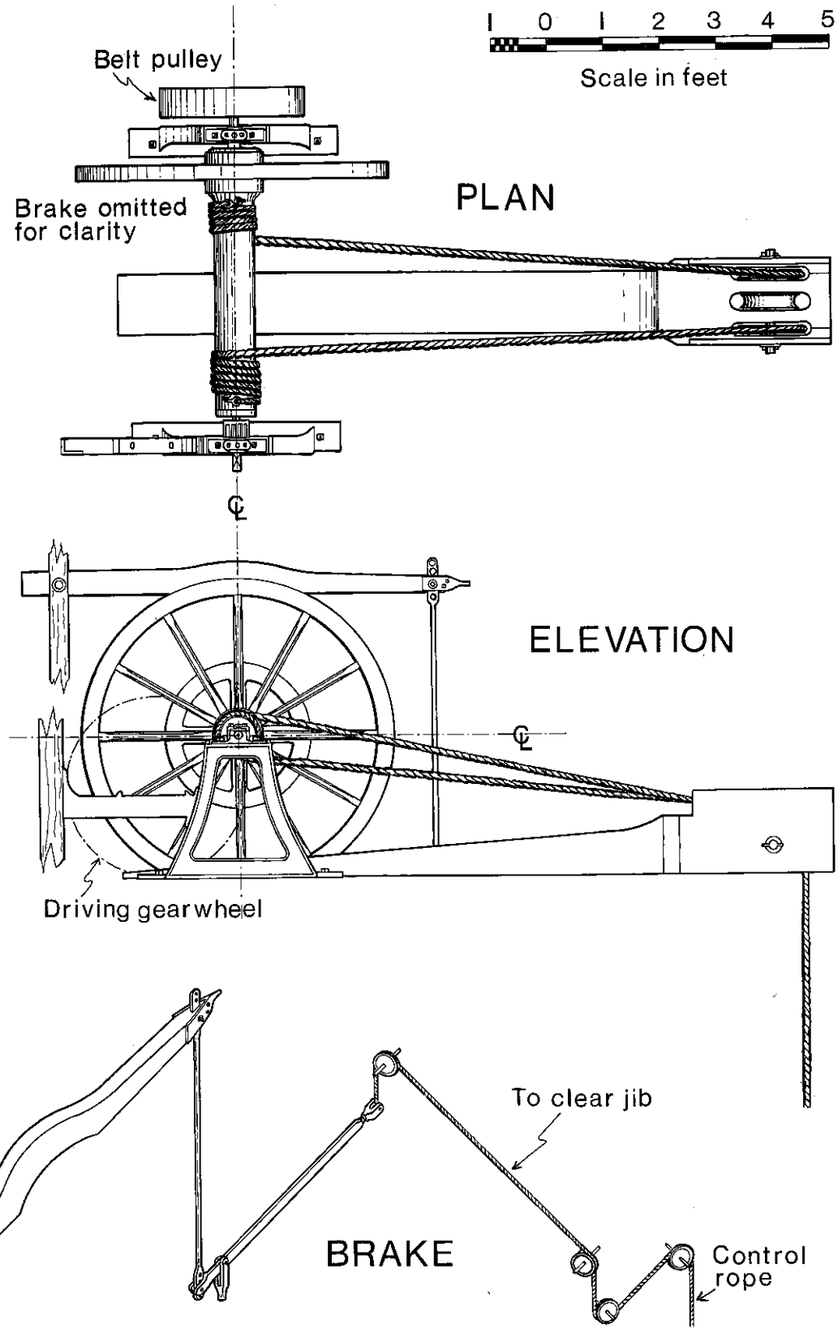
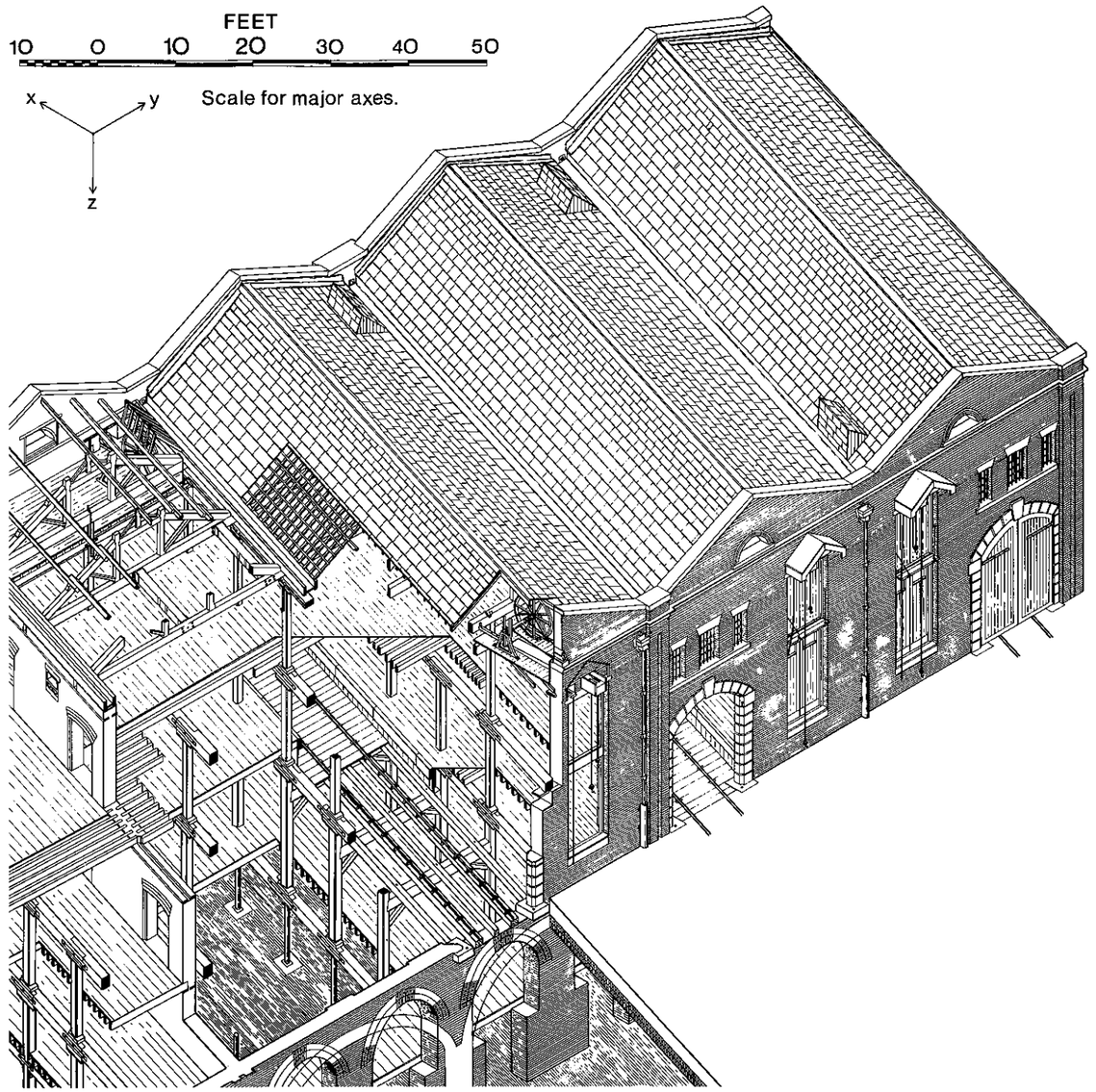
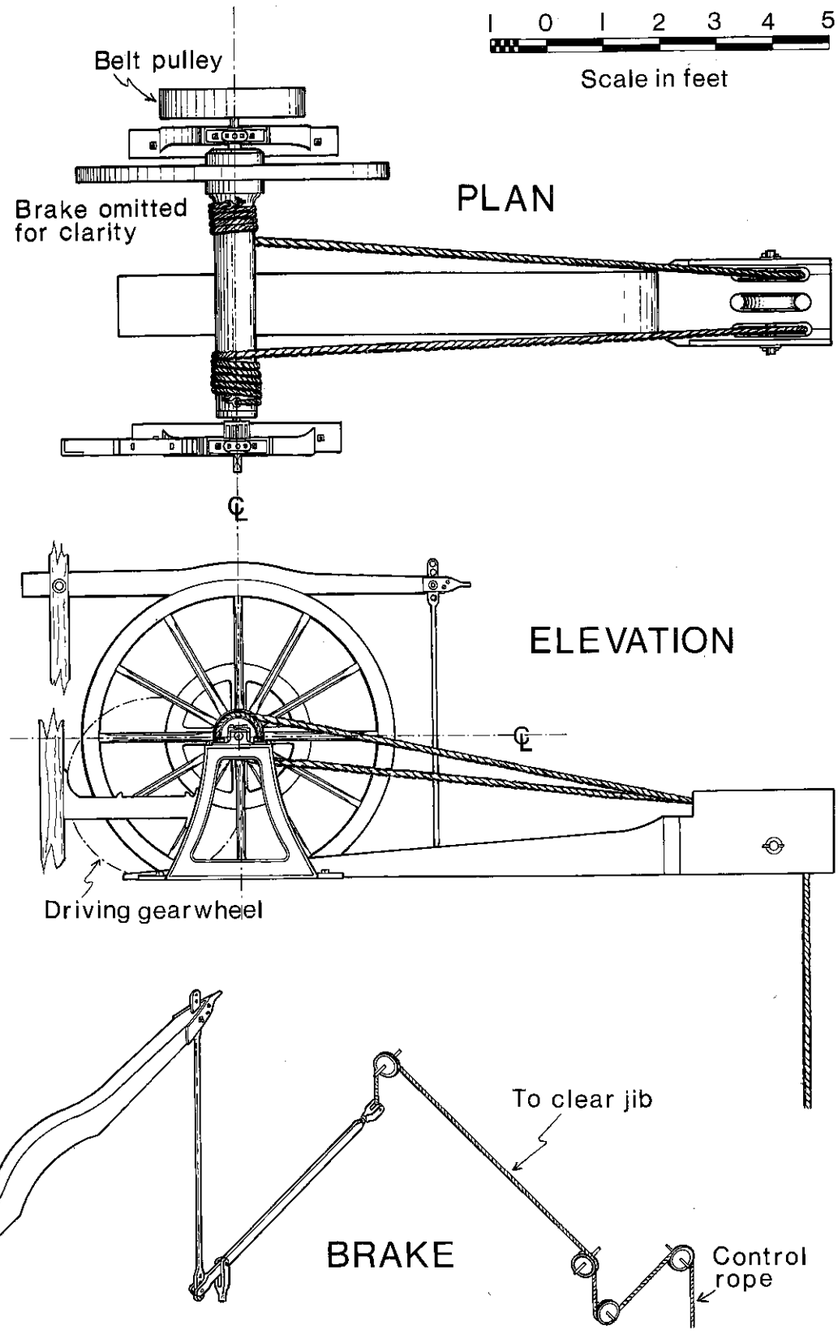


