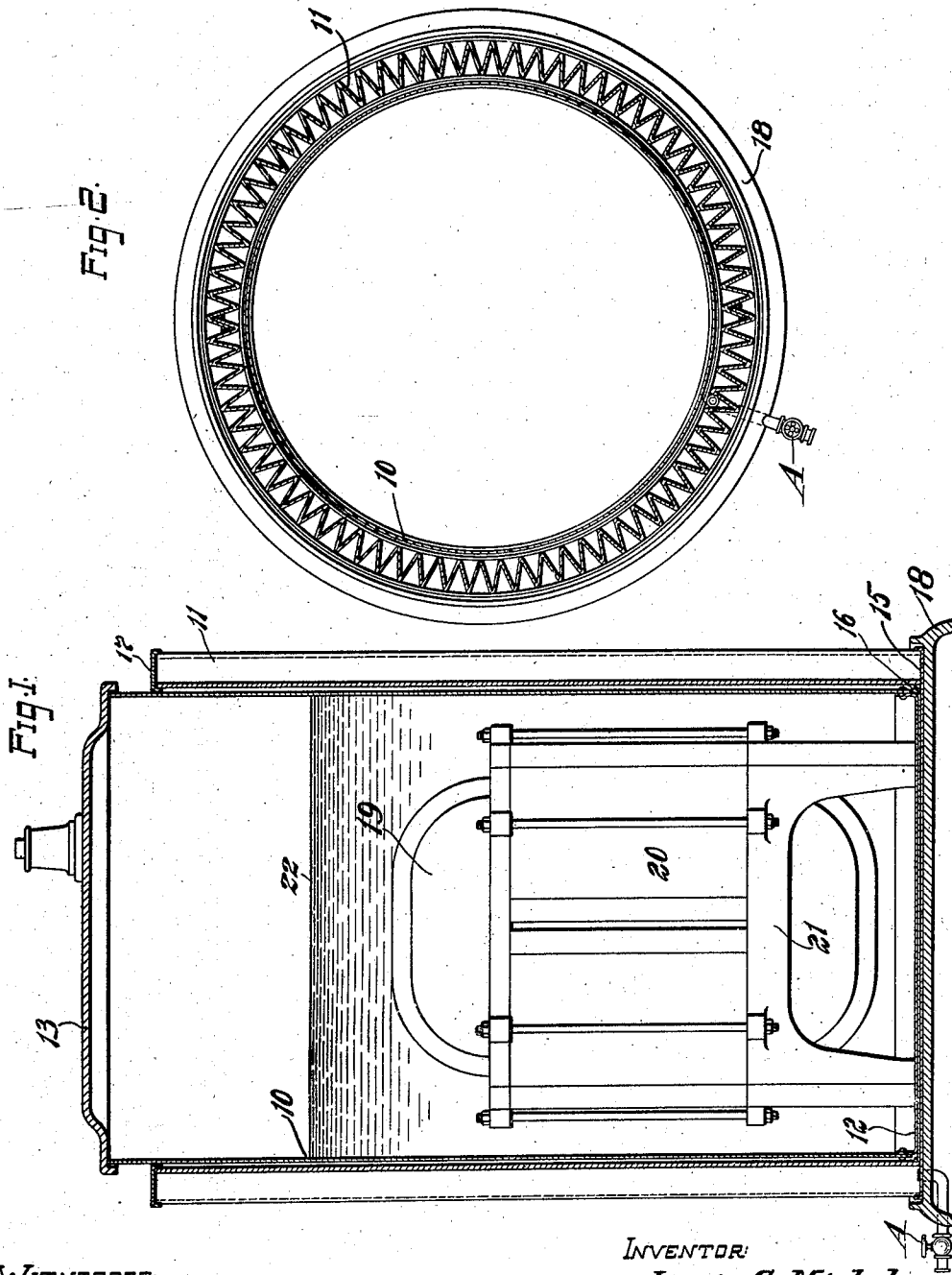


L. C. NICHOLS.
 TRANSFORMER CASE CONSTRUCTION.
 APPLICATION FILED OCT. 19, 1905.

949,086.

