(No Model.) 3 Sheets—Sheet 1.

J. OLMSTED.

ELECTRIC LAMP.

No. 252,396. Patented Jan. 17, 1882.

FIG. 1.

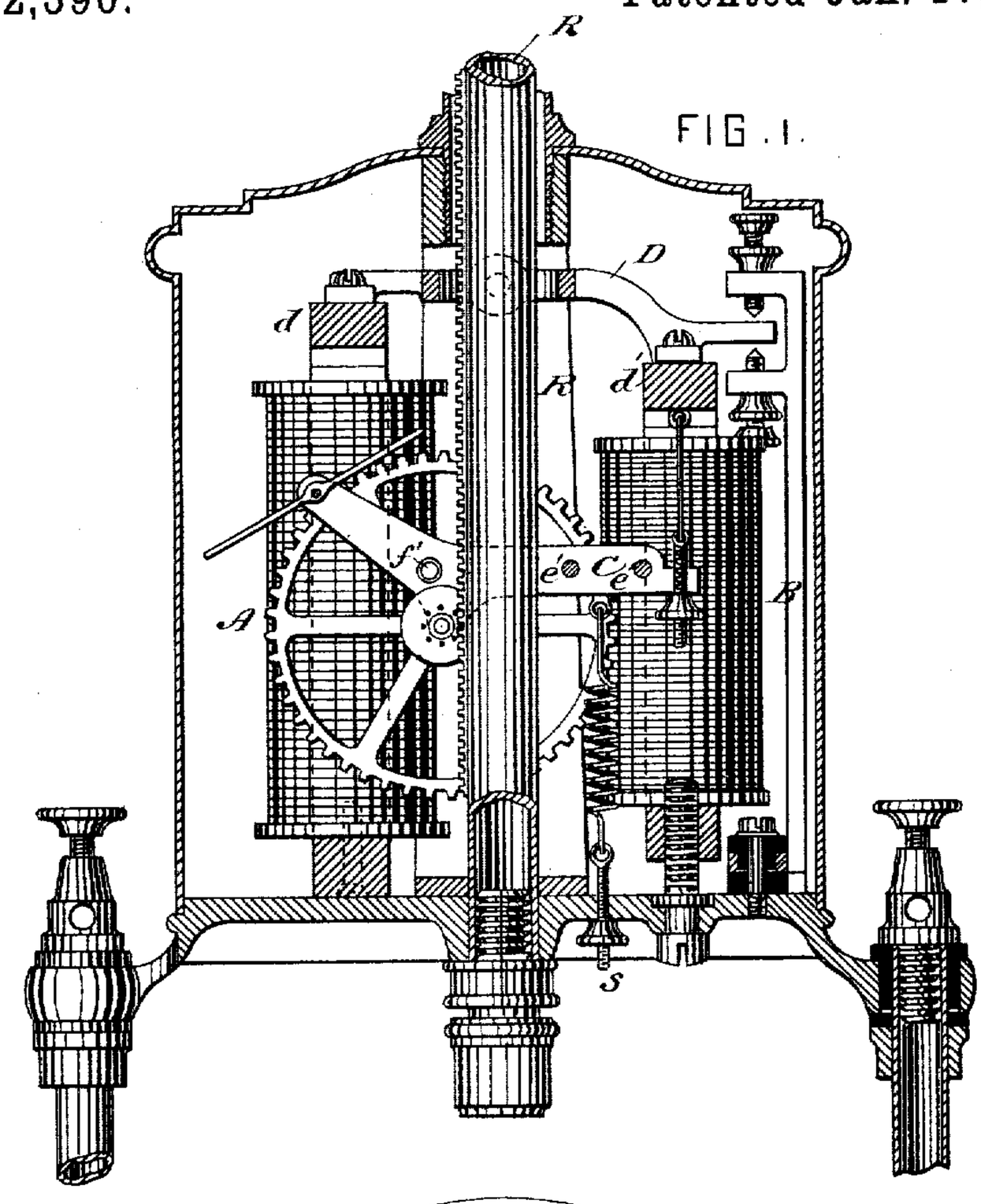
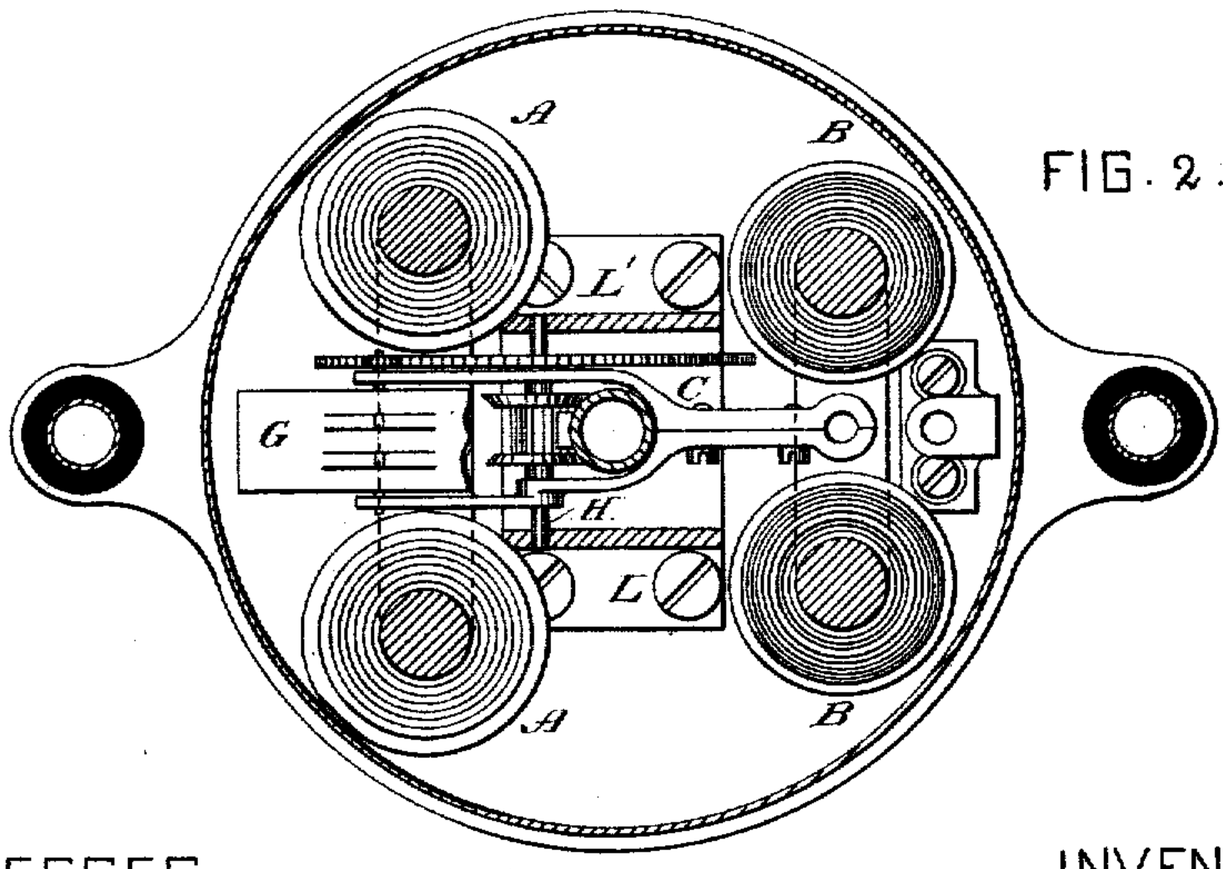


