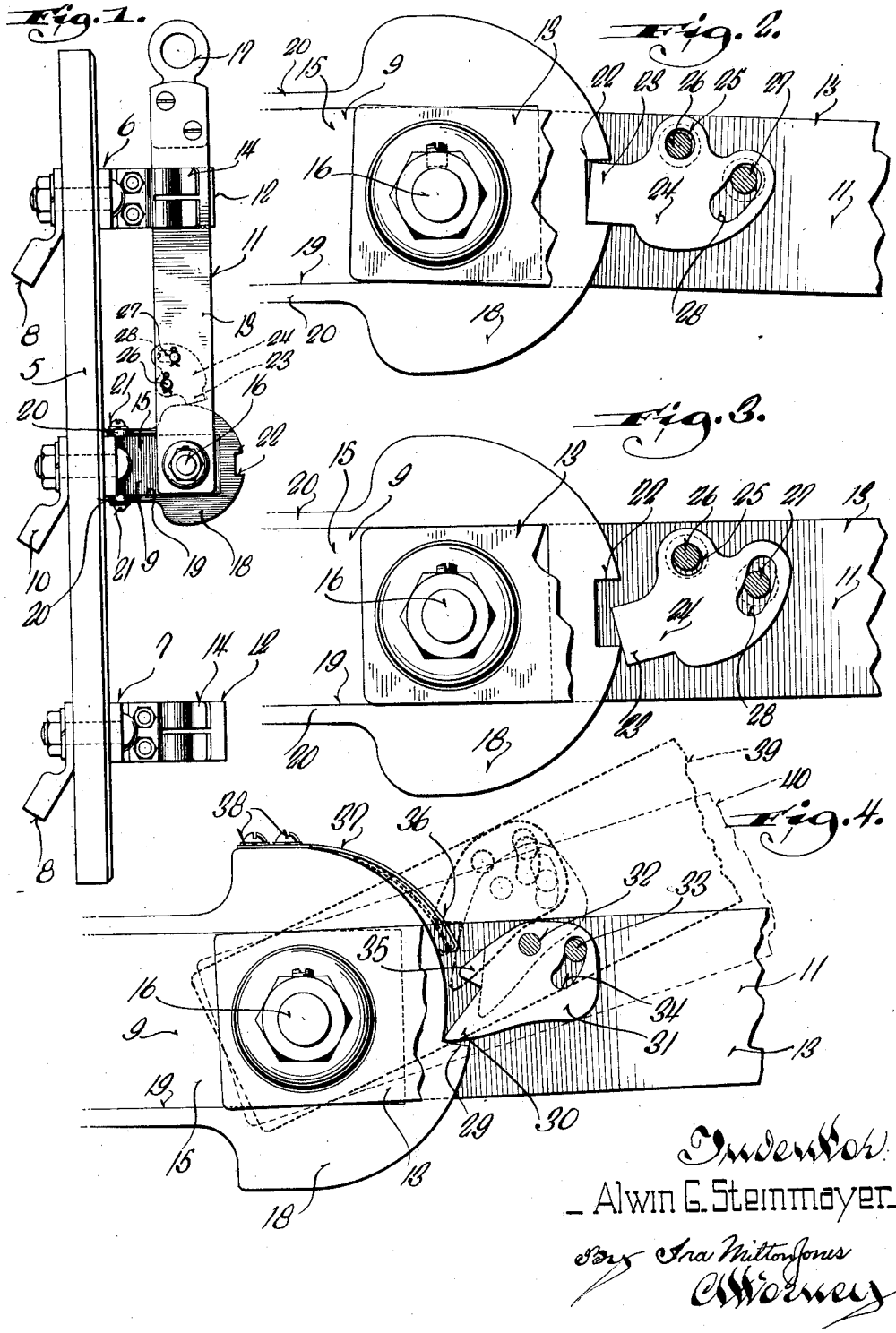
March 18, 1930. A. G. STEINMAYER 1,750,693

SWITCH

Filed April 15, 1927



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Patented Mar. 18, 1930 1,750,693

UNITED STATES PATENT OFFICE

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SWITCH

Application filed April 15, 1927. Serial No. 184,077.

In double throw switches of the type generally employed in connection with service lines and particularly where generators, alternators or other machines cause a certain amount of vibration which is very often transferred to the switch board, it is desirable that positive means be provided for locking the movable switch element in its intermediate or neutral position to prevent its accidental movement, due to such vibration or any other cause, to engage with the lowermost fixed contact completing a circuit which would probably cause serious injury to equipment or to persons engaged in work on the open circuit, and it is, therefore, an object of this invention to provide improved means for readily releasably retaining the movable switch element in an intermediate position.

It is also highly desirable that all necessity of touching the movable switch element by personal contact be avoided and, therefore, this invention has as another object the provision of improved means for securing the movable element in its intermediate position and which is automatically releasable by actuation of the movable element to thus eliminate touching of the switch element by the operator to release the locking means except by the conventional switch actuating member such as a handle of insulating material having provision at one end for engaging the switch element.

