March 7, 1944. E. T. PLATZ 2,343,264

SWITCH

Filed Nov. 6, 1942 3 Sheets-Sheet 1

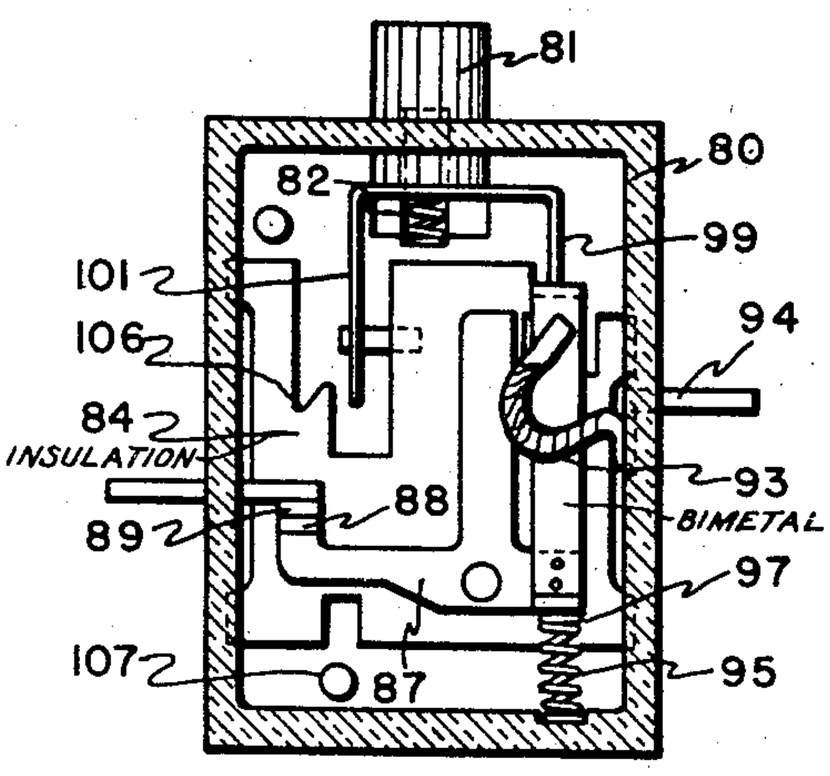

Fig. 1 "ON"

