Aug. 15, 1933. J. SACHS 1,922,060

ARC EXTINGUISHING DEVICE FOR ELECTRIC SWITCHES

Filed Jan. 15, 1931

Fig. 1

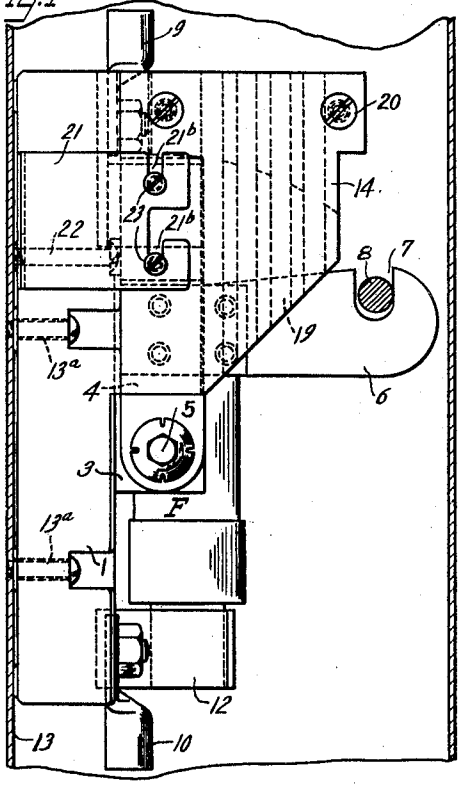


Fig. 2

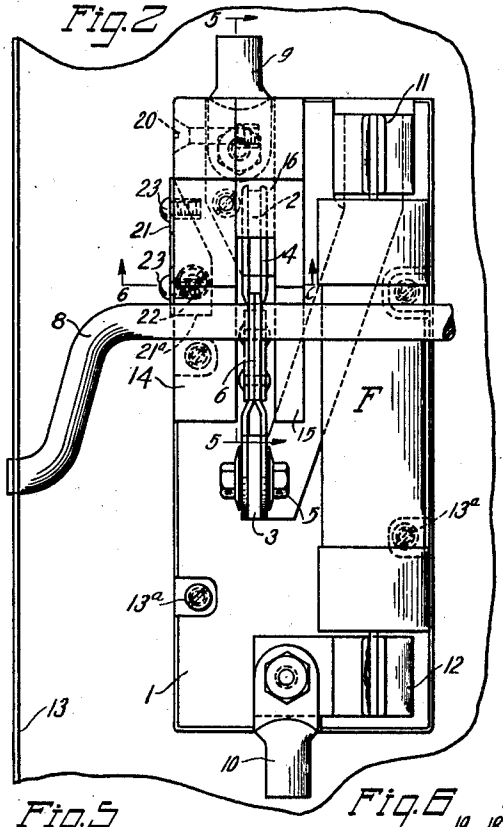


Fig. 3

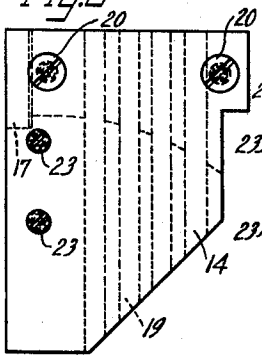


Fig. 4

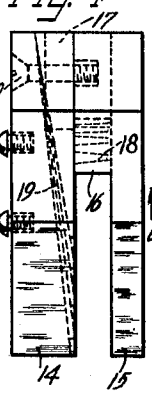


Fig. 5

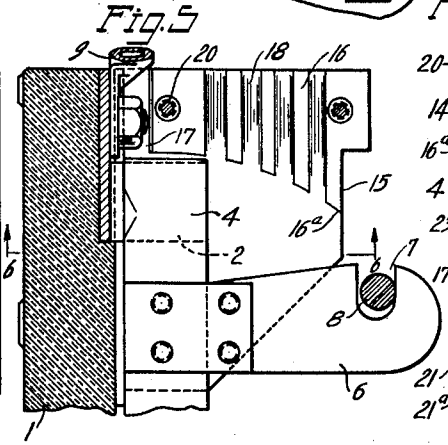
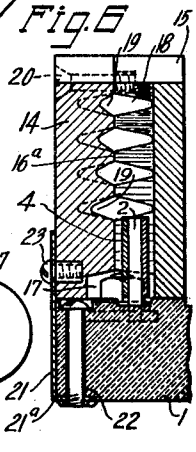


