

A butterfly valve was also placed on the filter effluent to prevent overflow of the filtered water reservoir into the pumping station. This valve can be closed rapidly but, in so doing, the final filters are disturbed. The usual practise, on occasion of power failure, if of more than five minutes' duration, is to close the sixteen filters by releasing each automatic valve. This, while not so rapid as the action of the butterfly valve, preserves the filter formations intact.

The filtration works uses electric current for power, heating and lighting. The city obtains current from the Montreal Light, Heat & Power Co., which has a 10,000-volt transmission line near the works. Branch connections from this transmission line bring 10,000-volt alternating current to the filtration transformer building, where it is reduced to 2,200 volts and then transmitted through an underground conduit system to the filtration buildings. Here it is used at 2,200 volts for the motors operating the main pumps or reduced by transformers to 550 and 220 volts for other machinery and for lighting and heating.

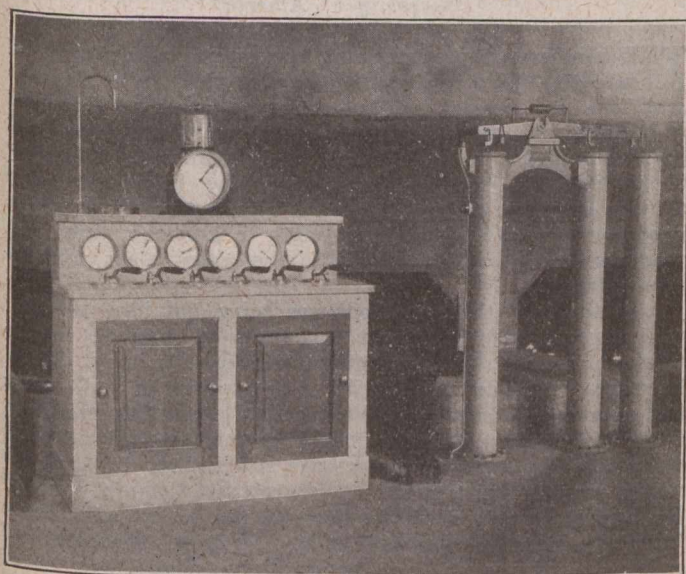


FIG. No. 5—PREFILTER OPERATING TABLE AND AUTOMATIC CONTROLS

Heating throughout the entire works is accomplished by means of electric radiators.

The Blaisdell machines require direct current. Consequently a motor-generator set is provided to supply this current to the machine motors through the three miles of double trolley lines by which the machines are operated in the final filters.

The cost of the plant is given in the following table:—

FILTRATION CONTRACTS		Cost
Pumping machinery, blower and cranes, British Electric Plant Co.	\$	40,250.00
Final filters and appurtenances, F. H. McGuigan, transferred to Norman M. McLeod		674,436.20
Prefilters and filtered water reservoir, F. H. McGuigan, transferred to Norman M. McLeod		498,782.30
Pumping station, wash-water tower and buildings, F. J. Jago Co.		160,076.00
Interior painting, Charles Larin		1,815.42
Exterior electrical conduit system, G. M. Gest.		6,069.80
Underground electrical cables and appurtenances, Northern Electric Co., Ltd.		12,627.04
Transformer building, city of Montreal		6,000.00
Total cost	\$	1,400,056.76

The operating tables, gauges, the strainer system and other filter equipment were supplied by the Roberts Filter Mfg. Co., of Darby, Philadelphia, Pa. The rate controllers

were supplied by the Pittsburgh Filter & Engineering Co., of Pittsburgh and Oil City, Pa.

After practically all of the above contracts were completed, the operation of the plant was prevented by the lack of proper filter sand. The earlier contractors endeavored to obtain filter sand and gravel from numerous locations around Montreal Island, but they were all found

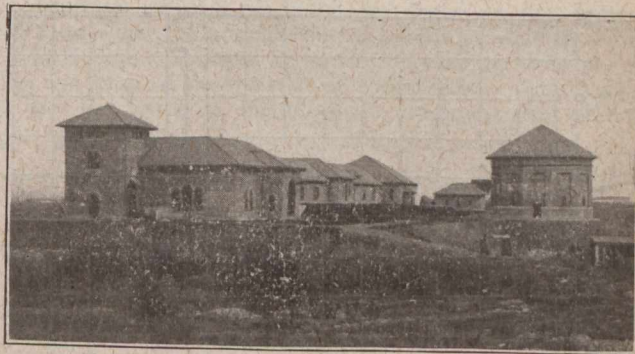


FIG. No. 6—EXTERIOR VIEW, POINT ST. CHARLES FILTRATION WORKS, MONTREAL

to be unsuitable. A plant was finally erected under the design of W. B. Fuller, formerly of New York, and was located at Pierreville, near Lake St. Francis.

A suction dredge was used and the material was washed in tanks and then graded by passing through suitable revolving screens. The gravel was treated in similar manner. It was found that the available sand properly graded for the pre-filters ran about 50% of the quantity handled to obtain same. The sand for the final filters was found in different pockets, under water, practically graded to conform to specifications. This sand ran close to 100% of the quantity pumped.

The total quantity of sand required for the pre-filters, ranging from 0.40 to 0.50 mm. in diameter, was 2,000 cu.



FIG. No. 7—PREFILTER GALLERY

yds.; that for the final filters, ranging from 0.25 to 0.35 mm. effective size, was 27,000 cu. yds. The total quantity of gravel for the pre-filters was 800 cu. yds.; the final filters required 8,000 cu. yds.

When the design of the Point St. Charles filtration works was started, the amount of water supplied by the municipality was about 37 million Imperial gallons daily. The filtration works were designed for a nominal capacity of 1½ times the requirements at that time. It was realized that extensions to the filters would be required in a few years, and the design allows for extensions with but little difficulty and without serious disturbance of the regular operation of the plant.