

C. J. KLEIN.
SNAP SWITCH.

APPLICATION FILED FEB. 20, 1908. RENEWED OCT. 24, 1910.

987,241.

Patented Mar. 21, 1911.

Fig. 1.

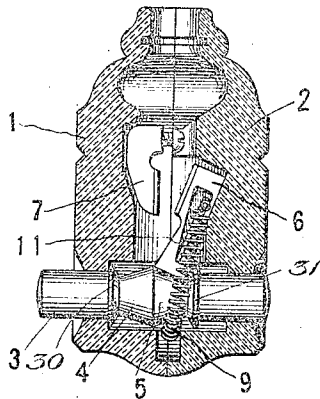


Fig. 2.

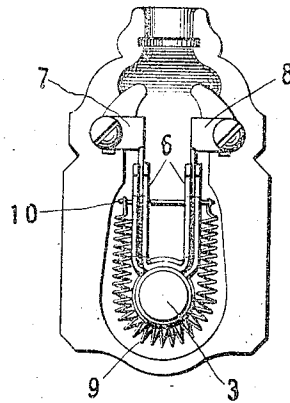


Fig. 3.

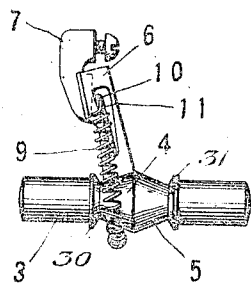
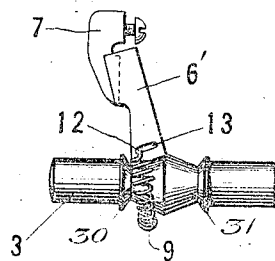


Fig. 4.



WITNESSES
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SNAP-SWITCH.

987,241.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES J. KLEIN, a citizen of the United States, and resident of the city of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Snap-Switches, of which the following is a specification.

This invention relates to switches adapted for use with electrical circuits.

The object of this invention is to provide a device incorporating its essential features in a simple and compact construction which shall be inexpensive to manufacture and at the same time effectively accomplish and fulfil the functions required in devices of this nature.

Other objects will be in part obvious and will in part appear hereinafter in connection with the description of the device shown in the accompanying drawings.

To illustrate my invention I have herein shown and described a simple form of pendant or socket switch, which is adapted for use in the usual manner to open and close the circuit by simply pressing a button.

In the drawings like parts have been given similar reference numbers in the several views.

Figure 1 is a sectional side elevation of a simple form of switch in its open position. Fig. 2 is a side elevation of one-half of the switch shown in Fig. 1. Fig. 3 is a side elevation of the operative parts of the switch shown in Fig. 1 in closed position. Fig. 4 is a similar view to Fig. 3, showing a modification of the operating mechanism.

At 1 and 2 are shown the two half-sections of a casing, preferably of insulating material, such as porcelain, in which the switch proper may be mounted. These half-sections are secured together by any suitable means and may be separated to permit of the assembling of the switch parts and also for making the wire connections.

At 3 is shown a movable member or cam, preferably of insulating material, mounted in the casing 1 and 2 so that the same may be moved back and forth by the alternate pressure of the finger on one end or the other of this member which projects through the casing as shown. The central portion of this cam or movable member 3 is so formed as to provide oppositely inclined surfaces on either side of a line transverse to the axis

thereof. These surfaces, for the convenience of manufacture, are preferably conical in form, as shown at 4 and 5, and may be readily turned on the member 3. Stops which may take the form of stop rings 30, 31 are secured to the member 3 and engage the casing to limit the movement of the cam. They form stops independent of the cam surfaces.

A switch blade 6 is carried upon the movable member 3 and alternately rides upon the conical portions 4 and 5 as the member 3 is moved, in the manner hereinafter described. Line terminals 7 and 8 are so positioned as to be engaged by the switch blade 6 when in its closed position and so close the circuit therethrough.

A resilient member 9 in the form of a coil spring surrounds the tapered portions 4 and 5 of the movable member 3. This resilient member forms the second movable member of the combination. The casing is so formed that the lower portion of this spring is substantially held stationary with relation to the movable member 3, but another portion of the spring is caused to move at an accelerated speed with relation to said cam. The ends of this coiled spring are attached to a pin 10 which is carried at one end of a third movable member 11, which constitutes a means for giving an impact to the switch blade. This member 11 is positioned in a triangular shaped recess in the switch blade 6 in such a manner as to have a bodily movement with relation to the switch blade and transverse to the axis thereof, the upper end thereof being swung forward and back as the device is operated.

