April 25, 1933. T. E. McDOWELL 1,905,038

ARC REDUCING ELECTRIC SWITCH

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Fig. 1.

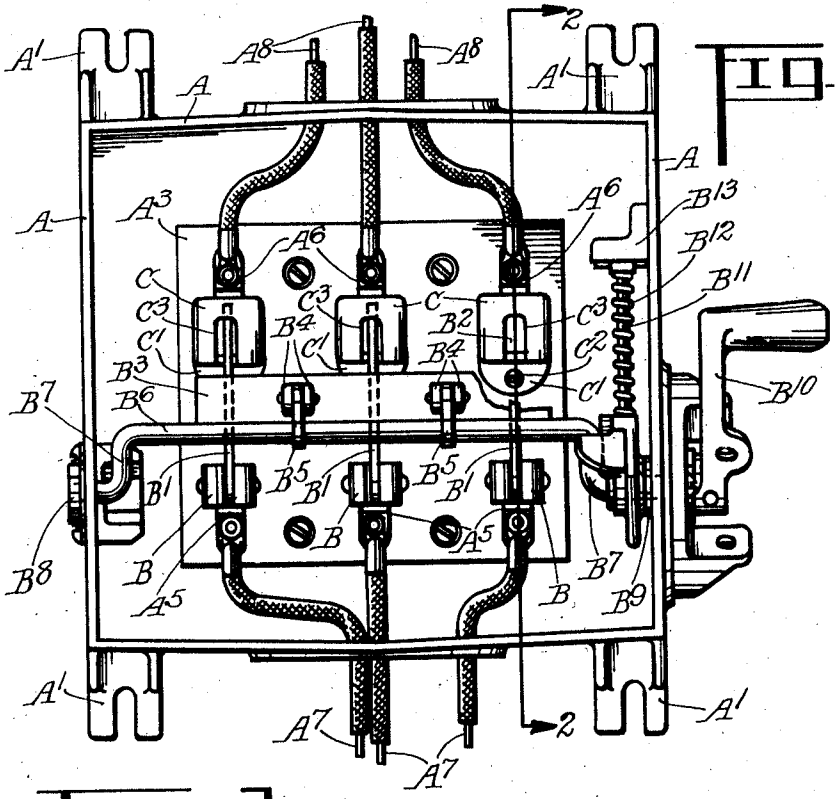


Fig. 3.

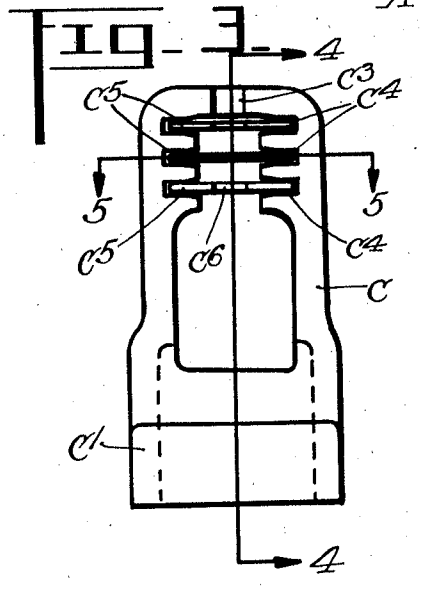
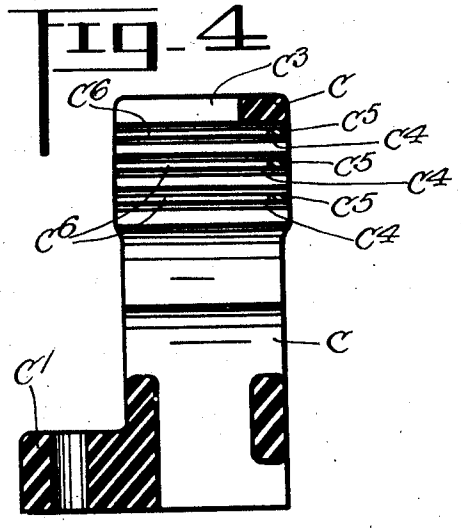


Fig. 4.



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Fig. 2.

