

RAILWAYS BEGAN HERE . . .



Entrance of the Railway at Edge Hill, Liverpool.

Railways began here...

STATIONS OF THE LIVERPOOL AND MANCHESTER RAILWAY ON MERSEYSIDE

by Paul Rees

*Cover: Entrance of the Railway at Edge Hill, Liverpool.R.
Ackermann (publ. 1833)*

RAILWAYS BEGAN HERE . . .

Although there are records of railways in Britain as early as 1605 and steam locomotives as early as 1813 and although 'Locomotion' was the first steam locomotive to run on a public railway, the world's first real railway was the Liverpool and Manchester. Here, for the first time, were brought together those attributes which make up railways as we know them; spectacular engineering, double track, locomotive haulage, regular timetabled passenger services, signalling and the railway providing its own carriages and waggons and acting as carrier.

When the inaugural procession left Crown Street Station, Liverpool, at 10am on 15th September 1830, those present, whether they knew it or not, were witnessing the dawn of the Railway Age.

EDGE HILL VISITOR CENTRE AND RAIL TRAIL

is administered by the Edge Hill Railway Trust, a Company limited by guarantee and registered as a charity. The aims of the Trust are to make accessible to the public the place from where the world's railways began and to operate an exhibition in part of the nearby Edge Hill station. The display there illustrates the development of the L.&M.R. in Liverpool from its opening day to its amalgamation with the Grand Junction Railway. A model owned and operated by the Merseyside Model Railway Society depicts the Edge Hill railway scene as it was in 1839.

This grand area of Edge Hill is an excavation on the eastern side of the hill, of a quadrangular form, about 50 yards in length, 68 feet in breadth and 40 feet in depth, cut through a solid rock, excepting a superstratum of marl. On three of the sides the rock forms the walls, which are perpendicular, and though dressed only with the pick, have from their magnitude a smooth finished appearance; they are surmounted with brick; ornamented with bold lines of stonework; the west wall is terminated by an embattled parapet, and the north and south by palisades, at the base of the west wall runs the grand tunnel, beside two small ones, and the opposite extremity or the fourth side of the quadrangular area is formed by a grand Moorish archway, which is the entrance into the Liverpool station. This archway, built in the Turkish style, from a design by Mr. Foster, to whose architectural science and taste Liverpool is indebted for many of her finest buildings, has its abutments of brick and stone formed into houses appropriated for the fixed engines which are to draw the loaded carriages up an inclined plane, from the Wapping end of the Tunnel, by means of ropes passing over pulleys.

Since the day of the opening these engine houses have been much elevated and now form small turrets; but from the sides of the houses spring the arch of the bridges, at a considerable altitude from the Railway surface. This surface has four lines of rails, where the locomotives stand ready to be attached to the carriages . . .

*Isaac Shaw. Views of the most interesting scenery
on the L&M R 1830.*



Drawn & Engraved by Elkanah Hart

THE OPENING OF THE LIVERPOOL & MANCHESTER RAILWAY SEP^R 15^TH 1830,
WITH THE MOORISH ARCH AT EDGE HILL AS IT APPEARED ON THAT DAY.

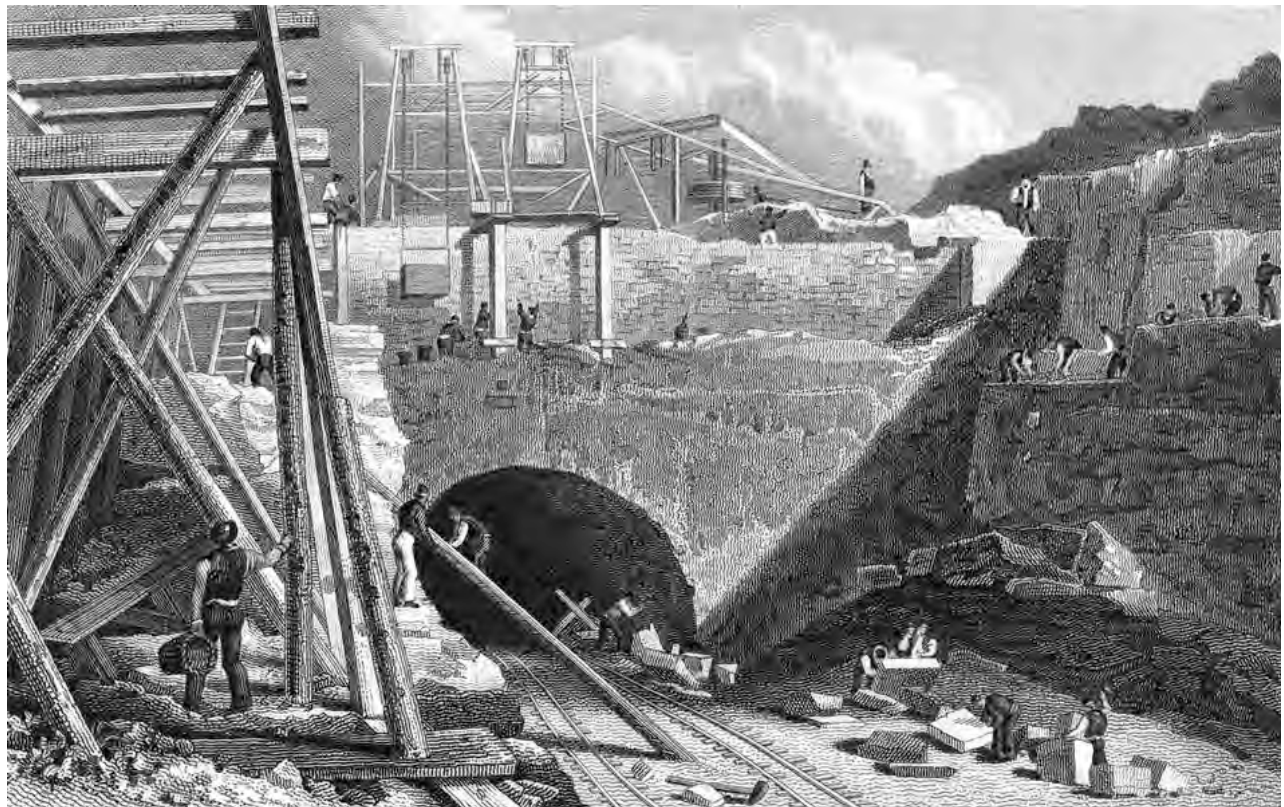
Published Jan^y 1 1831 by I Shaw Post Office Place Liverpool & Grundy & Fox Manchester

