GREAT WESTERN RAILWAY OF ENGLAND 1837····1927

The Quickest Route
NEW YORK TO LONDON
via **PLYMOUTH**

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1837 - - 1927

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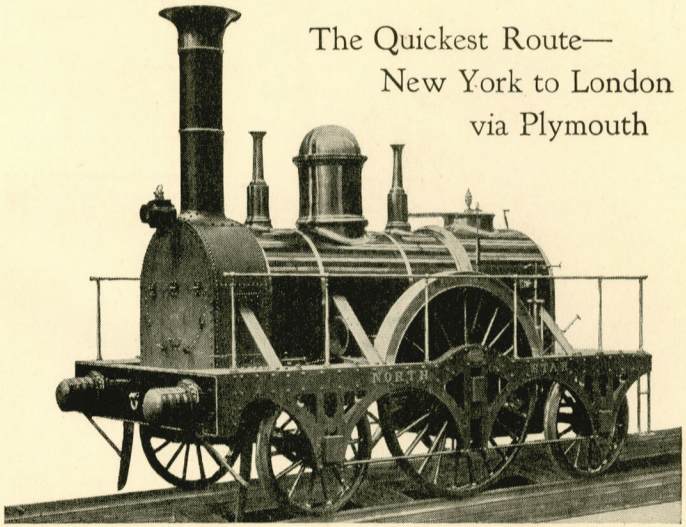

THE "NORTH STAR."

SOUVENIR published by the Great Western Railway of England in connection with the Centenary Exhibition & Pageant of the Baltimore & Ohio Railroad, Baltimore, Maryland, U.S.A.

September 24th—October 8th, 1927

FELIX J. C. POLE,
General Manager.

Paddington Station,
London, W.2, England.

"We feel it a duty to observe here that the public are mainly indebted for the present rate of speed and the increased accommodation of the railway carriages to the genius of Mr. Brunel and the liberality of the Great Western Railway Company."

—*Report of the Gauge Commissioners*, 1846.

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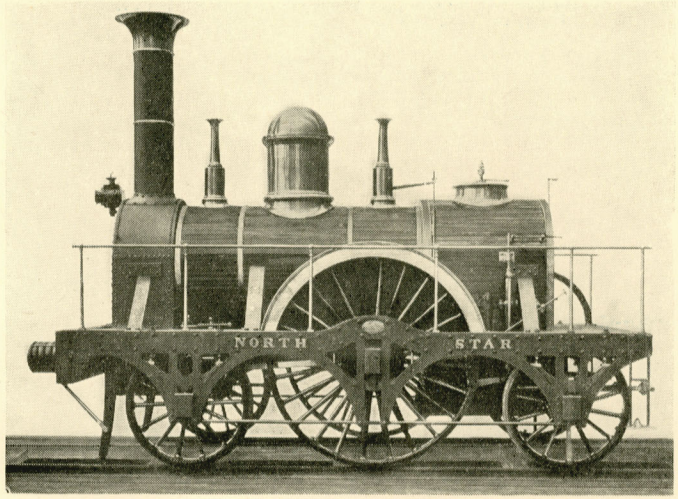


The "North Star"

"The public will always prefer that conveyance which is the most perfect, and speed within reasonable limits is a material ingredient in perfection in travelling."

Brunel's Report to the Directors, 1838.

THE GREAT WESTERN RAILWAY OF ENGLAND as originally conceived was intended as one of the links in a chain of communication between England and America.

Brunel, its Engineer, not only laid out a line between Bristol and London intended to be suitable for higher speeds than previously considered safe or economic, but he also designed the first steamship for the trans-atlantic service which should complete the sea link between New York and London.

Circumstances and routes have changed and the line to Bristol no longer plays its former part in this connection; but by its extension, in later years, to Plymouth, the great port of call for the most famous Atlantic liners, the Great Western Railway to-day retains its original importance as the shortest and quickest line of communication between the commercial capitals of America and England.

LOCOMOTIVE POWER—1837

"Steam is almost an Englishman."
—Emerson: Visit to England, 1847.

"If you are an Englishman he (the American traveller) guesses that you don't travel faster in England, and on your replying that you do, it is quite evident he don't believe it."
—Charles Dickens: American Railroad Dialogue, 1842.

THE steam locomotive is a peculiarly British institution and the present exhibit by the Great Western Railway Company of England is intended to show the earliest and latest types employed on their line.

The first of these types is represented by a reconstruction of the North Star, which was made at the Company's works for the British Railway Centenary Celebration in 1925, to represent as far as possible the engine in its original form. It has a special interest for the present occasion of exhibition in America, in that the original engine was built for the New Orleans Railway, but, owing to a financial crisis in America at the time, the engine was not delivered but left on the hands of the makers in England. It was unsuitable for use on the English railways then in operation, having been built for a wider gauge between the rails.

THE NORTH STAR.

The English lines up to this time had been built to a gauge of 4ft. 8 ins. or 4 ft. 8½ ins. derived from the Colliery lines of the North, but some engineers were considering the desirability of a wider gauge to provide more room for the working parts of the engine between the frame, or for better coach accommodation, or for safety.

THE GAUGE.

The New Orleans & Nashville Railroad Company, after enquiries by their Engineer, Ranney, had adopted a gauge of 5ft. 6 ins.

It appears, too, that they must have intended high speeds, for the driving wheels of their engine were made of a greater diameter than usual at the time, and the boiler was larger In adopting the larger driving wheel their Engineer was probably influenced by a theory, then commonly held, that piston speeds should be kept as low as possible.

THE WHEELS

Such was the locomotive which the makers had on their hands when Brunel wrote to his friend, Robert Stephenson, on 4th July, 1837: "If you are satisfied with the verbal order of course I am; however, this will confirm it, that I expect you will furnish us with an engine of the best construction in as short a time as you can—and I look forward to having such an engine as never was before."

Brunel, in his designs for comfort, speed, and safety, had gone far beyond any other Engineer. He decided to place the body of his passenger coaches between the wheels, and since the coach was 6 ft. 6 ins. wide, he adopted a gauge of 7 feet for the Great Western Railway.

THE SEVEN-FOOT GAUGE.