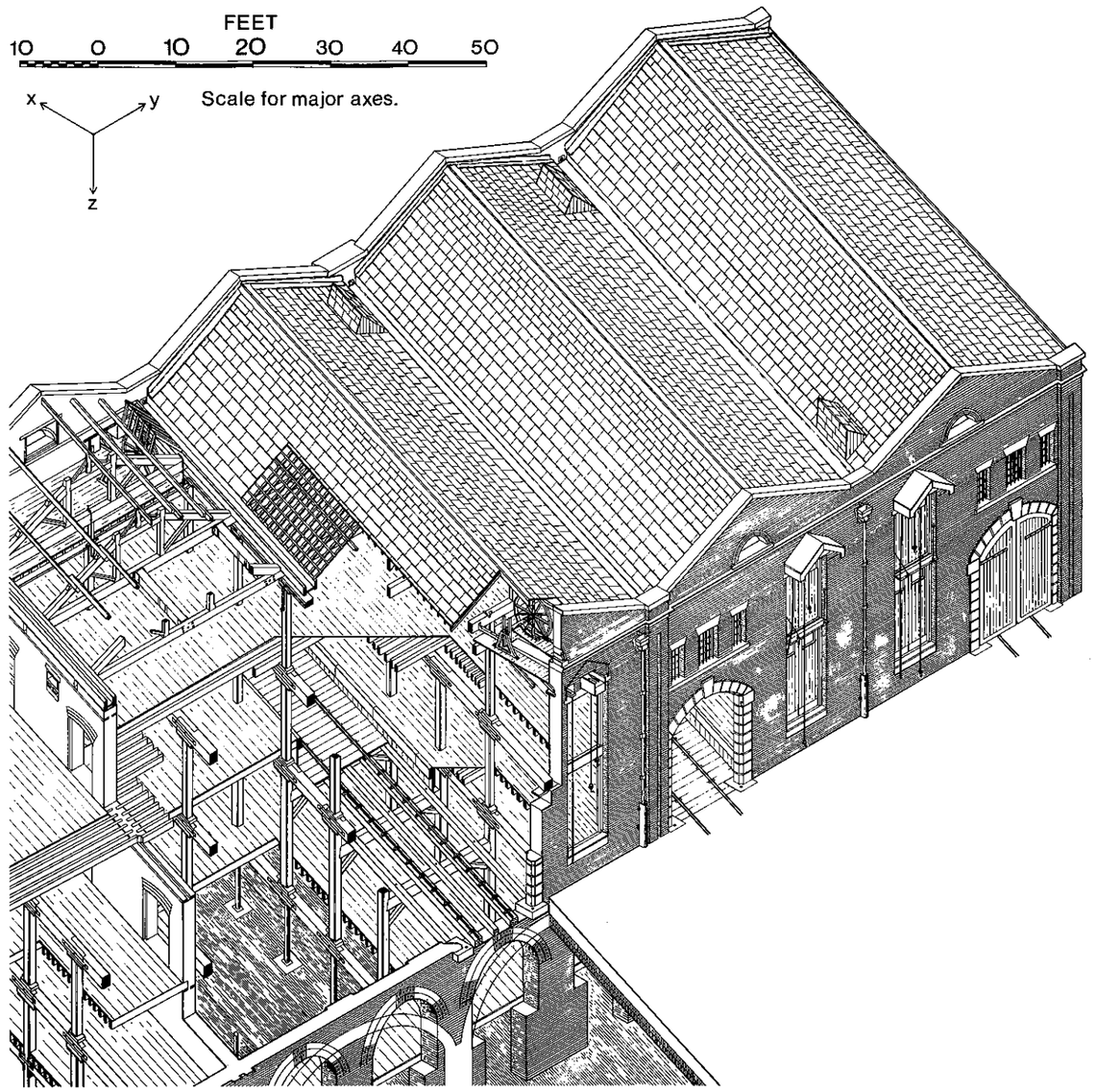
Liverpool Road Station warehouse: crane.



