(Model.)

W. SAWYER.
Electric Lamp.

No. 233,284. **Patented Oct. 12, 1880.**

FIG 1

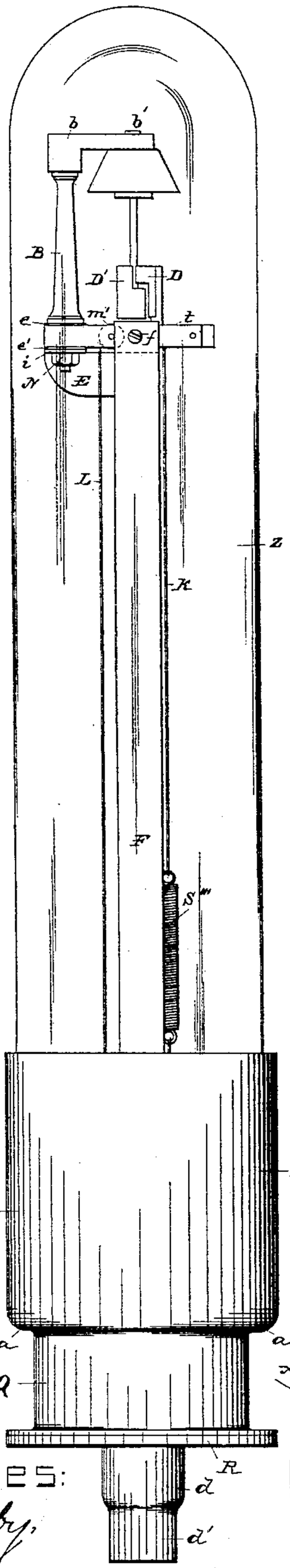


FIG 2

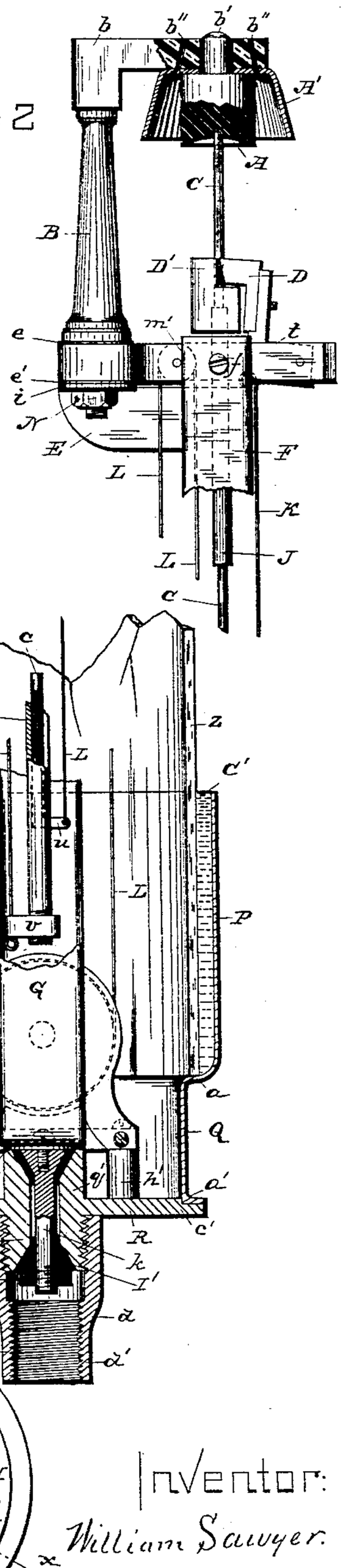


FIG 5

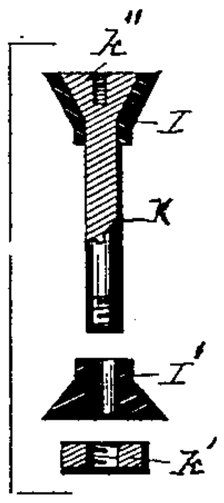
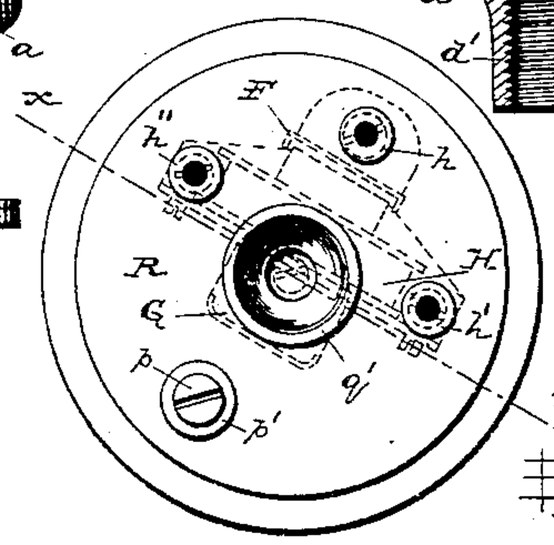


FIG 3

FIG 4



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UNITED STATES PATENT OFFICE.