In the standard English railroad at this period the T rails were carried in chairs attached either to stone blocks or to transverse wooden sleepers. Brunel adopted a flat-bottomed rail, carried throughout its length on timber. This gave an easier riding road than the rail carried on stone blocks.

THE ROAD.

The engine, which had been constructed for the New Orleans Railway, was altered by its builders to suit the gauge of the Great Western, and since Brunel considered a maximum piston speed of 250 ft. per minute to be desirable, the engine was provided with driving wheels having a diameter of 7 feet. All the original parts which have been recovered, including the driving wheels, crank axle, and even some of the buffers, together with the name and number plates, have been used in the reconstruction.

THE ENGINE.

The "North Star," on the Great Western Railway, was the most powerful passenger locomotive of its day, a favourite with the Directors, "Who," wrote Brunel, "consider the Stars double Stars I suppose, as they always reckon them for two."

A FAVOURITE.

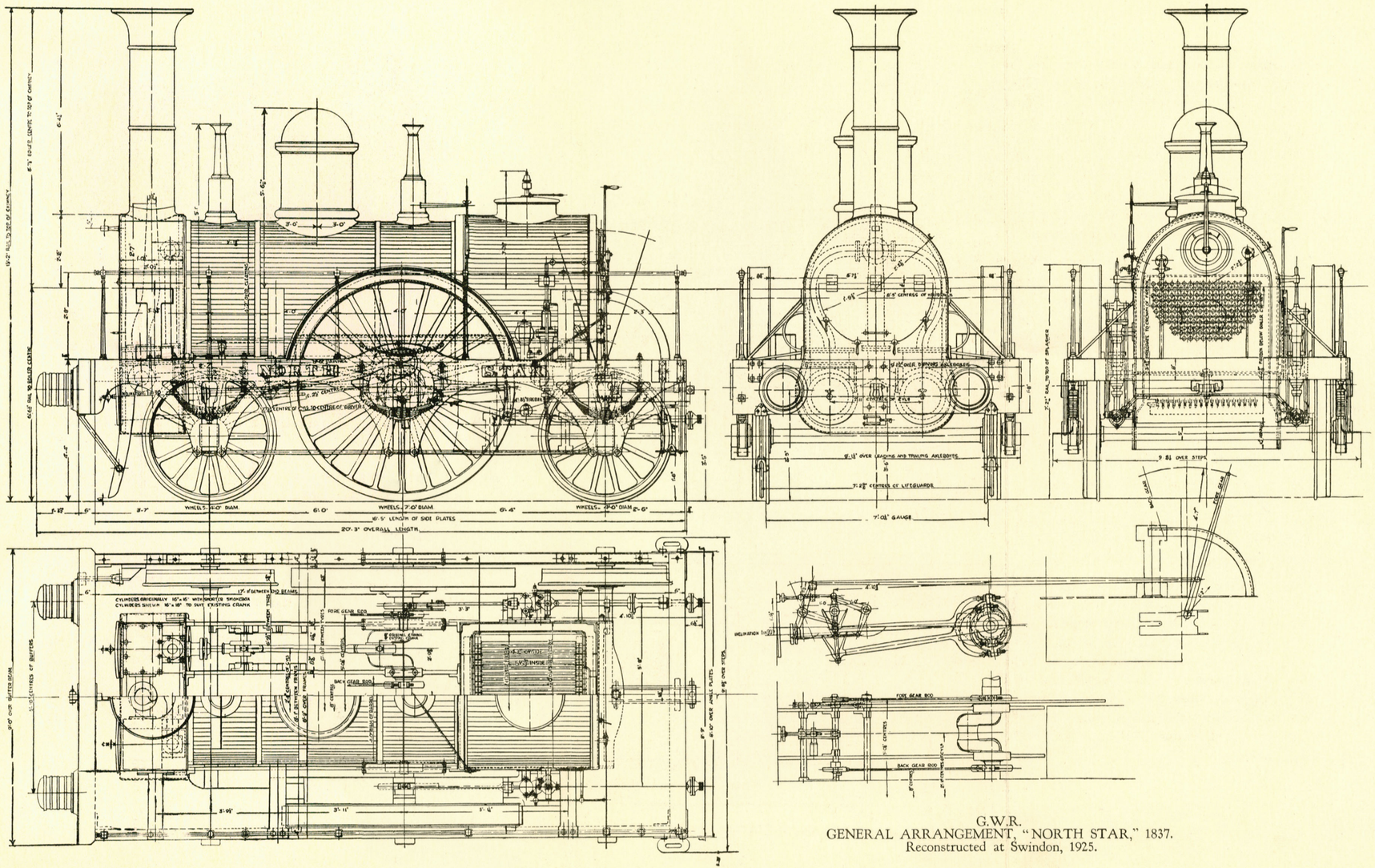
On June 1st, 1838, the first passenger train on the Great Western Railway drawn by the "North Star" conveyed 200 passengers and attained a speed of thirty-six miles per hour.

PERFORMANCES.

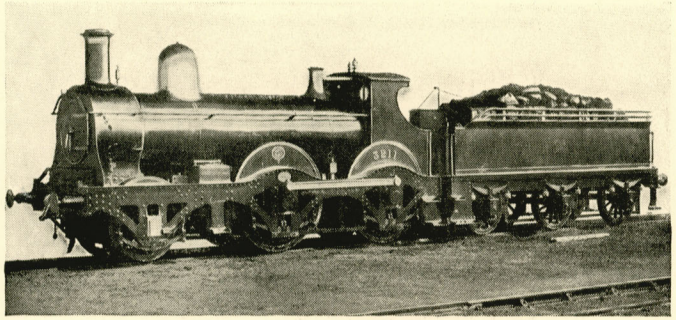
The records of another test give a load of 371,840 lbs., maximum speed 23.3 miles per hour, mean 18.63 miles per hour, consumption of coke per ton mile .306 lbs. For this test the working pressure, originally 50 lbs. per square inch, had been raised to 68.7 lbs.

The reconstructed "North Star" is not only an interesting link with the days of Robert Stephenson and Brunel, but one of the few evidences left to remind us of a great controversy. The Gauge question, which was settled in England for all subsequent lines by a Royal Commission in 1845, was not solved in America until much later by the conversion of all its lines to the standard 4 ft. 8½ ins.

