

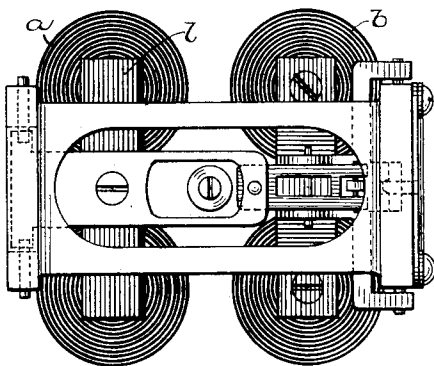
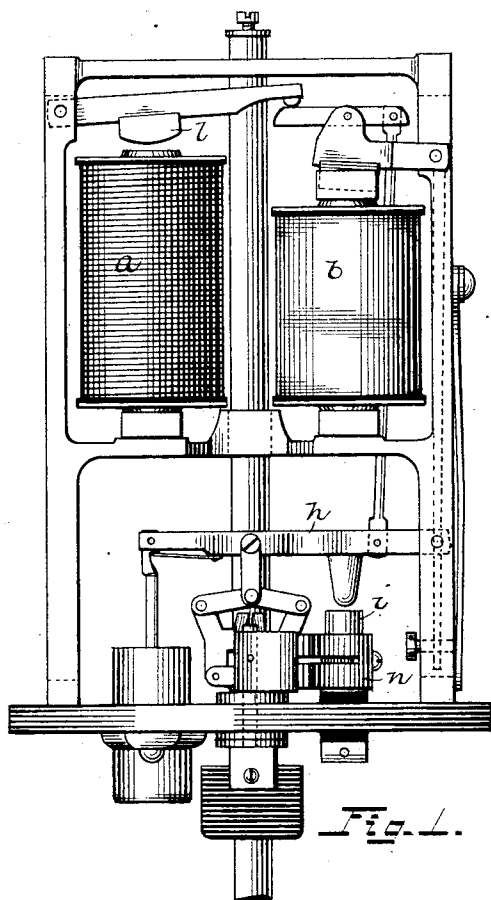
(No Model.)

2 Sheets—Sheet 1.

C. E. SCRIBNER.
CUT-OUT FOR ELECTRIC ARC LAMPS.

No. 423,638.

Patented Mar. 18, 1890.



Witnesses.

Ella Odler
Geo. C. Parker.

Fig. 2.

