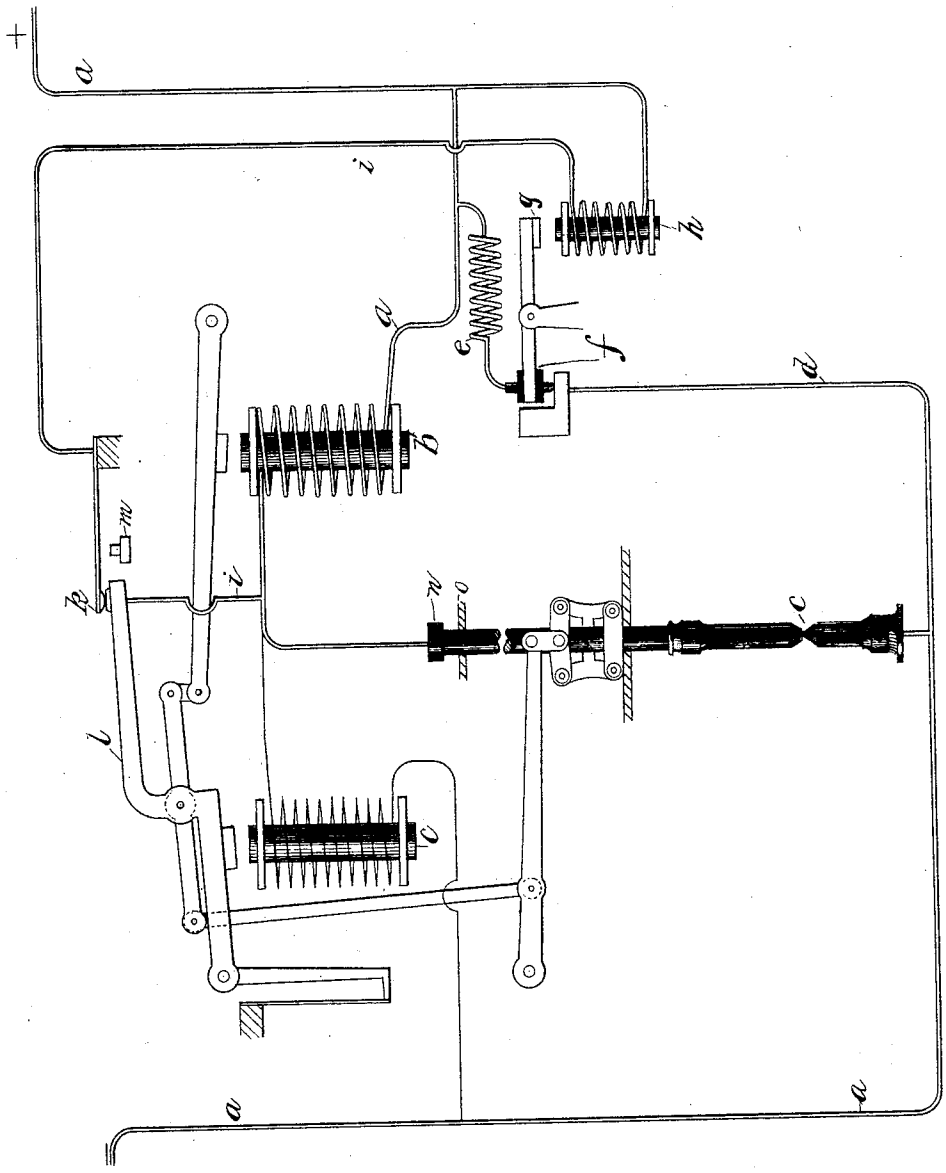
(No Model.)

# C. E. SCRIBNER.

## CUT-OUT FOR ARC LAMPS.

No. 455,953. Patented July 14, 1891.




Witnesses.
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

CHARLES E. SCRIBNER, OF CHICAGO, ILLINOIS.

## CUT-OUT FOR ARC LAMPS.

SPECIFICATION forming part of Letters Patent No. 455,953, dated July 14, 1891.

Application filed November 4, 1890. Serial No. 370,318. (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 Arc Lamps, (Case 241,) 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.

Heretofore various devices have been employed for automatically closing a circuit around the lamp when for any reason the arc becomes abnormally long or is extinguished. One well-known device for doing this work is the Siemens, which consists in an electro-magnet in circuit with the carbons, which, while the lamp is burning, holds open the shunt-circuit around the lamp. When, however, the current through the arc is weakened or broken, this electro-magnet being de-energized or partially so, its armature is acted upon by the retractile spring connected therewith to close the shunt.

