May 23, 1939. F. B. ADAM ET AL 2,159,645

ARC QUENCHER

Filed Nov. 14, 1936

Fig. 1.

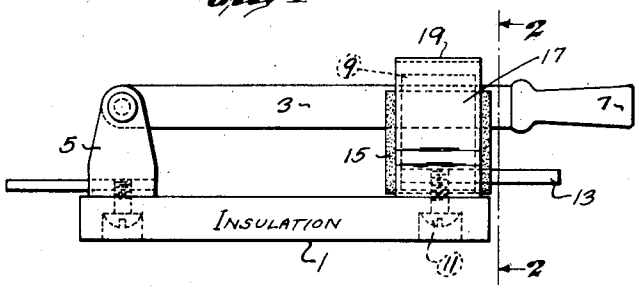


Fig. 2.

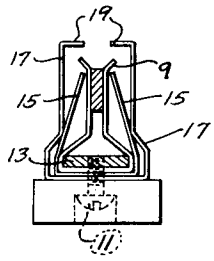


Fig. 4.

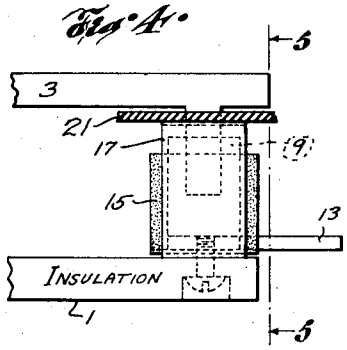


Fig. 5.

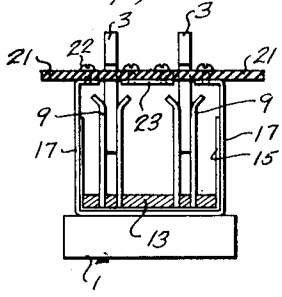


Fig. 3.

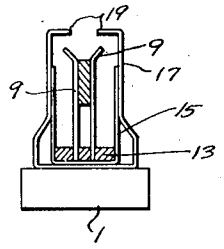


Fig. 6.

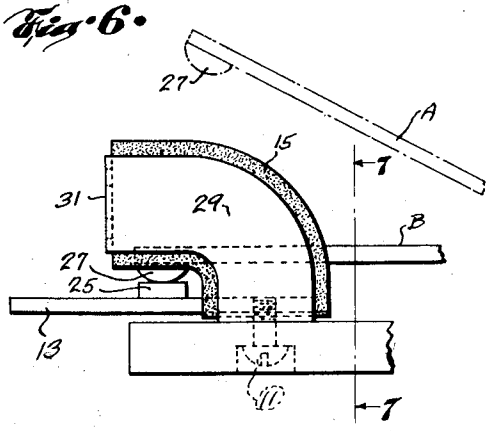
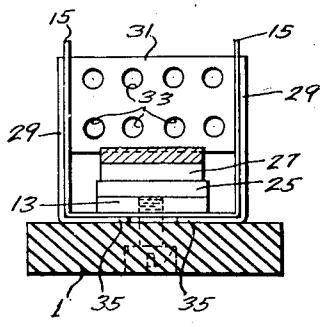


Fig. 7.



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ARC QUENCHER

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Application November 14, 1936, Serial No. 110,824

2 Claims. (Cl. 200—147)

This invention relates to arc quenchers which materially reduce the arc at circuit rupturing points of switches and circuit breakers.

It is an object of this invention to provide arc quenchers which may be applied to knife switches, butt contact type of switches or circuit breakers and other forms of switches and circuit breakers either manually or electrically operated.

Further objects and advantages will appear from the following detailed description and the accompanying drawing.

Two types of the arc quencher are shown in the drawing, the one is particularly applicable to the knife blade type of switch while the other is more particularly applicable to switches or circuit breakers employing butt type contacts.

While only two types of the arc quenchers are illustrated, it is obvious that the arc quencher is of such a design as to be easily applied to any type of circuit making or breaking device. The shape of the arc quencher may be varied at will to accommodate it to any particular type of circuit rupturing device.