The coming of the railway

The idea for a railway had been brought to Liverpool in 1822 by William James, a far-sighted Land Agent, and was quickly taken up by the merchants. Experiencing difficulties and high costs in transporting their goods inland by road, river, and canal, they quickly saw the potential of the James plan. The first attempt to obtain Parliamentary approval to build the line failed because of poor surveying and opposition from the canal and landowners. Undaunted, the promoters modified their Bill and by May 1826 had obtained their Act.

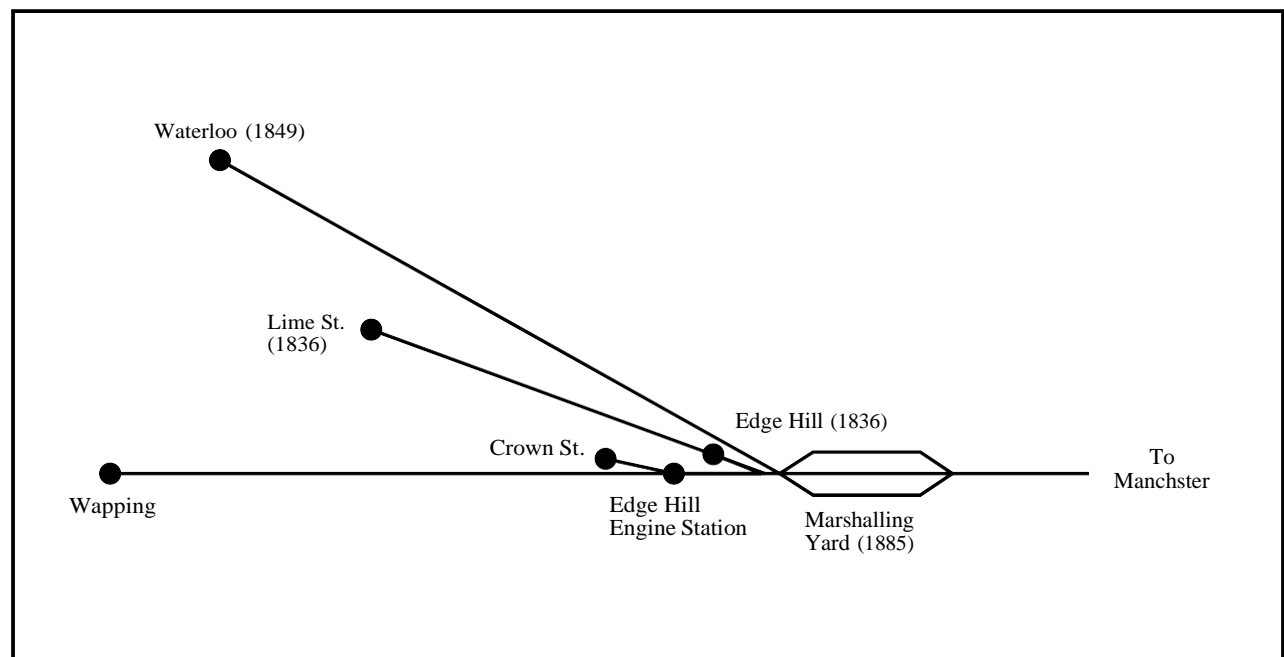
George Stephenson was invited to engineer the line and work began quickly on the two most difficult sections, the tunnel under Liverpool from the docks to Edge Hill and the crossing of Chat Moss. Stephenson designed many of the features of the line himself and spent many long hours supervising the work. As construction proceeded, the Directors of the Company discussed how best to operate the line and whether to use horses, stationary engines, or steam locomotives to pull the trains. Eventually they agreed to offer a prize for the best locomotive and announced the Rainhill Trials. The locomotive 'Rocket', entered by George and Robert Stephenson and Henry Booth, won the £500 prize and in so doing established principles of design that lasted until the end of the steam locomotive era.

The railway opened on 15th September 1830, almost a year after the Trials. The bands played and the crowds cheered as the grand procession of locomotives and carriages left Liverpool for Manchester. However, the mood of gaiety and celebration was not to continue: at Parkside, just beyond Newton-le-Willows, while the locomotives took on water, William Huskisson, M.P., was run over and killed. The procession reached Manchester in low spirits, and it was far into the night before all the guests managed to return to Liverpool.



Entrance to the tunnel of the Liverpool and Manchester Railway, Edge Hill.

Drawn by C. & G. Pyne. 1829.



Stations of the Liverpool and Manchester Railway on Merseyside.

The Edge Hill engine station



Foundations of the Moorish Arch under excavation, 1978.

The two tunnels from Wapping and Crown Street emerged into a cutting beneath the present-day Chatsworth Street, known then as the Edge Hill Engine Station. In this cutting, excavated 40ft into the sandstone rock, was the famous Moorish Arch. This 'grand entrance to the Liverpool stations' was a prestigious facade which concealed the houses for the steam engines required to operate the two ropes. The engines themselves cost £3,400 and were supplied by Robert Stephenson and Company. Steam to power them came from boilers which were mounted in openings excavated into the cutting sides. Other openings were used as locomotive sheds, coal stores, stables, and accommodation for the railway staff.

