H. P. BALL.

SNAP SWITCH.

APPLICATION FILED DEC. 4, 1906.

947,881. Patented Feb. 1, 1910.

Fig. 1.

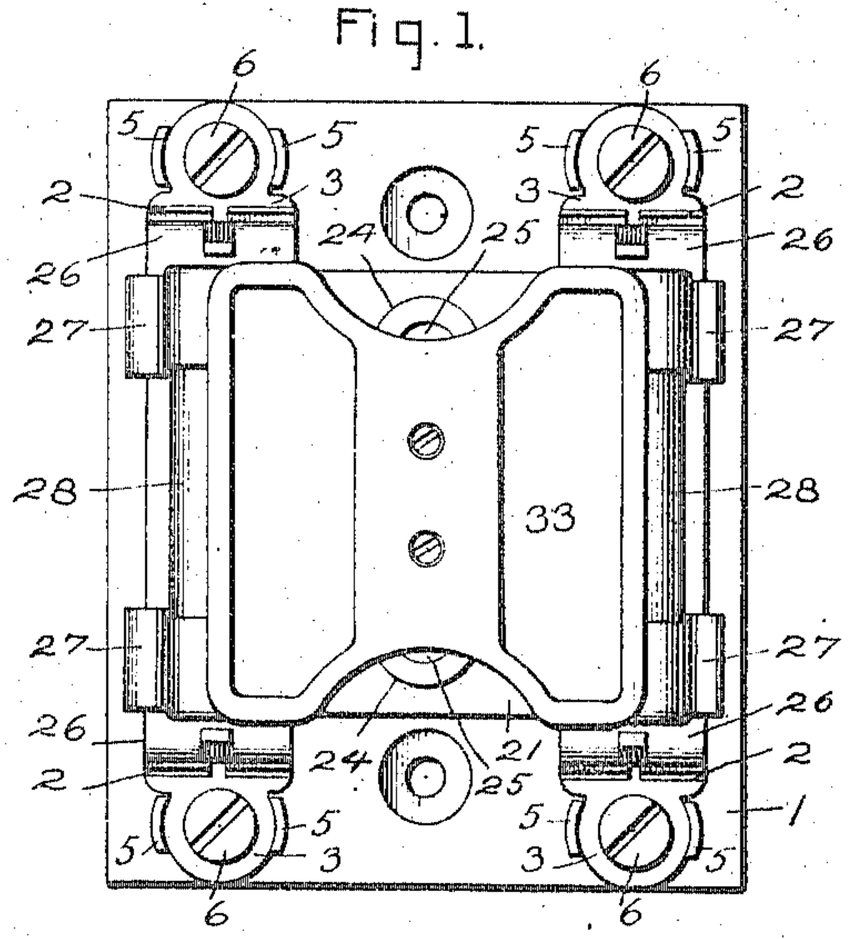


Fig. 4.

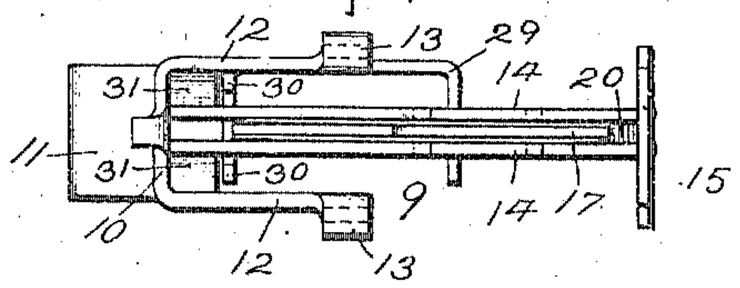


Fig. 5.

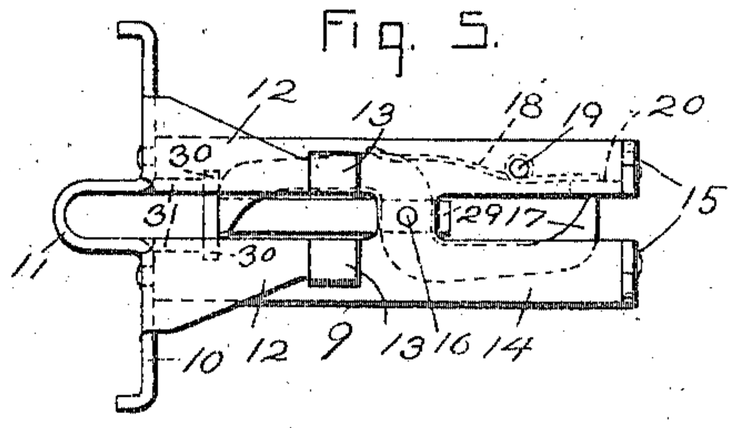


Fig. 2.