In the drawing:

Fig. 1 is a side view of a knife blade switch equipped with an arc quencher.

Fig. 2 is a cross-sectional view on line 2—2 of Fig. 1.

Fig. 3 is a cross-sectional view of a knife blade switch similar to that shown in Fig. 1 but provided with a different type of clip assembly.

Fig. 4 is a side view of a switch with enclosed clips and equipped with a suitable arc quencher.

Fig. 5 is a cross-sectional view along line 5—5 of Fig. 4.

Fig. 6 is a side view of a portion of a switch with butt contacts and an arc quencher for that particular type of switch.

Fig. 7 is a cross-sectional view along line 7—7 of Fig. 6.

In the drawing the same reference numerals are used to designate the same parts thruout all of the figures. The numeral 1 denotes a switch base of some insulating material with a switch blade 3 supported thereon by a support 5. The knife blade may be provided with a handle 7. A switch clip 9 is secured to the base by a machine screw 11 which screws into a conductor bar 13. A piece of insulating paper 15 may be provided to insulate the switch clip from the arc quencher 17. The arc quencher may be formed substantially as shown and of some material of low magnetic reluctance such as soft iron or other suitable metals. The ends 19 of the arc quencher extend over the top of the clip and are so placed as to cause the arc to be quenched when the knife switch is opened.

In many switches the clips are covered by an insulating front often called a "dead front" and may be of a type shown in Figs. 4 and 5 where the cover or insulating top 21 may be secured to the arc quencher by screws 23. If the switch is provided with two clips as shown in Fig. 5 a small piece of metal 25 of the same material as the arc quencher may be secured to the insulating cover or top so as to extend over the switch clips.

An arc quencher suitable for switches of the butt contact type is shown in Figs. 6 and 7 where the numeral 25 indicates a butt contact, circuit rupturing or breaking contact member positioned on the conducting bar 13. The co-operating butt contact 27 is shown in open position at A and in closed position at B. The arc quencher 29 may be formed substantially as shown of a material of low magnetic reluctance and is provided with a closed end 31 which may be provided with some cooling means such as holes 33 therein. Fins might advantageously be provided in some instances as a cooling means. The open ends 35 of the arc quencher are held under the conductor bar 13 by the screw 11 which screws into the conductor bar. The insulating paper 15 may be provided to insulate the arc quencher from the conducting portions of the switch.

It has been found in actual operation that arc quenchers of this design and construction will materially reduce arcing at switch rupturing points. These arc quenchers do not require separate exciting coils or coiling of the conducting bars of the switching device and hence do not require the additional space which many other designs of arc quenchers do. Likewise the small and compact design enables them to be used in many more circuit rupturing devices than the conventional types of arc quenchers.

From the above description it can be seen that this invention provides an arc quencher which may be easily and cheaply manufactured. No additional windings or magnets are employed and very little space is required by the arc quencher proper.

While only several forms of the invention have been described it is to be understood that various additions, substitutions, modifications, omissions and changes may be made in the described apparatus without departing from the spirit and scope of the invention as defined by the appended claims.

We claim:

1. In an electric switch in combination, a sup-

porting base, a stationary contact, a movable contact, and an arc quencher comprising a thin plate of magnetic sheet metal having a central portion positioned under and insulated from the stationary contact and having upwardly extending parallel side portions on opposite sides of the stationary contact, the side portions of the plate having their upper ends extending inwardly at right angles to the side portions, said end portions spaced apart above the stationary contact to provide a narrow gap for passage of the movable contact, the current through the contacts serving to produce a magnetic field between the opposed end portions of the plate.

2. In an electric switch in combination, a stationary switch clip contact, a movable blade contact and an arc quencher comprising a generally U-shaped plate of thin sheet magnetic metal, said plate having its central portion positioned under and insulated from the clip contact, and its parallel side portions extending upwardly and terminating in opposed end portions spaced apart and above the clip contact providing a narrow gap for passage of the blade and substantially surrounding the clip contact, the current through the contacts serving to produce a magnetic field between the spaced apart ends of the plate.

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