

C. J. KLEIN.

SNAP SWITCH.

APPLICATION FILED SEPT. 20, 1907. RENEWED OCT. 24, 1910.

987,240.

Patented Mar. 21, 1911

Fig. 1

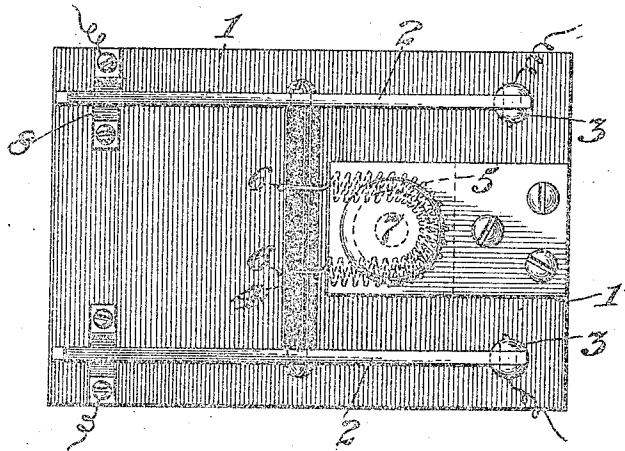
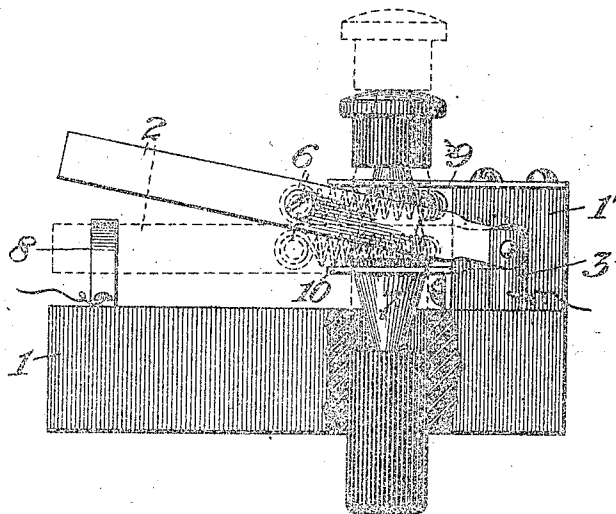


Fig. 2



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SNAP-SWITCH.

987,240.

Specification of Letters Patent.

Patented Mar. 21, 1911.

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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 in certain respects to a mechanical movement and more particularly to an electric snap switch including three members, one, a member carrying the switch contact and suitably connected with a fixed support, another a cam, and a third, a resilient tension member which, in the particular form illustrated, consists of a helical spring engaging the cam and connected to the switch member. The parts are so arranged and operated in such a manner that when a relative movement between cam and spring is produced the spring is put under tension, and in the particular embodiment illustrated, moves quickly along the engaging face of the cam pulling on the switch member with a sudden jerk and causing the switch to open and close with a snap action.

The object of this invention is to provide a device incorporating its essential features in a simple and inexpensive construction which may be adapted to many and various uses and which shall be positive in its operation to effectively accomplish the desired results.

Other objects will be in part obvious and will in part appear hereinafter in connection with the specific embodiment herein shown.

The adaptability of the invention to many other uses in addition to that shown will be obvious.

To illustrate my invention I have herein shown and described a simple form of an electric switch which is adapted for use in the usual manner in connection with circuits in which a quick break is desired.

In the drawings accompanying this specification like parts have been given the same reference numbers in the several views.

Figure 1 is a plan view of a simple form of knife switch. Fig. 2 is a side elevation of Fig. 1.

At 1 is shown a base, which may be of in-

sulating material, upon which are mounted two contact blades 2 by means of suitable posts 3. These blades 2 are joined by a connecting member or cross-bar of insulating material to which is attached a resilient member in the form of a coiled spring 5 which is attached at either end 6 thereof to the cross-bar 4.

An operating member 7 is mounted in the base 1 so as to be movable vertically as shown in Fig. 2. The central portion of this member is formed so 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. The resilient member 5 surrounds the tapered portion of the operating member 7 and is adapted to ride over this tapered portion as said member is moved.

Contact clips 8 provided with suitable line terminals are provided and arranged so that when the blades 2 are in their closed position, as shown in dotted out-line in Fig. 2, the circuit will be closed from the posts 3 through the blades 2 to the contact clips 8.

