

(No Model.)

A. G. WATERHOUSE.
ELECTRIC ARC LAMP.

No. 336,184.

Patented Feb. 16, 1886.

Fig. 1.

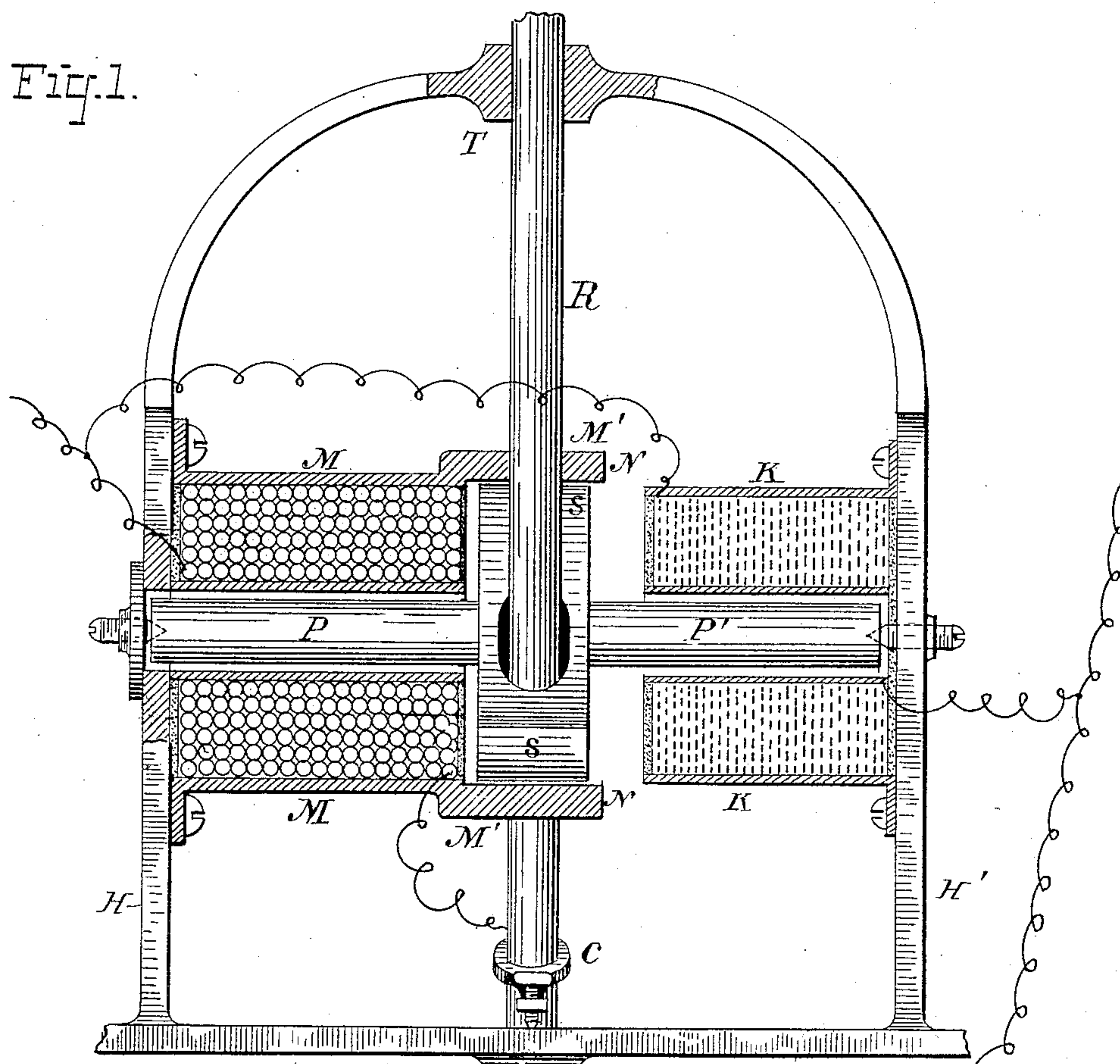


Fig. 5.

