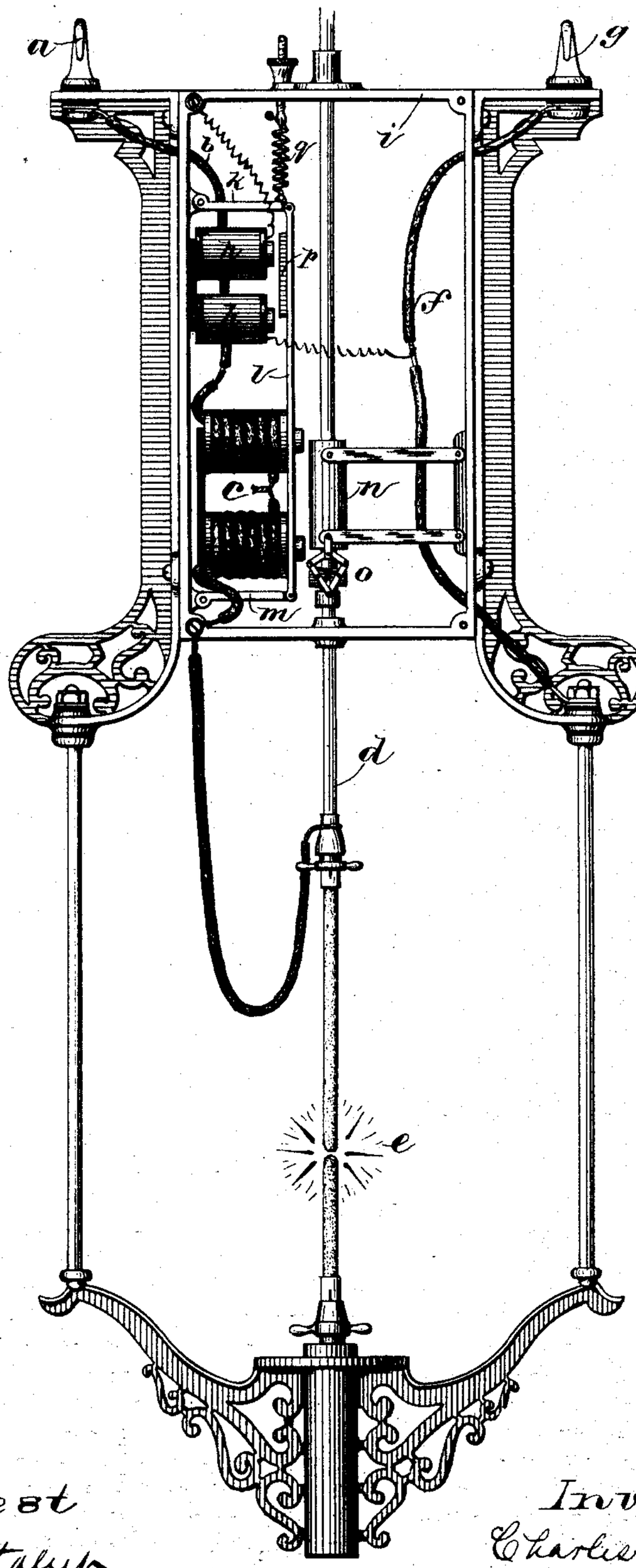
(No Model.)

C. E. SCRIBNER.

ELECTRIC ARC LAMP.

No. 420,109. Patented Jan. 28, 1890.



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ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 420,109, dated January 28, 1890.

Application filed January 2, 1883. Serial No. 80,752. (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 Movable Magnets for Arc Lamps, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention herein set forth relates to electric-arc lamps in which a regulating-magnet is attached rigidly to the frame of the lamp and a suspended lifting-magnet is employed, as hereinafter described and claimed.

In lamps now in common use, including those in which the lifting-magnet is wound differentially, one winding being a portion of the main circuit and the other a portion of a shunt around the arc, and also including those lamps like the Von Hefner Alteneck, (United States Patent No. 243,341, June 21, 1881,) in which the lifting-solenoid in the main circuit and the solenoid in the shunt of the arc act upon the same carbon rod, the current of the main circuit acts in opposition to the current of the shunt of the arc. In all these lamps the armature of the lifting-magnet, in order to compensate or feed, moves away from the poles of said lifting-magnet. This movement of the lifting-armature away from the poles of its magnet, which produces the feed, is caused chiefly by the variations in the strength of the current of the shunt of the arc. As the strength of the current in the shunt of the arc increases, the armature of the lifting-magnet moves away and causes the feed. The compensation for the inequalities of the current is caused chiefly by the variations of the strength of the current of the magnet in the main circuit. In my lamp, however, as herein described, the electro-magnet in the shunt of the arc does not act in opposition to the electro-magnet in the main circuit. The strength of the lifting-magnet is not changed, nor is the position of the armature of the lifting-magnet changed relatively to the poles of said lifting-magnet, by variation in the strength of the electro-magnet in the shunt of the arc.

