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**THREE-PHASE POWER TRANSMISSION AT
ST. HYACINTHE, QUEBEC.**

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THE oldest transmission plant in Canada employing a three-phase system is that in St. Hyacinthe, in the Province of Quebec, Canada, a city of 13,000 inhabi-

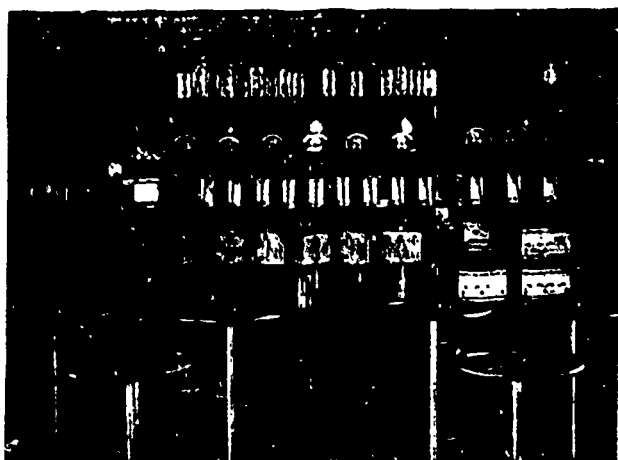


FIG. 1.—SWITCHBOARD.

tants, mostly French, distant about 40 miles from Montreal. In April, 1894, La Compagnie des Pouvoirs Hydrauliques de St. Hyacinthe or the St. Hyacinthe Hydraulic Power Co. was formed, with the object of generating electrical power by utilizing the rapids on the Yamaska River and transmitting it into the city of St. Hyacinthe for illuminating and power purposes. By Christmas of the same year, the incandescent light had made its appearance there. This river Yamaska takes its source far back amongst the Green Mountains of Vermont, and its onward flow is fed by numerous small streams until it reaches the majestic St. Lawrence.

Situated five miles from the city of St. Hyacinthe, there was an old grist mill which had been operating for years by water power, a small head being obtained by damming up the river at Flat Rapid. This property the company secured and began improving the water power by raising the dam three feet, widening the head race from 15 to 40 feet, and by digging a tail race. The river at this point is 600 feet wide and one part of the dam has been built half way across, after which it turns slightly and runs obliquely towards the shore, thus making an entrance for the head race. This dam is of cribwork, in a triangular shape, filled in with cobblestones, 9 feet deep and 22 feet thick at the bottom. The up-stream side slopes upwards to the water surface and is 24 feet long, being the hypotenuse of a right angled triangle of the above dimensions. The timbers in its construction are all very large, those in front being 18 inches square. The side sloping upwards to

the crest, 24 feet long, is lined with 3-inch planks 12 feet long, placed end to end, at the upper end of which iron plates 3/8-inch thick and 3 feet long are nailed in place across the whole length of the dam. These are used on account of the ice and rubbish which, passing over the crest, would otherwise injure it. This cribwork is also filled in with cobblestones.

In summer, when the water becomes scarce, planks 14 inches wide are placed edgewise on the crest of the dam to raise the head of the water by preventing any waste. The wing dam, extending from the beginning of the head race to the bottom of the tail race, a distance of 2000 feet, is also built of cribwork similar to the main dam, but is much higher and wider. The head race, originally 15 feet wide, is now increased to 40 and is 500 feet long, the sides being all boarded up. At the entrance a wooden boom 2 feet deep extends diagonally outwards, thus sweeping all ice and rubbish out towards the middle of the river and over the dam. A short distance further down four head gates, operated by a rack and pinion, control the supply of water entering the head race, while at the termination wooden racks prevent any rubbish which may have passed the boom from entering the wheel flumes. Four other wooden gates 6 inches thick are placed at the entrance of the wheel flumes, operated by gearing inside the power house. A waste gate at the termination of the head race allows of the disposal of all rubbish and dirt which may have entered.

The tail race, 40 feet wide and 1500 feet long, has been excavated from the solid rock by blasting. A head

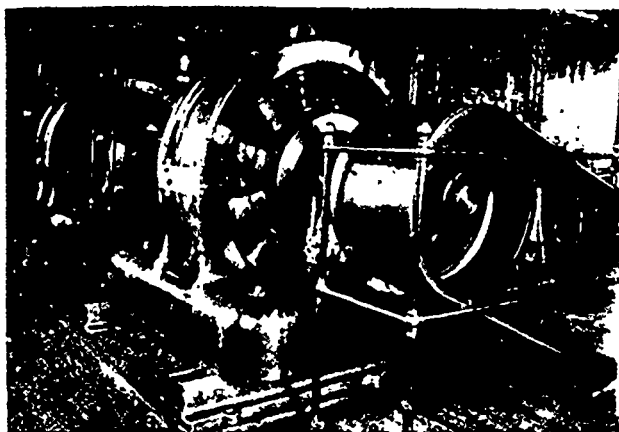


FIG. 2.—180 K.W. THREE-PHASE GENERATOR.

of 16 feet has been obtained by thus increasing the height of the dam and by excavating a tail race.

The plan adopted for uninterrupted power is that of having a steam auxiliary plant, which may be used should the water become too low or should there be any trouble experienced with frazil and anchor ice. When