(No Model.)

M. D. LAW.

REGULATOR FOR ELECTRIC LAMPS.

No. 248,763. Patented Oct. 25, 1881.

FIG. 1.

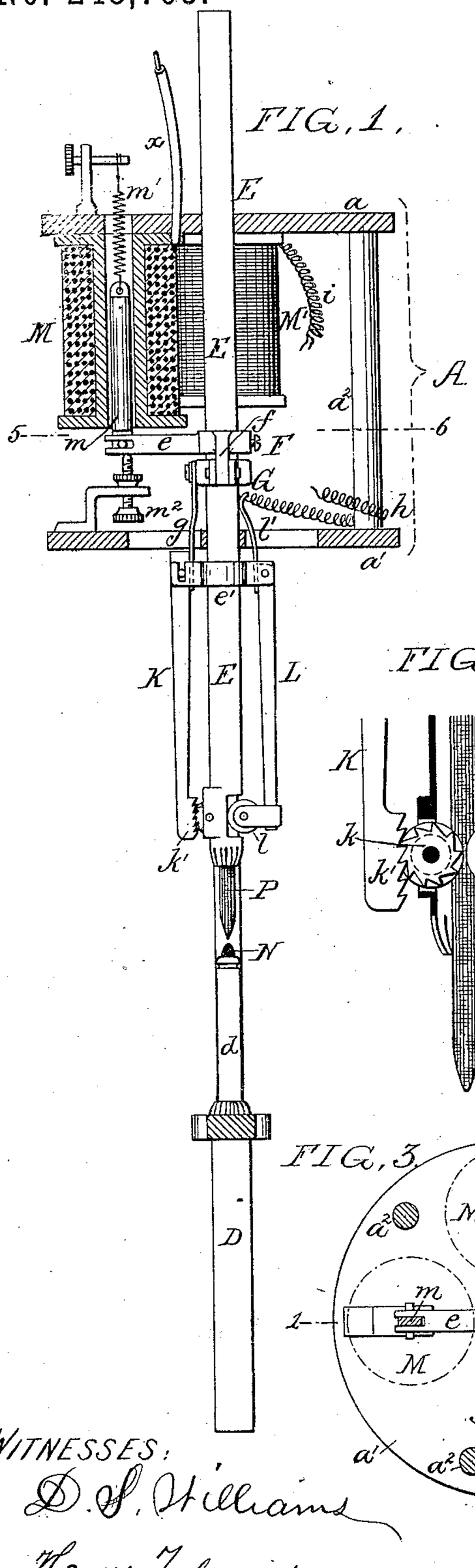

FIG. 2.

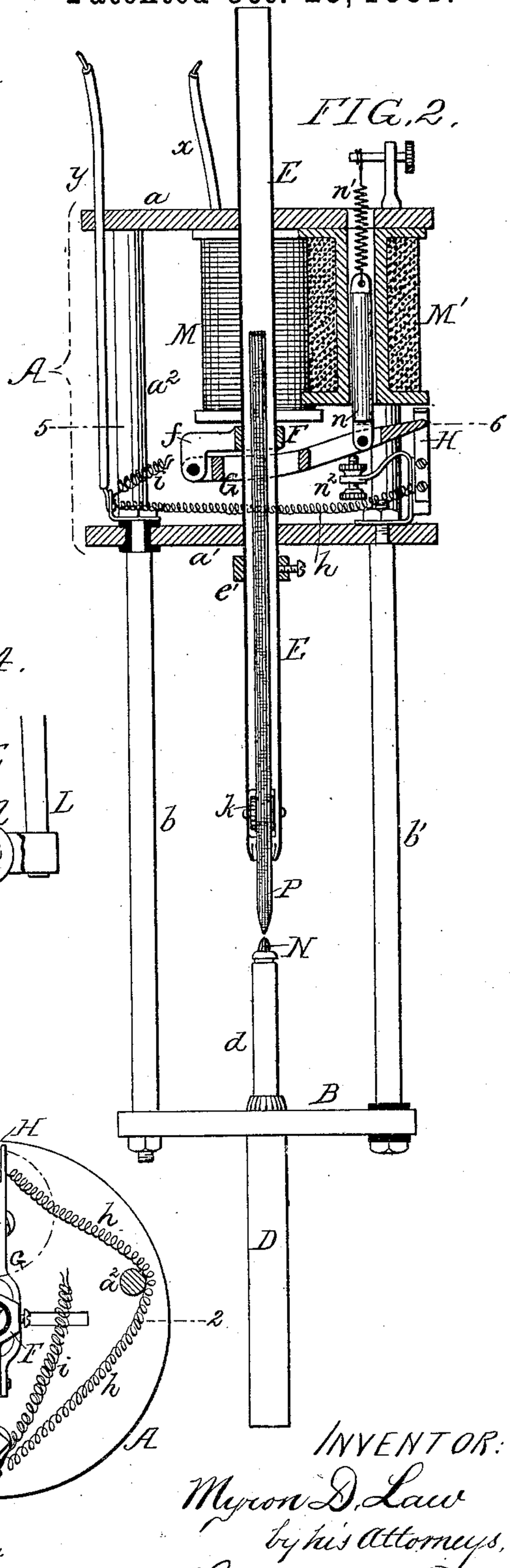

FIG. 4.

FIG. 3.

WITNESSES:

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REGULATOR FOR ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 248,763, dated October 25, 1881.

Application filed May 27, 1881. (No model.)

