Nov. 28, 1933. H. H. RUGG 1,936,802

INCLOSED ELECTRICAL APPARATUS

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Fig. 1.

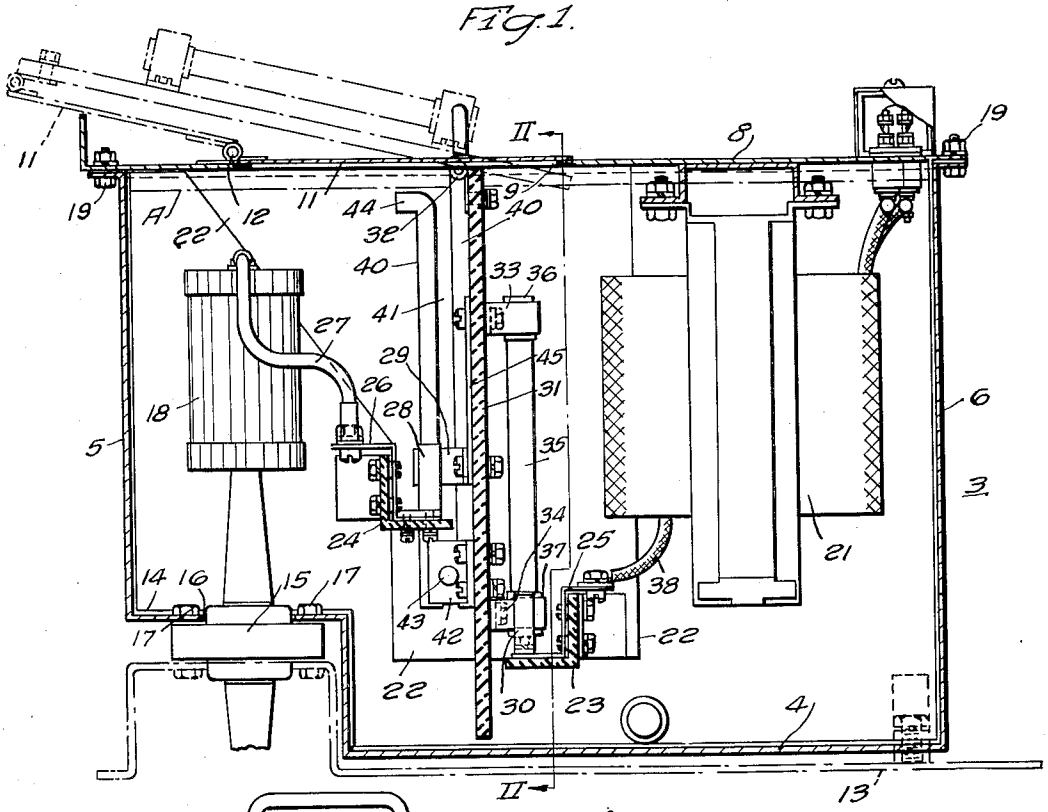
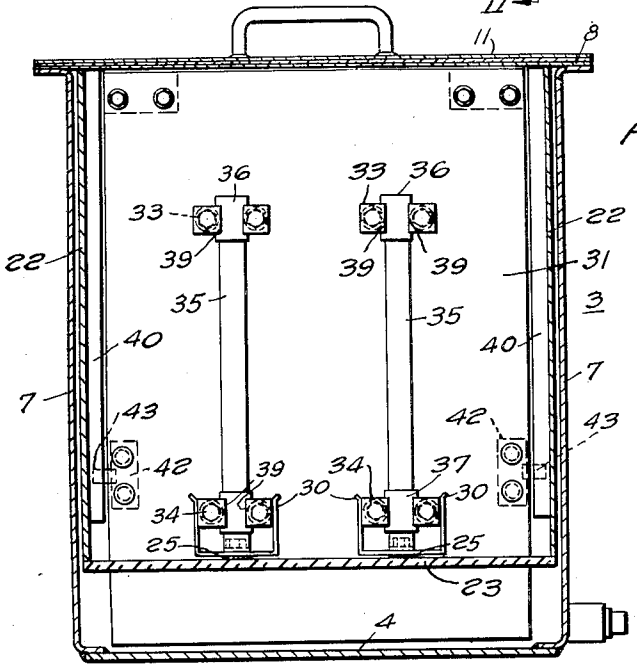


Fig. 2.



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INCLOSED ELECTRICAL APPARATUS

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7 Claims. (Cl. 247—9)

My invention relates to inclosed electrical apparatus and particularly to the inclosures for containing potential transformers and their protecting fuses that are associated with inclosed circuit breakers.

