

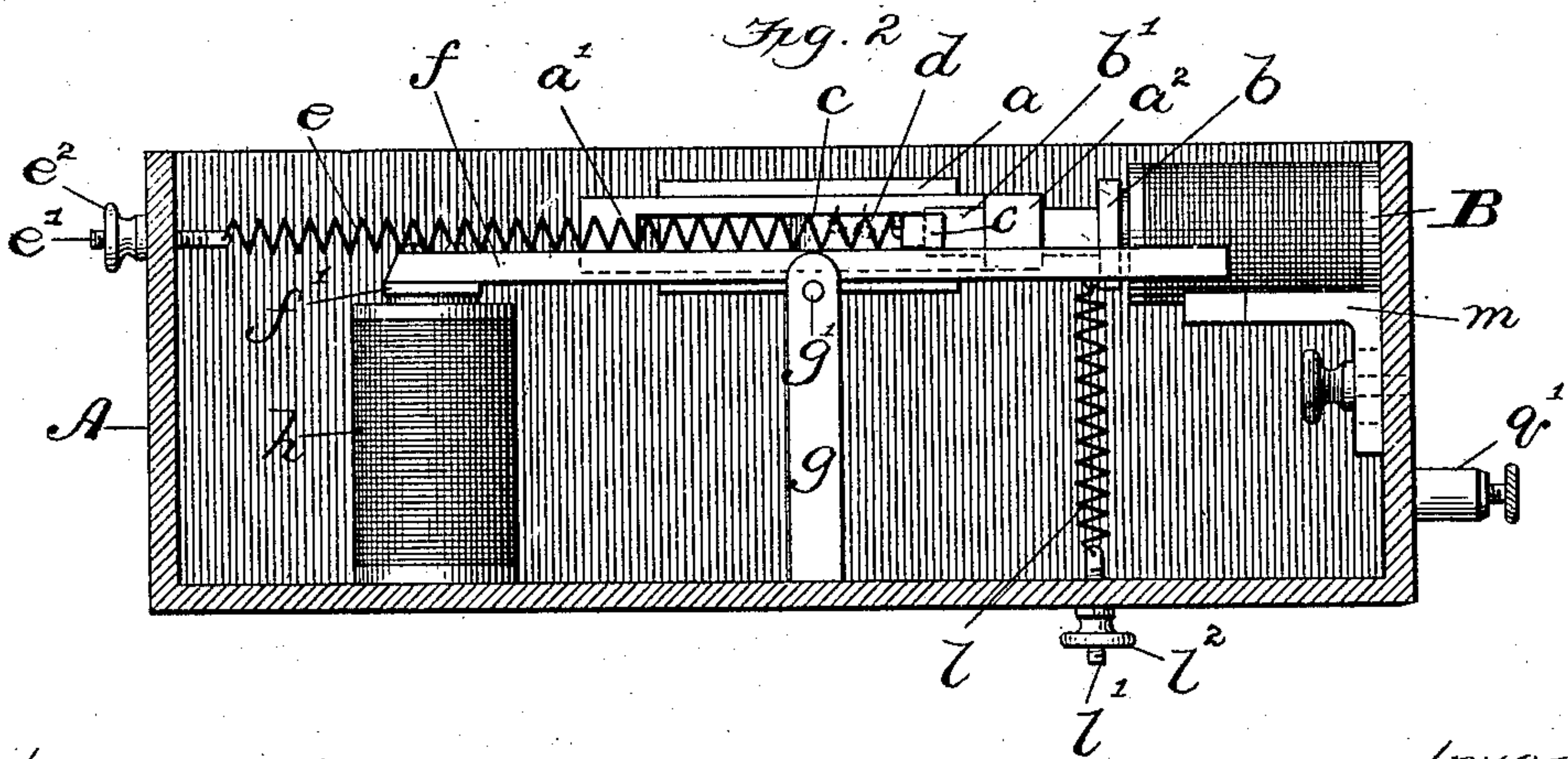