The accompanying drawing, which is illustrative of my invention, shows a front elevation of an electric-arc lamp.

The circuit may be traced from hook *a* by wire *b*, through the suspended lifting-magnet *c*, and thence to the carbon rod *d*, and thence through the arc *e* and by wire *f* to hook *g*. The regulating-magnet *h* is included in the shunt of the arc and attached rigidly to the frame *i* of the lamp, and controls the regulating mechanism of the lamp. The three pieces *k*, *l*, and *m*, pivoted as shown, form a kind of pivoted armature-lever supporting the lifting-magnet *c*, the poles of which extend toward the lifting-armature *n*, that carries the usual friction-clutch *o*. The lifting-armature *n*, with its suitable movable supporting parts, is carried up and down with the lifting-magnet. It should therefore not extend either above or below the poles of the lifting-magnet. The two ends of the lifting-armature come, preferably, opposite the centers, respectively, of the two poles, as shown. The armature *p* of the regulating-magnet is mounted upon the pivoted armature-lever. The frame is held suspended by means of the adjustable retractile spring *q*. Armature *n* of the main-circuit magnet is mounted upon armature-levers *n'*, pivoted to the frame of the lamp. The clutch *o* is suspended directly upon the lower one of these two pivoted levers upon which the armature *n* is mounted.

The operation of my lamp as thus described is as follows: As soon as the circuit is closed, the armature *n* is raised by the lifting-magnet and the clutch *o* lifts the rod, thus separating the carbons and establishing the arc, as shown. The action of the magnet *h* will at the same time draw upon its armature against the tension of spring *q*. The spring *q* must therefore be adjusted to sustain its armature-lever and the parts it supports after the lifting-magnet has raised the rod. The armature *n* will move as the magnet *c* moves. It has also a compensating motion up and down as the strength of the magnet *c* increases and diminishes. As the resistance of the arc increases, the regulating-magnet becomes more strongly magnetized, and the armature *p* is drawn downward, and also piece

l, which carries the lifting-magnet *c*. The lifting-armature *n*, it is evident, will descend at the same time, thus compensating and feeding as the current varies or the carbons burn away. It will thus be seen that the current in the shunt of the arc acts to change the position of the lifting-magnet and its armature. This action is in no way opposed to the action of the current which is passing through the coils of the lifting-magnet. Increase of the current in the shunt lowers the armature *p* and the lifting-magnet *c* just the same without reference to the magnetic force of the lifting-magnet—that is to say, armature *n* is attracted by the main-circuit magnet and assumes a definite position with relation thereto, which position it holds no matter what changes may take place in the strength of the shunt-magnet. Armature *n*, through the attraction of the main-circuit magnet, is connected through magnetic action with armature-lever *k l m*, and the movements of this armature-lever in responding to the changes taking place in the electro-magnet in the shunt of the arc are communicated to armature *n*, its lever, and to clutch *o*. Thus it will be seen that clutch *o* is carried and controlled by the pivoted armature-lever *k l m* and the pivoted armature-lever upon which said clutch is supported. The compensation and feeding of my lamp is thus more delicate and reliable than in lamps heretofore known or used.

I claim as my invention—

1. In an electric-arc lamp, the combination, with an electro-magnet in the shunt of the arc and its armature, of an electro-magnet in the main circuit and its armature, said electro-magnet in the main circuit being carried upon a movable support, said support being controlled by the armature of the electro-magnet in the shunt of the arc, whereby the position of the main-circuit electro-magnet and its armature is caused to vary in response to the variations in the strength of the current passing through the electro-magnet in the shunt of the arc.

2. In an electric-arc lamp, the combination, with a clutch suspended upon suitable movable supporting parts, an armature forming part of said movable supporting parts, an electro-magnet in the main circuit with its poles presented to said armature, a regulating mechanism pivoted to the lamp-frame and carrying the main magnet, and an electro-magnet in the shunt of the arc with its poles presented to an armature carried by said regulating mechanism, whereby the position of the carbon-feeding mechanism is varied as the strength of the magnet in the shunt varies independently of the action or electrical condition of the magnet in the main circuit.

3. In an electric-arc lamp, an electro-magnet in the shunt of the arc, a pivoted armature-lever responding to the changes in the strength of said shunt-magnet, in combination with a magnet in the main circuit and a pivoted armature-lever responding to the changes in strength of said main-circuit magnet, a carbon rod, and clutch for the same, said clutch being carried and controlled by the said armature-levers, whereby the movements of either armature-lever may be communicated to the clutch to feed and regulate the lamp.

In witness whereof I hereunto subscribe my name this 29th day of November, A. D. 1882.

CHARLES E. SCRIBNER.

Witnesses:

PAUL A. STALEY,

GEORGE P. BARTON.