A BRIEF DESCRIPTION OF A MODERN STREET RAILWAY TRACK CONSTRUCTION.*

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With the increasing demands made on various traction companies throughout the country to provide good service, the matter of securing a permanent roadbed in the busy and paved sections of a city has become a serious problem. When the work is poorly done originally, and is not on a proper foundation, the cost of maintenance is increased, the paving along the poor roadbed becomes cracked and ruined by the movement of the track, unfavorable public comment on it arises, and the company finds itself face to face with one of two propositions, either the entire rebuilding of the roadbed or the attempt to surface and repair the old one. Either alternative is expensive, as the work will have to be done on a busy street and will interfere with car schedules, with consequent loss of revenue to the company and inconvenience to the public. Therefore, when the paving is done originally, the permanent roadbed should be substantial and effective.

In this paper the writer has attempted to give a general description of the methods and materials used at Springfield,

Mo., in rebuilding the Springfield Traction Company's lines on streets which were being paved by the city during 1911.

The company's franchise stipulates that it shall pave the space between its rails and for two feet outside of the rails, when the city paves on the various streets occupied.

The work was done by the company, under the writer's supervision, and aggregated more than three miles of new tracks.

It was desired to secure as permanent a roadbed as possible, in fact, one which would outwear the rail itself and allow its replacement without disturbing the roadbed if so desired. Fig. 1 shows the general cross-section and detail of the work as put in.

General Features.—The general features of the structure were, a 7-in., 70-lb. **T**-rail section, 62 ft. long, laid on steel ties, and directly under each rail longitudinal concrete beams, each

reinforced with two ¹/₂-in. twisted steel rods, and a 5-in. concrete mat over the beams and the centre of the tracks for a paving foundation.

In this case the city contractors were allowed to place the street pavement first, except where it was of asphalt. After the paving on each side of the track had been completed, the old track was moved to one side or the other on the completed pavement, and excavation between the tracks Was commenced.

Excavation.—The standard depth below the finished pavement to which the general excavation was made over the whole 9-ft. space was 10 in., as shown by Fig. 1. Then two trenches were excavated to exact dimensions, a depth of 9 in. more, and running with the rail. At the joints these trenches were connected by cross trenches, 30 in. wide at

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Ties.—All ties were punched at the proper gauge to take 7-in., 70-lb. or 80-lb. **T**-rails, but the 70-lb. rail was used principally. There were two types of ties, one under the joints which came opposite one another, and the other intermediate between them. The joint tie was an I-beam section, weighing 20 lb. per ft., 6 ft. 8 in. long, having an 8½-in. top, on which the joint rested, and a 4½-in. base. The intermediate ties were of the same length, but weighed 14.5 lb. per ft. and had a 6-in. top and a 4-in. base. All ties were spaced 5 ft. apart, or as near that as the distance between joints would permit.

Fastenings.—The rail was fastened to the tie by special lugs and **T**-headed bolts with square shoulders next to the head. These bolts could be inserted from the top, if so desired, being dropped through the rectangular hole punched in the tie, turned, and then raised until the square shoulder fitted up into the rectangular hole, which prevented it from turning while running down the nuts. The lug had a projection on its under side which also fitted into the rectangular

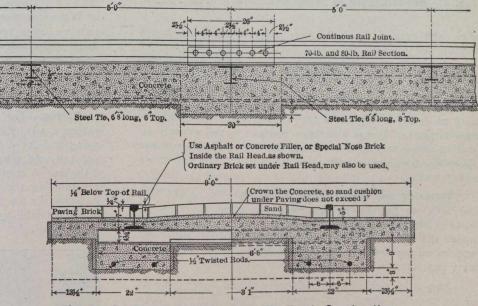


Fig. 1.-Section of Concrete Steel Tie Track Construction.

hole, and prevented it from turning or backing off the rail. A socket wrench was used to run down these bolts rapidly. The joint ties were heavier and wider than the intermediate ones, as noted above, and were punched to allow the lug to fasten over the continuous joint which was used.

Joints.—Six-bolt continuous joints were used, and the following method of making them was adhered to with greatest care, as the joint is generally the weak part of the track work:

First, those parts of the rail with which the joint came in contact were carefully cleaned and polished with files and emery cloth until all scale, rust, and particles of dirt were removed and the surface was bright. Then those parts of the joints which came in contact with the rail received the same treatment. All contact parts were then greased and the joint put on. The tightening of the bolts was started from the centre, working out toward the ends, pulling up a bolt on one side of the centre and then the corresponding bolt on the other side, and when the bolts were