No. 678,951. Patented July 23, 1901.

J. A. HEANY.

ELECTRIC ARC LAMP.

(Application filed Dec. 13, 1900.)

(No Model.)

Fig. 1.

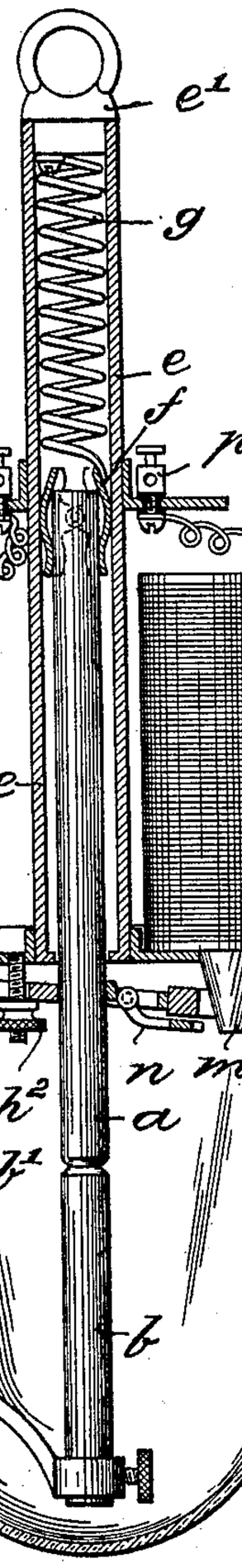


Fig. 3.

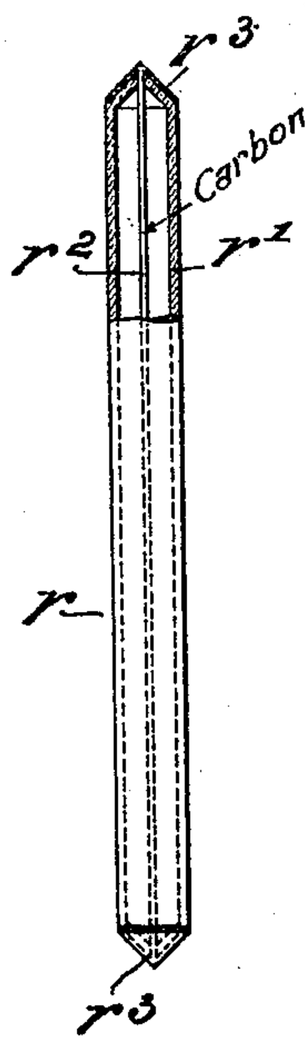


Fig. 4.

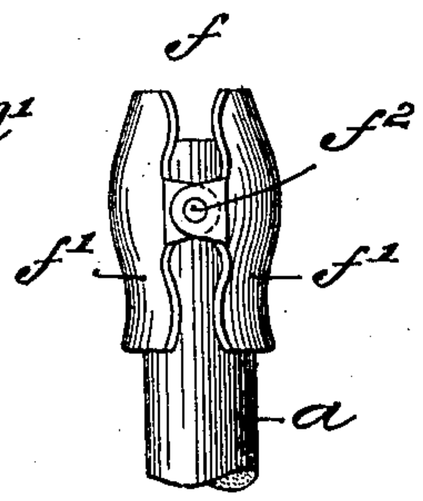


Fig. 5.

