Feb. 11, 1930. A. G. STEINMAYER 1,747,035

ELECTRICAL SWITCH

Filed July 27, 1925

Fig. 1.

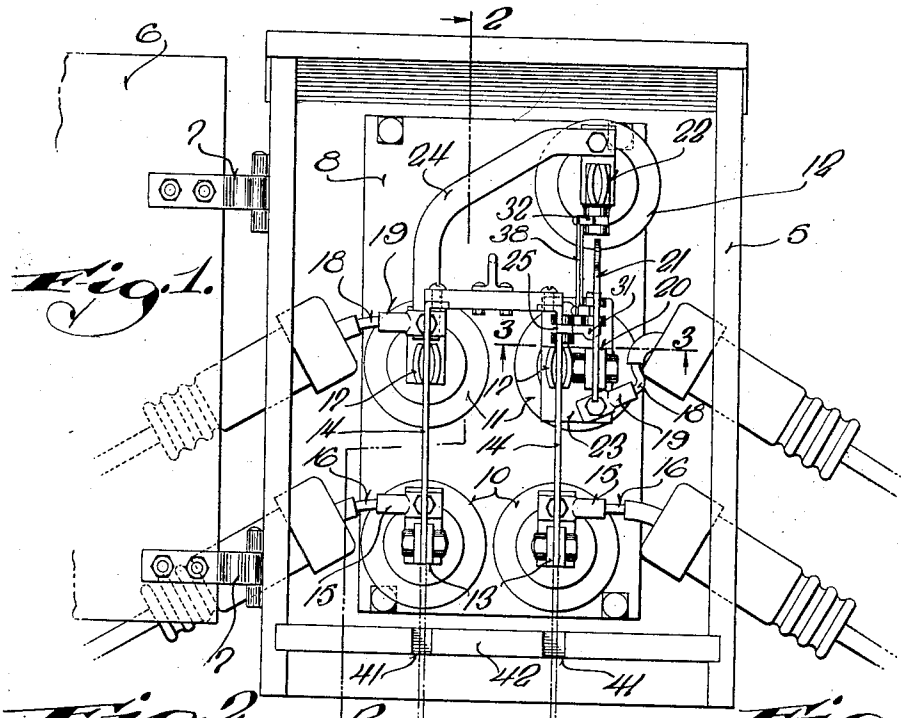


Fig. 2.

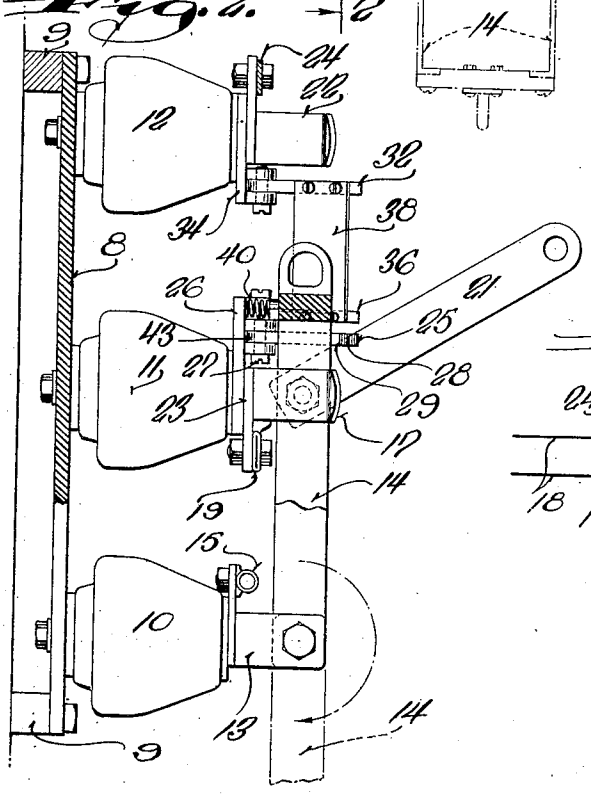


Fig. 3.

