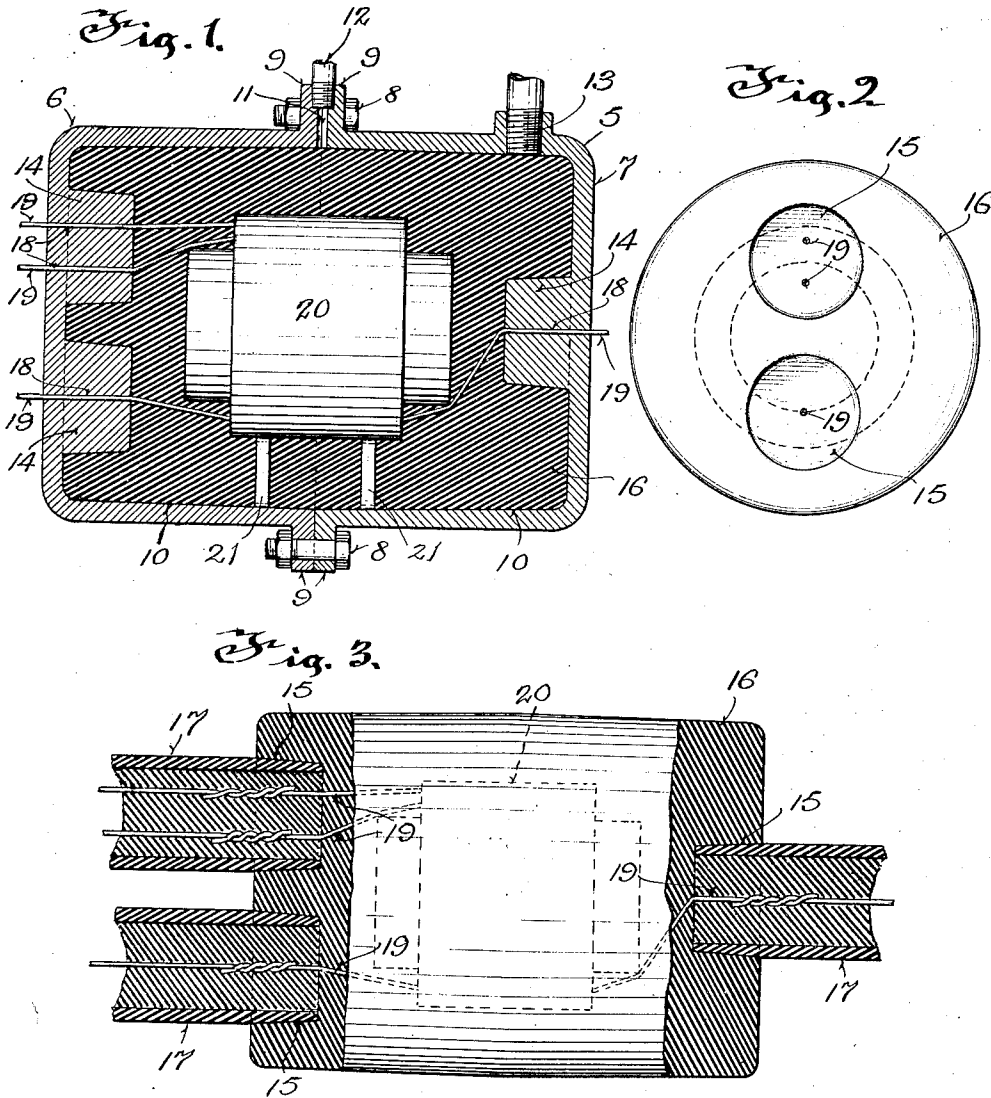


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METHOD OF INSULATING AND PROTECTING TRANSFORMERS OR OTHER ELECTRICAL APPARATUS.
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Patented Mar. 9, 1920.



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METHOD OF INSULATING AND PROTECTING TRANSFORMERS OR OTHER ELECTRICAL APPARATUS.

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Specification of Letters Patent.

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Application filed August 13, 1917. Serial No. 185,891.

