

(No Model.)

A. BERNSTEIN.
ELECTRIC SWITCH.

No. 343,266.

Patented June 8, 1886.

Fig. 1.

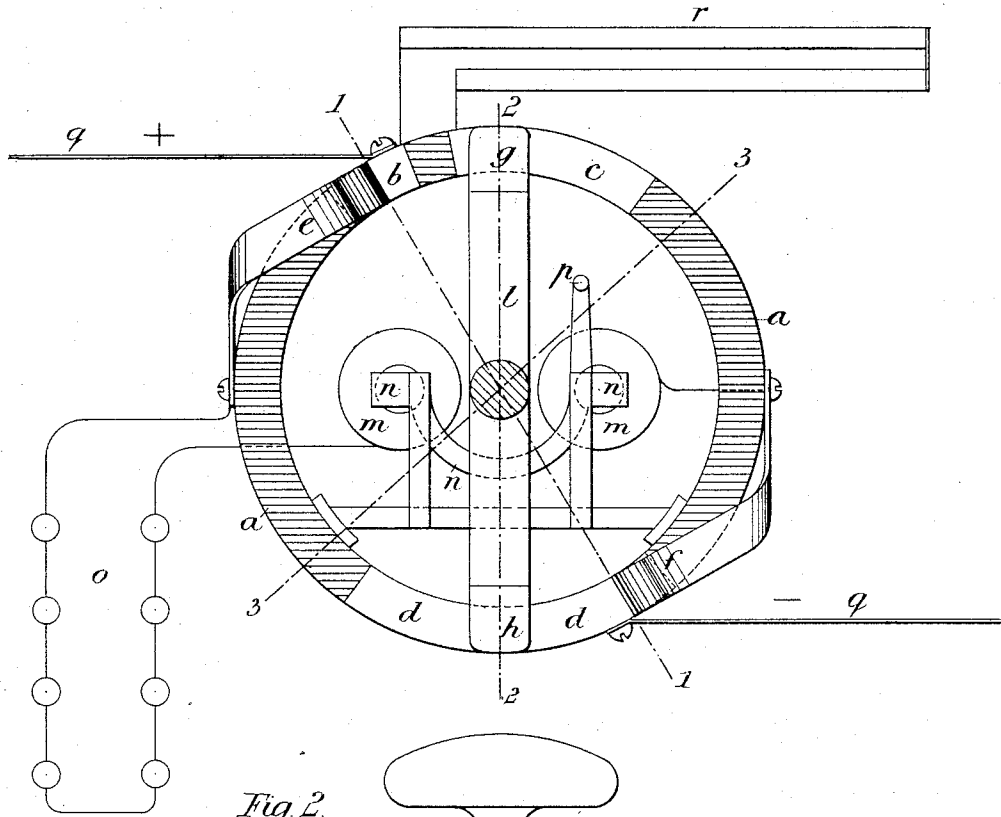
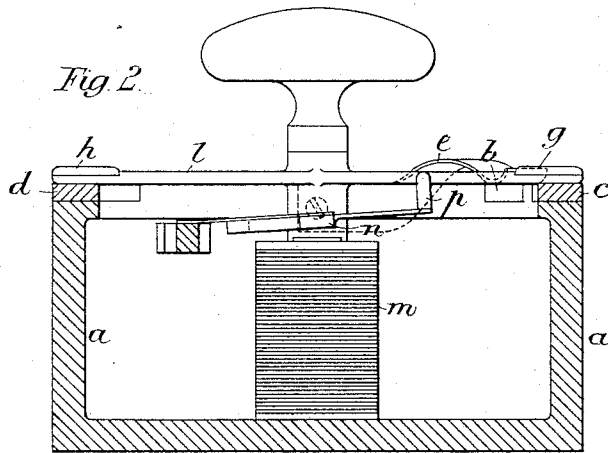


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

ALEXANDER BERNSTEIN, OF LONDON, ENGLAND.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 343,266, dated June 2, 1886.

Application filed March 4, 1886. Serial No. 193,938. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER BERNSTEIN, a subject of the Emperor of Germany, residing at London, England, have invented new and useful Improvements in Electric Switches, of which the following is a specification.

My invention relates to certain improvements in electric switches intended to be used in electric circuits, such as those in which a large number of devices—such as glow-lamps—are arranged in series on one common conductor.

