

SOME PARTICULARS OF THE MUNICIPAL PURIFICATION PLANT AT LINDSAY, ONT.

First municipal ozonizing plant to treat the entire water supply of a town on the American continent.

Constructed under contract with the town of Lindsay by J. Howard Bridge, the inventor and patentee.

Daily capacity, 1,500,000 gallons.

Cost, including pre-filter, \$7,250.

Cost of operation, 8 horse-power, for which the town pays \$35 a horse-power year. This equals \$280 for the treatment of 547 million gallons yearly, or 51c. per million.

There are no other costs, the plant being operated by the regular employees of the pumping station.

Besides breaking all waterworks records for cost of installation and economical operation, Mr. Bridge broke all



Plant Under Construction.

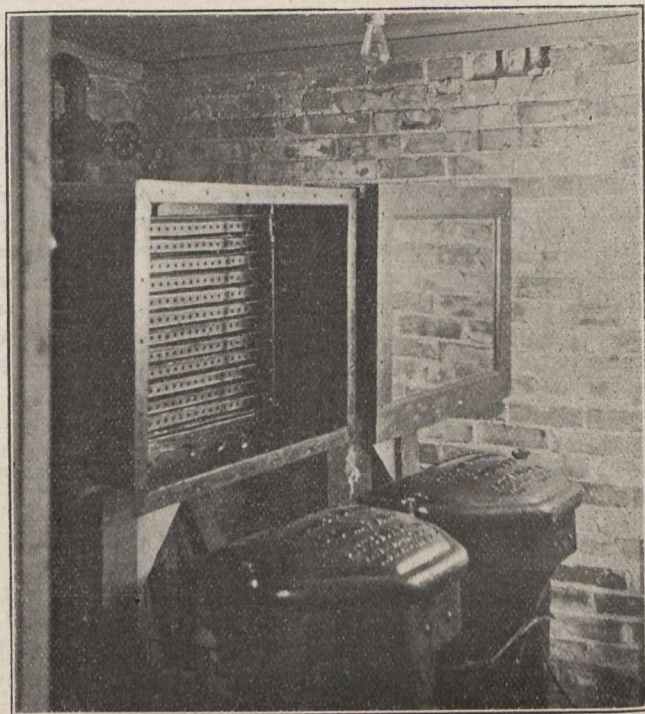
records for rapidity of construction, which in the purification of a public water supply is of almost equal importance. Mayor Begg, of Lindsay, turned the first sod on August 24th. The plant, including a pre-filter of reinforced concrete, was completed and in operation on October 23rd—a little over eight weeks.

The ozone-purification plant is located at the city pumping station, on the banks of the Scugog River, from which the town supply is taken. The Scugog is a sluggish stream running from a shallow lake of the same name into Sturgeon Lake. The water is strongly charged with vegetable matter derived from the lake and surrounding swamps, and this, besides affording a rich pabulum for bacteria, imparts an unpleasant odor and taste to the water. As a result the citizens have had recourse to well-water, which in itself has not always been above suspicion, and typhoid fever has been quite prevalent in the town.

Prior to the installation of the ozone plant, a rough and ready sort of filtration was practised which did little more than strain out the grosser particles of suspended matter. The new system includes a modern rapid filter of reinforced concrete, a sterilizing well forty feet deep and about six feet square, and a purified-water basin from which it is pumped directly into the mains of the town. The system is so contrived that the water passes entirely by gravity from the river through the filter and sterilizing well to the suction pipes of the pumps; while in the electrical part of the plant there is a similar absence of mechanical means, so that with the exception of a small blower of $\frac{1}{4}$ horse-power there is not a wheel turning anywhere. By an ingenious automatic device the graded opening of a single valve admits varying quantities of water to the apparatus as required by the needs of the town. At ordinary times the pumpage is five hundred gallons per minute. During fires this may be doubled; in either case the rate of filtration and ozone sterilization is simply regulated by the operation of a raw-water valve, and no other attention is required. So too, when the pumps are completely stopped, provision is made by which the ozone produced is automatically drawn from the ozonizers, so that these may safely run continuously should the attendant neglect to turn off the electric current supplying them.

To come to details. A twelve-inch pipe leads from a crib sunk in the river to a raw-water basin, holding fifteen to twenty thousand gallons. From this the water flows into a rectangular tank of reinforced concrete, some 12 feet by 15 feet, where it passes through three feet of coarse sand, to strain out the suspended matter. This pre-filter is cleaned by simply reversing the current, the wash-water coming from the city main under a pressure of 60 to 100 lbs. to the square inch. The cleansing process occupies about three minutes, and is practised every day when the river is especially foul. At other times the filter may run several days without washing. The waste-water after washing the sand escapes into the river through two eight-inch pipes furnished with check valves. After rough filtration the water under treatment flows through an eight-inch pipe into another chamber, in which its height is automatically regulated by a butterfly-valve and float. Here it passes into an air-tight box built of concrete, which is directly connected, by means of a two-inch pipe, with the ozonizers, in a small building adjoining. The water now falls down a number of four-inch pipes leading to the bottom of a well, thirty feet deep, and in doing so passes the ends of a great many small brass tubes, through which, by suction, the ozonized air is drawn and thoroughly mixed with the water. An arrangement of baffle-plates prevents the too rapid escape of the ozonized air from the water, and the two fluids, thoroughly commingled, flow slowly up the well into a pure-water basin, where the non-exhausted ozone separates from the water. When thus freed from the purifying gas, the water is allowed to pass to the suction pipes of the pumps, which send it at once through the city mains and to the stand-pipe.

The ozonizers occupy a brick building only 8 feet by 10 feet, built against the pump-house. They consist of two iron boxes, each containing 26 separate units. Each unit has its own fuse, so that, if by any chance, a short-circuit should occur, the unit affected would be the only one to go quietly out of commission, while the remainder would continue oper-



Ozonizers—One with Glass Front off to show the Twenty-six Separate Electrodes.

ative. These units are so constructed that a workman can remove or replace them in a few moments.

The city current is brought into the building at 1,040 volts, and is raised by step-up transformers to 10,000 volts. Each of the two ozonizers has its own transformer, and independent air inlet and outlet, so that they may be operated together or separately. The air is sucked into the apparatus by the movement of the water through the sterilizing well, and no air-pump is used, as is the custom abroad. Nor, contrary to European usage, is anything done to free from mois-