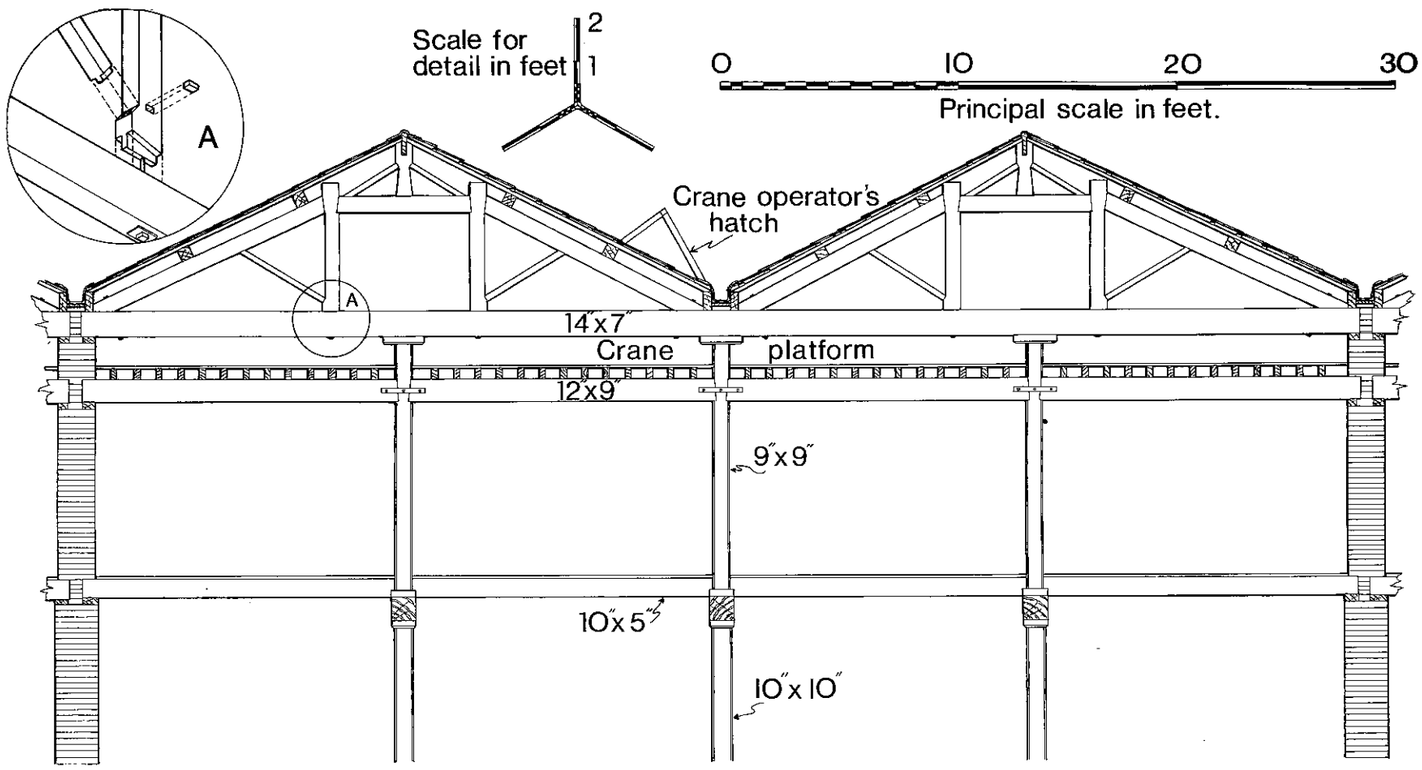
Liverpool Road Station warehouse: reconstruction of south elevation and section *c.* 1835.



