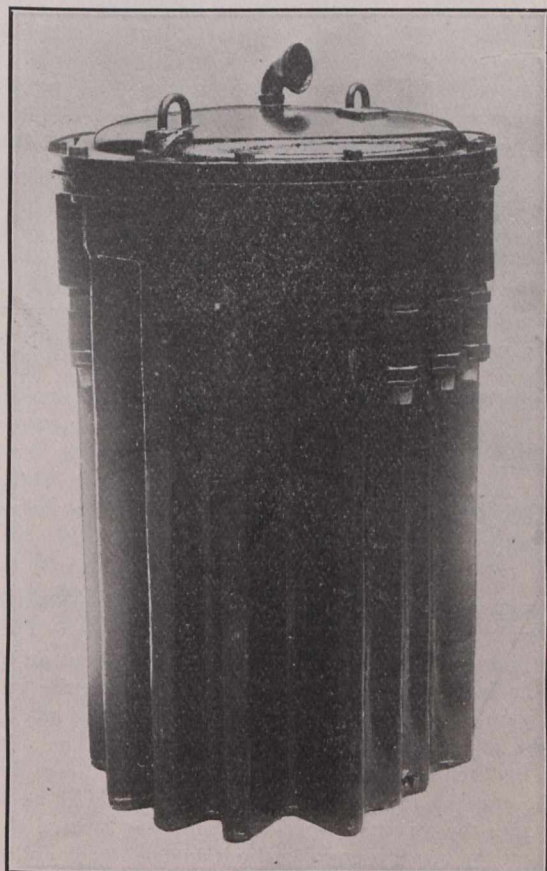


## SEVERE SERVICE CONDITIONS REQUIRE IMPROVED MANHOLE TRANSFORMER.

There is a growing demand for distributing transformers to be installed in underground vaults, called manhole or subway openings, that furnish access to underground systems of distribution. This demand comes from the larger companies who are operating in the big cities, and is for an absolutely first-class unit, with regard to both operating efficiency and adaptability to the service conditions.

As these transformers are installed in subway manholes which are liable to flooding from heavy rains or overflow water, one of the main requirements of service is that the manhole transformers shall be water and air-tight; that is, the joints between the case and cover and where the leads issue from the case must be water and moisture-proof. Hence, it is necessary to enclose the transformer in a her-



metically sealed case, and design it for an exceedingly low temperature rise. This demands careful design as well as the highest grade workmanship. At the same time, the transformer must not only be so constructed that it is possible to make it water-tight, but such that the unit can be installed quickly and easily. Also, it is necessary that the design permit the transformer to be connected to or disconnected from the line without removing the cover or otherwise opening the case.

Any expansion of the oil under a rising temperature, of course, compresses the air in the upper portion of the transformer case and causes a rise in pressure. Under abnormal operating conditions, such as a short circuit, a considerable rise in this pressure may occur, which will make the transformer case liable to serious injury. In order to avoid any danger from such occurrences, a safety or relief valve for any excess pressure should be provided. The completed transformers should be tested at the factory at a sufficient

air pressure to insure their being air-tight and moisture-proof.

The Westinghouse type "S" manhole transformer fulfills the foregoing conditions of service and exactions of design and is rapidly increasing its popularity. The magnetic circuits and coils of this transformer are the same as those of the well-known Westinghouse type "S" transformer, but they are mounted in a case of special design that adapts them to manhole service.

The accompanying illustration shows the transformer supplied by the Westinghouse Electric and Manufacturing Company to the Kentucky Electric Company, Louisville, Ky., one of the largest electrical companies in the country employing underground distribution. The many advantages of this type of construction have led to its adoption for the entire line of transformers designed for manhole service.

## STANDARD SPECIFICATIONS FOR REINFORCING BARS.

The Association of American Steel Manufacturers has just announced the formal adoption by letter-ballot of a standard specification governing the chemical and physical properties of concrete reinforcement bars. This announcement is an important one, since it is the first specification to appear which could be called authoritative; it also differs from the many specifications under which steel for reinforcement has been manufactured up to this time in the fact that hard steel as well as the usual medium grade is included, in both plain and deformed sections; also in providing standards for the manufacture of cold-twisted bars. The Association of American Steel Manufacturers is a technical body composed of the principal steel manufacturers of the United States.

### Standard Specifications for Concrete Reinforcement Bars.

1. Steel may be made by either the open-hearth or Bessemer process. Bars shall be rolled from billets.
2. The chemical and physical properties shall conform to the following limits:
3. In order to determine if the material conforms to the chemical limitations prescribed in paragraph 2 herein, analysis shall be made by the manufacturer from a test ingot taken at the time of the pouring of each melt or blow of steel, and a correct copy of such analysis shall be furnished to the engineer or his inspector.
4. For the purposes of these specifications, the yield point shall be determined by careful observation of the drop of the beam of the testing machine, or by other equally accurate method.
5. (a) Tensile and bending test specimens may be cut from the bars as rolled, but tensile and bending test specimens of deformed bars may be planed or turned for a length of at least 9 inches if deemed necessary by the manufacturer in order to obtain uniform cross-section.  
(b) Tensile and bending test specimens of cold-twisted bars shall be cut from the bars after twisting, and shall be tested in full size without further treatment, unless otherwise specified as in (c), in which case the conditions therein stipulated shall govern.
- (c) If it is desired that the testing and acceptance for cold-twisted bars be made upon the hot rolled bars before being twisted, the hot rolled bars shall meet the requirements of the structural steel grade for plain bars shown in this specification.
6. At least one tensile and one bending test shall be made from each melt of open-hearth steel rolled, and from