Patented Feb. 15, 1910.



WITNESSES:

George J. Schwartz
Fred J. Kinsley

INVENTOR:

Louis C. Nichols

By

Chas. E. Lord
 ATTORNEY

UNITED STATES PATENT OFFICE.

LOUIS C. NICHOLS, OF NORWOOD, OHIO, ASSIGNOR TO THE BULLOCK ELECTRIC MANUFACTURING COMPANY, A CORPORATION OF OHIO.

TRANSFORMER-CASE CONSTRUCTION.

949,086.

Specification of Letters Patent. Patented Feb. 15, 1910.

Application filed October 19, 1905. Serial No. 283,533.

To all whom it may concern:

Be it known that I, LOUIS C. NICHOLS, citizen of the United States, residing at Norwood, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Transformer-Case Construction, of which the following is a full, clear, and exact specification.

My invention relates to transformers and especially to casings for transformers of the oil-filled self-cooling type.

Transformer casings are usually made of corrugated metal, so as to obtain heat radiating surfaces of sufficient area to dissipate the heat absorbed by the oil within the casing. Corrugated casings made both of cast metal and sheet metal are well known. Cast metal casings are objectionable on account of their weight and because the thickness of the metal prevents closely corrugated, and hence good heat radiating surfaces.

Sheet metal casings have many advantages over the cast metal casings, since comparatively thin and closely corrugated sheet metal plates can be employed. Thus the casing is light in weight and has a large heat radiating surface. Furthermore as thin sheet metal is employed, heat can easily be conducted from the oil in which the transformer is immersed to the atmosphere surrounding the casing. The corrugated wall is usually composed of a number of sections secured together by fusible metal, and this corrugated wall is attached to a base of fusible metal in order to obtain oil-tight joints. It is necessary to seal the joints by fusible metal since the corrugations prevent the joints from being rendered oil-tight by riveting or calking or by any other means. The use of fusible metal in the construction of sheet metal transformer casings is a serious objection, for, should the casings be subjected to considerable heat, the fusible metal would melt and allow the oil to flow from the casing.

The object of my invention is to provide a sheet metal transformer casing in which no fusible metal is required to obtain oil tight joints.

In carrying out my invention I provide a sheet-metal transformer casing having a large heat radiating surface, with riveted and calked joints, whereby the joints are oil tight and will not be opened by excessive heat.

More specifically considered my invention consists of a transformer casing which comprises a sheet-metal oil tank having riveted and calked joints and a surrounding water tight corrugated sheet-metal jacket or cover containing water or other liquid having a high specific heat.

My invention still further consists in the details of construction and the combinations of elements described in the specification and set forth in the appended claims.

For a better understanding of my invention reference is had to the accompanying drawings in which;

Figure 1 is a vertical section through the transformer casing, (the transformer being shown in elevation;) and Fig. 2 is a horizontal section of the casing.

The cylindrical portion of my casing consists of two parts, an inner smooth uncorrugated sheet-metal cylindrical tank 10, adapted to hold the oil, and an outer corrugated sheet-metal jacket or cover 11 adapted to contain the water or other liquid having a higher specific heat than the oil. The cylindrical portion 10 may be made of a single sheet of metal the ends of which are riveted together, and the joint made oil-tight by calking. The bottom of the cylindrical portion 10 is riveted to a sheet-metal base 12 and the edges are calked to provide an oil tight joint. The cylinder 10 is provided at its top with the usual cap 13. It is seen that the oil tank is provided with joints which can not be opened by heat. In order that this tank may have a large heat radiating surface and hence be self-cooling, I surround the oil tank or chamber with the corrugated sheet-metal jacket 11. The spaces between the cylinder 10 and jacket 11, I fill with water or any other good heat conducting fluid having a higher specific heat than oil. The jacket 11 may be made of any number of sections secured together by fusible metal. I have shown for convenience only two sections. The corrugated portion 11, rests on a plate or base 15 and may be secured thereto by any easily fusible metal. Between the plates 12 and 15 is shown in this case a plate 16. The corrugated jacket or wall 11 is preferably provided with a sheet-metal cap 17. If desired, means such as a valve A may be provided for withdrawing the water from the inclosure between the tank 10 and jacket 11. The entire casing and

transformer is supported on a cast metal base 18.