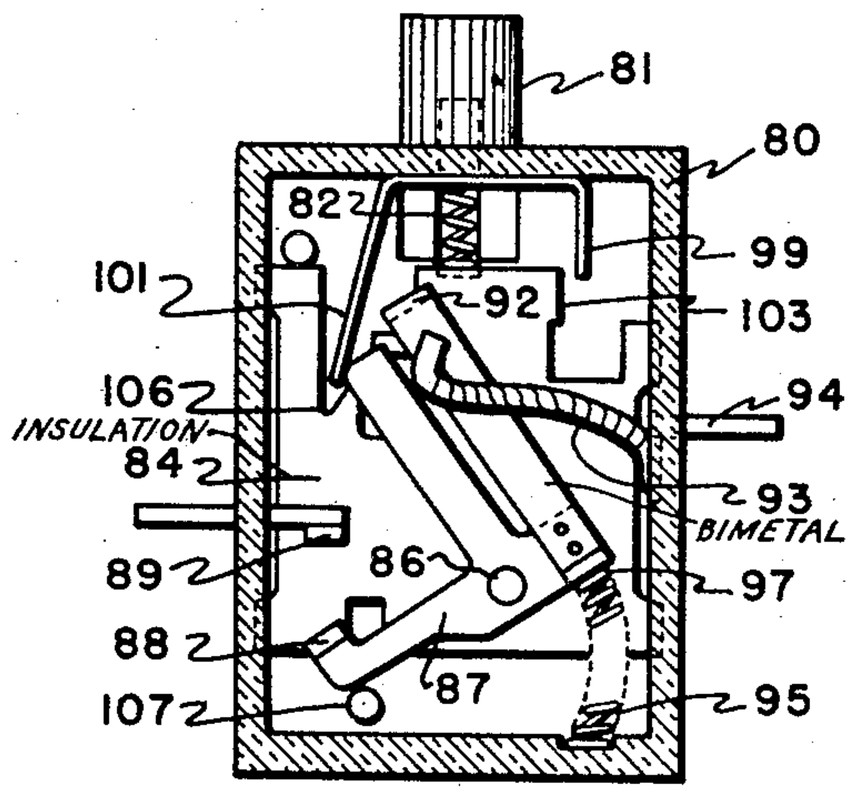

Fig. 2 "OFF"-TRIPPED

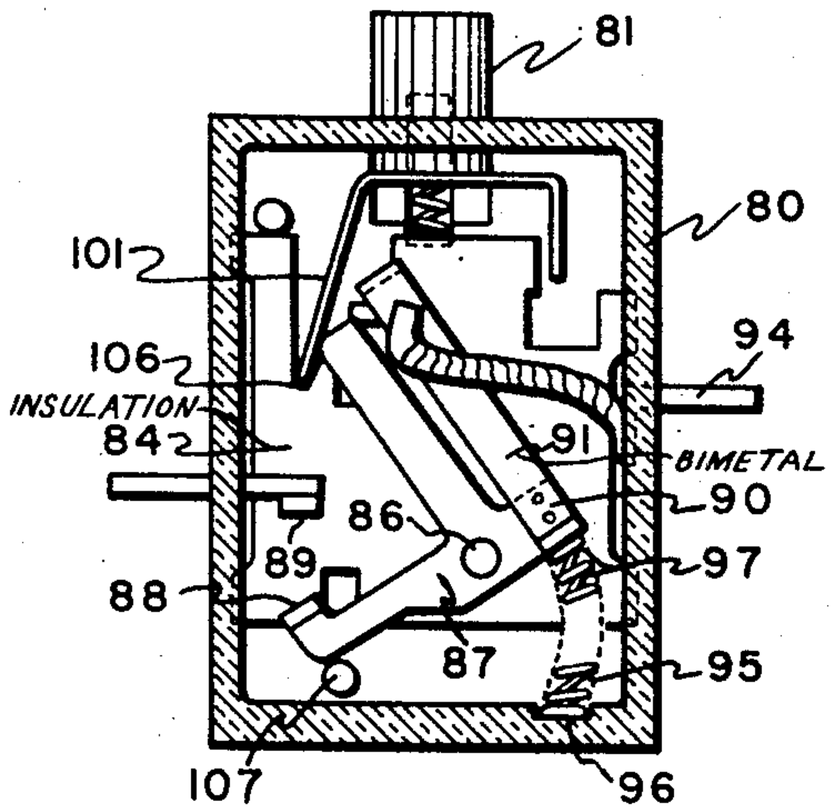

Fig. 3
FIRST PART OF RESET

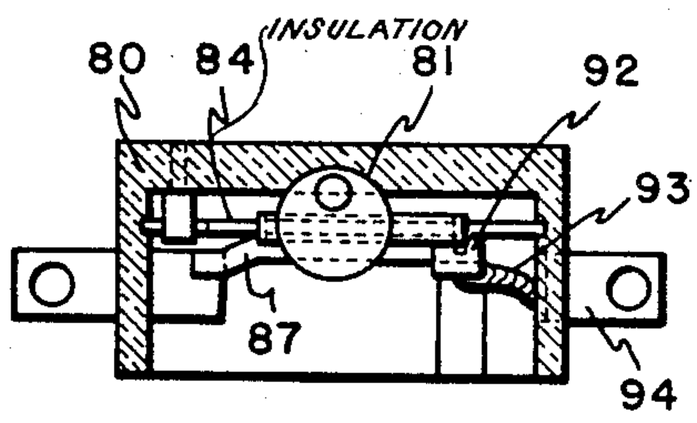

Fig. 4

INVENTOR
Elwood T. Platz
