

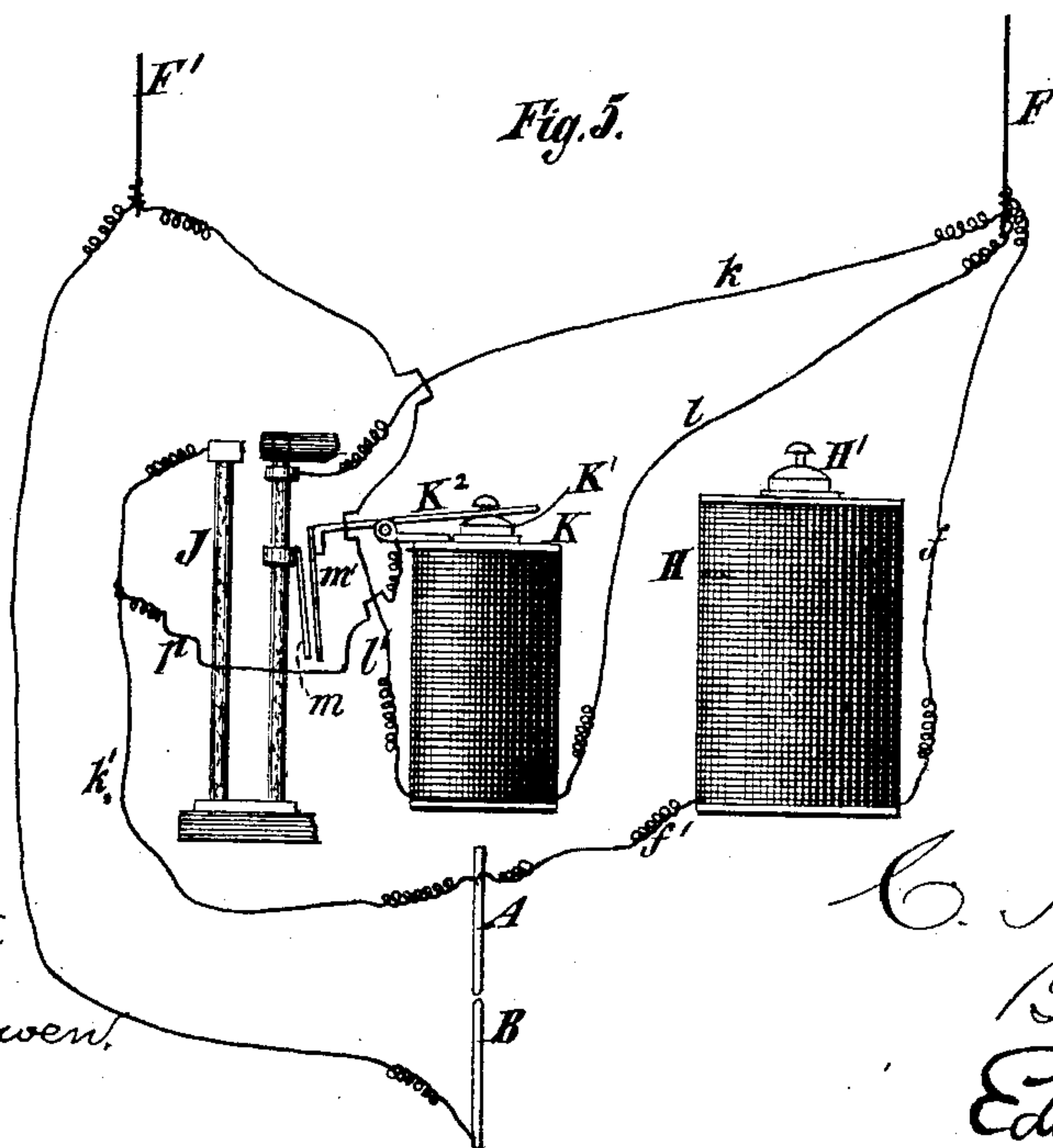
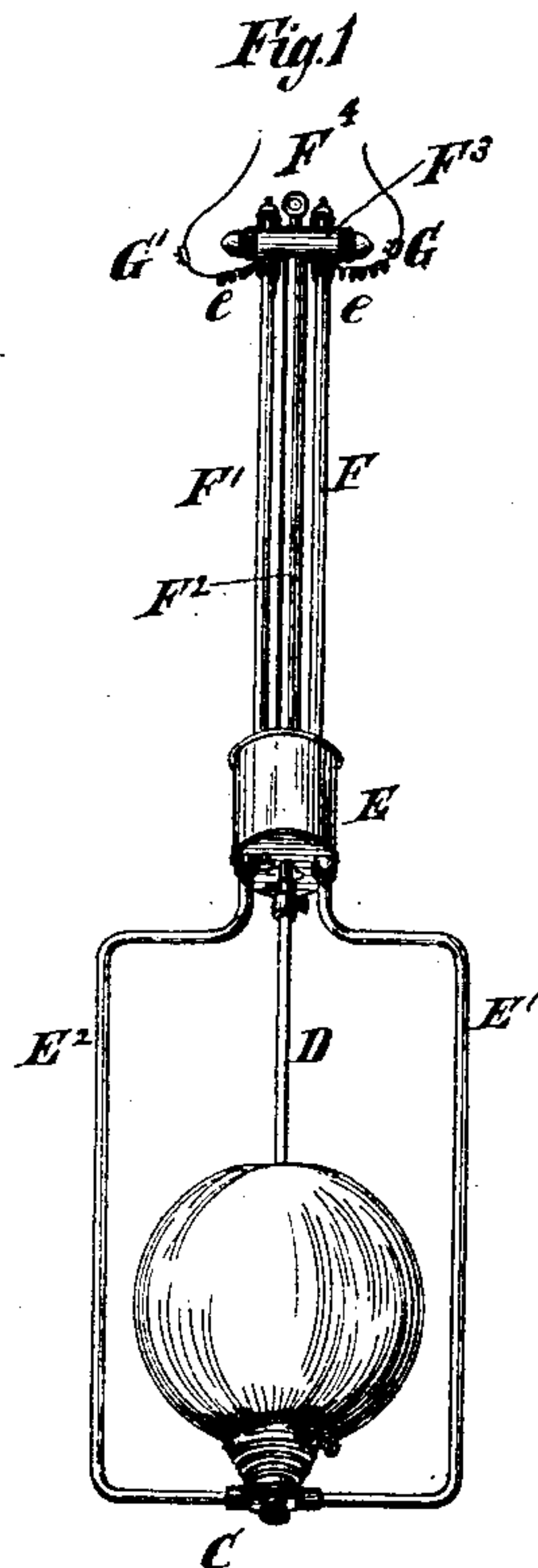
(No Model.)