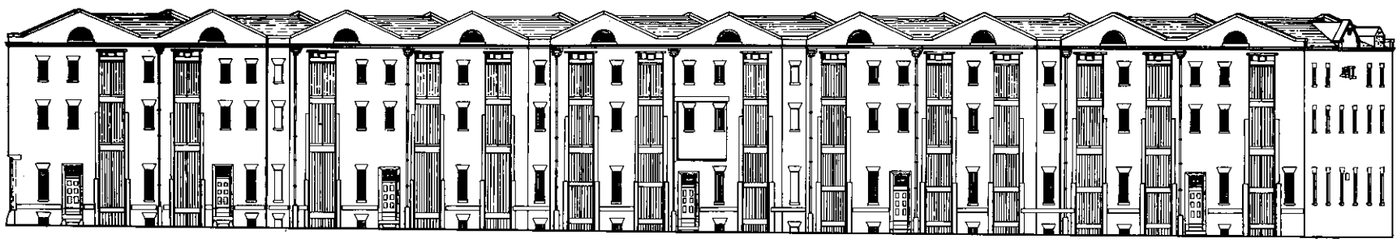
Liverpool Road Station warehouse: crane.



Liverpool Road Station warehouse: reconstruction of south elevation and section *c.* 1835.



Liverpool Road Station warehouse: section through top floor and roof trusses.



NORTH ELEVATION

SECTION

10 0 10 20 30 40 50 60 70 80 90 100

Scale in feet

Liverpool Road Station warehouse: north elevation and section.

history of Manchester. At the end of the eighteenth century the brothers David and George had been joiners and carpenters.[25] The former was probably the father of David Bellhouse Jnr. By the mid-1820s the firm of David Bellhouse and Son had grown to become the town's leading timber importer, with powered sawmills adjoining the Old Quay. In 1824 it had begun to transport its timber from Liverpool by means of a steam tug hauling specialised lighters.[26] One of the Bellhouses owned a brickfield in the Castlefield area, and a later trade directory indicated that by 1840 the building firm of David Bellhouse was operating independently.[27]

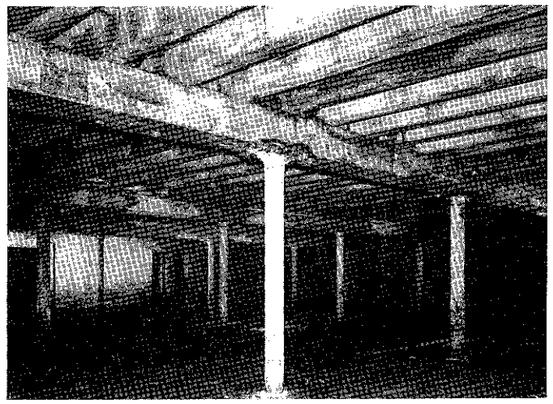
The construction of the warehouses was relatively uneventful, although in May 1830[28] it was felt advisable to call upon Haigh to appoint a competent person to remain on the spot to superintend the brickwork and masonry. Progress was rapid, for by 24 July 1830 the *Manchester Guardian*[29] could report that the warehouses were nearing completion and that the whole range was roofed over. It was sufficiently complete by the opening day to act as a reception area for the guests who did finally reach Manchester. The upper storey had been given over to a '. . . cold collation provided by Mr. Lymm of the Waterloo Hotel . . .'[30] which was intended to be consumed by a thousand people. Bellhouse had constructed a temporary timber staircase to give access to the upper storeys. In the event it was a sombre and dispirited affair, marred by Huskisson's unfortunate accident with the *Rocket* and the hostile mob which awaited Wellington at the Manchester end. Of course it rained.

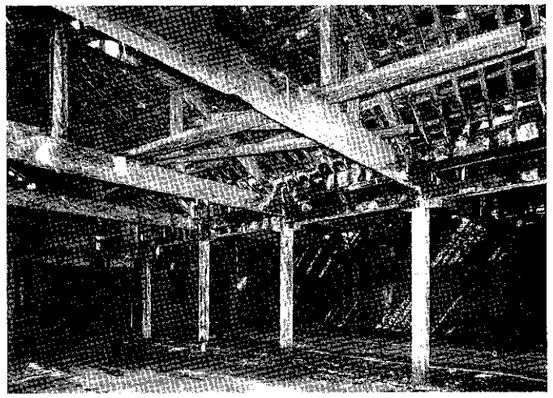
The building as it stands today is a remarkable survival. With the exception of the intermediate floor, installed later in the western end, it is virtually unaltered. The ground plan consists of five major transverse divisions, the easternmost of which is subdivided into two equal halves. Prior to alterations of 1831 the floor levels comprised cellar, ground floor at street level, rail level and top storey. The linear axis of the building conforms to the curvature of the railway viaduct. The north elevation rises from street level, but the south façade is orientated to the rail level of the viaduct. Transit through the warehouse involves movement between levels. At rail level the façade is pierced by double loading doors and loopholes, the latter of which rise to the top storey. In 1830 there were six sets of double doors corresponding to the internal divisions and fourteen loopholes, three for each full division, and one each for the easternmost two. The double doors led from the viaduct into the building, and, by means of a timber trestle incorporated into the internal structure, rail tracks passed from the exterior into the building. Inside, the rails were flanked by wharves which allowed wagons to be unloaded direct. To the rear or street side of the building loopholes served to discharge goods on to carts and to receive new loads.

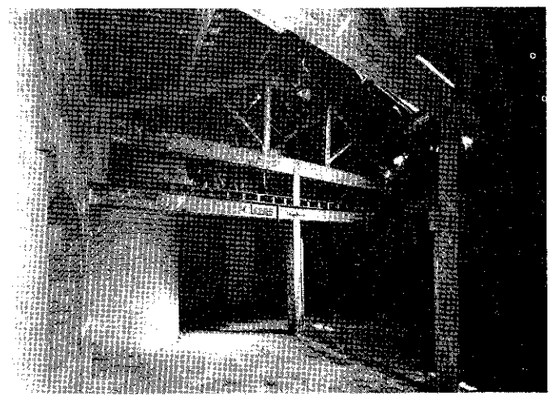
The debt the design owes to the Manchester warehouses described previously will be immediately evident. The division of the building into separate compartments has its parallel in the 1793 extension to the Grocers' Company warehouses and the Merchants' Warehouse. Equally, the transhipment facilities have their origins in the earlier canal warehouses, with their internal docks. Finally, the operation of the warehouse on split levels is a clear adaptation of the tradition established by the Rock House Warehouse and its successors.

