Nov. 6, 1923. 1,473,574

B. E. GETCHELL

INCLOSED SWITCH

Filed Jan. 30, 1922

Fig. 1.

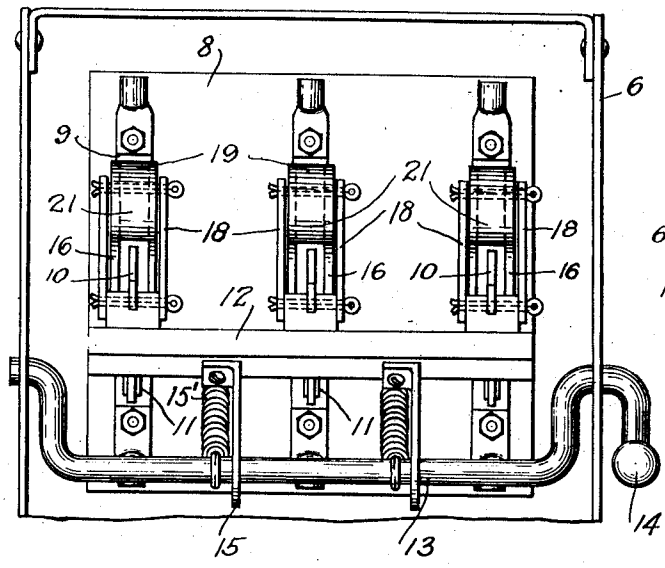


Fig. 4.

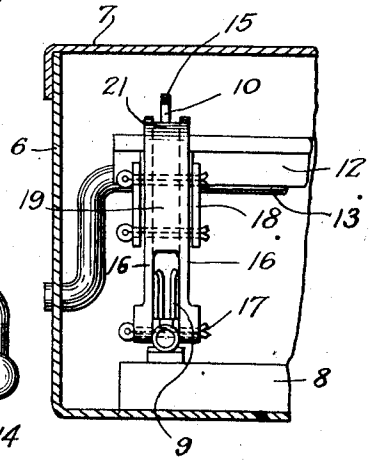


Fig. 2.

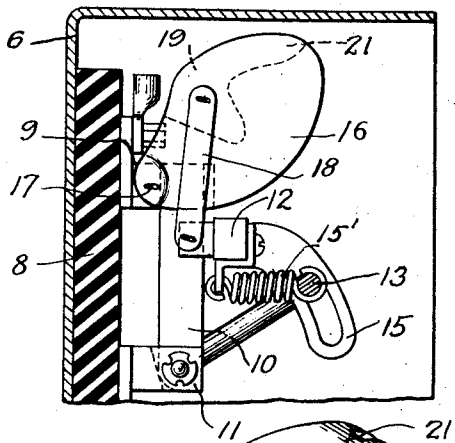


Fig. 3.

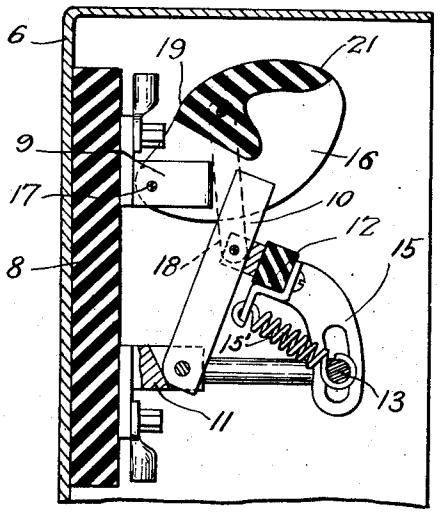
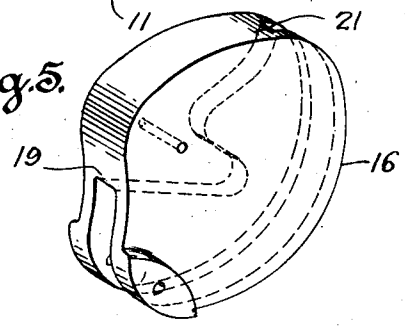


Fig. 5.



INVENTOR

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BY

ATTORNEY

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UNITED STATES PATENT OFFICE.