To all whom it may concern:

Be it known that I, FRANCIS A. VAUGHN, a citizen of the United States, and resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Methods of Insulating and Protecting Transformers or other Electrical Apparatus, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

This invention relates to improvements in method of insulating and protecting a transformer or other electrical apparatus.

In the use of transformers or other electrical apparatus in electrical or power systems it is desirable in installing such a system to bury the transformer in the ground in order to avoid the use of unsightly supporting means and to protect the transformer from the elements but heretofore this has not been done due to the injurious effects of dampness, rust, electrolysis or chemicals upon the transformer or other electrical apparatus.

It is one of the objects of the present invention to overcome the before mentioned objectionable features and provide a method of insulating and protecting a transformer or other electrical apparatus in a manner to permit the apparatus being buried in the ground, if desired.

A further object of the invention is to provide a method of insulating and protecting a transformer or other electrical apparatus which permits the easy exterior connection of the circuit wires with the inclosed apparatus and the easy connection of the protecting conduits with the inclosing means.

A further object of the invention is to provide a method of insulating and protecting a transformer or other electrical apparatus which also includes means for exhausting the air from the interior of the inclosing member within which the transformer or other electrical apparatus is temporarily placed.

A further object of the invention is to provide a method of insulating and protecting a transformer or other electrical apparatus in which the apparatus may be completely insulated at the shop and when installed in the system of which it is to form a part the terminal wires of the apparatus may be connected to the circuit wires of the system and

said wires inclosed in conduits and in an insulating compound which forms an integral connection with the insulating covering of the apparatus.

A further object of the invention is to provide a method of insulating and protecting a transformer or other electrical apparatus which is very simple and effective in use and is well adapted for the purpose described.

With the above and other objects in view the invention consists of the improved method of insulating and protecting a transformer or other electrical apparatus and its parts and combinations as set forth in the claims and all equivalents thereof.

In the accompanying drawing in which the same reference characters indicate the same parts in all of the views:

Figure 1 is a longitudinal sectional view of a construction illustrating the improved method of insulating and protecting a transformer or other electrical apparatus shown therein;

Fig. 2 is an end view of the inclosing molded medium of the apparatus; and

Fig. 3 is a side view, partly in section and on a larger scale, of the molded insulating and protecting means and the conduits forming part of the improved method.

Referring to the drawing the numeral 5 indicates a casing which is preferably divided medially transversely to form two half sections 6 and 7 which are removably fastened together by bolts 8. The bolts pass through openings in the annular flanges 9 formed on the inner abutting edges of the sections and form a tight joint between the two sections. The bores 10 of said sections are of tapered formation and enlarge toward each other to permit easy removal of the molded medium therefrom. The sections at the joint and at the highest point of the bores are provided with a threaded air outlet opening 11 for connection with a means 12 for exhausting the air from the bores of the sections if desired. A threaded inlet opening 13 formed in one of the sections is provided for feeding the insulating and protecting compound or medium into the casing while in a molten condition. The ends of the sections are formed with inwardly extending tapered projections 14 for forming conduit recesses 15 in the molded inclosing insulating medium or member 16

to receive the tapered end portions of circuit wire conduits 17 adapted to be mounted therein. The tapered projections are provided with openings 18 to receive the circuit wires 19 of the transformer or other electrical apparatus 20 desired to be protected. Supports 21 temporarily hold the electrical apparatus while the insulating medium is formed therearound, and the openings formed by these supports are filled with the insulating compound after the supports are withdrawn.

