

C. J. KLEIN.
SNAP SWITCH.

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

987,632.

Patented Mar. 21, 1911.

Fig- 1 -

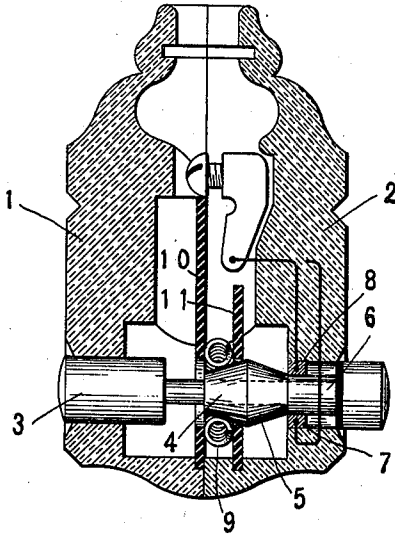


Fig- 2 -

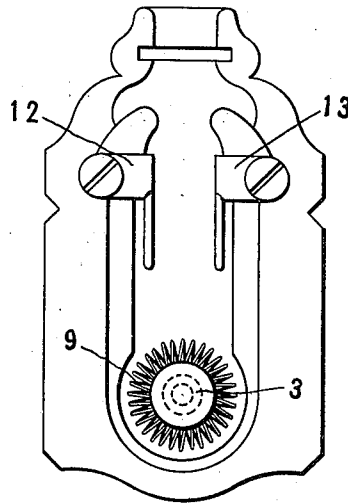


Fig- 3 -

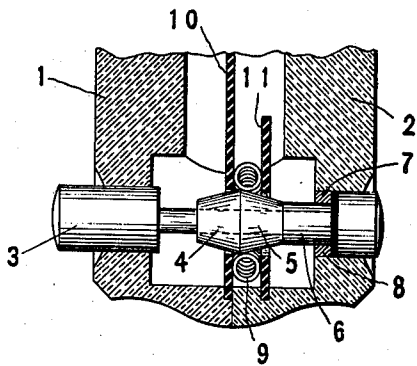
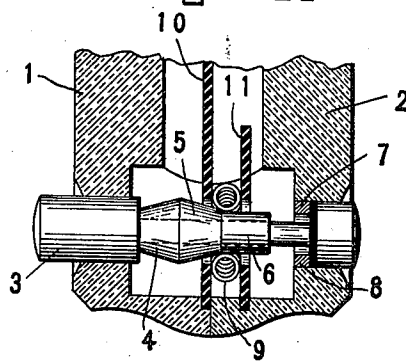


Fig- 4 -



WITNESSES

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SNAP-SWITCH.

987,632.

Specification of Letters Patent.

Patented Mar. 21, 1911.

Application filed February 20, 1908, Serial No. 416,934. Renewed October 24, 1910. Serial No. 588,786.

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 electric circuits.

One of the objects of this invention is to provide a switch in which a cam and spring engaging the cam produce a snap action of a switch blade, the spring being held stationary and the cam receiving an accelerated movement with relation to its operating member.

Another object of this invention is to provide a device of simple and compact construction incorporating the essential features of the invention and which will effectively accomplish and fulfil the functions required of 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 and described in the accompanying drawing.

To illustrate my invention I have shown and described a simple form of pendant or socket switch in which the circuit is opened or closed by simply pressing a button.

Like parts in the several views have been given similar reference numbers.

Figure 1 is a sectional side elevation of a simple form of switch in its closed position. Fig. 2 is a side elevation of one-half of the switch shown in Fig. 1. Fig. 3 is a view similar to Fig. 1 showing the switch as same is about to be opened. Fig. 4 is a similar view to Fig. 3 showing the switch in its open position.

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

At 3 is shown an operating member, preferably of insulating material, mounted in the casing 1 and 2 so that the same can be moved or oscillated by the alternate pressure

of the finger on one end or the other of this member which projects through the casing.

In the particular embodiment of the invention illustrated the operating member is provided with two push buttons. In the particular embodiment of the invention illustrated the central portion of this operating member 3 is formed with a section of reduced diameter providing a support for a circuit closing member which is mounted thereon so as to be movable relative to the operating member 3, as will be described more fully hereinafter.