Assuming the parts to stand in the open position, as shown in Fig. 1, the sliding member 3 being pushed to the right shifts the point upon which the switch blade 6 rests causing the same and the spring 9 to ride over the high central portion of the member 3 and upon passing this point to move quickly down upon the opposite inclined portion 4. As this takes place the movement of the spring 9 causes the member 11 to be swung quickly to the opposite side of the recess in the blade 6 and the impact or blow produced accelerates the movement of the switch blade 6 and also insures the same being positively and quickly brought into engagement with the line terminals 7 and 8, thus insuring a more perfect contact and

closing of the circuit. To open the switch the sliding member 3 is moved in the opposite direction and the inclined portions 4 and 5 cause a similar movement of the switch blade and associated parts in the reverse direction. The member 11 is swung in the opposite direction by this movement and the impact or blow caused by the same striking the opposite side of the recess in the blade 6 facilitates the releasing of the same from its engagement with the line terminals 7 and 8 and also accelerates the movement thereof and assists in producing the quick breaking of the circuit which is one of the desired results in switches of this nature.

In the modification shown in Fig. 4 the operation of the several parts is similar to that just described. The coiled spring 9 is attached to a pin 12 which is positioned in a slot 13 in the switch blade 6. The movement of the sliding member 3 causes the pin 12 to be moved with relation to the switch blade, transversely to its axis and quickly from one end to the other of the slot 13, accelerating and assisting the operation of the device in producing the quick opening and closing of the circuit. The operation of this form of device is similar to that just described and will be readily understood without further explanation.

It will be understood that the movement of the member 3 may be accomplished in various ways depending upon the use to which the device is to be put.

It will be noted that the straight line movement of the operating member 3 is transformed into a swinging movement of a third member about a pivot and that the pivotal point at which the third member is supported is also moved as the switch blade is caused to operate. This produces the accelerated swinging movement which has many advantages for devices of this nature.

It will be understood that my invention may be applied to devices for various uses other than the one shown and described herein and that I do not confine myself to this or any other particular embodiment of the same. It is further and particularly to be understood that I do not confine myself to any specific details of construction.

As many changes could be made in the above construction and many apparently widely different embodiments of my invention designed without departing from the scope thereof, I intend that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative merely of an operative embodiment of my invention and not in a limiting sense.

What I claim is:

1. In an electric switch, the combination of line terminals, a switch blade arranged to open or close the circuit through said ter-

minals, a cam, a resilient tension spring, having a portion engaging said cam, said engaging portion of said spring being bodily movable with relation to said cam, said cam and spring being constructed and arranged so as to produce an accelerated movement between them, and means for giving an impact to said switch blade, said means being connected to said spring and movable transversely to the axis of said switch blade.

2. In an electric switch, the combination of line terminals, a switch blade arranged to open or close the circuit through said terminals, a cam, a spring having a portion engaging said cam and arranged to move at an accelerated speed by the movement of said cam, and means for giving an impact to said switch blade, said means being connected to said spring and movable transversely to the axis of said switch blade.

3. In an electric switch, the combination of line terminals, a switch blade arranged to open or close the circuit through said terminals, a movable cam having oppositely inclined surfaces on either side of a line transverse to the axis thereof, a spring having a portion engaging said cam and arranged to move at an accelerated speed by the movement of said cam and means for giving an impact to said switch blade, said means being connected to said spring and movable transversely to the axis of said switch blade.

4. In an electric switch, the combination of line terminals, a switch blade arranged to open or close the circuit through said terminals, a cam having oppositely inclined conical surfaces on either side of a line transverse to the axis thereof, a spring engaging said cam and arranged to move at an accelerated speed by the movement of said cam and means for giving an impact to said switch blade, said means being connected to said spring and movable transversely to the axis of said switch blade.

5. In an electric switch, the combination of line terminals, a switch blade arranged to open and close the circuit through said terminals, a cam, a spring engaging said cam, a movable arm carried by said switch blade and arranged to give an impact to said blade, said arm being connected to said spring.

6. In an electric switch, the combination of line terminals, a switch blade arranged to open or close the circuit through said terminals, a cam having oppositely inclined tapering portions, said switch blade being carried upon said tapering portions, a spring engaging said inclined portions and connected to a movable arm, said arm being carried by said switch blade and moving transversely to the axis thereof when said cam is moved, whereby the switch blade is caused to move into and out of engagement with the line terminals.

