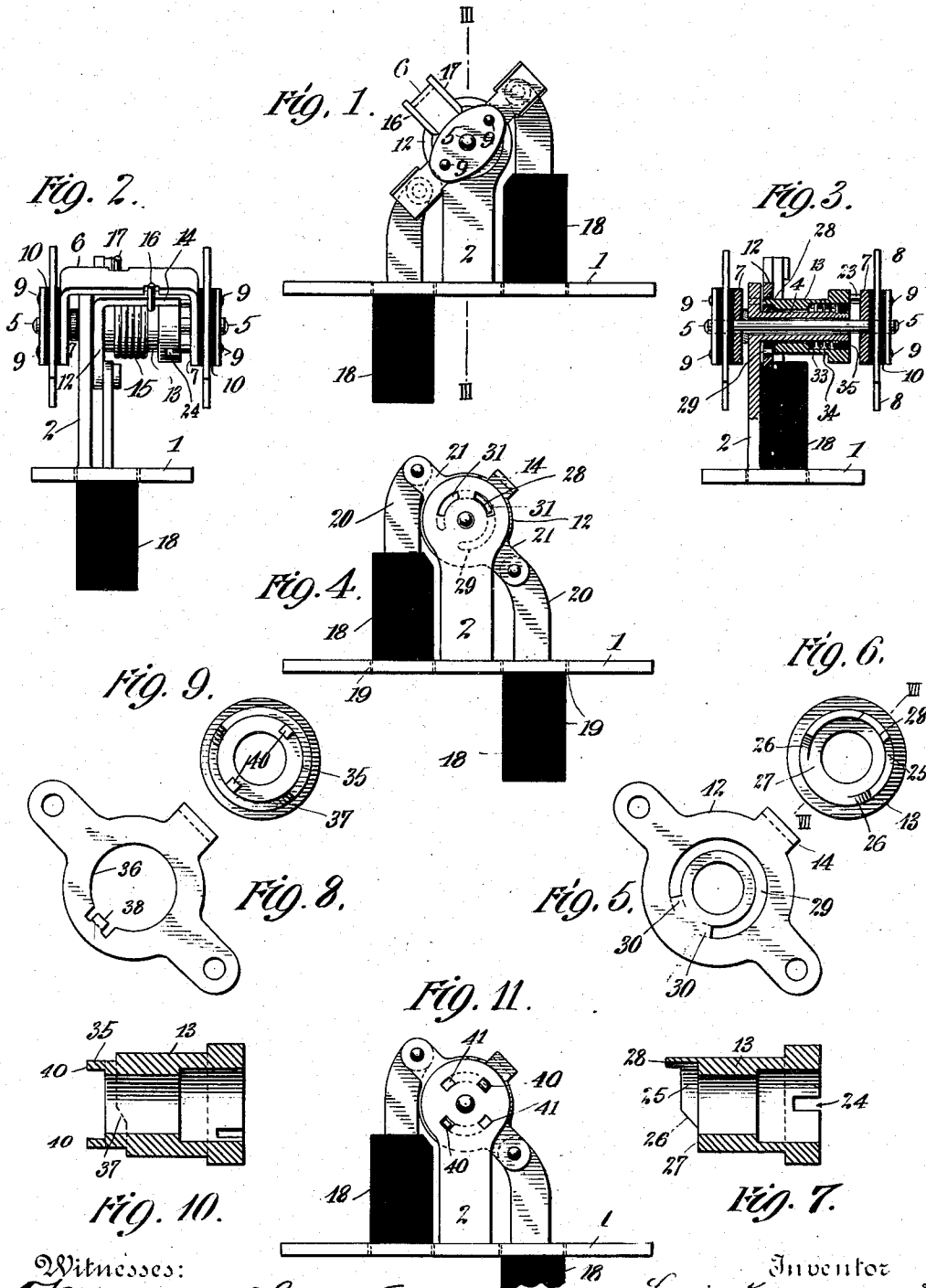


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TWO POLE SNAP SWITCH.
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939,599.

Patented Nov. 9, 1909.



Witnesses:
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UNITED STATES PATENT OFFICE.

LOUIS KELLNER, OF NEW YORK, N. Y.