FIG. 2.



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INVENTOR:

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per Parker W. Page

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(No Model.)

3 Sheets—Sheet 2.

J. OLMSTED.

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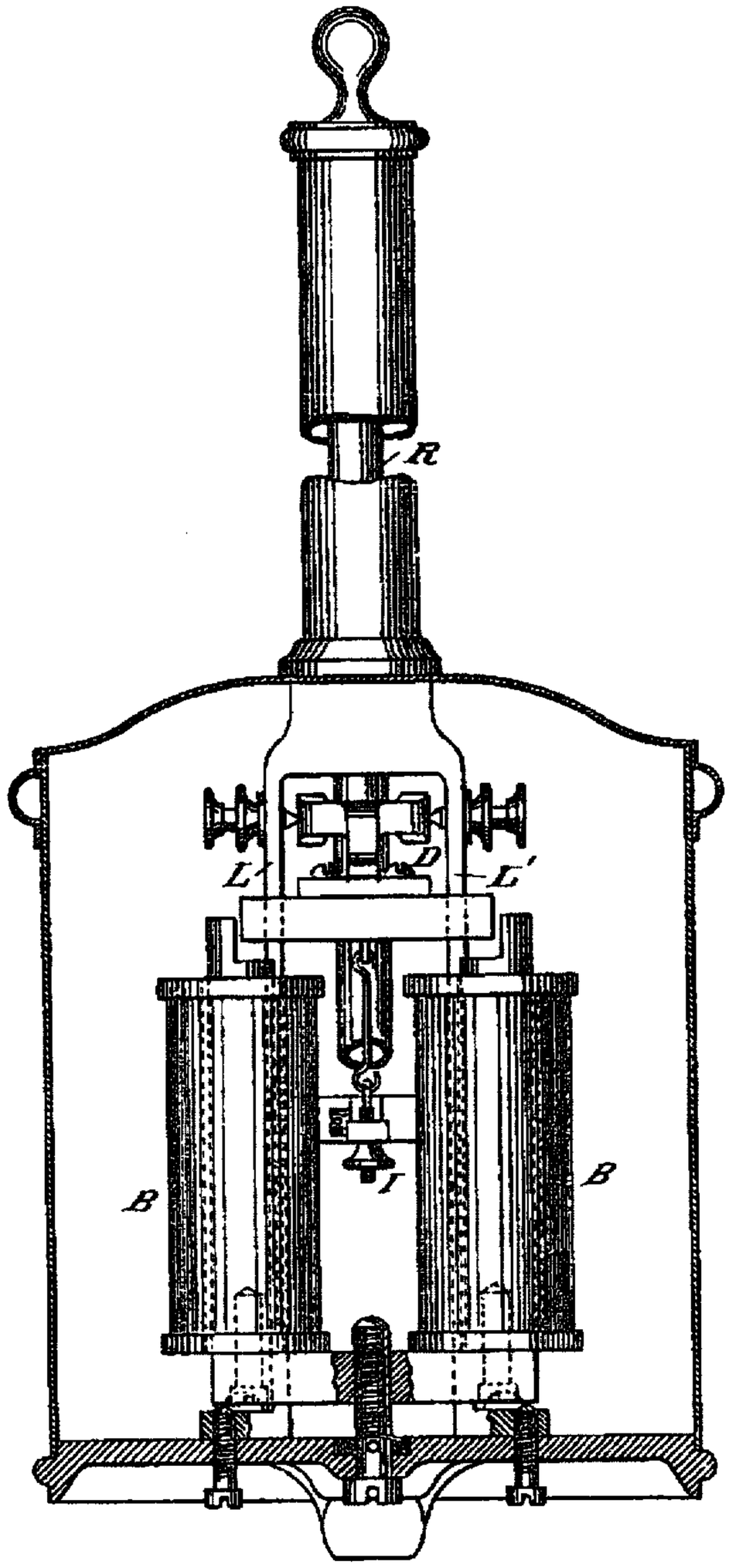
FIG. 3.



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(No Model.)

3 Sheets—Sheet 3.

J. OLMSTED.

ELECTRIC LAMP.

No. 252,396.

Patented Jan. 17, 1882.

FIG. 4.

