

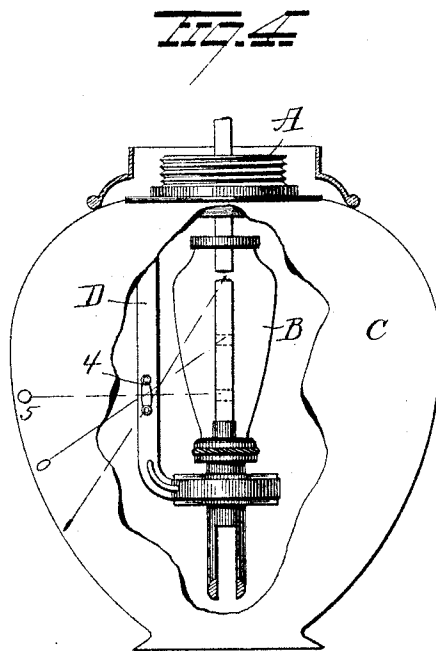
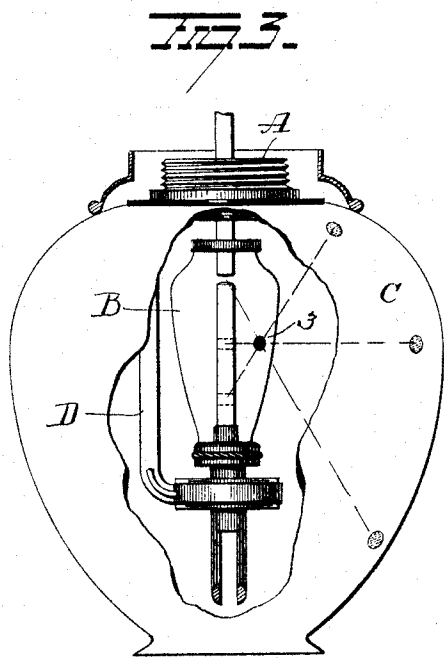
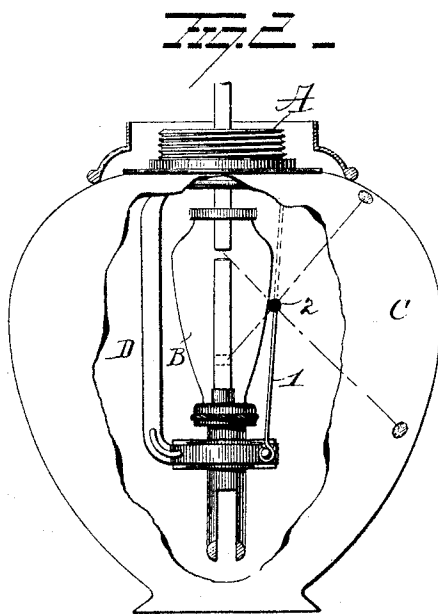
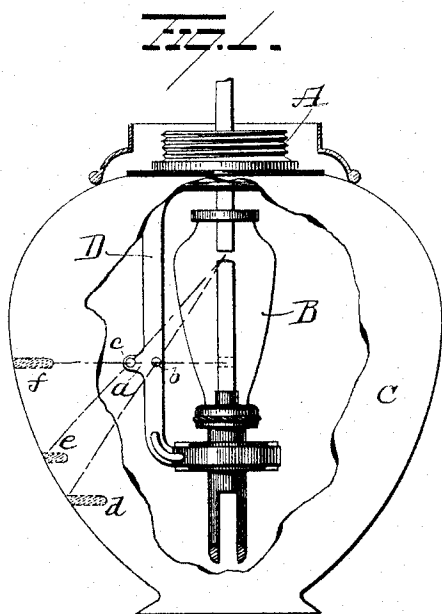
(No Model.)

2 Sheets—Sheet 1.

B. A. STOWE.
ELECTRIC ARC LAMP.

No. 586,208.

Patented July 13, 1897.



Witnesses
E. J. Nottingham
G. J. Downing.

Inventor
B. A. Stowe
By H. A. Seymour
Attorney

(No Model.)