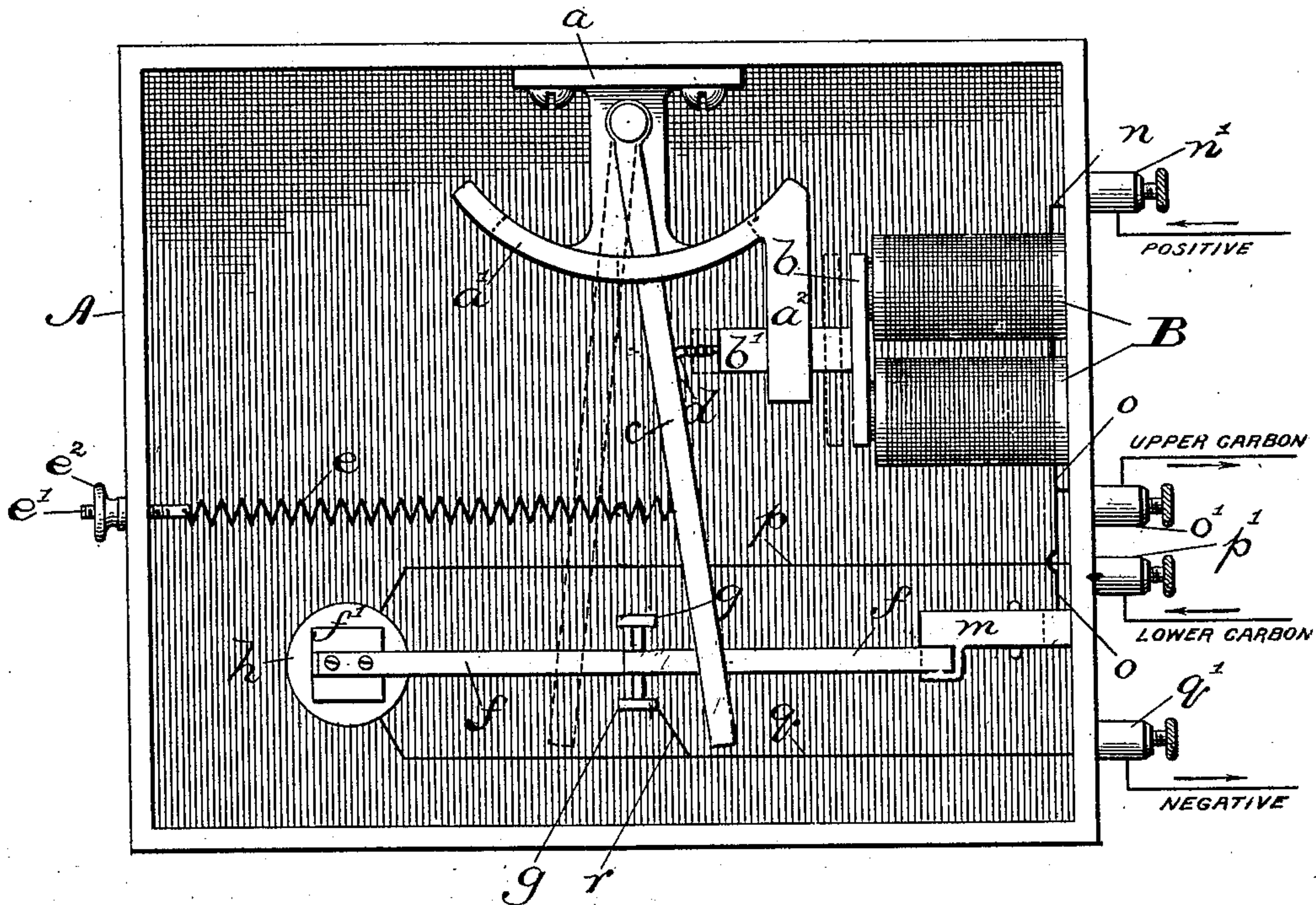
No. 756,516.