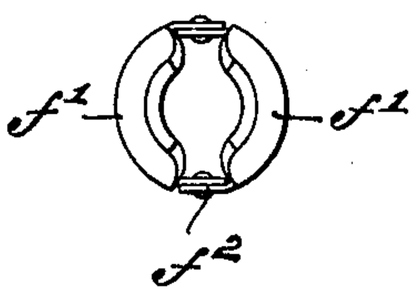
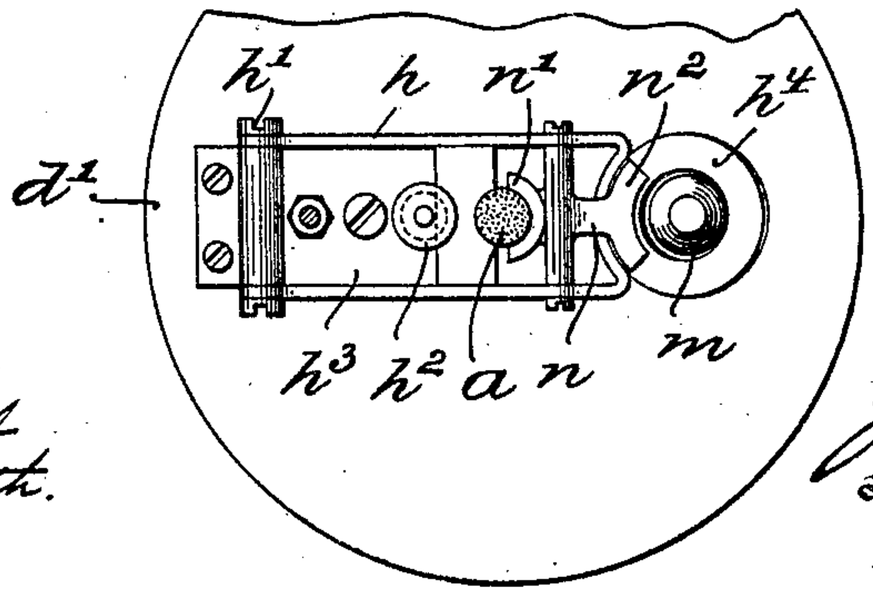


Fig. 2.



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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. 678,951, dated July 23, 1901.

Application filed December 13, 1900. Serial No. 39,619. (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 arc-lamp a substantially air-tight receptacle wherein the carbons are adapted to be consumed and a feeding mechanism for the upper carbon located within the receptacle and consisting of a lever pivoted at one end, a clutch-arm pivoted to the lever intermediate of its ends, a magnet-core projecting into the receptacle, and an armature for said core formed on the free end of the lever; second, to provide in an arc-lamp an upper and lower carbon and feeding mechanism for the upper carbon, all located within a substantially air-tight receptacle, a magnet located without the receptacle, and a core for said magnet projecting into the receptacle and adapted to control the feeding mechanism for the upper carbon; third, to provide in an arc-lamp a tube wherein the upper carbon is adapted to slide and located in the main circuit, a clip comprising two semitubular wings pivotally connected to clamp the upper end of the upper carbon, said clip adapted to slide in the tube, and a spring connecting the clip with the tube, and, fourth, to provide in an arc-lamp a removable resistance piece or pieces whereby the use of a resistance-coil is obviated.

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 arc-lamp embodying main features of my invention. Fig. 2 is an underneath plan view of the feeding mechanism for the upper carbon. Fig. 3 is a front elevational view, enlarged and partly broken away, of the resistance removed from the lamp; and Figs. 4 and 5 are enlarged detail views of the clip or holder for the upper carbon.

Referring to the drawings, *a* represents the upper and *b* the lower carbon. The abutting ends of these carbons are inclosed in a globe *d*, having a plate or roof *d'* fitted to the upper end of the globe *d* to form an air-tight receptacle. From the roof or plate *d'* projects upward a tube *e*, the upper end of which is provided with a cap *e'*. In the tube *e* the upper carbon *a* is adapted to slide. The lower carbon *b* is supported within the globe *d* by means of a holder *b'*, suspended from and also insulated from the roof-plate *d'*. The upper carbon *a* is suspended from a clip or holder *f*, consisting of two semitubular wings *f'*, pivotally connected, as at f^2, to inclose the carbon. The clip or holder *f* is supported by a coiled spring *g* depending from the cap *e'* and in electrical connection therewith. The feeding mechanism for the upper carbon *a* comprises a lever-arm *h*, pivoted, as at *h'*, to the under face of the roof-plate *d'* and limited in its downward movement away from the plate *d'* by means of the set-screw h^2, working in the slot or recess h^3 in the arm *h*. The free end of the lever-arm *h* carries an armature h^4, formed, preferably, of a ring of soft iron. Projecting through the roof-plate *d'*, adjacent to the ring-armature h^4, is a core *m*, of preferably conical shape. This core *m* is magnetized when a magnet *m'*, located outside the globe *d* and on the roof *d'*, is energized. Intermediate of the pivoted and armature ends of the lever *h* is pivoted or hinged a magnetic clutch *n*, comprising a clamping-face *n'*, adapted to bite into the carbon *a*, and a tailpiece n^2, adapted to be attracted toward the armature h^4 when said armature is attracted by the core *m* of the magnet *m'*. If now the magnet *m'* be energized, its core *m* will first magnetize and then attract the armature h^4. The magnetization of the armature h^4 will cause the tailpiece n^2 to be attracted, thereby causing the clamp *n'* to bite into the carbon *a* to fasten said carbon to the lever *h*. The subsequent upward movement of the lever *h* toward the core *m* will then serve to lift the

carbon a away from the carbon b until the arc between said carbons is disrupted.

