Jan. 28, 1941. W. H. FRANK ET AL 2,229,843

SWITCH

Original Filed Nov. 29, 1937 2 Sheets-Sheet 1

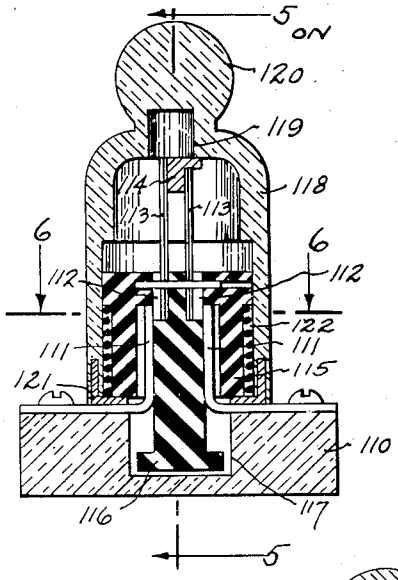


Fig. 1

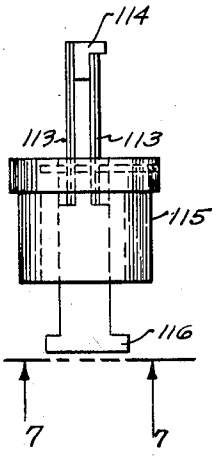


Fig. 2

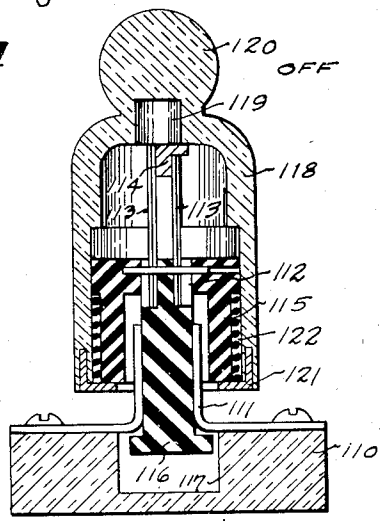


Fig. 3

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SWITCH

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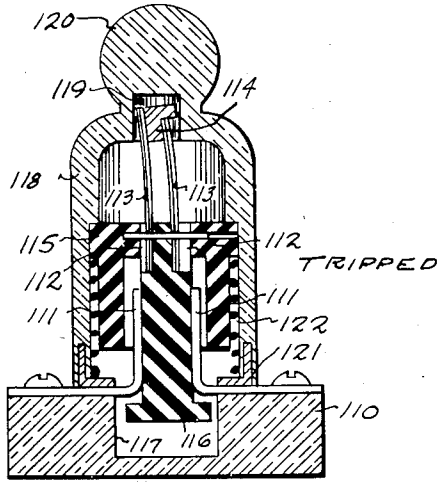


Fig. 4

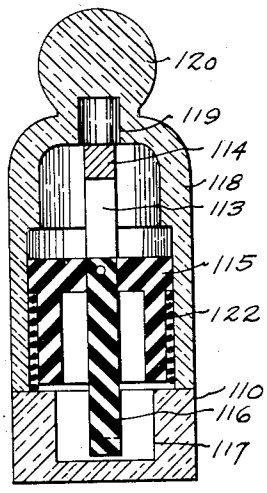


Fig. 5

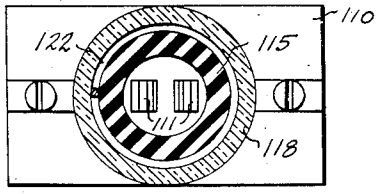


Fig. 6

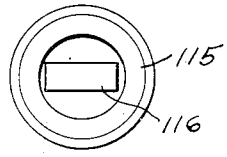


Fig. 7

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UNITED STATES PATENT OFFICE

2,229,843

SWITCH

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Original application November 29, 1937, Serial No. 176,958, now Patent No. 2,211,107, dated August 13, 1940. Divided and this application April 1, 1940, Serial No. 327,190

7 Claims. (Cl. 200—116)

This application discloses a circuit protector and circuit control switch and is a division of our prior application, Serial No. 176,958, filed November 29, 1937, now Patent No. 2,211,107, issued August 13, 1940, which in turn is a continuation-in-part of another prior application, Serial No. 58,870, filed January 13, 1936, now Patent No. 2,108,812 issued February 22, 1938.

For an understanding of the switch herein disclosed, reference should be had to the appended drawings. In these drawings,

Fig. 1 shows an overload protective switch in the "on" or closed circuit position;

Fig. 2 is an elevation view of a part thereof;

Figs. 3 and 4 are views similar to Fig. 1 but showing the parts in the "off" or open circuit and "tripped" or overload released positions, respectively;

Figs. 5–6 are sections on lines 5—5 and 6—6 of Fig. 1;

Fig. 7 is a view as if on line 7—7 of Fig. 2.

The drawings show an overload release switch characterized by the fact that all of the parts of the switch are enclosed within a casing which itself forms a handle part of the mechanism of the switch, thus simplifying the construction and protecting all the parts against outside influences, and also minimizing the space required for the switch. The switch comprises a base 110 on which are mounted stationary contacts 111 adapted to be engaged by movable contacts 112 bridged through an overload release latch in the form of bimetal elements 113 having a bridging block 114 at their free ends, parts 112—114 all being mounted on a slide block 115 having an extension 116 seated within a socket 117 of the base 110, with parts 112 being in cells of blocks 115 receiving contacts 111. Telescoped around the parts just described is a handle or casing 118 having a socket 119 formed in a part 120 thereof and the casing has its lower end formed with a flange 121 with which reacts a compression spring 122 tending normally to separate the slide block and the lower end of the casing.

