No. 795,436. PATENTED JULY 25, 1905.

H. GEISENHÖNER.

SNAP SWITCH.

APPLICATION FILED FEB. 19, 1902.

Fig. 1.

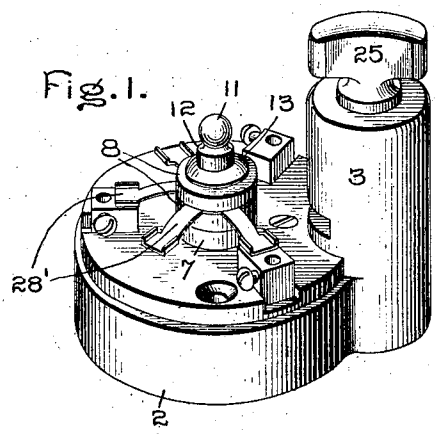


Fig. 2.

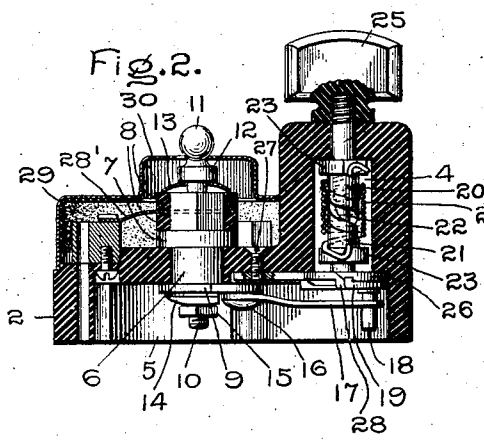


Fig. 3.

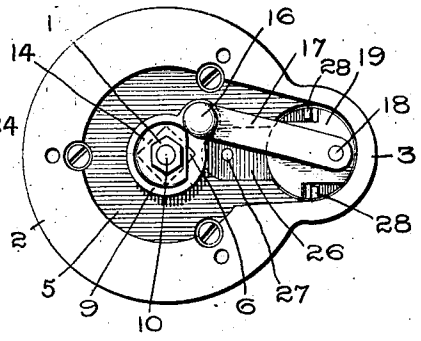


Fig. 5.

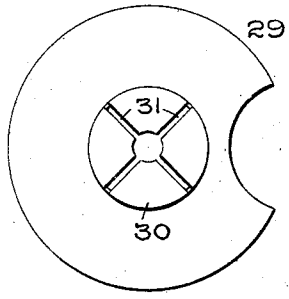
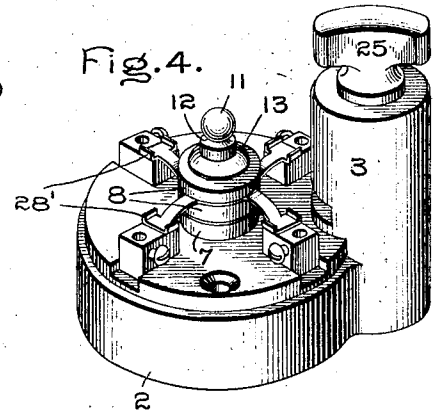


Fig. 4.



Witnesses:
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UNITED STATES PATENT OFFICE.

HENRY GEISENHÖNER, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

SNAP-SWITCH.

No. 795,436. Specification of Letters Patent. Patented July 25, 1905.

Application filed February 19, 1902. Serial No. 94,737.

To all whom it may concern:

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

My invention relates to improvements in snap-switches, and more particularly to improvements in switches of the oscillating-blade type.

It is well known that switches having oscillating contact-blades wear longer and give more uniform results than switches having rotary contact-blades; but on account of the danger of straining or breaking an oscillating switch by turning the thumb-piece in the wrong direction and on account of the difficulty of taking apart and repairing switches of this kind have been little used. Moreover, on account of the heretofore practical impossibility of introducing a spring between the actuating and actuated members, so as to operate satisfactorily in both directions, snap-switches with oscillating contact-blades have been used only to a limited extent.

