(No Model.)

T. A. EDISON.

INCANDESCENT ELECTRIC LAMP.

No. 476,992. Patented June 14, 1892.

Fig. 1.

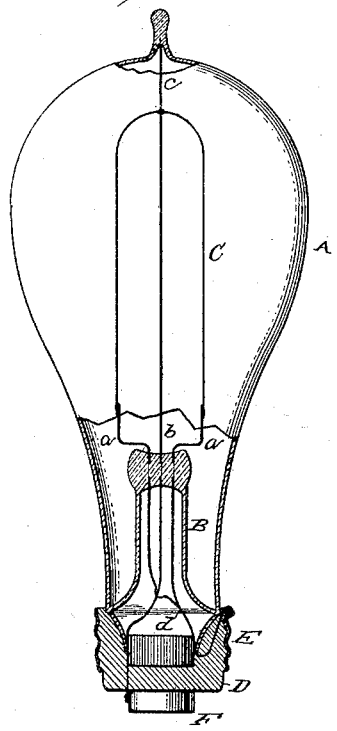
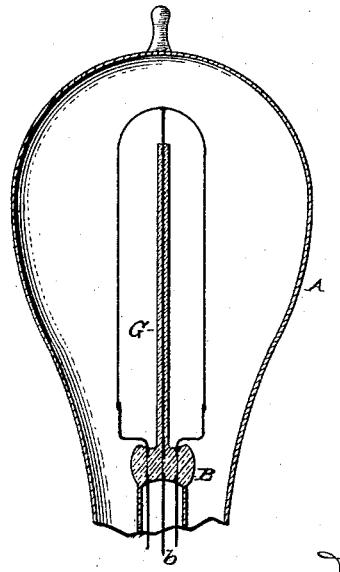


Fig. 2.



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THOMAS A. EDISON, OF LLEWELLYN PARK, NEW JERSEY.

INCANDESCENT ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 476,992, dated June 14, 1892.

Application filed January 24, 1891. Serial No. 378,922. (No model.)

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, a citizen of the United States, residing at Llewellyn Park, in the county of Essex and State of New Jersey, have invented a certain new and useful Improvement in Incandescent Electric Lamps, (Case No. 905,) of which the following is a specification.

My invention relates to incandescent electric lamps of the general character set forth in my application filed August 7, 1882, Serial No. 68,606, in which a carbon filament of an arch or loop form is employed and a wire is connected to the middle point of the loop and extends outside the lamp for connection with an external circuit.

The incandescent electric lamps commonly in use are made with a view to the employment of a certain potential, usually about one hundred volts. It is often desired to use lamps employing half this potential, and to accomplish this the filament has usually been shortened and thickened, so as to make it of half the standard resistance. By my invention, however, I provide a lamp taking half the potential of the standard lamp, but in which the filament is of the same size and length as the standard or full-potential lamp. To accomplish this in a simple and effective manner is the object which I have in view; and to this end my invention consists in the novel improvements in the process of making such lamps and in certain novel improvements in the construction of such lamps, as hereinafter set forth and claimed.

My invention is illustrated in the accompanying drawings.

Figure 1 is a view, partly in section, of a lamp embodying the preferred form of the invention; and Fig. 2, a section of the upper portion of a lamp employing a modified arrangement.

Referring first to Fig. 1, A is the vacuum-globe, B the inner stem, and C the usual filamentary carbon loop or arch. To each end of the filament C is attached one of the leading-in wires *a a'*, which are sealed in the upper end of the stem B and extend outside the vacuum-chamber. I also provide a third leading-in wire *b*, which passes also through the upper end of the stem B and extends to the top of the filament, where it is connected with the center of the loop. This connection may be made by an electroplated deposit or by a deposit of carbon or in any other suitable and convenient way. Another wire *c* or an extension of the wire *b*, forming an arm, extends up from the top of the loop and into the recess *f* at the foot of the projecting tip at the top of the lamp. This forms a support for the filament and the intermediate wire *d*. With the ordinary incandescent electric lamp the filament does not usually require any support other than the leading-in wires *a a'*, because the inertia of the light carbon filament is so small that it vibrates freely and is not easily broken by any jar or shock; but with the comparatively heavy wire *b* attached to it the weight is so much greater that it does not yield readily, and is therefore liable to be broken, and for this reason the additional support is provided.

In making the lamp the ends of the wires *a*, *a'*, and *b* are at first left projecting loosely from the lamp, and when the lamp is to be heated electrically in exhausting it no connection is made to the wire *b*, but the current is passed from *a* to *a'*, so that the two sides of the filament are heated in series, the object of this being to produce uniformity in resistance and structure of the two sides, both being heated to the same final high temperature during exhaustion; but after this process is completed and the globe is sealed the wires *a* and *a'* are connected together outside the lamp, as shown at *d*. The lamp is then provided with the usual base D, having permanently affixed external terminals, such as the screw-threaded ring E and the contact-button F. The wire *b* is connected with one of these external terminals, and the wire *d*, which is the common extension of wires *a a'*, is connected with the other terminal. These terminals being, as is well understood, adapted for connection with corresponding terminals in a suitable socket or receptacle, the two sides of the filament are thus permanently joined in multiple-arc relation to each other, and they are so used in practice, the result being a lamp requiring half the potential, but having a filament both sides of which are alike and which is of the same length and size as that of the lamp of full potential.

Fig. 2 shows a different form of support for

the filament. A glass arm G extends up from the top of the stem B, and the intermediate wire *b* extends through the arm. The arm G rises nearly to the top of the loop and so forms a rigid support for the wire and loop.

What I claim is—

1. In an incandescent electric lamp, the combination, with the loop-shaped carbon filament connected with leading-in wires, of the third wire connected with the center of the loop and extending outside the lamp and a wire extending from the top of the loop and supported by the top of the lamp-bulb, substantially as set forth.

2. The improvement in the method of making and using incandescent electric lamps, which consists in heating the lamp electrically during exhaustion, with the two sides of the looped filament in series, and afterward using said lamp with the sides in multiple arc, substantially as set forth.

3. The improvement in the method of making an incandescent electric lamp having a wire extending from the center of its looped filament, which consists in passing current through the filament during exhaustion, with the two sides of the loop in series, and afterward permanently connecting together the leading-in wires which extend from the ends of the loop, substantially as set forth.

This specification signed and witnessed this 20th day of January, 1891.

THOS. A. EDISON.

Witnesses:

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HARRY F. MILLER.