2 Sheets—Sheet 1.

C. A. HUSSEY.
ELECTRIC ARC LAMP.

No. 269,938.

Patented Jan. 2, 1883.



Witnesses
T. J. Kane
James R. Bowen

Inventor
C. A. Hussey
By his atty.
Edwin H. Brown

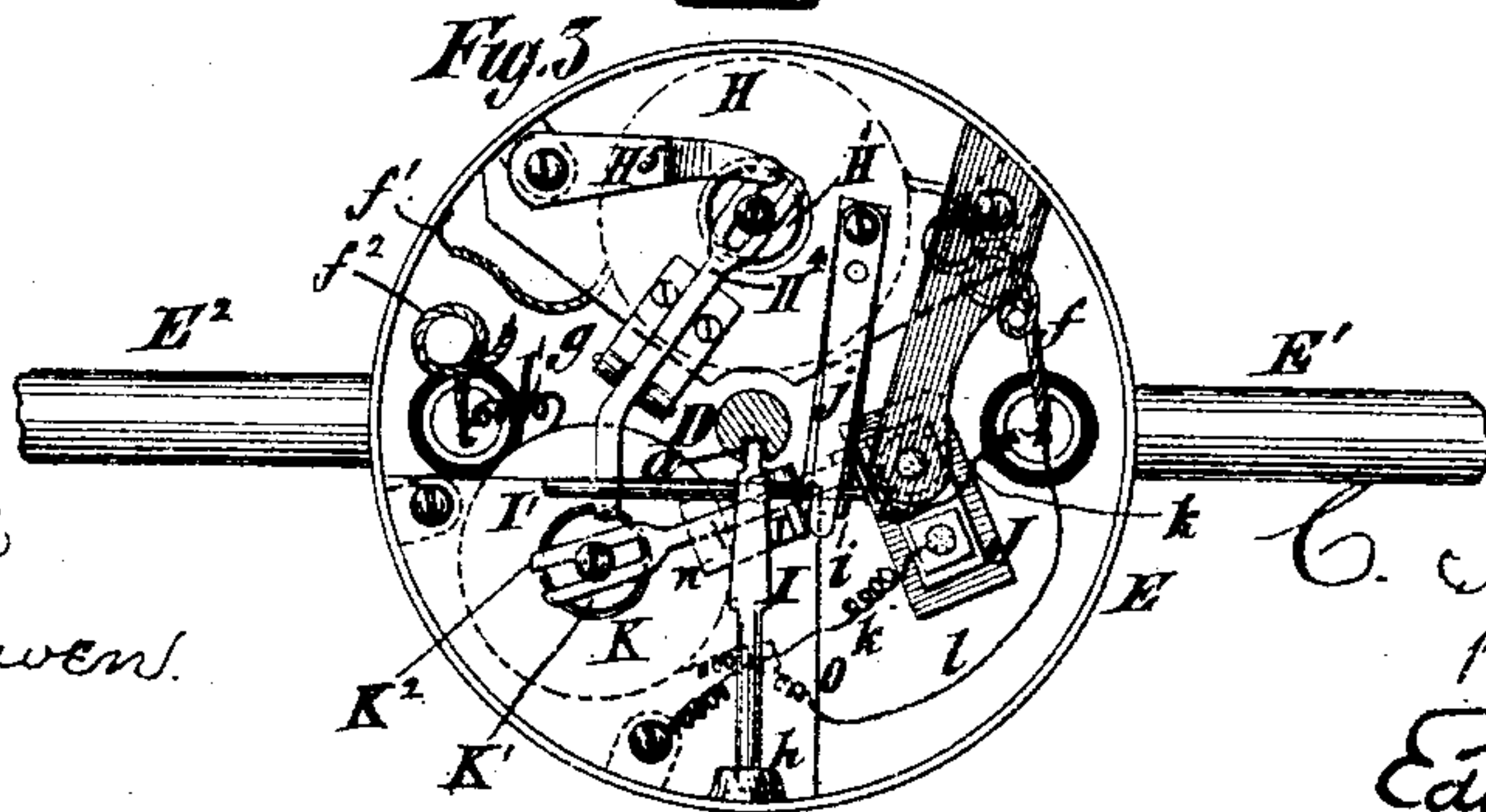
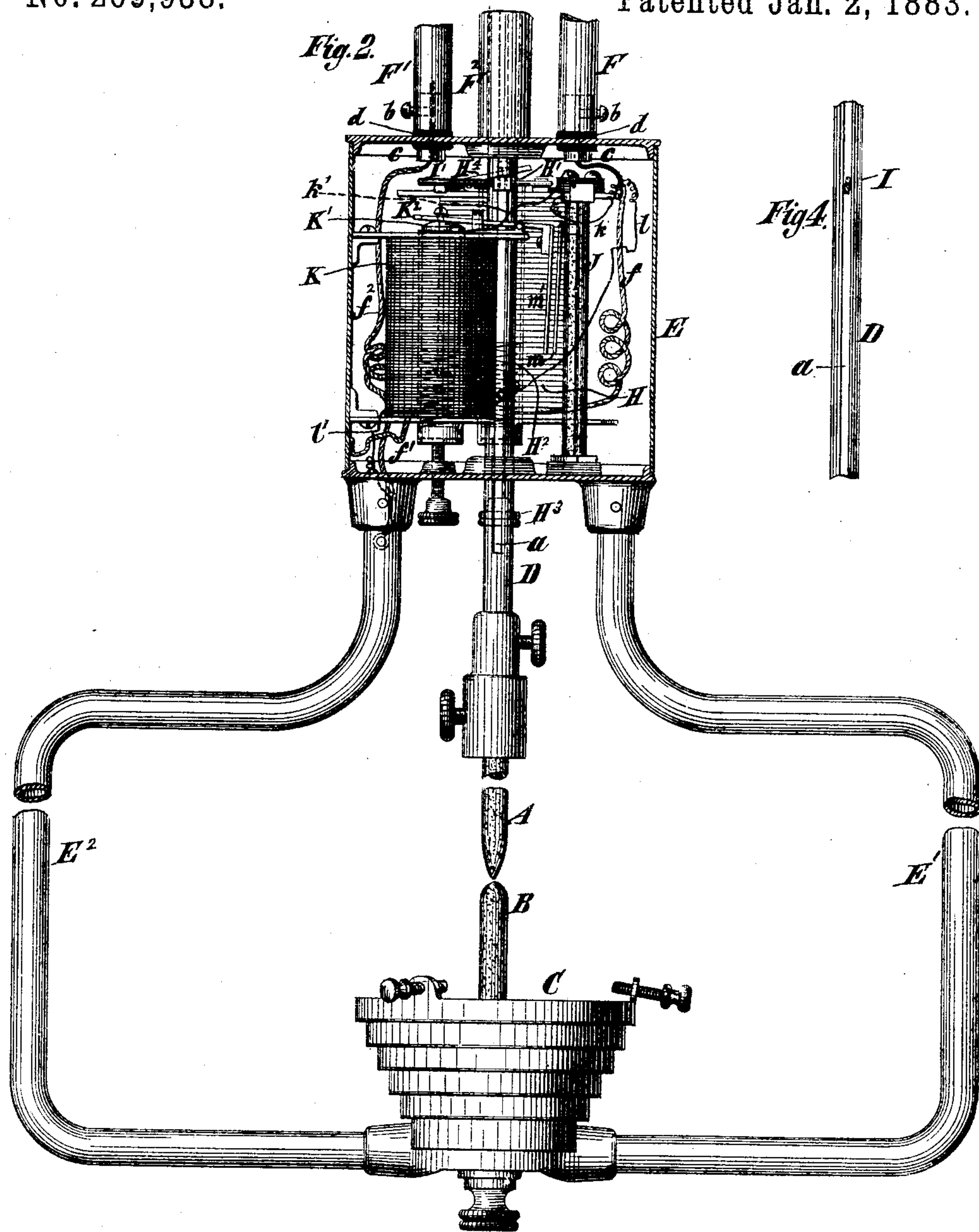
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