BENJAMIN E. GETCHELL, OF PLAINVILLE, CONNECTICUT, ASSIGNOR TO THE TRUMBULL ELECTRIC MANUFACTURING COMPANY, OF PLAINVILLE, CONNECTICUT, A CORPORATION OF CONNECTICUT.

INCLOSED SWITCH.

Application filed January 30, 1922. Serial No. 532,608.

To all whom it may concern:

Be it known that I, BENJAMIN E. GETCHELL, a citizen of the United States of America, residing at Plainville, Connecticut, have invented a new and useful Inclosed Switch, of which the following is a specification.

My invention relates particularly to means for preventing injurious arcing in the opening of the circuit of the switch. I have shown the invention as applied to a knife blade type of switch.

The main object is to provide simple and inexpensive means which may be embodied in the construction of an ordinary knife blade switch for either effectively preventing arcing from the switch parts to the casing or extinguishing any arc which starts to form in the act of opening the switch. I have sought not only to prevent arcing from the switch contacts to the casing, but also to interrupt any arc which might form between the stationary and the movable contact or blade.

In its preferred form, I provide an insulating housing which is pivoted to the stationary contact and connected to the swinging contact or blade so as to prevent an arc from jumping from the stationary contact or from the end of the blade to the casing or wall of the receptacle containing the switch. This insulating housing also interposes an insulating barrier between the stationary contact and the end of the switch blade as the switch is opened, thus chopping off the arc.

Fig. 1 is a plan view of a part of an inclosed type of switch embodying the improvements of my invention, the cover of the box being omitted and the switch being shown in the open circuit position.

Fig. 2 is a side view and section showing the switch in the closed circuit position.

Fig. 3 is a similar view showing the parts of the switch in the position which they would occupy just as the circuit is broken.

Fig. 4 is an end view showing parts in the fully open circuit position.

Fig. 5 is a perspective view of the insulating housing.

The switch box or receptacle is usually of sheet steel having a body part 6 and a cover 7.

The switch proper is usually mounted on an insulating base 8 suitably secured in the box.

The switch may have any number of stationary contacts 9 and corresponding blades 10 hinged to posts or supports 11. I have shown the invention as applied to a switch with three blades and corresponding contacts in which the blades are connected by an insulating cross bar 12. It should be understood that so far as my invention is concerned the switch may be operated in any suitable manner. I have shown herewith an operating crank 13 pivotally mounted in the sides of the box and provided with an external operating handle 14. As shown herein the crank 13 is connected to the cross piece 12 by quick-break mechanism including slotted links 15 and springs 15′.

Each unit of the switch consists of a stationary contact and the hinged blade adapted to cooperate therewith, and is provided with an insulating housing having two side plates 16 hinged at 17 on opposite sides of the stationary contact. This housing is connected by side links 18 to the switch blade or movable contact, so that as the switch blade is swung by the crank 13 and handle 14, the insulating housing will swing with it.

Between the sides of the housing is a barrier 19 of insulating material. This barrier is so shaped and arranged as to lie between the contact 9 and the end wall of the casing when the parts are in the closed circuit position and also so as to extend between the swinging end of the switch blade and the adjacent end of the casing or box as the circuit is being broken, as shown in Fig. 3. A part of the barrier may be extended up toward the end of the housing, as at 21, so as to be effectively interposed between the extreme end of the blade and the casing in the latter part of the opening movement of the switch at the same time that a part of the barrier 19 is interposed between the end of the stationary contact and the adjacent edge of the blade.

In practice it is found that an arc sometimes tends to jump from the top end of the stationary contact to the adjacent portion of the casing and from that point either to the end of the movable blade or to an adjacent stationary contact, and it is the

special object of my invention to prevent the arc from jumping from the switch parts to the casing.

It has been found in actual commercial practice that by having the housing pivoted at the sides of the stationary contact and by having a part of the housing interposed between the contact and the casing, it is practical to make the device much more compact than has been the practice in switches of equal voltage capacities, and at the same time shield or insulate the arcing points of the contacts and blades from the adjacent walls of the casing. As an example of the utility of the invention I may state that it has been found entirely practical to make a 600 volt switch of approximately the same size as formerly considered necessary for a 250 volt switch. It will be observed that the operation of the barrier is entirely automatic and interferes in no way with the usual construction or operation of the switch.

