| | " Flues. | | STEEL. |
| | " Pipe. | | Old Rails, under 3 feet. |
| | " Bumpers. | | " 3 feet to 8 feet. |
| | Light sheet (steel and iron mixed). | | " 8 feet and over. |
| | ---------- | | Frog and Guard Rails. |
| | ---------- | | " Point Castings, heavy. |
| | ---------- | | ---------- |
| | CAST IRON. | | ---------- |
| | Old Wheels. | | ---------- |
| | No. 1 Cast. | | ---------- |
| | Borings. | | ---------- |
| | ---------- | | MISCELLANEOUS. |
| | ---------- | | Rail Clippings, mixed iron and steel. |
| | ---------- | | " Splinters, " " " " |
| | STEEL. | | " Punchings, " " " " |
| | Old Tires. | | Brass Castings. |
| | Flat Spring. | | " Borings. |
| | Heavy Coil (Volute included). | | " Sheet and Turnings. |
| | Tool. | | Old Rubber Springs. |
| | Boiler and Fire Box. | | " Rope. |
| | " Shell. | | " Bagging. |
| | Turnings (clean). | | " Leather. |
| | Old Files. | | ---------- |

(NOTE.—This return is made by storekeepers and is sent to the general storehouse. These returns will afterward be forwarded to the manager.)



FORM 30.
(Size 8½x14 in.)

REPORT OF OLD RAIL RECEIVED AT GENERAL STOREHOUSE.

OLD RAILS *Received from* _____ *Division,*

*in the month of* _____ *18* , *at general storehouse,*

*for week ending* _____ *18*

| Date of Way-Bill. | Initial and number or car. | Station from which shipped. | Lineal feet of lb. pattern. | Lineal feet of lb. pattern. | Lineal feet of lb. pattern. | Lineal feet of lb. pattern. | Lineal feet steel ----pattern. | Net Weight. |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |

FORM 31.
(Size 6½x7 in.)

## REPORT OF OLD RAIL DELIVERED TO ROLLING MILLS.

SCRAP RAIL FORWARDED FROM STOREHOUSE

*for the month of* _____ *18*____

*To* _____

*Account of* _____ *Rolling Mills.*

*Order No.* _____ *For* _____ *Tons.*

| Date. | Car Initial. | Car No. | GROSS. | TARE. | NET. |
|---|---|---|---|---|---|
| | | | | | |

_____ *Storekeeper.*



FORM 32.
(Size 6x3 in.)

## ORDER TO LOAD MATERIAL.

_____ *Shop.* _____ *18*

*To* _____

You will please load in Car_____ number_____ on account of requisition No._____ page No._____, material as follows:

_____
Storekeeper

FORM 33.
(Size 8½x14 in.)

*Accounting Officer's Folio*_____

_____ *Shop,*

*Folio of Distribution Book*_____

GENERAL DISTRIBUTION OF LABOR BOOK for the Month of_____18

*Charged to*_____

| Eyelet. | Name. | Kind of Service. | Folio time book. | Time worked. | RATE. | Detailed amount. | | Total amount. | |
|---|---|---|---|---|---|---|---|---|---|
| Eyelet. | | | | | | | | | |
| Eyelet. | | | | | | | | | |

(NOTE.—Loose sheets of the form and style of the above should be furnished to all who are required to make returns of labor. The object of furnishing the blank in loose sheets instead of in book form is to enable the person who writes it up to take an impression copy before it leaves his hands; thus, the clerical work that would otherwise be required in making a written copy is avoided, the impression answering for local uses while the original copy goes to headquarters.

It will be noticed that the sheets are eyeletted; these eyelets are to enable the timekeeper to collect the sheets together and bind them in book form before they leave his hands. The covers for the books are similarly eyeletted. Tape and covers should be furnished with the blanks.)

FORM 34.
(Size 10½x16 in.)

## DAILY RECORD OF OIL, WASTE AND TALLOW DELIVERED TO LOCOMOTIVES (AS PER ORDERS ON FILE).

*At*_____ *during month of*_____ *18*_____

| No. of Locomotive. | Quantity of Waste used by Wipers. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | Total. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 { Pints Engine Oil. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| " Kerosene Oil. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| " Signal Oil. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| " Cylinder Oil. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| " ---------- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| lbs. Tallow. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| " Waste. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

(NOTE.—Upon this form the orders for oil, waste and tallow should be written up daily.)