In insulating and protecting a transformer or other electrical apparatus the device is placed upon supports within the half sections of the casing and the circuit terminal wires of the device are extended through the openings in the sections. The sections are then bolted together and the insulating and protecting medium or compound in a molten condition is poured or otherwise fed into the charging opening of the casing. An air exhausting means is connected to the outlet opening to create a partial vacuum within the casing and prevent the formation of air pockets around the device. The medium, such as bituminous insulating compound, is poured into the casing, has the desired insulating, moisture proof, rot proof, acid proof and electrolysis proof qualities and when set or hardened will form an inclosing medium entirely inclosing the apparatus. When the medium has set or hardened the casing and the supports are removed and the support openings filled with the insulating material and when being installed the projecting terminal wires are joined to the wires of the system which have previously been extended through protecting conduits. The tapered ends of the conduits are then inserted in the tapered recesses of the insulating member and the conduits may also be filled with the medium if desired and if filled the medium will form an integral connection with the medium covering the apparatus. The electrical apparatus when thus insulated and protected may be safely buried in the ground or exposed to the elements without liability to injury.

From the foregoing description it will be seen that the improved method of insulating and protecting a transformer or other electrical apparatus is very simple and is well adapted for the purpose described.

What I claim as my invention is:

1. The method of insulating and protecting electrical apparatus, which consists in placing the apparatus in spaced relation within an inclosing casing forming conduit engaging portions and with the terminal wires of the apparatus projecting outwardly therefrom through said portions, then filling the space within the casing and around the apparatus with an insulating and protecting compound while in a molten condition and

when the compound has set or become hardened removing the casing.

2. The method of insulating and protecting electrical apparatus, which consists in placing the apparatus in spaced relation within an inclosing casing with the terminal wires of the apparatus projecting outwardly therefrom, said inclosing casing being shaped to receive the terminal wires and to form conduit receiving recesses in the compound which is fed into the casing, then filling the space within the casing and around the apparatus with an insulating and protecting compound while in a molten condition and when the compound has set or become hardened removing the casing, then inserting the ends of conduits within the conduit recesses.

3. The method of insulating and protecting electrical apparatus, which consists in placing the apparatus in spaced relation within an inclosing casing with the terminal wires of the apparatus projecting outwardly therefrom, said inclosing casing being shaped to receive the terminal wires and to form conduit receiving recesses in the compound which is fed into the casing, then filling the space within the casing and around the apparatus with an insulating and protecting compound while in a molten condition and when the compound has set or become hardened removing the casing, then inserting the ends of conduits within the conduit recesses and the terminal wires in the conduits, then filling the conduits with the insulating compound which combines with the compound covering the apparatus and forms an integral connection therewith.

4. The method of insulating and protecting electrical apparatus, which consists in placing the apparatus in spaced relation within a sectional inclosing casing provided with openings through which the terminal wires of the apparatus extend, said inclosing casing having inwardly extending projections which surround the wire openings to form conduit receiving recesses in the compound which is fed into the casing, then filling the space within the casing and around the apparatus with an insulating and protecting compound while in a fluid state, and when the compound has set or becomes hardened removing the casing, then inserting the ends of conduits within the conduit recesses and the terminal wires in the conduits, then filling the conduits with the insulating compound which combines integrally with the compound covering the apparatus.

5. The method of insulating and protecting electrical apparatus, which consists in placing the apparatus in spaced relation within a two part sectional inclosing casing provided with openings through which the terminal wires of the apparatus extend, said

inclosing casing having inwardly extending
projections which surround the wire open-
ings to form conduit receiving recesses in
the compound which is fed into the casing,
5 then partially exhausting the air from the
casing and filling the space within the cas-
ing and around the apparatus with an in-
sulating and protecting compound while in
a fluid state, and when the compound has
10 set or become hardened removing the casing,
then inserting the ends of the conduits with-
in the conduit recesses and the terminal
wires in the conduits, then filling the con-
duits with the insulating compound.
15 6. The method of insulating and protect-

ing electrical apparatus, which consists in
placing the apparatus in spaced relation
within an inclosing casing forming conduit
engaging portions and with the terminal
wires of the apparatus projecting outwardly 20
therefrom through said portions, then par-
tially exhausting the air from the casing and
then filling the space within the casing and
around the apparatus with an insulating and
protecting compound while in a molten con- 25
dition and when the compound has set or be-
come hardened removing the casing.

In testimony whereof, I affix my signature.

FRANCIS A. VAUGHN.