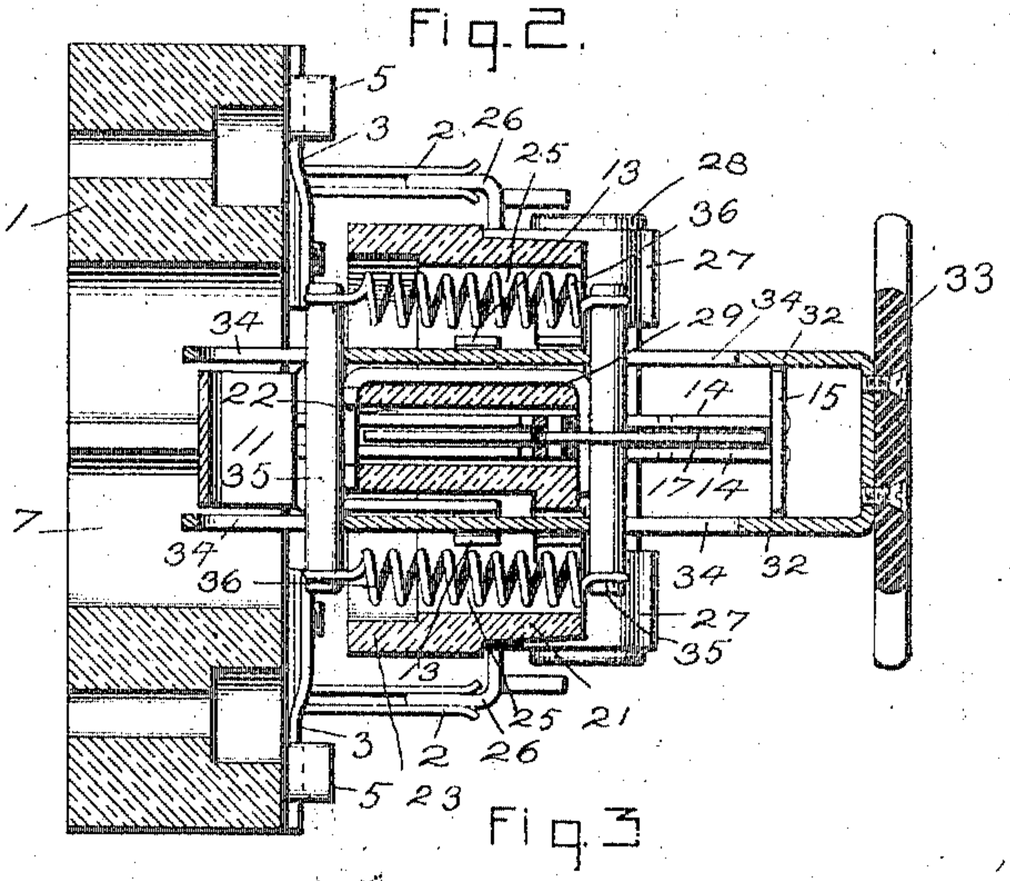


Fig. 6.