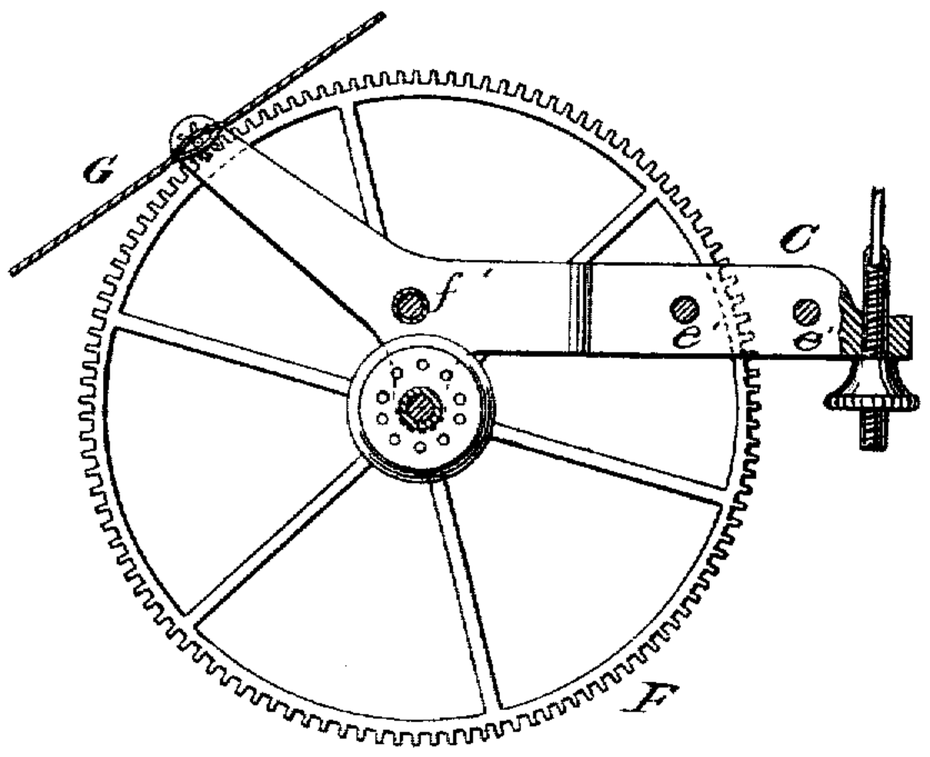


FIG. 5.

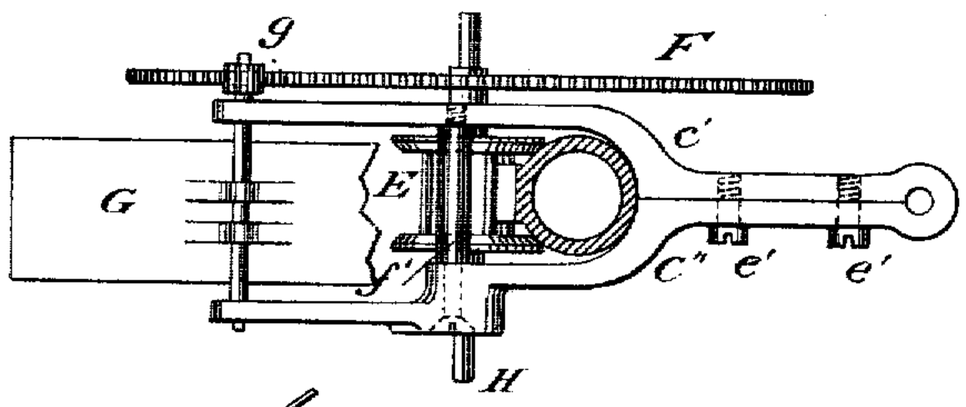
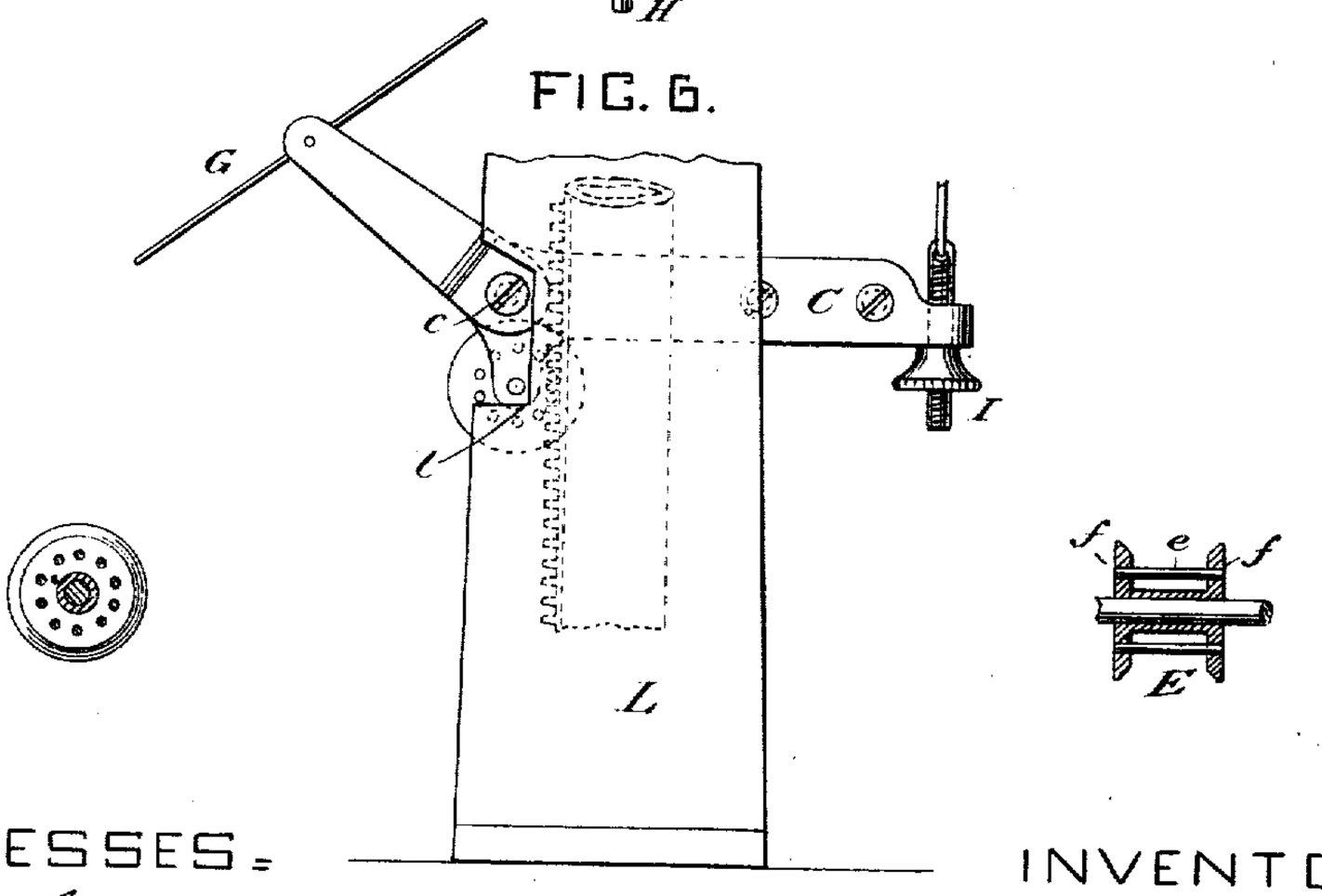