FORM 35.
(Size 8½x14 in.)

STATEMENT OF OIL, WASTE AND TALLOW DELIVERED TO LOCOMOTIVES.

*At*_____ *during Month of*_____ *18*____

| LOCOMOTIVE NUMBER. | OIL. | | | | | | TALLOW. | | | WASTE. |
|---|---|---|---|---|---|---|---|---|---|---|
| | Pints Engine. | Pints Kerosene. | Pints Signal. | Pints Cylinder. | Pints | Total Pints. | No. lbs. Tallow. | | Total Pounds. | No. lbs. Waste. |
| 1. | | | | | | | | | | |
| 2. | | | | | | | | | | |
| 3. | | | | | | | | | | |
| 4. | | | | | | | | | | |
| 5. | | | | | | | | | | |
| 6. | | | | | | | | | | |
| and so on. | | | | | | | | | | |

(NOTE.—This report is a recapitulation of the "Daily record of oil, waste and tallow delivered to locomotives," Form 32.)



FORM 36.
(Size 8½x14 in.)

REPORT OF COAL RECEIVED AT_____ *Station,*

*during the Month of*_____ *18*____.

| Date received. | WHERE FROM | Car initials. | No. of car. | No. of way-bill. | WEIGHT. | Advanced charges. |
|---|---|---|---|---|---|---|
| | | | | | | |

.....*Agent.*

(NOTE.—This report is required to be made by agents at stations where coal is received, no matter whether received from contractors or from some other station.)

FORM 37.
(Size 8x10 in.)

**STUB.**

Wood inspection report.

No.

Date, 18

For whom,

Location

Inspector,

REMARKS:

No. 18

REPORT OF WOOD MEASURED BY

*for*

| No. of rank. | Length. | Height. | Width. | No. cords hard. | No. cords soft. | LOCATION. | | | Remarks on condition &c. | Hard Woods.—Hard Maple, Oak, Hickory, Ironwood, Beech, and Black or Red Birch. Soft Woods.—Soft Maple, Elm, Ash, Walnut, Bass, Tamarack, Hemlock and White Birch. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | PLACE. | Side of track. | Dist. from track. | | |
| | | | | | | | | | | |

*Inspector.*





FORM 38.
(Size 8x10 in.)

## AGENT'S REPORT OF WOOD DISBURSED.

REPORT OF Marked Wood removed by wood trains, or by sawyers, from Station,

in Month of 18

Agent

| No. of rank. | The No. of piles or parts of same. | No. of cords. | BY WHOM REMOVED. |
|---|---|---|---|
| | | | |

(NOTE.—This is in addition to the regular monthly fuel report, and is only required when long wood is removed or sawed.)

FORM 39.
(Size 13¾x8½ in.)

## GENERAL FUEL REPORT.

*From* _____ *Station, for Month ending* _____ *18*

| STATION, DR. | Cords of Sawed Wood. | Cords of Unsawed Wood. | Pounds of Coal. | STATION, CR. | Cords of Sawed Wood. | Cords of Unsawed Wood. | Pounds of Coal. |
|---|---|---|---|---|---|---|---|
| To amount on hand per last report, | | | | By amount taken by locomotives, | | | |
| " received during the month, | | | | * " taken for stove fuel on trains, | | | |
| " purchased of..... | | | | * " used at stations and shops, and subsidiary buildings, | | | |
| | | | | " used account of water supply, | | | |
| | | | | " shipped to..... | | | |
| **TOTAL.** (Number of cords wood sawed to be added to sawed and deducted from unsawed wood.) | | | | **TOTAL, CR.** | | | |
| **TOTAL, DR.** | | | | **BALANCE ON HAND.** | | | |

* As per receipts enclosed herewith.

| | ONE CUT. | TWO CUTS. |
|---|---|---|
| Sawed during the month, | _____ Cords. | _____ Cords. |

_____ Agent.

(NOTE.—This report must be made by agents at all fuel stations.)



FORM 40.
(Size 3¼x1½ in.)

## ENGINE FUEL TICKET.

Form of ticket to be delivered to agents at fuel stations by engineers for all fuel furnished for use on locomotives.