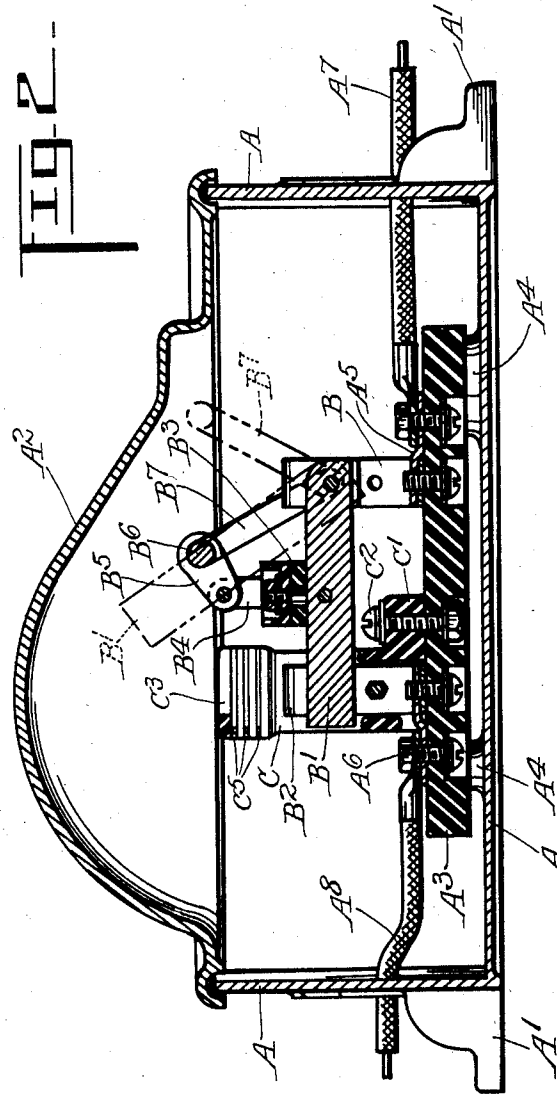


Fig. 5.

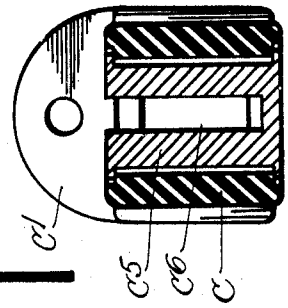
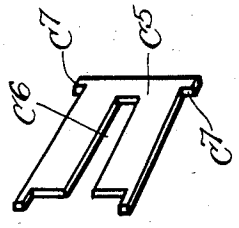


Fig. 6.



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UNITED STATES PATENT OFFICE

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ARC REDUCING ELECTRIC SWITCH

Application filed August 15, 1930. Serial No. 475,441.

My invention relates to improvements in arc reducing electric switches and the like. It has for one object to provide in combination with an electric switch preferably of the knife switch type, means for breaking or arresting the arc which is formed when the circuit is broken by the opening of the switch. Other objects will appear from time to time throughout the specification and claims.

My invention is illustrated more or less diagrammatically in the accompanying drawings, wherein—

Figure 1 is a plan view;

Figure 2 is a section along the line 2—2 of Figure 1;

Figure 3 is an elevation of the arc arresting mechanism;

Figure 4 is a section along the line 4—4 of Figure 3;

Figure 5 is a section along the line 5—5 of Figure 3;

Figure 6 is a perspective view of the arc arresting blade.

A is a switch housing comprising a bottom, side walls and slotted flanges A^1 whereby the switch housing may be bolted in place. A^2 is a cover for the switch. A^3 is an insulating plate contained within the housing and supported on bosses A^4 and having terminals A^5 A^6 associated with conductor cables A^7 A^8 which pass out through suitable apertures in the walls of the housing. As shown there are three of these terminals and three cables at each side though there might be more or less.

Rising upwardly from the insulating plate A^3 are a plurality of pivot brackets B, one associated with every one of the conductors A^7. Pivoted in these brackets are knife switch blades B^1 which blades may be moved into and out of contact with spring fingers B^2, there being a pair of fingers for every blade. Extending across the upper edges of all three of these blades is an insulating bar B^3 which is mounted on the blades so that movement of the bar moves all blades simultaneously. Projecting upwardly from the bar are a plurality of lugs B^4. Links B^5 pivoted on these lugs are also pivoted on a switch arm B^6. This switch arm has offset ends at B^7 which ends are pivoted at B^8 B^9 in the wall of the housing, one of the ends B^7 being outwardly bent and terminating in a switch handle B^{10} outside the housing whereby the switch may be opened or closed. B^{11} is a switch locking arm associated with a coil spring B^{12} and an abutment B^{13} whereby the switch is yieldingly held in open or closed position as the case may be. All this arrangement is common, conventional switch arrangement.

