J. J. FRANK.

ELECTRICAL APPARATUS.

APPLICATION FILED JUNE 21, 1921.

1,437,232. **Patented Nov. 28, 1922.**

Fig. 1.

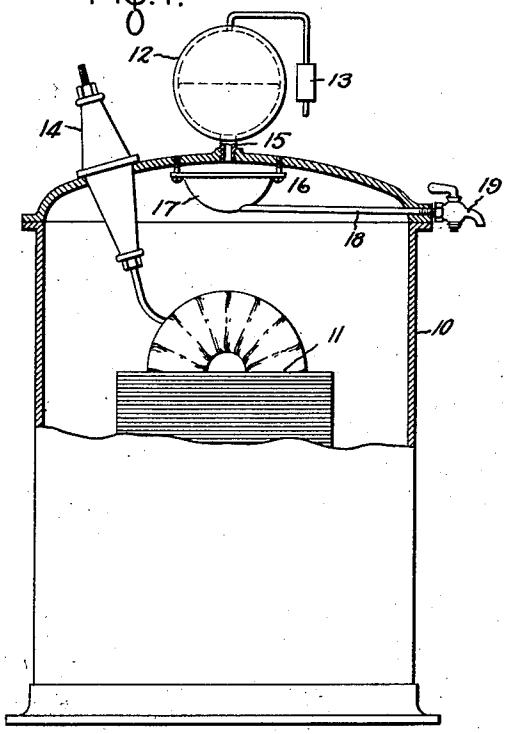


Fig. 2.

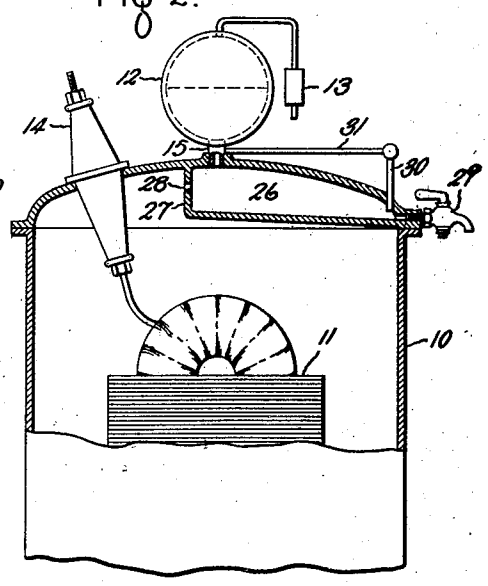


Fig. 3.

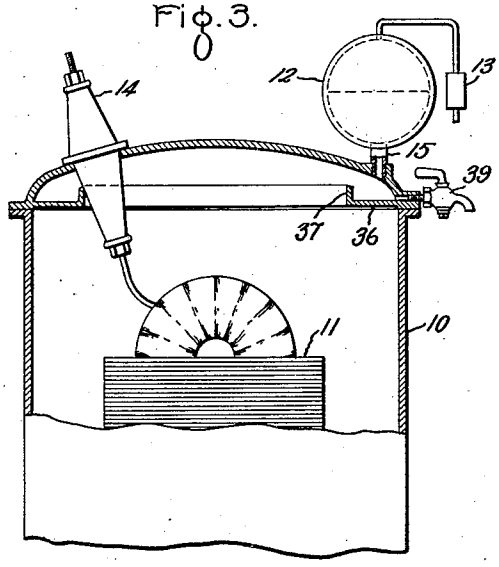
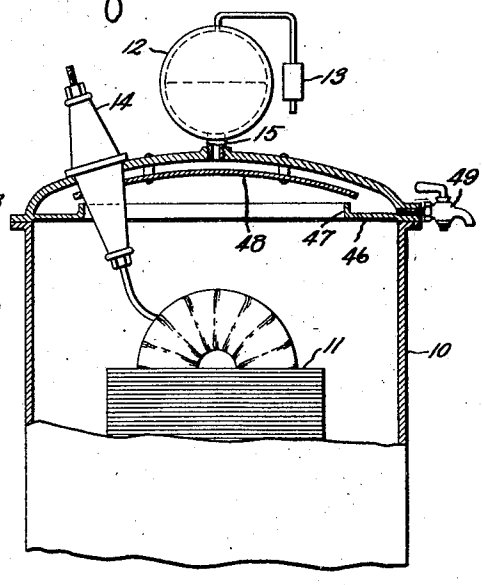


Fig. 4.



Inventor:
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Patented Nov. 28, 1922. 1,437,232

UNITED STATES PATENT OFFICE.

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ELECTRICAL APPARATUS.

Application filed June 21, 1921. Serial No. 479,401.

To all whom it may concern:

Be it known that I, JOHN J. FRANK, 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, of which the following is a specification.

My invention relates to electrical apparatus, and particularly to oil submerged electrical apparatus; and has for its object an improved construction and arrangement of parts which is economical and readily manufactured.

In oil submerged electrical apparatus, such as transformers, some reactors, oil switches and the like, it has been found that the air space above the oil in the casing which houses the apparatus has many disadvantages in addition to making the apparatus bulky and therefore needlessly expensive.

It accordingly has been proposed to eliminate the air space and fill the casing entirely with oil and to take care of the expansion and contraction of the oil content thereof by the provision of an auxiliary tank or casing, generally styled a "conservator," which is arranged to communicate with the main casing.

Such conservators, according to the best practice, are made not only to keep the air away from the hot oil and thereby prevent sludging or rapid oxidization of the oil, but to collect and trap moisture; a special sump being generally provided to this end as taught in the U. S. Letters Patent to Kulka No. 1,002,527.