A further object of this invention resides in the provision of a switch construction embodying a pair of terminal members and a movable switch member pivotally connected with one terminal member and adapted to have its free end swung into and out of contact with the other terminal and having coacting means carried by the movable switch member and the first terminal member for securing the movable element in one position.

And a still further object of this invention resides in the provision of an improved switch construction embodying a movable switch element adapted to be swung to an upward position to complete one circuit and to a lower position to complete another circuit and having means for securing the same at an intermediate position, said means being readily releasable to permit movement of the element to either circuit making position.

With the above and other objects in view which will appear as the description proceeds, my invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

In the accompanying drawing, I have illustrated two complete examples of the physical embodiment of my invention constructed according to the best modes I have so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a view in side elevation of a switch structure embodying my invention;

Figure 2 is an enlarged, fragmentary view of the inner end of the movable switch element and the portion of the intermediate terminal member to which it is secured, parts thereof being broken away and in section and the movable switch member being illustrated in its intermediate position;

Figure 3 is a view, similar to Figure 2, illustrating the position of the latch member as the movable switch member is moved past its intermediate position, and

Figure 4 is a view similar to Figure 2 illustrating a slightly modified form of retaining means.

Referring now more particularly to the accompanying drawing, in which like numerals designate like parts throughout the several views, the numeral 5 designates a panel of suitable insulating material having a pair of spaced contact terminals 6 and 7 mounted thereon and having tube terminals 8 for facilitating the electrical connection therewith of conductors, not shown. On the panel 5, at a medial point between the contact terminals and in vertical alignment therewith, is a terminal member 9 likewise having a tube terminal 10 for the connection therewith of a conductor, not shown, the terminal 9 mounting a movable switch element 11

adapted to have its free end swung into electrical contact with either of the contact terminals 6 and 7.

Each contact terminal consists of a substantially inverted T-shaped member 12 having its outer end tapered to pass between the spaced blades 13 forming the movable switch element 11 and spring clips 14 are secured to the opposite sides of the members 12 to bear against the outer faces of the blades to insure a good electrical contact between the movable switch element and the contact terminals 6 and 7. The terminal member 9 is likewise of substantially inverted T-shape similar to the members 12 and the leg 15 of the T extends between the inner ends of the blades 13 which are pivoted thereto at 16, the outer ends 13 being spaced by the inner end of an eye 17 which is secured therebetween and provides means with which a suitable hook or other tool, not shown, may be engaged to swing the movable switch element to either of its respective positions.

A cam or segmental member 18 is carried by the terminal member 9 by having an opening 19 fitted about the portion 15 of the terminal member and is secured thereto at its ends 20 by screws or other fastening means 21, lateral movement of the outer portion of the member 18 being restrained by the blades 13 of the movable switch element between which the member 18 is mounted. The periphery of the cam 18 is provided with a substantially centrally located retaining notch or recess 22 with which the locking projection 23 of a pawl or dog 24 is engageable to retain the movable switch element in an intermediate position and prevent its dropping into accidental engagement with the contact terminal 7. The pawl or dog 24 is of approximately segmental shape and has an aperture 25, which provides a loose bearing for a pivot pin 26 extending across the blades 13 and forming an axis about which the dog swings. A second pin 27, connecting the blades 13 and passing through an elongated arcuate slot 28 in the segment opposite its lug 23, provides a stop for limiting the movement of the dog about its pivot.

The distribution of the weight of the dog or pawl is such that its lug 23 is at all times urged against the peripheral surface of the cam 18 as it rides thereover so that as the movable switch element nears a lateral or horizontal position, the lug 23 rides into the keeper recess 22 and holds the switch element in its horizontal position against the force of gravity and prevents the accidental engagement thereof with the lowermost contact terminal. However, should it be desired to move the switch element directly through from its uppermost position to its lowermost position, the lever is quickly moved past its intermediate position and as a result the intertia of the parts is sufficient to provide a delaying action so that the lug 18 rides free of the keeper recess. When the movable switch element is disengaged from the lowermost contact terminal, the lug 23 continues to ride on the surface of the cam 18 and ratchets over recesses 22, and should the movable switch element be allowed to drop, the lug moves into the recess holding the element in its intermediate position. Assuming the switch element to be in its intermediate position illustrated in Figure 2, and it is desired to swing the same into engagement with the lowermost contact terminal, the lever is moved upwardly a distance sufficient to free the lug 23 from its keeper recess and is then quickly moved downwardly past the recess. Figure 3 illustrates the manner in which the lug frees the recess 22 as it is moved to its lowermost position with sufficient speed to prevent the engagement of the retaining lug in the recess.

