No. 661,126. Patented Nov. 6, 1900.

# J. A. HEANY.

## ELECTRIC ARC LAMP.

(Application filed Feb. 27, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

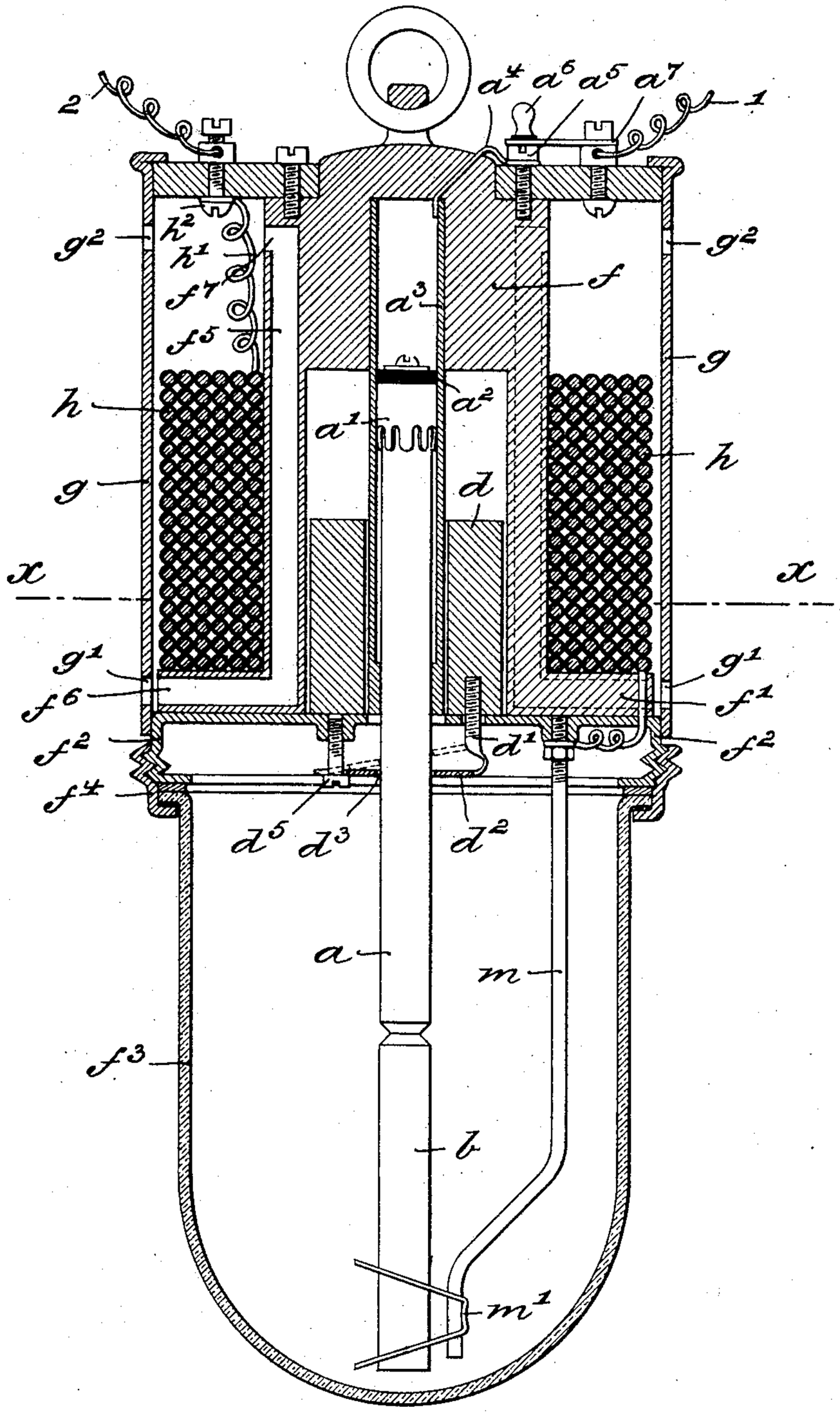


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Fig. 2.