WILLIAM SAWYER, OF NEW YORK, N. Y.

ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 233,284, dated October 12, 1880.

Application filed August 31, 1880. (Model.)

To all whom it may concern:

Be it known that I, WILLIAM SAWYER, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Electric Lamps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to that class of electric lamps in which a pencil of carbon is heated to incandescence in a hermetically-sealed tube or globe filled with nitrogen gas or exhausted air; and it consists, essentially, first, in a cup having an annular space or shoulder at its lower end for the reception of the tube or globe; secondly, in a bottom contact-plug, also hermetically sealed; thirdly, in a cap covering the top or upper carbon; and, last, in details of construction that will be hereinafter more fully described.

In the accompanying drawings, forming a part of the specification, Figure 1 is a perspective view of my improved lamp; Fig. 2, a side elevation (partly in section) of the upper portion of the lamp-connections, showing the post or supporting-standard, the upper-carbon cap, and the conductors. Fig. 3 is a vertical section through the sealed cup and globe and insulated plug; Fig. 4, a plan view of the base-plate; Fig. 5, a sectional detail view of the lower plug, showing the insulation.

Like letters of reference indicate like parts in all the drawings.

Z represents the tube seated in the annulus or shoulder *a* of the cup P, with the sealing compound or cement C′ interposed between the sides of the cup and tube. In practice I place the tube in position in the following manner: First, I pour a sufficient quantity of the cement on the shoulder *a* of the cup to hold the bottom edges of the tube firmly in place; then the heated cement is slowly poured into the space between the tube and interior of the cup, filling this space and allowing the cement to extend slightly above the top of the cup, so as to compensate for settling and for any air that may have been driven to the cement, so that when the cement becomes cooled the space between the cup and tube will be solidly filled. The joint is thus rendered hermetical and leakage practically impossible.

The base-plate or stopper R, which supports the interior mechanism of the lamp, is provided with a shoulder, *c′*, to receive the lower flange, *a′*, of the cup P, and is further provided with an upper and lower extension, *q′ q*, cast or formed in one piece with the base-plate R, and are hollowed out and chamfered to receive the insulated plug *k*, surrounded at its upper and lower end by a jacket or envelope, I, of insulating material, such as wood fiber, vulcanite, &c. The plate R and the several extensions and mechanism supports may be of cast metal; but I prefer to make them of spun brass.

The shank of the plug *k* does not entirely fill the openings in the extensions *q q′*, the intervening space being filled with a suitable elastic cement, as hereinafter described.

After the tube Z has been sealed and fastened to the cup P, I attach the several conductors and interior supports to the base-plate R, as shown. I then heat the plate R very hot and place the plug *k* (also heated) in position, as indicated in Fig. 2. The plate R is then reversed or placed upside down, and the space between the plug and extensions filled with the cementing material. The heat of the plug and projections or extensions *q q′* causes the cement to evenly distribute itself and fill the vacant space, so that the interior of the plug is also hermetically sealed. Then the insulated cap I′ and washer *k′* are placed in position. Finally, the cup and base-plate are brazed together.

By means of the insulated cap I′ and washer *k′* the shank of the plug is preserved from contact with the bracket-piece *d* and short-circuiting avoided.

By reference to Figs. 3 and 5 it will be observed that the top of plug *k* is slightly perforated to receive the end of a screw which holds the conductor G, which passes over the top of *q′*, (from which it is insulated by a disk of insulating material, *n*,) and is secured in po-

sition by a screw passing through the lower end of said conductor G and into the top of plug *k*.

The opposite conductor, F, is supported by and secured to a support, *h*, on the base-plate. The drum H, around which passes the feed-wire L, is supported by and secured to supports *h' h''* on the base-plate, said supports being cast or made in one piece with the base-plate, and are perforated for the reception of the ends of screws passing through the lower or supporting frame of the drum.

The carbon-pencil feed mechanism does not differ from that shown in Letters Patent No. 227,386, granted to me May 11, 1880, except that in the present instance the wire K, connected to the coil S''', is attached directly to the lower carbon-holding piece, D.

The conductor F is attached to the cross-frame *t* by a screw or bolt, while the other, G, is attached to cross-piece E of the frame by a bolt. This piece E is bent at right angles with the frame, and makes connection with the standard B by a nut, N, which holds the standard securely in place on the metal frame *t*. The lower end of the standard passes through the metal piece E, but does not touch the sides thereof, as mica washers *e e'* serve to insulate them and prevent contact.