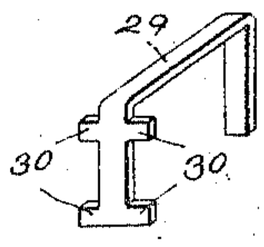
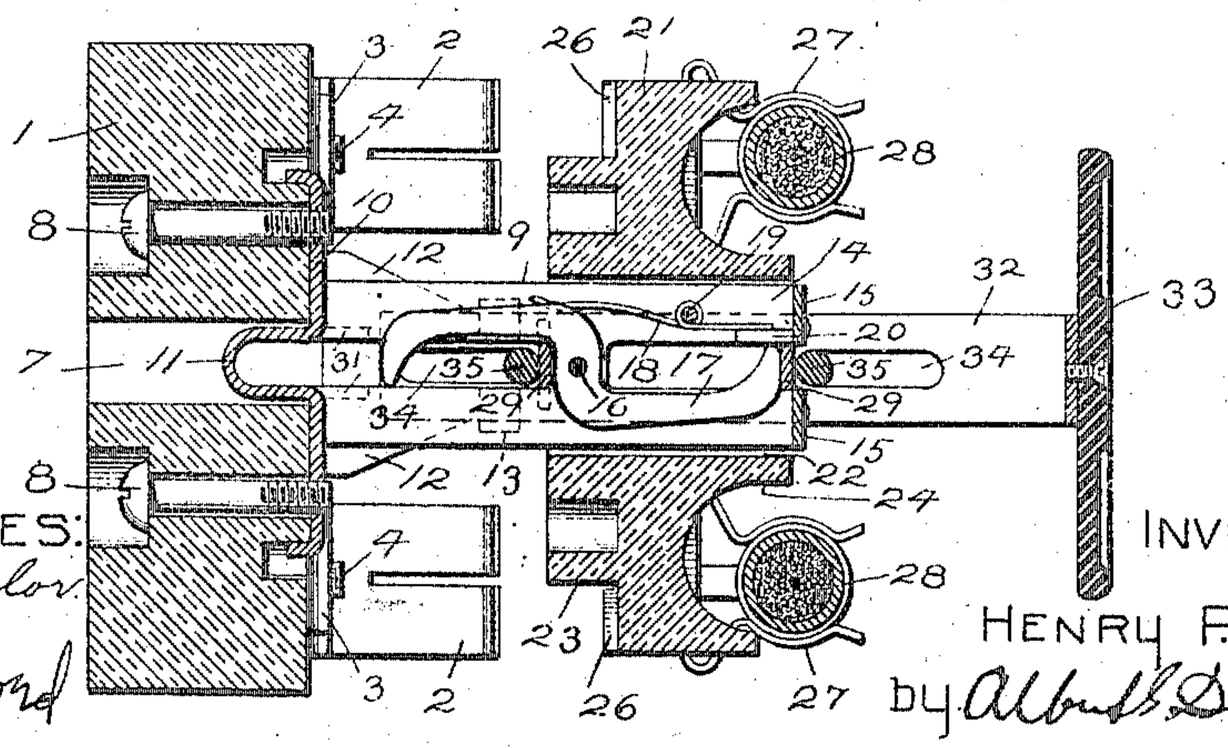


Fig. 3



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SNAP-SWITCH.

947,881 Specification of Letters Patent. Patented Feb. 1, 1910.

Application filed December 4, 1905. Serial No. 290,064.

To all whom it may concern:

Be it known that I, HENRY P. BALL, a citizen of the United States, residing at New York, county of New York, State of New York, have invented certain new and useful Improvements in Snap-Switches, of which the following is a specification.

The present invention relates to electrical cut-out devices and more especially to snap switches in which the movable member is actuated into and out of engagement with the stationary contacts by a snap action so as to prevent the holding of arcs upon the making and breaking of the electric circuit.

In many instances it is necessary to employ fuses or thermal cut-outs in conjunction with a switch to automatically break the circuit upon the occurrence of an abnormal current, and it has been necessary heretofore to provide a switch base of double length upon which the fuses are mounted or to place two bases in juxtaposition upon which the switch and fuses are respectively mounted, but on panel boards and many other places where space is limited either of these arrangements is objectionable. Switches with exposed fuses mounted thereon have been proposed but such switches, by reason of the flashing of fire upon the blowing of the fuses, are considered too dangerous for use.

The object of my invention is to provide a snap switch which shall be compact, highly efficient in service, and adapted to receive the standard forms of inclosed fuses. I employ a base of the size heretofore used for supporting the fuses and their line connections, and at the center of the base I mount a rigid guide frame upon which the movable member may travel toward and from the base. The movable member carries insulated clips or clamping means for securing inclosed fuses thereto in such position as to close the circuit when the movable member is moved toward the stationary contacts mounted on the base. In order to produce a snap action of the movable member the guide frame is provided with a latch which normally engages some portion of the movable member and locks it in either of its extreme positions, and an actuator having springs connecting it with the movable member operates according to the direction in which it is moved to first tension the springs and thereafter trip the latch so that the movable member of the switch is carried by a quick movement to its opposite extreme position under the recoil of the springs where it is automatically locked in position by the latch.

For a more complete understanding of my invention reference may be had to the following detailed description and to the accompanying drawing forming a part of this specification, in which—

Figure 1 is a top plan of a snap switch embodying one form of my invention; Fig. 2 is a longitudinal axial section; Fig. 3 is a transverse axial section; Fig. 4 is an edge elevation of the guide frame and latch; Fig. 5 is a side elevation of the same; and Fig. 6 is a perspective view of the stop yoke.

The base 1 has mounted thereon, near opposite edges, two pairs of contact clips 2 each consisting of a strip of spring metal folded upon itself and the free ends bent up at right angles with a space between them for the reception of the movable contact blade, and overlying the folded end of the clip is a metal plate 3 which clamps the clip to the base by means of a screw 4 extending up through the base while the opposite end of the plate is provided with lugs 5 and a binding screw 6, and the middle of the plate has a transverse aperture through which the contacts 2 are threaded. The base has a recess 7 formed at its center over which is secured by screws 8 the guide frame 9 which consists of an attaching plate 10 having a central loop 11 depending into the recess 7, vertical bifurcated side arms 12 bent up from opposite sides and terminating in U-shaped guides 13, and secured to the attaching plate between the arms 12 are two H-shaped posts 14 of sheet metal connected transversely at their opposite ends by guide plates 15. Between the H-shaped posts 14 and pivoted on a shaft 16 at their middle points is an S-shaped latch 17 with cam-shaped ends which is normally held in the position indicated in Figs. 3 and 5 by a bent spring 18 supported between the posts 14 by a pin 19 and bearing at its upper end against a shoulder 20 on one of the posts 14.