Retaining members 9 and 10 are mounted upon a suitable insulating support 1' and cause the resilient member 5 to ride over the tapered portions of the operating member 7 as the same is moved, as will be described hereinafter.

The operation of the device is as follows: Assuming the parts to stand in the open position as indicated in full lines in Fig. 2, the operating member 7 is raised to the position shown in dotted outline, causing the resilient member 5 to engage the retaining member 9 and to ride over the high portion of the conical part of the operating member 7, thus extending the spring and putting the same under tension. As soon as this high point has passed the tension of the spring causes the same to move quickly downward over the opposite conical portion of the operating member 7 and carries with it the blades, causing the same to swing about their pivots on the posts 3 and close the circuit through the contact clips 8. To open the device the operation is reversed by moving the operating member 7 downward, the resilient member 5 engaging the retaining

member 10 and riding over the conical portion of the operating member 7 in the manner just described, causing the blades 2 to move quickly upward and out of engagement with contact clips 8 and providing a quick break for the circuit. It will thus be seen that the movement of the operating member 7 causes an accelerated movement of the members 5 and 2 in the opposite direction.

It will be understood that the movement of the member 7 may be accomplished in various ways depending upon the use to which the device is put. It will also be noted that the straight line movement of the operating member 7 is transformed into a swinging movement of a third member about a fixed pivot.

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 in construction and many apparently widely different embodiments of my invention could be 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 combination, a fixed support, a cam having an inclined face, a member pivoted to said fixed support, and a tension spring having a portion surrounding and engaging said inclined face of said cam and connected to said pivoted member to cause said member to move.

2. In combination, a fixed support, a cam member having an inclined face, a member pivoted to said fixed support, a helical spring engaging said inclined face of said cam member and connected to said pivoted member and causing said member to move.

3. In an electric switch, in combination, a fixed support, a movable cam member having an inclined face, a member pivoted to said fixed support, a switch contact associated with said pivoted member and actuated thereby, and a helical spring, having one or more of its coils engaging said cam member and connected with said pivoted member.

4. In combination, a fixed support, a cam member having an inclined face, a member pivoted to said fixed support, a helical spring connecting with said pivoted member and having one or more of its coils engaging said cam member, and a switch contact asso-

ciated with said pivoted member and actuated thereby.

5. In an electric switch, in combination, a fixed support, a cam having oppositely inclined faces, a switch member pivotally mounted upon said fixed support, a helical tension spring having one or more coils engaging said cam and operatively connected to said switch.

6. In a switch mechanism, in combination, a fixed support, a frame, a movable cam member in the form of a double conical frustum, a switch member pivotally mounted upon said fixed support, a helical spring surrounding the cam member and operatively connected with said switch member.

7. A mechanical movement comprising a fixed support, a cam having oppositely inclined faces, a member pivotally mounted upon said fixed support, a tension spring having a portion surrounding and engaging said cam and connected with said pivoted member, said pivoted member being moved by a coaction between said three members, and means whereby said cam is moved to shift one of said inclined faces from engagement with said spring, and to bring the other face into engagement therewith.

8. In an electric snap switch, the combination of a fixed support, a reciprocating member, a cam actuated thereby, a tension spring having a portion surrounding and engaging said cam, the engaging portion of said spring being bodily movable with relation to said cam, a switch member movably secured to said fixed support, means connecting said switch member and spring, the parts being so constructed and arranged that the reciprocation of said cam places said spring under tension and produces a quick snap action of said switch member.

9. In an electric snap switch, the combination of a fixed support, a reciprocating member, a cam actuated thereby, a tension spring having a portion surrounding and engaging said cam, the engaging portion of said spring being bodily movable with relation to said cam, retaining members for said spring, a switch member movably secured to said fixed support, means connecting said switch member and spring, the parts being so constructed and arranged that the reciprocation of said cam places said spring under tension and produces a quick snap action of said switch member.

10. In an electric snap switch, the combination of a fixed support, a reciprocating member, a cam actuated thereby, a helical tension spring engaging said cam, the engaging portion of said spring being bodily movable with relation to said cam, a switch member movably secured to said fixed support, means connecting said switch member and spring, the parts being so constructed and arranged that the reciprocation of said

cam places said spring under tension and produces a quick snap action of said switch member.