A LINK WITH THE PAST.



G.W.R.
GENERAL ARRANGEMENT, "NORTH STAR," 1837.
Reconstructed at Swindon, 1925.



The influence of the "North Star" on the locomotive designs of the Great Western Railway continued for half a century, and may be seen in locomotives built in 1889 for the Company's narrow gauge traffic. These engines were used for hauling the special trains carrying the celebrated menagerie of the American showman, Barnum, on his visit to England in 1898, and are still known on the line as "Barnums."

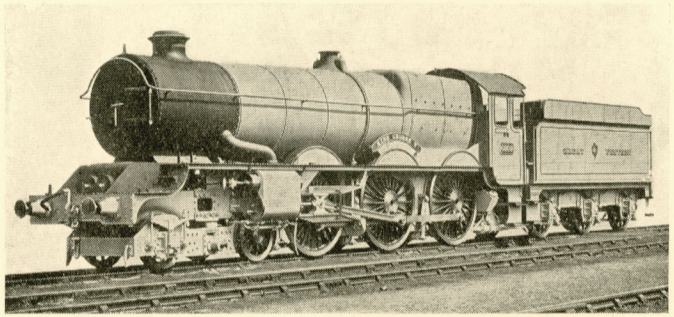
FIFTY YEARS LATER.

In 1892 the seven-foot gauge, where it still existed concurrently with the 4 ft. 8½ in. gauge, was removed and west of Exeter the Broad Gauge was converted to the Narrow.

The whole road was entirely relaid on the standard English method with I rails carried in iron chairs on transverse sleepers. Experience had shown these to be superior to either the stone block, or longitudinal sleeper, of earlier times.

THE ROAD TO-DAY.

The illustrations on pages 12 and 13 show the original and the present road laying of the Great Western Railway.



LOCOMOTIVE POWER—1927

"You may, perhaps, consider these very large dimensions to the steam passages to be useless—but I shall be obliged by your adopting these alterations."

"Now your engine is capable of being made very handsome—and it ought to be so."

Brunel to Engine Designers, 1838.

"Mr. Robert Stephenson will tell you there is no difficulty in making an engine as powerful on a 4 ft. 8½ in. gauge as can be used with safety on any other gauge."

—Capt. J. M. Laws, R.N., before the Gauge Commission, 1845.

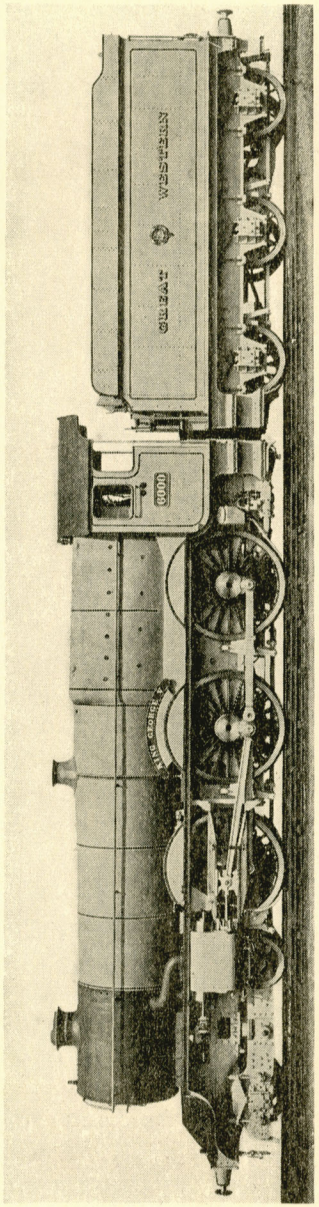
"At one time an attempt had been made to reduce the speed of the piston—it was now found that the utmost speed was desirable."

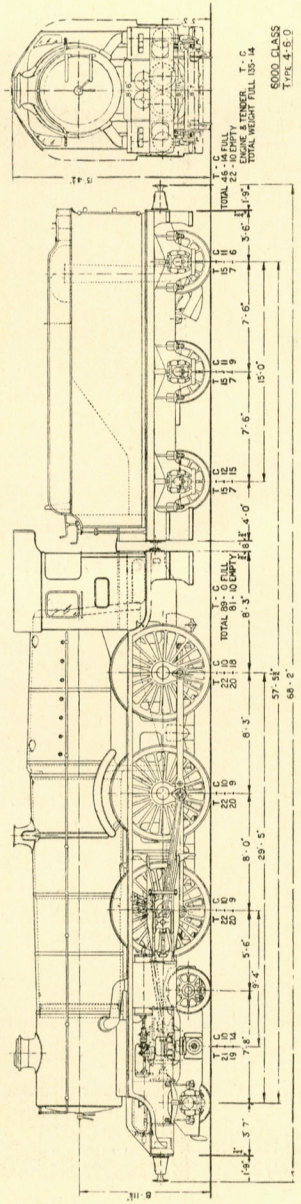
—Robert Stephenson at the Institution of Civil Engineers, 1849.

The second exhibit shown by the Great Western Railway Company is a locomotive of the latest type designed to maintain those traditions for speed which are "a material ingredient in perfection in travelling."

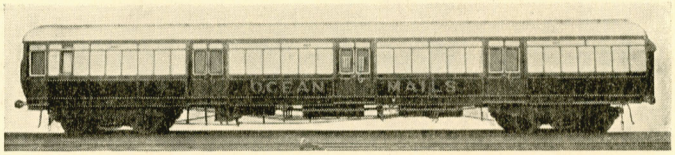
KING GEORGE V.

The passenger of to-day seeks increased comfort and





G.W.R. Express Passenger Locomotive "King George V."



Ocean Mail Coach—Plymouth-London Boat Express

greater speed in railway travel, but this can only be met by greater power.

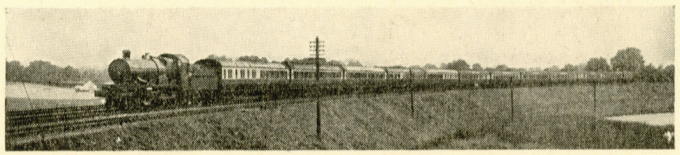
The demands of the twentieth century for increased power and greater economy have received very great consideration at the Locomotive Works of the Great Western Railway of England, and for the last twenty years the efforts of those in authority have been concentrated on developing the 4-cylinder locomotive.

