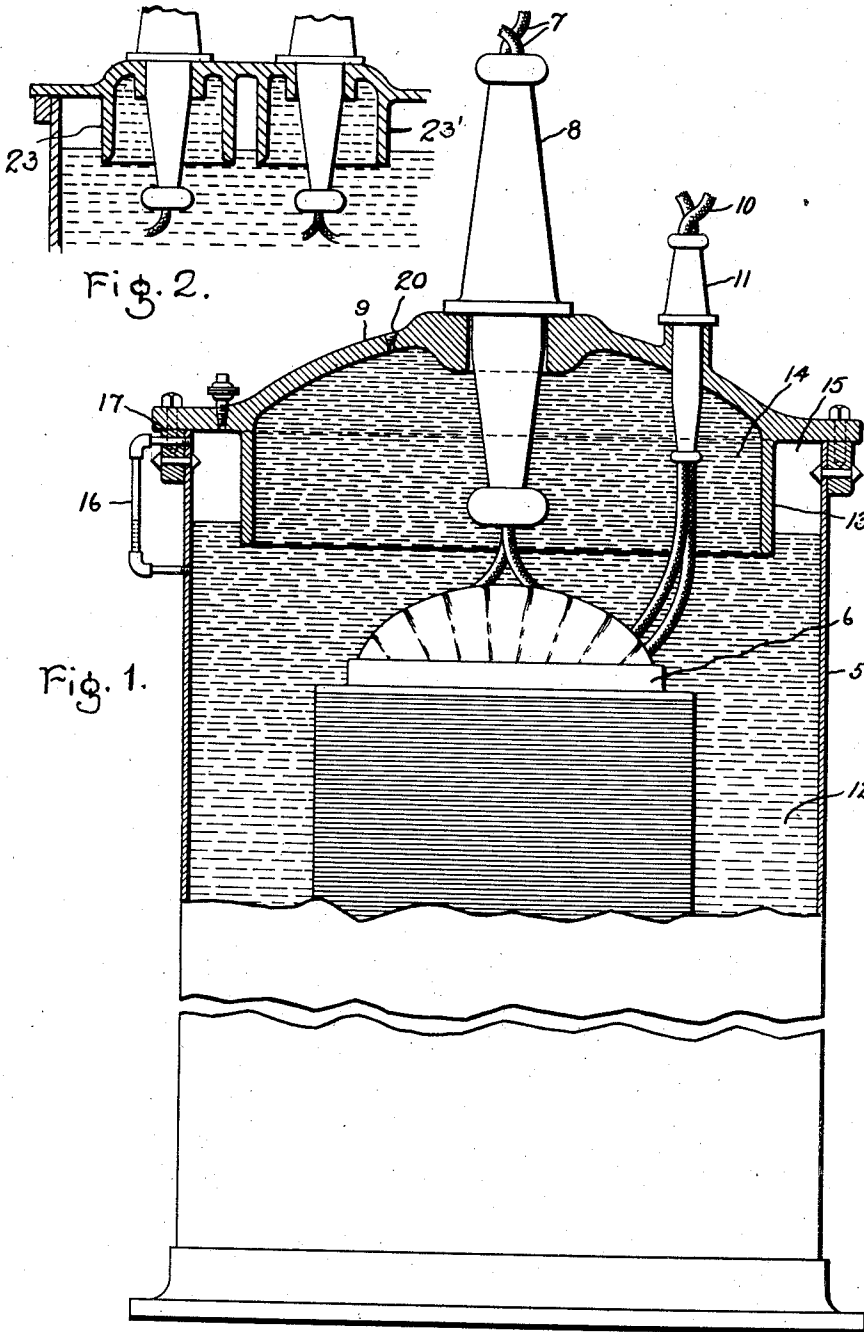


J. WILKINSON,
CASING FOR ELECTRICAL APPARATUS.
APPLICATION FILED OCT. 29, 1917.

1,347,769.

Patented July 27, 1920.



Inventor:
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His Attorney.

UNITED STATES PATENT OFFICE.

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CASING FOR ELECTRICAL APPARATUS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JAMES WILKINSON, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Casings for Electrical Apparatus, of which the following is a specification.

My invention relates to the construction of casings for electrical apparatus and has for its object the provision of means for rendering the use of such casings safe and efficient.

More specifically my invention relates to casings for electrical apparatus of the oil submerged type and is designed to enable the leads to the contained windings to be led through the casing in a safe and efficient manner.

Prior to my invention, casings for electrical apparatus of the oil submerged type, such as transformer casings, had an air or gas filled space above the oil or compound filling of the casing through which the leads or conductors to the contained windings passed; since these leads customarily entered the cover of the casing so as to avoid forming entrances therefor in the sides of the casing which would be liable to permit leakage of the oil or compound.

In this air space at the top of the casings, such as transformer casings, an explosive mixture of gases occasionally formed which, if ignited, from any source resulted in an explosion.

The air space in the top of a casing for electrical apparatus is therefore undesirable not only because it is a harbor for explosive mixtures of gases but also because the dielectric strength of the insulating material through which the leads pass is here reduced.

To avoid the use of an air space in the top of the casing, it has been proposed to entirely fill the casing with oil or insulating compound; but this cannot be successfully accomplished unless provision is made for the expansion and contraction of the oil or compound.