My invention is an improvement upon this Siemens device; and it consists in placing the electro-magnet controlling the circuit-closer of the shunt or cut-out circuit in a shunt simply around the lifting-magnet of the lamp, this shunt-circuit around the lifting-magnet being automatically closed and opened by the mechanical action of the feeding mechanism. Thus when the lamp is in its state of rest or when burning with its normal arc the shunt-circuit around the lifting-magnet, which contains the magnet of the cut-out device, is closed, so that the cut-out magnet is energized to hold the circuit-closer of the shunt around the lamp open. When, however, the arc becomes abnormally long, the feeding mechanism is carried beyond its normal feeding point or limit. Such excessive movement of the feeding mechanism acts to open the switch included in the shunt around the lifting-magnet, thus de-energizing the cut-out magnet included therein, and the cut-out magnet thus losing its power its armature acts to bring together the contacts of the circuit-closer—that is, acts to shunt out the lamp.

My invention, it will be understood, may be applied to any of the well-known forms of arc lamps, either single or double. The lamps which I have constructed embodying my invention herein have contained the balance-lever mechanism of my patent, No. 415,571, granted November 19, 1889, for electric lamps. I do not deem it necessary, therefore, to describe in detail all the operative parts of the lamp.

My invention is illustrated in the accompanying drawing, in which the circuits of a lamp are shown in connection with my automatic cut-out. The main circuit may be traced by wire *a* through the lifting-magnet *b*, the carbons *c*, and out by wire —. The usual fine-wire feeding-magnet *c* is included in the usual manner in a shunt around the carbons. The shunt *d* around the lamp may include a small amount of resistance *e*. The circuit-closer *f*, included in this shunt, is controlled by the armature *g* of the cut-out magnet *h*, which is included in the shunt-circuit *i* around the lifting-magnet *b*. In this shunt-circuit *i* around the lifting-magnet I have placed a switch or circuit-closer *k*. One contact of this circuit-closer *k* is placed upon or controlled by the armature-lever *l* of the feeding-magnet *c*. A stop *m* is fixed at a proper distance from the spring of the circuit-closer *k*, so as to limit the distance through which this contact-spring will follow its opposing contact upon the armature-lever *l*. Thus the movement of the feeding mechanism while the arc is burning normally will not be sufficient to open the circuit-closer *k*. In case of an abnormal arc, due to the collar or other enlargement *n* upon the rod coming against the stop *o* upon the frame of the lamp, or other cause which should prevent the rod from feeding, the feeding mechanism—in this instance the armature-lever *l*—will be lowered so far that the contacts of the circuit-closer *k* will be opened, thus opening the circuit through magnet *h*, and thereby closing the circuit-closer *f* of the shunt-circuit *d*, so as to shunt out the lamp. The resistance of the coil of the electro-magnetic circuit-closing device should be greater than that of the lifting-magnet. For example, the lifting-magnet might have a resistance of, say, half an ohm,

while the coil of magnet *h* of the circuit-closing device might properly have a resistance of two ohms.

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

1. The combination, in an electric-arc lamp, of a shunt-circuit around the same, containing a circuit-closing device adapted to be held open by an electro-magnet included in a shunt around the lifting-magnet, said shunt around the lifting-magnet containing a circuit-closer controlled by the feeding mechanism of the lamp to open the same upon an excessive movement of the feeding mechanism, whereby when such excessive movement of the feeding mechanism takes place the magnet controlling the circuit-closer in the shunt around the lamp is de-energized, thereby causing the circuit-closer or cut-out in the shunt to be closed, substantially as and for the purpose specified.

2. The circuit-closer *k*, provided with the stop *m*, adapted for continuous closure through limited movement of the circuit-closer, but adapted to break upon an abnormal movement of such parts, in combination with a shunt-circuit including a cut-out magnet and the said circuit-closer, and a cut-out circuit including resistance controlled by the cut-out magnet, whereby the lamp may be shunted out of circuit upon the formation of an abnormal arc.

In witness whereof I hereunto subscribe my name this 24th day of October, A. D. 1890.

CHARLES E. SCRIBNER.

Witnesses:
ELLA EDLER,
GEORGE L. CRAGG.