One of the objects of my invention is to provide an oscillating switch with actuating means which cannot be turned in the wrong direction to the injury of the device. Another object is to so arrange the parts of a switch that access may be had to the contact parts by the mere removal of a cap and without disconnecting the thumb-piece, as is usually necessary; and a still further object of my invention is to provide an arrangement of the parts of a switch whereby the spring which operates to snap the contact-blades in either direction shall be subjected to strains acting in one direction only.

My invention includes many changes and modifications of the particular construction herein shown and described, and I therefore wish it understood that I do not restrict myself to the said construction.

In the drawings, Figure 1 is a perspective of a three-way snap-switch embodying my invention, the cover being removed to show the contacts. Fig. 2 is a vertical longitudinal section thereof. Fig. 3 is a bottom plan view. Fig. 4 is a perspective of a four-contact switch, and Fig. 5 is a detail plan view of a cap or cover.

The switch shown in the drawings consists of the circular base-piece 2, of hard rubber or other insulating material, and offset from one edge is the integral extension 3 of cylindrical form and provided with an axial chamber 4. The lower part of the base-piece 2 is cored out at 5 to provide a recess in which certain operative parts are free to move, and to the upper surface of the base-piece are connected the usual contact parts. The center of the base-piece 2 is bored out, forming a bearing for the blade-arbor 6. The blade-arbor 6 is made of hard rubber and is provided with an intermediate flange 7, a polygonal upper end adapted to receive the contact-blades and space-rings 8, and a similarly-shaped lower end for the reception of the wrist-plate 9. The arbor 6 is provided with an axial hole for the reception of the bolt 10, which has a knob-head 11 and a shoulder 12, adapted to bear upon the spring-washer 13 and hold the space-rings 8 and the contact-blades pressed downward upon the flange 7. The lower end of bolt 10 carries a spring-washer 14, which is forced against the wrist-plate 9 by the nut 15.

The free end of wrist-plate 9 carries a pin 16, which passes through an end of the link 17, having its opposite end pivoted on the actuating crank-pin 18, fast in ratchet-plate 19. The link 17 is preferably made of non-metallic material, so as to insulate the actuating means from the conducting parts.

The main actuating-shaft consists of two sections 20 and 21, having interlocking helical ends and cored for the reception of the loose guide-pin 22. Each section is provided with a notched flange 23, adapted to engage the respective ends of a spring 24, coiled about the said shaft and operating to yieldingly hold the helical ends of the sections 20 and 21 screwed together. The upper section 20 is journaled in a hole at the upper end of the extension 3 and is screw-threaded at its upper end for the reception of the thumb-piece 25. The lower section 21 is connected at its lower end to the ratchet 19 and is mounted to rotate and move longitudinally in the stop-plate 26, held in position on the under side of the base 2 by a screw 27 and provided with depending stop-lugs 28, adapted to be engaged by the corresponding projections on the ratchet-plate 19.

By the interlocking of the projections on the stop-plate 26 with the projections on the ratchet-plate 19 the latter is positively held with the crank-pin 18 in either the extreme outer position or the extreme inner position.

When the thumb-piece 25 is turned right-handedly, the upper section 20 of the actuating-shaft is carried around with it against the tension of the spring 24 and causes its helical end to partially unscrew from the helical end of the lower section 21, forcing the latter section to move downward until the projections of the ratchet-plate carried thereby clear the stop projections 28, whereupon the recoil of the spring 24 throws the said lower section 21, ratchet-plate, and crank-pin 18 around through a half-rotation, whereupon the projections of the ratchet-plate 19 engage the opposite stops on plate 26. When the thumb-piece 25 is turned left-handedly, it merely unscrews from the shaft. By properly adjusting the length of the arm of the wrist-plate 9 the arbor 6 may be caused to oscillate a greater or less amount, according to the distance it is desired to move the switch-blades. In the device shown in Fig. 1 this amount will be one-sixth of a rotation, and in Fig. 4 it will be one-eighth of a rotation.

