work in cleaning the transformers is facilitated by the use of compressed air, which is obtained in both the power house and the sub-station from a single drill compressor driven by an induction motor. It is safe to say that so long as this method of transformer examination and cleaning is faithfully carried out the Kootenay transmission will never lose a transformer from the choking of its air ducts. Slides for regulating the amount of air to be delivered to each transformer are provided, and of course the subway is always air tight, and the man who cleans the transformers is under the

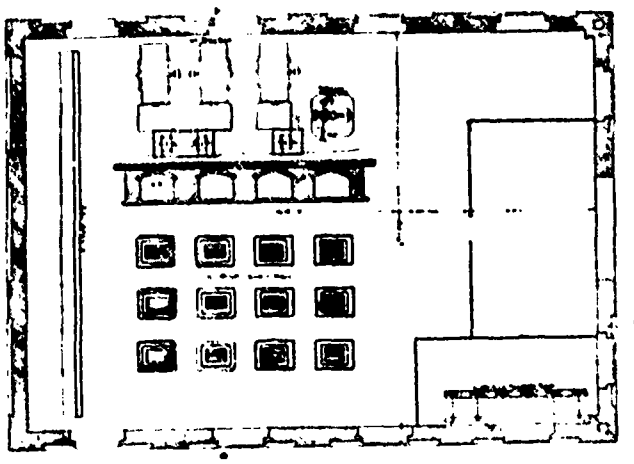

Fig. 3. Floor Plan of Sub-Station at Rossland.

increased atmospheric pressure of the air blast while at his work.

The photograph showing the interior of sub-station was taken shortly after the plant started operations, and since then important additions have been made. The distributing switchboard at the right in the rear has had new panels added to it to accommodate other circuits. The third blower has been added, and immediately in front of it, as shown in the floor plan of the sub-station in Fig. 3, has been placed the induction regulator by means of which the potential of the outgoing lighting service is controlled by the sub-station attendant in-

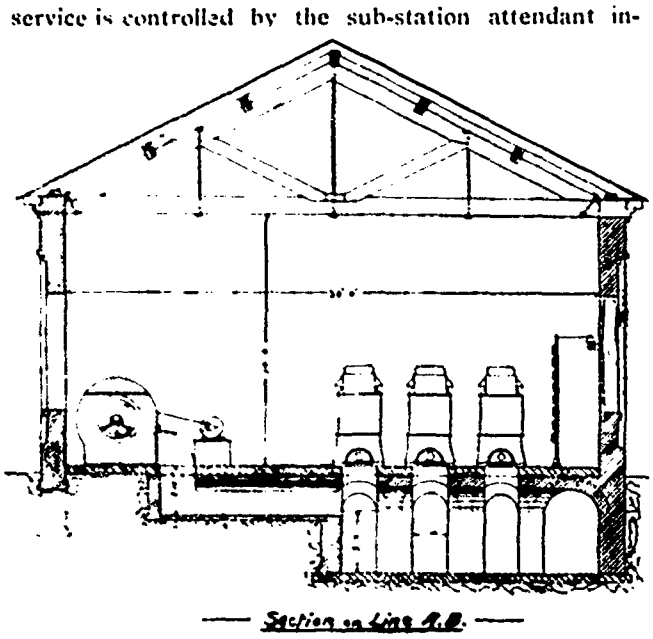

Fig. 4. End Elevation of Sub-Station at Rossland.

dependent of the power house. This is a new device of the General Electric Company, bearing the designation "type I. R. T., class 4-20-60, form A." It is wound for seventy amperes per phase at 2,200 volts, and has a range of 220 volts in either direction. It is described as consisting of an induction motor with a vertical shaft, which is connected through bevel and worm gearing to the shaft of a pilot motor placed on top of the case so that the rotor of the induction regulator may be made to turn a given arc in either direction, and in so turning raises or lowers the electromotive force in the primary mains passing through the stator windings as desired. The pilot motor is manipulated from a single double-pole, double-throw

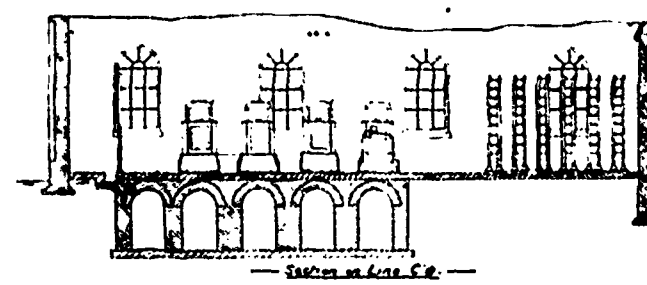

Fig. 5. Side Elevation of Sub-Station at Rossland.

reversing switch placed on the switchboard; and this motor too is an induction motor. All details of this novel regulator, together with those of the limiting switch placed thereon, are given in Fig. 11. At present this regulator is used only on the lighting circuits, nor is its use contemplated on the power service.

All the electric lighting in Rossland, in both arc and incandescent services, is rendered from alternating circuits, and indeed the only use to which direct currents are put in the Kootenay plant is for the excitation of generators and synchronous motors. The electric lighting load reaches a maximum of nearly 400 horse power. Enclosed alternating arc lamps are used exclusively, and these are burned from the 110-volt

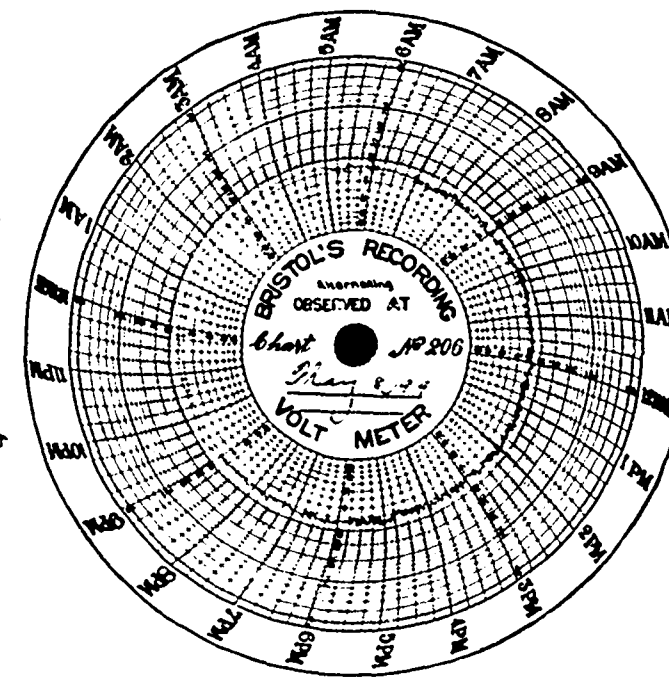

Fig. 6.- Tytical Chart of Voltage Regulation.

commercial circuits. The ultimate distribution is on the Edison three-wire system through the use of type H transformers, taking either 1,400 or 2,080 volts on the primary and delivering 230 volts across the outsides of three-wire service. The utmost care has been exercised in preserving the balance on the three-wire distribution circuits as well as in balancing the primaries of the commercial transformers on the three-wire, three-phase, 2,200-volt circuits, and this balancing has been carried out so well that it has never been observed that the phases of the 2,200-volt circuits have been more than 10 amperes out of balance.

As stated heretofore, the principal interest in the Kootenay-Rossland transmission centers in its applica-