

H. CAHEN.
 PUSH BUTTON ELECTRIC SWITCH.
 APPLICATION FILED MAR. 22, 1911.

1,038,284.

Patented Sept. 10, 1912.

Fig. 1.

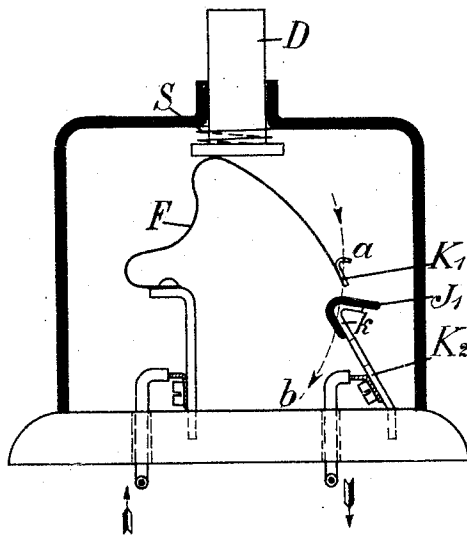


Fig. 2.

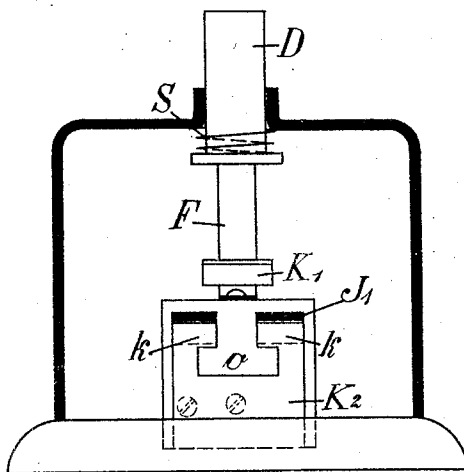


Fig. 3.

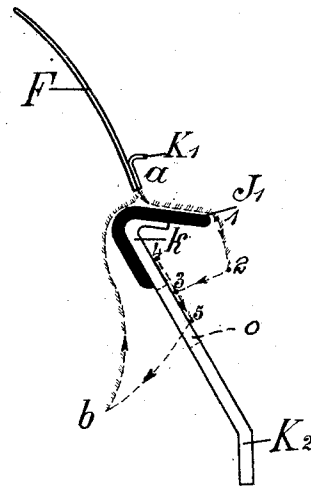
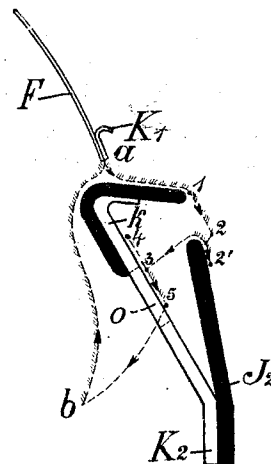


Fig. 4.



Witnesses

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PUSH-BUTTON ELECTRIC SWITCH.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HERMANN CAHEN, a citizen of the German Empire, and residing at Frankfort-on-the-Main, Hesse-Nassau, Prussia, Germany, have invented certain new and useful Improvements in Push-Button Electric Switches, of which the following is a specification.

A push-button switch constructed according to my improved method is represented in vertical section in Figures 1 and 2 of the accompanying drawings the latter view being taken at right angles to that of the former; while Figs. 3 and 4 are views, on an enlarged scale, of a special detail herein-after more particularly referred to.

In order to make the method of working readily understood it will be assumed that the fixed contact K_2 has been removed. If now the push-button D be pressed down, the contact K_1 will pass through the course $a-b$ shown by the dotted arrow in Fig. 1; and on releasing the push-button, the latter will be moved up again by the reaction of the spring F; K_1 passing back through the same course but in the reverse direction $b-a$.

