

neous influences, or to be acted upon by changes of temperature and of volume of flow within the sewer.

The size should be increased gradually, and only so rapidly as is made necessary by the filling of the sewer half full at the hour of greatest flow.

Every point of the sewer should, by the use of gaskets or otherwise, be protected against the least intrusion of cement, which, in spite of the greatest care, creates a roughness which is liable to accumulate obstructions.

The upper end of each branch sewer should be provided with a Field's flush tank of sufficient capacity to secure the thorough daily cleaning of so much of the conduit as from its limited flow is liable to deposit solid matter by the way.

There should be sufficient manholes, covered by open grating, to admit air for ventilation. If the directions already given are adhered to, manholes will not be necessary for cleansing. The use of the flush tank will be a safeguard against deposits. With the system of ventilation about to be described, it would suffice to place the manholes at intervals of not less than 1,000 feet.

For the complete ventilation of the sewers it should be made compulsory for every householder to make his connection without a trap, and to continue his soil pipe to a point above the roof of his house. That is, every house connection should furnish an uninterrupted ventilating channel four inches in diameter throughout the entire length. This is directly the reverse of the system of connection that should be adapted in the case of storm-water and street-wash sewers. These are foul, and the volume of their contained air is too great to be thoroughly ventilated by such appliances. Their atmosphere contains too much of the impure gases to make it prudent to discharge it through house-drains and soil-pipes. With the system of small pipes now described, the flushing would be so constant and so complete, and the amount of ventilation furnished, as compared with the volume of air to be charged, would be so great that what is popularly known as sewer-gas would never exist in any part of the public drains. Even the gases produced in the traps and pipes of the house itself would be amply rectified, diluted and removed by the constant movement of air through the latter.

All house connections with the sewers should be through inlets pointing in the direction of the flow, and these inlets should be fun-