(No Model.)

J. DU SHANE.

AUTOMATIC CUT-OUT FOR ELECTRIC APPARATUS.

No. 312,985. Patented Feb. 24, 1885.

Fig. 1.

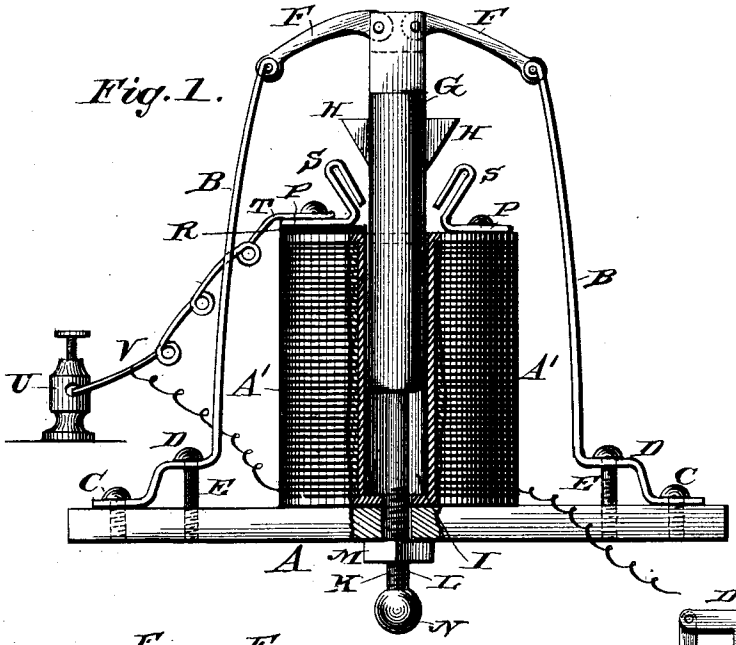


Fig. 2.

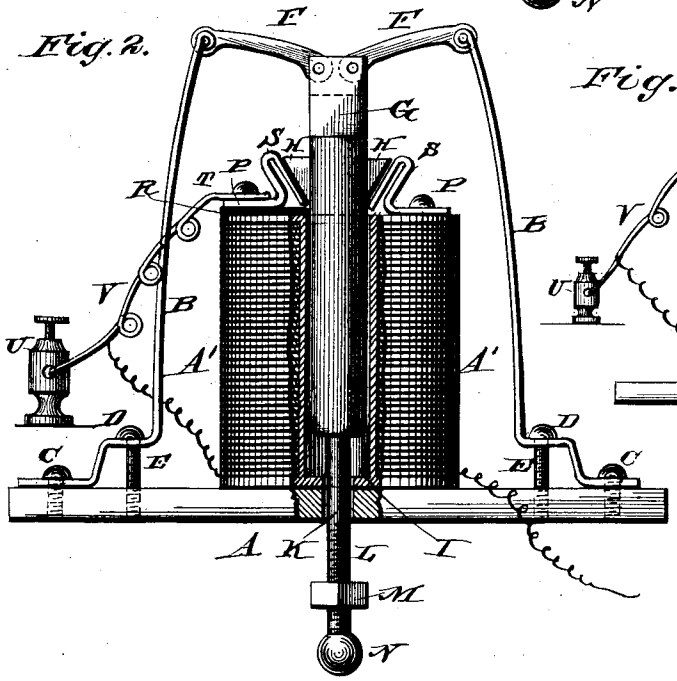
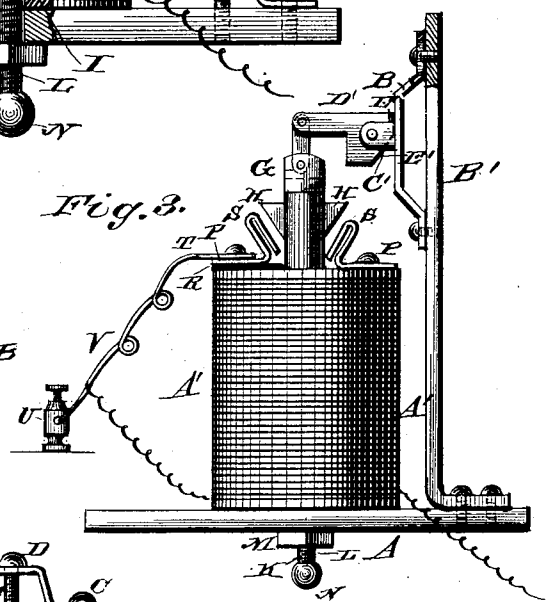


Fig. 3.



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AUTOMATIC CUT-OUT FOR ELECTRIC APPARATUS.

SPECIFICATION forming part of Letters Patent No. 312,985, dated February 24, 1885.

Application filed May 15, 1884. (No model.)