**ONE TON COAL.**
*Delivered to Engine* _____
*Date* _____ *189*__
**3**

**ONE TON COAL.**
*Delivered to Engine* _____
*Date* _____ *189*__
**2**

**ONE TON COAL.**
*Delivered to Engine* _____
*Date* _____ *189*__
**1**

**ONE TON COAL.**
*Delivered to Engine* _____
*Date* _____ *189*__
**0**

FORM 41.
(Size 17x27 in.)

## RECORD OF BUSINESS DONE AT _____

| DATE. | | CONSIGNOR. | CONSIGNEE. | WHERE FROM. | WHERE TO |
|---|---|---|---|---|---|
| | | | | | |

## STOCK YARDS, MONTH OF _____ 18___

| W.-B. No. | Car No. | No. live hogs. | No. dead hogs. | No. cattle. | Charges collected here. | | Charges to be entered on way-bill. | | SEAL RECORD. | | | | REMARKS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | North. | South. | East. | West. | |
| | | | | | | | | | | | | | |



FORM 42.
(Size 3½x8 in.)

Approved for Payment.
.....Foreman.

## RECEIPT FOR FEED FURNISHED STOCK YARDS.

.....*Station*,..... .....*18*....

Received of.....Agent,

in full for..... .....

delivered at.....Stock Yards by..... .....

.....Dollars ($.....)

NOTE.—This receipt, when approved by the foreman of the stock yards and receipted by the person furnishing the feed, should be retained by the agent, as cash, until he receives a voucher to cover the same.

..... .....

.....

## RECORD OF PAYMENT FOR FEED FURNISHED STOCK YARDS.

.....*Station*,.....*18*....

Payment made by.....Agent

in full for.....

delivered at.....Stock Yards by.....

.....Dollars ($.....)

[NOTE —This record will be retained by the foreman of the stock yards. Give quantities and prices.]

FORM 43.
(Size 8½x14 in.)

MONTHLY REPORT OF SUPPLIES RECEIVED AND EXPENSES INCURRED

*in connection with the operations of the Stock Yards at*_____
*for the month of*_____*18*____

| DATE. | NAME. | WHAT FOR. | QUANTITY. | PRICE. | AMOUNT. |
|---|---|---|---|---|---|
| | | | | | |

REPORT OF QUANTITY OF FEED ON HAND ON THE LAST DAY OF THE MONTH.

| | DESCRIPTION. | QUANTITY. | PRICE. | VALUE. |
|---|---|---|---|---|
| | Hay, | lbs. | | |
| | Corn, | bu. | | |
| | Oats, | bu. | | |
| | | Total. | | |



FORM 44.
(Size 8½x13½ in.)

RECORD OF MONEYS COLLECTED at_____
Stock Yards, Month of_____18____

| DATE. | From whom collected. | AMOUNT. | | How disposed of. | Signature of person receiving the money. |
|---|---|---|---|---|---|
| | | | | | |

FORM 45.
(Size 8½x14 in.)

## MONTHLY REPORT OF STOCK YARD CHARGES,

made for feeding stock and other expenses incurred in connection therewith, at

_____Stock Yard, for the Month of_____18____

| DATE | Way-Bill No. | Way-billed to | On whose account. | Car No. | Description of charge. | Quantity. | Price. | Amount collected at the stock yards and way-billed as miscellaneous charges prepaid. | | Amount to be collected at destination and way-billed as miscellaneous charges unpaid. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |



FORM 46.

*Department No.*.....

BILL AGAINST INDIVIDUALS, FIRMS AND CORPORATIONS. ("VARIOUS PERSONS' BILL.")

.....

To.....RAILWAY CO. DR.

*18*

| | | | | | | |
|---|---|---|---|---|---|---|
| | | *For* | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | *Auditor's No.* | | | | |

*I hereby certify that the above account is correct* .....

*Examined and Entered*.....*Auditor.*

*Certified to* .....

*Approved* .....

*Approved* .....*Auditor of Expenditures.*

This is one of four forms, namely:
Various Persons' Bill.
Duplicate Statement of Account.
Triplicate Statement of Account.
Record of Various Persons' Bill.
Under the multiplex system of accounts, these forms are written simultaneously.

FORM 47.
(Size 11x16¾ in.)