BY Daniel G. Fuller
ATTORNEY

March 7, 1944. E. T. PLATZ 2,343,264

SWITCH

Filed Nov. 6, 1942 3 Sheets-Sheet 2

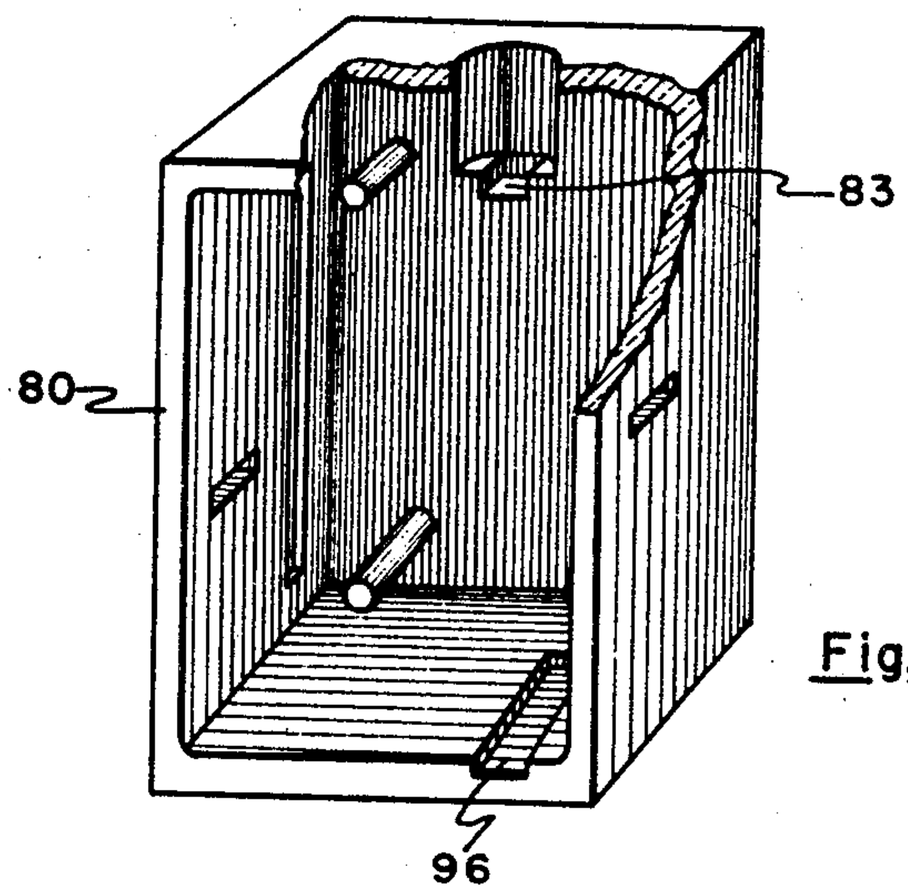

Fig. 5

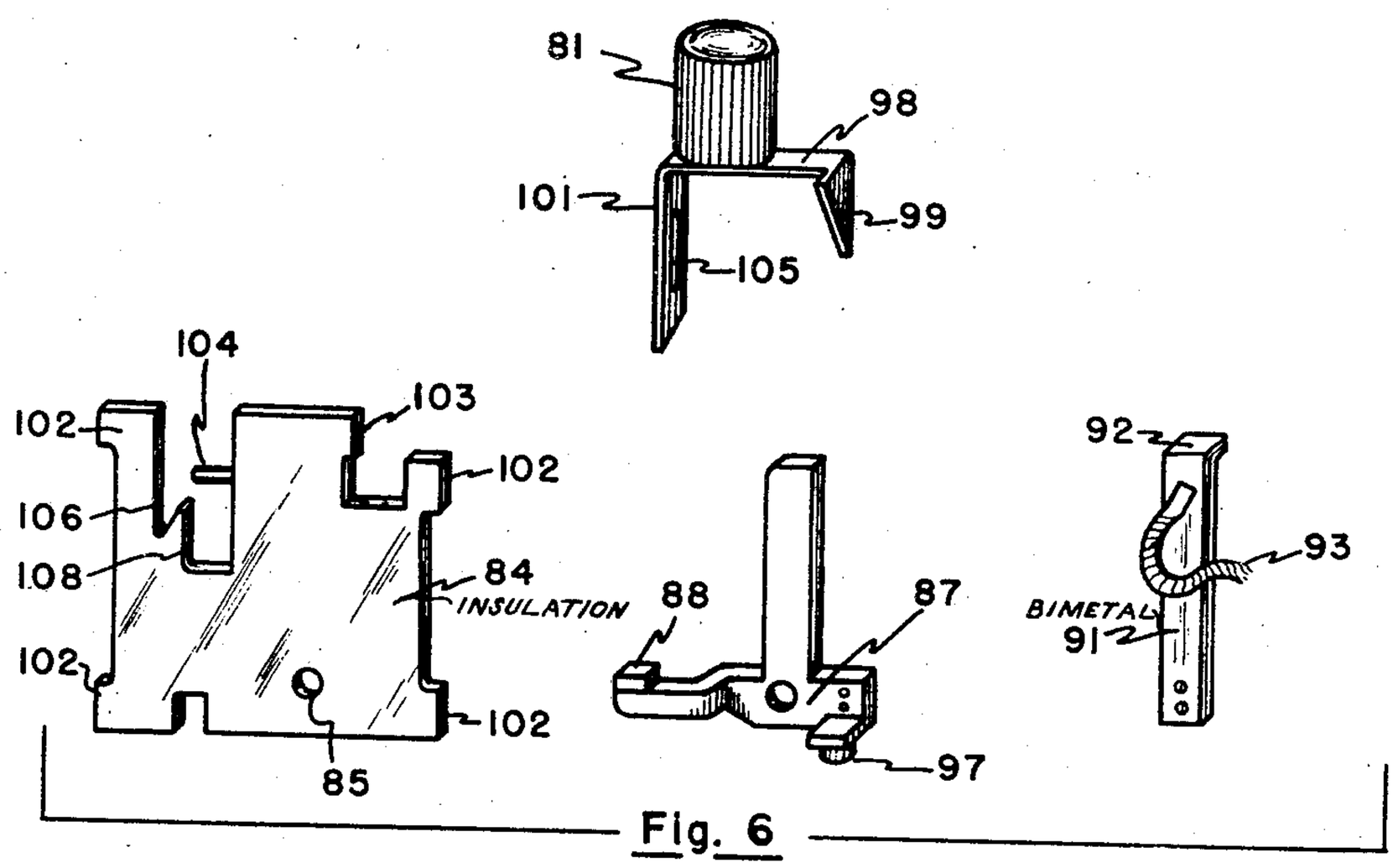