The circuit closing member has a cam portion which includes 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 at one end of this member a switch contact is provided which, in the particular embodiment of the invention illustrated may assume the form of a cylindrical extension 6. The contact or extension 6 is constructed of conducting material and when the switch stands in the position shown in Fig. 1 the extension 6 closes the circuit between the line terminals 7 and 8, which are connected to the terminals 12 and 13, respectively, to which the wire leads may be attached by means of suitable fastening screws. A resilient member 9 in the form of a coil spring is carried by and surrounds the tapered portions 4 and 5 of the circuit closing member. This resilient member is retained against longitudinal movement with the aforesaid movable members by means of retaining members such as 10 and 11, which may be constructed of insulating material and suitably mounted in the casing 1—2 as shown.

The operation of the switch is as follows: Assuming the parts to stand in the closed position, as shown in Fig. 1, the operating member 3 is pushed to the left carrying with it the circuit closing member, which in turn causes the spring 9 to ride over the tapered portion 4 of said member and places the spring under tension. When the members have been moved as described to the position shown in Fig. 3, the high portion of the conical member having passed under the center of the spring after having placed the same under tension, the spring acting upon the inclined surface 5 causes the circuit closing

member to continue its movement toward the left with an accelerated motion. This quickly carries the extension 6 out of engagement with the line terminals 7 and 8, providing a quick breaking of the circuit and causing the member to assume the position shown in Fig. 4. To close the switch the operating member 3 is pushed from its opposite end in the reverse direction, causing the spring 9 to ride over the inclined portion 5 and to operate the inclined portion 4 of the circuit closing member to close the circuit in a similar manner.

It will thus be seen that the quick break in opening the circuit and the accelerated movement in closing the same is accomplished in a very simple and effective manner by the device just described. It will be noted that with this device it is impossible for the operator to hold the switch either partly open or partly closed and thus any arcing between the contacts is prevented as a movement of the operating member sufficient to cause the circuit closing member to move out of engagement with the line terminals at the same time causes the spring to operate on the inclined surfaces and automatically and quickly open the circuit entirely. The same is true when the switch is being closed, consequently, it is impossible for the operator to hold or manipulate the device so as to cause an arcing between the circuit closing member and the line terminals.

It will be understood that the movement of the member 3 may be accomplished in other ways than by manual manipulation as described and also that the invention may be applied to devices for various uses other than the one shown and described herein.

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 contact arranged to open and close the circuit through said terminals, an operating member, a cam actuated by and movable with relation to said operating member, said switch contact being actuated by said cam, a resilient tension member engaging said cam, means for preventing the resilient member from moving in the direction of movement of the operating member, the parts being so constructed and arranged that said cam is given an accelerated movement with relation to the said operating member to open and close said circuit.

2. In an electric switch, the combination of line terminals, a switch contact arranged to open and close the circuit through said terminals, an operating member, a cam mounted on and movable with relation to said operating member, said switch contact being actuated by said cam, a resilient tension member engaging said cam, means for preventing the resilient member from moving in the direction of movement of the operating member, the parts being so constructed and arranged that said cam is given an accelerated movement with relation to said operating member to open and close said circuit.

3. In an electric switch, the combination of line terminals, a switch contact arranged to open and close the circuit through said terminals, an operating member, a cam actuated by and movable with relation to said operating member, said switch contact being actuated by said cam, a resilient tension member engaging said cam, retaining walls for holding said resilient member, the parts being so constructed and arranged that said cam is given an accelerated movement with relation to said operating member to open and close said circuit.

4. In an electric switch, the combination of line terminals, a switch contact arranged to open and close the circuit through said terminals, an operating member, a push button carried by said operating member, a cam actuated by and movable with relation to said operating member, said switch contact being actuated by said cam, a resilient tension member engaging said cam, means for preventing the resilient member from moving in the direction of movement of the operating member, the parts being so constructed and arranged that said cam is given an accelerated movement with relation to said operating member to open and close said circuit.

5. In an electric switch, the combination of line terminals, a switch contact arranged to open and close the circuit through said terminals, an operating member, a push button carried by said operating member, a cam mounted on and movable with relation to said operating member, said switch contact being actuated by said cam, a resilient tension member engaging said cam, means for preventing the resilient member from moving in the direction of movement of the operating member, the parts being so constructed and arranged that said cam is given an accelerated movement with relation to said operating member to open and close said circuit.

