

blacksmith shop, but the other parts, such as sills, stringers, side plates, etc., are all finished in the steel car shop. The material, as brought from the mill, is brought in car lots along the track adjoining the steel car shop, and handled by the yard crane to the several piles shown, where they are conveniently arranged for rehandling into the shop, as required. The heavier of these parts as needed are again handled by the crane, and carried in lots to the north end of the shop, where they are loaded on shop

the point from which fig. 6 was taken. Running under the trestles at each end of the sills, there is a 15 in. track, each track carrying a small air jack, the heads of which just clear the under side of the sills when in the lower position. As required, the sills are lifted three at a time, flanges down, and carried down on to the rollers of the traveller, and deposited thereon. The form of the traveller rollers is shown in the foreground of fig. 6. For the sill webs, the traveller rollers have narrower faces, and

travel of the head, and closes the circuit of punch control, the punch dies descending through the work. This template is laid out to give the requisite spacing of the holes throughout the length of the member to be punched, and is easily removable, when another pattern is to be punched. The templates are made of wooden strips 3 by $\frac{7}{8}$ in., and the projecting pins are of 3 in. nails, cut off so that the end projects about $\frac{1}{2}$ in. above the surface of the strip. The travel of the head being automatic, the pins arrest

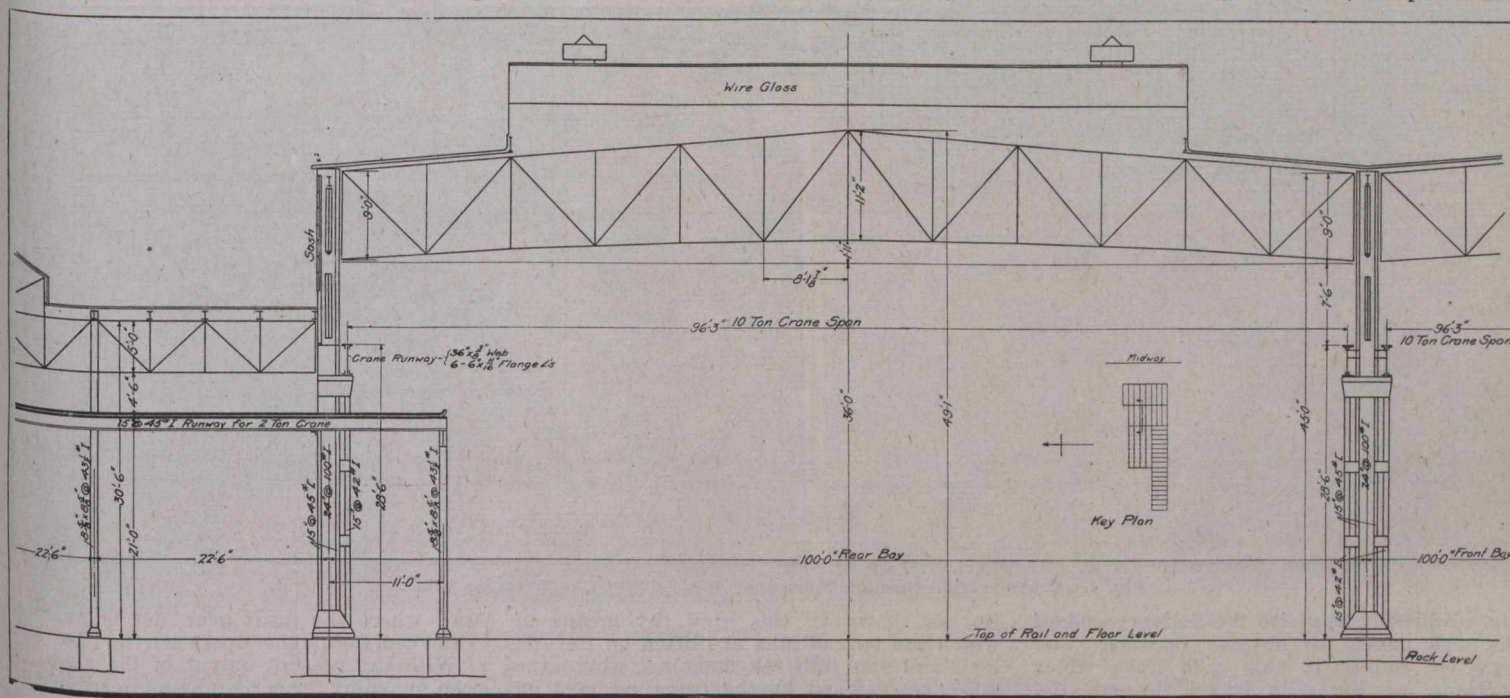


Fig. 3.—Cross section through Front Bays of Steel Car Shop.