Fig. 6



Inventor

Joseph Sachs

By S. Jay Teller

Attorney

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UNITED STATES PATENT OFFICE

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ARC EXTINGUISHING DEVICE FOR ELECTRIC SWITCHES

Joseph Sachs, West Hartford, Conn.

Application January 15, 1931. Serial No. 508,944

2 Claims. (Cl. 200—144)

The principal object of the invention is to provide a simple and inexpensive, but nevertheless effective, arc muffling or extinguishing device, which is adapted to be used in conjunction with an electric switch, particularly a switch of the pivoted blade type. The invention relates more specifically to certain details of construction for the arc extinguishing device.

In the accompanying drawing I have shown the embodiment of the invention which I now deem preferable, but it will be understood that the drawing is intended for illustrative purposes only and is not to be construed as limiting or defining the scope of the invention, the claims forming a part of this specification being relied upon for that purpose.

Of the drawing:

Fig. 1 is a side view of a switch unit embodying the invention.

Fig. 2 is a front view of the switch unit shown in Fig. 1.

Figs. 3 and 4 are views similar respectively to Figs. 1 and 2, but showing the arc extinguishing device separately from the switch.

Fig. 5 is a vertical sectional view taken along the line 5—5 of Fig. 2.

Fig. 6 is a transverse sectional view taken along the lines 6—6 of Figs. 2 and 5.

In the drawing I have shown a switch of the type disclosed in my Patent No. 1,680,118 issued August 7, 1928. The invention is well adapted for use with a switch of this particular type, but it is by no means so limited. The drawing shows a single switch unit which may be used by itself or which may be combined with other similar units.

The switch unit comprises an insulating base 1 on which are mounted stationary switch contacts 2 and 3. The contact 2 is a rupture contact and the contact 3 serves as a hinge mounting for a pivoted blade or contact 4. The contact 4 is pivotally movable about a pivot stud 5 carried by the contact 3, and the said contact preferably comprises two strips of metal which are in engagement at their central portions and which have their end portions separated to engage the outer surfaces of the respective stationary contacts 2 and 3. To the central portion of the pivoted contact 4 there is connected an insulating plate 6 having a notch 7 therein for the reception of a pivoted operating bail or spindle 8. The stationary switch contact 2 is electrically connected with a wire terminal 9 and the stationary switch contact 3 is electrically connected with a wire terminal 10, such connection preferably extending through fuse contacts 11 and 12 in which may be mounted a fuse F.

The entire switch unit may be mounted in a suitable box or casing 13 of conventional form, being secured to the rear wall thereof by means of screws 13^a, 13^a. The operating bail or spindle 8 is carried by the side walls of the box in the usual manner, and when there are two or more switch units the same bail or spindle may serve for all of them. The bail 8 is mounted coaxially with the pivoted switch contact 4 and it will be obvious that when the spindle is turned the blade or contact 4 is moved into or out of engagement with the stationary contact 2 so as to make or break the circuit through the switch. A quick break mechanism (not shown) may be associated with the spindle 8 in order to so move the parts as to effect a very rapid separation of the movable blade or contact 4 from the stationary contact 2.

When a switch of the type disclosed is intended to be used for relatively high voltages, it is necessary, or at least desirable, to provide some special device for quenching or extinguishing any arcs that may be formed between the stationary and movable contacts when the latter is moved to break the circuit. The present invention relates particularly to a device intended and adapted for this purpose.