The circuit through the lamp is as follows: To a clamping or binding post p one end of the main line is secured. The current then passes by wire p' into the magnet m', from which it emerges by wire p^2 in electric engagement with the roof-plate d. This plate d' is in electrical contact with the tube e and cap e', and hence the current passes from wire p^2 to the plate d' and tube e to the cap e'. The current then proceeds by the spring g from the cap e' to the clip or holder f and to the upper carbon a. It then passes to the lower carbon b and its holder b' to a wire p^3 and thence through a removable resistance-piece r to a wire p^4 and thence by the binding-screw p^5 to the return-wire of the main circuit. The removable resistance r constitutes one of the main features of my invention. It comprises a tube r', of glass, porcelain, or similar non-conducting material, sealed at both ends and having the air exhausted from its interior. A strip of carbon r^2 or similar resistance material traverses the interior of the tube r' and has its ends projecting through the sealed ends of said tube r' and in electric connection with metallic cap-pieces r^3, secured to the sealed ends of the tube. On the roof-plate d' is located a socket-piece r^4 in electric connection with the wire p^3, but insulated from the roof-plate d'. In this socket-piece r^4 the lower capped end of the resistance r is adapted to be inserted. In an extension or bracket r^5 of the tube e is also adjustably supported a socket-piece r^6, insulated from the extension or bracket r^5, but in electric contact with the wire p^4. A spring r^7 serves normally to depress the socket-piece r^6 toward the socket r^4; but the socket r^6 may be elevated against the tension of the spring r^7 to permit the upper capped end or resistance r to be slipped into or out of the socket r^6. Of course the resistance r may be of any value desired, and as it can be easily removed and replaced in the circuit by other pieces of more or less value the strength of the current passing through the lamp may be readily controlled and all danger of burning out can be avoided.

The simple construction and cheap character of the resistance r, together with the fact that it may be removed and replaced, serve to make the lamp much cheaper and better than a lamp wherein many pounds of coiled wire are used as a resistance.

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 substantially air-tight receptacle wherein the carbons are adapted to be consumed, and a feeding mechanism for the upper carbon located wholly within the receptacle and comprising a lever pivoted at one end, a magnetic clutch-arm pivoted to the lever intermediate of its ends and adapted to bind or release the upper carbon to or from the lever, a magnet-core projecting into the receptacle and an armature for said core formed on the free end of said lever, substantially as and for the purposes described.

2. In an electric-arc lamp, a tube wherein the upper carbon is adapted to slide and included in the main circuit, a clip comprising two semitubular wings pivoted together to receive and hold the upper carbon, said clip adapted to slide in said tube, and a spring adapted to support said clip and connecting said clip to said tube, substantially as and for the purposes described.

3. In an electric-arc lamp, a tube wherein one of the carbons is adapted to slide and included in the main circuit, a clip, comprising two semitubular wings pivoted together to receive and hold the carbon, said clip adapted to slide in said tube, and means for connecting said clip electrically with said tube and for supporting said clip, while so connected, in said tube, substantially as and for the purposes described.

4. In an electric-arc lamp, an upper and a lower carbon, means for feeding one of said carbons toward the other, a main circuit, wherein the two carbons are included, a binding-post to which one wire of the main circuit is secured, a socket-piece located adjacent to said post and in electrical connection therewith, a second socket-piece located adjacent to and in electric connection with one of the carbons, and a resistance-piece removably secured in said socket-pieces and bridging the same, substantially as and for the purposes described.

5. In an electric-arc lamp, an upper carbon and a lower carbon, means for adjusting said carbons with relation to each other, said means, comprising a feeding mechanism for one of said carbons, an inclosed resistance included in and bodily removable from the main circuit in which said carbons are included, the same consisting of a sealed tube of non-conducting material having a vacuum in its interior, a strip of carbon or similar resistance material traversing said tube, and metallic caps secured to either sealed end of said tube and in electric connection with said resistance, said resistance interposed in the main circuit between the fixed and movable carbons, 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:
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THOMAS M. SMITH.