The transformer proper, consisting of coils 19 and core 20 is mounted on a base 21, which rests on the bottom of the tank. The transformer is adapted to be surrounded by a cooling and insulating oil 22 as in the customary manner. The heat generated in the transformer will be absorbed by the oil and conveyed to the cylindrical wall 10 which will transmit the heat by conduction to the surrounding water or other heat conveying fluid of higher specific heat than the oil. The large radiating surface of the jacket 11 permits the heat to be readily dissipated.

I aim in my claims to cover all modifications which do not depart from the spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent is:—

1. In combination, a transformer casing comprising a sheet metal tank containing oil, a transformer therein, and a surrounding jacket for dissipating the heat, said jacket containing water.

2. In combination, a transformer casing comprising a sheet metal tank having riveted and calked joints, an oil immersed transformer therein, and a surrounding jacket having a large heat radiating surface, said jacket containing a fluid of higher specific heat than the oil.

3. In combination, a transformer comprising a sheet metal tank for containing oil, said tank having riveted and calked joints, an oil immersed transformer therein, and a corrugated metal jacket surrounding the tank and containing a fluid of higher specific heat than the oil.

4. A transformer casing comprising a sheet-metal oil tank having riveted and calked joints, and a surrounding water tight corrugated sheet-metal jacket or cover containing water.

5. A transformer casing consisting of a sheet-metal tank having a cylindrical body portion and a base plate riveted thereto, the seam or joint being calked, and a corrugated sheet-metal jacket consisting of corrugated sections and a base plate, the joints of the jacket being sealed whereby water or other fluid may be retained in the spaces between the cylindrical tank and the corrugated jacket.

6. In combination, a transformer, a casing inclosing said transformer, said casing comprising a tank containing a cooling and insulating oil, said tank being formed of smooth or uncorrugated sheet metal plates having riveted and calked joints, and a corrugated sheet metal wall or jacket surrounding said tank, the space between the tank and wall being filled with a heat conducting liquid.

7. In combination with a receptacle containing a heat-producing device and a liquid, of a liquid in which the receptacle is immersed having a greater thermal capacity than the liquid within the receptacle.

8. The combination with a receptacle containing a heat-producing device and a liquid, of another liquid in which the receptacle is immersed having a higher specific heat than the aforesaid liquid.

9. The combination with a heat-producing device, a liquid surrounding the same, and a receptacle therefor, of a reservoir in which the receptacle is located, and a liquid contained therein having greater specific heat than the aforesaid liquid.

10. The combination with a heat-producing device, a liquid surrounding the same, and a receptacle therefor, of a reservoir in which the receptacle is located, and a liquid contained therein having a greater thermal capacity than the aforesaid liquid.

11. The combination with a receptacle containing an electrical translating device and an insulating liquid, of a liquid surrounding the receptacle having a greater thermal capacity than the insulating liquid.

12. The combination with a receptacle containing an electrical translating device and an insulating liquid, of a liquid surrounding the receptacle having a higher specific heat than the insulating liquid.

13. The combination with a receptacle containing a heat-producing device and a liquid, of a substance surrounding the receptacle that has a greater thermal capacity than the liquid in the receptacle.

In testimony whereof I affix my signature, in the presence of two witnesses.

LOUIS C. NICHOLS.

Witnesses:

FRED J. KINSEY,
ARTHUR F. KWIS.