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Charles E. Scribner.
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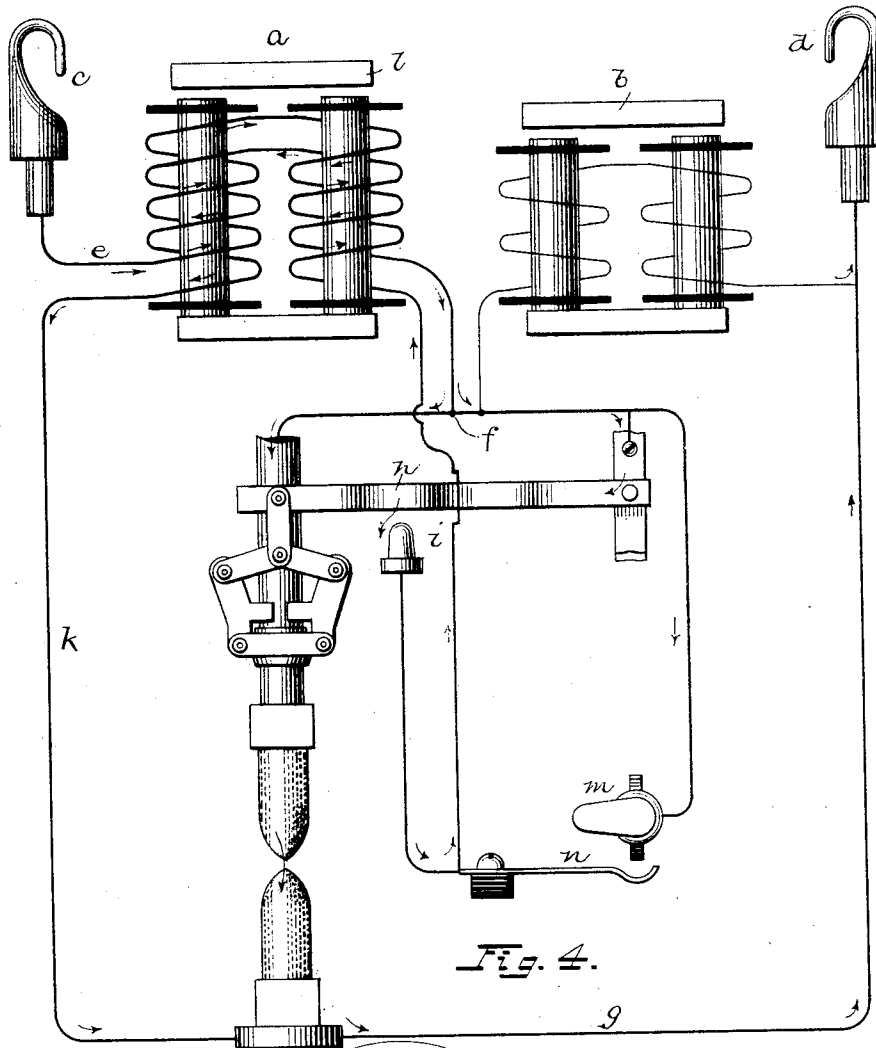
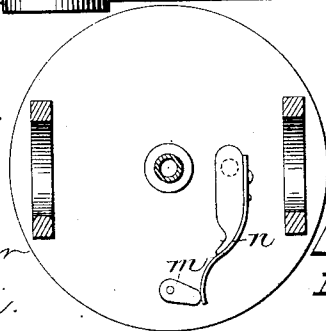


Fig. 4.

Fig. 3.

Witnesses.
Ella Edler
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Inventor
Charles E. Scribner.
By George P. Barton
Attorney.

UNITED STATES PATENT OFFICE.

CHARLES E. SCRIBNER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WESTERN ELECTRIC COMPANY, OF SAME PLACE.

CUT-OUT FOR ELECTRIC-ARC LAMPS.

SPECIFICATION forming part of Letters Patent No. 423,638, dated March 18, 1890.

Application filed October 26, 1889. Serial No. 328,253. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. SCRIBNER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Automatic Cut-Outs for Electric-Arc Lamps, (Case 211,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

The object of my invention is to provide for automatically cutting out one lamp of several from a circuit when its carbons are consumed, so that the circuit of the other lamps in the same series will not be interrupted or in any wise impaired.

My invention consists in a differentially-wound lifting-magnet with circuits and switching apparatus connected therewith and so arranged that when the descent of the rod is arrested, or, in short, when for any cause the arc becomes abnormally long, it will go out and the circuit will be maintained through the different coils of the lifting-magnet, so as to neutralize the same.

My invention will be readily understood by reference to the accompanying drawings, in which—

Figure 1 is a side elevation illustrative of the regulating mechanism of an arc lamp embodying my invention. Fig. 2 is a plan view of the same. Fig. 3 is a detailed view of the hand-switch. Fig. 4 is a diagram illustrative of the circuits.

Like parts are indicated by similar letters of reference throughout the different figures.

The lifting-magnet *a* is wound differentially, each winding being of, say, from one-tenth to one-fifth of an ohm's resistance, or thereabout, according to circumstances. The regulating-magnet *b* is included in the ordinary manner in the shunt of the arc, and is of high resistance—say two hundred ohms. The lifting-magnet, when the lamp is brought into circuit and while the lamp is burning, performs its usual functions, and the same may be said of the regulating or feeding magnet *b* in the shunt of the arc.

I do not deem it necessary to describe in de-

tail the operation of the clutch, the lever carrying the same, or the system of levers controlled by the magnets by means of which the carbon is fed to maintain the arc during the time of the service of the lamp.

