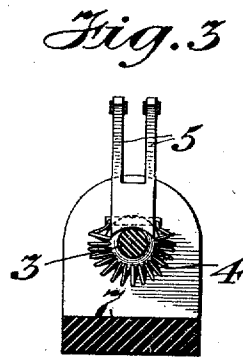
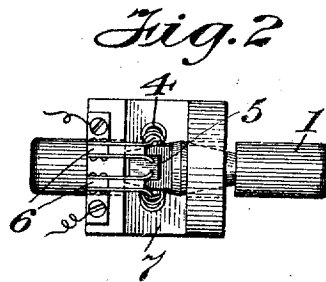
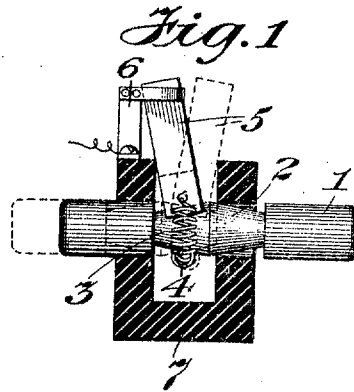


C. J. KLEIN.
SNAP SWITCH.

APPLICATION FILED SEPT. 20, 1907. RENEWED JULY 30, 1910.

987,306.

Patented Mar. 21, 1911.



Witnesses:
Chas. J. Clagett
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UNITED STATES PATENT OFFICE.

CHARLES J. KLEIN, OF NEW YORK, N. Y.

SNAP-SWITCH.

987,306.

Specification of Letters Patent.

Patented Mar. 21, 1911.

Application filed September 20, 1907, (Serial No. 393,793.) Renewed July 30, 1910. Serial No. 574,685.

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.

My invention relates to improvements in mechanical movements which are especially adapted for operating electric switches.

The object of my invention is to provide a simple and compact mechanism for operating the contacts of a snap switch.

In the accompanying drawing I have illustrated a simple structure embodying the principles of my invention.

The structure shown in the drawing has merely been selected to show the nature of my invention, and therefore it should be construed in an illustrative and not in a limiting sense.

The principles of my invention may be embodied in different forms and applied to switches and other devices of various types.

The views in the accompanying drawing, in which like parts have the same reference numbers, are as follows:

Figure 1 is a side elevation of a switch with the supporting frame shown in section.

Fig. 2 is a plan view of the switch. Fig. 3 is a cross sectional view.

I provide a cam member 1, which in the present instance has two oppositely inclined portions 2 and 3 in the form of a double conical frustum. The ends of the cam member 1 are preferably formed as buttons which may protrude through the sides of the frame or casing in which this cam member may be mounted. The cam member may be moved from left to right, and vice versa, by alternately pushing the protruding ends or buttons.

Around the cam extends a helical spring 4, the ends of which are connected to the sliding member 5 which is mounted upon the inclined or tapering portion of the cam member and between the sides of the frame and having its base engaging the cam. The helical spring has its helices engaging the cam faces and holds the sliding member against the cam, causing a movement of said member in a peculiar manner which will be explained hereinafter. The helical spring 4

is shown as connected to the sliding member 5 by means of a pin, into which are fastened the ends of the spring, said pin passing through said sliding member. Of course, the spring may be connected to the sliding member in any other suitable way.

The sliding member 5 carries upwardly extending contacts, which contacts are adapted to engage the stationary contacts 6 mounted upon the frame 7. The switch contacts may assume any suitable form and may be associated with the sliding member in any suitable manner so as to be actuated thereby.

I shall now describe the operation of the structure shown in the drawing.

With the parts standing in the position shown in Fig. 1 the switch is closed. If the button be pushed so as to move the cam 1 to the left, the spring 4 will engage the left side wall of the frame 7, the cam faces 3 will pass through and extend the spring 4. When the inclined surface 2 comes into engagement with the spring 4 and the sliding member 5, the spring, on account of its resilient engagement with said face, will slide over said face 2 and also cause said sliding member to slide over said face toward the left, thereby quickly imparting a bodily movement to the sliding member 5. The sliding member will also partake of a pivotal movement upon being shifted from engagement with the face 3 into engagement with the face 2. These movements will shift the bodily and angular position of the sliding member, and the contacts carried thereby into the position indicated by dotted lines, thereby separating said contacts from the stationary contacts 6 and thus opening the switch. In order to close the switch the left hand button may be pushed to move the cam member 1 to the right, thereby causing the spring 4 to engage the opposite side wall of the frame 7 so that the cam face 2 will pass through said spring 4 until said spring and the sliding member 5 reengage the taper face 3 of the cam, which will cause the sliding member 5 and the contacts to partake of bodily and angular movement in the opposite direction, thereby throwing said contacts into engagement with the stationary contacts 6 again.