lorries on the track that runs through the end of the east bay, and brought into the shop, where the crane in this bay handles the material to the several machines. The smaller and lighter parts which are stored in the front storage yard, are brought into the shop on the narrow gauge service tracks, to the several machines. The arrangements for expeditious and convenient handling, are excellent. The material can be skidded from the piles on to the shop lorries when required.

are six in number, and are set so that there is a set of rollers near the side of each of the sills, on which the latter roll. These rollers are adjustable vertically as shown in fig. 6, by means of a long rod from the punch in the background, an arm on each roller stand controlling the location of each set of rollers, all the rollers acting in unison from the central control at the punch. This adjustment is arranged for so as to accommodate shapes of different

the travel at the required points, punching the holes at the points required. Permanent steel templates may be used. The punch is of a powerful type, and punches as many as three $\frac{3}{4}$ in. holes in each of the three sills at one stroke. The punch has a gagging attachment, controlled by the operator. At each of the points at which the automatic head arrests the forward travel, the operator places out of operation the desired punches by this gagging arrangement. The pass

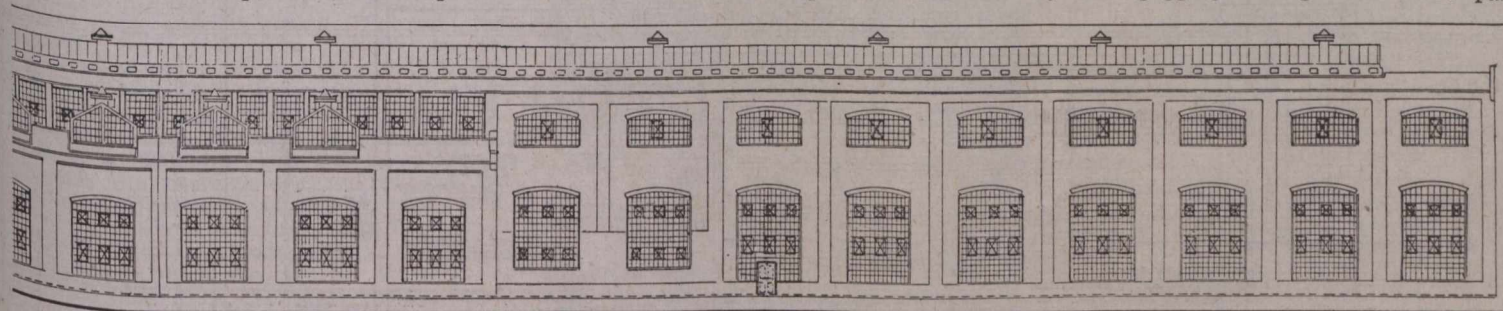


Fig. 2 (contd.).—Side Elevation of Steel Car Shop (see opposite page)

ed, as when the yard crane breaks down. The two main service tracks running into the shop in the third and fourth sections from the south, handle most of the material to and from the machines for the freight car work. The centre sills and side sills, which are channel sections, in one piece, are brought in on truck lorries on the northerly side of the 2 ft. main service tracks, and just inside the door, opposite the traveller of the centre and side sill web punching machine. They are lifted by the crane, and are carried across the traveller, and deposited on three trestles to the back of the traveller. The trestles are topped with rail, for convenience in shifting the channel sections across the top. This storage position is just back of

depths. On the far side of the punch, as shown on the left in fig. 6, there is a similar set of spacing rollers, differing only in that over top of the rollers there is an elevated runway carrying the traveller head, which is clearly shown on the left in fig. 6. This head works automatically in spacing the sills under the punch for the requisite punching. On the punch end of the head, there are projecting jaws, in which the member to be punched is gripped. Along the operating side of the traveller head track, there is a spacing template, laid out with projecting pins, which engage a trip lever suspended from that side of the head. This suspended lever, on striking a pin, closes an electric circuit, which arrests the

through the machine is very rapid, and the accuracy of the spacing mechanism is such that the punching error is very slight, and is not as great as if each hole was laid out independently, as punched in an ordinary punch.

As the sills pass through three at a time, and have all the web holes punched, they are released from the jaws of the traveller head, when the latter is in the position shown on the left in fig. 6, and the three sills are lifted out by two jib cranes, one of which is shown on the left at the end of the traveller table, in fig. 6. The other is just back of the position from which the view was taken. These two jibs deposit the sills in the storage space made by the bent rails