The contact spring F is employed for the purpose of forming a contact with the terminal K_2 and is so arranged in the track $a-b$, that on pressing down the button, the contact K_1 will first be driven against the contact K_2 , and on being pressed farther down will slide off the contact K_2 , so that, on releasing the pressure, the spring F, together with the contact K_1 , will again return to their initial position. For this purpose, K_2 is made of the shape shown in Figs. 1 and 2 and, on a larger scale, in Fig. 3, which shape will be readily understood if the movement of the contact K_1 consequent on this shape be examined (see Fig. 3). On pressing down the push-button, the contact K_1 is first moved from the initial position a along the original track $a-b$ until the lowest point of K_1 arrives in contact with a trough-shaped layer of insulating material J_1 , whereupon it is forced to slide along the same up to the point 1 and thence along the front edge of J_1 up to the point 2. Inasmuch as the spring F is placed under tension owing to this forced deviation from its original track $a-b$, the contact K_1 , as soon as it leaves the edge of J_1 , flies along the

course 2-3 against the actual contact surface k , and on releasing the pressure rests firmly against the upper curving of this surface. In this position the circuit is closed. On further pressing down for the purpose of switching off, the contact K_1 slides from the point 4 over 3 along the surface k until at point 5 it reaches the opening o (Fig. 2), when it again flies back owing to the action of the spring F to the end point b of the original track and thus the circuit is momentarily interrupted. If now the push-button be released then the contact K_1 will slide back into its original position a , whereby it is prevented from forming any metallic contact with k by reason of the insulating layer J_1 being prolonged backward. The spring F itself, owing to the shape of the opening o as shown in Fig. 2, has unhindered passage through the contact K_2 .

In Fig. 2 for the sake of clearness the contact K_1 is shown curved somewhat upward.

This device would suffice in the manner described for the regular switching on and switching off. It has, however, the disadvantage that, on rapidly pressing down the button D, the contact easily slides through the opening o , and again interrupts the circuit after short contact with the surface k . In order to prevent this, according to Fig. 4, a special step J_2 of suitable insulating material is provided and, catching the contact sliding off the point 2 forces it first to slide along the surface J_2 up to the point 2'. On releasing the pressure, the switching-on is then effected along the course 2'-2-3 and the locking of the contact K_1 in the closed position of the current is effected at the point 4. The switching-off is effected by renewed pressure on the button in the same way as in Fig. 3.

The essential feature in the formation of the contact K_2 consequently consists in that when switching-on, the contact K_1 is first guided from the contact K_2 against the action of the spring, in order then to be driven against it; and in that, when switching-off, the spring is again placed under tension by a similar guided movement and the current is momentarily interrupted.

For the sake of greater clearness, the portions of the course in which the movement of the contact is positive are shown hatched

in the drawings 3 and 4; whereas the portions of the course of the free spring movement are shown in thick dotted lines.

A special feature consists in that the button D is forced by a spiral spring S to follow the movement of the flat spring F, in order thus to be able to recognize from its position whether the switch is switched on or off. Instead of providing a spiral spring, any other positive connection between the push-button D and the spring F may be employed.

Now, what I claim is:

1. In a push button electric switch, a base member, a switch mechanism comprising terminal plates mounted upon the base member, a contact spring having an enlarged free end portion and secured to one of said terminal plates, the other terminal plate being inclined toward the contact spring, means on the other of said terminal plates for holding and an opening for releasing the contact spring, insulation on the inclined terminal plate to prevent premature contact by the said contact spring, and means for operating the contact spring.

2. In a push button electric switch, a base member, a switch mechanism comprising terminal plates mounted upon the base member, a contact spring having an enlarged free end portion secured to one of said

terminal plates, the other terminal plate being inclined toward the contact spring, and provided with a hooked end portion and an opening, said opening corresponding to the enlarged free end portion of the contact spring to permit the latter to pass therethrough, insulation on the hooked end portion of the inclined terminal plate, a casing, and a push button for operating the contact spring.

3. In a push button electric switch, a base member, a switch mechanism comprising terminal plates mounted upon the base member, a movable contact spring mounted on one of the terminal plates, insulation on the hooked end portion of the other of said terminal plates, a wall of insulating material secured to the base of the latter terminal plate and diverging upwardly therefrom, said wall of insulation terminating short of the insulation on the hooked end portion of the plate, a casing, and a push button provided with means to cause it to follow the contact spring.

In testimony whereof I have affixed my signature in presence of two witnesses.

HERMANN CAHEN.

Witnesses:

JEAN GRUND,
CARL GRUND.