Fig. 6

INVENTOR
Elwood T. Platz
BY Daniel G. Cullen
ATTORNEY

March 7, 1944. E. T. PLATZ 2,343,264

SWITCH

Filed Nov. 6, 1942 3 Sheets-Sheet 3

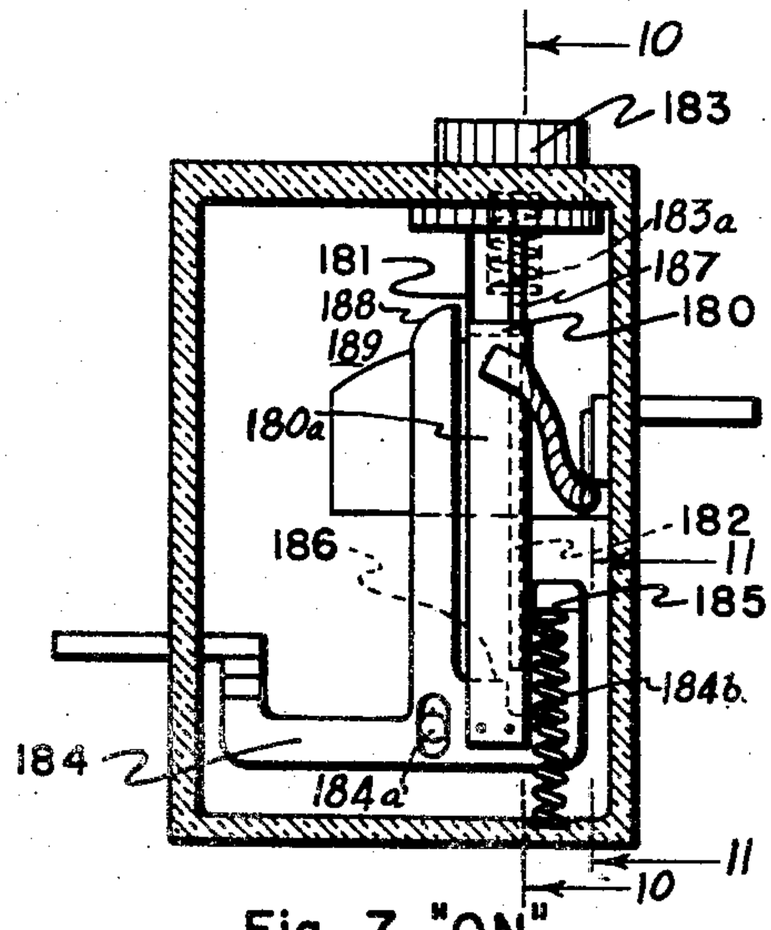

Fig. 7 "ON"