My invention relates more particularly to the winding of the lifting-magnet *a* and the connections of those windings with the carbon rod and the circuit through the lamp. Thus we will consider, as shown in Fig. 4, the hook *c* as connected with the line in and the hook *d* as connected with the line out. The line *e* from hook *c* passes through the coils of magnet *a* in one direction to connection *f*, and then, when the lamp is burning, through the arc and out by wire *g*. When, however, the carbons are in contact, the clutch-lever *h* will rest upon the contact *i*. When circuit is thus closed between lever *h* and contact *i*, we have a circuit from point *f* through said lever *h* to contact *i*, and thence back through the other winding of the coils of magnet *a* and by wire *k* to wire *g*, leading out—that is to say, lever *h*, when closed on contact *i*, completes a shunt-circuit around the arc, said shunt-circuit including a winding of the lifting-magnet.

The operation of my lamp is briefly as follows: The current being established and the carbons being together, the lifting-magnets *a* will be energized, so as to attract the armature *l*. The current will pass from the point *f* in two directions—in one direction through the carbons and in the other direction through the contact *i* and the coil of the magnet *a* connected therewith. The whole current will of course pass through one winding of the lifting-magnet to the point *f*, where the circuit divides, going in one direction through the carbons and in the other direction back differentially through the other winding of the lifting-magnet. As the two differential windings of the lifting-magnet are of the same number of convolutions and of substantially the same resistance, and as the current through one of the windings is weaker on account of the circuit through the carbons, the lifting-magnet will be sufficiently energized to attract the armature *l*, and thus through the intermediate lever shown raise the clutch-lever and

cause the clutch to grasp the rod to separate the carbons and establish the arc, the contact between the lifting-lever *h* and the contact *i* being broken upon the first movement of the clutch-lever. The whole current will accordingly pass through the carbons and the lifting-magnet will be energized during the burning of the lamp. When the rod in its descent is arrested by its stop or otherwise, so as to draw an abnormally long arc, the current passing through the feed-magnet *d* will be increased and the clutch-lever will fall, until finally it will close upon the contact *i*. This will immediately extinguish the arc by shunting all the current through the other winding of the lifting-magnet—that is to say, the whole current will be directed differentially through the two coils of the lifting-magnet, so as to neutralize the same. The carbons are thus automatically cut out of the circuit, while at the same time the circuit through the lamp is maintained unimpaired.

The switch *m* is adapted to be turned by hand. Thus at any time the lamp may be cut out, as shown in Fig. 3, this switch *m* being brought into contact with the spring or contact piece *n*, thus directing the whole current through the two opposite windings of the lifting-magnet *a*.

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

1. The combination, with the differentially-wound lifting-magnets of an arc-regulator, of the carbons and a shunt-circuit around the carbons containing a switch so arranged that its closure directs the whole current back through the second of the differential windings of said magnet to neutralize the same, substantially as and for the purpose specified.

2. In an arc lamp, the combination, with

the carbons and a shunt-circuit around the carbons, said carbons being included in a circuit leading from one of the differential windings of the lifting-magnet out to line and the said shunt, which includes the switching device, leading from the same differential winding back through the other differential winding of the lamp, said switching device being operated automatically to close the shunt-circuit and rob the carbons of their current on an abnormal increase of the length of the arc, thereby directing the current through the lifting-magnet differentially to neutralize the same, substantially as and for the purpose specified.

3. A circuit through one winding of a differentially-wound lifting-magnet to a common point *f*, and thence through the carbons and out to line, in combination with a shunt-circuit from said common point to the clutch-lever, and thence through a contact with which said lever is closed when the lever is at its lowest position back through the other winding of said lifting-magnet, and thence out to the common line, substantially as and for the purpose specified.

4. In an electric-arc lamp, a lifting-magnet having two windings, one of said windings being connected in a shunt of the arc differentially to the other winding, the said shunt-winding having included in its circuit a switch, whereby the arc is extinguished on closing the switch and the lifting-magnet de-energized, substantially as and for the purpose specified.

In witness whereof I hereunto subscribe my name this 8th day of October, A. D. 1889.

CHARLES E. SCRIBNER.

Witnesses:

ELLA EDLER,
C. G. HAWLEY.