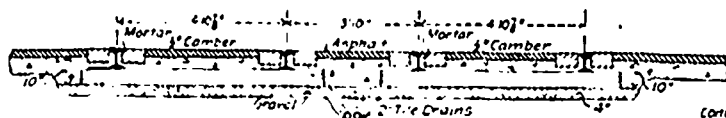


The rail adopted by the company, and approved by the city, was a 6½ inch steel girder rail, weighing 70 pounds to the yard, and having a web ¾-inch thick and a base 4½ inches wide. A slight alteration was afterward made in the size of the base, making it 5 instead of 4½ inches. The rail now weighs about 73 pounds to the yard. From experience since gained, a heavier section of rail should have been used. The following are the quantities of materials and weights required to build one mile of single track: 114 714 tons of 73 pound rails; 5.85 tons of fish plates, weighing 17 pounds per pair; 1,800 cedar ties; 1 ton of spikes, weighing ¾-pound

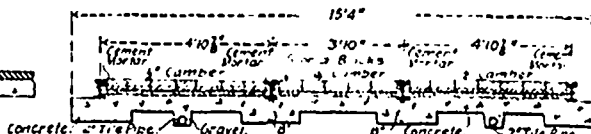
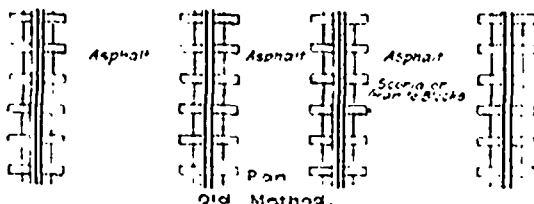
to be used between street railway tracks. After having been down only four years the asphalt commenced to disintegrate. This was at first more noticeable where the asphalt joined the toothings, but it was not long before the rest of the material between the rails commenced to wear into holes. This was due probably to the lack of proper foundation under the ties, which was shown by the settlement of the rails in several places, to the impossibility of properly tamping the asphalt between the toothings, to the constant watering of the asphalt rendered necessary by the dust caused by the passage of the cars, and to the climatic conditions. On one street

with the contractors whereby they substituted brick for the asphalt and were paid \$1.50 per square yard, but when the guarantee had expired the price paid for substituting scoria for asphalt averaged about \$2.40 per square yard. This includes taking up the old asphalt and 4 inches of concrete.

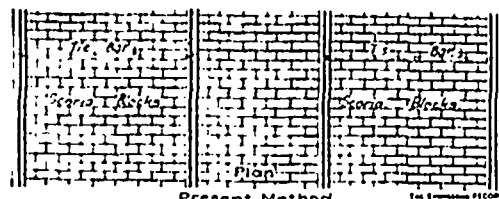
Granite is no doubt the most durable material to use between street railway tracks, but owing to the strong opposition of the cyclists to this material not so much of it was used as the department would have liked, and scoria blocks imported from England were used instead. On streets where there was not a great deal



Cross-Section



Cross-Section.



OLD AND NEW TYPES OF PAVEMENT BETWEEN STREET RAILWAY TRACKS AT TORONTO.

each, and 1 ton of bolts and nuts, weighing 1 pound each. The work of constructing these permanent pavements and the laying of new rails was carried on continuously until the work was practically completed in 1894. In constructing these new pavements the street railway company took up the old rails, tamped the gravel under the ties, put down new rails and lined and levelled them, and the paving contractor did the rest of the work.

In 1893 and 1894 the amount of track relaid was 26.1 and 9.8 miles, respectively. The width of paving for double track was 15 feet, and the average cost per linear foot for the different classes of pavement laid during the years 1892, 1893 and 1894 was \$5.23 for asphalt, \$2.43 for granite, \$4.21 for brick, and \$3.83 for cedar blocks. This covers the cost of stone or scoria toothings, but where granite was used the contractor was allowed to re-lay the blocks that were on the streets. The average length of double track paving laid per day was, for asphalt, granite, brick and cedar blocks, 131, 56, 73 and 96 feet, respectively.

In 1894 on one street the method of laying the granite or scoria toothings was slightly altered. It was found that when the blocks were laid as headers and stretchers the water lodged next the block and assisted in destroying the asphalt. To prevent this it was decided to lay scoria blocks, 4 x 5 x 9 inches, parallel to the rail, and then lay the asphalt. The practice had been to lay the first 6 inches of concrete up to the bottom of the rail, then lay the scoria blocks in mortar, and finally put in the remainder of the concrete. On this street a change was also made in this respect. The whole of the concrete was put in at once and while still wet scoria blocks were pounded into it and left to consolidate with the concrete before the asphalt was laid down. In any extension constructed since 1895 wooden ties have been dispensed with, and steel tie bars, 2 x ½ inches, placed 6 feet apart, are used, the rails being laid on a solid bed of concrete 8 inches deep by 20 inches wide. This method of construction is much superior to the first type adopted, and is largely used in other cities. It is shown in the accompanying illustration.

After an experience of six years with the different materials used, it is evident that, with the conditions existing in Toronto, asphalt is not a suitable paving material

where the asphalt was laid without toothings, a rut was soon formed, rendering necessary constant repairs.

As previously mentioned, the first pavements were laid in 1892, and in 1897 it became necessary to commence tearing up the asphalt and replacing it with granite, scoria or brick, depending on the amount of travel on the street. By 1900 all the asphalt between the rails will have been replaced by a more permanent material. Up to the present time seven and one-half miles of this work have been done. As these asphalt pavements were guaranteed for five years, arrangements were made

of travel Canadian bricks were used. Cement grout was almost entirely used for this work, although some filling was done with paving patch, but cement was found to be the more satisfactory. Owing, however, to the impossibility of stopping street car traffic while this work was in progress, it was very difficult for the filling to become properly set. On one street, during the past summer, where scoria block was substituted for the asphalt, a portion of the pavement between the tracks was laid with concrete. It has been down now some two months, but not long enough to know the result.



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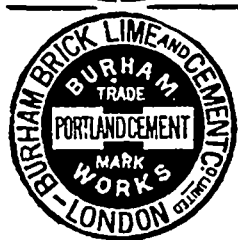
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