An object of my invention is to provide a separate compartment for a potential transformer, fuses and current-limiting elements associated with an inclosed circuit breaker, wherein the inclosure is mounted upon the top of a steel cubicle for containing the circuit breaker, and wherein the transformer and current-limiting devices are immersed in an insulating liquid and separated by an insulating barrier which also serves as a support for the fuses associated with the transformer.

A further object of my invention is to provide an inclosed electrical apparatus having the above-noted characteristics, wherein the fuse-supporting barrier shall extend vertically between the potential transformer and the current-limiting device and be operatively connected to the door of the inclosure in such manner as to be movable to an accessible position exterior of the inclosure when the door is in open position.

A further object of my invention is to provide a barrier structure for an electrical-apparatus inclosure having the above-noted characteristics, wherein the terminals of the fuses supported thereon are disengaged from the contact terminals associated with the transformer and current-limiting devices when the door is moved to open position and when the barrier is moved to an accessible position, thereby rendering the fuses safe for operation and inspection, and wherein closure of the door automatically moves the fuse terminals into operative engagement with the contact terminals.

A further object of my invention is to provide an inclosure for auxiliary apparatus of a circuit breaker wherein the apparatus is immersed in oil and wherein the protecting fuses are withdrawn from the oil for inspection and change when the cover is in open position, and wherein a relatively inexpensive structure is provided.

These and other objects that will be made apparent throughout the further description of my invention are obtained by means of the apparatus hereinafter described, and illustrated in the accompanying drawing, wherein,

Figure 1 is an elevational view, partially in section, of an inclosed electrical apparatus embodying features of my invention, and,

Fig. 2 is an elevational view of the apparatus, partially in vertical section, taken along the line II—II of Fig. 1.

Referring to the drawing, the apparatus includes a sheet-metal housing 3 having a bottom wall 4, end walls 5 and 6, side walls 7 and a removable top wall or cover 8, having an opening 9 adjacent to one end thereof to be closed by a hinged door 11 that is attached to one edge of cover 8 by means of hinges 12.

The inclosure or housing 3 is designed to rest upon the top wall 13—indicated in broken lines—of a steel cubicle, such as is usually employed to inclose heavy-duty circuit breakers, the bottom wall being offset at 14 to receive an insulating bushing 15 that extends through an opening 16 in the bottom wall and is connected, in oil-tight relation thereto, by means of bolts 17. The bushing 15 serves to support a resistor or current-limiting device 18, and the cover 8, which is secured to the upper portion of the inclosure 3 by bolts 19, serves to support a potential transformer 21 that is suspended therefrom and is disposed in the end of the housing opposite to that in which the resistor element is mounted.

The inclosure is preferably made of sheet metal and designed to contain an insulating liquid, such as oil, in which the transformer and current-limiting devices are immersed, the normal oil level being indicated by the broken line "A".

The cover 8 is provided with two depending plates 22 that constitute a frame for the electrical contact terminals associated with the transformer and current-limiting devices, the plates being connected, adjacent to their inner ends, to angle bars 23 and 24 of insulating material which serve to support conductive straps 25 and 26, respectively. A lead 27 of the resistor 18 is connected to the strap 26, and a contact jaw 28 is conductively connected to the said strap, the jaw 28 being adapted to receive a contact blade 29 that is secured to a movable insulating barrier plate 31, pivotally connected, by means of a hinge 32, to the free end of the door 11, as indicated in Fig. 1.

Fuse clips 33 and 34 are mounted in spaced relation on the side of the barrier plate, adjacent to the potential transformer, and are adapted to conductively engage and support a cartridge fuse 35 having terminals 36 and 37. The contact clip 34 releasably engages contact jaws 30 connected to the strap 25 which is conductively connected to the lead 38 of the potential-transformer device 21.

By referring to Fig. 2, it will be seen that the fuse terminals 36 and 37 are provided, on opposite sides, with grooves 39, for receiving portions

of the contact jaws 33 and 34 of corresponding shape and thereby preventing any axial displacement of the fuses with respect to the contact clips and permitting removal of the fuses from the clips by a movement only in a direction normal to the plane of the barrier plate 31.

The fuse clip 34 is designed to fit into the contact jaws 30 and to be withdrawn therefrom when the barrier plate 31 is moved upwardly, in the manner to be hereinafter described.

The frame plates 22 are provided with guide members 40 which cooperate to form a vertical guide slot 41, the purpose of which will hereinafter appear.