When Lime Street Station opened in 1836 and passenger traffic was transferred from Crown Street, the importance of the Engine Station did not decline because of the growth in goods traffic. In November 1839, an eminent railway engineer visited the site and wrote: —

Old Tunnel-Station Engines, Liverpool — The old engine-station, which is at the top of the Wapping and bottom of the Crown Street tunnels, is about 68 yards in length and 22 yards wide, independent of the recesses formed in the red sandstone rock on either side for the boilers, stable, etc.



North side engineer's staircase, with boiler houses below

The whole of the firing of the engines to work the Wapping and Crown Street tunnels, as well as the engines at Edgehill, is concentrated at this station. There are no fewer than eight large boilers erected for the use of the several fixed engines: two of which may be considered as extra spare boilers, to be used in case of repairs to any of the others. Some of these boilers are multi-tubular, having 3-inch tubes; and others have return fire-tubes. The usual working pressure is 40lbs. on the square inch. Coke is mixed with the coal for the Wapping engine.

The engine-houses are situated on either side of the Moorish arch, and are 29 feet and 5 inches apart, each 35 feet in length, and 18 feet in width externally. The engines have each 24-inch cylinders and 6-feet stroke; the usual pressure is stated to be 35lbs., the working beam is 13 feet 4 inches long, and the fly-wheel 20 feet in diameter.

For the Crown Street tunnel, the rope is wound on a roll 3 feet in the clear and 3 feet 4 inches in diameter; and for the Wapping tunnel an endless rope is used, with a tightening-carriage, as described for the Edgehill engines, but the large rope-wheel is fixed in a horizontal position, and is of 10 feet diameter; and there are two 5 feet horizontal wheels placed in the same line and between the large wheel and the tightening carriage. The rope passes twice round the large wheel, twice round the first 5-foot wheel, the centre of which is 11 feet from that of the large wheel, and once round the second 5-foot wheel. The well is 40 yards deep, and the bore below 60 yards additional. The counterweight consists of a plate-iron bucket, which holds 2½ tons of scrap-iron, and is 3 feet in diameter and 4 feet deep. There is also a small pumping-engine at this station, with 12-inch cylinder and 3½ feet stroke.

There are four men to attend these engines: the enginemmen receive 30s. a week each, and the firemen 20s. The working hours are from 6am to

6pm, with an allowance of two hours for meals.

From twelve to eighteen trains, of about twelve laden wagons each, are drawn up through the Crown Street tunnel daily. When the train reaches the top of the Crown Street tunnel Incline, the end of the rope is brought back by a small four wheeled carriage, called a pilot, drawn by one horse; an operation which occupies about five minutes.

After Francis Whishaw had written that account, there were few changes in operation until the late 1840's when two new rope haulage engines (known as the Wapping engines) were brought into use, closer to Edge Hill station. These allowed longer trains to be hauled up from the docks and they superseded the engines in the Moorish Arch, which was eventually demolished. Rope haulage continued until the 1890's when locomotives took over and the Engine Station became finally derelict in 1972 with the closure of Crown Street.

Two years later, recognising the importance of the site in railway history, staff, and students from the C. F. Mott College of Higher Education and the County Museums began a

survey to compare the visible remains with the published evidence. Measurements were taken of the whole site, as well as of the various openings, chimney flues and steam pipe passages so that accurate drawings could be made. From these it was then possible to deduce the exact uses of the various passages and openings.

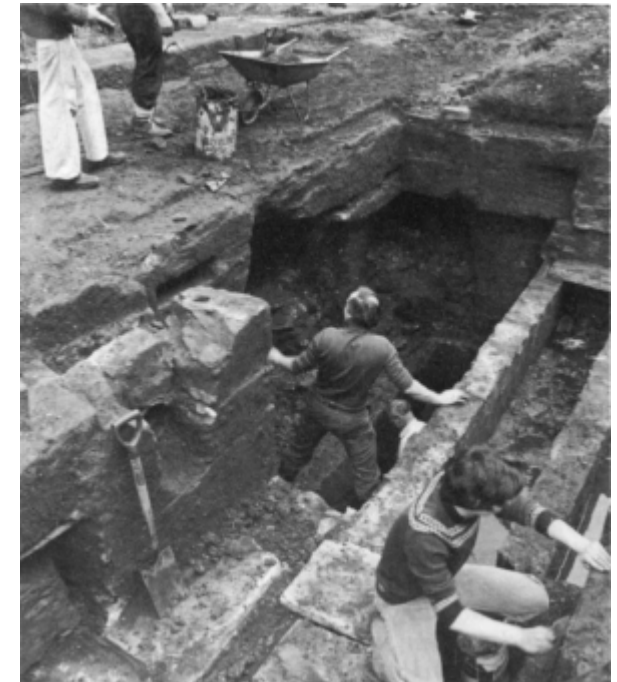
When the survey was completed, it was decided to make a small excavation to see what remained of the Moorish Arch and the rope haulage machinery that Whishaw had described. Calling upon the assistance of the N. W. Society for Industrial Archaeology and History, a start was made to find a corner of the North engine house in the Moorish Arch. Thanks to the accuracy of Whishaw's measuring, the first spade stroke came within 6 inches of the corner. Underneath a 6 inch layer of ballast was the sandstone plinth that formed the foundation of the Arch. Clearance of the whole foundation plinth continued after a mechanical excavator (kindly paid for by the City of Liverpool Heritage Bureau) had removed the mounds of rubble dumped on the site.

