No. 678,876. Patented July 23, 1901.

J. A. HEANY.

ELECTRIC ARC LAMP.

(Application filed Jan. 28, 1901.)

(No Model.) 2 Sheets—Sheet 1.

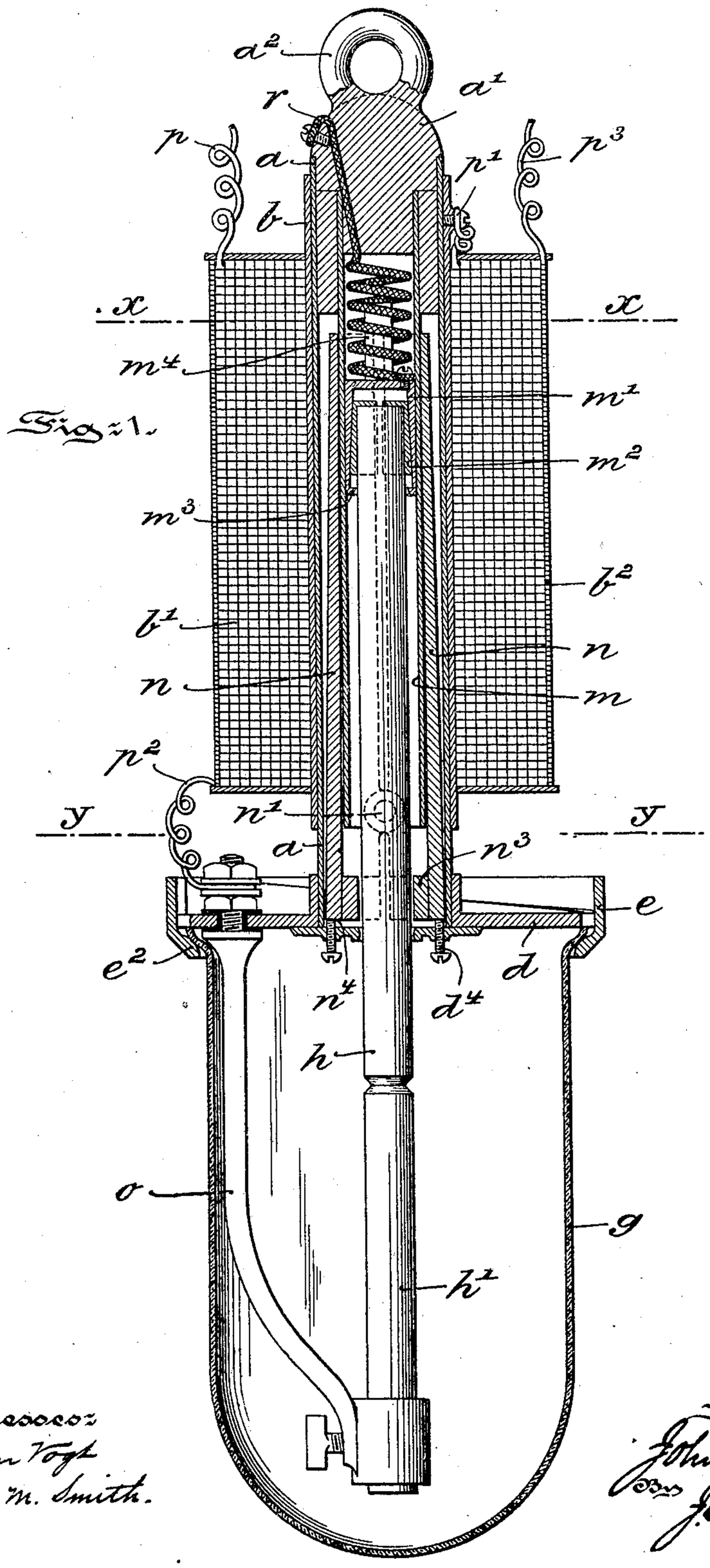

Fig. 1.

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Fig. 2.