My invention is designed to provide means for avoiding the use of an air space in the top of casings for electrical apparatus, such as transformers, through which the leads must pass, and to this end I displace a portion of the air in this space, employing a

pneumatically supported column of oil or compound which reaches to the top of the casing where the leads enter and through which they pass.

The use of such a column of oil or compound not only provides a homogeneous insulating medium through which the leads to the contained windings pass but enables the length of the leads customarily used to be shortened and also provides an air space about the column which will compensate for expansion and contraction of the oil or compound in the casing.

For a more complete understanding of the nature and objects of my invention reference may be had to the following detailed description, when taken in connection with the accompanying drawing in which:

Figure 1 shows a transformer casing, partly in section and partly in elevation, constructed in accordance with my invention; while Fig. 2 shows a modification.

Referring now to the drawing, 5 denotes the transformer casing having therein suitable transformer windings shown at 6. These windings have high tension leads 7 entering the casing through the bushings 8 in the cover 9 and low tension leads 10 entering the casing in a similar manner through the bushings 11.

The transformer casing 5 is normally filled with liquid insulating material, such as oil or compound, as shown at 12. In order that this insulating medium may reach to the top of the cover 9 where the leads enter, I provide the cover 9 with a depending flange 13 of sufficient length that its lower edge will be submerged slightly below the normal surface of the oil or compound filling for the transformer casing 5.

The flange 13 is arranged to inclose that portion of the cover 9 where the leads enter; however, a plurality of such depending flanges inclosing groups of leads might be used equally well as shown at 23 and 23' in Fig. 2.

The flange 13, when so arranged, constitutes the sustaining wall for the column of oil or compound shown at 14, reaching to and projecting against the top of the cover 9 and surrounding the leads 7 and 10 so that they enter the casing 5 and connect with the windings 6 through a region of homogeneous insulating material. This column 14 is supported by the gas or atmospheric pressure

acting on the surface of the oil or compound in the transformer, operating in accordance with the well-known laws of pneumatics.

The space 15 between the depending flange 13 and the wall of the casing 5 is an annular air space and is designed with such capacity that it constitutes an expansion chamber for the oil or compound filling of the transformer.

The casing 5 is here shown as provided with a gage glass 16, in order that the height of the oil or compound in the transformer may be visually indicated, while the cover is shown as provided with the plug closed opening 20 which may be conveniently employed when raising or lowering the oil column 14.

A cover formed as above described can hence be bolted or otherwise secured to the casing 5, as shown at 17, well above the normal surface of the oil or compound, which avoids possible leakage thereof at the joint of the cover 9 with the casing 5.

While I have shown an embodiment of my invention as applied to a transformer by way of illustration, I would have it understood that my invention is not limited to such application, since it may be embodied equally well in the construction of analogous electrical apparatus, such as oil switches and the like, nor is it limited to the precise details shown for accomplishing a proposed end but should be construed in accordance with the scope of my claims hereunto annexed.

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

1. In an electrical apparatus, the combination with an inclosure having therein windings surrounded by liquid insulating material, of bushings having leads for said windings passing through the top of said inclosure and means for providing a region of homogeneous insulating material about the entire portion of said bushings and leads within said inclosure, and a sustaining body of gas in an adjacent region.

2. In an electrical apparatus, the combination with an inclosure having therein windings surrounded by liquid insulating material, of bushings having leads for said windings passing through the top of said inclosure, and means for sustaining a pneumatically supported column of said insulating material around said bushings and leads against said inclosure.

3. In an electrical apparatus, the combination with an inclosure having therein

windings surrounded by liquid insulating material, of bushings having leads for said windings passing through the top of said inclosure and a depending flange on that portion of the inclosure where the bushings and leads enter and arranged to surround the same and to maintain a region of homogeneous insulating material about said bushings and leads within said inclosure.

4. In an electrical apparatus, the combination with an inclosure having therein windings surrounded by liquid insulating material, of bushings having leads for said windings passing through the top of said inclosure and a depending flange on said top arranged to surround said bushings and leads and to sustain a pneumatically supported column of insulating material about said bushings and leads against said inclosure.

5. In an electrical apparatus, the combination with an inclosure having therein windings surrounded by liquid insulating material, of bushings having leads for said windings passing through the top of said inclosure and a depending flange on the inclosure arranged to surround said bushings and leads having its lower edge submerged beneath the normal surface of said insulating material whereby an insulating column is pneumatically sustained about said bushings and leads against said inclosure.

6. In an electrical apparatus, the combination with a casing having therein windings surrounded by oil or compound, of a cover, bushings containing leads for said windings passing through the cover, and a flange on said cover inclosing that portion where the bushings enter arranged to sustain a pneumatically supported column of said oil or compound around said bushings against said cover.

7. In a transformer, the combination with a casing having therein windings surrounded by oil or compound, of a cover, bushings containing leads for said windings passing through the cover, and a depending flange on said cover inclosing that portion thereof which the bushings pass through and having its lower edge submerged beneath the normal surface of the oil or compound in said casing whereby a column of homogeneous insulation is sustained about each bushing along the entire portion within said casing.

In witness whereof, I have hereunto set my hand this 27th day of October, 1917.

JAMES WILKINSON.