The outline of the Arch was quickly revealed and it soon became obvious that when the Arch

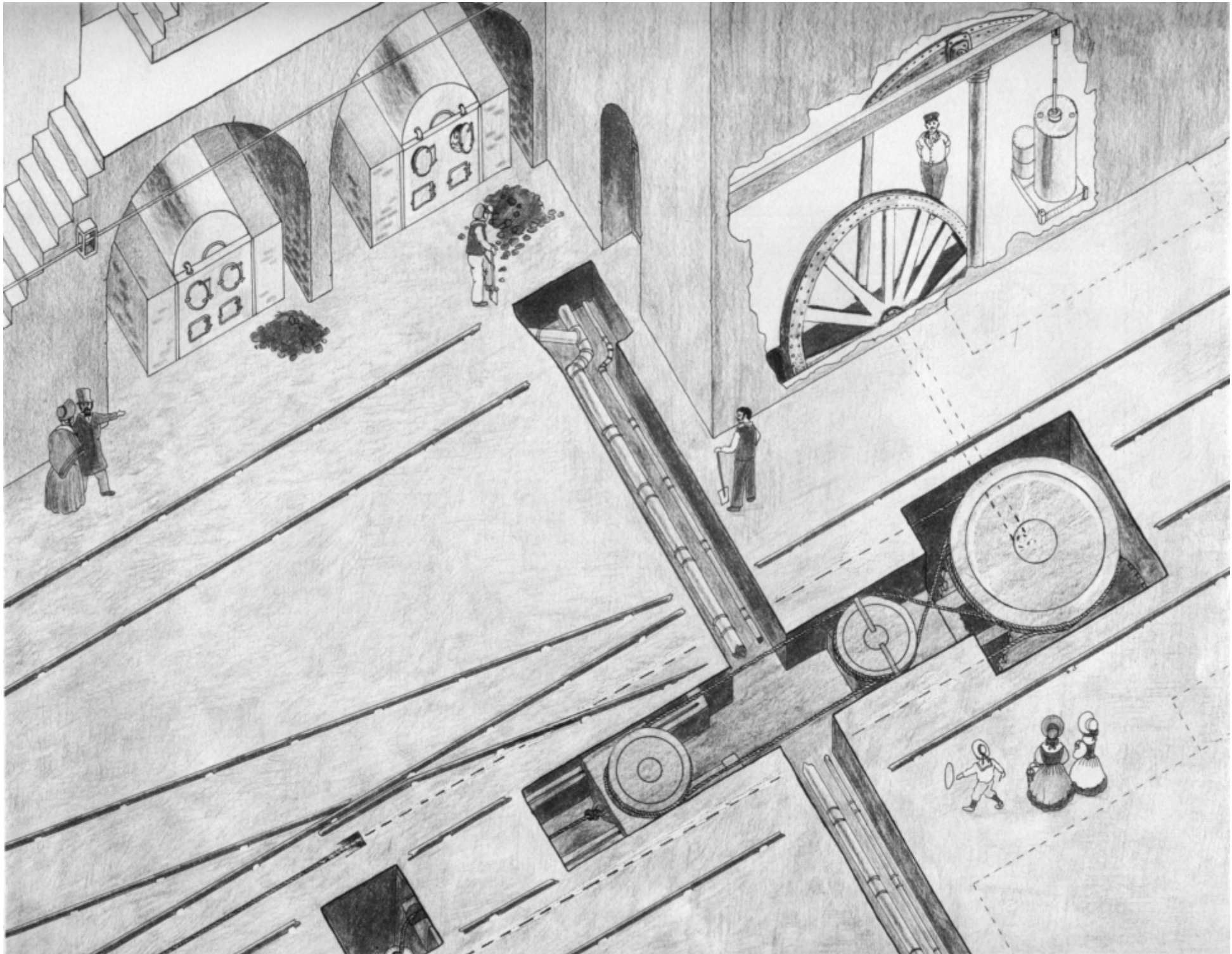
was demolished, it had been knocked down into its own cellar. Halfway along the wall was the end of a tunnel which led out from the engine house under the tracks. Because of what Whishaw had written about a 10 foot diameter rope wheel, this tunnel was expected to lead into a large hole. Excavation began and an 11 ft 6in square hole was revealed, with side tunnels leading into it from the engine houses and two deep parallel slots in the bottom. These slots contained the vertical cog wheels on top of which rested the horizontal rope driving wheel. Running from the square hole towards the Wapping tunnel mouth was a trench which was clearly wide enough to contain the five foot pulleys, described by Whishaw, which kept the rope under tension. One of these was fixed: the other 'travelled' on rails resting on plinths at the trench bottom. This ingenious system was all devised by George Stephenson himself and was used later on the Lime Street and Waterloo branches as well as on the other railways. That the system remained in operation until the 1890's testifies to its efficiency and suggests that it was an invention that solved a problem eliminated only by the more powerful successors of 'Rocket'.



Site of the Moorish Arch, 1976



Excavation of the rope wheel hole



Cutaway view of the rope haulage machinery.