2 Sheets—Sheet 2.

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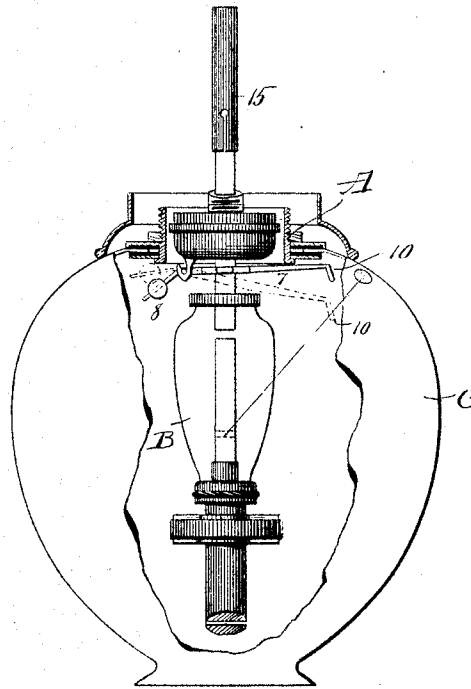
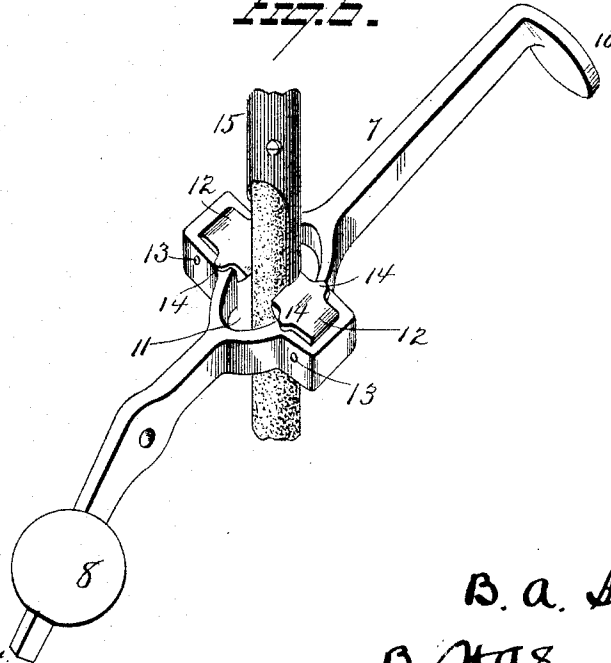


Fig. 5.

Fig. 6.



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UNITED STATES PATENT OFFICE.

BERNARD A. STOWE, OF CLEVELAND, OHIO.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 586,208, dated July 13, 1897.

Application filed December 28, 1896. Serial No. 617,239. (No model.)

To all whom it may concern.

Be it known that I, BERNARD A. STOWE, a resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Electric-Arc 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.

My invention relates to an improvement in electric-arc lamps, and more particularly to means for indicating the extent of consumption of the carbons.

In using electric-arc lamps constructed to burn for a considerable length of time, and which consequently will need trimming only once in from one hundred to one hundred and fifty hours, it is of great advantage to know just when the lamps should be trimmed without the necessity for opening or otherwise closely examining them. It is particularly of advantage to easily ascertain the extent of consumption of the carbons where the time of burning of a large number of lamps is controlled by various persons. In such cases some of the lamps are kept burning a greater length of time than others, and consequently there would be a considerable amount of unconsumed carbon wasted if all the lamps were trimmed at the same time. Thus it is quite difficult for an attendant or trimmer to keep account of the length of time each lamp has burned. Under these conditions some device on each lamp to show when the trimming-time is approaching is very valuable. Such a device is especially valuable with lamps having alabaster globes, as the position of the arc cannot be determined on account of the density of such globes. It is also difficult to determine the position of the arc through a clear globe without some signal, as the brightness of the light will dazzle the eye.

It is the object of my invention to provide means whereby an attendant can ascertain by a mere glance at the lamp whether or not the carbons have been consumed sufficiently to necessitate the trimming of the lamp.

A further object is to provide an electric-arc lamp with a device by means of which the position of the arc will be indicated on the globe.

With these objects in view the invention consists in an electric-arc lamp comprising the carbons, the globe, and a light-obstructing device at a point within the globe which is at all times in the light-field space of the arc.

The invention further consists in an electric-arc lamp comprising the carbons, one of which is movable and the other fixed, the globe, and a light-obstructing device fixed at a point within the globe which is at all times in the light-field space of the arc.

My invention further consists in certain novel features of construction and combinations and arrangements of parts, as hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view of an electric-arc lamp, showing one way in which my invention can be carried into effect. Figs. 2, 3, 4, 5, and 6 show modifications.

A represents a portion of the frame of an arc-lamp of the arc-inclosed type.

B represents the inner or arc-inclosing globe, and C the larger or outer globe.

The depending arm D of the frame may be enlarged somewhat, as at *a*, where two pins *b c* will be attached so as to be disposed in the path of rays of light from the arc, one of said pins being somewhat longer than the other—that is to say, the pins *b c* are at a point within the outer globe which is at all times in the light-space of the arc. The pins *b c* being, as above stated, in the path of rays from the arc, shadows *d e* will be cast on the outer globe C. The pins *b c* are so disposed as to be in line with the arc when the carbons shall have been nearly consumed, and thus a single shadow *f* will be cast on the outer globe, indicating that the lamp is approaching the trimming-point. With carbons of full length in the lamp the arc will appear near the upper end of the smaller globe and the diagonal rays will be intercepted by the pins *b c*, thus casting the two shadows *d e* on the lower portion of the outer globe, the shorter shadow above the longer one. As the carbons burn away and the position of the arc descends the shadows *d e* will consequently rise and approach more closely to each other until both pins become in line with the same horizontal rays from the arc, and thus cast a single shadow on the outer globe, indicating that

the lamp should be trimmed, as above explained. Should the lamp be not trimmed when a single shadow appears on the outer globe, the arc can still descend a short distance, as small portions of carbon still remain unconsumed. Should this occur, the longer shadow would appear above the shorter one, and would thus indicate that the lamp should be trimmed immediately.

