

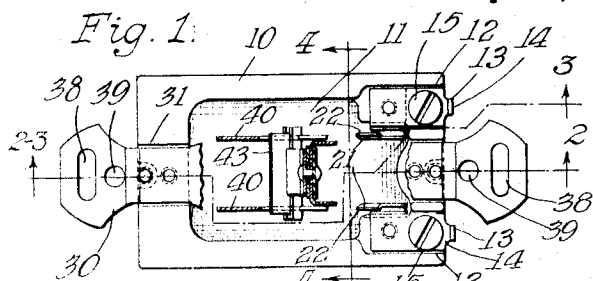
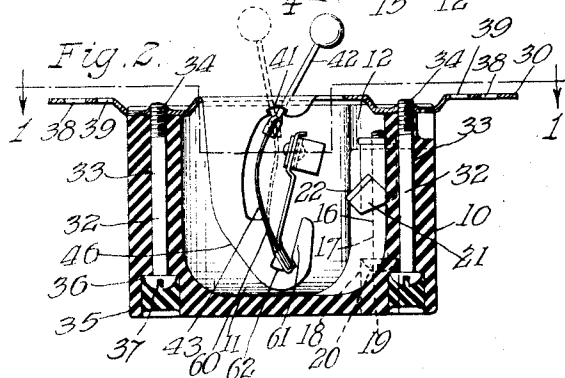
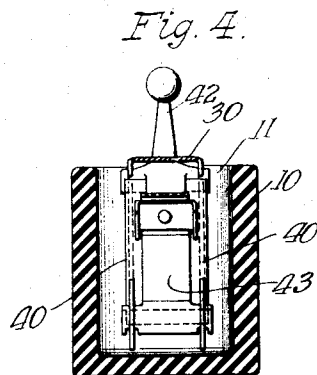
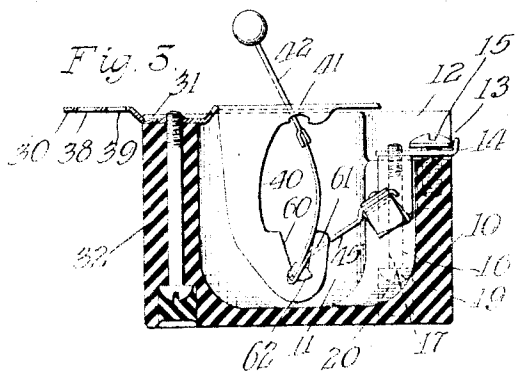
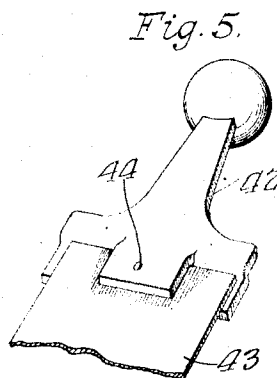
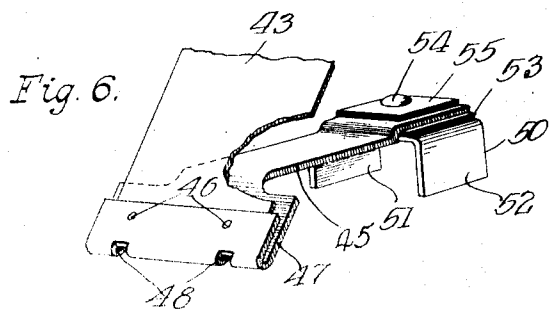
Dec. 11, 1928.

1,694,569

A. E. WALSH

SWITCH

Filed Sept. 14, 1925



Inventor:
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UNITED STATES PATENT OFFICE.

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SWITCH.

Application filed September 14, 1925. Serial No. 56,128.

This invention relates to switches and more particularly to improvements in that type of switch commonly known as a "key switch."

The object of the present invention is to provide an improved switch of simple, compact and inexpensive construction.

In accordance with the features of my invention, there is provided a switch including a pair of spaced electrical contacts and a member for establishing electrical connection therebetween comprising a flexible clock spring band relatively short in length and bent into a bow shape. As will become more apparent as the accompanying description progresses, by flexing this resilient member connection may be made or broken between the contacts with facility.