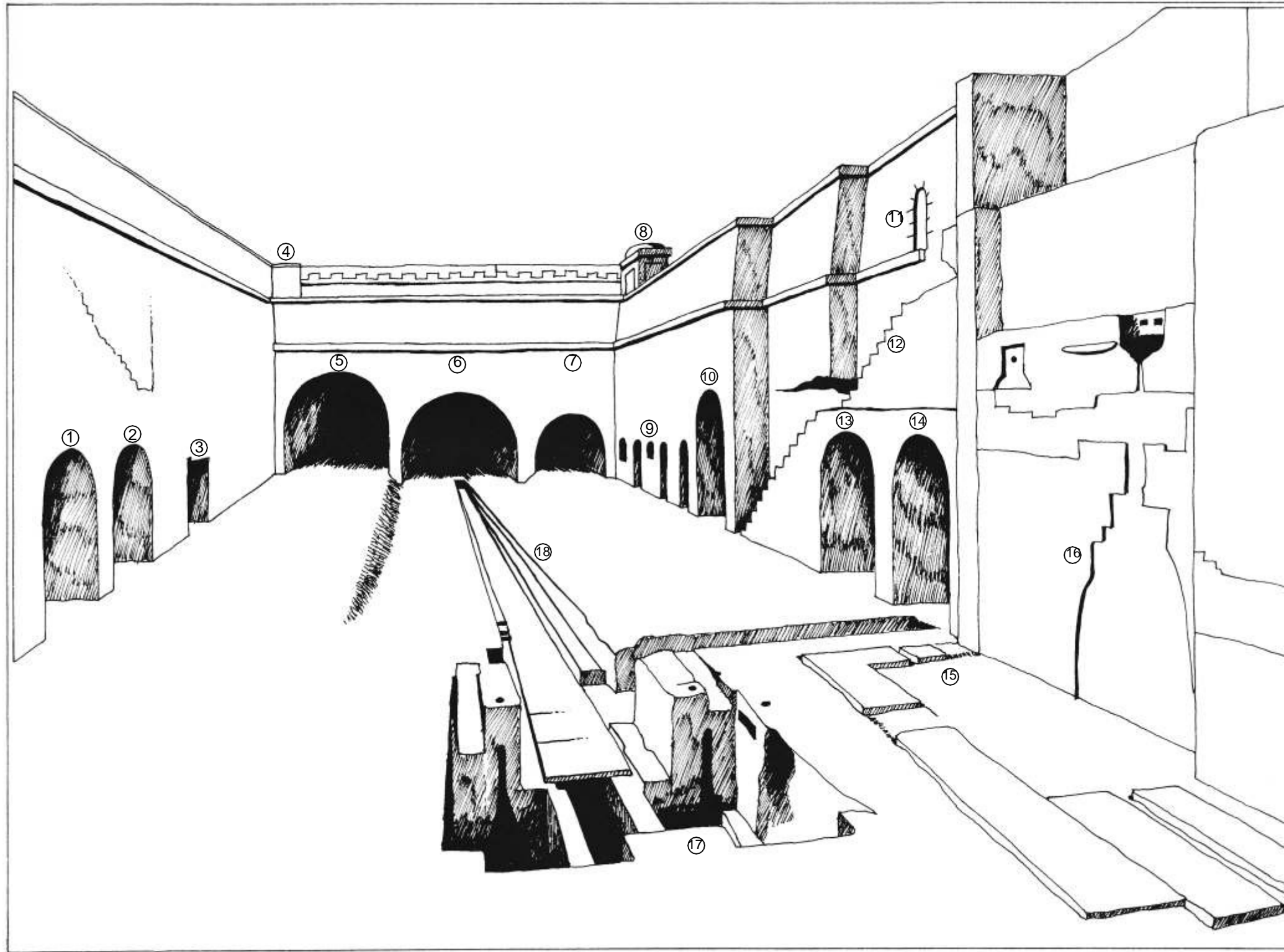
Graham Sumner.



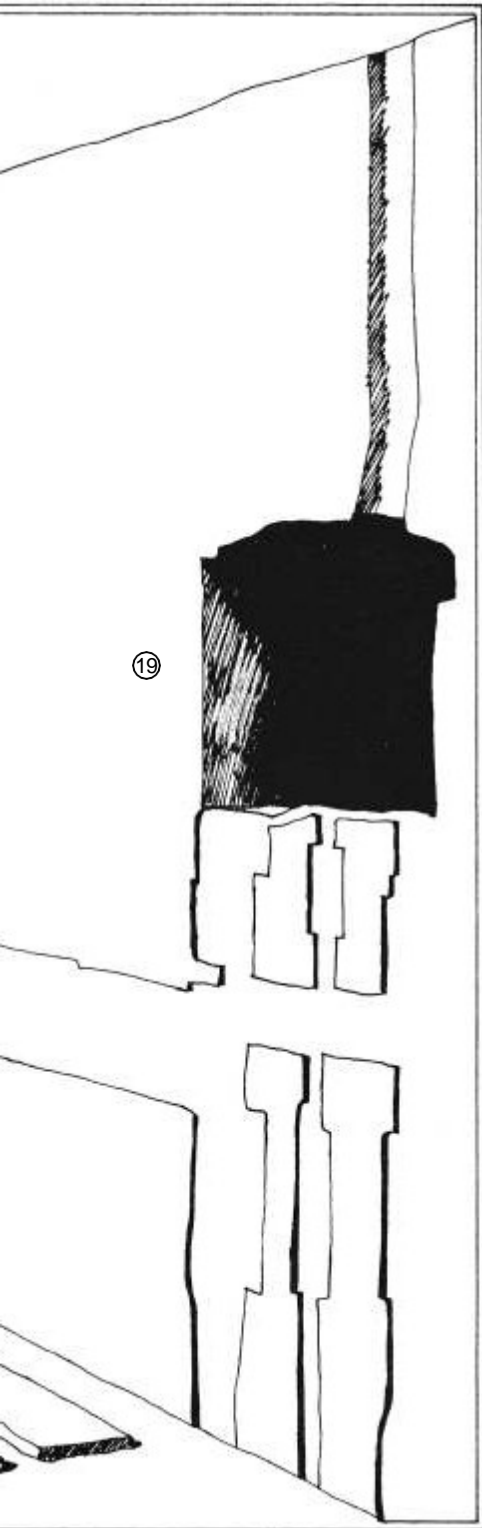
Artist's reconstruction of the site just before the opening day



Duncan Harper.



Edge Hill engine station in 1980 ~ 150 years after opening



- 1 Boiler house.
- 2 Boiler house.
- 3 Later opening, purpose unknown.
- 4 Widening of cutting made when the Moorish Arch was demolished shows in brickwork.
- 5 Tunnel to Crown Street, 1846.
- 6 Tunnel to Wapping Goods Station.
- 7 'Stephenson' tunnel to Crown Street, dated 1829 by a stone at the far end.
- 8 Base of chimney.
- 9 Openings, originally stables, later staff accommodation.
- 10 Boiler house, 1836, specially built to provide steam to the Lime Street Engines at Edge Hill Station.
- 11 Entrance to tunnel carrying steam pipes to Edge Hill Station.
- 12 Engineer's staircase.
- 13 Boiler house.
- 14 Boiler house.
- 15 Excavated site of Moorish Arch. One of the two stationary engines used to haul the wagons up from Wapping was installed here.
- 16 Interior wall of the engine house, with fixing points for machinery.
- 17 Excavated hole contained pulley which operated the ropes.
- 18 Excavated trench contained the rope tensioning gear.
- 19 Opening contained steam-heated tank which provided the hot water for the locomotive tenders.