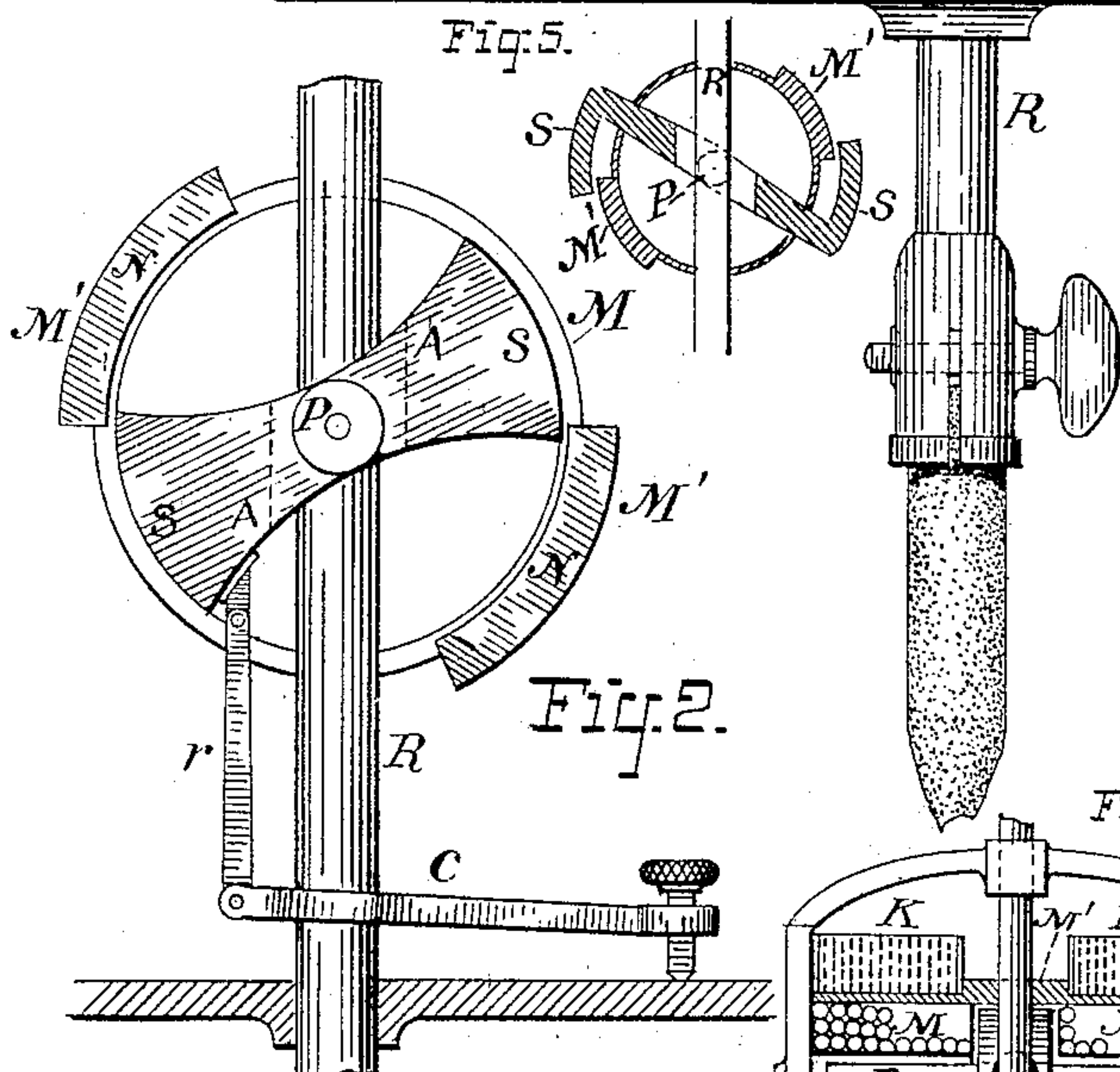


Fig. 2.

Fig. 4.