It will be evident that various changes may be made in the structure which I have

illustrated and described herein, without in any way departing from the principles of my invention.

What I claim is:

5 1. The combination of a cam, means for moving said cam, a spring engaging the face of said cam, a member connected to said spring and coöperating with the face of the cam and means for producing a relative
10 movement between the cam and the spring, thereby causing a bodily and angular movement of said movable member.

2. The combination of a cam having two portions inclined with relation to each other,
15 a spring directly engaging said cam, a member engaging said cam and connected to said spring and means for producing a relative movement between cam and spring whereby
20 a bodily and angular movement of said member is produced at an accelerated speed.

3. The combination of a cam, a spring directly engaging said cam, a member connected to said spring and engaging said cam
25 and means for reciprocating said cam, thereby causing said member to partake of a bodily and angular movement at an accelerated speed in either of two directions.

4. In combination, a cam member having an inclined face, a sliding member having
30 a base adapted to engage said face, and a resilient member engaging said face and connected to said sliding member to cause said sliding member to move.

5. In combination, a cam member having
35 an inclined face, a sliding member adapted to engage with said face, a helical spring engaging said face and connected to said sliding member and causing said sliding member to move.

6. In an electric switch, in combination, a movable cam member having an inclined face, a sliding member engaging therewith,
40 a switch contact associated with said sliding member and actuated thereby, and a helical member engaging said cam member and connected with said sliding member.

7. In combination, a cam member having an inclined face, a sliding member engaging therewith, a helical spring connecting with
50 said sliding member and engaging said cam member, and a switch contact associated with said sliding member and actuated thereby.

8. In an electric switch, in combination,
55 a cam having oppositely inclined faces, a switch member engaging said cam, a helical spring engaging said cam and connected to said switch member.

9. In a switch mechanism, in combination,
60 a frame, a movable cam member in the form

of a double conical frustum, a switch member engaging said cam member, a helical spring surrounding the cam member and connected with said switch member.

10. A mechanical movement comprising a 65 cam member having oppositely inclined faces, a sliding member engaging therewith, a resilient member engaging said cam member and serving to hold said sliding member upon said cam member, said sliding member 70 being moved pivotally and bodily by a co-action between said three members, said cam member being moved to shift one of said inclined faces from engagement with said sliding member and said resilient member 75 and bring the other face into engagement therewith.

11. In an electric snap switch, the combination of a cam having oppositely inclined faces, a spring engaging said cam, a 80 switch member engaging said cam member and connected to said spring and means for moving said cam, the parts being so constructed and arranged that the switch member is given an angular and bodily move- 85 ment at an accelerated speed independent of the means for moving the cam.

12. In an electric snap switch, the combination of a reciprocating cam having oppositely inclined faces, a frame supporting and 90 guiding said cam, a push button carried by said cam and projecting through the side of the frame, a coiled spring engaging said cam, a switch member coöperating with said cam and connected to said spring, the parts 95 being so constructed and arranged that the switch member is given an angular and bodily movement at an accelerated speed independent of the cam.

13. In an electric snap switch, the combination of a reciprocating cam, push buttons 100 mounted at opposite ends of the cam, said cam having oppositely inclined faces, a frame for supporting and guiding said push buttons and cam through which frame the 105 push buttons project, a switch member engaging said cam member, a coiled spring secured to said switch member, said spring likewise engaging said cam, the parts being so constructed and arranged that the switch 110 member is given an angular and bodily movement at an accelerated speed independently of the cam.

Signed at the city of New York in the county of New York and State of New York 115 this 19th day of Sept. A. D. 1907.

CHARLES J. KLEIN.

Witnesses:

LEWIS J. DOOLITTLE,

A. W. SOUTHARD.