CHARLES A. HUSSEY, OF NEW YORK, N. Y., ASSIGNOR TO THE HUSSEY
ELECTRIC COMPANY, OF SAME PLACE.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 269,938, dated January 2, 1883.

Application filed May 20, 1882. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. HUSSEY, of New York, in the county and State of New York, have invented a certain new and useful Improvement in Electric Lamps, of which the following is a specification.

My present improvement consists in the combination, with a rod supporting a carbon in an electric lamp and having a longitudinal groove or slot, of a bar fitting at one end in a bearing and at the other end entering said groove or slot, and means for rocking or turning the said bar so as to cause it to engage with or become disengaged from the walls of the said groove or slot, whereby I produce a very desirable clutch for controlling the feed of the carbon.

The improvement also consists in the combination, with a rod supporting a carbon in an electric lamp and having a longitudinal groove or slot, of a bar fitting at one end in a bearing and at the other end entering the said groove or slot, and an electro-magnet or solenoid for rocking or turning the said bar so as to cause it to engage with or become disengaged from the walls of the said groove or slot.

The improvement also consists in the combination, with a rod supporting a carbon in an electric lamp and a clutch for controlling the feed of the carbon, of a divided but closed main circuit, an electro-magnet or solenoid in one division having an armature or core which operates the said clutch, a resistance device in the other division, a derived circuit, an electro-magnet or solenoid in the derived circuit, and a device connected with the electro-magnet or solenoid of the derived circuit for short-circuiting out the resistance device to effect the weakening of the electro-magnet or solenoid in the main circuit, whereby I produce a very sensitive mechanism for feeding the said carbon whenever necessary.

The improvement also consists in certain other features, which are hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a perspective view of an electric lamp embodying my improvement. Fig. 2 is a sectional elevation of the same. Fig. 3 is a sectional plan of the same. Fig. 4 is a detail view

thereof, and Fig. 5 is a diagram illustrative thereof.

