

UNITED STATES PATENT OFFICE.

WALTER M. AUSTIN, OF SWISSVALE, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

ELECTRIC SWITCH.

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To all whom it may concern:

Be it known that I, WALTER M. AUSTIN, a citizen of the United States, and a resident of Swissvale, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Electric Switches, of which the following is a specification.

My invention relates to electric switches and more particularly to those of the double-throw plunger type, and it has for its object the provision of a switch of this character which is accurate, possessed of great durability, and which occupies a minimum amount of space.

Switches constructed in accordance with my invention are designed particularly for use in connection with circuit breakers, to control auxiliary circuits that are used to actuate signaling apparatus to show the position of the circuit breaker, and they may also control auxiliary circuits which are used to operate interlocking devices on other circuit breakers, so that the opening or closing movement of the main circuit breaker will automatically cause an associated circuit breaker to open or close, as desired.

One form in which my invention may be applied is shown in the accompanying drawing, wherein—

Figure 1 is a side elevation of a circuit breaker with my switch applied thereto;

Fig. 2 is a longitudinal sectional view of the switch;

Fig. 3 is an end elevation looking from the left of Fig. 2;

Fig. 4 is a side elevation of the movable contact carrier;

Fig. 5 is a plan view of the same;

Fig. 6 is an end elevation of the carrier, and

Figs. 7 and 8 are plan and side elevational views, respectively, of the movable contact member.

For purposes of illustration, I have shown my switch as applied to a panel 9 on which is supported an ordinary form of carbon circuit breaker having the usual brush member 10 and arcing tips 11, a pivoted supporting arm 12 being provided for supporting the brush and carrying it into and out of engagement with a pair of stationary contact members 13.

My device consists of a tubular casing

member 14 whose inner face is slightly flattened at the points of engagement by bolt heads 15 to prevent rotation of the bolts when their holding nuts are being turned. The casing member 14 is also provided with a pair of slots 16.

A movable contact carrier 17, of tubular form, is provided with two pairs of openings 18 (Fig. 5) through which extend the up-turned ends, or contacting faces, 19 of a pair of movable contact members 20 (Figs. 7 and 8), the faces 19 of these members lying in position to engage the bolt heads 15 as the movable carrier moves back and forth within the casing member 14.

A plunger 21 extends into the contact carrier 17 and has a pair of lugs 22 which abut against the movable contact members 20 and hold them in position against the inner wall of the movable contact carrier 17, so that their contacting faces 19 protrude through the openings 18.

The plunger 21 is provided with a hole 23 therethrough, and the movable contact carrier 17 is provided with a hole 24. A pin 25 extends through the holes 23 and 24 to maintain the movable contact carrier and the plunger in proper relative position, and the pin has reduced extensions 26 adapted to lie in the slots 16 of the casing member 14, to prevent rotation of the plunger and movable contact carrier, and thereby insure proper alinement of the contacting faces 19 with the bolt heads 15.

The plunger 21 has an enlarged portion 27 against which one end of spring 28 abuts, the other end of the spring engaging a washer 29 that is supported on a shouldered portion 30 of a tubular casing member 31.

The spring 28 is under compression and normally maintains the plunger in the position shown in Fig. 2.

The movable contact carrier 17 abuts against the washer 29 to limit the outward movement of the plunger and the parts carried thereby, when the opening of the circuit breaker causes the plunger to be released.

The tubular member 32 having its inner end threaded for engagement with a tubular member 31, and a collar 33 on its other end, serves as a clamping member to secure the switch to the panel, the member 31 being cemented in the casing 14.

To remove the switch, the tubular mem-

bers 31 and 32 are unscrewed the one from the other, thus permitting the removal of the tubular member 14, and the parts carried thereby, from the wall. The plunger 21 is then depressed against the spring 28 until the pin 25 is clear of the slots 16. The pin 25 may then be removed to permit withdrawing of the plunger from the carrier 17 and the contact members 20 are then removed. The ordinary length of travel of the plunger 21 inwardly is not sufficient to cause the pin 25 to pass the ends of the slots 16, as the plunger normally moves only under the action of the brush member 10.

When the plunger is depressed, as shown in Fig. 1, by movement of the circuit breaker to closed position, a connection is effected between the terminal members 40 and 41 and an auxiliary circuit carrying a red lamp member is thereby closed, to show that the circuit breaker is closed. When the circuit breaker is opened, the brush 10, of course, releases the plunger 21 and permits the spring 28 to move it to its retracted position, as shown in Fig. 2, thereby breaking the red lamp circuit and closing another circuit through terminals 40 and 42. This second circuit may illuminate either a white or green lamp to show that the circuit breaker is open.

In like manner, connections may be made between terminals 43 and 44, and 43 and 45, to close circuits which actuate other mechanism, so as to effect the proper relative positioning of a series of associated circuit breakers.

It is obvious that various changes, in details of construction and in the manner of application of my device, might be made without departing from the spirit of the invention, as set forth in the appended claims.

I claim as my invention:—

1. In combination, in an electric switch, a tubular casing member, longitudinally-disposed stationary contact studs extending

through the wall of the casing member, a movable contact member having longitudinally-spaced engaging surfaces and adapted to simultaneously engage a plurality of the stationary contact members, a tubular carrier for the movable contact member slidably mounted in the casing member, a plunger also slidably supported in the casing and connected to the carrier, and a spring for normally maintaining the plunger in one of its extreme positions.

2. In combination, in an electric switch, a tubular casing member, stationary contact members extending through the wall of the casing member, a movable contact member adapted to engage the stationary contact members, a tubular carrier for the movable contact member slidably mounted in the casing member, a supporting panel, a tubular clamping member having a shoulder on one end in position to abut one side of the panel and having its other end extending through the panel and screw threaded into the casing member to clamp the panel between the said shoulder and the end of the casing member, and a plunger extending through the clamping member and operatively connected to the said carrier.

3. In an electric switch, a plurality of spaced stationary contact members, a movable contact carrier of tubular shape with perforations therein registering with the stationary contact members, a movable contact member consisting of a strip of conducting material having upturned ends and lying within the carrier, and a plunger extending within the carrier in position to maintain the movable contact in position against the wall of the carrier, with the said upturned ends extending through the perforations in the carrier.

In testimony whereof, I have hereunto subscribed my name this 22nd day of October 1920.

WALTER M. AUSTIN.