The improved switch is adapted for use wherever an electric device is to be included in or excluded from the main current, and it is especially suitable for use in connection with a system of electric lighting such as is described in the specification of my former English Letters Patent No. 6,075, dated December 20, 1882. In electric-lighting circuits—such as are referred to in the specification of my said former Letters Patent—a switch is required wherever the current enters and leaves a house to be lighted, and in describing my improved switch I shall suppose the same to be used in a place which requires that the switch shall serve the following purposes, *videlicet*: To allow the house-circuit to be passed by the current or a short circuit to be made in order to prevent the current from passing through the house. In the latter case it is further desirable that the house-circuit shall be entirely disconnected from the main circuit, so that any repairs or alterations can be effected inside the house without danger, even if the main circuit should have a defective insulation. It is moreover necessary to prevent any interruption of the circuit in case the house-circuit is not complete at the time at which it is intended to turn the current into the same, and the attainment of this object is the main feature of my invention. For this purpose I arrange the switch in such a manner that the switch-lever, after leaving the "off" position, in which the house-circuit is short circuited, and before coming into the "on" position, in which the current would pass through the house, can take an intermediate position, in which the main current will divide itself into two branches, one part of the cur-

rent passing through a permanent resistance connected with the switch, and the other part passing through the house-circuit, if the same is complete. If the latter be the case, then the current in the house-circuit will excite an electro-magnet the armature of which is attracted. This armature, if it were not attracted, would interfere with a further movement of the switch-lever from the said intermediate position, and in this way the lever is prevented from coming into the on position, except when the house-circuit is complete.

In order to enable my invention to be fully understood, I will proceed to describe the same by reference to the accompanying drawings, in which—

Figure 1 represents a plan of an electric switch constructed according to my invention, and Fig. 2 is a cross-section on line 2 2 of Fig. 1.

a represents a circular box of insulating material, on the upper edge of which three contact pieces or strips of metal, *b*, *c*, and *d*, are fastened.

l is the switch-lever, made of metal. This lever turns on a central pivot and can occupy three different positions, indicated in Fig. 1 by the dotted lines 1 1, 2 2, and 3 3, respectively. In the position marked 1 1 the lever connects the strip *b* with the strip *d*. In the position marked 2 2 the strip *c* is connected by the lever *l* with the strip *d*, and in the position marked 3 3 the lever *l* rests on insulating-pieces at both ends.

e and *f* are two flat springs of metal, the free ends of which rest, respectively, on the strips *b* and *d*. These springs are in practice generally placed concentric with the top edge or rim of the box *a*, but are shown in the drawings placed at an angle thereto for the sake of clearness.

The lever *l*, as shown in Fig. 2, carries on its upper side, at its two ends, the pieces of insulating material *g* and *h*. When the lever is placed in the position marked 1 1, as hereinbefore described, it connects the strip *b* with the strip *d*, and as the strip *b* forms one terminal of the main circuit *g* and the strip *d* forms the other terminal thereof, it follows that the two ends of the circuit are then directly connected. The spring *e* forms one

terminal of the house-circuit *o*, and the spring *f* forms the other terminal of the same. When the lever *l* is moved into the position marked 1 1, it lifts the spring *e* from the strip *b* and the spring *f* from the strip *d*, thereby causing the two springs *e* and *f* to rest on the two pieces of insulating material *h* and *g*, respectively, attached to the ends of the lever *l*, and the house-circuit *o* will be entirely out of electrical connection with the main circuit *g*.

In order to prevent any interruption in the circuit in case the house-circuit should not be completed, as hereinbefore mentioned, I connect the two contact-pieces *b* and *c* with each other by means of a permanent resistance-piece, *r*, which represents a certain part of the resistance of the house-circuit *o*. This latter circuit, *o*, includes an electro-magnet, *m*, which is placed inside the box *a*, as shown.

The armature *n* of the electro-magnet *m* carries a pin, *p*, which is placed in such a way that if the armature be not attracted the pin *p* will be on a level with the lever *l*; but if the armature be attracted, then the pin will be below the lever *l*, and will not prevent the free movement of the lever. If, then, the lever *l* be placed in the intermediate position, (marked 2 2,) part of the current will pass through the permanent resistance-piece *r*, and part will pass through the house-circuit *o*, if the same is complete. Consequently the armature *n* will be moved downward, and the lever *l* can now be moved into the position marked 3 3, in which position it will be entirely insulated, and the whole current will then pass through the house-circuit *o*. If, however, the house-circuit *o* had been interrupted, it would have been impossible to move the lever *l* into the position marked 3 3, and a break in the

main circuit *g* would have been in this way prevented.

Instead of employing the electro-magnet *m*, any other suitable known device—such as a galvanometer—can be used, which merely indicates the existence of a current in the house-circuit *o*, thereby showing that the lever *l* should not be moved into the position marked 3 3.

The switch which I have described as a main house-switch is also adapted to be used in connection with every single electric device, such as glow-lamps or other like devices, which are placed in the house-circuit.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In an electric switch, the combination, with a permanent resistance arranged to act as a temporary pass for the main current, of a suitable electro-magnetic device—such as that herein described—for indicating a current in the circuit, which is intended to be included in the main circuit, as hereinbefore described.

2. In an electric switch, the combination, with a permanent resistance arranged to act as a temporary pass for the main current, of an electro-magnet the armature of which operates so as to arrest the movement of the switch-lever in case of interruption of the circuit, which it is intended should be included in the main circuit, as hereinbefore described.

ALEXANDER BERNSTEIN.

Witnesses:

G. F. REDFERN,
A. S. KLUTT.