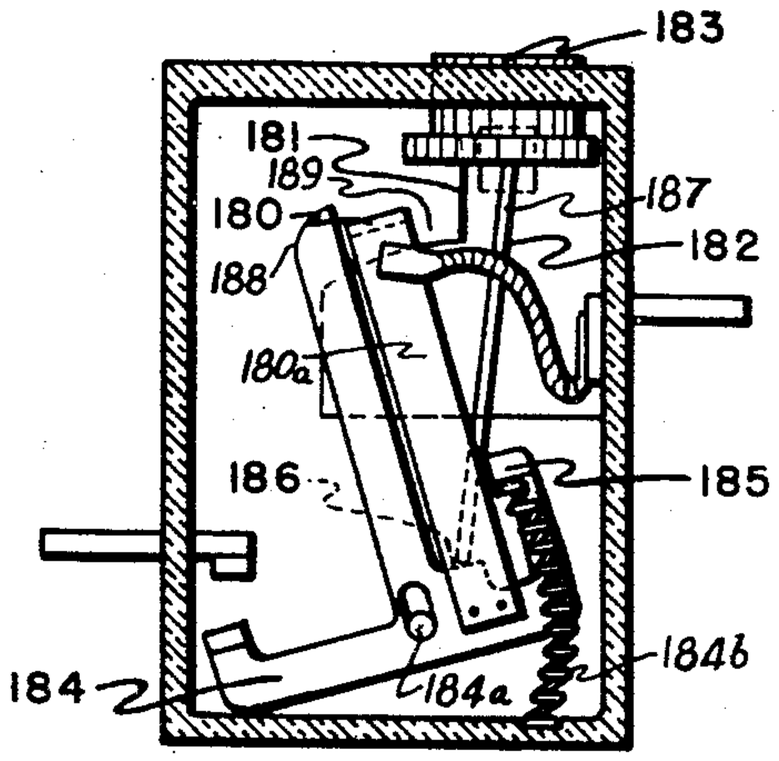

Fig. 8 First Pt. of Reset

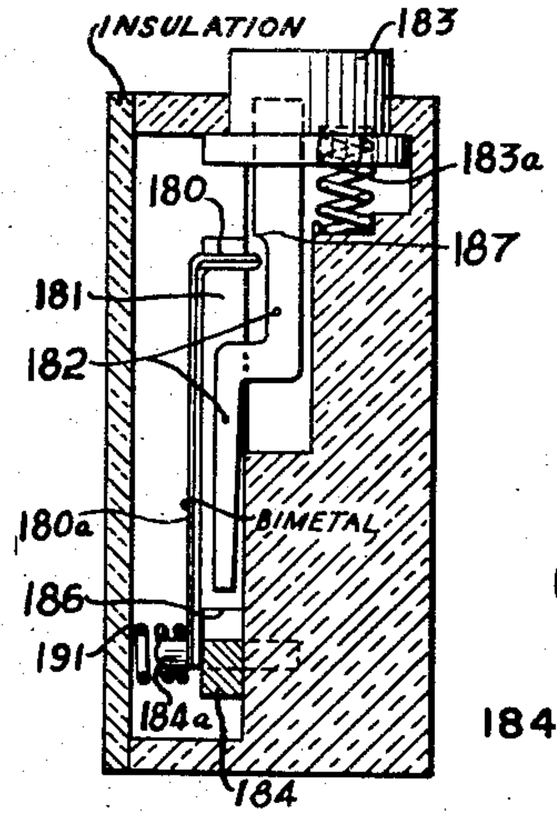

Fig. 10

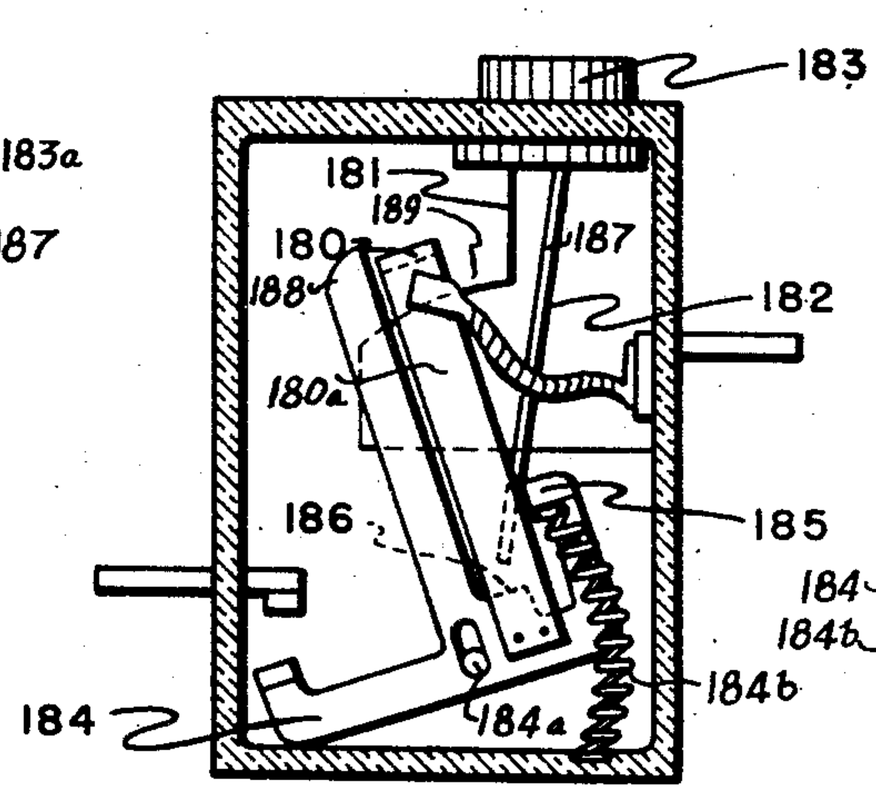

Fig. 9 "OFF" & Tripped

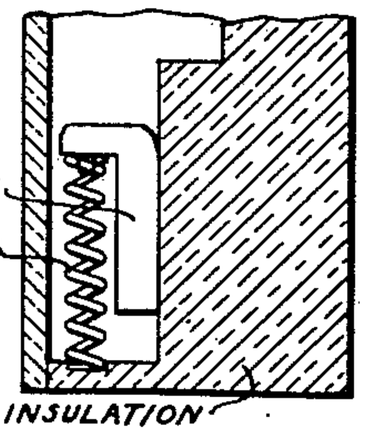

Fig. 11

INVENTOR
Elwood T. Platz
BY Daniel G. Mullen
ATTORNEY

Patented Mar. 7, 1944 2,343,264

UNITED STATES PATENT OFFICE

2,343,264

SWITCH

Elwood T. Platz, Detroit, Mich., assignor to Bulldog Electric Products Company, Detroit, Mich., a corporation of West Virginia

Application November 6, 1942, Serial No. 464,774

3 Claims. (Cl. 200—116)

This application relates to switches, generally resembling the one shown in my prior application, Serial No. 451,431, filed July 18, 1942. The switches hereof are shown in the appended drawings.