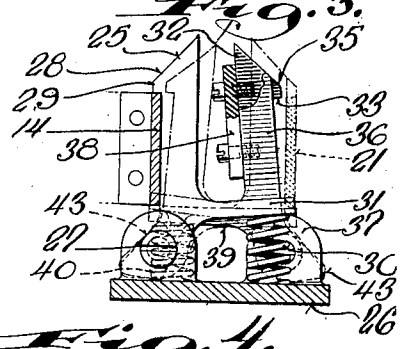
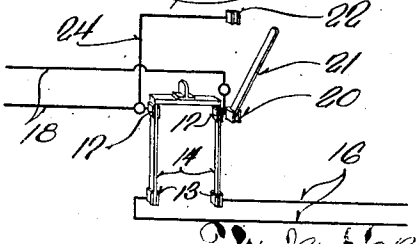


Fig. 4.



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UNITED STATES PATENT OFFICE

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ELECTRICAL SWITCH

Application filed July 27, 1925. Serial No. 46,349.

This invention relates to certain new and useful improvements in electrical switches and refers more particularly to a switch especially adapted for use in arc lamp circuits.

In arc circuits it is absolutely essential that the circuit be complete at all times and this invention contemplates as one of its objects the provision of an improved interlocking arrangement whereby but one switch can be pulled at one time so that the circuit will never be broken.

Another object of this invention resides in the provision of an improved device of the character described having two switches, each provided with a locking device so connected that one switch cannot be pulled to open position until after the other has been fully closed.

A further object of this invention resides in the provision of an improved device of the character described which is of extremely simple construction and which, while described as applied to arc circuits, may be employed in any other type of circuit where it will perform its functions in a satisfactory manner.

And a still further object of this invention resides in the provision of an improved switch construction adapted to be housed within a protecting housing and having a means whereby the position of the main switch may be readily indicated.

With the above and other objects in view which will appear as the description proceeds, my invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

In the accompanying drawing, I have illustrated one complete example of the physical embodiment of my invention constructed according to the best modes I have so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a view in elevation of a switch embodying my invention, the door of the protecting housing being in open position and partly broken away;

Figure 2 is a view, partly in side elevation and partly in section, being taken through Figure 1 on the plane of the line 2—2;

Figure 3 is an enlarged, fragmentary, detail view, partly in section and partly in elevation, taken through Figure 1 on the plane of the line 3—3 and illustrating the improved switch interlock; and

Figure 4 is a diagrammatic view of the manner of incorporating my improved switch in an arc circuit.

Referring now more particularly to the drawing, in which like numerals designate like parts throughout the several views, the numeral 5 designates a protecting housing of suitable construction adapted to be normally closed by a door 6 hinged thereto, as at 7. A panel board 8 is fixed in the housing on spacing supports 9 and has secured thereto two pairs of insulators 10 and 11 and a single insulator 12, the insulators 10 having fixed thereto suitable hinge terminals 13 for mounting the blades 14 of the main switch.

A socket 15 is connected with the hinge members 13 to facilitate the electrical connection therewith of the conductors 16 of the auxiliary circuit. Mounted on each insulator 11 is a spring contact or clip member 17 adapted to receive the free end portion of the adjacent switch blade to electrically connect its conductor 16 with the conductor 18 of the main circuit. The conductors 18 are electrically connected with the contacts 17 by socket members 19.

Also mounted on the insulator 11 adjacent the insulator 12 is a hinge terminal 20 in which the inner end of an auxiliary contact blade 21 is mounted, the free end thereof being engageable in a spring contact 22 mounted on the insulator 12. The hinge terminal 20 is in electrical contact with the line or conductor 18 connected with the adjacent contact clip 17 preferably by being fixed upon a common base 23 of conducting material and the contact clip 22 is electrically connected with the other spring contact 17 by a conductor or lead 24. When the main switch is

closed, the main circuit is connected with the auxiliary circuit, but when the main switch is open and the auxiliary switch is closed, the main circuit is completed through the line 18 connected with the auxiliary switch to the other line 18 through the auxiliary switch contact 22 and the conductor 24.

In order to prevent the disruption of the main line circuit when the switch 14 is opened, an interlock is provided between the main and auxiliary switches to prevent the opening of one before the other has been fully closed. This interlock comprises a latch element 25 of approximately L shape and pivotally supported from a base 26 mounted on the insulator 11 carrying the auxiliary switch by a pin or other member 27. The upper end of the latch element vertical arm is inclined downwardly and inwardly, as at 28, and has a locking lug 29 thereon adapted to engage over the adjacent blade 14 of the main line switch when in fully closed position, being normally urged to this position by a contractile spring 30 confined between the lateral arm portion of the L 31 and the base 26. The upper end of the latch element being of cam shape or inclined facilitates the closing of the main switch in the event the lug 29 is not entirely free of the switch blade.

