April 21, 1925.

1,534,749

M. O. TROY

ELECTRICAL APPARATUS CASING

Filed May 27, 1922

Fig. 1.

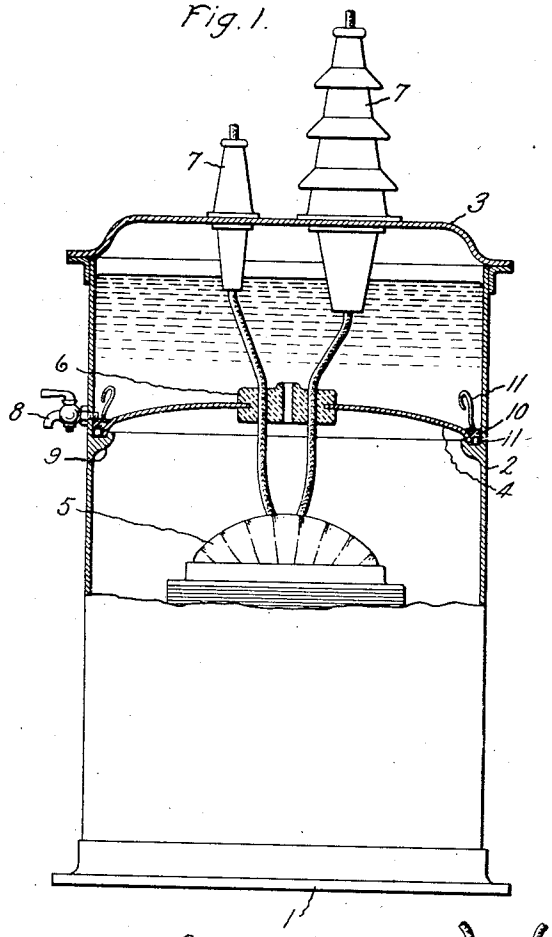


Fig. 2.

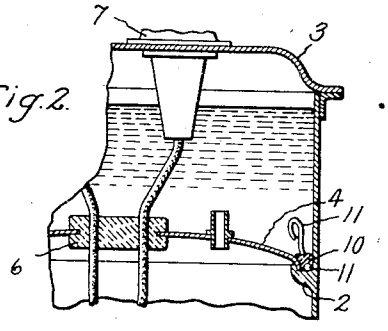
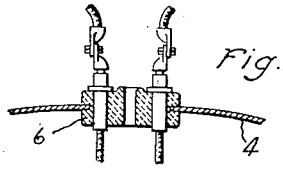


Fig. 3.



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UNITED STATES PATENT OFFICE.

MATTHEW O. TROY, OF PITTSFIELD, MASSACHUSETTS, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

ELECTRICAL APPARATUS CASING.

Application filed May 27, 1922. Serial No. 564,182.

To all whom it may concern:

Be it known that I, MATTHEW O. TROY, a citizen of the United States, residing at Pittsfield, in the county of Berkshire, State of Massachusetts, have invented certain new and useful Improvements in Electrical Apparatus Casings, of which the following is a specification.

My invention relates to electrical induction apparatus which is cooled by a suitable liquid, such as oil, in which the apparatus is immersed within a surrounding casing.

When a transformer or other electrical induction apparatus is immersed in oil within a casing, the heat generated by the apparatus and transferred to the oil causes the oil to expand and contract. It is desirable that the compartment containing the electrical apparatus be completely filled with oil in order to exclude all air, the heated oil in contact with the apparatus thus being protected from oxidation and absorption of moisture. The expansion and contraction of the oil is commonly provided for by connecting to the apparatus compartment a separate expansion compartment or chamber which is partially filled with oil. The general object of the present invention is to provide a simple and inexpensive electrical apparatus casing with an apparatus compartment and a separate expansion compartment arranged to prevent any oxidation products or moisture formed in the expansion chamber from passing back into the apparatus compartment. A further object of the invention is to construct the casing in such manner that it may be easily opened for inspection or repair of the apparatus therein.