The performances of the "Caerphilly Castle" in 1923 attracted so much attention that the results of the trials that had been made with it were published in the form of a paper at the World's Power Conference in 1924 by the Chief Mechanical Engineer.

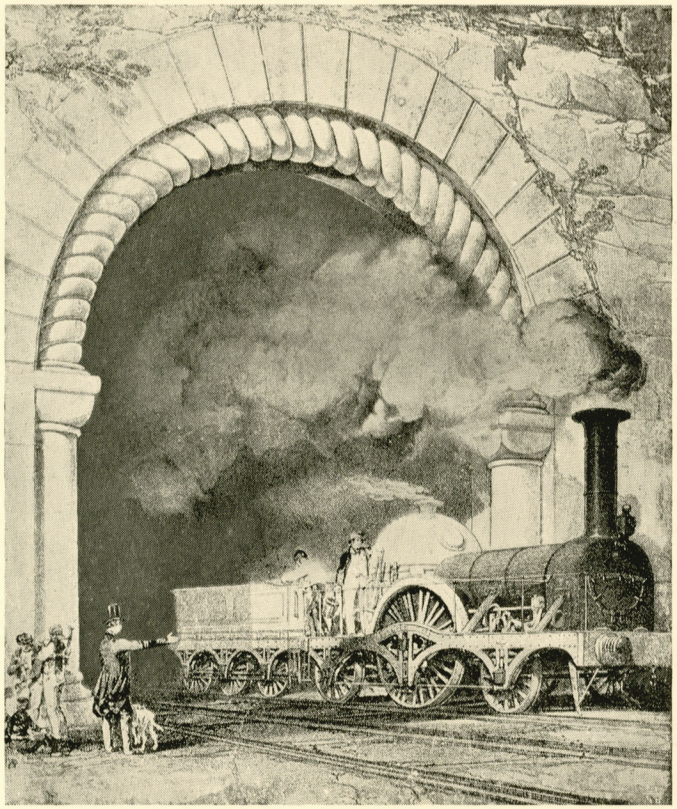
The latest development of the 4-cylinder type of engine on the Great Western Railway is to be seen in the "King George V," which, like the first locomotive of this railway, is the most powerful passenger engine of its time in Great Britain.

This locomotive has been designed to uphold traditions and justify to the American traveller in England to-day Charles Dickens' claims for its railways in 1842.

J. G. H. W.

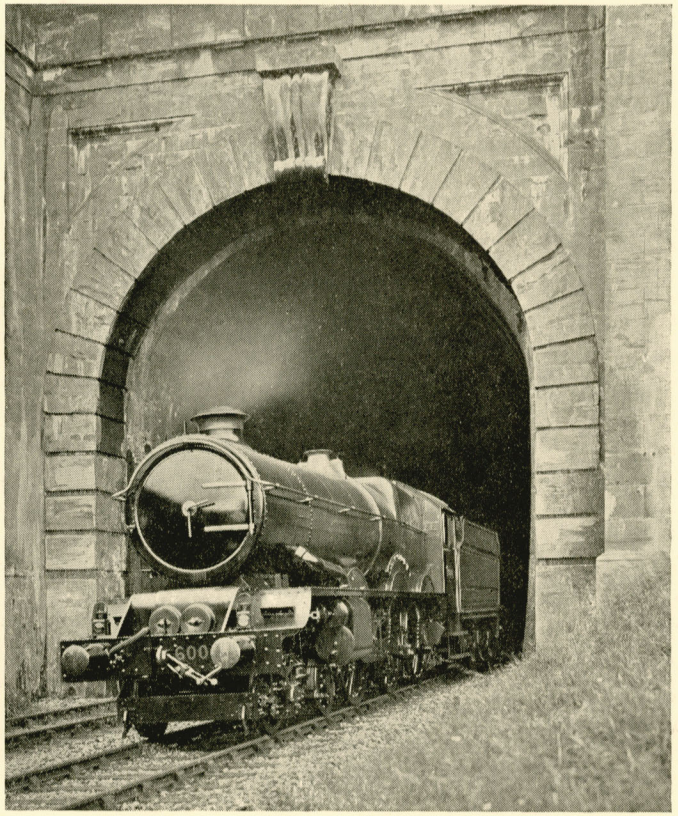


Ocean Boat Express—Plymouth to London



1848
EXPRESS PASSENGER LOCOMOTIVE
"ACHERON."

GREAT WESTERN RAILWAY

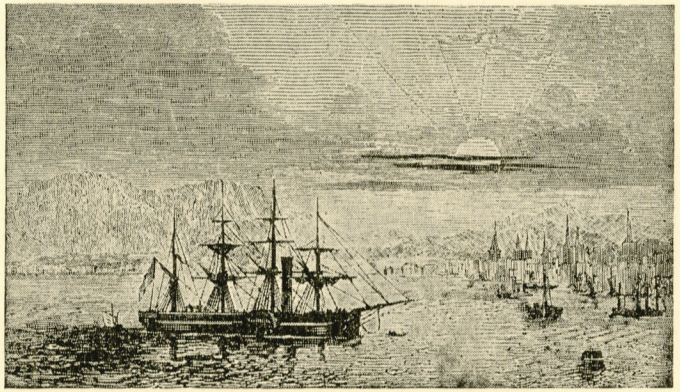


1927
EXPRESS PASSENGER LOCOMOTIVE
"KING GEORGE V."

GREAT WESTERN RAILWAY

PASSENGER LOCOMOTIVE DEVELOPMENT

	1838 North Star.	1906 North Star.	1923 Caer-philly Castle.	1927 King George V.
CYLINDERS : Diam. and Stroke	(2) 16x16	(4) 14¼x26	(4) 16x26	(4) 16¼x28
DRIVING WHEEL: Diameter - -	7ft. oin.	6ft. 8½in.	6ft. 8½in.	6ft. 6in.
BOILER PRESSURE : Lbs. per sq. in. -	50	225	225	250
HEATING SURFACE : Total — Sat. and Sup., sq. ft. -	711	2124.8	2312	2514
GRATE AREA : Sq. ft. - -	13.62	27.07	30.28	34.3
TRACTIVE EFFORT : m.e.p.=85% B.P.	2,070	25,085	31,625	40,300
WEIGHT OF ENGINE : Lbs. - - -	41,440	168,268	178,864	199,360
RATIO : Lbs. Tractive Effort, per ton	111.9	334	396	452.8



THE STEAMSHIP "GREAT WESTERN," 1838, OFF NEW YORK.