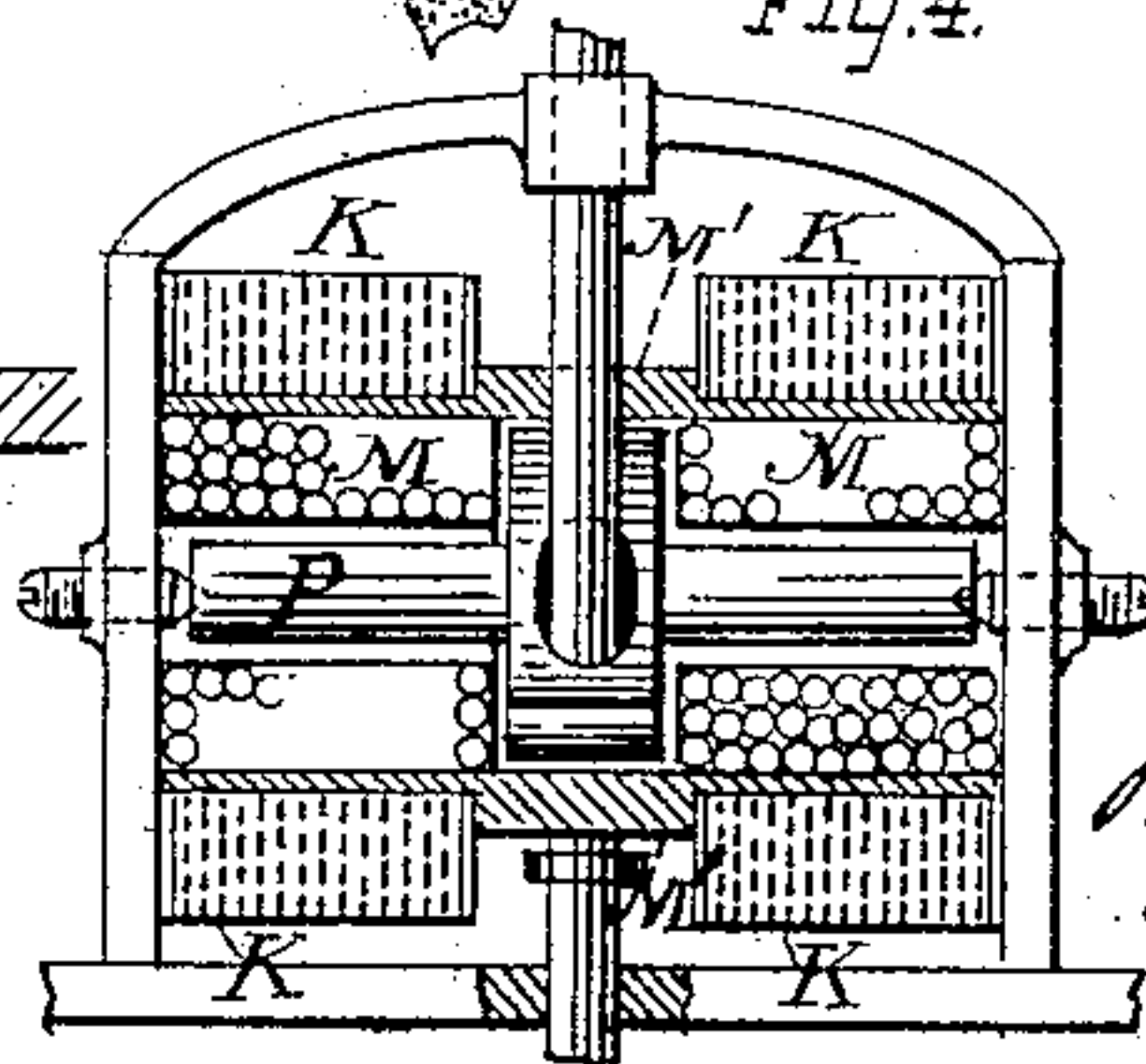
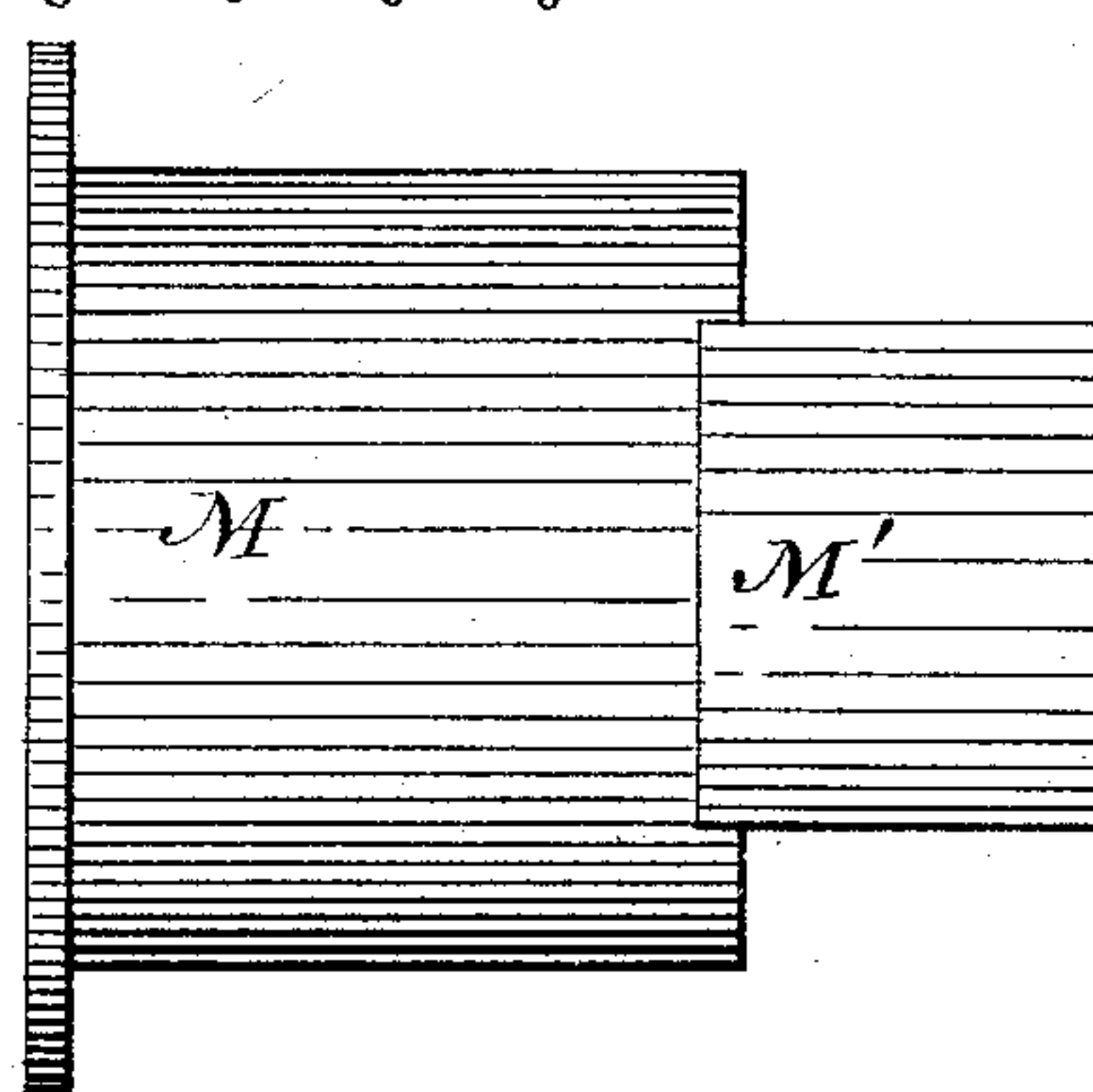


