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1,655,694

F. GROPP ET AL

ELECTRIC SWITCH

Filed Jan.6, 1927

Fig.1.

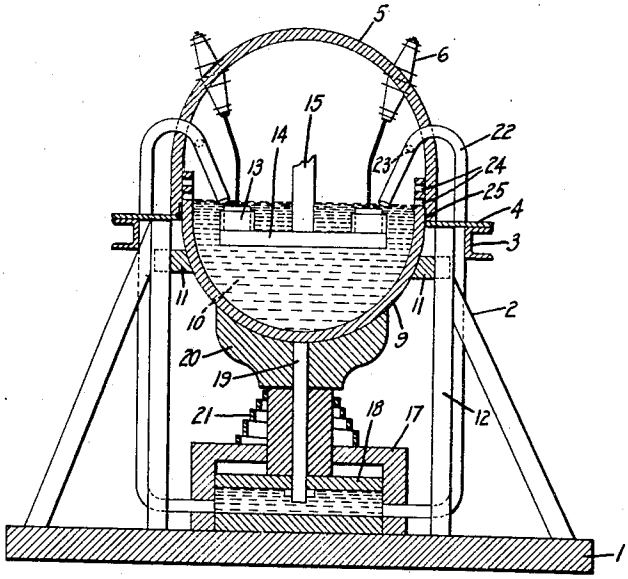
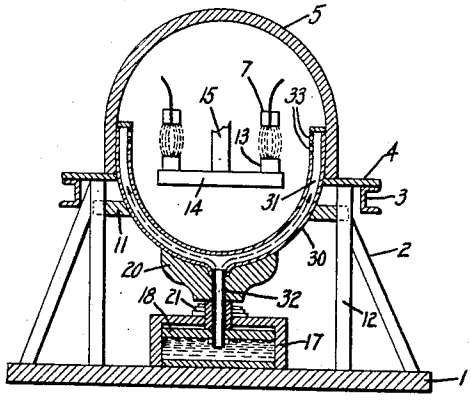


Fig.2.



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UNITED STATES PATENT OFFICE.

FRIEDRICH GROPP, OF BERLIN, AND MAX BUTTERLIN, OF NEUBABELSBERG, GERMANY, ASSIGNORS TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

ELECTRIC SWITCH.

Application filed January 6, 1927, Serial No. 159,421, and in Germany February 25, 1926.

Our invention relates to electric switches and particularly to electric switches of the fluid break type. An object of our invention is the provision of an improved switch of the fluid break type, the casing or tank of which is shaped to be better able to withstand internal pressure and is constructed to resiliently yield to such pressure. Another object of our invention is the provision of means responsive to a yielding movement of a portion of the casing or tank for directing a stream of arc extinguishing liquid between the contacts.

Our invention will be better understood from the following description taken in connection with the accompanying drawing, and its scope will be pointed out in the appended claims.

Referring to the drawing, Fig. 1 is a sectional view of a fluid break switch embodying our invention and Fig. 2 shows a modification thereof.

By way of illustration we have shown our switch supported on a base 1 by means of a framework 2 comprising a channel 3 and plate 4. The switch contacts are inclosed by a casing comprising two globular or semispherical cooperating portions 5 and 9. The portion 5 constitutes the cover member through which extend the insulator bushings 6 supporting the fixed contacts 7, and it is mounted in a fixed position on the plate 4. The lower member 9 is arranged to slide within the upper member and hold the insulating liquid 10 in which separation of the contacts takes place. Member 9 has guide pins 11 which slide in the slide rails 12 forming part of the supporting frame-work. The movable contacts 13 are connected by the bridging member 14 and are arranged to be actuated by mechanism not shown connected to the operating rod 15. Below the switch casing and resting on the base 1 is the cylinder 17 in which slides the piston 18 secured by the rod 19 and supporting disk 20 to the lower member 9. Coil spring 21 between disk 20 and the cylinder serves to carry the weight of the lower member and associated parts and to return them to their uppermost position after being depressed by pressure within the casing. The space in the cylinder 17 below the piston is filled with the same insulating liquid as that in which the contacts 7 and 13 are immersed. Pipes 22 connect this space with the contact casing being extended into its casing to a point near the contacts. In the tubes 22 are filters 23 for removing foreign matter from the oil before it reaches the contacts. Near the edge of the lower member of the casing are shown openings 24 which when the member is sufficiently depressed communicate with a recess 25 in the wall of the upper member to permit the escape of gas.

Whenever in opening the switch the pressure in the casing reaches a predetermined value the lower casing member is depressed against the spring 21 and insulating liquid is forced through the pipes 22 in a stream toward the contacts thereby assisting in extinguishing the arc between the contacts. After the circuit has been interrupted the spring will return the movable parts to their original positions and in this movement insulating liquid in the casing will be drawn back through the pipes into the cylinder.

In the modified form of our invention shown in Fig. 2 which has a mounting similar to that shown in Fig. 1 the lower member 30 of the casing is provided with passages 31 in the walls thereof which openings communicate through the hollow rod 32 with the space below the piston 18. Passages 31 terminate in inwardly directed openings 33 whereby when the lower member of the casing is depressed by pressure in the casing a stream of insulating liquid is directed toward the contacts and into an arc therebetween.

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

1. A fluid break switch having cooperating contacts, a casing therefor comprising portions relatively movable in response to internal pressure, and means actuated by the movement of one of said portions for directing a stream of insulating liquid against said contacts.

2. A fluid break switch having cooperating contacts, a casing therefor comprising a fixed upper portion and a relatively movable lower portion, means for resiliently opposing downward movement of said lower portion, and means responsive to downward movement of said lower portion for directing a stream of insulating liquid into an arc drawn between its contacts.

3. A fluid break switch having cooperating contacts, a casing containing insulating liquid in which the contacts are immersed, said casing comprising a fixed upper member and a resiliently mounted lower member, a receptacle containing insulating liquid, a plunger therein connected with said lower member and means for conducting liquid from said receptacle to the vicinity of said contacts.

In witness whereof, we have hereunto set our hands this 21st day of December, 1926.

FRIEDRICH GROPP.
MAX BUTTERLIN.