(No Model.)

A. EKSTRÖM.

ELECTRIC SNAP SWITCH.

No. 483,713. Patented Oct. 4, 1892.

Fig. 1.

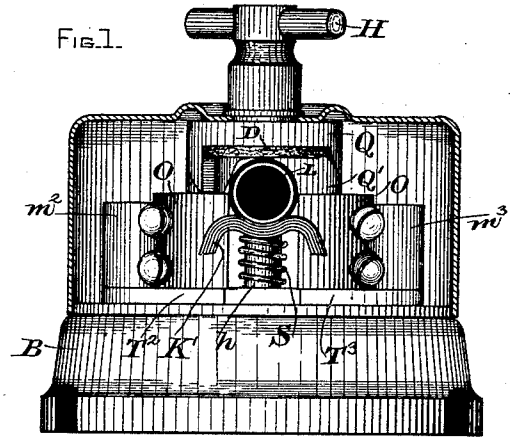


Fig. 4.

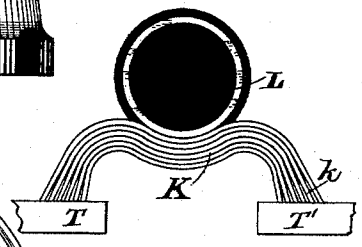


Fig. 5.

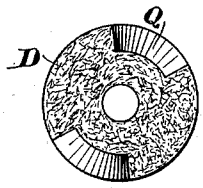


Fig. 2.

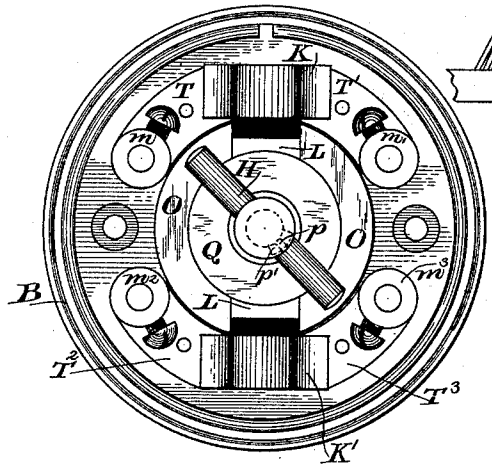
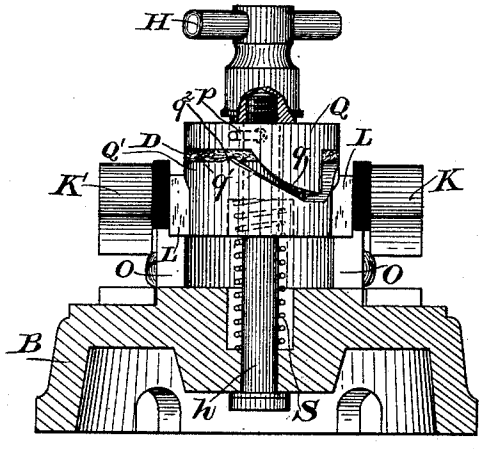


Fig. 3.



Witnesses.
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UNITED STATES PATENT OFFICE.

AXEL EKSTRÖM, OF LYNN, MASSACHUSETTS, ASSIGNOR TO THE THOMSON-HOUSTON ELECTRIC COMPANY, OF CONNECTICUT.

ELECTRIC SNAP-SWITCH.

SPECIFICATION forming part of Letters Patent No. 483,713, dated October 4, 1892.

Application filed April 7, 1891. Serial No. 388,044. (No model.)

To all whom it may concern:

Be it known that I, AXEL EKSTRÖM, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented a certain new and useful Improvement in Electric Snap-Switches, of which the following is a specification.

My invention relates to electric snap-switches and provides a switch of great current-carrying capacity in proportion to its size with a quick and certain break, few and simple parts, and comparatively-noiseless action.

In the accompanying drawings, Figure 1 is an elevation of a double-pole switch embodying my improvements, the cover being shown in section Fig. 2 is a plan view of the same with the cover removed. Fig. 3 is a section of the switch in the plane of the contact-bar, certain parts being shown in elevation. Figs. 4 and 5 show details.