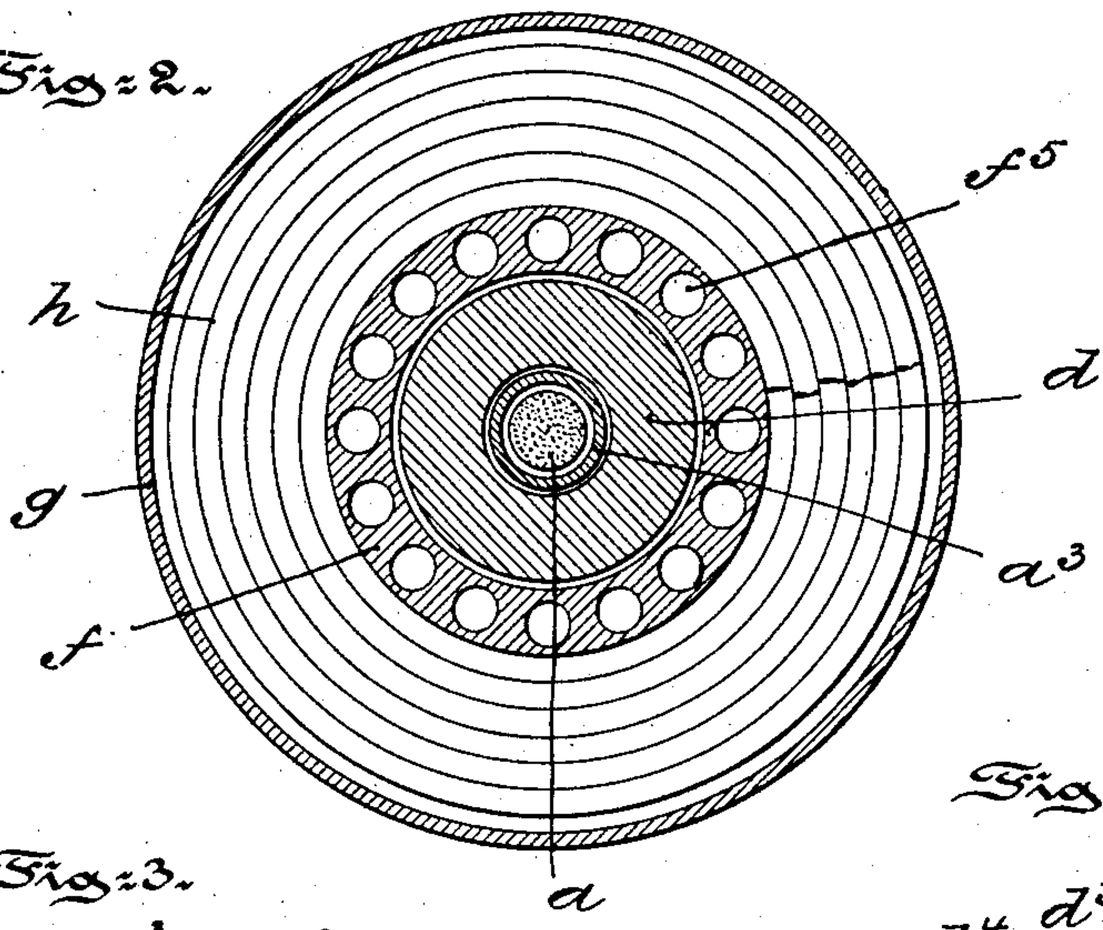



Fig. 3.

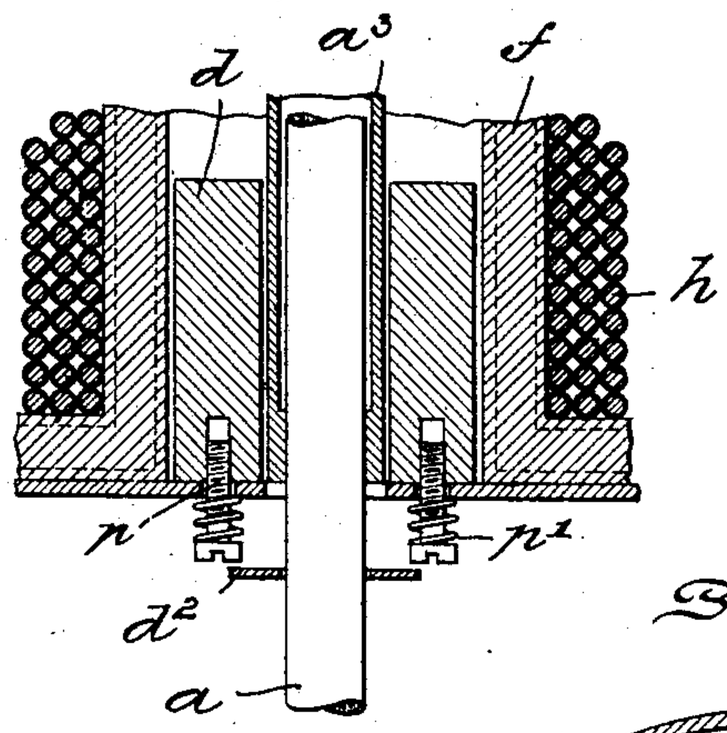



Fig. 4.