Railway Office, Liverpool

Ackermann & Co., 1830.



Edge Hill Station. End of tunnel. Ackermann & Co. (publ 1836)

Crown Street

Because of a town council restriction on steam locomotives entering Liverpool, the railway's original passenger terminus was at Crown Street, some way from the centre. Even then the locomotives did not operate from the terminus itself. Departing trains ran downhill on a gentle gradient through a 290 yard tunnel to the 'Engine Station' where the locomotives were attached. Arriving trains were hauled up through the tunnel, in the reverse direction, by rope.

Despite the horse buses provided by the Company to carry passengers into town, the station was clearly inconvenient and was quickly superseded by another in Lime Street. When this opened in 1836, Crown Street was given to coal and goods traffic and remained in operation until 1972.

Recently, the site has been landscaped by the City Council. The tunnel still remains, the carved date, 1829, still being visible in the roof.



Entrance to the tunnel, 1980

Travelling
BY THE
RAILWAY.

THE DIRECTORS of the LIVERPOOL and MANCHESTER RAILWAY beg leave to inform the Public, that on and after MONDAY next the 4th of October, the Railway Coaches will start from the Stations in Liverpool and Manchester respectively, at the following hours:—

The FIRST CLASS COACHES, Fare 7s.
At Seven o'Clock.
Ten o'Clock.
One o'Clock.
Half-past Four o'Clock.

The SECOND CLASS COACHES, Fare 4s.
At Eight o'Clock.
Two o'clock.

On Sundays, the First Class Coaches will start at Seven o'Clock in the Morning, and half-past Four in the Afternoon; and the Second Class Coaches at half-past Six in the Morning, and Four in the Afternoon.

Places may be booked at the Liverpool end, either at the Station in Crown-street, or at the Company's Coach Office, in Dale-street; and at the Manchester end at the Coach Office in Liverpool-road, or at the Company's Coach Office in Market-street, corner of New Cannon-street, where Plans of the Coaches constituting each Train will lie, in order that Passengers may make choice of their respective Seats. Tickets for which will be given on payment of the Fare.

A conveyance by Omnibuses twenty minutes before each of the above-mentioned hours of departure of the First Class Coaches only, will proceed from the Company's Office, Dale-street, to Crown-street, free of charge, for Sixty-eight Passengers and their Luggage, (the said number, *first booked*, having the preference, on their claiming it at the time of booking) and for the same number from Crown-street to Dale-street, on the arrival of the Coaches from Manchester, a preference on the same terms being given to Passengers first booked at the Company's Coach Office, Manchester.

After the Festival week, during which it is impossible to ensure the desired accommodation, a conveyance to and from Crown-street will be provided for all the Passengers carried by the First Class Coaches.

Parcels will be received at any of the Company's Coach Offices, and delivered with the greatest regularity at the usual rates, and without any charge for booking or delivering.

No fee or gratuity is allowed to be taken by any Porter, Guard, Engine-man, or other servant of the Company, and the Directors are determined to enforce this regulation by the immediate dismissal of any person in their employ offending against it.

Railway Office, John-street, Liverpool, 30th September, 1830.

PRINTED BY BANCKS AND CO. EXCHANGE STREET.

Edgewood 1130.

The Edgehill station is situated at the upper end of the Lime Street tunnel, and extends from the mouth of the tunnel a distance of about 490 feet, the whole width being about 97 feet. The station is approached from Edgehill by two inclined carriage-roads, each 29 feet in width, the entrance-gates to which are fixed over and in a line with the face of the tunnel. The clear width of open space at the face of the tunnel is 39 feet 6 inches, having a double way, which continues through the tunnel to Lime Street station; and two sidings, each about 100 yards in length, and communicating with the main way by means of traverses.

The buildings, which are here placed on each side of the line, are of uniform elevation, and consist of two engine houses for the fixed engines, each 34 feet in length and 24 feet in width; a dwelling, which is occupied by W. Ralph, who attends the engines; a booking-office and waiting room in one; a lamp-shop and also porter's lodge and dwelling. The length of building on each side is upwards of 100 feet; but, excepting the engine-houses, which are situated at the east end, the width is only 18 feet.

The intermediate space at this station is 4 feet 10 inches, and the side spaces each 1 foot 8½ inches. The stone platforms in front of the buildings are upwards of 19 feet in width, except where the engine houses project; here the width is reduced to 13 feet.

