(No Model.)

C. E. SCRIBNER.

ELECTRIC ARC LAMP.

No. 330,052. Patented Nov. 10, 1885.

Fig. 1.

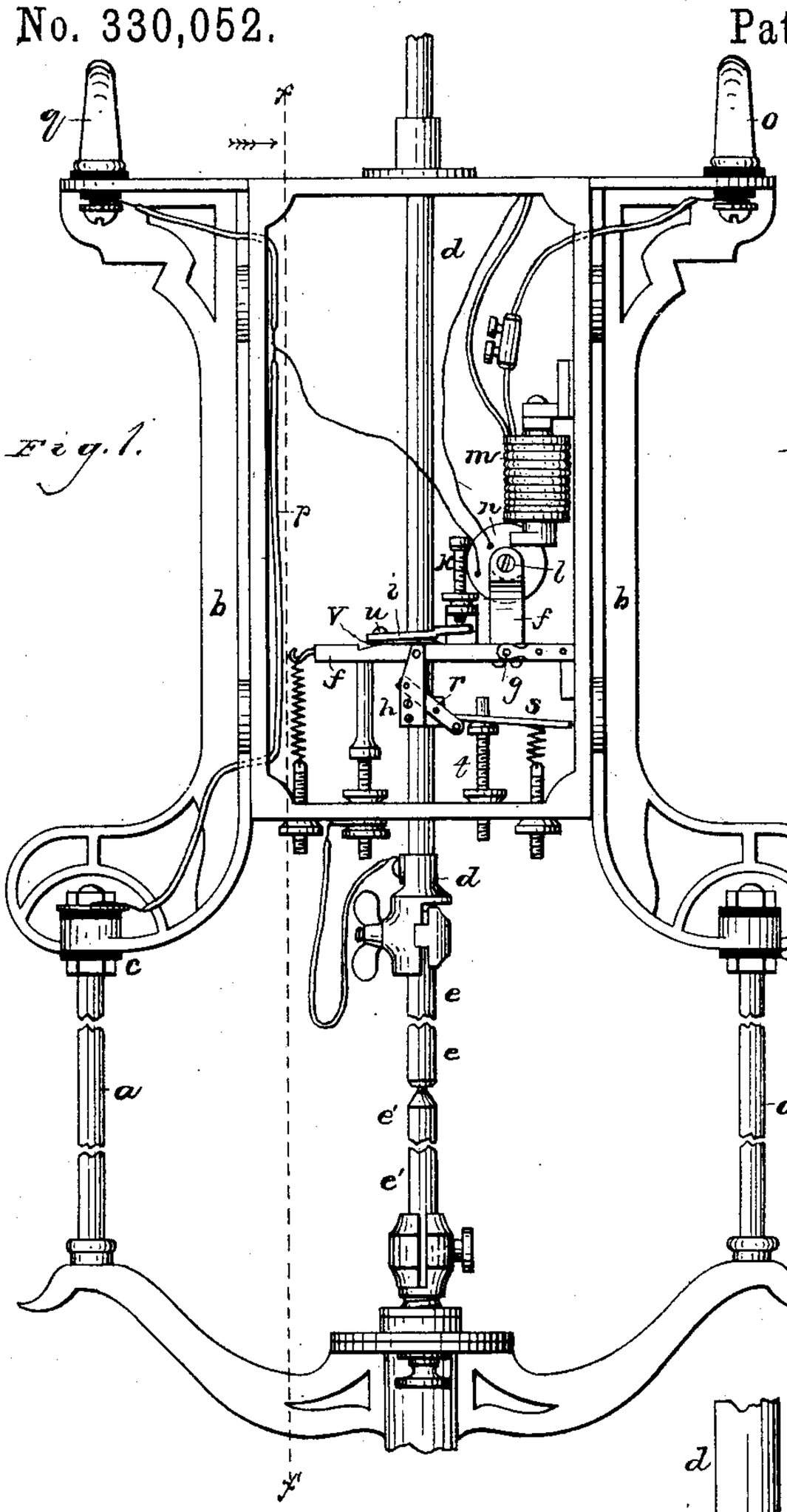


Fig. 2.