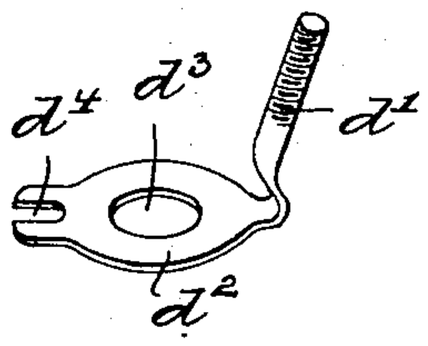



Fig. 5.

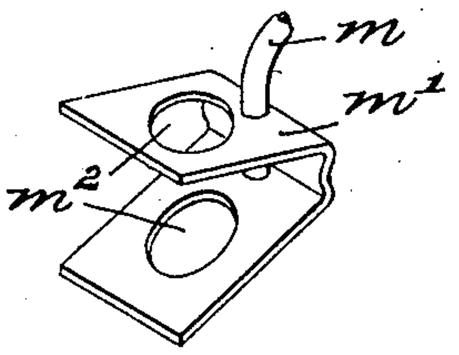
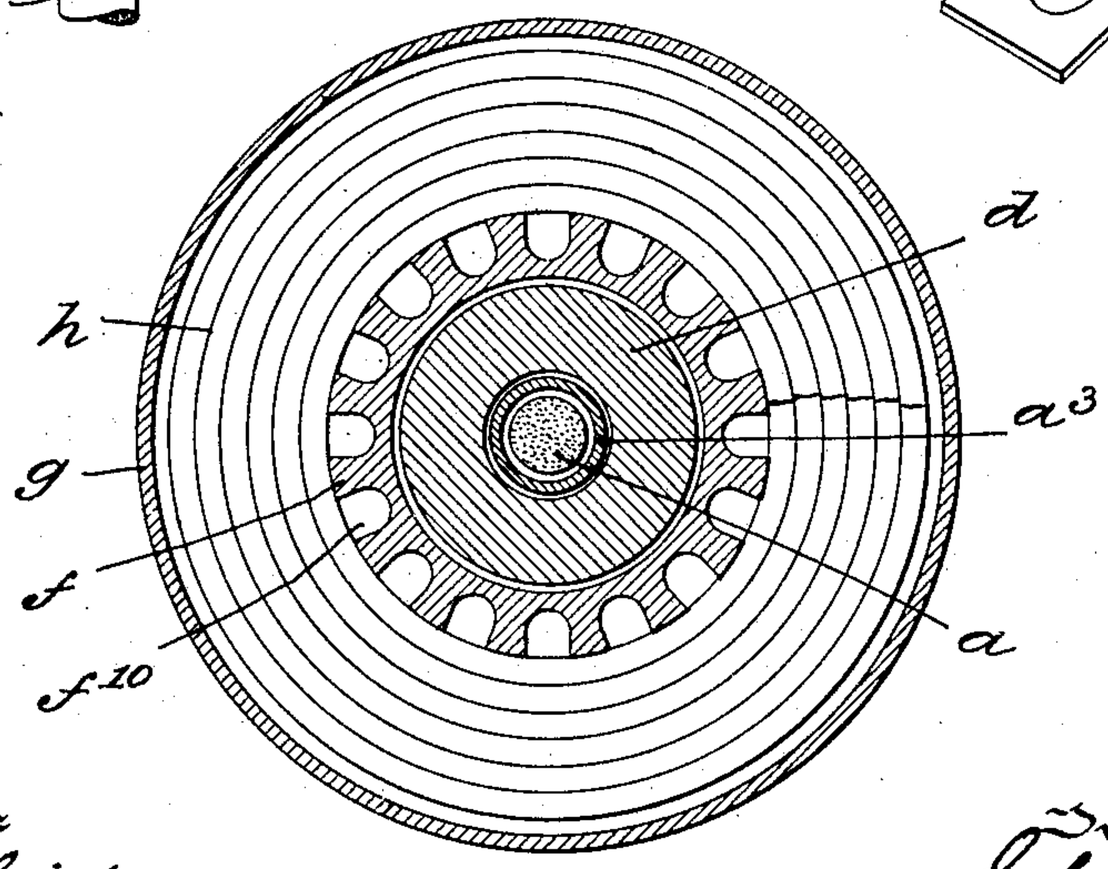



Fig. 6.




