MUNICIPAL DEPARTMENT

THE SEWERAGE OF VICTORIA, B. C.

(Concluded.)

House connections not intended for immediate use were fitted with earthenware stoppers through which the ground water was allowed to percolate into the sewers to render them self-cleansing until the population has increased to call for the full capacity of the sewers. At each junction a piece of 2x2-inch scantling was brought to the surface.

In order to have a trustworthy record of the positions of the junctions, plans on a scale of 50 feet to 1 inch were prepared showing all manholes, ventilators, flush tanks and junctions, with the measurements of the last from fixed points. On these plans are also shown all buildings with the position of the house pipes, and the points at which they enter the building to connect with closets, baths, sinks, etc. They also show the nature of the subsoil, whether earth, hardpan or rock. The drainage of basements, and the admission to the sewers of subsoil water, and the exclusion of sewage from the basement drains were matters which received considerable consideration. To attain the foregoing results a special trap was designed, which so far has been

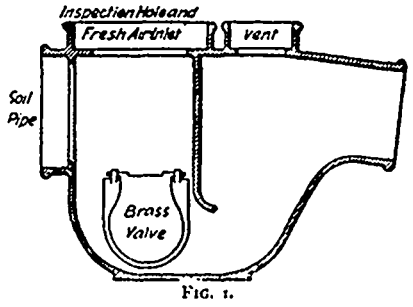

FIG. 1.

found to answer the purpose (see Fig. 1). This trap is sometimes placed under the sidewalk, sometimes in the basement in a sump hole below the level of the floor, in which the subsoil water is collected. Its body is of cast iron; it is provided with ventilator and fresh air inlet; the subsoil water enters through a brass flap valve with ground faces. The valve can only open to admit the subsoil water when the head exceeds that of the sewage pressing against its inner side. To prevent foreign substances entering the trap through the valve a fine grating is provided. Mr. Mohun has suggested that in addition to the grating the water should pass through a filter of small shingle. Several of these traps have been in use for the past two or three years, and it is believed have given general satisfaction. The method of hanging the valve has proved simple and efficacious. The flap is suspended from two hooks which allow it a slight horizontal play, so that when the pressure is applied from the inside, the ground faces are immediately brought into close contact.

HINTS ON ROAD-MAKING.

By A. W. Campbell, C. E.

DRAINAGE.

Perfect drainage, first, of the foundation of the road-bed; secondly, of the road surface, are the points in road-making on which too much stress cannot be laid.

The first is accomplished by under-drainage, tile drains being laid at a depth of three or more feet below the surface on each side of the roadbed at the foot of the grade and parallel to it. Care should be taken to fit and settle the tile in the trench, so that when refilling with earth, they will not be displaced. As a rule two and one half inch to four inch tile will be sufficient. The joints should be close and the grade a true line. Loose joints and an uneven grade allow silt to pass into the tile and remain there, destroying the drain.

Surface drainage is accomplished by open drains on each side of the grade, having sufficient capacity to drain, not only the roadbed, but the land adjoining. With open drains and with tile drains make and maintain a free outlet to the nearest watercourse. A drain without an outlet is useless. In constructing a good road a dry foundation is the matter of first importance.

CROWNING THE ROAD.

The graded portion of the road should be wide enough to accommodate the travel upon it, and not greater, the slope being uniform, not heaped in the centre. The crown should be well above the overflow of storm water and should have a grade sufficient to shed water readily to the open ditches on either side. Do not round it up so as to make the grade steep and dangerous, under the mistaken impression that better drainage will thereby be secured. Nor should it be so low as to allow water to stand upon it in depressions. Under ordinary circumstances one inch to one inch and a half to the foot is a proper grade; that is, a roadbed twenty-six feet wide should be from thirteen to twenty inches higher at the centre than at the side.

QUALITY OF GRAVEL.

The gravel should preferably be sharp, clean and of uniform size. Pit gravel usually contains too much earthy matter, and where the latter is in excess, the gravel, as a road-making material, is useless. Lake gravel is apt to be rounded, water-worn and lacking in the necessary earthy matter to make a solid and compact surface, but it is generally a better road metal than pit gravel. A coating of pit gravel with a surfacing of creek gravel is a good combination. All large stones should be removed, as they will work to the surface, and will then roll loosely or form rough protuberances.

PLACING THE GRAVEL.

The gravel should be spread evenly over the surface of the subgrade to a depth of six or eight inches, and to the required width, then rolled with a heavy roller. Rolling should be performed in showery weather, as it is impossible to consolidate dry earth or gravel. The heavier the roller the better will be the results, but if a heavy roller cannot be obtained, a light roller is much better than none. The roller should be passed over the surface until the gravel or earth is so compact as not to be displaced and rutted by the wheels of a wagon passing over it with an ordinary load. The surface must be maintained smooth and hard, to shed water and resist wear. Every municipality should have a roller, but whether one can be obtained or not the gravel should not be left in a heap just as it falls from the wagon. Spread it evenly.

REPAIRS.

Gravel roads already constructed will need repair. By the use of road machinery scrape the surface and cut off the corners, which will have formed at the foot of the grade by the washing down of dusty material from the crown of the road. Loosen the surface, particularly that part of the travelled portion and where the road is rutted, with picks, or, if possible, with road machinery, then apply a coating of gravel and roll thoroughly. It is of more importance, however, to see that the drains are not obstructed in their course and that their outlets are free and open.

PAPER BRICKS.

Paper is indeed becoming one of the most useful articles which we have. There have lately been tests made of the new paving brick of paper pulp. A brick four inches square and eight inches long weighed three pounds, whereas a brick exactly the same size made of clay weighs as much as ten pounds. The color of the paper pulp brick is the same as that of vitrified brick in use in many cities. The inventor makes these bricks from ordinary wood or the straw pulp from which paper is made, and reduces it to a mush by the use of water. He then adds sulphate of zinc as a preservative, and the material being thoroughly mixed is put into a vat where several other chemicals are added. These chemicals are the secret of the inventor. The bricks, or rather the pulp, having been subjected to a pressure of 2,000 lbs. to the square inch, is then placed in a kiln and baked for forty-eight hours at a heat of 200° F. The inventer thinks it will do for other things besides paving, as he says it will be absolutely indestructible. Conduits for the use of electric telephone cables are about to be made of this substance, and, in fact, it will be useful for anything for which at present wood or bricks are used.—Invention.

Men are doing great things now-a-days in the way of bridges, waterworks, &c., but we doubt if any city can show a greater triumph of engineering as to its water supply than ancient Rome. Eight immense aqueducts supplied the city with pure spring water from the hills, delivering forty millions of cubic feet daily. The Claudia aqueduct was forty-seven miles long and 100 ft high. The Martia was forty-one miles, thirty-seven miles of which were carried on 7,000 arches seventy feet high.