7. In an electric switch, the combination of line terminals, a switch blade arranged to open or close the circuit through said terminals, a cam having oppositely inclined surfaces on either side of a line transverse to the axis thereof, a spring having a movable portion engaging said cam and a fixed portion, an impact member connected to said spring and arranged to strike said switch blade.

8. In an electric switch, the combination of line terminals, a switch blade arranged to open or close the circuit through said line terminals, a cam having oppositely inclined surfaces, a spring having a portion adapted to be moved by the movement of the cam and a fixed portion, an impact member carried by said blade and arranged to give an impact to said switch blade when said cam is moved.

9. In an electric switch, the combination of line terminals, a switch blade arranged to open or close the circuits through said terminals, a cam having oppositely inclined tapering portions, said blade being carried upon and alternately swung from one to the other of said tapered portions as said cam is moved, an impact member carried by said switch blade and arranged to give an impact to said blade by a movement transverse to the axis thereof, a spring connected to said impact member, said spring having a portion engaging said cam and a fixed portion.

10. In an electric switch, in combination, a helical spring, a movable cam member engaged thereby, said cam member having a tapering face which may be brought into engagement with said helical spring to cause said spring to move bodily over said tapering face, a switch blade engaging said cam member and held against said tapering face of said spring, and a third movable member carried by said switch blade and having a limited movement relatively thereto, said spring being attached to said third movable member and adapted when moved to cause a movement of said member, the combined movement of said members causing an accelerated movement of said switch blade.

11. In an electric switch, in combination, a helical spring, a movable cam member engaged thereby, said cam member having a conical portion which may be brought into engagement circumferentially with said helical spring to cause said spring to move bodily over said conical portion, a switch blade engaging said cam member and held against said conical member by said spring, and a third movable member carried by said switch blade and having a limited movement relatively thereto, said spring being attached to said third movable member and adapted when moved to cause a movement of said member, the combined movement of

said members causing an accelerated movement of said switch blade.

12. In an electric switch, the combination of line terminals, a switch blade arranged to open or close the circuit through said terminals, a cam, a resilient tension spring, having a portion engaging said cam, said cam and engaging portion of said spring being bodily movable with relation to each other, a casing for guiding said cam, stop rings secured at opposite ends of said cam to limit the movement thereof, the parts being constructed and arranged so that when said cam is operated an accelerated movement between cam and spring is produced, thereby giving a quick make and break action to said switch blade.

13. In an electric switch, the combination of line terminals, a switch blade arranged to open or close the circuit through said terminals, a cam, a spring engaging said cam, means connecting said spring and switch blade, stops secured to said cam and limiting the movement thereof, a casing in which said cam is guided, the parts being constructed and arranged so that by movement of the cam, an accelerated movement is given to said spring.

14. In an electric switch, the combination of line terminals, a switch blade arranged to open or close the circuit between said terminals, a cam, a spring engaging said cam, means connecting said spring with said switch blade, a casing for guiding said cam, means independent of said cam and supported on the member carrying the cam for limiting the movement thereof, the parts being constructed and arranged so that the movement of the cam gives an accelerated movement to said spring.

15. In an electric switch, the combination of line terminals, a switch blade arranged to open or close the circuit through said terminals, a cam, a tension spring engaging said cam, a casing in which said cam is supported and guided, stops secured to the member carrying said cam and engaging said casing to limit the movement thereof, the parts being constructed and arranged so that the movement of the cam gives an accelerated movement to said spring.

16. In an electric switch, the combination of line terminals, a switch blade arranged to open or close the circuit through said terminals, a cam, a tension spring engaging said cam, a casing in which said cam is supported and guided, stop rings secured at the ends of said cam to engage said casing to limit the movement of said cam, the parts being constructed and arranged so that the movement of the cam gives an accelerated movement to said spring.

17. In an electric switch, the combination of line terminals, a switch blade arranged to open or close the circuit through said ter-

minals, a cam, a spring engaging said cam, a portion of said spring being fixed, means connecting said spring with said switch blade, the parts being constructed and arranged so that a movement of the cam produces an accelerated movement of said switch blade.

Signed at the city of New York in the county of New York and State of New York this Feb. 14, 1908.

CHARLES JULIUS KLEIN.

Witnesses:

H. BISSETT,

ALFRED E. YAAGE.