I have shown an arc extinguishing device or structure preferably formed of insulating material and having two substantially parallel walls 14 and 15, which are closely adjacent the contacts 2 and 4 and which are at opposite sides thereof. The two walls 14 and 15 are connected at their upper ends by a third wall 16 which extends transversely between them, this wall being closely adjacent the path of movement of the movable contact 4. Preferably the bottom surface 16^a of the wall 16 is curved to more closely conform to the said path. A recess 17 is formed to provide clearance for the wire terminal 9 and for the nut which holds it in place.

The transversely extending wall 16 has a series of openings 18, 18 extending therethrough, and there are also provided grooves 19, 19 in one of the side walls, as for instance the side wall 14. The grooves 19, 19 preferably register respectively with the openings 18, 18 and when so registering constitute transverse extensions thereof. The openings 18, 18 and the grooves 19, 19 provide chambers for receiving and condensing arc-formed gases, the action being similar to that

described in my Patent No. 1,554,528 issued September 22, 1925.

As a matter of convenience and economy in the manufacture of the arc extinguishing device, the described structure is initially made in two parts or members with the wall 16 initially formed as an extension or projection on the wall member 15. The openings 18, 18 are preferably in the form of grooves initially open at the side toward the wall member 14. After having been originally constructed separately the two parts or members of the structure are joined together by means of screws 20, 20 so as to provide a single connected unit.

Preferably the arc extinguishing structure which has already been described is detachably connectible with the switch unit. The provision for the convenient attachment and detachment makes it possible for the arc extinguishing structure to be used when the switch is intended to be used for high voltages and to be omitted when the switch is intended to be used only for low voltages; and it further makes it possible for the arc extinguishing structure, when used, to be readily removed to permit the switch contacts to be inspected and cleaned.

For holding the arc extinguishing structure in place there are provided cooperating connecting elements on the said structure and on the base, these elements serving to permit disconnection upon manual movement of the arc extinguishing structure bodily with respect to the base. As shown in the drawing the connecting element on the base is in the form of a plate 21 which is located at one side of the base and which has an extension 21^a at the rear, which extends behind the base and is engaged by a screw 22 extending through the base. The plate 21 has formed therein two similar open ended notches 21^b, 21^b. Projecting from the arc extinguishing structure at the corresponding side thereof are two headed projections 23, 23 which are adapted to be positioned in the notches 21^b, 21^b of the plate 21. The projections 23, 23, by reason of their engagement with the plate 21, serve to hold the arc extinguishing structure in place, but it will be evident that it may be readily disconnected by manually moving the said structure upward.

The headed projections 23, 23 may be in the form of screws threaded into inserts molded in the wall member 14, and when screws are provided they may be turned so that the heads thereof will frictionally engage the plate 21 to more firmly hold the arc extinguishing device in place.

What I claim is:

1. In an electric switch having a fixed contact and a pivotally mounted contact movable into and out of engagement with the fixed contact, the combination with the said contacts of an arc extinguishing structure comprising two separate insulating members respectively constituting two substantially parallel walls closely adjacent and at opposite sides of the said contacts and one of the members having an integral transverse projection constituting a curved third wall extending transversely between the first said walls closely adjacent the path of movement of the said movable contact, the last said wall being formed with a series of opening extending therethrough and providing chambers for receiving and condensing arc-formed gases.

2. In an electric switch having a fixed contact and a pivotally mounted contact movable into and out of engagement with the fixed contact, the combination with the said contacts of an arc extinguishing structure comprising two separate insulating members respectively constituting two substantially parallel walls closely adjacent and at opposite sides of the said conctacts, one of the said members having an integral transverse projection constituting a curved third wall extending transversely between the first said walls closely adjacent the path of movement of the said movable contact and being formed with a series of longitudinal open-sided grooves extending therethrough and providing chambers for receiving and condensing arc-formed gases, and the other of the said members being formed with a series of longitudinal grooves adjacent the path of movement of the contact and also adjacent and in register with the first said grooves.

JOSEPH SACHS.