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

A designates the upper carbon, and B designates the lower carbon. They are both detachably secured in metallic holders in the usual manner, and the lower carbon has no adjustment during the operation of the lamp in this example of my improvement. Adjacent to the lower carbon, B, is a globe-holder, C, which may be of any suitable form. The holder for the upper carbon is connected to a metal rod, D, which, as here shown, is arranged in bearings in the top and bottom of the case E, also made of metal. In the rod D is a longitudinal groove, *a*, preferably having parallel sides.

E' E² designate rods, shown as of tubular form, extending downwardly from the case E and supporting the holder for the lower carbon and the globe-holder. They are insulated from the case by gaskets of hard rubber or other suitable material.

F F' designate metal rods, here shown as of tubular form, whereby the lamp is suspended. They are secured by set-screws *b* to metal plugs *c*, which extend through the top of the case E. The rods are, however, insulated from the said case by gaskets *d*, of hard rubber or other suitable material. The rod D above the case extends into a tube, F², which, like the rods F F', is connected to the top of the case E. These rods F F' are connected at the upper end to a cross piece, F³, of wood or other suitable insulating material, provided with a suspending loop, F⁴. The line-wires G G' are secured to binding-screws *e* on the rods F F', and thence the circuit extends along the said rods. From the plug *c*, which is secured to the rod F, a wire, *f*, extends to one end of the coil of wire of a solenoid, H, and from the other end of the said coil a wire, *f'*, extends to the case E. The spool of this solenoid is made of insulating material, as usual. The circuit extends from the case E along the rod D to the upper carbon, thence to the lower carbon, thence along the rod E² to a wire, *f*², connected thereto by a set-screw or otherwise, and thence to the rod F'. The core H' of the sol-

enoid H has combined with its lower end a spring, H^2 , which tends constantly to force it upward. The action of this spring may be varied more or less by means of a screw, H^3 , whereby it can be compressed or relaxed. A stop, H^5 , limits the upward movement of the core of the solenoid. The upper end of the core of the solenoid is connected to one end of a lever, H^4 , which is fulcrumed to a plate, g , secured to the top of the solenoid.

I designates a bar, which at one end fits within the longitudinal groove a of the rod D and at the other ends fits within a bearing, h , so as to be capable of being rotated or turned and canted at an angle therein.

I' designates a bar secured to the bar I and extending transversely thereto. At one end this bar rests on the free end of the lever H^4 , and at the other end it rests on a block, i , a spring, j , being preferably employed to hold it in contact therewith. The end of the bar I which fits in the groove a of the rod D is square or rectangular in the cross-section. I preferably make the arm of the bar I' which rests on the lever H^4 much longer than the other arm, so as to give it an advantage in leverage, and to cause it to rest on the lever H^4 and follow the motions of the latter. As soon as a current of electricity is supplied to the lamp the solenoid H draws down its core H' , thereby raising the free end of the lever H^4 . The lever H^4 , acting on the bar I', cants, turns, or rocks the bar I, so that its end which fits in the groove a of the rod D will bite in the groove and lock the rod in position. When, through the consumption of the carbons, the voltaic arc becomes elongated sufficiently to materially alter the resistance in the main circuit, hereinbefore described, and the solenoid H, in consequence thereof, becomes sufficiently weakened to allow the spring H^2 to force the core H' upward, the free end of the lever H^4 is depressed, the adjacent end of the bar I' descends, and the sides of the end of the bar I that fits within the groove a of the rod D assume a position parallel with the sides of the groove, and thereupon the said rod is released, and, descending with the upper carbon, reduces the length of the voltaic arc, thereby restoring the normal resistance in the main circuit. As soon as this happens the solenoid H becomes energized sufficiently to again draw down its core, raise the free end of the lever H^4 , and rock the bar I so as to cause its end to engage with the groove a in the rod D and lock the latter in position. On a further variation in the resistance in the main circuit the operation is repeated, and so on during the operation of the lamp.

I will now proceed to explain other features of my improvement with special reference to the diagram, Fig. 5.

