

BRIDGEBURG SEWAGE DISINFECTION.*

THE town of Bridgeburg is situated at the Canadian end of international bridge over Niagara River. It is chiefly a freight-handling point for international traffic of the Grand Trunk Railway.

In 1915 Bridgeburg had a population of 2,110, located chiefly at the bridge terminal and along a river frontage of $1\frac{1}{4}$ miles. Its water supply is derived from the Niagara River and is used without treatment to the average extent of 504,000 U.S. gallons daily, a consumption which is equivalent to 239 gallons per capita. This use of water is additional to that of the railroad, which maintains an independent pumping station and supply.

For its size, Bridgeburg possesses the most costly sewerage of any of the riparian towns, having expended for sewer and treatment-works construction a total of

possible, as the size of the opening and the height of the overflow weir are such as to limit the interception to about 4 or 5 per cent. of the storm capacity of the laterals. Moreover, the smallness of the discharge orifice in the dam permits of occasional stoppage from sticks, leaves, and paper, with consequent dry-weather over-flow to the storm outlets. However, both the collection and diversion devices are capable of intercepting all the dry-weather flow, together with a reasonable percentage of storm water.

The treatment works are situated just beyond the northerly city limits, and consist of three covered tanks, each 66 feet long, 12 feet wide, and $6\frac{1}{2}$ feet deep below water line. These dimensions are such as to give a total capacity of 115,900 U.S. gallons, equivalent in terms of present average water consumption to a $5\frac{1}{2}$ -hour retention. At maximum dry-weather rates of sewage run-off

the detention is perhaps in the vicinity of four hours, while for night flows the period is considerably longer.

At the time of inspection a slight scum was noted in the tanks; the effluent was turbid but did not carry any large suspended solids. The general locality was entirely free from odor.

The tanks have been cleaned once in a period of three years, at which time some 50 or 60 cubic yards (estimated) of sludge were taken out, some of this being grit which had escaped the local detritus tanks of a stone working establishment. At present, attendants are reputed to occasionally open clean-out valves to permit of sludge discharge direct to the river.

The conclusion of the Niagara River report is that existing international pollution of boundary waters can

be most readily remedied by the treatment of contaminating sewage to the extent of clarification accompanied by disinfection. The existing works at Bridgeburg, while not of a type which represents modern ideas in this respect, are such as to accord reasonably well with the clarification requirement. To secure complete conformity with the remedy suggested, necessitates but the addition of disinfection.

Fig. 1 represents a typical installation which has been designed in detail to meet Bridgeburg needs. It consists of a small frame house, planned to be placed over the existing distribution manhole on the tank influent line. Contained in the house is a hopper-bottomed circular tank of dimensions sufficient to enable the mixing into solution of the contents of a 750-pound drum of bleaching powder. The drums are handled by chain hoist and trolley and opened in a small chamber located above the mixing tank. The bleach is washed out by means of a water jet, while mixing is accomplished through vortex motion of the liquid as created by a small circulating pump. A proper operating schedule will insure mixing in advance of need of the solution in order that it may settle in the mixing

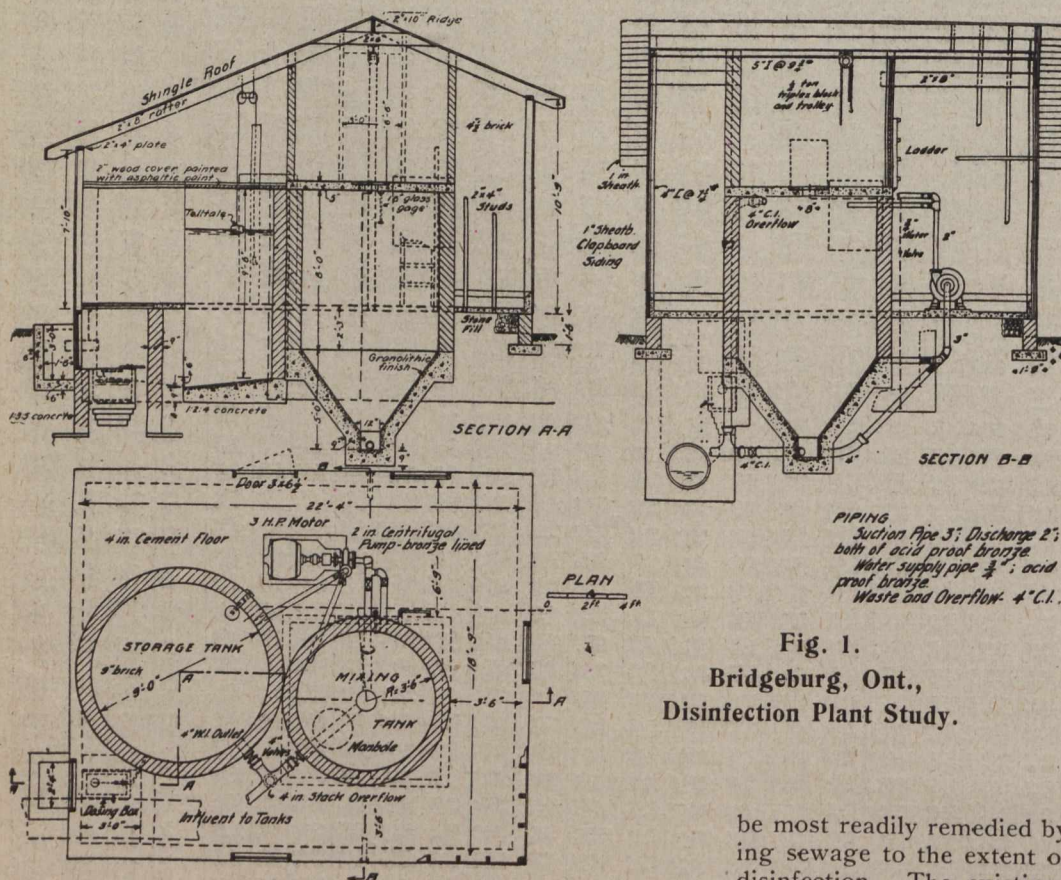


Fig. 1.
Bridgeburg, Ont.,
Disinfection Plant Study.

\$98,103.58, or upon the basis of its present population at the rate of \$46.50 per capita, an amount which is over double that prevailing in large cities.

The sewerage consists of several main drains tributary to the river and intercepted by a marginal sewer which discharges by gravity to treatment works. The interception is effected in a manhole by means of a small opening in a dam placed across the lateral. An overflow weir permits of storm-water discharge to the river outlet. The marginal sewer in its maximum size is a 24-inch vitrified pipe laid on a 0.001 grade carrying 6 cubic feet per second at full capacity. This is equivalent to 1,835 U.S. gallons per head per day from the present tributary population. With arrangements as existing, such diversion is not

*Notes abstracted from report of F. C. Tolles, District Engineer, made to Prof. Phelps, Consulting Engineer to the International Joint Commission.