GREAT WESTERN RAILWAY

A connecting link with New York and London

SINCE the days when Brunel designed the "Great Western"—the first steamship for transatlantic service—there has been a constant endeavour to shorten the distance between the commercial capitals of the two great countries of the United States of America and Great Britain. The gigantic liners of recent years and triumphs of railway engineering have brought these two cities within a six-days' journey. By the enterprise of the Great Western Railway the port of Plymouth has now become the great gateway to Britain for overseas travellers, from which port the famous Ocean Boat Expresses make the journey of 226 miles to London in just over four hours, saving passengers the slower sea journey up the English Channel, and the possibility of being delayed by sea fogs.

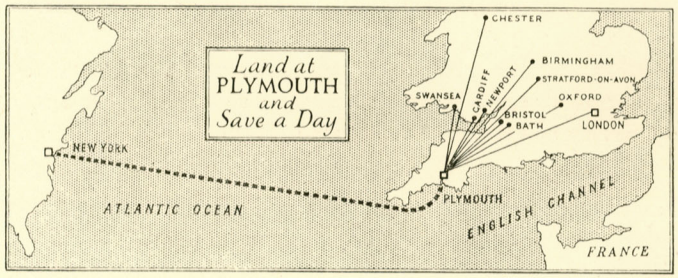
The latest achievement of engineering skill—the handsome locomotives of the "King George V" class—with their great power and capabilities, will, undoubtedly, tend to shorten still further the journey from New York to London, and make for increased travel comfort.

The Great Western Railway, in its 8,000 miles of track, traverses the finest river, valley, mountain, woodland, and pastoral scenery in the British Isles, and serving, as it does, so many places which are linked with Anglo-American history and literature, offers unique attractions to the tourist from the United States. Its connections extend as far north as Chester, Birkenhead, Liverpool and Manchester. It passes through the Shakespeare Country and picturesque Western Midlands; North, Central and South Wales; the Valleys of the Dee, Wye, Usk, and the Severn; the Counties watered by the River Thames; and, of course, as its name implies, through those beautiful West of England Counties, Somerset, Dorset, Devon and Cornwall. At least twenty-one cathedrals may be visited by its various lines. In a word—to travel on the Great Western Railway is the surest means of seeing the best that England and Wales has to offer, and by landing at Plymouth, travellers substitute a mile a minute in the train for a considerable journey by sea.

G.W.R. Territory.

The following Steamship Lines from the United States call at Plymouth—the Western Gateway to England:—

American Merchant Line.
Atlantic Transport Line.
Cunard Line.
French Line (C.G.T.)
Holland America Line.
Norddeutscher Lloyd.
Red Star Line.



GREAT WESTERN RAILWAY

The Historic and Scenic Line of England

THE territory served by the Great Western Railway is the richest in sights and scenes typically British. A brief study of the map at the end of this brochure will convince the intending visitor to Britain that he must GO GREAT WESTERN! to see the best that Great Britain has to show.

What an entrancing vista is unfolded to the eye as it travels westward from Paddington Station (the G.W.R. London Terminus) to Penzance in old Cornwall, and then along the sea-coast to Birkenhead and Liverpool and back by Chester, Shrewsbury, Warwick, Oxford, Reading and the Thames-side towns past Windsor to London! Instinctively the eye will dwell upon the glorious West of England, that territory which gave Britain such men as Drake, Frobisher, Raleigh, Hawkins, Davis and others of the breed of Devon, the Shire of the Sea Kings, and upon Plymouth, whence sailed the Pilgrim Fathers.

Historic England.

England can offer to the sightseer much, and, perhaps, more, than any other country no matter what its size or where its location. Within her borders are traces of early civilisation, of the stone age, the bronze age. There are the abodes of the cave-dwellers; there are the cromlechs and other ancient stones, the principal of which is the Stonehenge, which tell of the days when men worshipped the sun and of those mysterious rites practised by the Druidical priesthood; primitive earthworks which speak of warring tribes before the Roman invasion, and evidence of a fair state of civilisation before Cæsar's legions planted their standards on these shores.

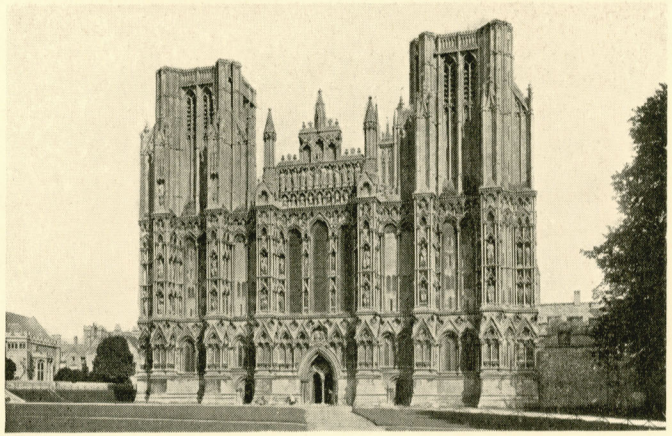
Prehistoric Remains.

PADDINGTON STATION, LONDON
THE HEADQUARTERS OF THE GREAT WESTERN RAILWAY OF ENGLAND

Roman cities, stations, encampments, and bathing establishments are in a fair state of preservation. Saxon churches link up with the little missionary centre in the Somerset marshland where Joseph of Arimathea brought Christianity to Britain and with great cathedrals. Cathedrals and abbeys there are containing architectural masterpieces without peer in Europe; historic cities and towns; great universities; seaports from which sailed the men who discovered new lands and from whence journeyed the progenitors of the great American peoples; birthplaces of poets and writers whose contributions to literature can never be adequately measured, of leaders of thought, of men and women of action widespread throughout the world, and much more.