In these drawings,

Figs. 1–6 and 7–9 show two different but similar switches.

Figs. 1–3 are different position views, as indicated, in section.

Fig. 4 is a transverse section view.

Fig. 5 shows the casing, partly browen away.

Fig. 6 shows the parts of the embodiment of Figs. 1–6.

Figs. 7–9 are different position views, as indicated.

Figs. 10–11 are section views on lines 10—10, 11—11, of Fig. 7.

Figs. 1–6 show a switch having a casing 80 in which is slidably movable an actuator in the form of a push button 81 constantly biased outwardly by a spring 82 within it and seated in a groove 83 of the casing. Within the casing is a plate or carrier 84 having a hole 85 receiving a pivot pin 86 of a contactor 87 having a contact 88 for engaging a stationary contact 89. Riveted at 90 to the contactor is a bimetal strip 91 having an end formed as a latching hook 92, and a flexible connector 93 establishes connection between the free end of the bimetal strip and a load terminal 94. A coil spring 95 has one end seated in the casing at 96 and its other end engages a spring seat 97 of the contactor 87. A thin metal U shaped strap 98 has two separate parts, moving in unison; one part is an unlatching cam 99 and the other part is a relatching cam 101; strap 98 is fixedly mounted on the push button or handle 81.

The plate 84 has guide portions 102 for guiding the motion of this plate in the casing, these portions engaging side walls of the casing. Plate 84 also has a holding means or latching surface 103 to be engaged by an edge of the hook 92 or latch of the contactor. Plate 84 also has a handle limiting pin 104 adapted to be engaged by the slot 105 of the relatching cam 101 and also has a relatching groove 106 adapted to be engaged by the relatching cam 101.

The casing has a stop 107 adaped to be engaged by the contactor in open circuit position.

In the closed circuit position the parts are as indicated in Fig. 1 with slot 105 receiving pin 104 of the plate, so that the bias of spring 82 to thrust handle 81 to extreme outward position is inhibited, handle 81 remaining in an intermediate position, and with the contactor latched to the plate 84 and with the circuit closed at 88—89. Spring 95 biases the parts for contact pressure.

The circuit may be opened, manually, by pushing the handle 81 inwardly whereupon unlatching cam 99 cams or pushes latch 92 out of engagement with the latching surface or holding means 103, or automatically, by warping of bimetal strip 91 also to pull latch 92 off plate portion 93, whereupon spring 95 rocks the contactor to open circuit position, Fig. 2, the contactor being stopped by casing stop 107. In such action the contactor will move the relatching cam 101 to release the engagement of that cam with pin 104 of the plate 84, thus freeing handle 81 for outward movement, and to move the relatching cam 101 towards the notch 106 of plate 84.

When the contactor is biased by its spring 95 to move the relatching cam 101 away from pin 104, it first pushes cam 101 against the portion 108 of the plate 84 and the parts there remain until the handle is released by the operator to be pushed outwardly to extreme position by spring 82. When the handle is thus released, the contactor continues to bias cam 101 and pushes that cam into alinement with the notch 106 of the plate 84, the end of the cam 101 clearing and crossing over the hump that defines notch 106 of plate 84. This places the cam 101 into relatching position.