It is obvious that the construction shown greatly minimizes arcing between the blade and the contact jaws as the circuit is broken so that there is but comparatively little pitting of the parts. This insures better electrical contact and greatly lengthens the life of the switch.

In the form shown the two side plates of each housing are integrally connected by the barrier. This is a desirable feature but I do not consider the invention as limited in this respect.

I claim:

1. In a switch, a casing, a stationary contact mounted therein close to a wall thereof, a switch blade pivoted to coact with said contact and an insulating housing pivotally embracing the stationary contact operably connected to the switch blade and movable to a position between said stationary contact and said wall of said casing.

2. In a switch construction, a casing, a stationary contact mounted therein, a pivoted switch blade coacting with said stationary contact, an insulating housing connected to said switch blade and movable between the arcing point of said stationary contact and an end wall of said casing as the blade is moved to open circuit position.

3. An electric switch comprising, a casing, a stationary contact therein, a switch blade contact mounted to coact with said stationary contact, a movable barrier mounted in said casing and means for moving said barrier simultaneously between said stationary contact and said blade contact and between the end of said stationary contact and said casing as the circuit is opened.

4. An electric switch comprising a metallic casing, a stationary contact and a cooperating blade contact mounted in said casing, an insulating barrier mounted in said casing, and means for moving said barrier between the arcing points of both of said contacts and the adjacent wall of said casing automatically as the blade contact is separated from the stationary contact.

5. An electric switch comprising, a casing, a stationary contact therein, a switch blade contact mounted to coact with said stationary contact, a movable barrier mounted in said casing and means for moving said barrier between said stationary contact and said blade contact and between the end of said switch blade contact and said casing as the circuit is opened.

6. In an inclosed switch, a casing, a stationary contact therein, an insulating housing between said contact and a wall of said casing, a hinged switch blade having a movable end adapted to coact with said stationary contact and an insulating link connecting said blade and said housing whereby said housing swings to an arc-interrupting position between said stationary contact and said blade and between the said stationary contact and the adjacent wall of said casing.

7. In an inclosed switch, a casing, a stationary contact mounted therein, a switch blade hinged to coact with said stationary contact, and a hinged insulating barrier normally standing between said stationary contact and the adjacent end wall of said casing when the switch is closed, and means of connection between said barrier and said blade for swinging said barrier between the adjacent ends of said stationary contact and said blade as the circuit is open, said barrier having a portion which is interposed between the end of the blade and the end wall of the casing at the instant the blade leaves the stationary contact.

8. In an inclosed switch, a casing, a stationary contact, a blade mounted to coact therewith, a pivotally mounted insulating housing embracing the sides and the arcing tip of said stationary contact, and having a portion interposed between said tip and the adjacent end and side walls of said casing, and a link connecting said housing and said blade.

9. In an inclosed switch, a stationary contact, a hinged blade coacting therewith, a casing enclosing said parts, insulating plates hinged to said stationary contact and having a barrier portion interposed between said stationary contact and the end wall of said casing and another portion interposed between the free end of the blade and said end wall, and a means of connection between said plates and said blade to move said barrier portions so as to intercept any arc that might be formed between the stationary contact or the free end of the blade and the adjacent wall of the casing.

10. In an inclosed knife switch, a casing, a stationary contact, a hinged blade adapted

to co-act therewith, an insulating shield member hinged to said stationary contact and adapted to swing between said contact and part of said blade on one side and between said contact and said casing on the other side and having a portion adapted to be interposed between the outer end of the blade and the casing, and a link connecting said blade and said shield member.

11. As an article of manufacture, an insulating arc interrupting member for a knife blade switch comprising side plates having pivotal means at one end, and a barrier between said plates extending from one side part way across toward the other and having a portion extending from said barrier portion around to the end of said plates opposite said pivotal means.

12. As an article of manufacture, an insulating arc interrupting member for a knife blade switch comprising side plates of oval form, pivotal means at one end of said member, a barrier between said plates extending part way across adjacent the center of said member and an auxiliary barrier extending approximately to the outer end of said member.

13. As an article of manufacture, an insulating arc interrupting member for a knife blade switch comprising side plates, pivotal means at one end of said member, a centrally disposed barrier between said plates extending part way across said member, hinge means in said member at said barrier portion and an extension barrier around the outer edge between said plates extending substantially to the end thereof.

BENJAMIN E. GETCHELL.