Adjacent to the lower end of the barrier plate 31 are mounted a pair of clips 42 having laterally extending pins 43, which engage the slots 41 and serve to determine the movement of the inner free end of the barrier plate after it is withdrawn through the opening 9 in the cover when the door 11 is moved to the open position as indicated in broken lines in Fig. 1. It will be understood that pins 43 rest upon a horizontal portion 44 of the guides 40 when the door is in full-open position, and, accordingly, the barrier plate 31 is supported, at this time, in an accessible position, wherein the fuse may be manipulated without danger, since the clip 34 is disconnected from the contact jaw 30, and the contact blade 29 that is connected to the contact clip 33 by means of a strap 45, is disconnected from the contact jaw 28. When the barrier plate 31 is in the raised position, shown in dotted lines in Fig. 1, the lower end extends under the cover 8 which limits outward movement thereof. The barrier plate completely closes the opening 9 and excludes all foreign substances. It also prevents a workman from coming into contact with the energized terminals while inspecting or replacing the fuses.

When the door 11 is moved to closed position, the pins 43 move downwardly in the slot 41 and guide the contact blade 29 and the contact clip 34 into engagement with the contact jaws 28 and 30, respectively, thereby establishing the circuit through the transformer and the current-limiting devices.

The insulating barrier 31 serves both as a movable support for the fuse 35 and as a barrier for increasing the insulation between the potential transformer 21 and the resistor element 18, thereby decreasing the danger of an arc being transmitted from the one to the other.

It will be understood from the foregoing that the simple opening movement of the door 11 disconnects the fuse from its circuit connections and moves it to a position wherein it is accessible for inspection or renewal, and that the construction is compact, efficient and relatively inexpensive.

While I have illustrated only one embodiment of my invention, it will be apparent to those skilled in the art that various changes, modifications, substitutions, additions and omissions may be made in the apparatus illustrated without departing from the spirit and scope of my invention, as set forth in the appended claims.

I claim as my invention:

1. A container for electrical apparatus comprising a housing having an open top, a removable cover for the top of the housing having an opening therein and having a depending supporting frame extending into the housing and constituting a guide member, a hinged door for closing the opening, a supporting member hinged to the free end of the door for supporting an electrical device and guided at its free end by the said guide member, whereby, when the door is moved to open position, the said supporting member is carried with the door and withdrawn from the housing to an accessible position substantially closing the opening in said cover.

2. A container for electrical apparatus comprising a housing having an open top, a removable cover for the top of the housing having an opening therein, a hinged door for closing the opening, a guide member disposed within the housing, a supporting member hinged to the free end of the door for supporting an electrical device within the housing and guided by the guide member whereby, when the door is moved to open position, the supporting member is carried with the door and withdrawn from the housing to an accessible position substantially closing the opening in said cover.

3. A container for electrical apparatus comprising a housing having an open top, a removable cover for the top of the housing having an opening therein, a hinged door for closing the opening, a guide member disposed within the housing, a supporting member hinged to the free end of the door for supporting an electrical device within the housing and guided by the guide member whereby, when the door is moved to open position, the supporting member is carried with the door and withdrawn from the housing to an accessible position substantially closing the opening in said cover, contact members supported within the housing, and contact members on the supporting member adapted to move into conductive engagement with the first contact members when the door is moved to closed position.

4. A container for electrical appartus comprising a housing having an open top, a removable cover for said top having an opening therein, a hinged door for closing the opening, a guide member disposed within the housing, a supporting member hinged to the free end of the door for supporting an electrical device within the housing and guided by the guide member whereby, when the door is moved to open position, the supporting member is carried with the door and withdrawn from the housing to an accessible position substantially closing the opening in said cover, contact members supported within the housing, and contact members on the supporting member connected to the said electrical device.

5. A container for electrical apparatus comprising a housing having an open top, a removable cover for said top having an opening therein, a hinged door for closing the opening, electrical devices within the housing and disposed in spaced relation, an insulating barrier hinged to the door and movable thereby from an accessible position substantially exterior of the housing, when the door is in opened position, to a position between the electrical devices when the door is in closed position, and means for guiding said barrier.

6. A container for electrical apparatus comprising a housing having an open top, a removable cover for said top having an opening therein, a hinged door for closing the opening, electrical devices within the housing disposed in spaced relation, a barrier hinged to the door and movable thereby from an accessible position substantially exterior of the housing, when the door is in open position, to a position between the electrical devices when the door is in closed position, the said barrier supporting a third electrical device that constitutes a conductive connecting link between the first said devices only when the door

is in closed position, and means for guiding said barrier.

7. A container for electrical apparatus comprising a housing having an open top, a removable cover for said top having an opening therein, a hinged door for closing the opening, electrical devices within the housing disposed in spaced relation, a barrier hinged to the door and movable thereby from an accessible position substantially exterior of the housing, when the door is in opened position, to a position between the electrical devices when the door is in closed position, separate contact members within the housing connected to the said devices, a third electrical device constituting a conductive connecting link between the first said devices mounted upon the barrier and movable into conductive engagement with the said contact members when the door is in closed position, and means for guiding said barrier.

HAROLD H. RUGG.