To all whom it may concern:

Be it known that I, JAMES DU SHANE, of South Bend, in the county of St. Joseph and State of Indiana, have invented certain new and useful Improvements in Automatic Cut-Outs for Electric Apparatus; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

This invention relates to certain improvements in electric switches and automatic cut-outs, being especially applicable to electric lamps; and it has for its objects to provide improved means for shunting the current from the carbons through a short circuit at any time during the operation of the lamp, so that the carbons may be renewed, adjusted, or repaired in case of accident, and also to provide for automatically short-circuiting the current when resistance becomes excessive in the carbons from any reason, and thus prevent injury to the lamp and its appendages. These objects I attain by the means illustrated in the accompanying drawings, in which—

Figure 1 represents a side elevation of my improved device, showing the parts in normal position. Fig. 2 is a similar view showing the parts shifted to short-circuit the current, and Fig. 3 is a modification of my invention.

The letter A indicates the bottom of an electric lamp or other suitable support, and B two flat springs, which are bent at their lower ends, as shown, and secured to the bottom by means of the screws C, or other fastening devices. Through the said springs at D pass the adjusting or set screws E, which enter the bottom or support, and serve to adjust the tension of said springs. To the upper ends of the springs are pivoted the arms F, which are also pivoted to the upper end of a bar of soft iron, G, which hangs between the springs. The said bar is provided with beveled metallic lugs H on opposite sides, for the purpose hereinafter explained.

The letter I indicates a vertical tube, which is secured to the bottom or support above mentioned, and which is provided with flanges at the top and bottom. The lower end of the bar G extends partly into the upper end of the said tube, as shown, and at its lower end has connected to it a vertical rod, K, which is screw-threaded at L, and passes through an opening in the bottom or support, the screw-threaded portion being provided with a nut, M, by which the position of the bar G may be adjusted. The lower end of the rod is provided with a knob, N, by means of which it may be operated by hand to switch or shunt the current, as more fully hereinafter described. To the top flange of the vertical tube, diametrically opposite each other, are secured two bent metallic contact pieces or bearings, P, the parts S of which are bent at an angle corresponding to the beveled faces of the lugs on the bar G. One of these contact-pieces is insulated by means of a rubber or other non-conducting washer, R, and is connected by means of a suitable wire, T, with the negative binding-post U of the lamp-circuit, a resistance-coil, V, being interposed between the contact-piece and said binding-post, if desirable. The other contact-piece connects with the lamp-circuit back of the positive carbon.

The operation of this part of my invention is as follows: When the lamp is in operation, the parts are in position shown in Fig. 1, and the current passes through the carbons in the usual manner. Should it become desirable for any reason to shunt or shift the current from the carbons, the bar G is drawn downward by means of the rod and knob until the arms F fall below a horizontal line, when the springs will act to force the bar downward, bringing the lugs in contact with the contact-pieces, and holding them against the same with proper pressure to insure perfect contact, thus short-circuiting the current to the negative post P and from thence to the line, diverging the current from the carbons.

To put the lamps into operation again, the rod is elevated, elevating the bar G until the arms are above the horizontal line, when the springs act to force and hold it up so as to throw the lugs out of contact with the contact-pieces and send the current through the carbons.

When it is desired to use my invention as an automatic cut-out, the vertical tube is surrounded by a solenoid or helix of insulated wire, as indicated by the letter A′. This solenoid or helix is of a resistance greater than th

normal resistance to the current through the carbons, and connects at one end with the line back of one of the carbons and at the other end with the line back of the other. The core or bar G is so adjusted by means of the set-screws that when the resistance in the line rises above the normal point, and an excess of current is passed through the solenoid or helix, the bar or core G will be drawn into the tube until the arms are brought below the horizontal line, when the springs will act to short-circuit the current, as before mentioned, diverting it from the carbons and preventing any injury to the lamp or its appendages, without affecting any other lamps in the line.

In the modification shown in Fig. 3, a single flat spring is employed instead of the two springs before mentioned. The said spring is bent as shown, and secured to an upright, B′. The upright is provided with lugs C′—one at each side of the spring—and between the lugs is pivoted an arm, D′, which has two bearing surfaces, E′ E′, arranged at an angle to each other, and adapted to bear against the spring to hold said arm in an elevated or depressed condition, to throw and hold the bar and its lugs out of or into contact with the contact-pieces, as before mentioned.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination, in an electric switch, of stationary contact-pieces forming part of a short circuit connecting with the line-circuit maker and breaker, and the flat springs and lever-arm to hold the contact maker and breaker away from or against the contact-pieces when initially started in proper direction, substantially as specified.

2. The combination, with the springs secured to a suitable support, of the arms pivoted to the same, the vertical bar pivoted to said arms and extending into a vertical guide-tube, the contact-pieces secured to said tube and connecting with the line-circuits, the beveled lugs on the bar, and the operating-rod having an adjusting-nut, the whole arranged to be operated to short-circuit the current or send it through the carbons, substantially as specified.

3. The combination, with the springs, the pivoted arms, and the dependent bar and adjusting-rod and its lugs, of the tube, its contact-pieces connected with the line-circuit, and the solenoid or helix surrounding the tube and connecting with the line-circuit, whereby the rod is initially moved and operated in connection with the springs to short-circuit the current when the resistance at the carbons becomes excessive, substantially as specified.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

JAMES DU SHANE.

Witnesses:

ALONZO WERST,

WILLIS A. BUGBEE.