Fig. 3.



ATTEST
J. A. Hurdle
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By J. H. Hurdle
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UNITED STATES PATENT OFFICE.

ADDISON G. WATERHOUSE, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE SCHUYLER ELECTRIC LIGHT COMPANY OF NEW YORK.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 336,184, dated February 16, 1886.

Application filed February 7, 1883. Renewed April 2, 1885. Serial No. 161,153. (No model.)

To all whom it may concern:

Be it known that I, ADDISON G. WATERHOUSE, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Electric Lamps, of which the following is a specification.

My invention relates, principally, to the magnet system by which the feed-regulating devices for electric lamps are controlled; and its object is to secure power and sensitiveness in action for said magnet system.

My invention is designed also to simplify the construction of the whole lamp and bring all the parts within a very small compass.

The nature of my invention will be readily understood from the subjoined description, taken in connection with the accompanying drawings, in which—

Figure 1 is an elevation, partially in section, of a lamp embodying my invention. Fig. 2 is a side view of the clutch devices, showing their connection with the moving parts of the magnet system. Fig. 3 is a view of the exterior of the lamp-magnet. Fig. 4 is a section of a lamp-magnet of preferred form. Fig. 5 shows a modified arrangement of the rocking or movable pole of the magnet with relation to the fixed pole.

Referring to Fig. 1, H H' are the sides of a frame or case supporting the magnets and other portions of the lamp, while R indicates the usual carbon-carrying rod passing through a guide-opening at T. The core P of the lamp-magnet is a movable one and rocks on supports in the sides H H'. It is provided with the rectangular polar extensions S S of one polarity—say south—which swing in the arc of a circle in the face of pole-pieces M' M' for said magnet of the opposite polarity—say north. The pole-pieces M' M' acquire their magnetism by magnetic connection direct or indirect with the opposite end of the core P, or by magnetic connection with parts which are polarized by the action of the coils M, surrounding P. In the present instance the magnetic connection is secured by means of an iron cylinder surrounding the coils M and bolted to the side piece, H, which latter is of iron and,

being in proximity to the coils M and to the end of P, is magnetized with a polarity the opposite of the pole-pieces S S. The swinging poles S S are connected by a link, r, with a tilting-clutch, C, of well-known form, which engages with the rod R when the poles S S of the magnet are attracted and swung by the poles M' M', and acts to lift said rod, or, when the attraction between the poles diminishes, to partially release the rod, so that it may feed.