Of the structural characteristics of the warehouse, the most obvious feature is the similarity between its system of vertical supports and that of near-by canal warehouses. The principal floor beams extend from the front wall to the back and consist of 13 in. square section deal baulks. At intervals these are scarfed by half lap joints secured by wrought-iron straps. The bridging joists which support 2 in. floor boards are of 5 in. × 10 in. section and run from the transverse walls longitudinally over the main beams. The main beams are supported at 10 ft. intervals by timber storey-posts, the free-standing height of which is 9 ft. on the upper two floors and 13 ft. at ground-floor level. The cross-sections are respectively 9½ in. × 9½ in., 10 in. × 10 in. and 11 in. × 11 in. At rail level the storey-posts carried the additional load of the railway into the building by means of horizontal beams spanning between two rows of posts in the four major divisions, and between a single row of posts and the walls at the eastern end. Diagonal braces reduce the free span. At cellar level the timber posts give way to cast-iron columns of cylindrical cross-section with a mean diameter of 7⅝ in. Their free-standing height varies between 5 ft. 6 in. at the western end and 8 ft. 6 in. at the eastern end to maintain the ground floor at street level. This combined use of timber and cast iron for the vertical supports has previously been described as applied to the Old Quay Company's New Botany Warehouse of 1824. A similar flood risk prevailed on the Railway Company's site.

The roof is of conventional form for the period. Two queen-post trusses share a common tie-beam which extends between the transverse walls and is supported intermediately by timber storey-posts. The central post carries the valley plate and gutters. At the front and rear of the building a platform extends from the wall to the first line of posts. Upon this are mounted the crane winches. The cranes are of a type common in the early







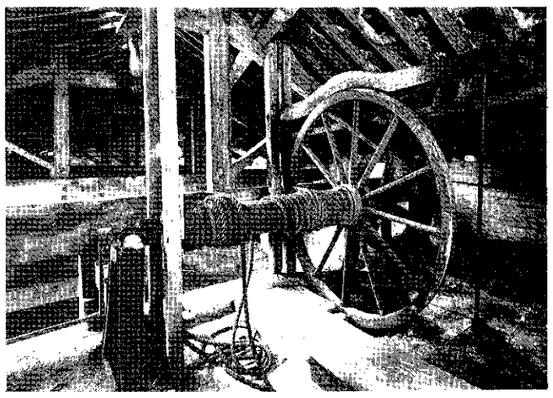
Liverpool Road, warehouse: *(above)* cellar, showing cast-iron columns; *(middle)* roof trusses and supports for valley plate; *(below)* roof truss in easternmost bay. The crane platform and the stair tower are also visible.

nineteenth century. A winch barrel mounted between two cast-iron pedestals has attached to it two contra-wound ropes. As one rope unwinds, the other is wound on. To operate the hoist, a load must descend to balance the ascending load. Control of the descent is by means of a brake wheel checked by a system of levers and ropes operable from each floor level.

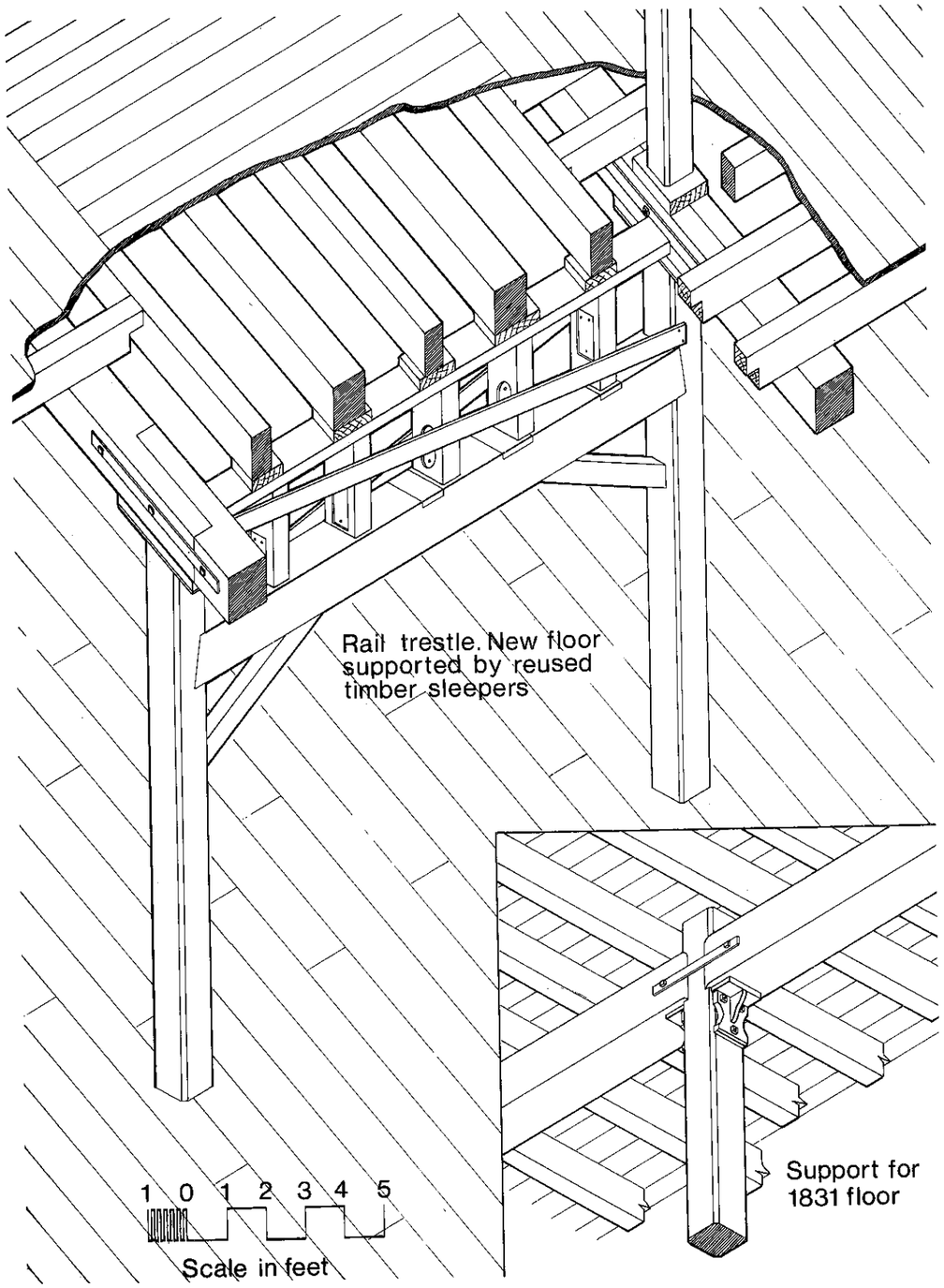
The architectural treatment of the building is restrained. The only concessions to decoration are the use of divided pilaster strips to denote the internal divisions, and the use of stone for the quoins around the shipping doors, for the lintels and sills of the windows, and for the cornice copings and lunettes. Interestingly, the profile of the cornice moulding and the distinctive style of the quoins are repeated on the Patricroft Bridge over the Bridgewater Canal.