11. In an electric snap switch, the combination of a fixed support, a reciprocating member, a cam having faces inclined with relation to each other and actuated thereby, a tension spring having a portion surrounding and engaging said cam, the engaging portion of said spring being bodily movable with relation to said cam, a switch member movably secured to said fixed support, means connecting said switch member and spring, the parts being so constructed and arranged that the reciprocation of said cam places said spring under tension and produces a quick snap action of said switch member.

12. In an electric snap switch, the combination of a fixed support, a reciprocating member, guides for said reciprocating member, a cam actuated by said member, a tension spring having a portion surrounding and engaging said cam, the engaging portion of said spring being bodily movable with relation to said cam, a switch member movably secured to said fixed support, means connecting said switch member and spring, the parts being so constructed and arranged that the reciprocation of said cam places said spring under tension and produces a quick snap action of said switch member.

13. In an electric snap switch, the combination of a fixed support, a reciprocating member, guides for said reciprocating member, said guides forming stops to limit the movements of said member, a cam actuated by said member, a tension spring having a portion surrounding and engaging said cam, the engaging portion of said spring being bodily movable with relation to said cam, a switch member movably secured to said fixed support, means connecting said switch member and spring, the parts being so constructed and arranged that the reciprocation of said cam places said spring under tension and produces a quick snap action of said switch member.

14. In an electric snap switch, the combination of a fixed support, a reciprocating member, guides for said reciprocating member, said guides forming stops to limit the movement of said spring, a cam actuated by said member, a tension spring having a portion surrounding and engaging said cam, the engaging portion of said spring being bodily movable with relation to said cam, a switch member movably secured to said fixed support, means connecting said switch member and spring, the parts being so constructed and arranged that the reciprocation of said cam places said spring under tension and produces a quick snap action of said switch member.

15. In an electric snap switch, the combination of a fixed support, a cam having an

inclined face, a switch member pivotally connected with said fixed support, a tension spring having a portion surrounding and engaging said inclined face and connected to said switch member and retaining members to limit the movement of said spring.

16. In an electric snap switch, the combination of a fixed support, a reciprocating cam having an inclined face, a switch member pivotally connected with said support, a bodily movable tension spring engaging said inclined face and connected to said switch member and retaining members to limit the movement of said spring.

17. In an electric snap switch, the combination of a fixed support, a reciprocating cam having an inclined face, a switch member pivotally connected with said support, a helical, coiled, tension spring embracing and engaging said inclined face and connected to said switch member, and means to limit the movement of said spring.

18. An electrical switch comprising a fixed support, a cam having oppositely inclined faces, means for moving said cam, a switch member pivoted upon said support, a connection between said member and said cam including a tension spring having a portion connected with said member and adapted to be put under tension by the movement of said cam, thereby actuating said switch member with a snap action.

19. An electrical switch comprising a fixed support, a reciprocating cam having oppositely inclined faces, a switch member pivoted upon said fixed support, a yielding connection between said member and said cam including a tension spring having a portion connected with said member and adapted to be put under tension by the movement of said cam, thereby actuating said switch member with a snap action.

20. An electrical switch comprising a fixed support, a reciprocating cam having oppositely inclined faces, said cam having secured at each end a push button for reciprocating said cam, a switch member pivotally secured to said support, said cam being arranged between said pivot and the end of said switch member, a yielding connection between said member and said cam, including a tension spring having a portion connected with said member and adapted to be put under tension by the movement of said cam, thereby actuating said switch with a snap action.

21. An electrical switch comprising a fixed support, a pair of switch blades each pivotally connected with said support, a reciprocating cam, said cam having oppositely inclined faces and having a push button at each end and arranged between said blades, a cross bar connecting said blades and a yielding connection including a ten-

sion spring having a portion connected with said cross bar, said spring surrounding said cam, and adapted to be put under tension by the movement of said cam thereby actuating said switch with a snap action.

22. An electrical switch comprising a fixed support, a pair of switch blades each pivotally connected with said support, a cross bar connecting said blades, a reciprocating cam, said cam having oppositely inclined faces and having a push button at each end and arranged between said blades and between the pivotal supports and the cross bar, and a yielding connection includ-

ing a tension spring having a portion connected with said cross bar, said spring surrounding said cam, and adapted to be put under tension by the movement of said cam thereby actuating said switch with a snap action.

Signed at the city of New York in the county of New York and State of New York this 19th day of Sept. A. D. 1907.

CHARLES J. KLEIN.

Witnesses:

LEWIS J. DOOLITTLE,
A. W. SOUTHARD.