July 8, 1924. 1,500,837

W. S. MOODY

INCASED ELECTRICAL APPARATUS

Filed Oct. 26, 1920

Fig. 1.

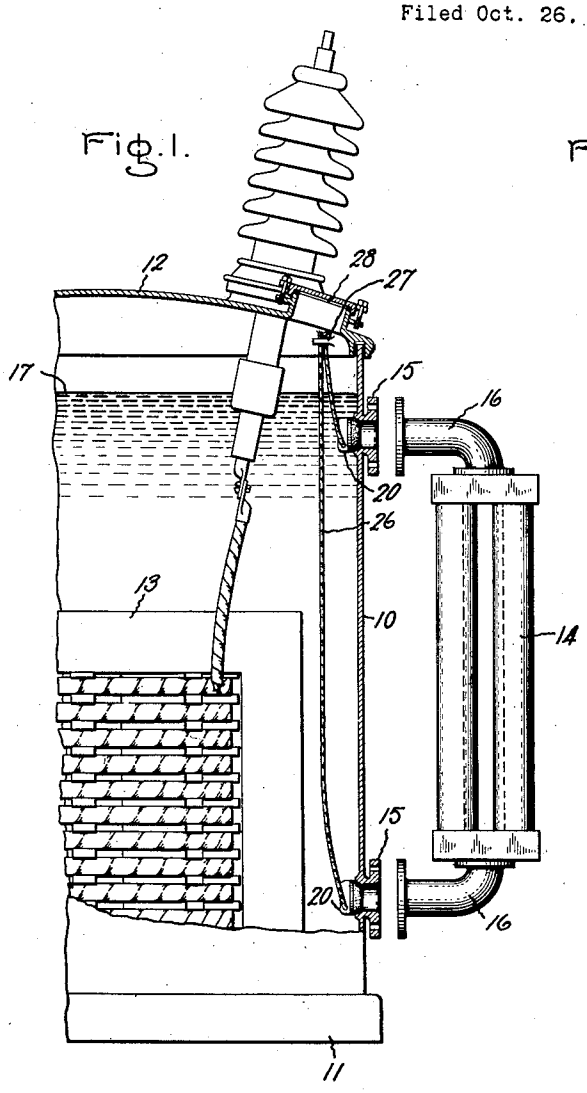


Fig. 2.

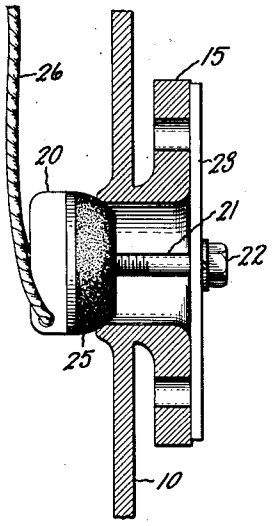
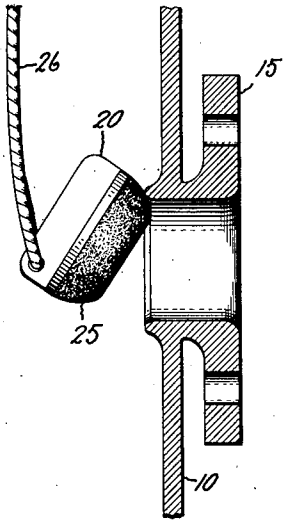


Fig. 3.



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UNITED STATES PATENT OFFICE.

WALTER S. MOODY, OF PITTSFIELD, MASSACHUSETTS, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

INCASED ELECTRICAL APPARATUS.

Application filed October 26, 1920. Serial No. 419,762.

To all whom it may concern:

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

My invention relates to incased electrical apparatus adapted to be submerged in a cooling medium, such as oil; more particularly my invention relates to apparatus of this type which is provided with external radiators for aiding in the rapid dissipation of heat from the cooling medium.

In shipping electrical apparatus of this type, it is generally desirable to have the external radiators detached during transit. It is, however, desirable at the same time that the apparatus should be shipped filled with oil, or with whatever cooling medium is employed, in order to avoid the shipment of separate containers with the oil therein and thereby reduce transportation expenses. Furthermore the presence of the normal cooling medium in the casing of the electrical apparatus during transit excludes vapors and the like which might attack and have a deleterious action on the apparatus within while on the road. Prior to my invention, if it was desired to ship such electrical apparatus filled with oil, it was generally necessary to provide special closures for the openings where the radiators are to be attached in order to prevent the oil from escaping during transit, and to remove the oil at the place of installation before removing the special closures to attach the external radiators for the final set-up of the appartus.