For relatching the contactor, and initiating the reclosing of the circuit from the open circuit position, the handle 81 is pushed inwardly and because cam 101 is alined with the notch 106 of the plate 84, handle movement pushes plate 84 inwardly and this causes the contactor to rock clockwise on its pivot 86 because of its engagement with stop 107 to return to latching position with respect to the plate 84 while maintaining contact separation. This frees the cam 101 from the influence of the contactor and the contactor spring 95. Now when the handle is released, the handle will be pushed outwardly by spring 82, and the cam 101 will leave the notch 106 and return to the closed circuit position where it is well clear of surface 108 of plate 84, to place slot 105 over pin 104, so that travel outward of the handle may be limited by the hold on pin 104 of the plate 84 provided by slot 105, to indicate the contactor position.

When the cam 101 leaves plate notch 106, it frees that plate and the contactor and thereupon spring 95 will bias the contactor 87 and the plate 84 towards contact 89 until the circuit is closed at 88—89.

It will be observed that whereas in the construction shown in application Serial No. 451,431, there is employed a relatch cam, and a translator pivotally connected to the contactor, and separate from the relatch cam, and biased by the contactor spring directly, to move in response to contactor movements, in this construction, cam 101 performs all of the functions of the translator and relatch cam of Serial No. 451,431.

In the embodiment of Figs. 7–9, the contactor is latched directly to the casing, rather than to a support member, and the relatching cam and the unlatching cam comprise a single springy metal strip (182) secured to the handle, rather than two separate parts (99, 101).

A latch hook 180 on the end of a bimetal strip 180*a* engages a latching surface 181 of the case. A spring strip 182 is mounted on the handle 183, the latter being biased outwardly by a spring 183*a*. In the closed circuit position the strip 182 is out of line with the relatching lug 186 of the contactor 184, pivoted to the casing by the pin 184*a*, but when this contactor moves to the open circuit position, under the bias of spring 184*b*, its lug 185 moves strip 182 to be directly above relatching lug 186 of the contactor, where by downward push on the handle 183 causes relatching of the unlatched contactor to the case at 181, while maintaining contact separation.

The edge 187 of strip 182 is in the form of a cam arranged for engaging the hook end of latch 180 and releasing it off the holding surface 181 of the case.

The contactor has a portion 188 riding on the casing wall 189 for guiding the contactor in its movement; and pivot pin 184*a* has one end seated in a casing recess and the other held in place by a coil spring 191.

Otherwise, the action of the parts is substantially the same as that just described for the embodiment of Figs. 1–6.

I claim:

1. In a switch, a stationary contact, a movable contactor for engaging it, a latch for the contactor, spring means for moving the contactor towards and for urging the contactor against the contact when the contactor is latched, and for moving the contactor from the contact when the contactor is unlatched, an actuator, an unlatching means for unlatching the contactor, when it is latched, and a relatching means for relatching the contactor when it is unlatched, the relatching means being movable by the contactor when the latter moves upon being unlatched for moving to a position where it can cause contactor relatching on the next movement of the relatching means, the unlatching and relatching means being carried by the actuator to move in unison with each other and the actuator, and being separate elements.

2. In a switch, a stationary contact, a movable contactor for engaging it, a latch for the contactor, spring means for moving the contactor towards and for urging the contactor against the contact when the contactor is latched, and for moving the contactor from the contact when the contactor is unlatched, an actuator, an unlatching means for unlatching the contactor, when it is latched, and a relatching means for relatching the contactor when it is unlatched, the relatching means being movable by the contactor when the latter moves upon being unlatched for moving to a position where it can cause contactor relatching on the next movement of the relatching means, the unlatching and relatching means, being carried by the actuator and being integral.

3. In a switch, a stationary contact, a movable contactor for engaging it, a latch for the contactor, spring means for moving the contactor towards and for urging the contactor against the contact when the contactor is latched, and for moving the contactor from the contact when the contactor is unlatched, an actuator, an unlatching means for unlatching the contactor, when it is latched, and a relatching means for relatching the contactor when it is unlatched, the relatching means being movable by the contactor when the latter moves upon being unlatched for moving to a position where it can cause contactor relatching on the next movement of the relatching means, the unlatching and relatching means, being carried by the actuator to move in unison with each other and the actuator.

ELWOOD T. PLATZ.