FIG. 6.



WITNESSES=

Frank Gyselager

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INVENTOR=

Joseph Olmsted

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UNITED STATES PATENT OFFICE.

JOSEPH OLMSTED, OF NEW YORK, N. Y., ASSIGNOR TO THE UNITED STATES ELECTRIC LIGHTING COMPANY, OF SAME PLACE.

ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 252,396, dated January 17, 1882.

Application filed July 20, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH OLMSTED, a citizen of the United States, residing at New York, in the county and State of New York, have invented certain new and useful Improvements in Electric Lamps, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

My invention relates to electric-arc lamps or light-regulators.

The object of the invention is mainly to provide for a steady and slow descent of the upper or gravitating carbon-carrier when released for the purpose of bringing the pencils together to compensate for waste or consumption, and at the same time to provide for a proper relative adjustment of the two carbons at all times when the lamp is in operation, whereby a constant and steady light of maximum intensity may be maintained. The means for effecting these objects involve the employment of the usual electro-magnets, helices, or their equivalents, a movable armature, and a combined clutch and retarding device to be used in conjunction therewith, and arranged to retain or release the carbon-carrier at such times as may be necessary for the successful operation of the lamp. These devices are illustrated in the accompanying drawings, in which—

Figure 1 is an interior view of the feed mechanism complete; Fig. 2, a plan of the same; Fig. 3, a side elevation of the magnets and pivoted armature-lever; Fig. 4, a side view, in detail, of the feed-controlling mechanism; Fig. 5, a plan of the same, and Fig. 6 an enlarged view of a pinion and devices connected therewith that form a portion of the regulating mechanism.

Similar letters of reference indicate corresponding parts in all the figures.

The magnets of the lamps are lettered A and B. The former is included in the main circuit—that is to say, the circuit which includes the electrodes. The latter, in a shunt of high resistance around the lamp-lock of the aforesaid magnets, has its armature *d d'*, attached to the ends of a lever, D, pivoted to the vertical sides of a supporting-frame, L L', and branched at its middle portion to permit the passage through it of the carbon-carrier R.

C is a Y-shaped frame, composed of two parts, *c' c''*, Fig. 5, which are clamped together by screws *e' e'* and a screw-rod, *f'*. The precise shape and character of this frame may be altered in many ways to suit the circumstances under which it may be used. The most convenient form, however, of which I am aware is that shown.

H is a spindle passing through the branched sides of the frame C and extending beyond the same on either side, as shown in Figs. 2 and 5.

E is a pinion of peculiar construction, fixed to spindle H, and F is a gear-wheel of considerable diameter, also fixed to one of the ends of the spindle H and without the frame. In the end of the frame C is journaled a second shaft carrying a fan or equivalent retarding device, which receives motion from the wheel F by a pinion, *g*, fixed to the projecting end of its shaft.