Other objects and advantages will appear from the following description taken in connection with the accompanying drawing which shows one form of the invention and in which Fig. 1 is a view, partly in section, of a casing constructed in accordance with the invention and containing an oil immersed transformer, Fig. 2 is a detailed sectional view of a modification of the invention, and Fig. 3 is another detailed sectional view of a further modification.

Like reference characters refer to similar parts in the different figures of the drawing.

In the particular embodiment of the invention shown in the drawing, the casing includes a base 1, wall 2 and cover 3. The casing contains a lower compartment and an upper compartment separated by a diaphragm or partition 4. The lower compartment contains the electrical apparatus, shown as a transformer 5, from which suitable leads extend through an insulating section 6 of the diaphragm 5 to bushings or outlets 7 in the cover 3 of the casing. The section 6 of the diaphragm may support separable connections interposed in the leads if desired as shown in Fig. 3. Communication between the two compartments is provided by an opening in the diaphragm, the opening being formed either in the insulating section 6 of the diaphragm as shown in Figs. 1 and 3 or in some other portion thereof if desired as shown in Fig. 2. A sufficient quantity of insulating oil is supplied to fill completely the apparatus compartment and to extend up through the opening in the diaphragm and partially fill the upper compartment. The upper compartment serves as an expansion chamber, the oil flowing to and fro between the compartments as the portion of oil within the apparatus compartment expands and contracts.

The cover 3 of the casing may be made gas tight if desired, in which case the space above the oil in the upper or expansion chamber may be filled with a cushion of air or some inert gas sufficiently compressible to permit the expansion and contraction of the oil. If the cover is not gas tight, then air from outside the casing will be drawn into the expansion compartment each time that the oil contracts. In either case, the oil is subject to more or less contamination where it comes in contact with the gas and particularly when the gas used is air. The opening extending through the diaphragm between the apparatus and expansion compartments is arranged with its upper end so high that any moisture or other substance which may collect and settle in the expansion compartment will remain above the diaphragm and cannot pass down into the oil in the apparatus compartment to impair its insulating strength. In accordance with the invention, the diaphragm is formed with a low or depressed portion where moisture or other matter which settles through the oil may collect and whence it may be drawn off through a faucet 8. As shown in the drawing, an upwardly convex diaphragm is used, the outer edge

portion being therefore lower than other parts.

Another feature of the invention resides in the manner in which the diaphragm is secured in place. A small shoulder or shelf 9 on the inner surface of the wall 2 of the casing has a shallow groove to receive the outer edge of the diaphragm which is sealed into the groove with suitable sealing compound 10 to make the joint substantially tight and to hold the diaphragm in place.

The seal may be broken or weakened to facilitate removal of the diaphragm by pulling out a wire or its equivalent which is embedded in the compound 10.

This invention provides a simple and efficient casing for oil immersed electrical apparatus and one well adapted to protect the apparatus and the oil surrounding it from injury or deterioration.

What I claim as new and desire to secure by Letters Patent of the United States, is:—

1. An electrical apparatus casing having an upper compartment and a lower compartment separated by a partition, the partition having an insulating portion with an opening to provide communication between said compartments, an insulating liquid filling the lower compartment and extending through said opening to a level in the upper compartment above the upper end of the opening, electrical apparatus immersed in the liquid in the lower compartment, and leads extending from said apparatus through the insulating portion of the partition to outlets above the partition, a second portion of the partition being below the upper end of the opening in its insulating portion to collect substances settling in the liquid above the partition and prevent their passage through said opening into the lower compartment.

2. An electrical apparatus casing having an upper compartment and a lower compartment separated by a partition having an insulating portion, there being an opening connecting said two compartments, an insulating liquid filling the lower compartment and partially filling the upper compartment, electrical apparatus immersed in the liquid in the lower compartment, and leads extending from said apparatus through the insulating portion of the partition to outlets above the partition, the partition having a depressed portion below the upper end of said opening to collect substances settling in the liquid above the partition and prevent their passage through said opening into the lower compartment.

In witness whereof, I have hereunto set my hand.

MATTHEW O. TROY.