ARCHITECTURAL GLORIES.

True, England herself is young compared with the civilisations of the East. But it is possible, so rich are the museums of London, to trace much of the work of those older civilisations and of the earth itself before even those civilisations were. England is the most complete of countries for touring purposes, and travelling by the famous trunk



WELLS CATHEDRAL

lines of the Great Western Railway, most of the historical and beauty spots can be visited with the minimum of exertion and the maximum of comfort, for its railway track is acknowledged to be the finest in Europe.

Such places of historic interest as Bath, Bristol, Gloucester, Wells, Glastonbury, Worcester, Winchester, Oxford, Stratford-on-Avon, Warwick, Chester, Hereford, Tintern and Pembroke are all reached by the G.W.R. and it is from Paddington Station (London) that the traveller must start for Royal Windsor and the Penn Country, a district which many Americans place in the forefront of their programme.

CITIES TO SEE.

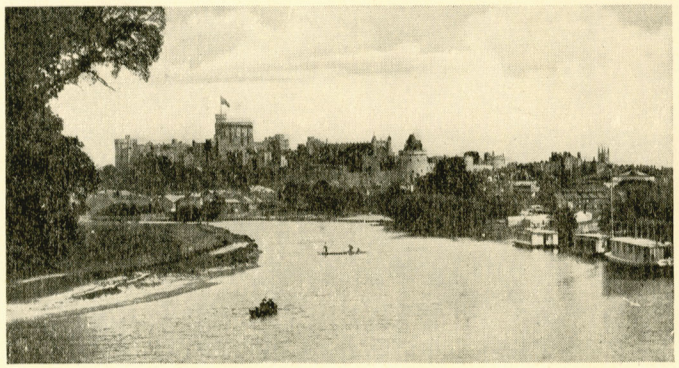
The fast turbine steamships of the Great Western Railway from Weymouth to the Channel Islands open up to the tourist the picturesque landscapes of those lovely isles; and from Penzance there is regular communication with the Isles of Scilly—The Lyonesse of poetry and romance. In addition the Company's splendid turbine steamers on the Fishguard-Rosslare service, the shortest sea passage to Ireland, afford unrivalled facilities for visiting Killarney and other beautiful districts of South and West Ireland.

STEAMSHIP SERVICES

SHAKESPEARE'S BIRTHPLACE, STRATFORD-ON-AVON

Intending visitors to England would be well advised to consult the Company's General Agent for the United States, K. W. C. Grand, 505 Fifth Avenue, New York, before arranging their tour, in order to obtain fullest information regarding the travel facilities, services, etc., which the Great Western Railway offers the American Tourist, or full information upon any subject will be forwarded upon application being made to the Superintendent of the Line, G.W.R., Paddington Station, London, W.2, England.

G.W.R. NEW YORK OFFICE.



WINDSOR CASTLE

GREAT WESTERN RAILWAY

An Asset to Commerce

WHEN the Great Western Railway was first incorporated in 1835 to establish a railway between London and Bristol, the most far-seeing of its promoters could hardly have anticipated the extension of its territory and the development of its activities that were to follow. The growth of the Great Western System has synchronised with the commercial development of many of what are, to-day, the most prosperous parts of Southern, Midland and Western England. The great coal area of South Wales, the multifarious industries of Birmingham, the "Black Country," and the mines and quarries of Somerset, Devon and Cornwall—each section owes a great deal to the manner in which the G.W.R. has discharged its part in the general advance.

COMMERCIAL DEVELOPMENT.

Always amongst the foremost of coal-carrying Companies, the Great Western Railway is now responsible for the transport of about 50 million tons of coal per annum from the South Wales area alone.

For the transport of merchandise and live stock the Company runs express vacuum-brake fitted trains, many of which travel at speeds equalling those of fast passenger trains, thus enabling expeditious transit to be maintained between the important cities and towns and seaports. Meat, corn and foodstuffs of every description, coal, iron, steel, timber, machinery and general merchandise are dealt with daily in enormous quantities.

RAPID TRANSPORT.

The rapidly increasing number of influential business concerns that have erected factories alongside the Great Western Railway has caused the Company, in the mutual interests of the trading public and themselves, to direct greater attention to the advantages and geographical position of its system, which not only serves the coalfields of South and North Wales, Forest of Dean, Somerset, Shropshire and South Staffordshire, but provides easy access to most of the important Ports of England.

GEOGRAPHICAL ADVANTAGES.

In order to meet commercial requirements the Great Western Railway have provided extensive warehouse accommodation at their principal Goods Stations. Block spaces can be rented on attractive terms. The merchant who can meet immediate demands for his products in important towns by virtue of local stock is in a superior position to his competitor, who may have to satisfy orders from his factory some distance away.

WAREHOUSE FACILITIES.

Factories and Works so situated as to secure abundant supplies of coal, and in close proximity to Docks, have a distinct and obvious advantage over producers whose works are less favourably placed. The Great Western Railway, at the Chief Goods Manager's Office, Paddington Station, London, maintain an up-to-date register of sites for factories, etc., which contains particulars of properties in those parts of England and Wales that are well adapted for industrial development.

SITES FOR WORKS.

Enquiries, which are treated confidentially, are always welcomed.

THE DOCKS OF THE GREAT WESTERN RAILWAY

"Britain's Western Gateways"

THE Great Western are the owners of the largest railway Dock system in the world—the water area of their docks extending to about 1,300 acres. The South Wales Docks, controlled by the Company, besides serving immense coalfields, are the natural ports for imports to and exports from the great industrial centres situated in the Midlands of England; indeed, a considerable proportion of world trade finds its way into and out of these ports.

When the Company assumed complete control of the docks in South Wales, no time was lost in overhauling and supplementing the appliances and facilities for handling the immense amount of traffic that has to be dealt with, the result being that already over five million dollars have been spent in effecting improvements, and the ultimate expenditure at present in view will exceed fifteen million dollars. With the fullest realisation of the necessity for the expeditious and economical handling of imports and exports, the Great Western Railway have decided that South Wales shall possess harbour, dock and transport facilities equal to any demand likely to be made upon them and to encourage in every way the development of new trades.