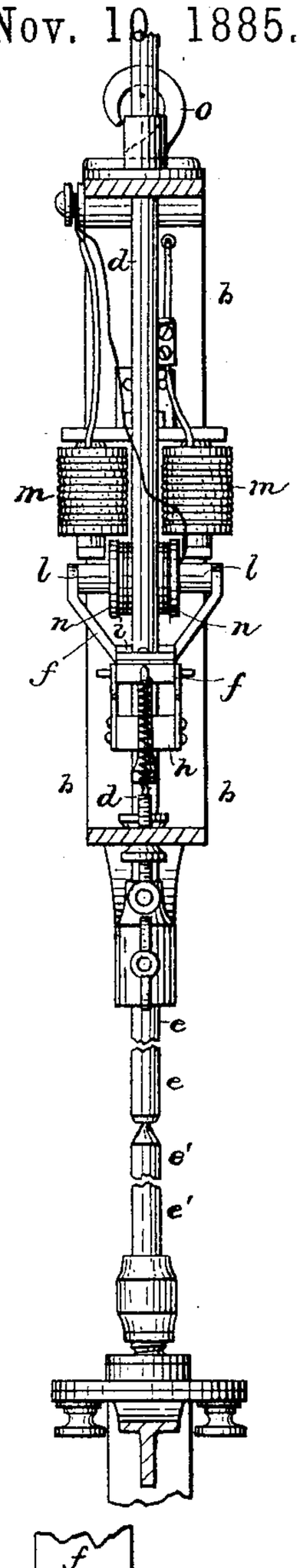
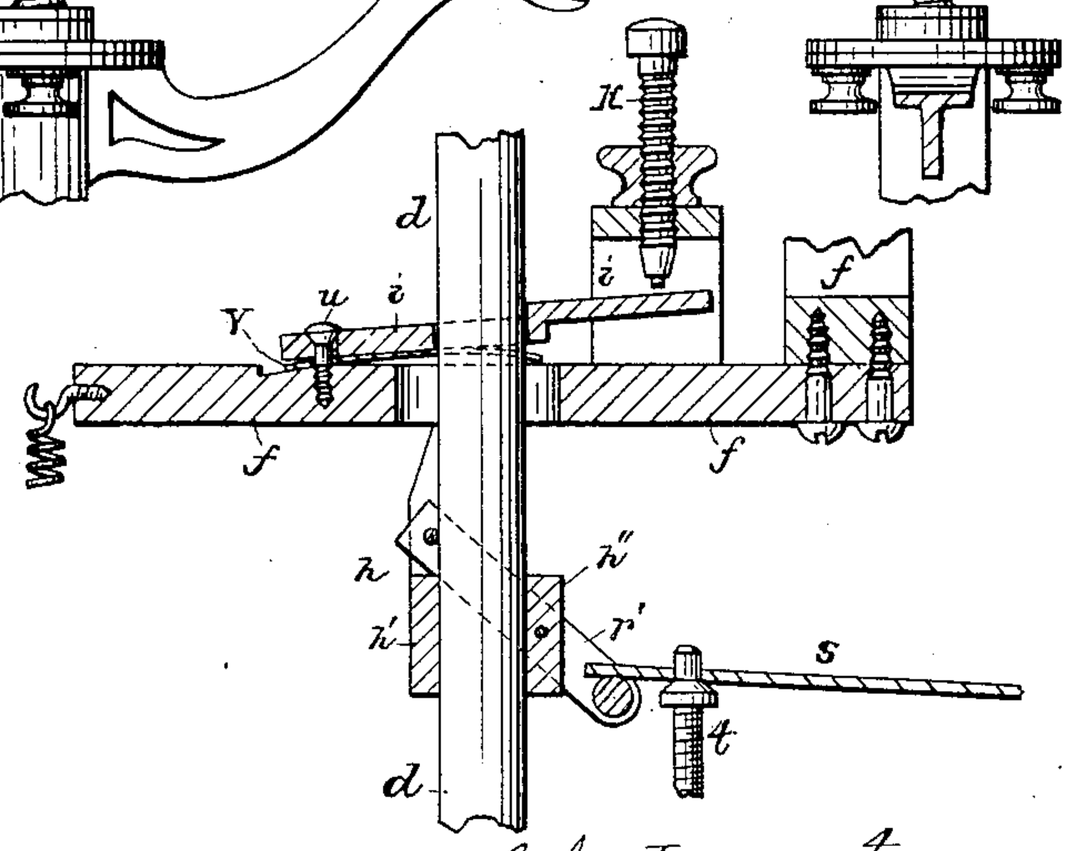


Fig. 3.



Witnesses.
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UNITED STATES PATENT OFFICE.

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

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 330,052, dated November 10, 1885.

Application filed May 12, 1882. Serial No. 61,121. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. SCRIBNER, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electric Lamps, 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.

My invention relates to the mechanism for regulating the feed of the carbon points of electric lamps; and it consists in the combinations hereinafter described and claimed.

In the drawings, Figure 1 is a front elevation of an electric lamp embodying my improvement. Fig. 2 is a section thereof on line *x x* of Fig. 1. Fig. 3 is a detail view, partly in section, of the lifting and feeding clutches. Like parts are indicated by similar letters of reference.

The standards *a* and *a'* are insulated from the frame *b*, as indicated, by the bushing *c* and *c'*. The carbon rod *d* is shown carrying the upper carbon, *e*, and electrically connected with the frame. The lower carbon, *e'*, is supported in the usual manner, as shown. The lever *f* is pivoted at *g* to the lug, which forms a part of the frame. Upon this lever are carried the lifting-clutch *h*, the feeding-clutch *i*, with its stop *k*, and the armature *l* of the electro-magnet *m*. The armature *l* is the core of helix *n*.