In the accompanying drawing,

Fig. 1 is a plan view of my novel switch;

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1 looking in the direction indicated by the arrows;

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 1 looking in the direction indicated by the arrows and showing the switch in a closed condition;

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 1;

Fig. 5 is a detail view showing the manner in which a handle is secured to the upper end of the flexible contact establishing member; and

Fig. 6 is a view of the lower end of the said member showing the manner in which the switch blade is fastened thereto.

Referring now to the drawings in detail, in which like reference numerals designate similar parts throughout the several views, 10 denotes the casing or housing for the switch mechanism which is preferably made of some insulating material, such as porcelain. The casing 10 is equipped with a central hollow space 11 in which the switch mechanism is disposed. The top surface of the casing 10 is equipped with two recess portions 12, in each of which a terminal 13 is positioned. Since both of the terminals are identical in construction, a description of one will suffice for both. Each terminal comprises a metallic piece 14 and a terminal bolt 15 to which an electrical conductor may be suitably attached. Each metallic piece 14 is held in place by a bolt 16 extending up from the bottom of the casing, through a bore 17 in the casing. The lower end of the bore 17 is countersunk, as

indicated at 18, in order to accommodate the head 19 of the bolt 16. The countersunk portion 18 is filled by a plug 20, preferably made of insulating material.

Each metallic piece 14 of the terminals 13 is provided with a bent ear 21 disposed in the space 11 of the casing 10. The ears 21 are directly opposite each other and are preferably in alignment. These ears constitute the two contact members between which an electrical connection must be established in order to close the circuit associated therewith. The pieces or members 14 should be made of some flexible metallic material, so as to provide the ears with a reasonable amount of resiliency. The end of each of these ears 21 is bent laterally, as indicated at 22, to more easily receive the contact establishing member, as will become more apparent with the progress of the present description.

Located on top of the casing 10 is a metallic top piece 30 disposed at each end in a groove or slot 31 in the top surface of the casing 10. The top piece 30 is held in position by a pair of bolts 32 extending up from the bottom of the casing 10.

Each of the bolts 32 pass through an aperture 33 in the casing and are threaded at their upper end into the top piece 30 as indicated at 34. The lower end of the aperture or bore 33 is countersunk, as indicated at 35, in order to receive the head 36 of the bolt 32. The countersunk portion 35 of the bore 33 is filled by a plug of insulating material 37 suitably fastened therein.

The top piece is provided at each end with a pair of apertures 38 and 39 by which it may be suitably attached to any desired mounting or support.

The top piece 30 has projecting laterally therefrom a pair of parallel ears 40. These ears extend down into the space 11 of the casing 10. The portion of the top piece 30 immediately over the space 11 in the casing 10 is provided with an opening 41 through which passes an end of a handle or knob member 42. The end of this member 41 inside of the space 11 is attached to the upper end of a clock band spring 43. One way of attaching this handle member 42 to the spring 43 is by peening it thereto. In Fig. 5 I have indicated a peen by the reference numeral 44.

Normally, the spring 43 is bent into a bow or arcuate shape, as indicated in Fig. 2. The lower end of the spring 43 is directly below

and in line with the upper end of the spring. The lower end of the spring 43 is peened to a bent member 45 clearly illustrated in perspective in Fig. 6. I have indicated the peens fastening the member 45 to the spring 43 by the reference numeral 46. One end 47 of the member 45 extends around the lower end of the spring 43 and is equipped with a pair of notches 48. These notches 48 are adapted to receive the edges of the ears 40 formed on the top piece 30. Thus it will be seen that the upper part of the spring 43 is held in position by the opening 41 in the top piece 30 and the lower end of the spring 43 is held in position by the two ears 40.

The member 45 has attached to its free end a contact or terminal connecting member 50 which comprises a piece of metal having two legs 51 and 52. Disposed intermediate the element 50 and the member 45 is a piece of insulating material 53 which insulates the element from the member. The element 50 is preferably attached to the member 45 by a bolt, rivet, or the like, 54, which is insulated from the top of the member 45 by a sheet of insulating material 55. The shank of the bolt 54 may be insulated from the member 45 by any suitable means, such as a bushing (not shown). Another way of insulating the shank of the bolt 54 from the member 45 would be to make the opening in the member 45 for receiving the bolt a trifle larger than the diameter of the shank of the bolt.