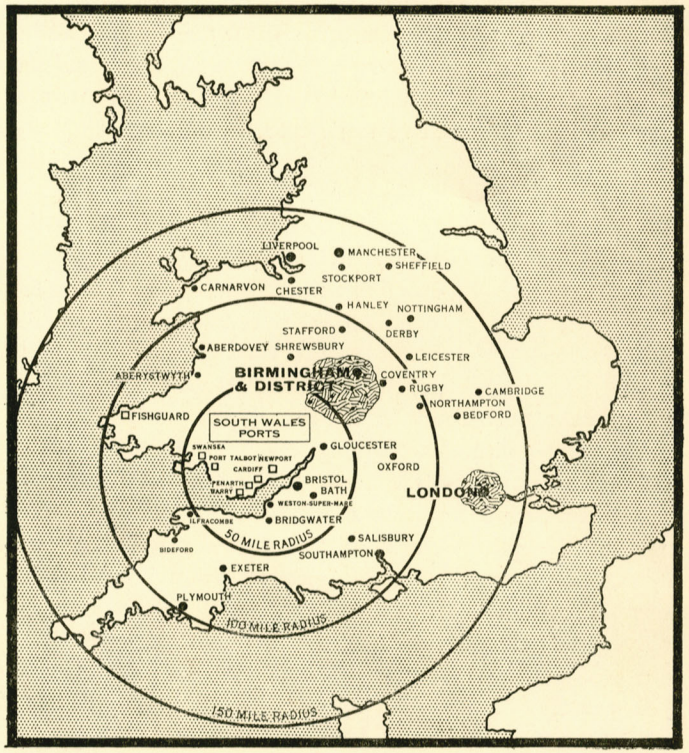
MODERN APPLIANCES.

The principal Docks of the Company are CARDIFF, SWANSEA, NEWPORT, BARRY, PORT TALBOT, PENARTH, PLYMOUTH and FISHGUARD HARBOUR. The shortest and most economical route between the great industrial area of the

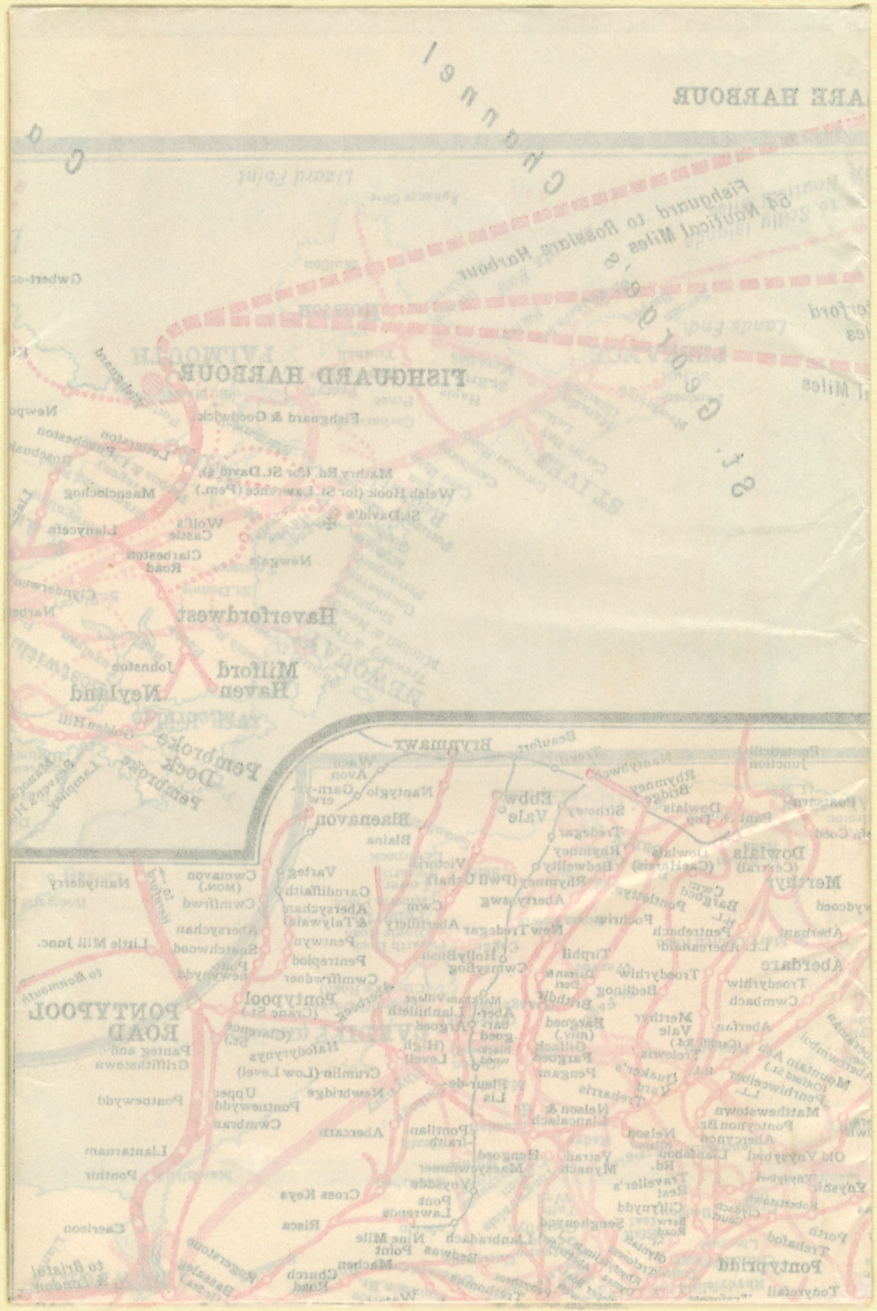
THE WESTERN PORTS.