## MONTHLY STATEMENT, VARIOUS PERSONS.

Charges against individuals and corporations for labor performed, material furnished, and on other accounts for the Month_____18____, at_____

| Date charge was incurred. | | NAME AND ADDRESS. | DETAILED DESCRIPTION OF THE CHARGE. | ITEMS. | | Grand total. | | REMARKS. |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |

Labor and material should be returned in separate amounts.
[NOTE.—This report should be made by storekeepers on the last day of the month, and should give details of all material sold to or work performed for outside parties.]



FORM 48.
(Size 8½x7 in.)

## VOUCHER.

_____Railway Company, Dr.,

To_____

of_____

Requisition No._____

18_____

I hereby certify that this account is correct.

For

Charge to_____

Audit No._____

Examined and entered. _____ Approved:_____

Received_____18_____, of the_____

Railway Company, the sum of_____

_____Dollars, ($_____)
100

in full for the above account. _____

FORM 49.
650 Revised.

## REPORT OF CONSTRUCTION WORK, including Rebuilding, Improvements and Enlargements, commenced in month of.....18....

on.....Division.

NOTE—When a bridge, culvert, building, dock, wharf, stock yard or other structure is being rebuilt, improved, or enlarged, or when expenditures are to be made on new work of any description, this report must be carefully filled out as per rules printed on the back of this blank. This report must be forwarded to the accounting officer as soon as the information required can be obtained.

| Location and Description of Old Structure. | Cost of Old Structure. | Description of New Structure and Location of New Work. | Estimated Cost of New Structure or Work. | Probable date when new structure or work will be completed. |
|---|---|---|---|---|
| | | | | |



FORM 50.

## REPORT OF TRAVELING AUDITOR—(CONFIDENTIAL.)

1. ..... *Shop*.....*18*..

2. *Examination made this day by*.....*Traveling Auditor.*

3. (☞ This report is not only intended as a record of the examination, but it also is intended as a reminder to Traveling Auditors of the salient points to be investigated by them at each storehouse. *It must, if practicable, be made before leaving the storehouse.* In those cases where, for any reason, answers are unfavorable to the storekeeper, or to the practices indulged in at the storehouse, the replies should be noted in *red ink.*)

| 4. Name of Storekeeper and Assistants. | Nature of Duties | Age. | Married or Single | Date of Appointment. | Age in Service of Company. | Salary. |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

5. Has each employe in storekeeper's office filled out the usual form and agreement, and is it on file in the office of the accounting officer? If not, please have it done forthwith.
6. Is there a telegraph station in storekeeper's office?
7. Does the operator assist the storekeeper?
8. Is there any way to reduce the expense of handling material, or accounting at this shop?

8½. *Can the storekeeper's force be reduced in any way?*
8¾. *Are salaries paid by him too high?*

9. Do the storekeeper and his assistants keep the accounts in a systematic and neat manner?
10. Is the office and storehouse kept clean and orderly?
11. Does the storekeeper rigidly enforce the rules in regard to roll call and quarter time? If not, in what particular does he deviate?
12. What is the custom when men are not on hand at roll call or cannot be found at quarter time?
13. How often is the quarter time book posted to the time book?
14. What is the practice in keeping the time of men employed at night, on holidays, and at other times when the time-keeper is absent?
15. What is the practice in keeping account of over-time?
16. On what basis is over-time allowed?
17. Does the storekeeper keep an account of the working hours that each employe is absent, in order to verify his time books?
18. Are time books and distribution books opened up before the commencement of the month?
19. Are skeleton pay rolls made before the end of the month?
20. Is the name of employe, kind of service, folio of time book and rate, posted to the several accounts on the distribution book as fast as they appear on the time books?

FORM 50—CONTINUED.