TWO-POLE SNAP-SWITCH.

939,599.

Specification of Letters Patent.

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Application filed December 5, 1908. Serial No. 466,061.

To all whom it may concern:

Be it known that I, LOUIS KELLNER, a citizen of the United States, residing at the city of New York, in the borough of Brooklyn and State of New York, have invented certain new and useful Improvements in Two-Pole Snap-Switches, of which the following is a full, clear, and exact description.

My invention relates to wall switches, particularly that type which is embedded in the wall so as to be substantially flush with the surface thereof, and including a two-button snap switch by which a circuit or plurality of circuits are controlled.

The present invention relates particularly to a mechanism for operating the switch elements abruptly in their circuit opening and circuit closing movement, and further insuring a 90° throw, so that the circuit is ruptured by the greatest possible sparking distance.

The present switch is designed to be of greater compactness and simplicity than the constructions hitherto used, making use of direct integral portions of the supporting standard and the collar or sleeve which turns the switch elements to cause a temporary restraint of the latter by which they move abruptly when finally released.

In connection with the switch elements, I provide a detent arm which is bent around to be engaged by the operating spring, and which has pins or the like to give the effect of a spline connection with said sleeve or collar and permit a limited longitudinal movement of the latter by which its temporary restraining functions are affected. The operating spring is tensioned by a rocker plate having direct link connections with the operating buttons and which has a cam surface to impel said sleeve or collar in the longitudinal movement mentioned.

With the foregoing and other objects in view, my invention consists in the features of construction and combination as hereinafter set forth and claimed.

In the drawings: Figure 1 is an end elevation of a switch embodying the principles of my invention; Fig. 2 is a side view of the same; Fig. 3 is a vertical sectional view on the line III—III of Fig. 1; Fig. 4 is an end elevation looking from the opposite side to that of Fig. 1; Fig. 5 is a detail view of the rocker plate; Fig. 6 is an end view of the sleeve or collar which coöperates therewith; Fig. 7 is a sectional view of the

same on the line VII—VII of Fig. 6; Figs. 8, 9 and 10 are views similar to Figs. 5, 6 and 7, showing a modified construction, and Fig. 11 is a view similar to Fig. 4 of the modified construction.

Referring to the drawings in which like parts are designated by the same reference sign, 1 designates a base which may be stamped of sheet metal, and carries a frame or standard 2, which supports the operating mechanism of the switch. The standard 2 is made in the form of a central vertical plate, to which is rigidly fixed a stud 4 axially perforated to form a journal or bearing for the spindle 5 which carries the switch elements. The switch blades or elements may be fixed to the spindle in any desired way. I prefer to make use of a U-shaped bail or frame 6 having enlarged extremities 7 in which the spindle is received and which are riveted to the switch blades 8. Screws or rivets 9 with insulating bushings and washers 10 may be used for connecting the switch blades to the enlarged extremities of the bail 6. The switch blades extend in the radial plane of the bail 6 so that they swing between forty-five degree angle positions when the bail is impelled between its corresponding limits of throw, as will be later described.

On the exterior surface of the stud 4 are journaled a rocker plate 12 and a sleeve or collar 13, the rocker plate occupying a position closely adjacent to the standard 2 so as to be guided in the plane thereof by its engagement therewith. The sleeve or collar 13 is capable of a limited longitudinal movement on the stud 4 in addition to its angular movement, and the rocker plate and the standard 2 are each made with features which coöperate together to secure a temporary restraining action on the sleeve or collar 13 when the latter is angularly impelled. I will, however, first consider the means by which the sleeve or collar is angularly impelled, and later refer to the construction and action of the restraining means.

The rocker plate 12 has a laterally projecting arm 14 which overlies the sleeve or collar 13 at a point inside the arc of movement of the bail 6 attached to the switch elements.

15 denotes a spiral spring received upon the sleeve or collar 13 and having radially projecting extremities 16, 17 which embrace

the parts 12 and 6 of the rocker plate and the switch elements, respectively. The spring tension is such that the extremities of the spring are impelled toward one another and tend to constrain the arms 14 and 6 which they embrace in the same radial plane of the spindle. If, for example, the arm 14 is deflected from any position, the bail 6 tends to follow in such movement. The movement of the arm 14 is limited to a 90° throw by a lug or detent on the standard 2, and this throw determines the arc of movement of the switch elements.

