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ORILLIA POWER DEVELOPMENT.

The town of Orillia has satisfactorily solved the question of municipal ownership, and has in successful operation an electrical plant which furnishes light for its streets and private consumption, and supplies power at such a cheap rate as to have already superceded steam in most of its factories, and induced a number of manufacturers to look to it as a desirable location for their business.

More than twenty years ago, a private company built waterworks, which were taken over by the town in 1883. In 1887 electric lighting was introduced—the arc system that year, followed by the incandescent system in 1894. The waterworks and electric light plant were both operated by steam till the electric power now in successful operation was installed.

Within the last four or five years the town found itself face to face with the problem of how power could be most economically obtained. The applications for water and light were increasing, and to meet them an extension of the steam plant had become imperative. The price of fuel had increased. The proposition to employ water-power was made, and though the town had no water-power close at hand, there was a splendid fall at Ragged Rapids, on the Severn, nineteen and one-half miles distant, with

the whole of Lakes Simcoe and Couchiching as a source of supply. Engineers were consulted, who estimated that for an expenditure of \$75,000, some 800-horse-power generated at these falls could be delivered to the extent of 720 horse-power in the town, the difference representing the loss in transmission. This entailed an annual expenditure of some \$4,337 to pay off principal and interest on the capital invested, in thirty years, or \$500 less than would probably be spent on fuel to supply much less power. The people readily voted the money. The contract for the development of the power—dam, flumes, wheels, penstocks, electric generators—was given for \$71,000. The contract was in a lump sum, and it is difficult to say just how much was apportioned to each service. The concrete and masonry dam was to take about 2,200 yards at \$7 a yard, or in all about \$15,000; the rock excavation for tail-race, flume, etc., about \$15,000; the new waterworks electric pump cost \$4,000; the hydraulic and electric machinery about \$11,000, the pole line and wire to the town about \$1,000 a mile, or some \$20,000. Then there was a power-house at the falls, of concrete, and a residence for the engineer. The total cost has been about \$150,000.

Ragged Rapids is in a gorge of the Severn river, nineteen and one-half miles from Orillia. Before the improvements were effected, there was a fall of about 35 ft. in the rapid, but most of the rapid has been effaced by the construction of the dam. The power house stands at the water's edge in the gorge, the rock having been blasted away to make way for the foundation. The dam, which is of concrete construction, gives a head of 33 ft.

The power-house is 62 by 40 ft, and is built of concrete on stone foundation. The concrete is in the proportion of one of cement, three of gravel, and six of broken stone.

The power-house contains two pairs of 35-inch turbines of the Croker variety, having a speed of 238 revolutions per minute, and regulated by two Lombard water-wheel governors. The dynamos consist of two units, S.K.C. system, made by the Royal Electric Co., Montreal. The current is generated at a voltage of 1,200, at which it passes from the machine to the high voltage panels and through step-up transformers, which step it up to 22,000 volts, at which it passes over the transmission lines to Orillia. The capacity of each generator is 300-kilowatts, equal to 400 horse-power. Lightning arresters are provided at both ends.

The transmission line consists of three No. 4 copper wires supported on poles 105 feet apart. There is also a double telephone line, the wires being transposed at every fifth pole.