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G. MILBURN.
AUTOMATIC ELECTRIC CUT-OUT.
APPLICATION FILED MAR. 31, 1903.

NO MODEL.

Fig. 1.



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AUTOMATIC ELECTRIC CUT-OUT.

SPECIFICATION forming part of Letters Patent No. 756,516, dated April 5, 1904.

Application filed March 31, 1903. Serial No. 150,388. (No model.)

To all whom it may concern:

Be it known that I, GUY MILBURN, a citizen of the United States, residing at Baltimore, State of Maryland, have invented certain new and useful Improvements in Automatic Electric Cut-Outs, of which the following is a specification.

This invention relates to improvements in automatic cut-outs for electric systems, and is especially designed for arc-lamps, although it is to be understood and will be manifest from the following description and accompanying drawings that the invention is applicable to other electric-lighting systems.

The main object of the invention is to provide an improved cut-out which will automatically establish a shunt-circuit around any lamp or light in the system whenever the circuit is interrupted by any damage to or defect in such lamp.

The invention consists in certain constructions, arrangements, and combinations of parts hereinafter fully described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a top plan view of my improved automatic cut-out with the lid or cover of the box removed; and Fig. 2 is a transverse section of the box, showing the parts in side elevation.

Referring to the drawings, the letter A designates a box in which the parts of the apparatus are assembled. To one side of said box is rigidly secured a bracket *a*, provided with a segmental slotted guide *a'*, at one of whose ends is an offset arm *a''*, in which the shank *b'* of the armature *b* is mounted to move longitudinally, said armature being intended for attraction by an electromagnet B, having in this instance two spools or helices.

An oscillating arm *c* is pivoted at one end to the bracket *a*, as indicated in Fig. 1, and extends through the slot of the segmental guide *a'*, and said oscillating arm is secured by a flexible connection, such as a chain *d*, to the shank of the armature *b* and is also secured to one end of a tension-spring *e*, whose other end is adjustably fastened to one side of the box A by a screw-rod *e'* and thumb-nut *e''*, the tension of the spring being in a direction to

draw the oscillating arm *c* and armature *b* away from the electromagnet B.

The free end of the oscillating arm *c* extends over and contacts with a rocking shunt-bar *f*, which is pivotally balanced intermediate of its ends on an axis *g'*, secured to the upper ends of two posts *g*, and one end of said shunt-bar carries a plate *f'*, arranged to act as an armature for an electromagnet *h*, while the other end of said shunt-bar is connected to a tension-spring *l*, adjustably fastened to the bottom of the box by means of a screw-rod *l'* and thumb-nut *l''*. The said spring tends to rock the shunt-bar in a direction to bring the end of the latter into engagement with a contact-plate *m*, which latter is in the present instance adjustably fastened to a side of the box in such position that the shunt-bar when rocked by its spring will come into frictional contact with it, as plainly indicated in the drawings.

The wiring of the parts consists of a wire *n*, connecting the electromagnet B with a binding-post *n'*, intended for the attachment thereto of a positive or feed wire, a wire *o*, connecting said electromagnet with a binding-post *o'*, from which the current leads to, for instance, the upper carbon of an arc-lamp, and said wire also connecting the electromagnet B with the contact-plate *m*, and two wires *p* and *q*, one of which connects a binding-post *p'* (to which the current from the lower carbon passes in this instance) with the electromagnet *h*, the other wire *q* connecting said electromagnet *h* with another binding-post *q'*, from which the current passes finally out of the box. Said wire *q* is also connected by wire *r* to one of the posts *g*, between which the shunt-bar *f* is mounted.

