

(No Model.)

J. W. HOFFMAN.
ELECTRIC SWITCH.

No. 445,752.

Patented Feb. 3, 1891.

Fig. 1.

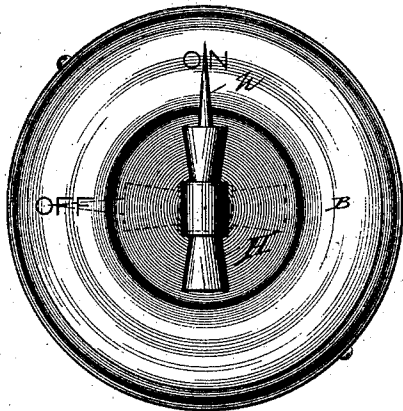


Fig. 2.

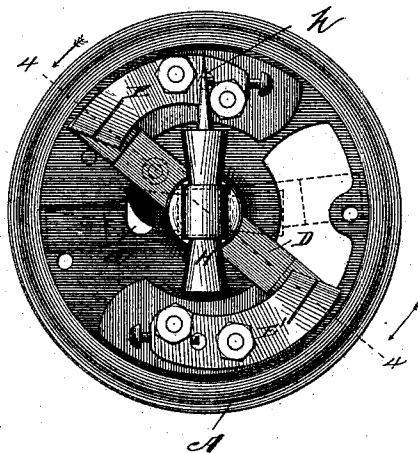


Fig. 3.

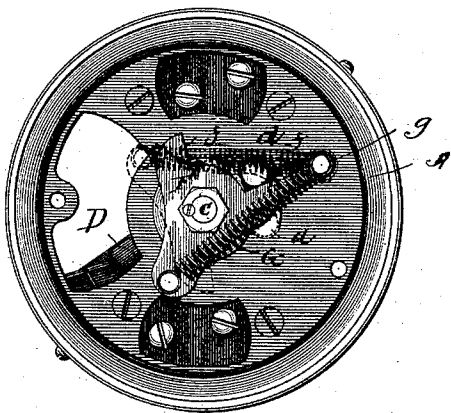
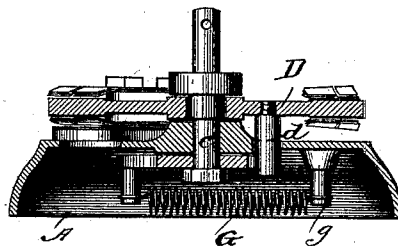


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN W. HOFFMAN, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE PULLMAN'S PALACE CAR COMPANY, OF SAME PLACE.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 445,752, dated February 3, 1891.

Application filed February 4, 1890. Serial No. 339,164. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. HOFFMAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electric Switches, of which the following is a specification.

The object of my invention is to provide an electric switch for electric lighting and like purposes, which will prevent sparking and which shall be efficient in action and simple and economical in construction.

The principal cause of sparking in electric switches is the slow movement of the switch-lever in and out of contact with the plates or other terminals of an electric circuit. I overcome this difficulty by providing a pivoted switch-lever which can be operated almost instantaneously, and preferably consisting of a bar having a central hub and two oppositely-projecting arms, the hub being pivoted on an arbor carrying a bell-crank lever, two of the arms of which are adapted when the lever is rocked to engage alternately a stud on the switch-lever and a third arm of which is connected by a spring to a fixed point, so that when the bell-crank lever is operated it will not affect the switch-lever, except when it is nearing the limit of its movement, and when one of its arms does engage the stud or pin of the switch-lever the action of the spring is such that the remainder of the stroke is rapid, thus turning the switch-lever quickly and making or breaking the connection almost instantaneously, whereby the sparking before referred to is obviated.

In the accompanying drawings, Figure 1 is a plan view of the switch with an exterior casing, on which is marked the two positions of the switch by means of a pointer and the words "Off" and "On." Fig. 2 is a similar view with said exterior casing removed to show the terminals and the operative parts of the switch. Fig. 3 is an inverted plan view of the device, showing particularly the bell-crank lever with its controlling spring; and Fig. 4 is a sectional elevation on the line 4 4, parts showing entire.

A is a base-plate, which may be of the form shown in the drawings and of cast metal, and

B is an exterior casing, which may be made of light sheet metal—say of brass—and on the face thereof words or characters may be placed indicative of the position of the switch-lever—as, for example, the words "On" and "Off," as in Fig. 1. Centrally of the top of the base A an arbor C is journaled, which arbor bears above the base A a switch-lever D, whose central portion is perforated and adapted to move freely on the arbor. The respective ends of the lever D will be adapted to make or break the circuit by means of their contact with or release from the terminals E E', which latter are secured with the base A, but properly insulated therefrom.

To the lower end of the arbor C is rigidly secured a bell-crank lever F, having the projecting arms *f*, which are adapted to engage when the lever is moved a pin *d*, depending from the lever D and projected through an opening *a* in the top of the base A. To the remaining arm of the lever F is connected one end of the spiral spring G, whose opposite end is connected to a fixed stud *g* at one side of the base A.

The arbor C has one of its ends projected above the casing, and to said end is applied a handle H, bearing a pointer *h*. This handle serves to turn the arbor in its bearing, and at the same time carries the pointer, which will indicate the position of the switch-lever.

Supposing the wires to be connected to the terminals E E', the operation of the switch is as follows: Figs. 1 and 2 show the device in position to transmit a current through the switch-lever, the latter being in contact with the terminals of the respective wires. If now it be desired to break the current, the handle will be turned in the direction indicated by the upper arrow, Fig. 2. During the first part of the movement the arbor will turn without affecting the lever, but carrying with it the rigidly-secured bell-crank lever, one arm of which will eventually engage the lower end of the pin *d*. This engagement will take place at a time when the spring is just over the center or when its attaching-pins and the lower end of arbor C are out of direct line. Immediately this occurs the spring which has

been extended by the movement of the bell-crank lever will contract, and this action will take place so as to cause the bell-crank lever to complete the remainder of its movement very rapidly, turning the switch-lever with equal rapidity and breaking the circuit almost instantaneously, thereby preventing sparking and a consequent early destruction of the switch appliances. The second position of the moving parts is shown in dotted lines in the drawings.

It is obvious that modifications may be made in the details of construction, and I do not therefore limit my invention to said precise details.

I claim—

1. An electric switch device comprising, in combination, a pivoted switch-lever whose ends are adapted to engage the respective terminals of an electric circuit and having a projection thereon, a three-armed operating-lever secured on an arbor and having two of its arms adapted to engage the projection of the switch-lever, and a spring having one

of its ends secured at a fixed point and the other to the third arm of the lever and arranged to move the latter after it has engaged the switch-lever projection, substantially as described.

2. An electric switch device comprising, in combination, a base-plate to which the respective terminals of an electric circuit are secured, an arbor mounted centrally of the base-plate, a switch-lever loosely mounted on the arbor above the base and having a projection thereon, a three-armed operating-lever secured on the inner end of the arbor and two of whose arms are adapted to engage the projection of the switch-lever, and a spring having one of its ends secured to the base and the other to the third arm of the lever and arranged to move the latter after it has engaged the projection of the switch-lever, substantially as described.

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