The rocker plate 12 may be displaced through its angle of movement in any desired way. I prefer a pair of push buttons 18 loosely received in the holes 19 of the base 1, and which have stems 20 pivoted to extending portions 21 of the rocker plate 12. In order to obtain as compact arrangement of the parts as possible, I deflect the stems 20 near the inner ends where they are pivoted to the rocker plate so as to permit a sufficient angular movement of the rocker plate without an interfering engagement between the stems 20 and the spring 15. It will be evident that by alternate depression of the push buttons, the rocker plate 12 may be oscillated between its extreme positions of throw, and the switch elements 8 will be impelled to follow this movement through the action of the spring 15. The switch elements are, however, temporarily or initially restrained until the rocker plate has nearly completed its throw, so that the switch elements move abruptly through their entire throw when finally released.

23 designate pins which may be continuations of the rivets 9 of one of the switch blades and these pins enter slots or notches 24 at the ends of the sleeve or collar 13. The pins act as a pline connection constraining the sleeve or collar 13 to move angularly with the switch blades, but permitting a slight independent longitudinal movement of the sleeve. At its other end the sleeve 13 has a thin annular portion 25 of less than a complete circumference, amounting to an angular extent of about two hundred or two hundred and fifty degrees. At its extremities 26 this annular or arcuate rib is beveled or inclined downward until it merges into the flat face 27 which constitutes the proper end face of the sleeve 13. Symmetrically between the beveled extremities 26 of the arcuate rib 25 there is a portion 28 which projects beyond the plane of the rest of the rib, this portion constituting a lug or detent. The collar 12 has an arcuate slot 29 adapted to receive the arcuate rib 25 and has a considerably greater angular extent than that of said rib, amounting to perhaps sixty or seventy degrees of excess. The extremities of the arcuate slot 29 are also beveled at 30 to correspond to the inclina-

tions of the beveled portions 26 of the rib. The standard 2 also has a pair of holes 31 each of which is adapted to snugly receive the lug or detent 28 at positions ninety degrees of angular movement apart from one another. It is evident, when the rocker plate 12 is assembled against the standard 2, and the sleeve 13 is fitted on the stud 4 with its rib 25 extending into the slot 29 of the rocker plate, that the lug 28 is adapted to enter the holes 31 of the standard 2. If, however, the rocker plate 12 is moved angularly to such an extent that its beveled portions 30 engage the bevel shoulders 26 of the sleeve 13, the latter will be cammed away from the standard 2 so that its lug 28 will be thrown out of the engaging hole 31. The bushing is therefore adapted to turn through its normal angle of throw when released in this way, under the action of its impelling spring 15. The sleeve 13 is normally impelled longitudinally in a direction to project its lug 28 into the holes 31 by a spring 33 contained in an annular recess 34 of the sleeve and put under tension by a nut or collar 35 threaded to the end of the stud 4 and also inclosed in the cavity 34 of the sleeve.

The use and operation of my invention are as follows: Assuming the parts to be in the positions shown in Fig. 4, it is evident that pressure on the right hand button will deflect the rocker plate 12 and tension the spring 15 so as to impel the bail 6 and switch elements to their alternate positions. At this time the lug or detent 28 is projected into the hole 31 of the standard under the influence of the spring 33, the position of the slot 29 of the rocker plate not intercepting such movement of the sleeve 13 at this time. The depression of the right hand button 18 and the accompanying angular movement of the rocker plate 12 continue through an angle amounting to nearly their entire throw before the cam or bevel surface 30 of the rocker plate engages the correspondingly beveled portion 26 of the sleeve 13. When this latter engagement occurs, the sleeve is necessarily impelled in a direction to withdraw the lug 28 from the hole in the standard 2, and as the switch elements and the sleeve, virtually splined together, are at this time under the tension of the spring 15, they will move abruptly to their alternate positions of throw. At the alternate position, however, the lug or detent 28 is opposite the alternate hole 31 of the standard 2, and as the rocker plate 12 has been turned so that it does not intercept the movement of the sleeve 13, the latter is projected longitudinally by its spring 33, so that its lug 28 again enters a hole 31 of the standard 2. The switch elements have therefore been abruptly impelled to their alternate positions of throw corresponding to the displace-

ment of the rocker plate and push buttons, and all the mechanism is in condition for a repetition of the above action in the reverse direction.