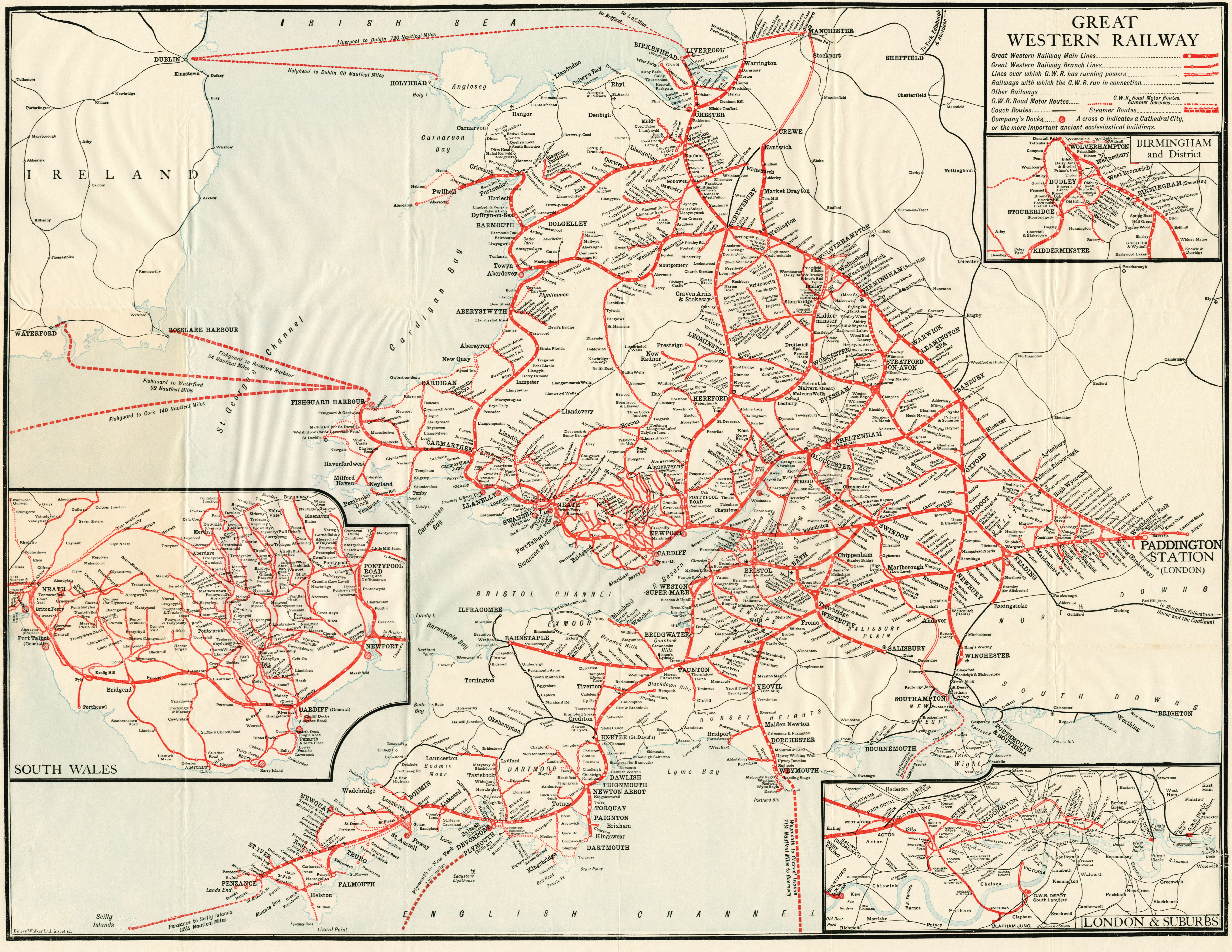
Midlands of England and Overseas is via the Great Western Railway and the South Wales Ports. All classes of traffic are dealt with expeditiously at the Ports, whilst the railway connections with all parts of Britain make them particularly suitable as economic distributing points for the country's imports and exports. Any information regarding the Company's Docks facilities will be gladly supplied by Chief Docks Manager, Great Western Railway, Cardiff, England.

ROUTE FOR OVERSEAS TRADE.



MAP SHOWING THE RELATIVE GEOGRAPHICAL POSITIONS OF THE DOCKS OF THE GREAT WESTERN RAILWAY AND PRINCIPAL INDUSTRIAL CENTRES OF ENGLAND.



 GREAT WESTERN RAILWAY
Great Western Railway Main Lines
Great Western Railway Branch Lines
Lines over which G.W.R. has running powers
Railways with which the G.W.R. run in connection
Other Railways
G.W.R. Road Motor Routes
G.W.R. Road Motor Routes. Summer Services
Coach Routes
Steamer Routes
Company's Docks
A cross ✠ indicates a Cathedral City, or the more important ancient ecclesiastical buildings.
BIRMINGHAM and District
SOUTH WALES
LONDON & SUBURBS
PADDINGTON STATION (LONDON)
IRISH SEA
IRELAND
Liverpool to Dublin 120 Nautical Miles
Holyhead to Dublin 60 Nautical Miles
to I. of Man
to Belfast
Fishguard to Rosslare Harbour 54 Nautical Miles
Fishguard to Waterford 92 Nautical Miles
Fishguard to Cork 140 Nautical Miles
St. George's Channel
Cardigan Bay
Carnarvon Bay
Carmarthen Bay
Swansea Bay
BRISTOL CHANNEL
Barnstaple Bay
Lyme Bay
ENGLISH CHANNEL
Penzance to Scilly Islands 35¼ Nautical Miles
Plymouth to New York
Weymouth to Channel Islands 71½ Nautical Miles to Guernsey
to Margate, Folkestone, Dover and the Continent
To York, Edinburgh & Aberdeen
DUBLIN
WATERFORD
ROSSLARE HARBOUR
HOLYHEAD
LIVERPOOL
BIRKENHEAD
MANCHESTER
CHESTER
CREWE
SHREWSBURY
WOLVERHAMPTON
BIRMINGHAM
WORCESTER
HEREFORD
GLOUCESTER
CHELTENHAM
OXFORD
SWINDON
READING
BRISTOL
BATH
CARDIFF
NEWPORT
SWANSEA
NEATH
CARMARTHEN
FISHGUARD HARBOUR
ABERYSTWYTH
BARMOUTH
WESTON-SUPER-MARE
TAUNTON
EXETER
PLYMOUTH
PENZANCE
WEYMOUTH
SOUTHAMPTON
SALISBURY
WINCHESTER
BRIGHTON
Scilly Islands
Emery Walker Ltd. inv. et sc.