The object of my invention is therefore to provide means whereby the incased electrical apparatus may be shipped filled with oil without the radiators being attached, the same to be attached at the place of installation without first emptying the casing of its oil.

For a more complete understanding of the nature and object of this invention, reference should be had to the following detailed description taken in connection with the accompanying drawing in which:

Fig. 1 is a view mainly in vertical section of an incased transformer provided with a detachable external radiator in accordance with my invention. Figs. 2 and 3 show details in the radiator connecting means employed.

Referring now to the drawing, 10 denotes a casing made preferably of heavy sheet metal, such as boiler plate, having a base 11 and cover 12; the transformer housed thereby being shown at 13. The casing 10 is adapted to have external radiators, such as are shown at 14, attached thereto by suitable means, such as the flanges and couplings indicated respectively at 15 and 16; which radiators are to increase the heat dissipating and radiating capacity of the casing. The radiator 14, which is normally attached, is shown in a detached position, in order more clearly to indicate the nature of the means which I have devised for enabling the casing with its enclosed apparatus to be shipped filled with oil; the oil in the casing is here indicated at 17.

The flanges 15 to which the radiators 14 are to be attached are welded or otherwise securely fitted into the wall of the casing as indicated in Figs. 2 and 3. The orifices in the wall of the casing thus provided by the flanges are closed by suitable plugs or stoppers 20 which are fitted into such openings from the interior of the casing.

In order to hold securely the stoppers 20 in place after having been inserted, they are each provided with a central threaded recess adapted to receive the threaded end of a bolt 21, as shown in Fig. 2. The head 22 of the bolt 21 is adapted to engage when drawn up with a perforated bar 23 placed across the flange 15 as indicated. In this manner the plugs 20 securely close the flange orifices and may be further provided with a facing of some yieldable material such as rubber, here indicated at 25, over that portion which is adapted to engage with the periphery of the orifices. This yielding material serves as a packing to make a fluid tight joint when the bolt 21 is drawn up to secure the plug in place.

The plugs 20 are inserted in place from the interior of the casing in order that the radiator 14 may be attached without first removing the plugs 20. The bars 23 only need be removed, the static pressure of the oil in the casing being sufficient to hold the plugs in place at all times after the bars 23 are removed except when displacing forces are directly applied.

In order to remove the plugs 20 after the radiators are attached, I provide cables, such as are indicated at 26, reaching to the top of the casing; suitable anchoring devices 27 for the cables being provided on the casing above the oil level to support their upper ends. In order to be able to manipulate the cables 26, the cover 12 is provided with a manhole 28 suitably located, preferably adjacent the anchoring device. The cables 26 as shown are preferably secured to the plugs at points below their centers in order that an upward pull on a cable may produce a torque tending to displace the plug with a rolling movement from its orifice as indicted in Fig. 3; which movement greatly facilitates the ready displacement of the plugs when desired.

Incased electrical apparatus according to my invention, preparatory to shipment, has plugs 20 secured in the flange orifices, the same being inserted from the interior of casing and being made fast by bolts and bars as indicated in Fig. 2. The cables 26 having been properly arranged, anchored, the casing is ready to be filled with oil to the proper level and shipped without the radiators being attached.

At the place of installation the apparatus thus shipped is ready to be immediately set up with the oil in place. After having been set up and when it is desired to attach the external radiators, the bolts and bars 21 and 23 are first removed and the radiators are then secured in place. To let the oil enter the radiators the plugs 20 are then removed by drawing out the cables 26. If these cables are suitably marked, they may be drawn out in a predetermined order; the lower cables are preferably drawn first as it permits the oil to enter and displace the air from the top openings when their plugs are removed. These plugs and their cables are adapted to be used over and over again, and it is seen that they do not occupy any useful space.

Having now described what is at present the best means known to me for carrying out an embodiment of my invention, I would have it understood that such means are merely illustrative and that I do not mean to be limited thereby to the exact details shown nor restricted in the choice of recognized equivalents except as defined in my claims hereunto appended.

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

A casing for oil submerged electrical apparatus having detachable external radiators, said casing being provided with plugs inserted from the interior of the casing into the orifices in the casing wall through which the radiators connect when attached thereto, exterior devices for securing said plugs in place against the action of direct displacing forces when the radiators are detached, and means disposed within the casing for opening said orifices by withdrawing said plugs after said exterior devices are removed and the radiators are attached, said means being arranged to be manipulated from inside the casing.

In witness whereof, I have hereunto set my hand this 23rd day of October, 1920.

WALTER S. MOODY.