J. F. CAVANAGH.

ELECTRIC SWITCH.

APPLICATION FILED MAR. 13, 1919.

1,354,803. **Patented Oct. 5, 1920.**

Fig. 1.

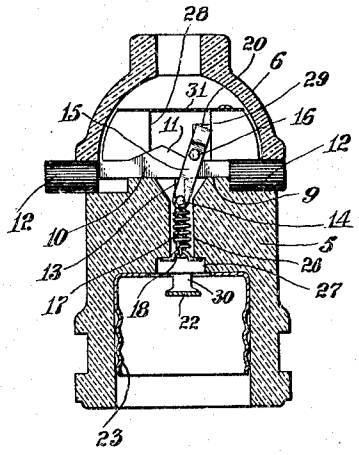


Fig. 3.

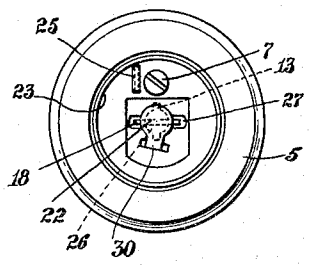


Fig. 2.

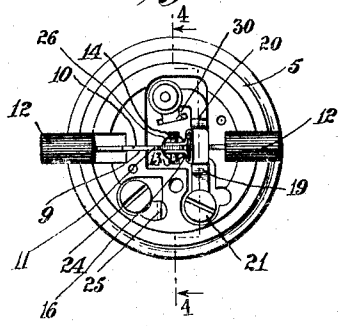
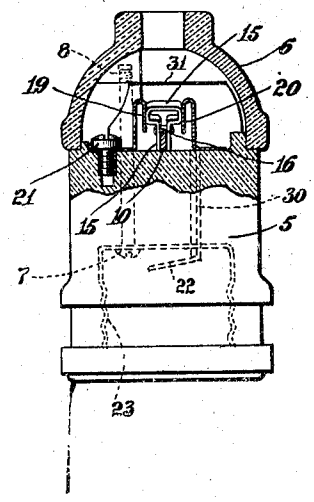


Fig. 4.



WITNESS:

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ELECTRIC SWITCH.

1,354,803. Specification of Letters Patent. Patented Oct. 5, 1920.

Application filed March 13, 1919. Serial No. 282,296.

To all whom it may concern:

Be it known that I, JOHN F. CAVANAGH, a citizen of the United States of America, residing at Meriden, Conn., have invented a new and useful Electric Switch, of which the following is a specification.

The objects of my present invention are to provide a simple and inexpensive form of snap switch mechanism of compact construction and especially suited to switches of the so-called socket type.

Briefly the invention comprises a swinging or oscillating contact making lever having a sliding pivotal mounting at one end and having a bearing at its opposite end on the peaked cam of a reciprocating operating member, said oscillating switch lever being held engaged with the peaked cam by a spring which supplies sufficient tension to cause the lever to snap over the peak of the cam as the reciprocating member is operated in opposite directions.

Various other features of the invention and details of construction will appear as the specification proceeds.

In the accompanying drawing I have illustrated a simple embodiment of my invention wherein:

Figure 1, is a longitudinal sectional view of the invention as incorporated in a socket switch.

Fig. 2, is a plan view of the base or lower portion of the switch with the cap removed to expose the switch mechanism.

Fig. 3, is a bottom plan view of the same.

Fig. 4, is a broken vertical section taken substantially on the plane of the line 4—4 of Fig. 2.

The body of the switch illustrated is of the weather-proof type comprising a main base portion 5 and a cover or cap portion 6, said parts being usually constructed of porcelain or other suitable insulating material and held together in this particular instance by a screw 7 passed up through the base into a screw seat 8 in the cap.

The base is formed with a transverse guide passage 9 for a reciprocating operating member in the form of a bar 10 provided with a double inclined or peaked cam 11 intermediate its ends and with protruding push buttons 12 at its opposite ends.

A longitudinal guide-way 13 is formed in the base beneath the transverse guide passage and extending downwardly therefrom substantially at a right angle. Working in this guide-way is a pivot pin 14 carried by the lower end of a swinging contact lever 15. This lever is provided near its upper end with a bearing pin 16 riding on the peaked cam of the sliding operating bar.

The contact lever is formed, in the illustration, of a piece of metal doubled upon itself to provide side arms embracing and disposed at opposite sides of the relatively flat slide, and the pivot pin 14 and the bearing pin 16 are shown as connecting these side arms, being secured thereto in the manner of rivets.

The lower or pivot end of the swinging contact lever is acted on by a spring 17 which exerts its tension to hold the bearing pin on the upper free end of the swinging lever engaged with the peaked cam. This spring is shown as a tension spring secured at its upper end to the pivot pin between the side arms of the lever and secured at its lower end to a transverse anchorage 18.

It will be clear from the foregoing that in the reciprocating movements of the cam slide, the contact lever will be caused to ride up one incline of the cam until the peak is reached and thereupon said lever will snap quickly over and down the opposite incline. A snapping movement of the contact controlling lever is thus secured in both directions.

The relatively stationary contacts of the switch are designated 19 and 20, the same being mounted upon the top of the base in position to be bridged by the widened upper end of the swinging contact lever. One of these contacts (19) is shown provided with a binding post 21 and the other contact (20) is shown connected with a center lamp contact 22 by a strap 30 extended down through the base to the cavity provided in the lower portion of the base for the screw shell contact 23. The other binding post 24 may be directly connected with the screw shell contact by a strip 25 extended up from the flange of the screw shell beneath the foot of the binding post 24.