The circuit of the lamp may be traced in Fig. 1 as follows: From the hook *o* to the electro-magnet *m*, thence to frame *b* and the carbon rod *d*, as shown, thence in the usual manner through the carbon points *e* and *e'* to the carbon-support, and by standard *a* and wire *p* to hook *q*. A derived circuit shunting the arc passes through helix *n* to wire *p*. When the lever *f* is turned upon pivot *g* by attraction between magnet *m* and armature *l*, the feeding-clutch *i* and lifting-clutch *h* are raised. The lifting-clutch *h* consists of two friction-pieces, *h' h''*, pivoted to the arms *r r'*. When the lifting-clutch is raised, these arms are arrested by spring *s*, which normally rests against stop *t*. The friction-pieces *h' h''* are thus brought against the rod, clamping it with sufficient force to sustain its weight. The carbon *e* is thus lifted and the arc established. Until the arc is established there will be no current through the helix *n*, which is included in the shunt of the arc. An increase of resistance in the arc increases the current in the shunt-circuit. The current through helix *n* charges to a north polarity that end of the armature *l* which is attracted by the north pole of the magnet *m*, and to a south polarity the end of the armature *l* which is attracted by the south-pole of the magnet *m*. Thus an increase of current through the helix *n* causes repulsion between the armature and the poles of the electro-magnet *m*. As the carbon points are burned away the resistance of the arc increases. Variations in the strength of the current also vary the resistance of the arc—that is, the stronger the current passing through an arc of any given length the less will be the resistance of said arc.

When many lamps are in the same circuit, there will be variations all the time in the strength of the circuit. Two independent causes will thus always be present which unite in varying the resistance of the arc of any given lamp—that is to say, first, the burning away of the carbons, and, second, the variations in the strength of the current passing through the arc. Continuous variations in the strength of the currents through magnet *m* and helix *n* cause attraction and repulsion, and the rod *d* is thus kept in continuous movement up and down.

If the carbon rod *d* were carried by the clutch *h* alone, it could not slip through said clutch until the lever *f* had descended to a point where spring *s* would rest upon the stop *t*, thus removing the friction of the pieces *h' h''* from the rod. This would occur were the lamp to go out or the current to cease flowing.

When the resistance of the arc is so great as to shunt sufficient current through the helix *n*, the armature-lever *f* will be moved down far enough to release the rod. The lifting-clutch thus alone is sufficient to feed the carbon point, and a lamp which I have constructed on this plan, without the feeding-clutch, has worked successfully. I find, however, the feeding-clutch a valuable part of my invention, and will describe the construction

and operation more in detail. The feeding-clutch *i* is attached to the lever *f*, and pivoted, preferably, as shown, at screw *u*. The spring *v* normally holds the clutch *i* in the position shown, so as to clamp the rod.

The clamp being pivoted may always move downward with the rod a little way until the rod is released. The clutch therefore does not keep the rod from moving downward.

The lever *f* is pivoted at *g*. The greater the distance of any given point of the lever from this pivot *g* the greater distance will it move when the lever is turned upon this pivot. It follows, then, that when the clutch *h* is moved a given distance the clutch *i* will be moved in the same direction a greater distance, since the clutch *i* is carried by point *u* of the lever, which is farther from pivot *g* than is the point which carries the clutch *h*.

When the lever *f* is raised, the lifting-clutch and rod are respectively carried the same distance, while the clutch *i*, which is free to slip upward upon the rod, is carried a greater distance. If, now, the lever *f* descend, the clutch *i* clamps the rod and moves it positively downward through the friction-jaws of clutch *h*. Thus it will be seen that the rod is fed positively a short distance at each complete vibration of the lever *f*, and as the lever *f* is in continuous vibration the carbon may be feeding all the time.

It is evident that if the feeding is more rapid than the consumption of the carbon points they would eventually be fed together. To prevent this I have provided the stop *k*, which is so placed that when the lever *f* is lifted beyond a certain distance the clutch *i* will be arrested and its grip or hold upon the rod loosened.

The armature-lever *f* is in continuous vibration while the lamp is burning. Its field of vibration, however, varies up and down as the resistance of the arc varies.

When the resistance of the arc is at its minimum, the lever is at its maximum height. The clutch *i* is then arrested by stop *k* and does not feed the rod. Therefore the minimum length of the arc may be regulated by means of the stop.

It will be seen that the lever *f* at three different positions in its field of vibration performs different functions. At its lowest position it releases clutch *h* and allows the rod to fall; at its highest position it carries the rod simply without feeding, while at its intermediate position or portion of its field the rod is fed positively at each vibration.

I claim—

1. The feeding-clutch pivoted to the vibrating armature-lever at *u*, in combination with the spring *v* and stop *k*, whereby the carbon may be fed positively, as and for the purpose specified.

2. The combination, with the rod and the lifting-liver pivoted at *g*, of the lifting-clutch and the feeding-clutch, said feeding-clutch being linked to the said lever at a greater distance from pivot *g* than the lifting-clutch, whereby the rod is forced positively through the lifting-clutch by the differential action of the two clutches.

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