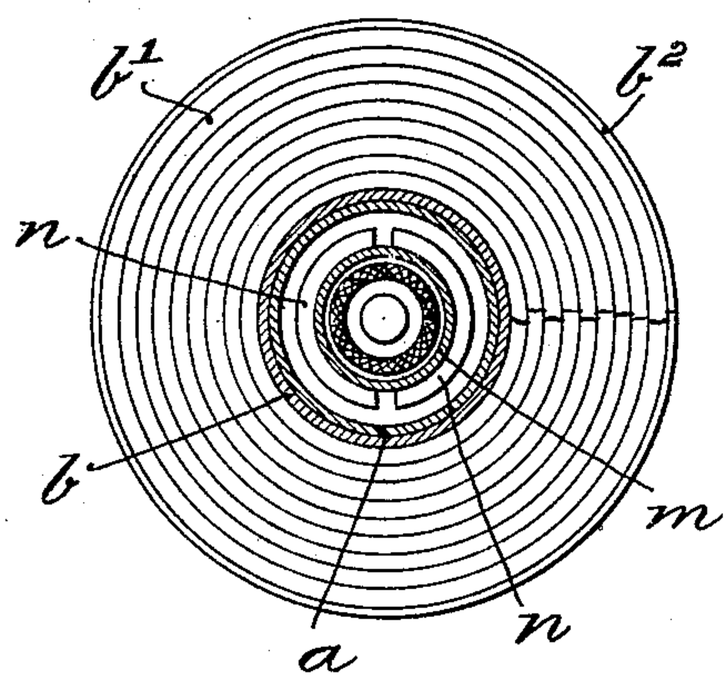


Fig. 3.

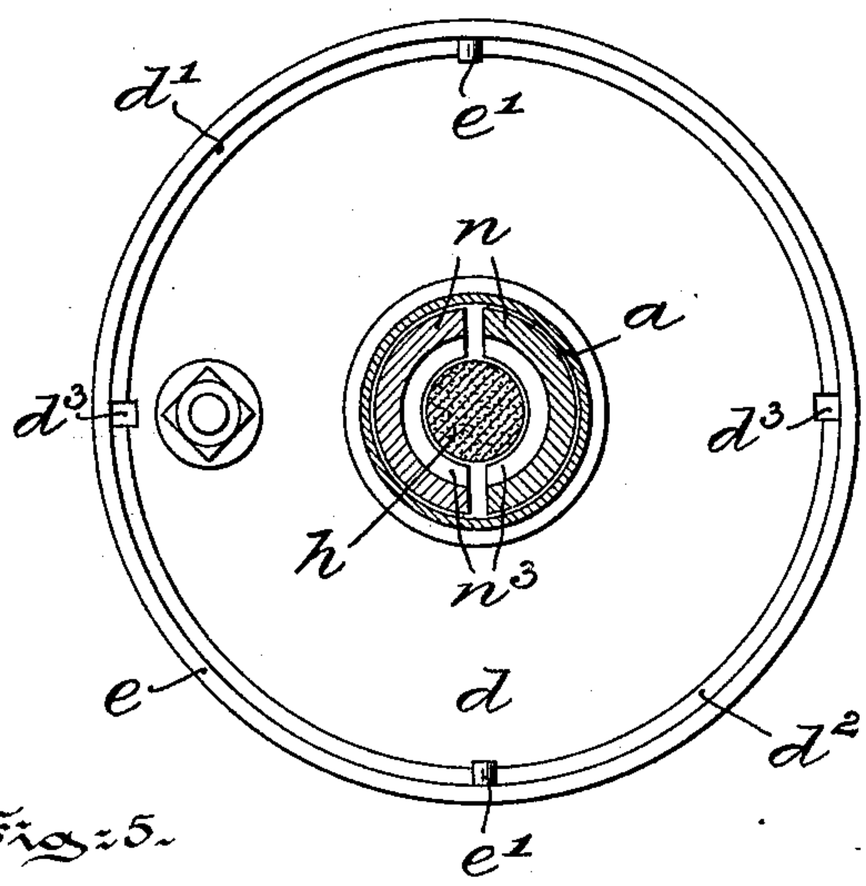


Fig. 4.