A convenient method of constructing the base is to provide a longitudinal bore 26 in the same, extending up from the screw shell socket to the transverse passage, said bore having the guide-way 13 for the pivot pin

formed in the sides thereof. This bore is made large enough to accommodate the lower sliding end of the oscillating switch lever and to receive the tension spring, said spring being conveniently hooked on to the pivot pin at its upper end and secured at its lower end to the anchor 18 which may simply be a short piece bridging the lower end of the bore. This anchor is shown as set in a chamber 27 at the lower end of the bore so as to be entirely free of the center contact. Suitable abutments may be provided for limiting the throw of the switch lever, such as the stop shoulders 28 and 29.

In the first part of the movement of the reciprocating cam, the switch lever rides up the nearest incline and this lifting of the lever assists in freeing it of the relatively stationary contacts at the moment the peak of the cam is reached. This sliding of the contact lever over the face of the stationary contacts also tends to keep the contact faces bright and clean and insures good electrical conductivity at all times.

Another feature of the invention which is of considerable practical importance is the separation of the base parts on a horizontal line. As shown in Fig. 1 the lower or so-called base member forms the support for all the switch parts and is provided with the transverse guide passage 9 for the operating slide. The cap covers the base and all the electrical parts supported thereon and holds the slide in position in its guide way. The screw 7 which secures the parts together passes up through the inside of the base member and into an "insert", or the like in the cap member. Hence there are no exposed screw heads. The abutments 28—29 which usually are formed integral with the base provide bearings over which the upper end of the switch lever slides in its rising movement at the beginning of its stroke.

The switch, it will be seen, is extremely simple and relatively inexpensive and the action is such as to produce both a quick make and a quick break. The simplicity of parts and the general compactness adapt the mechanism particularly for socket switches, where the space is necessarily limited.

The switch parts may be protected, when the cap is removed, by an insulating cover 31, secured on top of the abutments 28, 29, which cover serves normally to keep dust away from these parts.

I claim:—

1. In an electric switch, the combination of a supporting base, a reciprocating operating member mounted on said base and provided with a peaked switch-throwing cam, a movable switch element having a sliding pivotal engagement on the supporting base at one end and engaged with the peaked cam at its opposite end and a spring exerting tension on the sliding end of the contact element to hold the opposite end thereof engaged with the peaked cam.

2. In an electric switch, a supporting base, a reciprocating operating member mounted on said base and provided with a peaked switch-throwing cam, said base having a guide-way at one side of and extending substantially at a right angle to the plane of movement of the reciprocating operating member, an oscillating switch element riding on the peaked cam at its free end and provided with a pivot pin at its opposite end sliding in the guide-way aforesaid and a spring acting on the pivot end of the contact element to hold said contact element tensioned against the peaked cam.

3. In an electric switch, a supporting base, a reciprocating operating member having a definite sliding movement on said base and provided with a peaked switch-throwing cam, said base having a guide-way therein at a point substantially mid-length of the stroke of the peaked cam and extending away from said peaked cam substantially at a right angle, a swinging contact lever bearing on the peaked cam at one end and provided at its opposite end with a pivot pin slidingly engaged in the guide-way and a spring operating on the sliding end of the contact lever to tension the same against the peaked cam.

4. In an electric switch, a sliding operating bar provided with a peaked cam, a swinging contact lever having arms disposed at opposite sides of and embracing the sliding bar, a bearing pin connecting said arms near one end thereof and riding on the peaked cam, a pivot pin connecting the opposite end portions of said arms, guiding shoulders disposed substantially at right angles to the sliding bar and engaged by said pivot pin to direct the same in a substantially rectilinear path with respect to the sliding bar and a spring exerting tension on the pivot end of the contact lever to hold the bearing pin in the swinging end thereof engaged with the peaked cam.

5. In a socket switch, the combination of a socket base provided with a transverse passage, a reciprocating operating bar slidingly guided in said passage and provided with a peaked cam intermediate its ends and push buttons at its opposite ends, said base having a longitudinal guideway beneath said transverse passage, a swinging contact lever having a pivot pin at its lower end slidingly engaged in said longitudinal guide-way and provided at its upper end with a bearing pin riding on the peaked cam and a spring engaging the pivoted sliding end of the contact lever to hold the swinging end of the same engaged with the peaked cam.

6. In a socket switch, a base having a

cavity in the lower side thereof a transverse passage in the upper portion thereof and a longitudinal bore provided with a guide-way extending from said cavity upwardly to the transverse passage, a double-ended push button slide guided in the transverse passage and provided with a peaked cam intermediate its ends, a stationary contact mounted on the base, a swinging contact lever adapted for engagement at its upper end with said contact and provided at its lower end with a pivot pin slidingly engaged in the guide-way, a bearing pin carried by the upper end portion of the swinging contact lever and riding on the peaked cam and a spring disposed in the bore and engaged with the lower sliding end of the contact lever.

7. In a switch of the character described, a swinging contact lever comprising spaced side arms, a pivot pin connecting said side arms near one end thereof, a bearing pin connecting said side arms near the opposite end thereof, a slide working between said side arms and having a peaked cam engaging the bearing pin, means engaging the pivot pin to guide the same in a path substantially at right angles to the movement of the slide and a spring engaged with the pivot pin between the side arms of the switch lever.

8. In an electric switch, the combination of a supporting base having spaced abutments, a swinging switch lever having a sliding pivotal engagement with the base at one end and having a swinging movement at its opposite end into engagement with the spaced abutments, a reciprocating operating member having a peaked cam for lifting and swinging the switch lever in opposite directions and a spring operating on the switch lever to hold the same engaged with the peaked cam, said switch lever having a sliding engagement with the spaced abutment in the course of the rising movement thereof.

JOHN F. CAVANAGH.