(No Model.)

N. M. GARLAND.

ELECTRIC ARC LAMP.

No. 458,387. Patented Aug. 25, 1891.

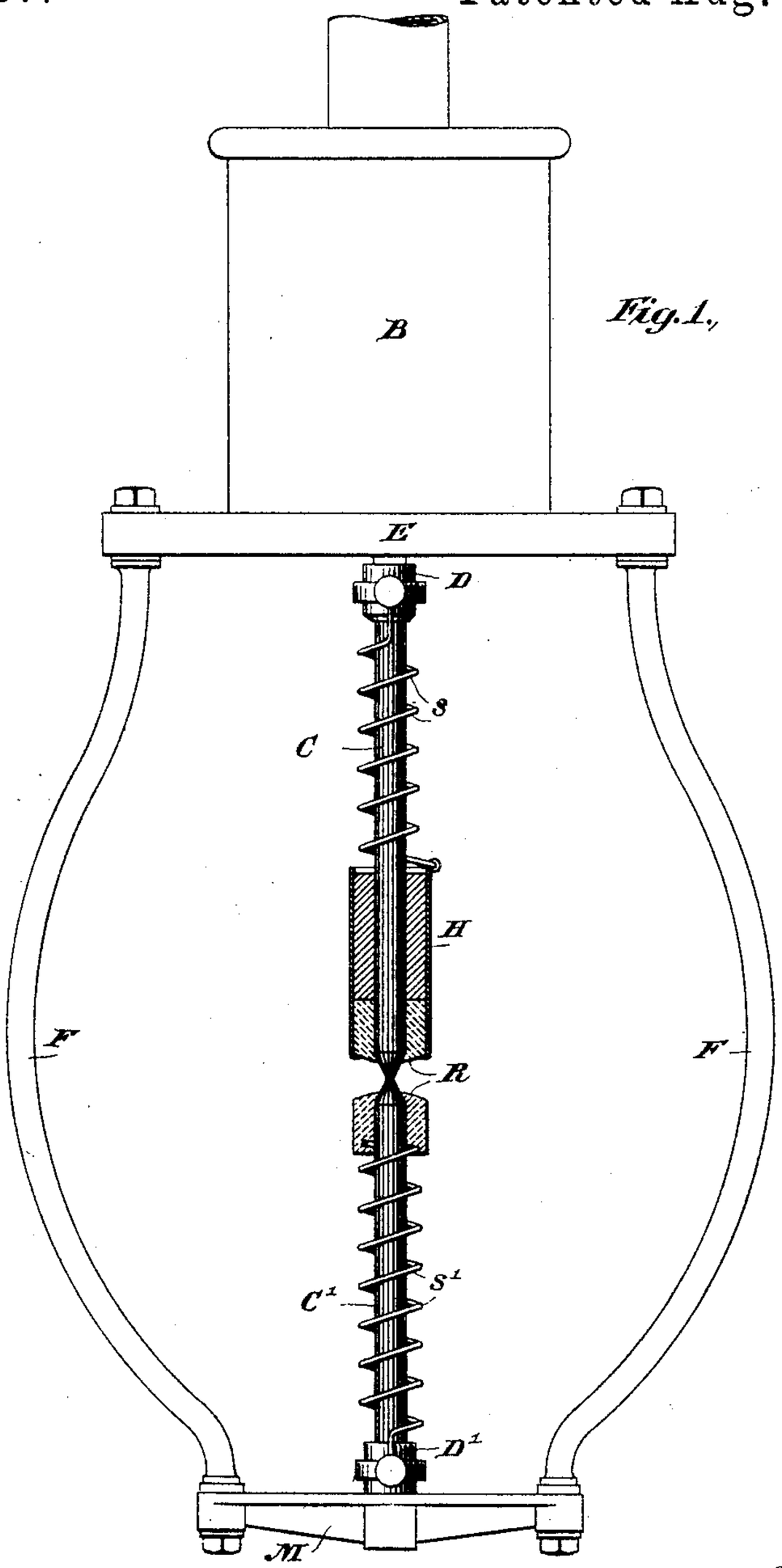
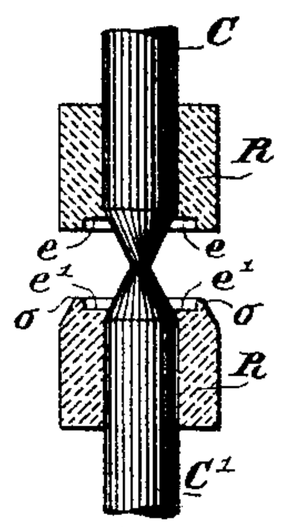