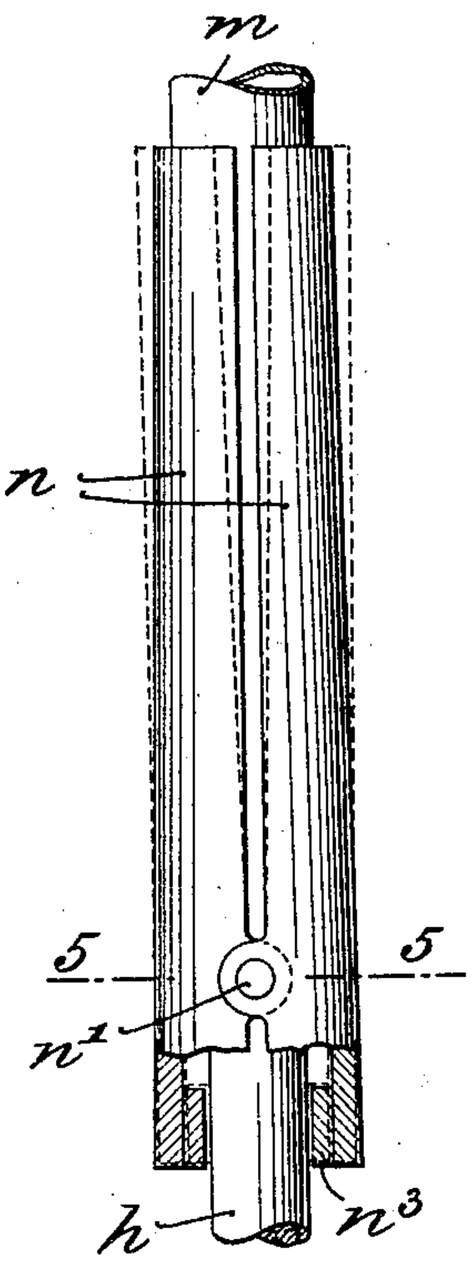


Fig. 5.

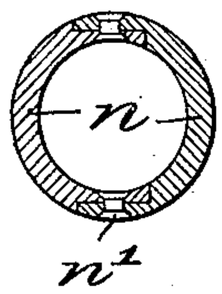


Fig. 6.

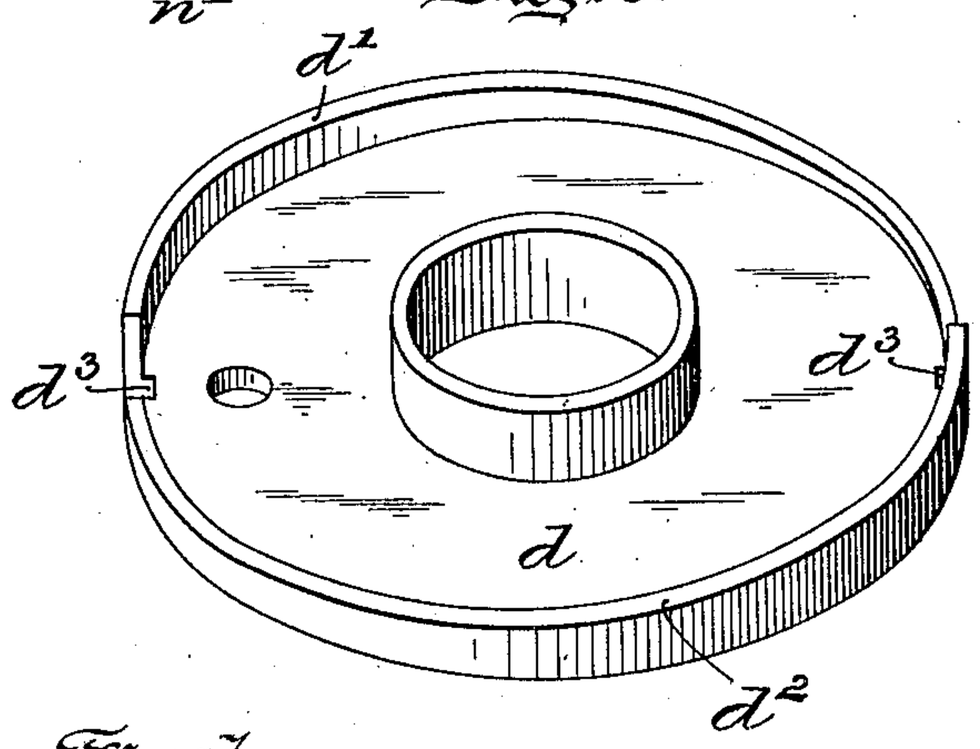


Fig. 7.