It remains briefly to chronicle the alterations which affected the warehouse in subsequent years, the most important of which occurred in the year following its completion. Towards the end of January 1831[31] it was decided to install an intermediate floor between rail level and the ground floor of the three western divisions. This was possible because of the 14 ft. headroom available, but it entailed the loss of rail access to the affected areas. The new floor was supported by the transverse walls and by cast-iron brackets attached to the storey-posts.

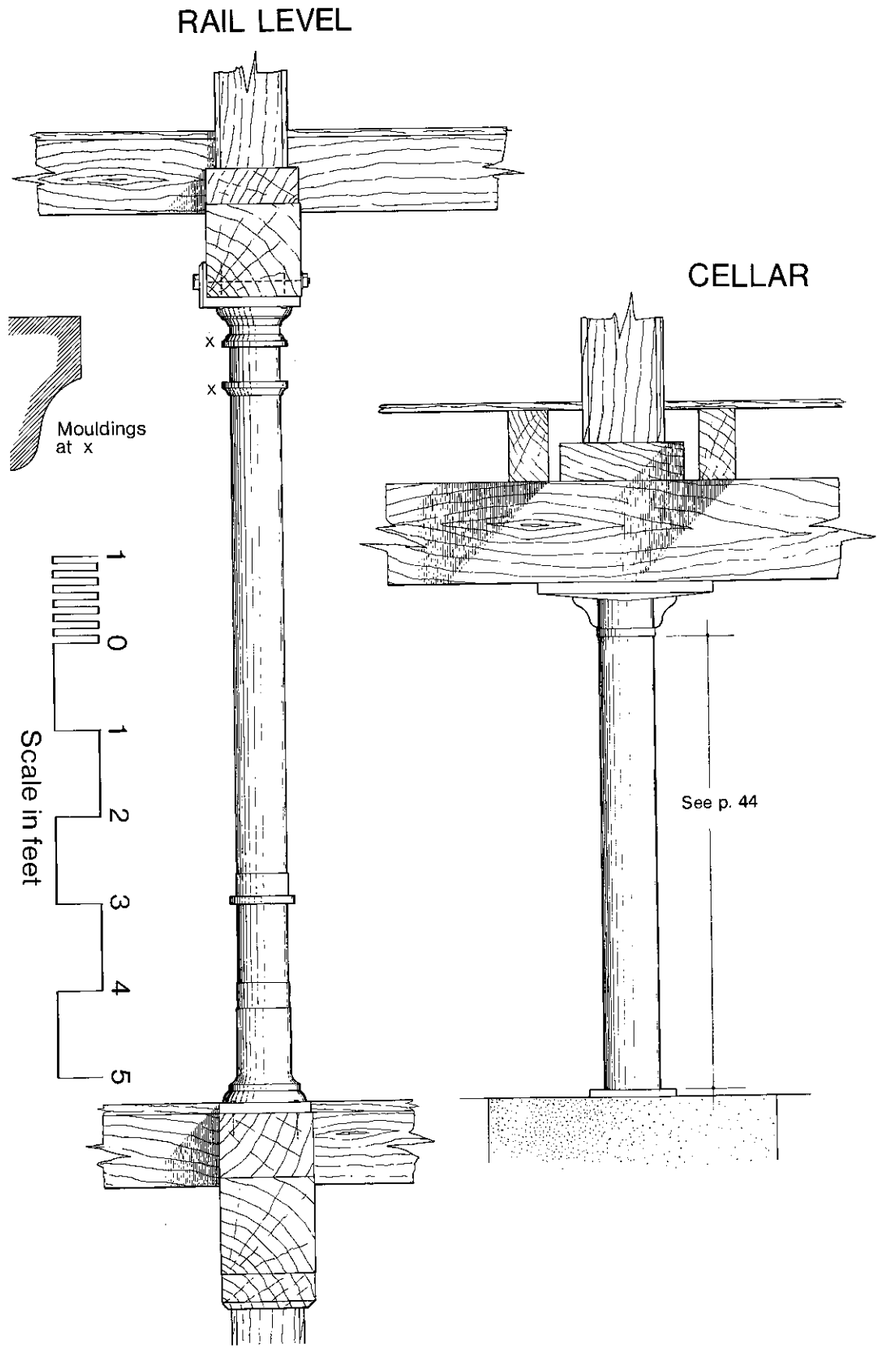
At the end of 1830 Stephenson was instructed to prepare plans for mechanising the lifting gear.[32] In the fol-



