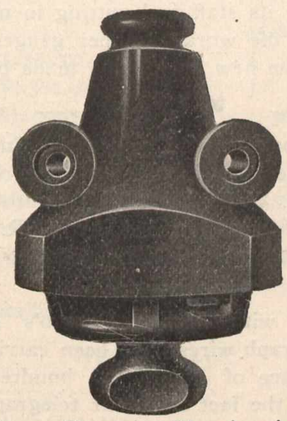
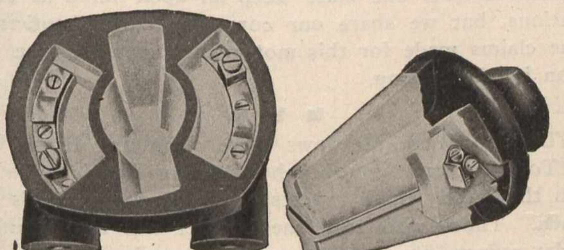
## TRANSFORMER PRIMARY CUT-OUT.

An improved form of a transformer primary cut-out, designed to protect the high tension side of transformers, is being introduced by the Westinghouse Electric and Manufacturing Company. It is made entirely of porcelain, and its form is such that it has high insulating and arc-breaking qualities. The plug to which the fuse is attached projects between the terminals, the upper end of it rising well into the top of the block, and interposing an effective barrier, and thus



Transformer Primary Cut-out.—Showing insulator top, holes for screws and openings for viewing fuse.

making it impossible to maintain an arc. The fuse is eleven inches in length, making a long break, and is so placed that the vapors of a discharge are blown down and out of the device and away from the terminals. The line wire is carried directly to the top of the device and attached to it as to an ordinary insulator, which it thus displaces. To reach the terminal the wire must be bent around the edge of the block, and is so supported in an angle between the terminal post and the porcelain case that it cannot be loosened by any swaying of the wire in the wind. The plug enters from the bottom. When it is raised into place, a partial turn draws the knife



Transformer Primary Cut-out.—Showing terminals, plug with groove for fuse, and locking device.

blades on the plug into the jaws on the block, preventing the plug from dropping out or being blown out. All live parts are protected from the weather by the projecting edges of the block and by placing the terminals well above its lower surface, with no apertures in the side or top. A bend in the fuse wire brings it into plain view at all times, and it is thus possible to observe its condition without removing the plug, guarding against any liability of opening the circuit when there is a current upon the line. It is fastened to the cross-arm or other support by two screws, passing through porcelain tubes, which form a portion of the block. It has a rated capacity of 2,500 volts, 30 amperes. It is light and easy to re-fuse.

## CANADIAN SOCIETY OF CIVIL ENGINEERS.

At the February meeting of the Electrical Section of the above society, a paper was read by Dr. Winship, of the Gould Electric Storage Battery Company, of New York. It was a description of the construction and application of storage battery of the present day. Some discussion took place, and the question of battery deterioration and the effect of varying temperature upon the battery was gone into. At a meeting on 24th March, the subject of the use of electricity on canals was up for discussion, and papers were read by L. A. Herdt on "The Use of Electricity on the Lachine Canal," and by F. H. Leonard, Jr., on "Electrical Equipment for the Cornwall Canal."

At the last meeting of the Mining Section a paper was read by C. P. Campbell, on "Mine Timbering in Section 16 of the Lake Superior Mining Co., Michigan."

At the meeting of the Mechanical Section on March 14th, a paper was read by A. W. Robinson, on the hydraulic dredge, "J. Israel Tarte."

On the evenings of March 3rd and 10th, meetings of the General Section were held for the continuation of the discussion of Mr. Jamieson's paper on "Grain Pressure in Deep Bins." Both meetings were well attended, and the discussion was carried up to a late hour. The following took part: Messrs. Vautelet, Kennedy, Toltz, Goldmark, Johnson, Sherwood, Lordly and Prof. Bovey.

J. J. Taylor's paper on the "Shubenacadie Bridge" was put down for 31st March.

A ballot for new members will be opened on the 14th April.

A meeting of the General Section will be held April 7th. Business talk on rock asphalt and mastic asphalt, and their use in the construction of bridges, reservoirs, etc., illustrated by lantern slides, by Mr. Wiederhold, visitor.

## GRAIN PRESSURES IN DEEP BINS.*

By J. A. Jamieson, C.E., Mem. Can. Soc. C.E.

The comparatively recent changes in the materials of construction of grain storage bins or silos has made the question of grain pressure one of great importance at the present time. Until within a comparatively recent date practically all grain elevators on this continent were built of wood, the storage bins being of laminated or cribbed construction, formed by building a number of walls both longitudinally and transversely of the building. The walls were constructed of plank 2-in. thick, laid flat and spiked one to the other, and from 6 to 8-in. wide, according to the quality of the material used and the size of bin required. The width of plank or thickness of wall decreased towards the top, and the walls were spaced 12 to 14 feet apart in both directions, thus subdividing the storage space into deep bins 12 to 14 feet square and 60 to 70 feet deep.

So long as this construction and size of bin was maintained, there was no great urgency for knowing accurately the lateral pressures produced by grain, as the thickness or necessary strength of the walls to safely resist the lateral pressure, and the strength of the hopper bottoms of the bins to carry the vertical load, had been well established by practice.

With a wooden bin wall of sufficient strength to resist the lateral pressure, the wall had ample area as a column to carry the vertical grain load transmitted to it by friction. This form of bin construction has been in use practically from the inception of the grain elevator system on this continent, and in many respects is admirably adapted for the purpose. The defect from a structural point of view was its lack of vertical rigidity, by reason of the shrinkage of the wood and the compressing of the many horizontal joints during the first loading of the bins, which usually amounts to a settlement of 12 to 18 inches in 70 feet, thus necessitating very great care being taken to distribute the grain load when first filling the bins in order to prevent undue strain of the structure. When, however, the initial settlement has taken place, no further precautions are necessary. The chief defect, however, of the wooden elevator is its liability to destruction by fire, involving heavy loss on the building and contents, and therefore high insurance premiums.

The increasing cost of insurance and timber, combined with the great inconvenience and loss of business to transportation companies by the destruction of an important terminal elevator, created a sudden demand for fireproof buildings; and the consequent change in the materials of construction made it necessary that a more accurate knowledge

*From a paper read before the Canadian Society of Civil Engineers.