

(No Model.)

W. B. POTTER.  
ELECTRIC CUT-OUT.

No. 489,983.

Patented Jan. 17, 1893.

FIG. 1.

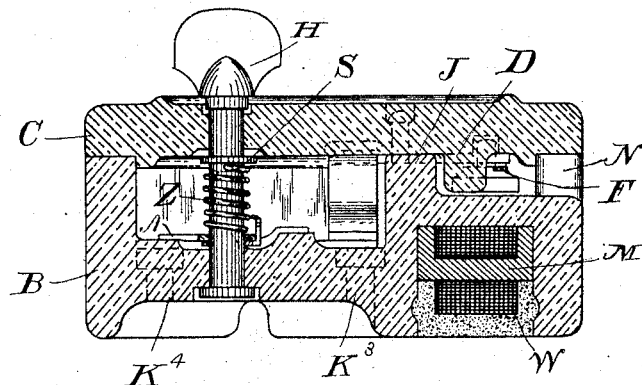


FIG. 2.

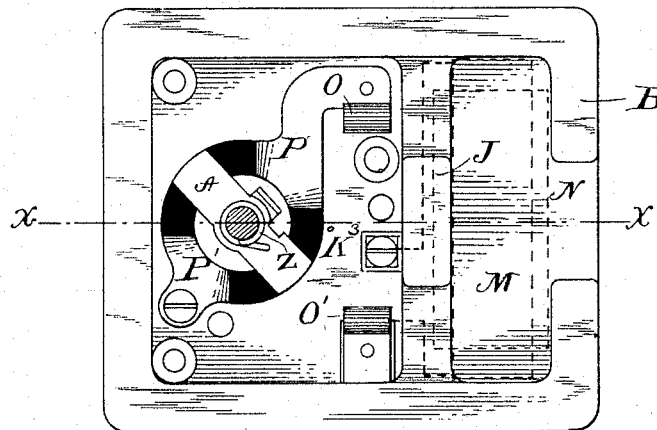
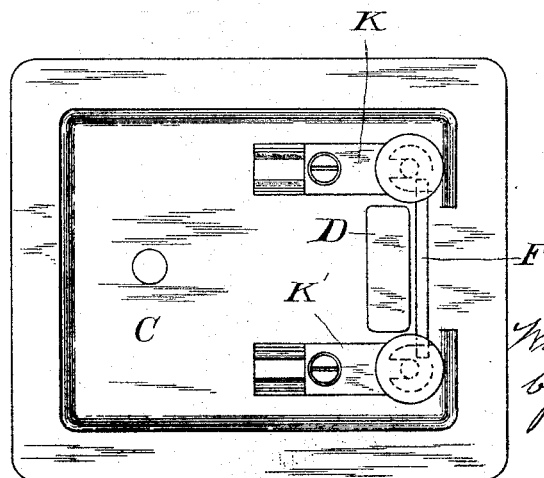


FIG. 3.



WITNESSES.

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# UNITED STATES PATENT OFFICE.

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## ELECTRIC CUT-OUT.

SPECIFICATION forming part of Letters Patent No. 489,983, dated January 17, 1893.

Application filed July 5, 1892. Serial No. 438,909. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM B. POTTER, a citizen of the United States, residing at Lynn, county of Essex, State of Massachusetts, have  
5 invented a certain new and useful Improvement in a Combined Switch and Fuse Box, of which the following is a specification.

My invention relates to electric lighting and its object is to provide means for quickly  
10 and effectively destroying the arc formed upon the melting of a safety fuse in a circuit of high potential.

The device is applicable to any system of electric lighting, but is intended more especially for the circuits used in connection with the incandescent lamps of electric railway lines. Such lamps are usually placed in series and are commonly brought into and out of circuit by a single switch provided therefor, the circuit being also provided with a safety fuse. Upon the rupture of the circuit by the melting of the fuse a dangerous and troublesome arc is apt to be established on account of the existence of the comparatively  
25 high potential between the electrodes. My invention aims to obviate these difficulties by arranging the fuse within a chamber between a lateral opening in the top of said chamber and a magnet in circuit with the fuse. When  
30 the fuse melts the arc formed is subjected to the action of the magnetic field and also to the expansive action of the air in the fuse chamber which becomes highly heated by the arc. The combined effect of these two agencies is to violently blow the arc through the opening and instantly disrupt it. The fuse and the arc destroying devices are conveniently arranged in the same box as the switch, suitable precautions being taken to protect  
40 the switch from the arc.