Formed on each of the ears 40 is a shoulder 60 for limiting the movement of the bent spring band 43 in one direction. Also formed on each of the ears is a shoulder or stop portion 61 for limiting the movement of the band 43 in the opposite direction. Each of the ears 40 is provided with a notch 62 intermediate the two shoulders 61 and 60 in which the lowermost end of the spring band 43 is disposed.

The operation of my novel key switch is believed to be obvious from the foregoing description. In Fig. 2 I have shown the bent resilient band 43 in the position it is in when the switch terminals are disconnected. In Fig. 3 the member 43 is in its other position and the terminals of the switch are shown connected by the member 50. That is to say, the legs 51 and 52 of the member 50 are in engagement with the ears 21 of the terminals.

Also in Fig. 2 I have illustrated in dotted lines what takes place as the spring 43 is flexed by the handle 42. As soon as enough of the spring 43 gets on the other side of the line connecting the two ends of the spring 43, if, on account of its own resiliency, is snapped over to the other side. Movement of the spring 43 is limited in either direction by the shoulders 60 and 61. Now by moving the handle 42 in the direction of the dotted position illustrated in Fig. 2, the spring member 43 can be snapped

over to the other side with considerable force, forcing the projections 51 and 52 on the member 50 into engagement with the ears 21 of the terminals, thereby establishing an electrical connection between the terminals, as illustrated clearly in Fig. 3. When it is desired to disconnect the terminals, the handle 42 is flexed in a direction opposite to that previously described. That is to say, the handle 42 illustrated in Fig. 3 is pulled to the right in order to disconnect the legs 51 and 52 from the ears 21 of the terminal.

It is to be understood that although I have disclosed the preferred embodiment of my invention, that the invention is not to be limited thereby, but only in so far as defined by the scope and spirit of the appended claims.

I claim:—

1. A switch comprising, in combination, an open-top casing of insulating material, a metallic member bridging the top of said casing and having an ear depending into said casing, a spring carried between bearing surfaces on said ear, said bearing surfaces being spaced apart less than the length of said spring, an operating handle connected with said spring and extending beyond the top of said casing, a relatively stationary contact member mounted in said casing, and a relatively movable contact member operatively connected with said spring and adapted by the operation of said handle to be snapped into and out of contact with said relatively stationary contact member.

2. A switch comprising, in combination, an open-top casing of insulating material, a member bridging the top of said casing and having spring supporting means depending into said casing, a spring carried between bearing elements on said spring supporting means, said bearing elements being spaced apart less than the length of said spring, an operating handle operatively associated with said spring and extending beyond the top of said casing, a pair of circuit terminals mounted in said casing, and a bridging member operatively associated with said spring and adapted by the operation of said handle to be snapped into and out of contact with said terminals.

3. A switch comprising, in combination, an open-top casing of insulating material, a member bridging the top of said casing and having spring supporting means depending into said casing, a spring carried between bearing elements on said spring supporting means, said bearing elements being spaced apart less than the length of said spring, an operating handle operatively associated with said spring and extending beyond the top of said casing, a contact member mounted in said casing relatively stationarily, and a contact member operatively associated with said spring and adapted by the operation of said handle to be snapped into and out of engage-

ment with said first named contact member.

4. A switch comprising, in combination, an open-top casing of insulating material, a metallic member bridging the top of said casing and having an ear depending into said casing, a spring member carried between bearing surfaces on said ear, said bearing surfaces being spaced apart less than the length of said spring member, an operating handle connected with said spring member and extending beyond the top of said casing, a stationary terminal mounted in said casing, and a movable terminal operatively connected with said spring member and adapted by the operation of said handle to be snapped into and out of contact with said stationary terminal.

5. A switch comprising, in combination, an

open-top casing of insulating material, a metallic member bridging the top of said casing and having ears depending into said casing, a leaf spring carried between bearing surfaces on said ears, said bearing surfaces being spaced apart less than the length of said spring, an operating handle connected with the upper end of said spring and extending beyond the top of said casing, a stationary terminal mounted in said casing, and a movable terminal mounted on the other end of said spring and adapted by the operation of said handle to be snapped into and out of contact with said stationary terminal.

In witness whereof, I hereunto subscribe my name this 10th day of September, 1925.

ARTHUR E. WALSH.