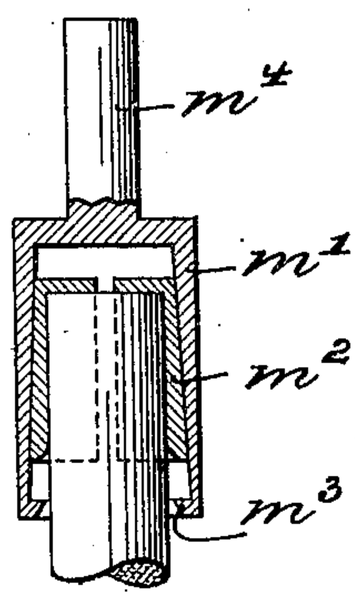
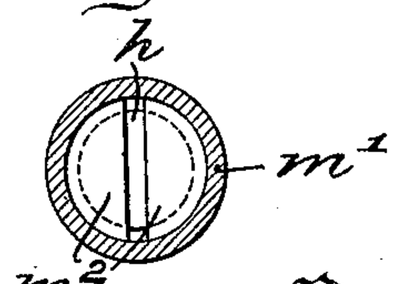


Fig. 8.



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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. 678,876, dated July 23, 1901.

Application filed January 28, 1901. Serial No. 44,997. (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 invention has relation to an electric-arc lamp, and in such connection it relates to the construction and arrangement of parts constituting such a lamp.

The principal objects of my invention are, first, to provide in an electric-arc lamp an improved feeding mechanism for the upper carbon; second, to provide an improved holder or support for the upper carbon, and, third, to improve certain other parts, whereby the efficiency and durability of the lamp are increased and its cost of construction materially lessened.

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 sectional view of an electric-arc lamp embodying main features of my invention. Fig. 2 is a cross-sectional view on the line $x\,x$ of Fig. 1. Fig. 3 is a similar view on the line $y\,y$ of Fig. 1. Fig. 4 is a detail view of the hinged solenoid-core and auxiliaries constituting the clutch and feeding mechanism for the upper carbon. Fig. 5 is a cross-sectional view on the line 5 5 of Fig. 4. Fig. 6 is a perspective view of the plate supporting the globe of the lamp; and Figs. 7 and 8 are detail views, enlarged, illustrating the construction and arrangement of the support for the upper carbon.

Referring to the drawings, a represents a tubular standard, to the upper end of which a cap a' is secured, said cap having an eye a^2, by means of which the lamp may be suspended from a suitable support. To the tubular standard a is secured the spool b of a solenoid-coil b', the exterior of the coil b' being wrapped with a resistance b^2. To the lower end of the standard a is secured a plate d, having its rim or edge upwardly flanged, as at d' and d^2. The rim d' is inclined from right to left, whereas the rim d^2 is inclined in a reverse direction to form two oppositely-arranged inclined or cam surfaces, as clearly illustrated in Fig. 6. The plate d has at two diametrically opposite points a slot or recess d^3, which is cut into the plate at each point where the inclination of the rim d' and of the rim d^2 begins. These recesses d^3 are cut out to permit of the passage of two lugs e', formed on the interior of a ring e, the lugs e' passing through the recesses d^3 until they rest upon the cams d' and d^2. When in this position, if the ring e be turned from left to right its lower flanged edge e^2 will be drawn upward against the base of the plate d. This flanged edge e^2 is arranged to receive and support the upper flanged open end of a bell-shaped globe g, within which the carbons h and h' are adapted to be consumed. When, therefore, the ring e is turned in one direction, the globe g will be tightly clamped to the plate d; but when the ring e is turned in reverse direction until its lugs e' register with the slots d^3 then the ring e and globe g may be drawn down out of engagement with the plate d. Concentric with and arranged within the tubular standard a is a tube m, arranged to receive and to guide the holder for the upper carbon h and to permit the holder and carbon to slide up and down. The holder for this upper carbon comprises a thimble m', having an open base and having its interior conical. Within this thimble m' is confined two pieces m^2, forming together a second split thimble, having a conical exterior and a cylindrical interior adapted to receive the carbon h. When the split thimble m^2 is not expanded by the insertion of the carbon h, it slips down in the thimble m' and rests upon a flanged base or ledge m^3 of the thimble m'. When, however, the carbon h is inserted in the split thimble m^2, said thimble m^2 is expanded until it fits snugly in the first thimble m'. When the carbon and thimble m^2 are driven upward into the thimble m', the sections of the thimble m^2 are compressed to tightly bind and hold the carbon. If the carbon h is pulled down, the split thimble m^2 is drawn down in the thimble m' until it

