

MUNICIPAL DEPARTMENT

CLEANING SEWERS IN PARIS.

The main sewers of Paris are periodically cleaned by means of scrapers carried on boats or cars. These conveyances are also used for conveying visitors through the large sewers under the Rue de Rivoli and the Boulevards Sevastopol and Des Malesherbes. These exhibitions take place four times a year, in spring and autumn, and about 8,400 visitors are admitted yearly. Until 1894 these cars and boats were drawn by men, but the labor and expense were found to be so excessive that now the traction is done entirely by electric motors, taking current from accumulator batteries on the boats or cars. These main sewers are in section very similar to an ordinary tunnel; but in the floor is formed the rectangular channel for the sewage, while round the roof are fixed the water and compressed air mains, the telegraph and telephone wires, etc. The sewer under the Boulevard des Malesherbes is the largest. It is 18 feet 4½ inches wide, 10 feet high from floor to roof, and the sewage channel in the floor is 3 feet 5¼ inches deep and 9 feet 10 inches wide. Boats are used in this channel.

The other sewers are smaller, the channels in them being only 3 feet 11 inches wide and from 3 feet 11 inches to 5 feet 7 inches deep. In these cars are run, the flanged wheels of the cars running on the edges of the channel, which are protected by angle bars, and from the rails. The approximate weight of a train of five cars with 100 passengers on board is about 7 tons 12 hundredweight, and this travels at the rate of 3¼ miles per hour. The accumulator battery consists of 28 elements and weighs 14 hundredweight, and its capacity is 100 ampere hours, with a mean discharge of 25 amperes at 50 or 60 volts. The motor, which is series wound, develops 2 horse power and runs at 1,600 revolutions per minute, this speed being reduced to 80 by means of a pinion and wheel and chain gearing to the driving axle, the wheels being 15¼ inches in diameter on the tread.

The boats are towed by means of a chain sunk in the sewage channel, which is brought to the surface and passes round a pulley driven by means of a double reduction gear from the motor. The chain, by means of guide pulleys, makes three-quarters of a turn round the driving pulley, this pulley being a magnetic one, magnetized by means of two coils, one on each side of it, on the axle. Each passenger train consists of six boats, in the first of which are carried the accumulator battery and a towing apparatus, while in the last boat, which is a smaller one, there is another towing apparatus.

The battery consists of 60 elements, giving an output of 60 amperes for 2½ hours at from 98 to 125 volts. It is divided into two parts, which can be connected in series or parallel, as required. The motors run at 580 revolutions per minute, but this speed is reduced by means of the gearing, so that the boats travel at about 1½ miles per hour. The power required for this is from about 2 horse power to 5½ horse power, according as the boats are travelling with or against the current. The total length of the sewers open in this way to the public is about two miles, and they are lighted partly by lamps on the footpaths or by oil lamps on the boats.—Genie Civil.

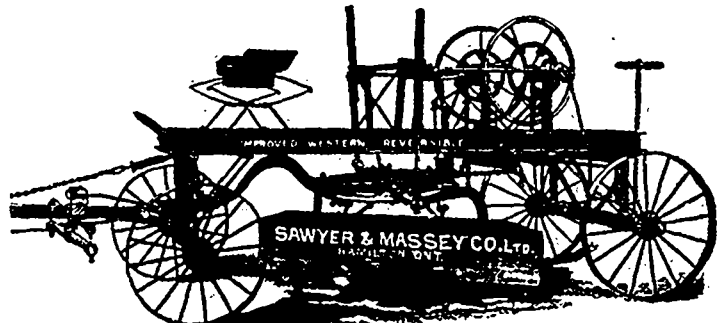
THE WESTERN REVERSIBLE STEEL ROAD MACHINE.

In keeping with the growing agitation in favor of securing the construction of a better class of roadways, manufacturers have lately placed upon the market various improved road-making machines admirably adapted to the requirements of municipalities. The Western reversible steel road machine which we illustrate herewith is manufactured by the Sawyer & Massey Company, Limited, of Hamilton, Ont., who claim for it many points of excellence, among which are the following:

The draft is direct, not nominal only, but positively and absolutely, for tongue

blade, enables the operator to always see his work ahead of and along the entire length of the scraper blade while at work; while the extensible axle entirely obviates any possibility of upsetting. The adjustments and changes are made by the operator from his place on the machine. The perfect proportions of the mechanism make all adjustments easy, which, combined with the erect, upright position of the operator for all classes of work, enables one man to operate the machine continuously without becoming tired. The great variety of angles and adjustments the scraper blade is capable of enables the machine to do the greatest variety of work necessary to be done, yet all is so simple in mechanical construction as to reduce to a minimum the probability of breakages, the first consideration having been to secure strength and durability. The axle can be extended quickly on either side, so that the wheel on delivering side of machine is no obstruction to the discharge of earth from the blade, and can be extended on both sides. It is the only direct draft machine having vertical adjustment of the blade. The various adjustments enable it to more easily and rapidly operate any kind of soil, insuring a lively movement of the earth, preventing banking and clogging incidental to other road machines, and aid in removing the draft. It will make a narrower and deeper ditch than any other road machine.

The above company also manufacture a full line of road machinery, including road scrapers, stone crushers, road rollers, plows, street sweepers, etc., and sell their machines on contract, providing that they shall be operated in the township buying them before settlement shall be required.



WESTERN REVERSIBLE STEEL ROAD MACHINE.

team as well as lead teams. The floating scraper blade cuts smoothly and evenly, and yet is not so rigid as to break machine or stop team when striking obstructions. It has no inclination to suck or dive, and while adjusted so as to relieve itself, if teams are pulling too hard, it can be easily held to its work by the operator. The wheels passing over the irregularities of the road, do not affect the evenness of the cut or the position of the scraper blade. The frame being of the best channel steel, it will adapt itself to the motion of the wheels in rough work, yet not affect the working parts of machine nor prevent the blade from reversing, the frame always springing back to its proper shape as soon as wheels are brought back to their normal position. The positive means of reversing scraper blade enables the machine to be reversed when in any position and while in operation. It has a circle within a circle, which is the strongest possible mechanical construction for the reversible feature. The height of the machine gives greatest possible elevation to the scraper

They will be pleased to furnish municipal officers with full particulars and prices upon application.

LEGAL DECISIONS AFFECTING MUNICIPALITIES.

KINGSTON V. DRENNAN.—The judgment of the Supreme Court of Canada in *Kingston v. Drennan* rendered last week, is of interest in the cities and towns of Canada. Miss Drennan, who was a student at college, slipped on the pavement on the main street, fell and injured herself. It was shown that the merchants levelled the snow and ice opposite the stores down to the granite pavement, but nobody touched the crossings, so that as winter wore on the crossing came to be several inches higher than the sidewalk, and pedestrians were liable to make a swift descent from one to the other. This was how Miss Drennan's accident came about, and the Supreme Court says that the corporation is responsible for such a state of things. The slippery character of the granolithic pavement is bad enough in itself; to level the street crossings would cause inconvenience to vehicles; there is no reason why, in places where snow and ice accumulate on the street, the snow on the stone pavement should not be left alone after the loose top is shovelled or ploughed-off.