Associated with every pair of spring fingers is an arc arresting device. It comprises a housing or bracket C of porcelain or other suitable material mounted on the insulating plate A^3 and has spaced side walls and an end member. The spaced side walls provide a slot in the housing through which the blade passes. This housing is provided with an ear C^1 apertured to be engaged by the bolt C^2 to hold it in place on the plate A^3. A housing encloses a pair of spring fingers B^2 and its end member is centrally apertured as indicated at C^3 to provide a slot therein so that the knife blade may pass through it into and out of engagement with the spring fingers. Toward its upper end above the ends of the spring fingers, the housing is provided with a plurality of parallel generally horizontal recesses C^4 forming pockets; in which are loosely socketed choke plates C^5 disposed one plate to a pocket, these choke plates being centrally slotted or notched at C^6 so that the knife blade may pass through the notches or slots. The plates are provided with shoulders C^7 for positioning the plates in the housing. The plates C^5 are provided with tongues C^8 at the forward ends which normally are in alignment with the adjacent side edges of the plates. When the plates are inserted in the recesses or pockets C^4, the plates are inserted from the back of the housing, that is, from the right-hand side of the housing as viewed in Figure 4. When the plates have been so inserted, the tongues C^8 are then bent outwardly to engage against the sides of the housing adjacent the pockets for securing the plates in position, as clearly seen

in Figure 5. This manner of securing the plates in position is simple and one which is economical in carrying into effect. The plates C^5, in this case there being three of them, are separately mounted in the housing C and have no electric contact with one another or with anything else. The plates C^5 lie in the path of the knife blade as it moves away from the spring fingers in the direction it travels to break the circuit and the knife blade travels through the slots in such plates C^5 without contacting the plate. The effect of this arrangement is that as the knife blade travels out to break the circuit, the presence alongside of the path of travel of the blade of these separate, separately insulated, separately mounted choke plates is sufficient to cause any arc which may be drawn out to be choked out or damped out or broken off and their presence prevents the drawing out of an arc at the switch points.

I claim:

1. Switch mechanism including in combination, a contact member, a blade movable into and out of engagement with said contact member, an arc quencing device about said contact member, said device comprising a housing having spaced side walls providing a slot, the inner faces of said side walls being provided with a plurality of spaced parallel grooves forming pockets, metal plates in said grooves disposed one plate to a pocket, said plates having notches therein which are in register with one another and with the housing slot when said plates are in position, the blade member being movable through the registering notches of said plates and the housing slot, said plates having projections thereon engaging with the side walls to prevent displacement of said plates from said housing.

2. Switch mechanism including in combination, a contact member, a blade movable into and out of engagement with said contact member, an arc quenching device about said contact member, said device comprising a housing having spaced side walls providing a slot, the inner faces of said side walls being provided with a plurality of spaced parallel grooves forming pockets, notched metal plates in said grooves disposed one plate to a pocket and disposed with the notches in register, a cross member connecting the ends of said walls and having a notch therein in register with the plate notches and the housing slot, and the blade member being movable through the registering notches and the housing slot.

3. Switch mechanism including in combination, a contact member, a blade movable into and out of engagement with said contact member, an arc quenching device about said contact member, said device comprising a housing having spaced side walls providing a slot, the inner faces of said side walls being provided with a plurality of spaced parallel grooves forming pockets, notched metal plates in said grooves disposed one plate to a pocket and arranged with the notches in register, said blade member being movable through the registering notches of said plates and the housing slot, and said plates having shoulders thereon for positioning said plates in said side walls.

4. Switch mechanism including in combination, a contact member, a blade movable into and out of engagement with said contact member, an arc quenching device about said contact member, said device comprising a housing having spaced side walls providing a slot, the inner faces of said side walls being provided with a plurality of spaced parallel grooves forming pockets, notched metal plates in said grooves disposed one plate to a pocket and arranged with the notches in register, said blade member being movable through the registering notches of said plates and the housing slot, and said plates having shoulders thereon for positioning said plates in said side walls, said plates also having tongues thereon bendable against the side walls to lock the plates in position in said side walls.

5. A housing for arc quenching purposes comprising a member having a bottom and a top and spaced side walls providing a slot through said housing, the top being notched, said housing being open at its rear, the inner faces of the side walls being provided with spaced parallel grooves forming pockets for receiving plates, notched plates in said pockets arranged one plate to a pocket and with the notches in register with one another and with the slot in the end member of the housing, said plates having shoulders and lugs for positioning the plates in the side walls, the shoulders bearing against rear edges of the side walls and the lugs being bendable against the opposite edges of the side walls for locking the plates in said housing.

Signed at Chicago, county of Cook, and State of Illinois, this 13th day of August, 1930.

THOMAS E. McDOWELL.