Fig. 1.

Fig. 2.



Witnesses
Geo. W. Breck.
Edward Thorpe.

Inventor
Nathan M. Garland
By his Attorney
Charles J. Kintner

UNITED STATES PATENT OFFICE.

NATHAN M. GARLAND, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO CLIFT WISE, OF SAME PLACE.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 458,387, dated August 25, 1891.

Application filed December 29, 1890. Serial No. 376,157. (No model.)

To all whom it may concern:

Be it known that I, NATHAN M. GARLAND, a citizen of the United States, residing at New York, county of New York, and State of New York, have made a new and useful Improvement in Arc Lights, of which the following is a specification.

My invention is directed particularly to arc lights of the type in which two or more carbons are fed toward each other in alignment, either by the action of gravity or through the medium of various forms of well-known devices, the arc being produced at the juncture of the carbons; and it has for its objects, first, an increased length of life of the carbons; second, the prevention of the combustion thereof through the combined effects of atmospheric air and the intense heat produced at the arc; third, the utilization of means which travel with the moving carbons as they are consumed for decreasing the resistance offered to the electrical current as it passes through the lamp; fourth, the diffusion of heat created at the arc, whereby a decrease in the general temperature of the entire lamp and of the space in its immediate vicinity is effected. I accomplish these objects by the use of the apparatus hereinafter described, and particularly pointed out in the claims which follow this specification.

Referring to the drawings, Figure 1 represents a side elevational view of an arc lamp of well-known form, showing my improvement attached thereto, partly in elevation and partly in section. Fig. 2 is a sectional detail view showing a pair of carbons provided with my preferred form of cap or hood, as will be hereinafter more particularly described.

In another pending application filed in the United States Patent Office, of even date herewith, and denominated as Case A, bearing Serial No. 376,156, I have described and claimed, broadly, methods of and apparatus for accomplishing the several results above enumerated, and the present application is directed especially to a modified form of apparatus for accomplishing these general results, so that I make no claim herein to either the methods or generic apparatus for accomplishing such methods, said claims being embraced in the aforesaid application.

Referring to the drawings in detail, a well-known form of arc light is shown, consisting of a base M, top E, and side-supporting rods F, provided with a carbon-holder D′ of the usual pattern for sustaining the lower carbon, and a movable carbon-holder D, adapted to sustain the upper carbon, said carbon-holder being geared or connected to regulating and feeding mechanism inclosed in a housing B, such regulating and feeding mechanism being of any preferred form, and the electrical connections through the feeding mechanism to the binding-posts of the lamp being such as is well known to those skilled in the art.

R represents a pair of refractory caps or hoods, of porcelain or any analogous non-friable material which will not fuse or disintegrate under the intense heat of the arc, said caps or hoods having an internal diameter substantially that of the carbons, the conical portions being adapted to fit on the coned ends of the carbons, as clearly shown. The upper hood R is united to a metallic sleeve H, which surrounds it and extends some distance above, the interior diameter of which is substantially that of the carbon C, so that good electrical contact is had between it and the carbon. This sleeve H is connected at its upper end directly to a spiral conducting-wire S, which in turn is adjustably connected to the carbon-holder D, so that when the hood is first put in place the spring S will exert a maximum strain between the collar H and the carbon-holder D, always tending to slide or move it in an upward direction as the carbon burns away, the tensile power of the spring S being such that when the carbon is finally exhausted the sleeve will be lifted to a point in the neighborhood of the carbon-carrier D. If desired, this carbon-carrier D may extend downward to a point such that when the sleeve H is in its uppermost position the carbon is entirely exhausted. The lower hood R is connected in a similar manner by a conducting spiral spring S′, which is adjustably secured to the lower-carbon holder D′. It will be understood, however, that there need