Witnesses:
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Richard L. Maxwell

Inventor:
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# UNITED STATES PATENT OFFICE.

JOHN A. HEANY, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE TETER-HEANY DEVELOPING COMPANY, OF SAME PLACE AND CHARLESTON, WEST VIRGINIA.

## ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 661,126, dated November 6, 1900.

Application filed February 27, 1900. Serial No. 6,659. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN A. HEANY, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Electric-Arc Lamps, of which the following is a specification.

My present invention has relation to an electric-arc lamp and to that particular type of lamp which is illustrated, described, and claimed in a companion application for a patent filed of even date herewith under Serial No. 6,658, series of 1900. In said companion application there are shown, described, and claimed certain generic features of invention, one of which may be briefly described as follows: the location of the carbons, the solenoid-core, and auxiliary working parts in an air-tight receptacle around which is arranged the solenoid-coil. In the present invention this same generic feature is involved; but a different arrangement of the parts, together with other specific details of improvement, forms the subject-matter of this application.

My present invention consists, first, in an improved means of conducting the electric current to the upper carbon; second, in an improved means for feeding said carbon; third, in an improved construction of the inner air-tight receptacle containing the carbons and the working parts, and, fourth, in an improved holder for the lower carbon.

My invention, stated in general terms, consists of an electric-arc lamp constructed and arranged in substantially the manner hereinafter described and claimed.

The nature and scope of my invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, in which—

Figure 1 is a vertical central sectional view of an electric-arc lamp embodying main features of my invention. Fig. 2 is a cross-sectional view taken on the line $x\,x$ of Fig. 1. Fig. 3 is a vertical central sectional view of the lower portion of the upper carbon and auxiliaries, said view being taken at right angles to the view illustrated in Fig. 1. Fig. 4 is a detail perspective view of the feeding-clutch for the upper carbon. Fig. 5 is a similar view of the lower-carbon support; and Fig. 6 is a cross-sectional view similar to Fig. 2, but illustrating a modified form of air-tight inner receptacle.

Referring to the drawings, $a$ represents the upper and $b$ the lower carbon of the lamp. The carbon $a$ is held at its upper end in a cap $a'$, to which is secured a brush $a^2$ of highly-conductive material. The cap $a'$, brush $a^2$, and carbon $a$ are adapted to slide up and down in a stationary metallic tube $a^3$, which is connected by wire $a^4$, binding-screw $a^5$, switch $a^6$, and binding-post $a^7$ with a pole 1 of the source of electric energy. The brush $a^2$ serves to always make electrical contact between the tube $a^3$ and carbon $a$, while permitting said carbon to be slid up and down in the tube $a^3$. Surrounding the tube $a^3$ and near its base is a solenoid-core $d$. This core $d$ carries the clutch or feeding mechanism for the upper carbon and is adapted to slide up and down upon the tube $a^3$ in a box or receptacle $f$, in the upper end of which the tube $a^3$ is secured. This box $f$ has a flanged base $f'$, which is supported upon and fixed to a screw-collar $f^2$. To the collar $f^2$ is clamped a globe $f^3$ by means of a screw-ring $f^4$, said globe inclosing the lower carbon $b$ and its holder and forming, with the box or receptacle $f$, an air-tight compartment inclosing both carbons, the solenoid-core $d$, and the necessary auxiliaries for the proper support and feeding of the carbons.

The receptacle $f$, as illustrated in Fig. 1, has its tubular walls vertically perforated with flues $f^5$, communicating at the base with a series of radially-disposed flues $f^6$, and at the upper end with radially-disposed outlets $f^7$, opening into the exterior of the box $f$. In the modified form illustrated in Fig. 6 the arrangement is the same, except that the outer periphery of the walls of the box $f$ is vertically channeled, as at $f^{10}$. Surrounding the box $f$ is an outer casing $g$, having at its base and top the openings $g'$ and $g^2$, registering, respectively, with the inlets $f^6$ to flues $f^5$ and the outlets $f^7$ from said flues. In the space between the casing $g$ and box $f$ and around