5 In Figs. 8, 9, 10 and 11 a slightly modified construction is shown which avoids the use of a long arcuate slot 29 in the rocker plate. In this construction the sleeve 13 has a reduced extremity 35 which is entirely received through a hole 36 of the rocker plate. The rocker plate therefore oscillates on the reduced extremity 35 of the sleeve 13 as a bushing, instead of being directly pivoted on the stud 4. In this case the sleeve 13 has cam inclines 37 outside its reduced portion 35 and these cam inclines are engaged by a lateral deflected ear 38 of the rocker plate, the inclines being spaced apart and located with reference to the ear 38 so as to secure the same functions as have been described with my preferred construction. The sleeve 13 also has a pair of lugs or detents 40 at its extremities which are receivable in holes 41 of the standard 2, the holes 41 being so located as to arrest the sleeve at two separate positions ninety degrees apart from one another. It will be obvious that this mechanism gives the same results or functions as obtained with the construction first described.

What I claim is:—

1. In a switch of the class described, a standard having a stud, a sleeve longitudinally and angularly movable on said stud, switch elements angularly movable with said sleeve, a rocker plate and spring for tensioning the said switch elements and sleeve to move angularly, push buttons connected to said rocker plate to oscillate the same, means forming part of said standard for initially restraining movement of said sleeve, and means forming part of said rocker plate for releasing said restraining means.

2. In a switch of the class described, a standard having a stud, a sleeve longitudinally and angularly movable on said stud, switch elements angularly movable with said sleeve, means for tensioning said switch elements and sleeve to move angularly, a pair of push buttons for operating said means, said sleeve having a lug to engage the standard to initially restrain its movement, and said means engaging said sleeve to displace it longitudinally to release said lug from said standard.

3. In a switch of the class described, a standard having holes, a sleeve rotatable thereon and having a lug to engage the holes of the standard, switch elements angularly movable with said sleeve, a rocker plate hav-

ing a cam surface to displace said sleeve longitudinally when said rocker plate is moved angularly for a predetermined arc or throw, and a pair of push buttons connected to said rocker plate.

4. In a switch of the class described, a standard having a stud, a sleeve longitudinally and angularly movable on said stud, a spring within said sleeve for impelling it longitudinally, means forming part of said standard to engage said sleeve and initially restrain it from angular movement, a rocker plate having a cam surface to engage said sleeve to impel it longitudinally in opposition to said spring, and means for impelling said sleeve angularly.

5. In a switch of the class described, a sleeve having an arcuate rib with a central lug, a standard having a hole to receive said lug, a rocker plate having an arcuate slot to receive said rib, and a spring tensioned by said rocker to impel said sleeve and move the same angularly when it is released from said standard.

6. In a switch of the class described, switch elements having a pin, a sleeve having a slot to establish a spline connection therewith and having a lug, a standard having a hole to receive said lug, a rocker plate having a cam surface to impel said sleeve longitudinally, and a spring tensioned by said rocker plate to impel said sleeve angularly.

7. In a switch of the class described, a sleeve having a rim formed with a lug and a cam surface, a standard having a hole to receive said lug, a rocker plate having a cam surface to engage the cam surface of said sleeve, switch elements having a spline connection with said sleeve, and a spring tensioned by said rocker plate to impel said sleeve angularly.

8. In a switch of the class described, a sleeve having a lug and a cam surface, a standard having a hole to receive said lug, a rocker plate having a cam surface to engage the cam surface of said sleeve, push buttons with stems pivoted to said rocker plate, switch elements having a spline connection with said sleeve, a spring tensioned by said rocker plate for impelling said sleeve angularly, and a spring within said sleeve to impel it longitudinally into engagement with the standard.

In witness whereof, I subscribe my signature, in the presence of two witnesses.

LOUIS KELLNER.

Witnesses:

WALDO M. CHAPIN,
JAMES D'ANTONIO.