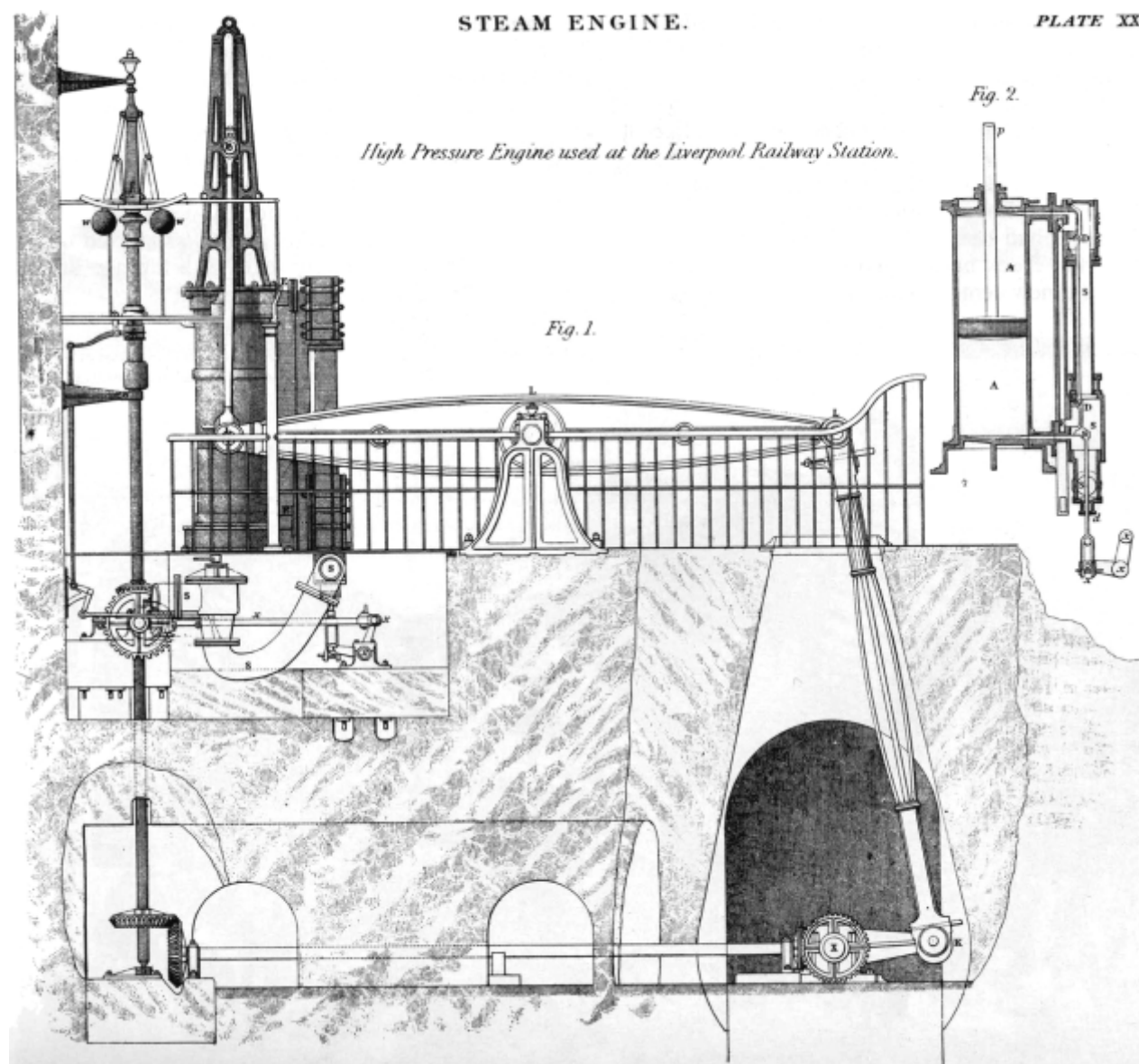
The fixed engines, to work the Liverpool incline through the tunnel, are placed in the buildings already mentioned. These engines which are in every respect similar to each other, were erected by



The cellar below the station which once contained the steam reservoir, explored during 1978

Messrs. Mather, Dixon and Co., and present a good specimen of the work produced at their establishment. The precaution of having two engines, in order to prevent stoppage in the efficient working of this part of the line, in case of either being out of repair, is attended with considerable advantages and is decidedly economical, Francis Whishaw. *Railways of Great Britain and Ireland, 1840.*

Edge Hill Station



Stationary engine used at Edge Hill Station. (From a drawing in the Encyclopaedia Britannica 1859)

In 1836 the new Liverpool terminus opened at Lime Street and with it a new station at Edge Hill. Built in a simple classical style, the station was sited at the top of the inclined tunnel from Lime Street. Apart from the waiting rooms and booking offices close to the tunnel mouth, there were two large stationary engine houses. Inside, powerful beam engines, supplied by the local firm of Mather Dixon, drove the machinery to rope haul the carriages up from the terminus. Steam to drive the engines was supplied from the Engine Station 448 yards away and was held in a reservoir which was in a cellar beneath the station buildings.

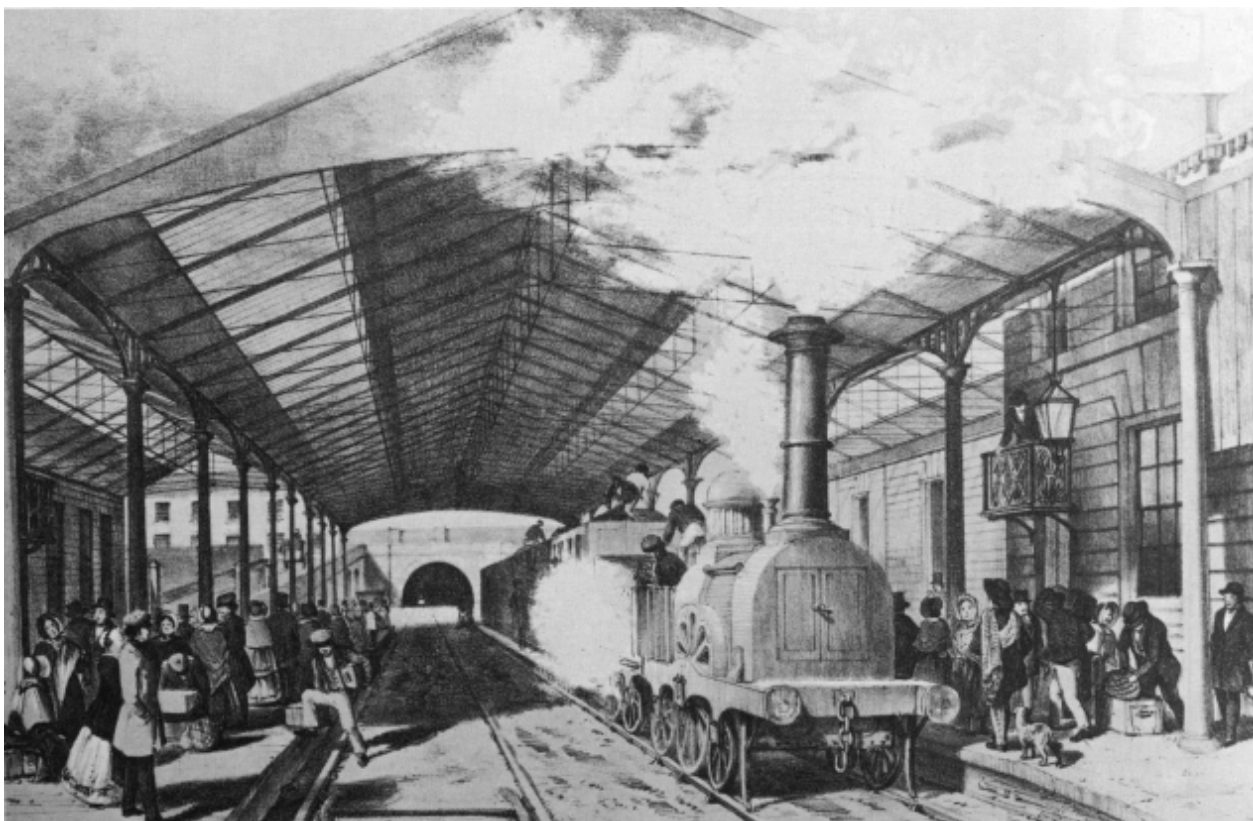
This inefficient system was superseded in 1841 when a new boiler house opened adjacent to the station. Also, during the 1840's an overall roof was added over the platforms. By 1849 the large engine house, which dominates No. 1 platform, had been erected to operate the Waterloo Dock branch. To provide the extra steam, a new central boiler plant was brought