the box is coiled the solenoid-coil $h$, connected by wire $h'$ and binding-post $h^2$ to the other pole 2 of the source of electric energy. This coil $h$ is formed of a wire of sufficient resistance as not to require an additional resistance to be placed in the circuit. The coil $h$ is also connected by wire $h^3$ to a rod $m$, forming a portion of the support for the lower carbon $b$. The support for said carbon $b$ comprises the rod $m$, to the lower end of which is secured a plate $m'$, of spring metal, bent into two angular wings. These wings are each centrally apertured, as at $m^2$, the diameter of the aperture being larger than the diameter of the carbon $b$. When the wings are in their normal position, as indicated in Figs. 1 and 5, the perforations $m^2$ do not register and the carbon will be bound securely in the perforations to the wings. When, however, the wings are caused to approach a parallel position, the perforations register to a sufficient extent to permit the carbon $b$ to slide through the wings.

The feed mechanism for the upper carbon $a$ comprises the solenoid-core $d$, from whose base projects a stem $d'$, carrying a spring-plate $d^2$, having a central aperture $d^3$, slightly larger in diameter than the carbon $a$. The normal position of this plate $d^2$ is oblique to the lower face of the core $d$, as illustrated in dotted lines in Fig. 1. The free end of the plate $d^2$ is slotted, as at $d^4$, and engages a stop pin or screw $d^5$, fixed to the collar $f^2$, and forces the plate $d^2$ to assume a position parallel to the lower face of the core $d$. When, now, the core $d$ rises, the plate will be tilted immediately and will grip the carbon $a$ and elevate the same. When the core $d$ falls, the free end of the plate $d^2$ will impinge upon stop-pin $d^5$, and the plate $d^2$ will be forced into a position substantially parallel with the lower face of core $d$ and the carbon $a$ will be released. The upward movement of the core $d$ in the box $f$ under the influence of the coil $h$ is checked or regulated, preferably, in the following manner: From the base of the core $d$ project the two screw-pins $p$, the stems of which traverse loosely the collar $f^2$, as indicated in Fig. 3. Between the heads of the pins $p$ and the collar $f^2$ and around the stem of said pins are coiled the springs $p'$. When, now, the core $d$ is elevated, the springs $p'$ will brake or check its movement.

The downward movement of the solenoid-core may be limited or adjusted by the stop pin or screw $d^5$, which is adapted to be advanced or retracted in the collar $f^2$ for this purpose in addition to its other purpose of causing the spring-plate $d^2$ to assume a position parallel to the base of the coil.

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

1. In an electric-arc lamp, an upper carbon, a cap to which the carbon is secured, a contact-brush carried by said cap, a stationary metallic tube connected with one pole of the source of electric energy, said carbon and its cap adapted to slide freely in said tube and said brush adapted to make contact with said tube, and a solenoid-core surrounding said tube and adapted to slide up and down thereon, said core adapted to operate the upper carbon in the tube, substantially as and for the purposes described.

2. In an electric-arc lamp, a feeding mechanism for one of the carbons, comprising a solenoid-core, a stem projecting from the base of said core, a spring-plate fixed at one end to said stem and having a central aperture surrounding the carbon and adapted to normally project obliquely to the base of the core, and a stop-pin adapted when the core is depressed to depress the free end of said spring-plate so that said plate shall assume a position parallel to the base of the core, substantially as and for the purposes described.

3. In an electric-arc lamp, a box or receptacle adapted to inclose the upper carbon and the solenoid-core, said box having its peripheral walls channeled or grooved to form air-flues, substantially as and for the purposes described.

4. In an electric-arc lamp, an upper carbon, a fixed tube, wherein the upper carbon is adapted to move, a solenoid-core surrounding said tube and adapted to slide up and down thereon, a stem projecting from the base of said core, a spring-plate fixed at one end to said stem and having a central aperture surrounding the carbon, said plate normally projecting from the stem obliquely to the base of the core, a set-screw adapted to form a means for adjusting the downward movement of the core, said screw adapted when the core is depressed to depress the free end of the spring-plate to cause the plate to assume a position parallel to the base of the core, substantially as and for the purposes described.

5. In an electric-arc lamp, a box or receptacle, a solenoid-core adapted to be elevated and depressed in said receptacle, a collar forming a base for the box or receptacle and a support for the core in the depressed position, a headed pin or pins depending from the base of the core and traversing said collar and a spring coiled around said pin and interposed between its head and the collar, substantially as and for the purposes described.

In testimony whereof I have hereunto set my signature in the presence of two subscribing witnesses.

JOHN A. HEANY.

Witnesses:

J. WALTER DOUGLASS,

THOMAS M. SMITH.