A wire, k , extends from the wire f to one end of a resistance device, J, here shown as consisting of rods of carbons united successively by metal plates. From the other end of the resistance device a wire, k' , extends to the case

E, or, as shown in the diagram, to the upper carbon, A. The wires k k' form a division of the main circuit. A wire, l , leads from the wire f to one end of the coil of a solenoid, K, of high resistance, and a wire, l' , leads from the other end thereof to the rod E^2 , or, as shown in the diagram, to the lower carbon, B. On the resistance device J is a contact-piece, m . The core K' of the solenoid K is connected to a metallic lever, K^2 , which is fulcrumed to a plate, n , affixed to a metal plate, o , which extends over the top of the spool of the said solenoid K. This spool, as usual, is made of insulating material. The covering-plate o is fastened to the case E. The free end of this lever carries a contact-piece, m' , which is adjacent to the contact-piece m before mentioned, and may be pressed against the same. The resistance offered by the resistance device J is such that it will cause the electric current to pass through the solenoid H in quantity sufficient to energize the solenoid for the performance of its duties. When the consumption of the carbons elongates the voltaic arc sufficiently to make a material change in the resistance of the main circuit, comparatively more of the electric current passes to the solenoid K, and the latter becomes sufficiently energized to draw down its core K' . When this happens the contact-piece m' is caused to impinge against the contact-piece m , whereupon the electric current is shunted from the resistance device J through the contact-pieces m m' to the lever K^2 , thence along the covering-plate o or the wire p in the diagram to the case E, and thence to the upper carbon. As the electric current can then pass more easily along this path than along the wire f , the solenoid H, and the wire f' to the upper carbon, the solenoid H is instantaneously so weakened that its core H' can rise and release the rod D to cause the feeding of the upper carbon. When the normal resistance is restored in the main circuit by the feeding of the upper carbon the solenoid K becomes so weakened that its core K' rises and removes the contact-piece m' from the contact-piece m , whereupon the electric current is forced to pass through the resistance device J again. It will be seen that both divisions of the main circuit are closed, and that I employ a resistance-coil in a closed division of the main circuit. This is more advantageous than open division of the main circuit would be, among other things, because the resistance-coil would have more uniform resistance than air. This feature of my improvement may be used in combination with other means for controlling the feed of the upper carbon than those described.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In an electric lamp, the combination, with a rod supporting a carbon and having a longitudinal groove or slot, of a bar fitting at one end in a bearing and at the other end entering said groove or slot, and means for rocking or

turning said bar so as to cause it to engage with or become disengaged from the walls of said groove or slot, substantially as specified.

2. In an electric lamp, the combination, with
5 a rod supporting a carbon and having a longitudinal groove or slot, of a bar fitting at one end in a bearing and at the other end entering said groove or slot, and an electro-magnet or solenoid for rocking or turning said
10 bar so as to cause it to engage with or become disengaged from the walls of said groove or slot, substantially as specified.

3. In an electric lamp, the combination, with
15 a rod supporting a carbon and having a longitudinal groove or slot, of a bar, I, entering said groove or slot, a bar, I', affixed to the bar I and extending transversely to it, the solenoid H, its core H', and the lever H⁴, substantially as specified.

20 4. In an electric lamp, the combination, with a rod supporting a carbon and having a longitudinal groove or slot, of the bar I, the bar I', the block i, the lever H⁴, the solenoid H, and its core H', substantially as specified.

25 5. In an electric lamp, the combination, with a rod supporting a carbon, of a divided but

closed main circuit, a clutch for controlling the feed of the said carbon, an electro-magnet or solenoid in one division of the said circuit, having an armature or core for operating the
30 said clutch, a resistance device in the other division of the said circuit, a derived circuit, an electro-magnet or solenoid in the derived circuit, and a device connected with the electro-magnet or solenoid of the derived circuit for
35 short-circuiting out the resistance device to effect the weakening of the electro-magnet or solenoid in the main circuit, substantially as specified.

6. In an electric lamp, the combination, with
40 a rod supporting a carbon, and a clutch for controlling said rod, of a divided but closed main circuit, the solenoid H in one division, the resistance device J in the other division, a derived circuit, the solenoid K, the core K',
45 the lever K², and the contact-pieces *m m'*, substantially as specified.

C. A. HUSSEY.

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