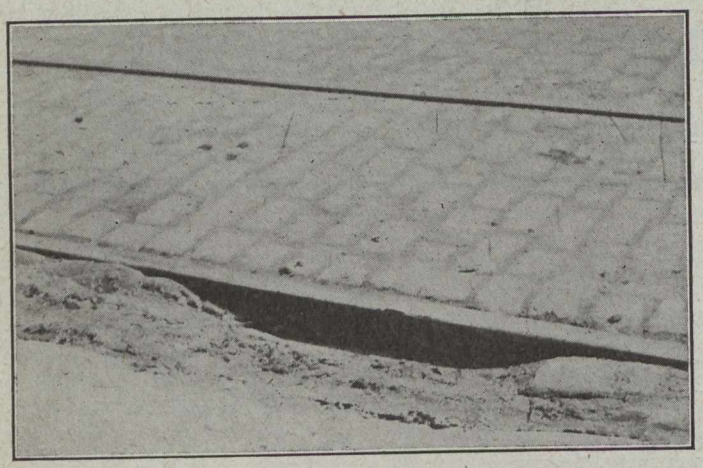

Fig. 4.—Sink Hole in Margin Blocks.

thus obviating the trouble we had as in the case of Bank Street. Sandstone blocks were used to pave the track area.

Fig. 7 shows a section of the track allowance on Rideau Street which was constructed this year. This is materially the same construction as shown in Fig. 6 with

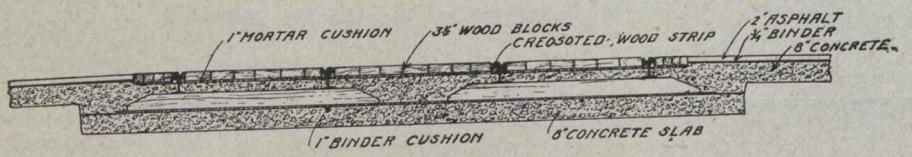

Fig. 5.

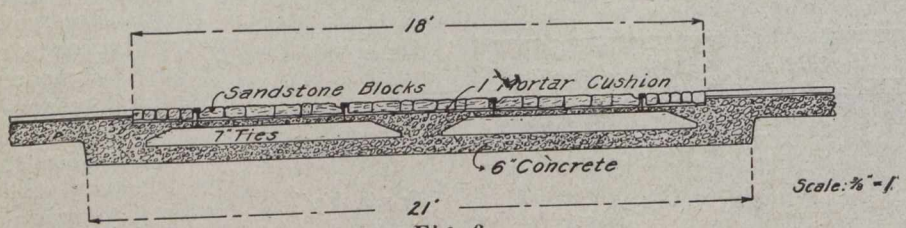

Fig. 6.

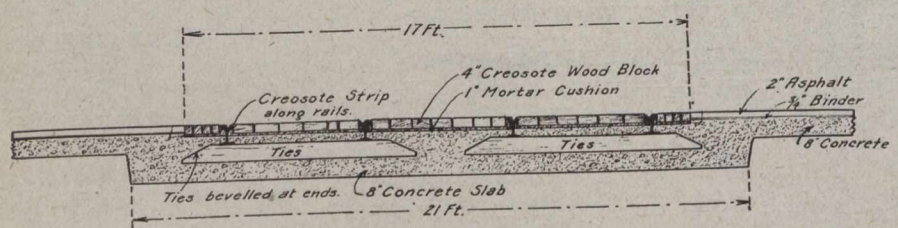

Fig. 7.

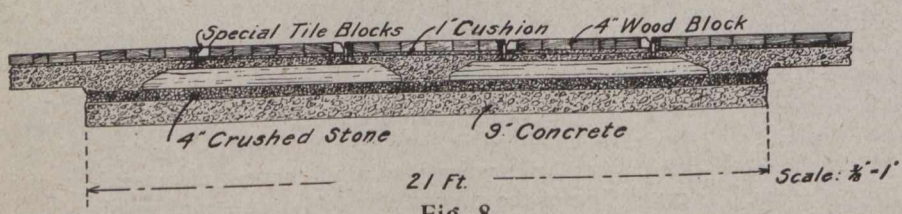

Fig. 8.

the difference that the depth of concrete under ties was increased to 8 inches and wood blocks were used instead of sandstone. An extra block was added to the margin to bring them beyond the edge of the ties, doing away with any chance of vibration which would cause the asphalt to crack.

In the Rideau Street pavement a change was made in the construction where the railway company's special work was laid. Instead of the rigid usual construction in straight track work, the concrete slab was laid first to a depth of 9 inches. On this was laid a 4-inch covering of 2-inch stone upon which the ties were laid, as shown in Fig. 8. This allows greater flexibility and also allows the special work to be renewed without disturbing the concrete slab. All pavement in the special work area will be constructed in this manner in future.

DIESEL OIL ENGINES.*

By F. Reginald Phipps, Assoc.M.Inst.C.E.

THE use of Diesel engines has of late years come prominently to the front for electric light works, sewage and water pumping, and the writer hopes that an account of their use may be welcome and instructive.

Having been instructed by his council to carry out an electric lighting scheme for the town of which I was borough engineer, the question of the most suitable prime mover to be used was one of the most important points to be decided.

The merits of steam, oil and gas engines were carefully considered. Gas engines worked by town gas were, of course, ruled out at once by the high running costs; allowing a consumption of only 20 cu. ft. of town gas per b.h.p.-hour, the cost at the local price of 3s. 1½d. per 1,000 cu. ft. would be .75d. per b.h.p.-hour. If producer gas is used, as in some towns, the economy becomes more marked, and nearly approaches that of Diesel oil engines. Thus in the waterworks which are worked by suction gas the average yearly cost per pump horse-power hour, with anthracite averaging 30s. per ton, has continued to be about .25d.

With the Diesel engines, which were decided upon and eventually installed, the cost of fuel per kilowatt-hour, with oil at 82s. per ton, is about .30d., equivalent to a price per horse-power-hour of actual work of .22d.

Even allowing for a higher efficiency of engine and dynamo over that of engine and pumps, the advantage in economy is with the oil engine.

Comparison of Cost of Fuel.—When considering these costs the price of fuel must be taken into consideration. Anthracite delivered at the station has varied in the last eight years between 26s. and 32s. per ton, while oil fuel has undergone greater fluctuations. Oil three years ago could be obtained at about 45s. per ton at station; our present contract price to August, 1916, is 82s. per ton, while the high price of 146s. 6d. has had to be paid to secure a contract for delivery in 1917. This is subject to a reduction of 50s. per ton six months after the declaration of peace.

This price is bound to drop considerably after the war, but whether it will ever reach its old low level is open to conjecture; but it is apparent that even at

*Abstract of paper read before the Institution of Municipal and County Engineers.