In Figure 4, a slightly modified construction is illustrated wherein the recess 22 is eliminated and the periphery of the cam 18 struck from two diameters to provide a stop or shoulder 29 with which the nose or end 30 of a pawl or dog 31 pivoted between the blades 13 at 32 engages, the movement of the pawl on its pivot being restricted by a stop or pin 33 passing through an arcuate slot 34 in the pawl. An auxiliary nose or tip 35 is formed on the pawl inwardly of the nose 30 which cooperates with the free end 36 of a spring 37 secured to the cam at 38, the free end of the spring normally being spaced from the adjacent peripheral portion of the cam as illustrated in full lines in Figure 4.

In this modification, the pivot pin 32 has a fairly snug fit in the dog or pawl so that it is frictionally held in the position to which it is actuated by the free end 36 of the spring. The dotted lines 39 indicate the position of the parts during the movement of the movable switch element from an uppermost position, the spring 37 being moved to its dotted line position by the pawl and as its nose or tip 30 leaves the end of the spring, the friction between the pawl and the spring causes its outward tension to be applied to the end 35 of the pawl or dog tending to swing the same on its pivot to engage the tip 30 with the periphery of the cam to ride against the stop or shoulder 29 and secure the movable switch element in its full line position. However, assuming it is desired to swing past its full line position illustrated in Figure 4, the lever is then swung upwardly to approximately its dotted line position 40 when the nose or tip 30 engages the end 35 of the spring 37 sufficiently to swing the dog on its pivot to move its nose 30 beyond the outer end of the shoulder 29 so that the switch element may be retracted and swung to its lowermost position as will be readily apparent.

From the foregoing description taken in connection with the accompanying drawing, it will be readily apparent to those skilled in the art to which an invention of the character described appertains that I have provided novel and improved means for releasably retaining the movable switch element in its intermediate position which is automatically operable by the movement of the switch element and that I provide an improved device of the character described which may be applied to switches now in use without materially altering their construction.

What I claim as my invention is:

1. In an electric switch having an upper and lower contact, a movable switch element and means pivotally mounting the movable switch element for selective engagement with either of the contacts, a member carried by the mounting means adjacent the pivotal mounting of the movable switch element, an abutment on said member, and a pawl pivotally carried by the movable switch element and engageable with the abutment when the switch element is slowly moved to releasably secure the movable element in an intermediate position, the inertia of the parts preventing engagement of the pawl with the stop when the element is quickly moved therepast.

2. In an electric switch having an upper and a lower contact and a movable switch element medially mounted between the contacts for selective engagement with either, a stop, a member pivotally carried by the switch element and actuated by gravity to engagement with the stop to positively restrain downward movement of the element, said member being disengaged from the stop and movable therepast by moving the element upwardly a slight distance and then quickly downward the inertia of the member maintaining the same out of engagement with the stop.

3. In an electric switch having an upper and a lower contact, a movable switch element, a member pivotally mounting the movable switch element for selective engagement with either contact, an abutment on said member, a pawl pivotally mounted on the movable switch member and normally engageable with the abutment when the movable switch member is in an intermediate position, and means adjacent the abutment for moving the pawl out of engagement with the abutment upon upward movement of the movable switch element, the inertia of the parts preventing engagement of the pawl with the stop when the element is quickly moved therepast.

4. In an electric switch having an upper and a lower contact, a movable switch element, a member pivotally mounting the movable switch element for selective engagement with either contact, a member carried by said mounting member and having a recess and a pawl pivotally mounted on the movable switch element and engageable with the recess to releasably secure the movable switch element in an intermediate position, a slight upward movement of the movable switch element moving the pawl out of active engagement with the recess and the inertia of the parts preventing engagement of the pawl with the stop when the element is quickly moved therepast.

5. In an electric switch having an upper and a lower contact, a movable switch element, a member pivotally mounting the movable switch element for selective engagement with either contact, a member having a portion of its periphery concentric with the axis of the pivotal mounting of the movable switch element positioned adjacent the movable switch element and having a recess communicating with its concentric periphery, and a pawl pivotally mounted on the movable switch element having a portion riding on said periphery as the movable switch element is moved from one position to another, and entering the recess upon slow downward movement causing the pawl to jump over the recess to permit the movable switch element to be engaged with the lower contact.

6. In an electric switch having an upper and a lower contact, spaced blades constituting a movable switch element, mounting means disposed between the blades to pivotally mount them for engagement with either contact, a member carried by the mounting means having a recess and likewise positioned between the blades, and a pawl pivotally carried by and between the blades for engagement with said member having the recess whereby the pawl enters the recess upon slow downward movement of the movable switch element toward intermediate position and the pawl enters the recess and arrests further movement to secure the movable switch element in intermediate position, and a fast downward movement carries the pawl past the recess without engaging it therein to permit the movable switch element to be engaged with the lower contact.

In testimony whereof I hereunto affix my signature.

ALVIN G. STEINMAYER.