In the practice of my invention, means are provided in the construction of the main casing for accomplishing the collecting and trapping of the moisture without the provision of a special sump on or connected with the auxiliary casing. This construction of the main casing results in a very rugged and very simple and advantageous type of tank construction.

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

Fig. 1 shows, partly in section and partly in side elevation, a main casing housing a transformer and provided with a conservator in accordance with my invention. Figs. 2, 3 and 4 similarly show modifications.

Referring now to the drawing, 10 denotes a main casing which houses a transformer 11, the casing having an auxiliary casing 12 communicating therewith and provided with a "breather" 13. An insulating bushing for a lead to the transformer winding is shown at 14, other bushings being omitted in the interest of clearness.

Communication between the auxiliary casing 12 and the main casing 10 is shown as a restricted passage at 15 leading directly from the bottom of the auxiliary casing 12 into the top of the main casing 10; such passage being restricted in order to prevent or reduce the occurrence of convection currents which would otherwise cause the hot oil in the main casing to rise quickly into the auxiliary casing. In this manner the oil in the auxiliary casing 12 is maintained relatively cool thereby reducing the tendency to "sludging" by reason of hot oil therein being exposed to the air.

In order to prevent moisture and the like which may have collected in the bottom of the auxiliary casing 12 from passing directly into the main casing 10 and onto the electrical, apparatus I employ a collecting means shown at 16 which is secured interiorly to the cover; which means comprises a receptacle 17 having a drain 18 running to some convenient point exterior to the main casing and controlled by the tap or cock 19.

At intervals, determined by the judgment of the operator in attendance upon the apparatus, the receptacle 17 is drained by opening the cock 19 sufficiently to draw off all moisture and the like which has collected there.

In Fig. 2 I have shown a modified type of collecting means disposed under the cover of the apparatus. The means here shown comprises the chamber 26 formed by the wall 27 which is cast integrally on the cover of the main casing. This chamber has an opening 28 well above its bottom which communicates with the main casing, a portion of the chamber extending over to the edge of the cover where a tap or cock 29 is provided to drain off the moisture which may have collected in the bottom of the chamber. In order to assist the attending operator to judge when to drain off the collecting means, I provide the gauge

glass 30 which is designed to communicate with the chamber 26 below the opening 28 so as to show the height to which water or moisture may have accumulated in the chamber, another connection 31 leading directly from its top to the auxiliary chamber 12. In practice, whenever the water is visible in the bottom of the gauge glass, it should be drawn off.

In Fig. 3 I have shown still another modification of a collecting means which may be formed in the cover of the main casing. In this form an integral ledge 36 with an upturned edge 37 is shown about the inner periphery of the cover. The auxiliary casing 12 communicates with the main casing at a point directly above this ledge so that its edge 37 serves as a dike to retain any water or moisture that may pass out from the auxiliary casing 12. A tap or cock 39 is provided to drain off the moisture which may be collected in this means.

In Fig. 4 I have a still further modification, similar to Fig. 3, in that a ledge 46 is employed to trap the moisture, but arranged so that the auxiliary casing 12 need not be connected to the main casing directly over the ledge 46. This arrangement involves the use of a deflector 48 secured in the cover of the main casing but spaced therefrom, the edges of which project over the upturned edge 47 of the ledge. Any moisture which passes from the auxiliary casing 12 to the main casing is deflected by the deflector 48 onto the ledge 46 where it is caught by the edge 47 and retained, but from which it may be drained by the cock or tap 49.

Having now described several embodiments of my invention which are at present the best means known to me for carrying the same into effect, I would have it understood that these are merely illustrative, and that I do not mean to be limited thereby to the precise details shown nor restricted in the choice of recognized equivalents except as defined in my claims hereunto annexed.

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

1. A main casing for electrical apparatus adapted to be filled completely with a fluid insulating medium, an auxiliary casing adapted to serve as an expansion chamber for said insulating medium, and a collecting means secured interiorly of the main casing and arranged to trap moisture passing from said auxiliary casing to the main casing.

2. A main casing for electrical apparatus adapted to be filled completely with a fluid insulating medium, an auxiliary casing adapted to serve as an expansion chamber for said insulating medium, and a collecting means secured interiorly of the main casing and arranged to catch moisture from the auxiliary casing, said collecting means being provided with a drain.

3. A main casing for electrical apparatus adapted to be filled completely with a fluid insulating medium, an auxiliary casing communicating with the main casing to serve as an expansion chamber for said insulating medium, and a moisture collecting means secured interiorly of the main casing and disposed below the communication between the auxiliary casing and the main casing.

4. A main casing for electrical apparatus adapted to be filled completely with a fluid insulating medium, an auxiliary casing communicating with the main casing to serve as an expansion chamber for said insulating medium, and a moisture collecting receptacle secured in the cover of the main casing below the communication between the auxiliary casing and the main casing, said receptacle being provided above its bottom with a communication leading to the main casing.

5. A main casing for electrical apparatus adapted to be filled completely with a fluid insulating medium, an auxiliary casing communicating with the main casing to serve as an expansion chamber for said insulating medium, and a moisture collecting receptacle secured in the cover of the main casing below the communication between the auxiliary casing and the main casing, said receptacle being provided above its bottom with a communication into the main casing and with a drain leading directly from its bottom.

6. A main casing for electrical apparatus adapted to be filled completely with a fluid insulating medium, an auxiliary casing communicating with the main casing to serve as an expansion chamber for said insulating medium, a moisture collecting receptacle secured in the cover of the main casing below the communication between the auxiliary casing and the main casing, said receptacle being provided above its bottom with an opening leading into the main casing and with a drain leading directly from its bottom, and an external tap controlling said drain.

In witness whereof, I have hereunto set my hand this 18 day of June, 1921.

JOHN J. FRANK.