into operation beneath what is now No. 4 platform and a complex of chimney flues, underground passageways and steam pipes was installed. These were explored and surveyed while the station was being renovated in 1978. By 1870, locomotives were working trains up from Lime Street and the engine houses at Edge Hill were redundant. The frontages were taken back to line up with the offices and they were reopened as waiting rooms for the ever-increasing numbers of passengers using the station. The rope machinery tunnel became a subway and new platform canopies replaced the old overall roof. Also at this time, the central boiler house was demolished and replaced by a smaller plant adjacent to the Wapping engines.

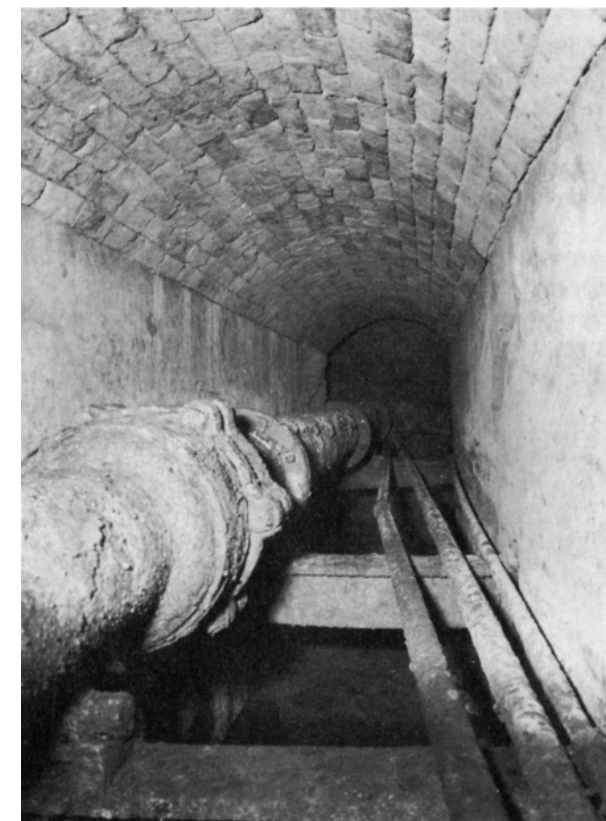
During the 1880's the two outer platforms (now Nos. 1 and 4) were constructed along with further passenger accommodation. At the same time hydraulic generating plant was erected on No. 1 platform. Finally in 1898, a luggage bridge was added between the platforms.



1880s canopy hides the Waterloo line engine house



Edge Hill Station about 1849. Lithograph by Tait



Steam pipe in the passage beneath No. 4 platform

With the twentieth century came the electric tram and then the motor bus and passenger numbers began to fall. By 1976, the buildings were derelict and British Rail ready to demolish them.

It was just at this time, however, that members of the N. W. Society for Industrial Archaeology and History, who were photographically recording the station, realised that it still retained parts going back to the days of George Stephenson. Checking the print published by Ralph Ackermann and reading the account written by Francis Whishaw it was easy enough to prove that the station was one of the oldest stations in the world still working. On the strength of this, the Department of the Environment listed it as being 'of historical importance.'

British Rail, accepting the need to retain the station in case of accident at Lime Street, prepared proposals to demolish the later extensions and to return the buildings to something like their original condition. These plans coincided exactly with the views of the planners and conservationists and work began. By 1980, the 144th year of the station's life, demolition, rehabilitation, and cleaning was complete.



No. 2 platform just before demolition and rehabilitation



Rehabilitation in progress



Edge Hill Station, 1980



Warehouses, &c. at the end of the Tunnel towards Wapping.

Wapping



The original goods station was built at Wapping opposite the Kings Dock and was connected to the main line by a steeply inclined tunnel 1¾ miles long. Waggons arriving from Manchester descended by gravity; those departing were hauled up by the ropes. At the station itself were four lines of way inter-connected by turntables. Some lines ran beneath the warehouses to facilitate the loading from above of cotton, the most common of the goods handled. In addition, there were consignments of coal, timber, building materials, glass, foodstuffs, and livestock.

By 1832, traffic had become so heavy that rails were laid across Wapping into the Dock itself. In 1838, the depot was being extended and in 1842, after further extensions, it was renamed Park Lane. It closed in 1965. The site is now an industrial estate.

© Edge Hill Railway Trust 1980

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Aintree, Liverpool

*Back Cover: Moorish Arch, looking from the Tunnel.
R. Ackermann (publ. 1831)*