The device shown in Fig. 1 is adapted for use in connection with a three-wire system of electric lighting, and, as will be observed, only three contact-posts are employed instead of four, with two cross-connected, as has been the practice heretofore. The several contact-arms 28′ are integrally connected, thereby necessitating but a single piece of metal stamping.

The cover or cap 29 is of pressed sheet metal suitably lined with insulating material and has a central projecting portion 30, having a number of radial slits 31, whereby spring lips or segments are formed, which are adapted to yield slightly as the cap is pressed down over the knob end 11 of bolt 9 and operate to hold the cap in place upon the base-piece 2.

By the arrangement above described it is to be noted that the binding-posts and contact-blades are rendered accessible by the mere pulling off of the cap-piece 29, the switch-blades are given a quick oscillating movement by a single spring always acting in the same direction, and the actuating-shaft is securely locked against retrograde motion, and thereby the several parts protected from injury from attempts to move the oscillating switch in a wrong direction.

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

1. The combination of a switch-blade, a crank-pin, a link-connecting means between said blade and crank-pin whereby rotary motion of said pin produces oscillating motion of the blade, and means for intermittently rotating said pin.

2. The combination of a switch-blade, an arbor carrying said blade, a spring-controlled rotary escapement, and means to transmit the rotary motion of said escapement to said arbor to oscillate the blade.

3. The combination of a switch-blade, an arbor carrying said blade and provided with a wrist-plate, a spring-controlled rotary escapement, and means to transmit the rotary movement of said escapement to said wrist-plate to oscillate said blade.

4. The combination of a switch-blade, an arbor carrying said blade and provided with a wrist-plate, a crank-pin connected to said wrist-plate, and means for imparting an intermittent rotary movement to said pin whereby said wrist-plate and switch-blade are oscillated.

5. The combination of a switch-blade, a sectional actuating-shaft, a spring connecting said sections, stops for normally restraining one of said sections from rotating while the other section moves through a partial rotation and puts tension on said spring, means connecting the held section with said switch-blade, and means to release said held section from the stops.

6. The combination of a switch-blade, a sectional actuating-shaft having inclined planes at the adjacent ends of said sections, a spring connecting said sections, stops to restrain one of said sections from rotating while the other section is rotated putting tension upon the spring and by means of the action of the inclined planes causing the former section to be finally released from said stops, and means for transmitting the rotary motion of the said former section to the switch-blade to oscillate the said blade.

7. The combination of a switch-blade, an actuating-shaft having one section provided with a thumb-piece, and another section provided with a crank-pin and adapted to move longitudinally with relation to the other section, a spring connected at its ends to each of the respective sections, stops to restrain the crank-pin section from rotation, means to move said section longitudinally to free said stops when the other section is turned through a part rotation to put tension on the spring, and means to transmit the motion of said crank-pin to said switch-blade.

8. The combination of a switch-blade, an oscillating arbor for said blade provided with a wrist-plate, a sectional actuating-shaft, one section having a thumb-piece at one end and an inclined surface at the other, the other section having a corresponding inclined surface at one end and a crank-pin at the other, a spring connecting said sections, stops for restraining the crank-pin section from rotation while the other section is turned through a part rotation putting tension on the spring and ultimately forcing the crank-pin section longitudinally away from said stops, and a link connecting said crank-pin and said wrist-plate.

9. The combination of a base, a central switch-blade arbor, means for actuating said arbor mounted upon said base, and a cap fit-

ting said base and provided with spring sections or jaws at its center adapted to engage the end of said arbor.

10. The combination of a base having a chambered offset portion, a switch-blade arbor carried at the center of said base and having a knob at one end, actuating mechanism for said arbor mounted upon the offset portion, and a cap fitting said base and provided with spring sections or jaws at its center adapted to engage said knob.

In witness whereof I have hereunto set my hand this 17th day of February, 1902.

HENRY GEISENHÖNER.

Witnesses:

ALEX. F. MACDONALD,
HARRY H. TILDEN.