

(No Model.)

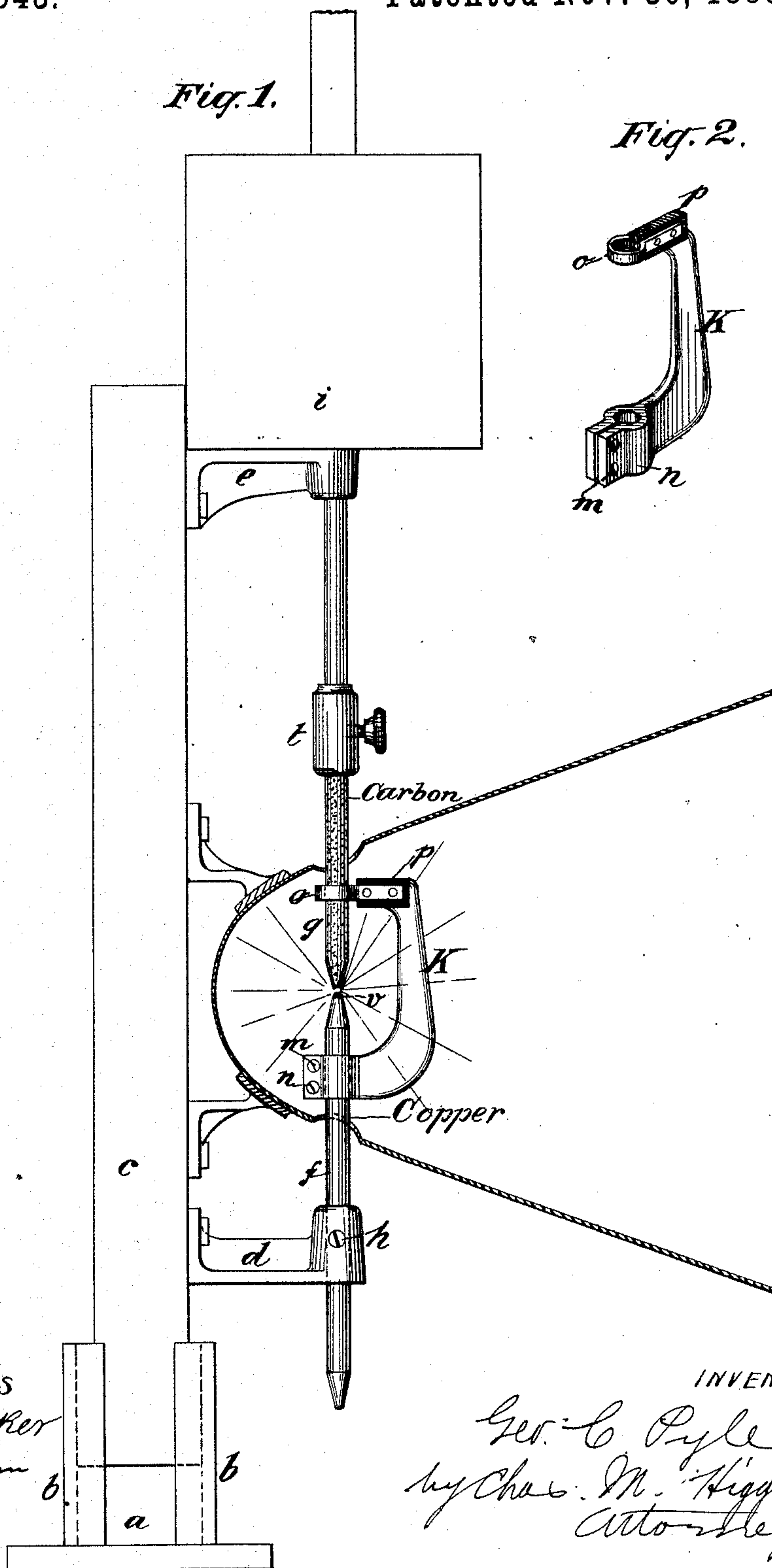
G. C. PYLE.
ELECTRIC ARC LIGHT.

No. 353,643.

Patented Nov. 30, 1886.

Fig. 1.

Fig. 2.



WITNESSES

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ELECTRIC-ARC LIGHT.

SPECIFICATION forming part of Letters Patent No. 353,643, dated November 30, 1886.

Application filed May 5, 1886. Serial No. 201,176. (No model.)

To all whom it may concern:

Be it known that I, GEORGE C. PYLE, of Cuyahoga Falls, in the county of Summit and State of Ohio, have invented certain new and
5 useful Improvements in Electric-Arc Lamps, of which the following is a specification.

My invention applies to focusing-lamps, and more particularly to those designed for locomotive head-lights; and its object is to pre-
10 vent unequal consumption of the illuminating points or electrodes, which causes the arc to pass out of the focus, and also to prevent the displacement and vibration of the points by the great jar which occurs on a locomotive-
15 engine when running rapidly.

To these ends I make one of the electrodes of my lamp stationary, and of a non-consuming conductible material, preferably of metallic copper, while the other electrode is of the
20 usual combustible carbon, and is movable or adjustable to and from the fixed electrode and controlled by automatic regulating mechanism, as usual in automatic lamps. I also attach a clamp or brace to the fixed electrode, at
25 or near the point thereof, from which a guide extends to and embraces the movable electrode at or near the point thereof, said guide or clamp being insulated to prevent passage of the current through the same. By this means,
30 therefore, one of the points is fixed and the other is guided through a fixed guide near the arc, so that the points cannot be jarred or shaken out of line by the jar of the locomotive; and as one of the electrodes is stationary
35 and non-consuming and the other is constantly fed or adjusted to it, the arc therefore remains at a constant focus or fixed point in relation to the reflector, and is therefore not displaced either by the effects of consumption or jar.
40 These are most desirable advantages for all purposes for which a focusing-lamp is used, but more particularly for locomotive head-lights; and my invention therefore consists in the features above outlined, as hereinafter fully set
45 forth.