In the drawings Figure 1 is a longitudinal section on the line  $x-x$  Fig. 2, Fig. 2 is a top plan view with the cover removed, and Fig. 3 is a bottom plan view of the cover.

45 The fuse box or receptacle B is made of some strong and highly insulating substance, such as porcelain, although other materials may be employed.

C is the cap or cover for the same closely  
50 fitted thereto and preferably made of the same material as the box.

The space within the receptacle is divided into two portions or chambers by the septum J and in the larger portion is a switch S, which is capable of being operated from the exterior by a handle H. Any form of switch mechanism may be used and this forms no part of the invention, the one shown consists of an arm A which can be rotated by the handle H to which it is connected by a spring Z, allowing a certain amount of independent motion between the two. The arm A in its revolution connects and disconnects the plates P P' electrically and in Fig. 2 is shown in the open circuit position. The fuse carrying plates K K' are attached to the cover of the receptacle in such manner that the fuse F, when the cover is in position, will be in the chamber of the receptacle, communicating with the exterior by the opening N, the septum between the chambers being cut away, as shown in Fig. 2, to receive the parts K K' which are made to fill the space between the box and cover as nearly as possible. The other ends of the plates K K' are adapted to engage, respectively, one with a terminal from the switch S, namely O, and the other with the terminal O'. The fuse F connects the plates K K' as shown. In a recess on the underside of the box B is placed a magnet M, which is seen in section Fig. 1 and is indicated by the dotted lines in Fig. 2. This magnet is held in place by a suitable cementing substance, such as plaster of paris and the coils of wire W wound upon it are in the circuit which includes the switch S and fuse F, one end of the coil W being connected to the terminal O', and the other to the contact plate K<sup>3</sup> which with plate K<sup>4</sup>, shown in dotted lines in Fig. 1 constitute the attaching points for the external wiring. It will be seen that the fuse F is placed near the opening N in the box B, and that the magnet M is located to one side of the fuse F and nearer the partition or septum J. The purpose of this arrangement is to prevent the possibility of the metallic vapors formed when the fuse melts gaining access to the inner chamber of the receptacle where an arc would be formed and not be subjected to any disruptive influence. As an additional safeguard against the entrance of metallic vapor into the inner cham-  
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ber the cover C is provided with an extension D which overlaps with the septum J and assists in closing the free space connecting the two chambers. It has been determined by experiment that the placing of the fuse to one side of the magnet, as shown, is essential to the proper and desired working of the apparatus. If the fuse is placed immediately above the magnet M it very frequently happens that the arc finds its way to the inner chamber and there continues. The magnetic field established by the magnet M does not act alone in extinguishing the arc formed when the fuse F melts. The confined body of air in the fuse chamber becomes suddenly and violently expanded by the highly heated metallic vapors and together with the action of the magnetic field instantly destroys the arc by blowing it through the opening N.

The device is very compact and exceedingly efficient, and when constructed in the manner described will never fail to quickly destroy any arc formed when the fuse melts even on constant potential circuits of such high potential as five hundred volts. The flame of the arc with such a potential is projected from the opening N to a distance of several feet and its disruption is attended with a loud noise indicating the vigor of the actions involved.

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

1. A switch and fuse box, having a chamber provided with an opening through the wall of the box, a magnet located adjacent to said chamber, and a safety fuse in said chamber between the magnet and the opening, substantially as set forth.
2. A switch and fuse box, having a chamber

provided with an opening through the wall of the box, a magnet adjacent to said chamber, and a safety fuse arranged at one side of the magnet near the opening, substantially as set forth.

3. The combination with the box having two chambers separated by a septum, of a cover provided with an extension or lug adapted to overlap the septum, one of said chambers having a lateral opening, substantially as set forth.

4. A switch and fuse box, having a chamber containing a switch, a second chamber having a lateral opening, a magnet embedded in said box below said second chamber, and a cover carrying a fuse arranged to occupy said second chamber at one side of the magnet and near the opening, substantially as described.

5. The combination with a box containing a switch, of a cover carrying a safety fuse, adapted to be received in a separate chamber in said box, the box having a septum and the cover having an overlapping lug, both lying between the fuse and the switch chamber, substantially as described.

6. In a switch and fuse box, the combination with a switch having a terminal O, of a magnet connected with a terminal O', and a cover carrying a safety fuse provided with contact plates adapted to bear upon the terminals O, O', the fuse lying at one side of the magnet in a chamber having a lateral opening, substantially as described.

In witness whereof I have hereto set my hand this 2d day of July, 1892.

WILLIAM B. POTTER.

Witnesses:

JOHN W. GIBBONEY,  
BENJAMIN B. HULL.