It is evident that my invention may be carried into effect in various ways other than that above described. For instance, the construction shown in Fig. 2 may be adopted. In this form of the invention a small rod 1 is attached to the frame of the lamp and terminated about midway between the ends of the arc-inclosing globe. This rod is provided at its free end with an opaque disk, ball, or other object 2, which will obstruct the rays of light from the arc and cast a shadow on the outer globe C. When the lamp is first started, the shadow will be cast near the lower end of the globe C, but as the carbons become consumed and the arc consequently descends the shadow will gradually travel upwardly until it disappears under the portion *g* of the lamp-casing. The absence of the shadow on the outer globe will therefore denote that the lamp should be trimmed.

Instead of attaching the rod 1 to the lower portion of the lamp-arm D it may be secured to the frame above the arc-inclosing globe, as shown in dotted lines in Fig. 2.

Instead of supporting the opaque object on a rod secured to the lamp-frame an opaque disk or spot 3 may be made in the arc-inclosing globe, as shown in Fig. 3.

Instead of using an opaque object a lens 4 may be attached to the depending arm D of the lamp-frame and focused a little beyond the outer globe. Thus when the lamp first starts the rays of light will be at such angle to the lens that little or no glow will appear on the globe C, but as the arc descends a glow *5*, first in the form of an ellipse, will appear on the outer globe.

When the carbons shall have been nearly consumed, the arc will appear in line with the lens and a circular glow will appear on the globe C, thus indicating that the lamp should be trimmed.

In the form of the invention shown in Fig. 5 a pivoted lever 7 is connected with the framework above the arc-inclosing globe. The lever 7 is pivotally supported near one end, and its shorter arm is provided with a weight 8, whereby to normally maintain a disk 10 at the free end of the long arm of the lever out of line with the rays of light from the arc. The longer arm of the lever 7 is made between its ends with an enlarged open portion 11, through which the upper carbon of the lamp passes. Dogs or detents 12 are pivoted in the enlarged portion 11 at 13 13, and each dog or detent is prevented from movement in one direction by means of lugs 14, which rest on the lever. From this construction it will be

seen that the carbon rod and the sheath 15, which carries it, can be readily passed up between the dogs or detents. The detents will be so disposed as to also permit the free downward movement of the carbon, so as not to interfere with the feeding thereof, but they will not permit the downward passage of the sheath, and therefore when the carbons shall have been nearly consumed the engagement of the lower end of the sheath with the dogs or detents 13 will cause the lever 7 to turn on its fulcrum and move the disk 10 downwardly, so as to cause it to intercept the rays of light from the arc, as shown in dotted lines in Fig. 5, and cast a shadow 16 on the outer globe, thus indicating that the lamp should be trimmed. It is evident that this form of the invention is applicable not only to an arc-lamp having a fixed lower carbon and in which the arc moves downwardly as the carbons become consumed, but that it is also applicable for use with a focusing-lamp in which the lower as well as the upper carbon is fed and the arc thus maintained at a fixed point.

When the construction shown in Fig. 5 is used with a focusing-lamp, it may be found desirable to pivot the lever in close proximity to the point thereon engaged by the sheath, so that a slight downward movement of the sheath after it strikes the lever will move the lever a sufficient distance to cause the disk 10 to intercept the rays from the stationary arc.

My improvements are simple in construction and are effectual in all respects in the performance of their functions.

Various slight changes other than those above specified may be resorted to without departing from the spirit of my invention or limiting its scope, and hence I do not wish to limit myself to the precise details herein set forth.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An electric-arc lamp comprising the carbons, the globe and a light-obstructing device at a point within the globe which is at all times in the light-field space of the arc.

2. An electric-arc lamp comprising the carbons, the globe and a light-obstructing device at a point within the globe which is at all times outside of the space marked by the cones of shadow formed by the obstruction of the light-field by the carbons.

3. An electric-arc lamp comprising the carbons, one of which is movable and the other fixed, the globe and a light-obstructing device fixed at a point within the globe which is at all times in the light-field space of the arc.

4. The combination with an arc-lamp, of two pins disposed so as to intercept rays of light from the arc and cast shadows on the globe, whereby to indicate the state of consumption of the carbons, substantially as set forth.

5. The combination with an arc-lamp, of two pins projecting from the frame thereof, one of said pins being longer than the other and

both adapted to intercept rays of light from the arc whereby to cast shadows on the globe, said pins being so disposed as to be in line with each other and the arc when the latter reaches such point that the carbons will have been nearly consumed, substantially as set forth.

6. In an arc-inclosed electric-arc lamp, the combination with the carbons, the inner or are-inclosing globe and the larger or outer globe, of a device so disposed as to intercept rays of light from the arc as they pass from

the arc and through the inner globe, whereby to produce an indication on the outer globe of the extent of consumption of the carbons, 15 substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

BERNARD A. STOWE.

Witnesses:

J. C. MONTGOMERY,
CHAS. MILEY.