can expand sufficiently to release the carbon *h*. Between the standard *a* and the tube *m* is arranged the core *n* for the solenoid. This core *n* is split from end to end into two semitubular sections or members. The two core-sections are pivoted or hinged together, as at *n'*, at a point near the base of each section, and each section is tapered from its base toward its upper end, so that the greater thickness of metal is at the base, whereas the top of each section is thinnest. This tapering is for a twofold purpose—namely, to decrease the thickness of the wall of the core *n* at its upper end, so that the sections may vibrate within the tubes *a* and *m* with greater freedom and to a greater extent, and to increase the thickness and consequent weight of the core at its base, so that it will readily drop by gravity and will readily grip the carbon even if a slight movement of the relatively thick jaws inward results. At the base of each section of the core *n* is formed a semicircular gripping-jaw n^3, adapted when the upper end of each section is attracted outward by the magnetization or energizing of the solenoid-coil *b'* to approach and bite against the carbon *h*. The sectioned core *n* has therefore two movements imparted to it by the energization of the coil *b'*—one which results from the attraction of the upper ends of the core and a succeeding movement of the entire core upward in the space between the tubes *a* and *m*. These two movements result in the gripping or securing of the carbon *h* to the core *n* and the movement upward of the carbon *h* and core *n* to permit the carbon *h* to separate from the carbon *h'*. When the sectional core *n* is not under the influence of the coil *b'*, it will drop by gravity toward the plate *d*. The extent of this downward movement may be regulated by adjusting the two set-screws d^4, the inner ends of which are arranged to bear upon the under surface of the core-sections *n* at points n^4, which are at or near the outer periphery of each section. By causing the sections *n* to strike the screws d^4 at these points n^4 the dropping of the core *n* will cause its upper ends to swing inwardly toward the inner tube *m* and to cause the lower ends of said sections to separate and release the carbon *h*. The lower carbon *h'* is supported by a curved arm or bracket *o*, depending within the globe *g* and secured at its upper end to the plate *d*, from which it is properly insulated.

The circuit through the lamp is as follows: The current enters from the main line by the wire *p*, then traverses the solenoid-coil *b'*, emerging by the wire *p'*, which is connected electrically with the cap *a'* and tubes *a* and *m*. The cap *a'* is connected with the support *m'* for the upper carbon by means of a flexible metallic cable or bond *r*, which by preference is coiled about a pin or projection m^4, formed on the upper portion of the thimble *m'*. Hence the current passes from the cap *a'* by the bond *r* to the thimble *m'* and thence to the upper carbon *h*, and it also passes from the tube *m* to the thimble *m'* and to the upper carbon *h*. The current passes to the lower carbon *h'*, thence by the bracket *o* to a wire p^2, which enters the resistance b^2 and emerges therefrom by the wire p^3, which leads to the return wire of the main line.

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

1. In an electric-arc lamp, a solenoid-coil, a tube uniting the coil to the other parts of the lamp, a tubular core divided its entire length into two semitubular sections, the walls of which taper upward, said sections being pivoted together near the base and provided with gripping-jaws arranged below the pivotal connection, said tubular core adapted to slide in the tube uniting the solenoid-coil to the other parts of the lamp, and two adjusting-screws adapted to be advanced in the tube and to impinge upon the under face of the base of the core-sections, at or near the periphery of said core, whereby the downward movement of the core in the tube may be limited and the upper ends of the sections forced away from the walls of the tube to release the lower gripping-jaws of the core, substantially as and for the purposes described.

2. In an electric-arc lamp, a support for the upper carbon, comprising a thimble having a conical interior and a thimble divided or split into two sections and having a conical exterior, said split thimble adapted to receive the upper carbon and to be advanced in the other thimble to tightly clamp said carbon, substantially as and for the purposes described.

3. In an electric-arc lamp, a ring provided on its interior with two diametrically-arranged lugs and having a lower flange or ledge, a globe adapted to be supported on said ledge, and a plate having two rims, the upper faces of which are oppositely inclined, said lugs adapted to enter the slots of said plate and to turn in said inclined rims to lock the ring and globe to said plate, 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.