The uprights or conductors F G are made of single flat pieces of metal, with their edges turned over, as shown in Figs. 2 and 3. This form of construction—*i.e.*, with turned edges—gives great strength and stability, with lightness and economy of metal, and the plates can be cut or struck up into the desired and exact shape without the necessity of machinery for turning them.

The carbons D D' do not differ materially from those shown in my former patent before referred to.

The upper carbon, A, has a projection, *b'*, passing through a metallic cap, A', and arm *b* of standard B. A thin sheet of platina is wound around and under it, where it is in contact with the arm *b*. The under side of carbon A is made slightly concave on its under side, where it is in contact with the pencil C; but this form of construction is not absolutely essential, as the carbon may be made with the ordinary plane face.

Surrounding the upper carbon, A, is a thin metallic cap, A', the purpose of which will be hereinafter described.

In lamps of this nature, when a voltaic arc occurs, it usually takes place at the upper end of the carbon pencil. Occasionally, however, disruption may take place at some other point of the pencil, and of course this results in impairing or entirely breaking the contact between the pencil and upper carbon, whereby a voltaic arc is created and the carbon vaporized. This vapor will rise like steam and condense itself on the first cool substance with which it comes in contact. Heretofore this condensation has taken place on the top of the glass globe or tube, and in course of time the top of the tube becomes discolored by the carbon deposited on it, and thus obstructs the free passage of the light. Now, by surrounding the carbon by a cap, A', as described, the vapor coming in contact with it will deposit itself on the under side of the cap and protect the tube from discoloration. The condensation takes place almost instantly; and in order to carry off and give current to the remaining vapor, I may provide passages *b' b''* through the cap and arm *b*. These are not, however, essentially necessary, and may be dispensed with, if desired. The arm *b* is screw-threaded at the end where it is attached to standard B, and can be turned around said post as a pivot.

When it is required to put in new carbons or pencils it is only necessary to turn the arm *b* to one side, and after the carbon or pencil has been adjusted to turn *b* back into position, as shown in the drawings.

The lamp is charged as in my patent of May 11, 1880, heretofore mentioned.

Having described my invention, what I claim is—

1. In an electric lamp, a perforated cap surrounding the upper carbon, as described, and secured to a movable arm on the upper-carbon-supporting standard, substantially as described.

2. In an electric lamp, the upper carbon, A, provided with an extension, *b'*, and secured to a movable arm of the carbon-supporting standard, substantially as described.

3. In an electric lamp, a carbon-supporting arm moving about a fixed standard as a pivot, whereby the arm and carbon may be moved transversely to the standard for the purpose of adjusting the carbon pencil, substantially as described.

4. In an electric lamp, the combination, with a supporting-standard secured to the lower-carbon frame, of a movable arm perforated to receive an extension of the upper carbon, and a metallic cap surrounding said carbon, substantially as described.

5. In an electric lamp, the combination of the conductor F, secured to the support *h* of the base-plate R, and to the lower-carbon frame *t*, and the conductor G, secured to the plug *k*, and insulated arm E, with the standard B and supporting-arm *b*, substantially as described.

6. In an electric lamp, the metallic conductors F G, having the inwardly-bent edges, substantially as described, and for the purpose set forth.

7. In an electric lamp, a tube-supporting cup provided with a lower outwardly-turned flange, *a'*, for securing the cup in a shoulder of the base-plate, and an upper annular shoulder, *a*, whereby a single cement-chamber is provided between the cup and tube, substantially as described.

8. In an electric lamp, the base-plate or stopper R, provided with two or more projections,

made in one piece with the plate, for the support of the pencil-feeding mechanism and one of the conductors, substantially as described.

9. In an electric lamp, a base-plate or stopper having two or more supports, as described, and a central upper and lower projection for the reception of a contact-plug, substantially as described.

10. In an electric lamp, a contact-plug inserted in a central projection of the base-plate of the lamp, the shank of the plug being of less diameter than the opening in the base-plate projection, so as to provide an intervening space to be filled with a suitable elastic cementing compound, substantially as described.

11. In an electric lamp, a contact-plug inserted in the base-plate of the lamp, and provided with an opening at its top for the reception of a screw, by which one of the conductors is secured to the plug and insulated from it by a suitable insulating-disk inserted between the plug and conductor, substantially as described.

12. In an electric lamp, a contact-plug inserted in the base-plate of the lamp and insulated from said plate at each end by an insulating-jacket, and having the space between the shank of the plug and the sides of the plate filled with a suitable elastic cement, substantially as described.

13. In an electric lamp, the plug *k*, having the opening *k''*, and the insulating-jackets I I'', substantially as described, and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WM. SAWYER.

Witnesses:
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