The operation of this form of switch is as follows: When the switch is in the "on" position, Fig. 1, the circuit is established through contacts 111—112, thermal elements 113 and bridging block 114 and the parts are held immobile against the influence of the spring 122 by the abutment of the bridging block 114 with the upper end of the casing 118 near the socket 119 as indicated in Fig. 1.

To open the circuit manually the operator pulls up on casing 120 and this casing, with the slide block within it, moves upwardly to the position of Fig. 3, the relative position of the slide block and casing not being changed; to close the circuit the operator pushes down on casing 120. On manual movement to and from "on" and "off" positions, the slide block and casing move as a unit.

On overload, however, the thermal elements 113 warp and shift the bridging block 114 into alinement with the socket 119 of the casing, whereupon spring 122 moves the slide block further into the casing to separate the contacts 111—112, with the casing, however, remaining stationary with respect to the base of the switch and with the contacts separated as shown in Fig. 4.

For relatching the operator pulls upwardly on the casing until the cup 119 of the casing clears the bridging block 114, whereupon the latter, the elements 113 being cooled, return to its position of Fig. 3 and the casing and slide block assume a relative position like that of Fig. 3 with the circuit open but with the slide block and casing latched to each other and ready to be moved as a unit to the closed circuit position of Fig. 1.

Now having described the switch hereof, reference will be had to the claims which follow:

1. A circuit interrupter comprising a pair of stationary contacts, a movable insulation block having cells constantly closed by said stationary contacts, a contact forming a wall of each cell and carried by the block and movable therewith to engage or be free of a stationary contact in the corresponding cell, the block contacts being electrically connected by circuit current responsive latching means on the block for bridging the stationary contacts and operable for opening the circuit on overload, a casing surrounding the block, and a spring tending to separate the block and the casing, the latch normally preventing such separation.

2. A circuit interrupter comprising a pair of stationary contacts, a movable insulation block having cells constantly closed by said stationary contacts, a contact forming a wall of each cell and carried by the block and movable therewith to engage or be free of a stationary contact in the corresponding cell, the block contacts being electrically connected by circuit current responsive latching means on the block for bridging the stationary contacts and operable for opening the circuit on overload, a casing surrounding the block, and a spring tending to separate the block and the casing, the latch normally pre-

venting such separation, the spring being between the block and the casing.

3. A circuit interrupter comprising a pair of stationary contacts, a movable insulation block having cells constantly closed by said stationary contacts, a contact forming a wall of each cell and carried by the block and movable therewith to engage or be free of a stationary contact in the corresponding cell, the block contacts being electrically connected by a circuit current responsive latch within the block for bridging the stationary contacts, the latch normally holding the block in circuit closing position, but operating, on overload, to release the block and permit it to be moved away from circuit closing position automatically, a casing surrounding the block, and a spring tending to separate the block and the casing, the latch normally preventing such separation.

4. A circuit breaker comprising a stationary contact, a movable contact, an overload release latch connected to the movable contact, a handle in the form of a casing surrounding the movable contact and latch, with the movable contact and casing arranged to be unmovable with respect to and move with each other on casing movement, when the latch holds, and with the movable contact movable free and independently of the casing when the latch releases, and a spring tending to move the movable contact with respect to the casing and so operating when the latch releases, but normally inhibited by the latch when it holds, and then being under stress.

5. A circuit breaker comprising a stationary contact, a movable contact, an overload release latch connected to the movable contact, a handle in the form of a casing surrounding the movable contact and latch, with the movable contact and casing arranged to be unmovable with respect to and move with each other on casing movement, when the latch holds, and with the movable contact movable free and independently of the casing when the latch releases, and a spring tending to move the movable contact with respect to the casing and so operating when the latch releases, but normally inhibited by the latch when it holds, and then being under stress, the casing being manipulable to be moved manually into relatching engagement with the latch and to stress the spring again after a latch release and subsequent spring relief and spring caused movement of the movable contact with respect to the casing and stationary contact, such relatching requiring movement of the casing to the movable contact, then separated from the stationary contact, and causing restressing of the spring.

6. A circuit breaker comprising a stationary contact, a movable contact, an overload release latch connected to the movable contact, a handle in the form of a casing surrounding the movable contact and latch, with the movable contact and casing arranged to be unmovable with respect to and move with each other on casing movement, when the latch holds, and with the movable contact movable free and independently of the casing when the latch releases, and a spring tending to move the movable contact with respect to the casing and so operating when the latch releases, but normally inhibited by the latch when it holds, and then being under stress, the spring reacting on the casing and on the movable contact and, when stressed, tending to move them relatively.

7. A circuit breaker comprising a stationary contact, a movable contact, an overload release latch connected to the movable contact, a handle in the form of a casing surrounding the movable contact and latch, with the movable contact and casing arranged to be unmovable with respect to and move with each other on casing movement, when the latch holds, and with the movable contact movable free and independently of the casing when the latch releases, and a spring tending to move the movable contact with respect to the casing and so operating when the latch releases, but normally inhibited by the latch when it holds, and then being under stress, the spring reacting on the casing and on the movable contact and, when stressed, tending to move them relatively, and being formed as a coiled spring surrounding the movable contact and surrounded by the casing.

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