My improvements are here shown embodied in a double-pole switch, although it will be understood that some of them are readily applicable to other forms of switches. The base B of the switch is provided with the four fixed contact-plates T T′ T^2 T^3, which are necessary for a double-pole switch, and said fixed contact plates or terminals are provided with the usual circuit-connecting clamps m m' m^2 m^3. Bridges or contact-plates K K′ are employed to connect these fixed contact-terminals in pairs, so as to complete both sides of a circuit at once, or, conversely, to simultaneously break both sides of the line. These bridging-contacts are carried and operated by a cross-bar L, which has a free up-and-down movement perpendicularly to the base, and is guided in such movement and prevented from rotation by means of the fixed guides O, which are preferably molded in one piece with a porcelain base. It is necessary that the bridging-contacts K K′ should be insulated from each other, and to this effect the end portions of the cross-bar L are made of insulating material. To give this cross-bar the requisite reciprocating motion, I employ a cam-action, actuated by a handle H, preferably through a lost-motion device, which may consist of a pin p on the spindle of the handle, engaging loosely in a slot p' in one of the cams Q, which is loosely mounted on the spindle h, and has downwardly-projecting inclined surfaces g engaging with inclined surfaces Q′, formed on or attached to the reciprocating cross-bar. A spring S, bearing between the cross-bar and the base, constantly tends to raise said cross-bar out of contact or to hold it when so raised.

It will be seen that in position shown in Fig. 1 the bridging-contacts are raised and the circuit is broken. By turning the handle H the upper cam Q engages with the lower cam Q′ to depress the cross-bar, and thereby bring the bridging-contacts firmly against the fixed contact-plates. The tops q' of the lower cam-surfaces are made flat, as shown in Fig. 3, so as to give a stable bearing for the cams when the cross-bar is thus depressed and the circuit closed. Just before the upper cam comes onto this flat top it snaps over a projection q^2. The purpose of this is to notify the operator that the circuit has been closed. Without such notification he is apt to continue turning the switch and to break the circuit. When it is desired to break the circuit, the handle is turned farther in the same direction until the projecting cam-surfaces are disengaged from one another, when the spring S will drive the cross-bar upwardly so as to remove the bridging-contacts from the fixed terminals.

By reference to Figs. 1 and 4 it will be seen that the bridging-contacts K K′ are each formed of a number of laminations or spring-plates k, curved downwardly and outwardly at both ends. The effect of this is that when the bridge is pressed down against the fixed terminals the ends of the spring-plates will spread and rub against said terminals, thereby securing a clean as well as strong contact. The upper cam projections q have their rear or releasing faces perpendicular to the base, so that when the cross-bar is released it is free to spring upwardly without impediment from the cams, its free movement being aided by the lost-motion device p p', which allows the upper cam to be thrown slightly without interfering with the motion of the cross-bar or being hindered by the handle.

When the cross-bar springs up, as described, there is liable to be more or less jar. This is

deadened by a cushion D, of leather, rubber, felt, or equivalent material, which is interposed between the two cams, preferably by being secured to the under face of the upper cam, as shown in Figs. 1 and 5. This cushion takes the blow of the lower cam when it is released, and is a valuable feature when the switch is to be applied to resonant surfaces, such as wooden walls. The guides O are formed, as before stated, directly on the base-plate, and being thus of insulating material there is no danger of their short-circuiting the contact-bridges, and the complication and expense due to separate metal guides is avoided.

What I claim as new, and desire to secure by Letters Patent, is—

1. In an electric switch, the combination, with the fixed contact-surfaces, of the reciprocating bridging-contact movable perpendicularly to said surfaces to press against or be withdrawn from the same and having outwardly and downwardly extending spring ends.

2. In an electric switch, the combination, with the fixed contact-surfaces, of the reciprocating bridging spring-plate movable perpendicularly to said surfaces to press against or be withdrawn from the same and having outwardly and downwardly extending ends.

3. The combination, in an electric switch, of the fixed contact-surfaces, the spring-plate having outwardly and downwardly extending ends for contact therewith, guides in which the spring-plate moves perpendicularly to the fixed contact-surfaces, and a rotary operating device—such as a cam-action—for depressing and releasing the spring-plate.

4. The combination, in an electric switch, of the fixed contact-surfaces, the laminated plate having outwardly and downwardly extending ends for contact therewith, guides in which the spring-plate moves perpendicularly to the fixed contact-surfaces, and a rotary operating device—such as a cam-action—for depressing and releasing the laminated plate.

5. The combination, with the vertically-movable switch-contact, of an actuator therefor, consisting of two engaging cams, one having an inclined surface, an adjoining elevated flat surface, and a projection at the junction of said surfaces and the other having an inclined tooth adapted to ride up said inclined surface and snap over said projection, substantially as described.

In witness whereof I have hereunto set my hand this 31st day of March, 1891.

AXEL EKSTRÖM.

Witnesses:
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