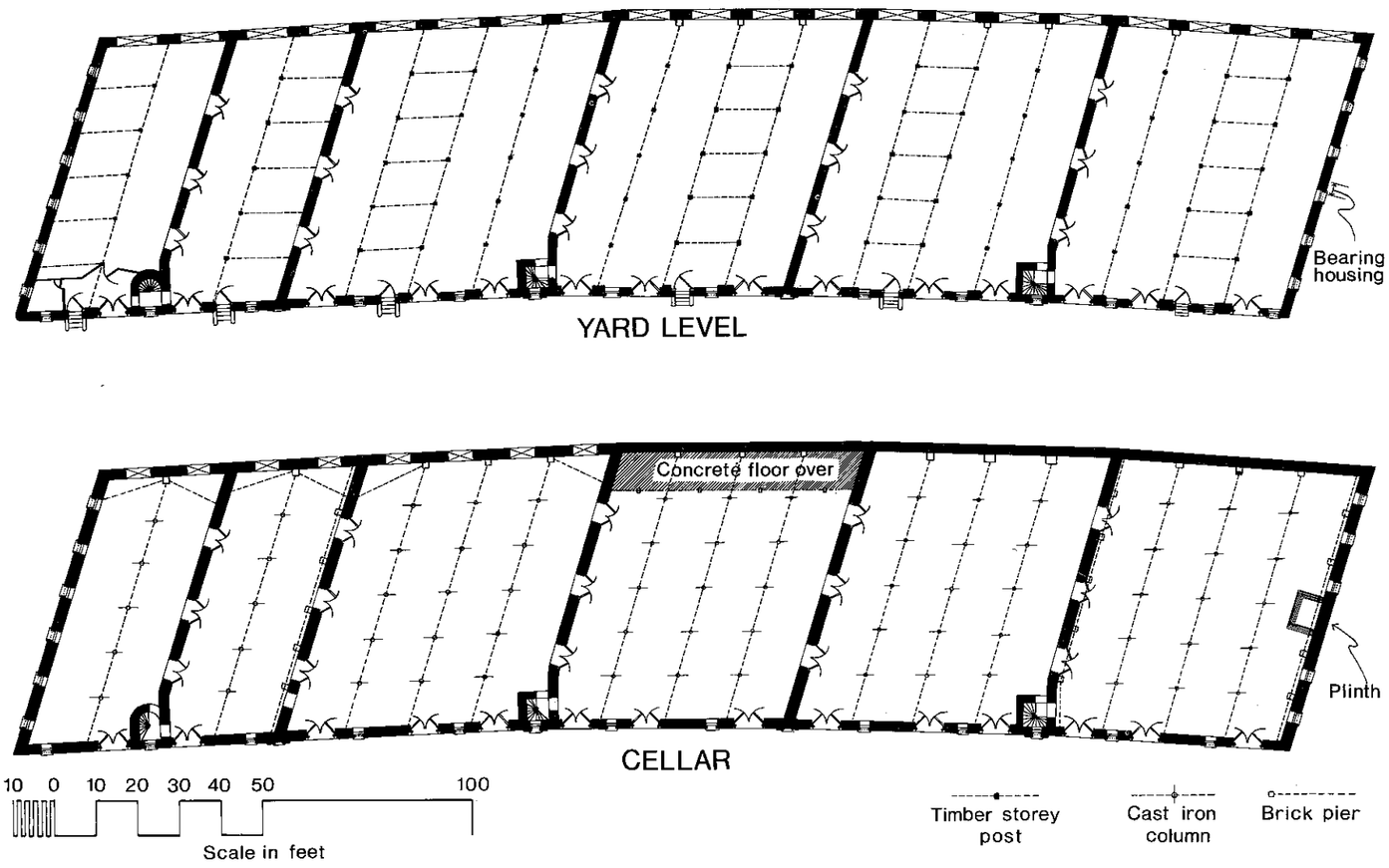
Liverpool Road, warehouse: crane winch. The contra-wound ropes are in place. To the right of the picture is the brake drum, and to the left the cog for the powered drive. The belt drum is a later addition.



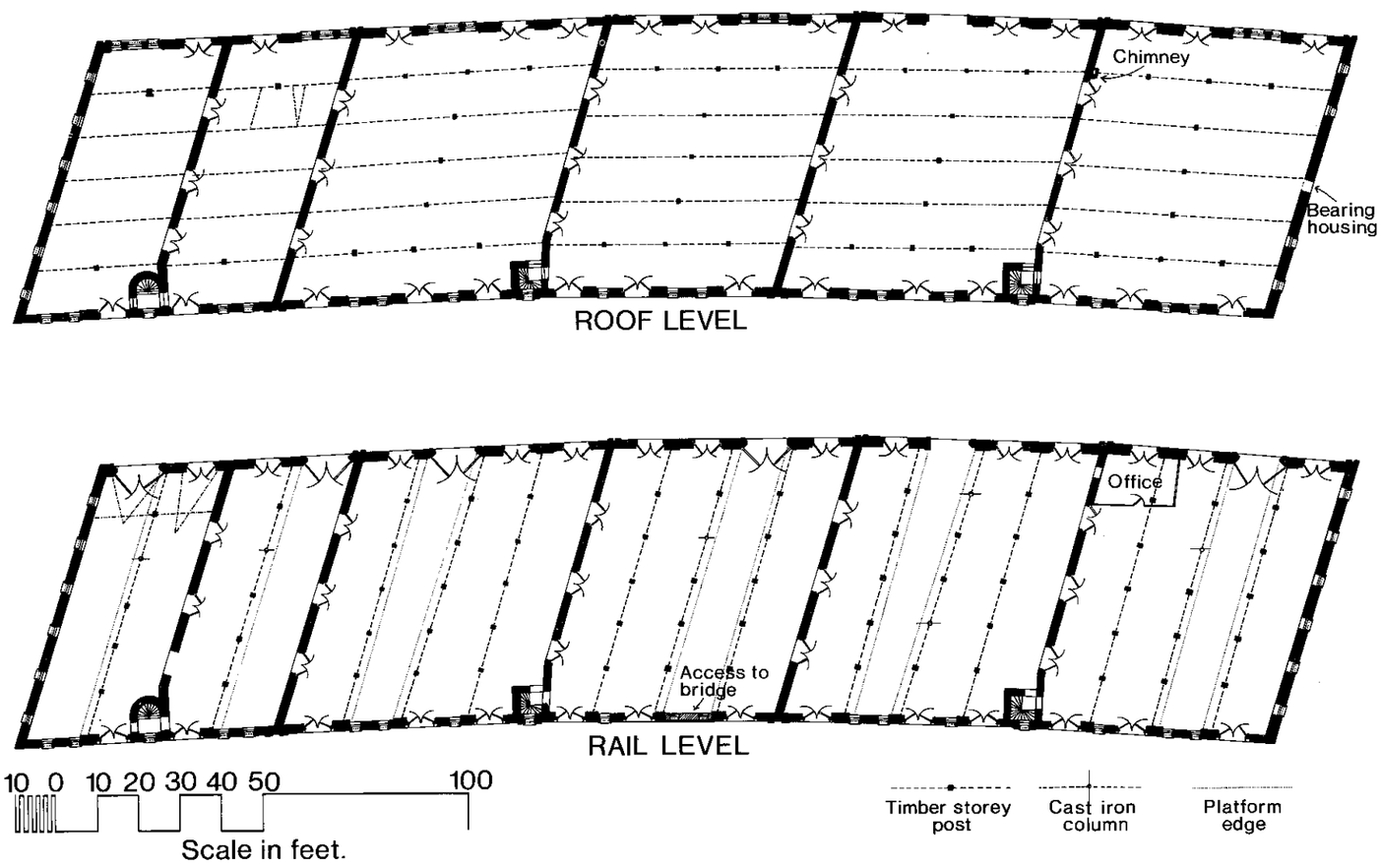
Liverpool Road Station warehouse: the present floor structures, ground-floor level.