be but little retractile influence in the spring S′ for this hood, inasmuch as it falls by gravity as the lower carbon burns away. This hood may also be provided with a conducting-sleeve H, if preferred.

In Fig. 2 I have shown a preferred form of hood, in which the refractory material is grooved or recessed around the tip of the carbon C at *e*, and similarly grooved or recessed at *e′* around the tip of the carbon C′, the lower hood being cut away at *o*, so as to avoid as far as possible the shadow of the arc. I find that with a cap or hood, which is grooved as shown in Fig. 2, increased life is also given to the carbon by reason of the fact that the protecting rim prevents the action of atmospheric air on the lower end of the carbon by preventing combustion. In other words, the depending groove offers a protecting shield against drafts of air, thereby allowing the arc to be more steady in its flow and causing the carbon to be consumed more evenly.

The operation of the apparatus is as follows: When the arc is established, the hoods or caps of refractory material R prevent any possible combustion of the carbons through the agency of the intense heat of the arc and any increase in combustive effect due to the presence of gusts of atmospheric air, and at the same time the spiral springs S and S′, being good heat-conductors and also electrical conductors, convey the heat to the carbon-holders D and D′, where it is radiated or dissipated, and also offer diminished electrical resistance to the passing current. As the carbons continue to burn away under the influence of the arc the upper hood or cap R is lifted under the influence of the spiral spring S, always exposing the conical portion from which the arc eminates. Similarly, the lower hood R, resting on the conical portion of the lower carbon, falls by gravity and the influence of the spring S′. This continues until the carbons are entirely consumed or until the sleeve H is brought into contact with the carbon-carrier D.

I am aware that it is not broadly new to devise means for giving increased life to an electric-arc-light carbon in the nature of a cap or hood located near the tip of the carbon, and I am also aware that it is old to conduct the current directly to and from the points of the carbons, thereby avoiding the resistance due to the carbons themselves, and I make no claim to these generic features.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. An arc-light carbon provided with a protecting cap or hood sustained in position by a spiral spring connected to a point in alignment with the carbon, substantially as described.

2. A movable cap or hood for the tip of an arc-light carbon, in combination with a sustaining-spring attached to a point near the base of the carbon, substantially as described.

3. A cap or hood for an arc-light carbon, having a coned bearing against the coned end of the carbon, in combination with a retractile spring attached to the hood and to a point in alignment with the carbon and tending normally to keep the hood in place as the carbon burns away, substantially as described.

4. A pair of arc-light carbons provided with protecting caps or hoods having shouldered bearings against the coned ends of the carbons, in combination with coiled springs, one for each hood, said springs being connected to the hoods and to points in alignment with the carbon and tending to hold the hood in place as the carbons burn away, substantially as described.

5. A cap or hood for an arc-light carbon, consisting of refractory material surrounded by a conducting-sleeve which has contact with the carbon, in combination with a spiral spring uniting the sleeve and the base of the carbon-holder, substantially as described.

6. A cap or hood for an arc-light carbon, made of refractory material and provided with a groove around the tip of the carbon, substantially as described.

7. A cap or hood for an arc-light carbon, having a shoulder or ledge adapted to bear against the coned end of the carbon, and a depression or groove, as *e*, substantially as described.

8. A pair of arc-light carbons provided each with a cap or hood of refractory material, said hoods having each a shouldered bearing against the coned ends of its carbons, and a circumferential groove, substantially as described and shown.

NATHAN M. GARLAND.

Witnesses:
GEO. H. STAYNER, Jr.,
A. V. HINEY.