The relative position of the parts at starting is shown clearly in Fig. 2. The swinging pole of P is perforated for the passage of the carbon-carrying rod R, as shown, so as to bring the parts within small compass. K indicates the usual derived-circuit coil of comparatively high resistance in a derived circuit around the arc. This coil is wound over an extension, P', of the core P, and is wound or connected so as to magnetically oppose the magnetizing effects of the main-circuit coil on said core, and to therefore tend to diminish the strength of magnetism in the poles S and M' of the magnet, and the consequent lifting-power of said magnet upon the clutch. The effect of this is, as is well understood, to allow the carbon rod to feed, when, by reason of an increase in the length of the arc by consumption, more current flows in the derived-circuit coil. The coil K is mounted on the side piece, H', or on any other suitable support.

In order to reduce the diameter of the main-circuit coil, bring the pole M' into closer magnetic relation to the end of the core from which it obtains its magnetism, and to still further reduce the size of the lamp, I prefer to use the construction shown in Fig. 4. In this form the whole length of the rocking bar P P' is wound with wire M in the main circuit and on both sides of the rod R. The coils M on both sides are wound so as to assist one another in producing the same polarity at the intermediate portion, S S, of the core, and the ends of said core are in suitable magnetic connection with or in proximity to an exterior cylinder or bar of iron formed at intermediate and diametrically-opposite portions into pole-pieces, M' M', for action in conjunction with the poles S S.

The derived-circuit coils K K are wound

over the coils M, and, as before, in such a way as to tend to produce at M' and S poles the opposite in name of those produced by the action of coils M. That the action of this arrangement is the same as in the case of the lamp shown in Fig. 1 will be readily understood by those skilled in the art, and need not therefore be described in detail.

Where it is desirable to increase the range of movement of the pole extensions S for the magnet, I propose to bring them outside of the poles M' M', as clearly shown in Fig. 5, and to give them the form therein shown. In this case, as before, S S are simply magnetic extensions from the electro-magnet and constitute one pole thereof, while poles M' M' are the other pole thereof, and act upon said poles S in obvious manner, so as to rock the core and tilt the clutch.

I do not limit myself to any particular manner of mounting or supporting the parts or to any particular kind of feed-regulating mechanism.

I have shown the clutch herein illustrated, instead of other well-known mechanisms, merely for the sake of simplicity.

It would obviously be within the scope of my invention to make those poles fixed that are herein shown as movable, and to make those movable which are herein shown as fixed, or to make the poles both movable. It is also evident that the positions of the main and derived circuit coils might be reversed without changing the character of the invention. These modifications in the details I have not described or shown, as they are obvious and could readily be made by any skilled mechanic.

What I claim as my invention is—

1. The combination, in an electric lamp, of a main-circuit coil or helix, a rocking core for the same, provided at one end with a polar extension or extensions which move in magnetic proximity to pole-pieces oppositely magnetized by connection with the opposite end of

the core, and an opposing derived-circuit helix wound, as described, and acting in magnetic opposition to the main-circuit helix.

2. The combination, in an electric lamp, of a main-circuit helix, a rocking core having a polar extension of one polarity, a pole-piece of the opposite polarity magnetized by induction from the core and arranged in suitable proximity to the movable pole-piece, and an opposing derived-circuit helix acting upon the core in magnetic opposition to the main-circuit helix on said core, and tending to diminish the magnetic intensity of both poles.

3. The combination, in an electric lamp, of the main-circuit helix M, core P, rocking on its longitudinal axis, exterior cylinder or bar of magnetizable material having a pole piece or pieces, M' M', acting in conjunction with the opposite pole of the core, and an opposing derived-circuit coil or helix applied, as described, to a coil of the main-circuit helix.

4. The combination, in an electric lamp, of the rocking bar P, rocking on its longitudinal axis, having a polar extension or extensions S, pole-pieces M' M', magnetized inductively from said core, and derived-circuit coil K, substantially as and for the purpose set forth.

5. The combination of the rocking core P, the pole-pieces M', magnetized by the helix for core P, and polar extensions for said core working over the outside of the pole-pieces.

6. The combination, with the main-circuit coil, of core P, rocking on its longitudinal axis and having the right angle polar extensions S, the pole-pieces, the carbon-carrying rod, and a clutch engaging with said rod and connected with the rocking core.

Signed at New York, in the county of New York and State of New York, this 29th day of January, A. D. 1883.

ADDISON G. WATERHOUSE.

Witnesses:

THOS. TOOMEY,
WM. H. BLAIN.