In the drawings annexed, Figure 1 presents a side elevation of my improved focusing-lamp. Fig. 2 is a perspective view of the brace or guiding-arm.

Referring to Fig. 1, *a* indicates the base of
the lamp, designed to be secured to the lantern-board or head-light platform of the locomotive. This base has upright guides *b b*, in
which the standard *c* is adjustable. From this standard two overhanging arms, *d e*, project,
55 from which the electrodes of the lamp extend toward each other, as shown. In the lower arm, *d*, is secured the negative electrode *f*, which is fixed therein by a set-screw, *h*, or other means,
which of course allows of its adjustment higher
60 or lower when the lamp is adjusted for use, but which renders the electrode stationary when the lamp is in action. Now, this electrode *f* is preferably made of a solid rod of copper turned to a conical point at the end,
65 the extreme tip being, however, flat or truncated, as shown; but this electrode may be made of any other material which will conduct the current and will not appreciably consume when in action, copper, however, being
70 the most advantageous.

The positive electrode *g* is made preferably of the usual carbon, and is automatically adjustable to and from the copper electrode *f*, being held, as usual, in a carbon-holder, *t*, which
75 projects from the mechanism-case *i*. The case *i* incloses suitable regulating mechanism connected to the carbon-holder to automatically control the movements of the carbon, as usual in electric lamps, and as this mechanism may
80 vary and is well understood, and forms of itself no part of my present invention, I have not illustrated the same, as it is not necessary to the understanding of my invention.

Now, *K* indicates a steadying arm or support, which extends parallel with the electrodes across the meeting points thereof, with each end turned at right angles toward and embracing the electrodes, as shown in Fig. 1. This arm is formed at its lower end with a
85 clasp-eye, *n*, provided with set-screws *m*, which is firmly clamped upon the copper electrode *f*, at or near the point thereof, thus securing the steadying-arm in a fixed position. The upper end of the arm is formed with a
90 guide eye or loop, *o*, through which the carbon electrode *g* passes smoothly, and which, embracing the same at or near the point, stead-

ies the carbon firmly and guides it in its adjusting motions to and from the copper electrode, but prevents all lateral play or side motion, and thus always keeps the points in line, no matter how much jar or shake may be imparted bodily to the head-light by the motions of the locomotive. The guide-loop *o* is insulated, as shown at *p*, from the metal of the arm *K*, so as to prevent passage of the current from one electrode to the other through said arm; but the insulation may of course be introduced at any other point in the arm between the eyes *o* *n*.

r is the reflector, of the usual parabolic form, which is suitably supported from the standard *c*, and is directed forward.

The electrodes project within the reflector, as usual, through openings in the top and bottom thereof, and meet at the focus point of the same, as usual, and the steadying-arm *K* is made as thin as possible, and is turned forward in a central radial position, so that it shall obstruct the light to the least extent possible, as shown in Fig. 1.

In the practical operation of my improved lamp I modify the quality of the electric current somewhat from that usual in lamps having both electrodes of carbon, so as to increase the quantity while reducing the electro-motive force thereof, and I use a somewhat shorter arc than usual. Under these conditions, when my improved lamp is in action, carbon is vaporized or dispensed from the positive pole and projected and deposited on the copper tip of the negative pole, as indicated at *v* in Fig. 1, thus forming a film of solid carbon thereon, which is maintained by fresh deposits continually. By this means the copper pole does not burn away appreciably, and does not appreciably tint the light of the arc, and it becomes the equivalent of a carbon pole without the disadvantages thereof; hence by these means not only is the arc kept at a constant focus by reason of the stationary and non-consuming negative pole, but by means of the steadying and guiding arm, embracing the electrode near the arc, all lateral play or vibration is prevented, and the arc is maintained laterally in

a fixed position, no matter how much the lamp, as a whole, may be shaken and jarred by the throbbing and lurching of the engine when under headway, which advantages, secured by the simple means set forth, render my invention an important improvement in focusing and head-light lamps.

I do not, of course, confine myself to the particular mechanical construction or arrangement of the parts of the lamp shown, as this may be varied without departing from the essential features of my invention.

What I claim is—

1. In a focusing arc lamp, the combination, with a movable or adjustable electrode and regulating mechanism to adjust the same, of a fixed non-consuming electrode, and a fixed brace or guide embracing or guiding the movable electrode at or near the tip thereof, substantially as and for the purpose set forth.

2. The combination, in a focusing-lamp, with a movable or adjustable electrode of carbon or equivalent consuming material, of a fixed electrode of copper and a fixed guide embracing or steadying the movable carbon electrode at or near the point thereof, substantially as set forth.

3. In a focusing arc lamp, the combination, with a movable or adjustable electrode, of a fixed non-consuming electrode, and a fixed steadying arm or brace, such as *K*, secured to the fixed electrode at or near the tip thereof, and having a guide to receive the movable electrode at or near the tip thereof, said arm being insulated between its extremities, substantially as and for the purpose set forth.

4. The combination, in an electric lamp, with an automatically movable or adjustable carbon electrode, of an opposite fixed electrode of copper, a tip or point of deposited carbon upon the end of said copper electrode, and a fixed brace or guide arranged to guide the movable carbon electrode at or near the point thereof, substantially as herein set forth.

GEO. C. PYLE.

Witnesses:

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L. WILCOX.