When the current is cut off from the box A, as it would be, for instance, in the daytime if the box were included in a street-lighting system, the spring *e*, which is stronger than the spring *l*, will draw the oscillating arm in a direction to so slide over the rocking shunt-bar *f*, as indicated by dotted lines in Fig. 1, as to hold the latter free from contact with the plate *m* and to hold the plate *f'* down against the core of the electromagnet *h*. The parts are now in readiness for the operation of lighting the arc-lamp in whose circuit

my apparatus is introduced. When the current is turned on, it will normally flow through the electromagnet B, energizing the same and attracting the armature *b*, which in its movement will draw the oscillating arm *c* backward against the tension of its spring until it takes position beyond the axis of the shunt-bar *f*, as seen in Fig. 1 of the drawings. The said shunt-bar, however, is not permitted to rock from the position just before described, owing to the fact that the current is also flowing out of the box to the upper carbon and thence back again from the lower carbon to the wire *p*, whence it energizes the electromagnet *h* and attracts the plate *f'* and finally flows out of the box through the wire *q*. The parts will stay in the position just described, which is the position shown in full lines in the drawings, so long as the circuit in the arc-lamp is closed and the latter continues in working order.

Should any accident happen to the lamp resulting in momentarily breaking or opening the circuit, the electromagnets will both become deenergized and the spring *e* will cause the oscillating arm *c* to move in a direction toward the magnet *h*; but at the same time the spring *l* will rock the shunt-bar *f* into contact with the plate *m* and before the oscillating arm *c* has moved to the other side of the pivot *g'*. As soon as this contact is made between the shunt-bar and plate *m* a shunt-circuit will be established, the electromagnet B energized, and the arm *c* drawn back to its former position by means of the armature *b*. The shunt-circuit is thus established from the electromagnet B, through wire *o*, to plate *m*, to shunt-bar *f*, one of the posts *g* and wires *r* and *q* out of the box, to the next lamp, thereby cutting out the defective lamp without affecting any other lamp in the system, and when the current is turned off the oscillating arm *c*, having assumed the position shown in dotted lines in Fig. 1, will mechanically hold the shunt-bar out of contact with the plate *m*, so that after the defective lamp has been fixed and the current is again turned on a normal and not a shunt circuit will be established. It is of course understood that one of my improved cut-outs is to be employed in the circuit of every lamp of the lighting system.

While the accompanying drawings and foregoing description disclose one form of my invention, it is to be understood that changes

may be made in the details of construction and arrangement of parts without departing from the scope of the invention as defined in the appended claims.

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

1. In an electric-lighting system the combination of a normal circuit through a lamp including an electromagnet, *h*; a shunt-circuit around the lamp and also around said magnet and including a shunt-bar held by said magnet in a position to keep the shunt-circuit open while the normal circuit is closed; means for rocking said bar to close the shunt-circuit when said magnet is deenergized by the opening of the normal circuit, and means whereby when the current is cut off the shunt-bar will be automatically set to open the shunt-circuit and the normal circuit reestablished.

2. In an electric-lighting system, the combination of a normal circuit through the lamp, including two electromagnets; a rocking shunt-bar arranged to be held by one of said magnets in an inoperative position; a shunt-circuit around the lamp; means for rocking said bar to establish the shunt-circuit when said magnet is deenergized; and an oscillating arm arranged to be actuated by the other magnet and provided with means whereby it will also hold said shunt-bar in an inoperative position.

3. An automatic cut-out, comprising two electromagnets; a normal circuit in which said magnets are included; a shunt-circuit consisting of a contact-plate, *m*, connected with the normal circuit, a wire, *r*, also connected with the normal circuit; a post, *g*, connected to the wire, *r*; a rocking shunt-bar mounted on said post and arranged to contact with the plate, *m* to establish the shunt-circuit, and normally held out of contact therewith by one of said electromagnets; and an oscillating arm arranged to sweep over said shunt-bar to hold the same out of contact with the plate, *m*, and actuated by the other magnet to release the shunt-bar.

In testimony whereof I affix my signature in the presence of two witnesses.

GUY MILBURN.

Witnesses:

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