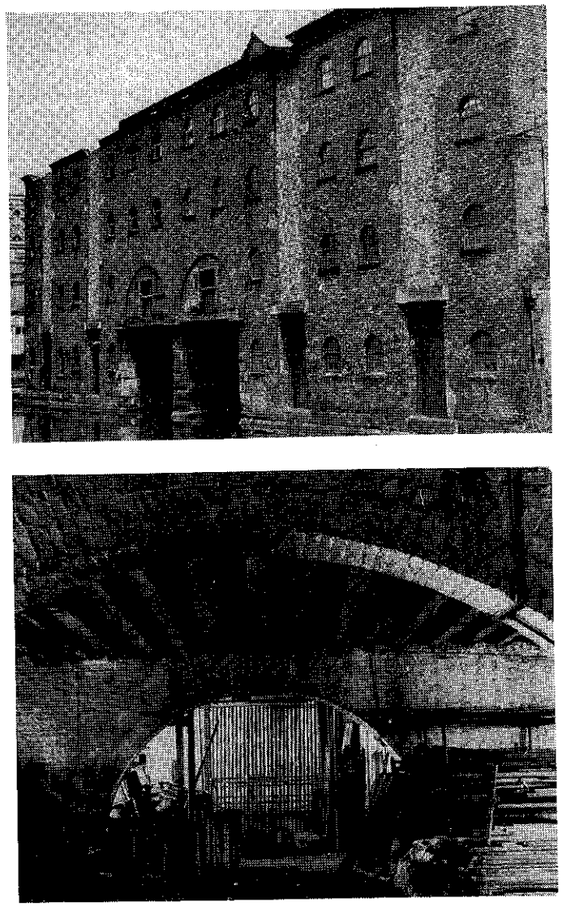
Liverpool Road Station warehouse: cast-iron columns.



Liverpool Road Station warehouse: floor and reflected beam plans, 1978.



Liverpool Road Station warehouse: floor and reflected beam plans, 1978.



The Merchants' Company Warehouse, Manchester. *(Above)* the canalside elevation with the internal loading facilities in the centre flanked by vertical loading bays or 'loopholes'. *(Below)* interior. The internal walls divide the building into units and the floor joists are supported by these walls.

place vertically through traps in the floors above. The internal loading bays are supplemented by loopholes in the façade facing on to the canal proper. The rear façade contains further loopholes which give access from each floor into the street.

These design features attained widespread popularity. By 1800 the ideas had been used by the Bridgewater Canal Company in Manchester and Liverpool, whilst both the Rochdale and Leeds to Liverpool canals had adapted the design to their own needs.

It is not clear who was responsible for turning the carrying committee's ideas into working designs. Possibly the Company drawing office at Clayton Square, Liverpool, carried out the work. There, until November 1829, Thomas Gooch was chief and possibly sole draughtsman, after which date he replaced Joseph Locke as resident on the western end of the line.[16] As his new post is unlikely to have permitted him to continue work in the office, the warehouse designs would need to have been prepared between July 1829, when the site plans were drawn up, and November. As personal secretary to Stephenson Gooch was replaced by Frederick Swanwick, but it is nowhere stated that Swanwick took over Gooch's duties as draughtsman.

The Company records omit any direct reference to the warehouse designer, and no other source has been found to throw light on the matter. Only one entry in the board minutes might provide a clue. On 17 May 1830,[17] whilst the buildings were under construction, a Mr Haigh was requested to appoint a competent person to oversee the works. Thomas Haigh was a Liverpool architect and surveyor.[18] The design of much of the subsequent building work for the railway can be definitively attributed to him, and when the warehouse accommodation at Manchester was extended in 1831 Haigh produced the designs.[19]

At the general meeting of March 1830 the Company announced that it had projected warehousing for 10,000 bales of cotton or other merchandise in proportion.[20] At the end of the month the *Manchester Guardian*[21] carried a notice to builders inviting tenders for the construction of five warehouses to be built of brick. The bricks were to be found by the Company and were probably part of the consignment which George Jones of Salford had delivered during December.[22] This was the largest quantity of bricks ordered by the Company over the period of the construction of the line and must in part have been intended for the building of the viaduct in addition to the station and the warehouses. The successful contractor was to be responsible for obtaining the rest of the materials, and security of £1,000 was required.

By 19 April the tenders were in.[23] Five firms submitted estimates: J. B. Brockbank and Samuel Ward and Sons of Manchester proposed £12,000; David Bellhouse, Jnr, £12,250; James White, £12,683; William Southern, £13,989; and Bartin Haigh of Liverpool, £14,000. Only the first two were considered, but there were reservations about Brockbank and his partner. Brockbank was, of course, the contractor for the Irwell Bridge with Alexander Fyfe. His association with Ward on this occasion probably reflects the different nature of the contract. The

board required testimonials for Ward but, whether these proved unsatisfactory or whether the events at the Irwell Bridge were the cause, Brockbank failed to qualify. The tender was let instead to David Bellhouse on the understanding that two of the warehouses were to be finished by 31 July and the remainder by 15 August.[24]

The Bellhouses with their ramified family connections occupy a central place in the nineteenth-century building

Liverpool Road, the warehouse: *(above left)* south or rail elevation. The three rail entrances alternate with conventional loading bays. *(Above right)* north elevation, showing discharging and loading doors and former access to the rail bridge link with the later warehouse No. 2. *(Below left)* ground-floor level. The timber storey-posts to the right carried the support for the internal rail tracks. After the rails were removed, about 1860, the floor levels were adjusted to eliminate the loading docks. The vertical supports for the new level consist of re-used sleepers. *(Below right)* rail support and storey-posts in the easternmost bay. The redundant sleepers used to readjust the floor levels above, following the removal of the tracks, can be clearly seen.