The arm 31 against which the spring 30 acts extends into the path of the auxiliary blade 21, as best illustrated in Figure 3, so that assuming the main switch is locked in closed position, see Figure 3, full closing of the auxiliary blade 21 depresses arm 31 against its spring and moves the latch element on its pivot 27 free of the main switch. Opening of the main switch actuates an L shaped latch element 32 of a construction somewhat similar to the latch element 25 which engages its locking lug 33 over the auxiliary switch and prevents its unauthorized opening. The latch element 32 is mounted on a plate 34 fixed to the insulator 12 and the upper end 35 of its vertical arm is inclined or cam-shaped to facilitate its movement by the auxiliary switch in the event the same is not entirely out of its path in closing.

The latch element 32 is connected with an L shaped actuating member 36 which is pivotally secured to lugs 37 formed on the base 26 and the vertical arm portion thereof is connected with the latch element 32 by a member 38 to coordinate their movements, the member 38 being preferably of insulating material. The transverse or lower arm portion 39 of the actuating member extends into the path of the adjacent main switch blade 14 and an expansile spring 40 confined between it and the base 26 normally urges the actuating member and latch element 32 to locking position.

With the auxiliary switch 21 closed and the main switch open, the main switch is moved to its full line position in Figures 1 and 2, the lower edge of the free end of the blade 14 on the right side with reference to the drawing, depresses the free end of the actuating member arm 38 against its spring 40 moving the latch element 32 to free its lug 33 of the auxiliary blade. The auxiliary blade is then free to be swung to its full line position illustrated in Figure 2 and as its edge leaves the arm 31 of the latch element 25, the spring 30 expands and engages the locking lug 29 over the main switch.

When it is desired to open the main switch and close the auxiliary switch, the auxiliary switch depresses the arm 31 of the latch element 25 as the same closes disengaging the latch element from the adjacent switch blade 14, as previously described. The main switch is then moved to open position, the spring 40 expanding moves the latch member 32 to engage its locking lug 33 over the auxiliary switch.

Movement of the latch elements under the action of their springs is restricted by cam shaped projections 43 extended therefrom at their pivots. The toe portion of each projection abuts the supporting base 26 after a predetermined movement of the same.

As it is desirable that some means be afforded to indicate the position of the main circuit switch, slots or notches 41 are formed in the bottom 42 of the switch housing in line with the switch blades 14 so that when the main switch is open the same extends outwardly of the housing, as illustrated by the dotted lines.

From the foregoing description taken in connection with the accompanying drawing, it will be readily apparent to those skilled in the art to which an invention of this character appertains that I provide an improved and novel switch construction wherein one switch cannot be opened until the other has been closed and that the position of the switch is visually indicated at all times.

I claim:

1. In an appliance of the character described, a protecting housing, a door normally closing said housing and permitting ready access to the interior thereof, a switch appliance mounted within the housing, and means normally concealed in the housing and operable to indicate from the exterior of the housing the position of the switch apparatus, said means being independent of the door.

2. In an appliance of the character described, a protecting housing, a door normally closing said housing and permitting ready access to the interior thereof, a switch appliance mounted within the housing and including a movable switch member normally concealed within the housing, and means permitting the projection of the movable switch member exteriorly of the housing without preventing closing of the door to indicate the

position of said member from the exterior of the housing.

3. An appliance of the character described, comprising a housing having an aperture therein, a main switch member, an auxiliary switch member, an interlock between the switch members whereby one of the switch members must be closed before the other can be opened, and means projectable through the housing aperture to indicate the position of the main switch member from the exterior of the housing.

4. In an appliance of the character described, a protecting housing having an opening in one side wall, a door normally closing the housing and permitting ready access to the interior thereof, and a switch member actuated from one position to another, said switch member being concealed within the housing when in one position and projected through the housing opening when in the other position to indicate said position from the exterior of the housing.

In testimony whereof I affix my signature.

ALWIN G. STEINMAYER.