21. Is the engineers' and firemen's time book written up from daily trip slips? If so, does the storekeeper compare this with daily reports from train dispatcher, roundhouse register and monthly return of the engineer?
22. Does the storekeeper receive a proper order for material and fuel disbursed by him?
23. Is the material arranged in the storeroom systematically, with a view to convenience in handling, and to facilitate the making of monthly requisitions and yearly inventory?
24. Are stock books properly written up?
25. Does the storekeeper keep a record of all statements required of him, showing date when due, and date sent forward?
26. Does he keep a record of his receipts and disbursements, so as to enable him to form a close estimate as to how his inventory will compare with his book account at the general office? If so, what was his balance last day of.....18 ?
27. Does storekeeper have a price list and are corrections made in same as prices change?
28. Is the storekeeper economical in the use of stationery, and is his supply kept clean and in good order?
29. Are all facilities taken advantage of in the storage of fuel, to protect it from the weather?
30. What precautions are taken to prevent coal and wood from being stolen or wasted?
31. Is there any possibility of coal or wood being taken by engineers or others without a ticket being given for the amount supplied?
32. What precautions are used to guard against fire?
33. Are all changes in the "Handbook of Expenditures" pasted in their proper place in each copy of same in the office?
34. Does the storekeeper keep a "Circulars Received Book" and is it kept posted up?
35. Are all orders, time tickets and other records of the office, filed away systematically and kept in a safe place convenient for future reference?
36. Is there any accumulation of obsolete material or overstock of any particular article or kind of material at this storehouse?
37. Is scrap carefully picked up and disposed of in the proper manner?
38. Does the storekeeper keep a record book, showing the daily accumulation of scrap and the source thereof, so that at the end of the month the proper accounts may receive credit?
39. Are requisitions on General Storekeeper promptly filled?
40. Is he careful to see that all material received is according to requisition and that it checks with the invoice?
41. Is he careful to examine each article as to quality?
42. Does he promptly notify the forwarding storekeeper in case he discovers errors in quantity, quality or price of material received?
43. Does he carefully inspect lumber received directly from dealers, rejecting such as is not up to specifications, and deducting same from the invoices therefor?
44. Is the material so arranged in the yard and outhouses as to protect same from weather and so that any abstraction therefrom would come to the storekeeper's notice?
45. Are the rules in regard to the return of old tools, brasses, implements, utensils, etc., when new ones are supplied, enforced at this shop?
46. Are invoices distinctly copied in the tissue record book of material received?
47. Is every possible means employed to guard against leakage, evaporation and loss of oils?
48. Does the storekeeper have the custody of the tools used at this shop when not in use?
49. If not, what precautions are taken to prevent them being stolen or lost?
50. Are there any old books or records no longer of use at this shop?
51. What precaution does the storekeeper take in regard to the proper disbursing of supplies at night?



FORM 50—CONTINUED.

52. Is the distribution of material book written up as far as practicable before the close of the month?
53. Does the storekeeper keep a tissue copy of all pay rolls and statements made by him? Are they legible?
54. Does he keep a record book for articles in course of manufacture, showing the exact amount of labor and material expended on each article manufactured?
55. Has he any small shops subordinate to his, the employes of which appear on his roll? If so, give name of such shop or shops.
56. How often does he receive statements of material used at such shops?
57. Is the time of men employed at such shops properly reported and certified to him?
58. How often are the time books of men employed at sub-shops forwarded to him during the month?
59. Does he understand that no material is to be sold or labor performed for any employe or outside party without orders from an authorized officer of the company?
60. Does he understand that in case any material is sold to or labor performed for any employe or outside party, that the cash must be collected at the time when practicable and forwarded to the treasurer by express without delay?
61. Does he understand that in the event of any irregularities being discovered by him, it is his imperative duty to at once advise the accounting officer?
62. Did it come to your knowledge that there are any unauthorized or irregular practices indulged in at this shop? If so, state them in detail.
63. Did it come to your knowledge that there were any differences between the storekeeper and his assistants and the master mechanic or foreman, that would tend to injure the service? If so, state the facts.
64. Is the storekeeper intelligent, energetic, attentive to his duties and alive to the necessity of constant watchfulness?
65. Is his staff composed of honest, faithful and capable men, fitted for the positions they occupy?
66. Are the storekeeper and his assistants well versed in and do they practice the rules contained in the "Handbook of Expenditures"?
67. Did you give the storekeeper full and minute instructions in every case wherein as shown by the foregoing, you found him negligent and in fault?
68. What are the office hours?

---

69 GENERAL REPORT.

70. (*This report must be concise and to the point.*)

71. (In the foregoing detailed report all facts should be stated exactly as they are. In the general report such facts as may be judged necessary to a full and complete knowledge of the storekeeper's character and record and to a general understanding of the state of affairs at the storehouse; also such observations as may be useful for reference or as a guide to future examinations, should be given.)

## INDEX.

This volume is carefully Indexed, but for the convenience of the reader and to render the book easier to handle, the Index is included (with a full Index of the whole work) in volume Twelve under the title "GENERAL INDEX." This "GENERAL INDEX" is also, in a measure, an Encyclopedia of Railway Knowledge.

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