To all whom it may concern:

Be it known that I, MYRON D. LAW, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Regulators for Electric Lamps, of which the following is a specification.

My invention relates to certain improvements in regulating devices for electric lamps; and the object of my invention is to construct devices for imparting a regular and positive automatic feed to the carbons, as fully described hereinafter.

In the accompanying drawings, Figure 1 is a vertical section on the line 1 2, Fig. 3, of an electric lamp embodying my improvements; Fig. 2, a vertical section on the line 3 4, Fig. 3; Fig. 3, a sectional plan on the line 5 6, Figs. 1 and 2; and Fig. 4, an enlarged sectional view of one of the details.

The frame A of the lamp consists of the upper and lower plates, *a* and *a'*, and connecting-rods a^2, three in the present instance. To the lower plate, *a'*, are secured the two pendent rods *b b'*, with the cross-bar B at the lower end, carrying the socket D for the lower carbon-holder, *d*. This holder, in the present instance, contains the negative carbon N, which, as it is consumed, is fed upward by a spiral spring acting against a clamp or socket at the point in the usual manner. The upper plate, *a*, of the frame A carries the main electro-magnet M, having a movable core, *m*, provided with a tension-spring, *m'*, and adjustable back-stop, m^2. This core is attached by a pin-and-slot connection to an arm, *e*, of a collar, F, secured to the vertical tube E, which passes through openings in the upper and lower plates, *a* and *a'*, and contains the positive carbon P.

To a second arm, *f*, Figs. 2 and 3, of the collar F is pivoted a lever, G, whose motion is limited in a downward direction by an adjustable back-stop, n^2, and in an upward direction by a projection on a plate, H, which is insulated from the frame A. To this lever G is pivoted the movable core *n* of the fine wire electro-magnet M', which is carried by the upper plate, *a*, of the frame, and forms part of a shunt-circuit, as described hereinafter. A tension-spring, *n'*, is connected to the upper end of the movable core *n*.

To the lever G is secured a pendent arm, *g*, Fig. 1, which is connected to or forms part of a lever, K, having pins adapted to guide slots in a collar, *e'*, secured to the tube E. The lower end of this lever K is provided with ratchet-teeth *k'*, gearing into a ratchet-wheel attached to or forming part of a grooved roller, *k*, which is adapted to turn on a pin in the lower end of the tube E, as shown in Fig. 4. The carbon pencil P is kept in frictional contact with this roller *k* by a grooved roller, *l*, carried by the lever L, which is pivoted to the collar *e'* and acted on by a spring, *l'*. The carbon P is guided also by the contracted end of the tube E.

The circuits are as follows: The current enters through the insulated wire *x* and the wire of the coil M, and thence through the frame and positive carbon P to the negative carbon N, the rod *b* being insulated at its connection with the plate *a'* and the rod *b'* at its point of connection with the cross-piece B. The current passes from the negative carbon, cross-piece B, and rod *b* to the insulated terminal wire *y*, electrically connected to said rod. The fine wire of the coil M' is electrically connected to the frame, and by means of the wire *i* with the terminal wire *y*, thus forming a shunt-circuit of greater resistance than the main circuit. The insulated plate H is also connected by the fine wire *h* with the terminal wire *y*, this wire *h* offering a resistance slightly greater than that offered by the arc and magnet M.

The operation is as follows: When the circuit is sent in through the coil M the core *m* is immediately raised, carrying with it the tube E, and thus separating the carbons, so as to form the voltaic arc. To compensate for the consumption of the carbons, the current passing through the coil M' in the shunt-circuit gradually causes the rise of the core *n* within the coil and raises the levers G and K. As the latter rises the ratchet-teeth *k'* cause the roller *k* to turn and feed the carbon P forward until the end of the lever G comes into contact with the plate H and the current passes through the wire *h* to the terminal wire *y*, thus practically cutting out the current from the coil M' in the shunt-circuit and allowing the core *n* and lever G to fall again. The lever K at the same time descends and the teeth *k'* slip over the teeth on the roller *k*. It will be understood that these regulating devices may

be applied to either the upper or lower carbon, or to both. If applied to only one, that one should be the positive carbon.

I claim as my invention—

1. In an electric lamp, the combination of the frame, the coil in the main circuit, the carbon-holders, and carbons with the shunt-circuit coil, a pair of rollers bearing on one of the carbons, and devices, substantially as described, whereby a positive rotary motion is imparted by the movement of the core of the shunt-coil to one of said rollers to feed the carbon forward as it is consumed.

2. In an electric-light regulator, the combination of the shunt-circuit coil, the carbons, and holders with rollers *k l*, lever K, controlling the movement of one of said rollers and lever G, connected with the lever K and carrying the core of the magnet in the shunt-circuit, substantially as set forth.

3. The combination of the positive and negative carbons with the frame, the tube E, collar F, having an arm, *e*, core *m*, and electro-magnet M in the main circuit, substantially as specified.

4. The combination of the frame, the coil M, its movable core, and coil M′ in the shunt-circuit, having a movable core, with the tube E, collar F, having an arm, *e*, connected to the core of the coil M, and pivoted lever G, connected to the core of the shunt-circuit coil, and devices, substantially as set forth, for causing said lever G to impart a positive feed to one of the carbons.

5. The combination of the shunt-circuit coil and its core with the pivoted lever G, carrying the said core and controlling the feed devices for one of the carbons, the insulated plate H, wire *h*, and terminal wire, all substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

M. D. LAW.

Witnesses:
HARRY SMITH,
HUBERT HOWSON.