6. In an electric switch, the combination of line terminals, a switch contact arranged to open and close the circuit through said terminals, an operating member, a push button carried by said operating member, a

cam actuated by and movable with relation to said operating member, said switch contact being actuated by said cam, a resilient tension member engaging said cam, retaining walls for holding said resilient member, the parts being so constructed and arranged that said cam is given an accelerated movement with relation to said operating member to open and close said circuit.

7. In an electric switch, the combination of line terminals, a reciprocating operating member, push buttons secured to opposite ends thereof, a switch contact arranged to open and close the circuit, a cam actuated by and movable with relation to said operating member, said switch contact being actuated by said cam, a resilient tension member engaging said cam, means for preventing the resilient member from moving in the direction of movement of the operating member, the parts being so constructed and arranged that said cam is given an accelerated movement with relation to said operating member to open and close said circuit.

8. In an electric switch, the combination of line terminals, a switch contact 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, an operating member on which said cam is mounted, said cam being movable with relation to said operating member, a spring engaging said cam and means for holding said spring, the parts being so constructed and arranged that said cam is given an accelerated movement with relation to said operating member to open and close said circuit.

9. In an electric switch, the combination of line terminals, a contact arranged to open and close the circuit through said terminals, an operating member, a cam actuated by and movable with relation to said operating member, said cam having oppositely inclined conical surfaces on either side of a line transverse to the axis thereof, a spring engaging said cam, means for preventing said spring from moving in the direction of movement of the operating member, the parts being so constructed and arranged that said cam is given an accelerated movement with relation to said operating member to open and close said circuit.

10. In an electric switch, the combination of line terminals, a switch contact arranged to open and close the circuit through said line terminals, an operating member, a cam carried by and movable with relation to said operating member, a spring carried by said cam and means for holding the said spring, the parts being so constructed and arranged that said cam is given an accelerated movement with relation to said operating member to open and close said circuit.

11. In an electric switch, the combination

of line terminals, a switch contact arranged to open and close the circuit through said terminals, an operating member, a cam having oppositely inclined conical surfaces movable on said operating member and with relation thereto, a spring carried by said cam and engaging the surface thereof, the parts being so constructed and arranged that said cam is given an accelerated movement with relation to said operating member to open and close said circuit.

12. In an electric switch, the combination of line terminals, a switch contact arranged to open and close the circuit through said terminals, an operating member for actuating said cam, a spring directly engaging said cam, means for preventing said spring from moving in the direction of movement of the operating member, said cam being bodily movable with relation to said operating member, the parts being so constructed and arranged that said cam is given an accelerated movement with relation to said operating member to open and close said circuit.

13. In an electric switch, the combination of line terminals, a switch contact arranged to open and close the circuit through said terminals, a cam having inclined cam surfaces and arranged to be moved with relation to its operating member, an operating member for actuating said cam, a spring directly engaging said cam, means for preventing said spring from moving in the direction of movement of the operating member, the parts being so constructed and arranged that said spring is placed under tension by the movement of said operating member whereupon the spring acting upon one of said cam surfaces causes a further accelerated movement of said cam independently of said operating member to open and close the circuit.

14. In an electric switch, the combination of line terminals, a switch contact arranged to open and close the circuit through said terminals, an operating member, a cam having oppositely inclined conical surfaces and arranged to be moved with relation to the operating member, a stationary helical spring circumferentially engaging said cam, the parts being so constructed and arranged that one of said conical surfaces is adapted to be moved into engagement with said spring so as to extend the same and the other of said conical surfaces is adapted to be moved into engagement with said spring so as to give an accelerated movement to said cam independently of the movement of the operating member.

15. In an electric switch the combination of a casing, line terminals, a reciprocating operating member supported and guided by said casing, a cam having oppositely inclined conical surfaces supported and guided on said operating member and movable with

relation thereto, and a stationary helical spring engaging said cam so that by the movement of said operating member, the spring is first placed under tension and thereupon produces an accelerated movement of the cam with relation to the operating member so as to control the circuit.

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. NYAAGE.