The movable member of the switch consists of a rectangular block or platform 21 of insulating material having a central aperture 22 for the guide frame 9 to pass freely through, a crown flange 23 on its lower surface and an oblong or elliptical central projection 24 on its upper surface, and on oppo-

site sides of the central aperture and parallel thereto are formed holes 25 through which the springs may play freely. At opposite sides of the block 21 are secured pairs of contact blades 26 in alinement with the respective stationary contact clips 2, and to each blade 26 is secured a U-shaped clip 27 adapted to receive and securely hold the metallic end of a cartridge fuse 28. The block 21 carries a yoke 29 of the form shown in Fig. 6 and arranged thereon so that its opposite ends extend across the central aperture 22 near the top and bottom surfaces of the block in positions to be engaged by the respective ends of the latch 17. The lower end of the yoke 29 has two pairs of lugs 30 which enter the spaces between the side arms 12 and the H-shaped posts 14 and, when the movable member is in closed position, rest upon stops 31 formed by bending in lugs near the lower ends of the side arms 12.

The actuator consists of two bars 32 connected at their outer ends and provided with a suitable grip plate 33, and extending through the bars 32 are longitudinal slots 34 for the reception of rods 35 to which the helical springs 36 are attached. The bars 32 are supported at their outer ends by the guide plates 15 and at their inner ends by the U-shaped guides 13 of the guide frame.

When the switch is in open position, as shown in Fig. 3, the latch 17 engages at its outer end with outer end of the yoke 29. By forcing the actuator toward the base the inner rod 35 engages the outer ends of its corresponding slots 34 and is carried inwardly therewith while the outer rod 35 rests upon the outer end of the yoke 29 and is held from movement. The springs 36 are thus gradually tensioned until the outer end of the latch 17 is moved out of the path of the yoke 29, which is effected by the crowding of the inner end of the latch back by the engagement therewith of the inner rod 35. As soon as the latch clears the outer end of the yoke the springs 36 react and carry the movable member with a snap action to closed position with the inner end of the yoke 29 lying beyond the inner end of the latch 17 and resting upon the stops 31. When it is desired to open the switch the actuator is pulled out and the steps above described are repeated in inverse order, the inner rod 35 being held stationary and the outer rod 35 moving with the actuator and putting the springs under tension.

I do not desire to restrict myself to the particular form or arrangement of parts herein shown and described, since it is apparent that they may be changed and modified without departing from my invention.

What I claim as new, and desire to secure by Letters Patent of the United States, is,—

1. The combination with a base provided with stationary contacts, a guide on said base, a movable switch member slidable on said guide, means for locking said member in extreme positions, an actuator for said member, a spring connecting said actuator and said member and tensioned in the same direction on both movements of the actuator, and means carried by the actuator for releasing said locking means.

2. The combination of a base provided with stationary contacts, a guide on said base, a movable switch member slidable on said guide, means for locking said member in extreme positions, an actuator slidable on said guide, a spring connecting said actuator and said member and tensioned in the same direction on both movements of said actuator, and means carried by said actuator for releasing said locking means.

3. In a snap switch, the combination of a guide, a movable switch member slidable thereon, a double-ended latch to lock said member in extreme positions, an actuator having means for tripping said latch, and a spring connecting said actuator and said member and tensioned in the same direction on both movements of said actuator.

4. In a snap switch, the combination of a guide, a movable switch member slidable thereon, a double-ended latch pivoted on said guide and operating to hold said member in extreme positions, an actuator for said movable member provided with latch tripping means, and a spring connecting said actuator and said member and tensioned in the same direction on both movements of said actuator.

5. In a snap switch, the combination of a guide, a movable switch member mounted to slide thereon, means for locking said member in extreme positions, an actuator mounted to slide on said guide, and spring connected rods bearing upon opposite sides of the switch member and adapted to be drawn apart by the actuator to put the spring connection under tension and thereafter release the locking means.

In witness whereof, I have hereunto set my hand this 25th day of November, 1905.

HENRY PRICE BALL.

Witnesses:
JNO. LOUIS,
D. STOCKMAN.