The sides of the frame L L' are cut away or notched, as shown at *l* in Fig. 6, and in these notches the ends of spindle H are caused to rest, and a link or cord with an adjusting-screw, I, employed as a means of connection with the armature *d'*, or that end of the lever D to which said armature is attached. The frame C being thus sustained at two points—that is to say, by the projecting ends of spindle H, which rests in notches *l*, and the flexible connection with the armature *d'*—will be free to assume various positions corresponding to changes in the position of the lever D.

The carbon-carrier R is provided with a projecting rack. Its position is in the fork of the frame C, and in a position to engage with the pinion E. This latter is shown in detail in Fig. 6, and consists of a spool with sides or flanges *f f*, in which are set a number of bars, *e*, that take the place of the usual teeth. The width of the flange is such as to embrace the smooth portion of the rack-bar and at the same time prevent the rack from binding or pressing against the teeth forming the pinion proper. As above stated, the rack-bar is situated between the flanges of the pinion and the fork of frame C, which forms a seat for it. When, therefore, the rack-bar and frame are placed at

right angles, the former may be moved through the frame, causing the pinion to revolve as it moves. Should the frame be tilted, however, the rack-bar is rendered incapable of further movement by being griped and held by the flanges *f* on one side and the fork of the frame on the other. Upon this mainly depends the action of the lamp.

I would here state that a spring, S, is employed, usually in connection with the lever D, to regulate the attractive effect of the magnets as may be desired, and also that a dash-pot or similar device may be used for precluding the too sudden movement of the parts. The remaining features of adjustment, stops for limiting the motion of the lever D, and other details of construction I have not described, as they are common in many lamps, and are now well understood.

The operation of the lamp is as follows: Supposing the current to be directed through the lamp, the main magnet, by its superior attraction, draws up the armature-lever *d'* and tilts the frame C until the pinion binds the rack-bar, upon which this latter is raised and the arc formed. As the carbons are consumed the diversion of current or increasing resistance imparts to lever D a tendency to resume its normal position. By this means the frame C and the rack-bar are lowered until the spindle H rests on the notched sides of frame L L', whereupon a further lowering of armature *d'* releases the rack-bar R, which descends, its movement being limited by the train of wheels and the fan, as above set forth. As soon as the carbons have approached a sufficient distance the increasing attraction of magnet A locks the rack-bar. It may be stated that the operation of feeding is effected by almost imperceptible steps, so that the moving parts may be said to have an exceedingly slow but practically continuous motion.

The principle of the operation of the lamp just described combines the advantages of a rack-and-pinion as well as a clutch lamp. It will be seen that the tendency common to the clutch-lamp of the carbons falling into contact when released is entirely avoided, and also that the least motion of the pinion or the frame carrying the same may effect the requisite amount of feed when the arc has increased beyond a predetermined point.

The form of lamp shown and described embodies the most approved arrangement of the several parts necessary to the successful operation of the lamp with which I am now familiar. I do not wish to be understood, however, as confining myself to this precise form, as the invention embraces many possible modifications. For instance, the character of the pinion may be greatly changed and equivalent forms used therefor. Again, the character of the magnets may be varied, as well as that of the train connected with the pinion-shaft.

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

1. The combination, in an electric lamp, of a divided or branched plate or frame controlled by one or more electro magnets, a pinion, and one or more gear-wheels carried thereby, and a rack-bar in gear with said pinion and passing between it and the frame, so as to be locked or released by the tilting of the said frame, substantially as hereinbefore set forth.

2. The combination, in an electric lamp, of frame C, pinion E, having teeth *e* and projections or flanges *f*, rack-bar R, engaging with the pinion, a train of gears for limiting the rotation of the pinion, and one or more electro-magnets operating to move the frame for the purpose of locking or releasing the said rack-bar, substantially as hereinbefore set forth.

3. The pinion E, having teeth *e* and flanges *f f*, in combination with a rack-bar and electro-magnetic detent mechanism, as and for the purpose set forth.

4. The combination of one or more electro-magnets, A B, lever D, and armatures attached thereto with frame C, adjustably connected thereto, pinion E, having flanges *f*, rack-bar R, and a train of gears carried by frame C and operating to limit the rotation of the pinion, as and for the purpose set forth.

In testimony whereof I have hereunto set my hand this 5th day of July, 1881.

JOSEPH OLMSTED.

Witnesses:
W. H. CALHOUN, Jr.,
W. W. CONKLIN.