(No Model.)

A. C. CAREY.

INCANDESCENT ELECTRIC LAMP.

No. 470,471. Patented Mar. 8, 1892.

Fig. 1.

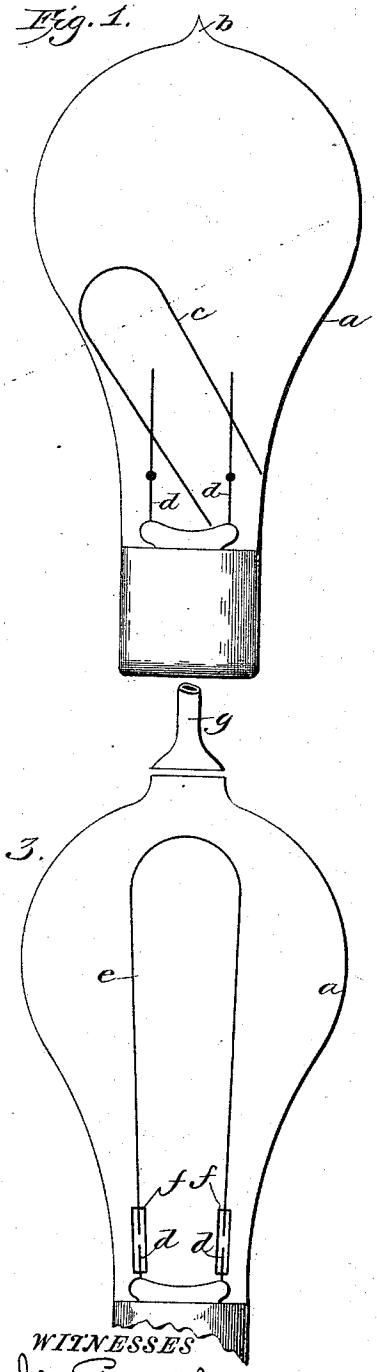

Fig. 3.

Fig. 2.

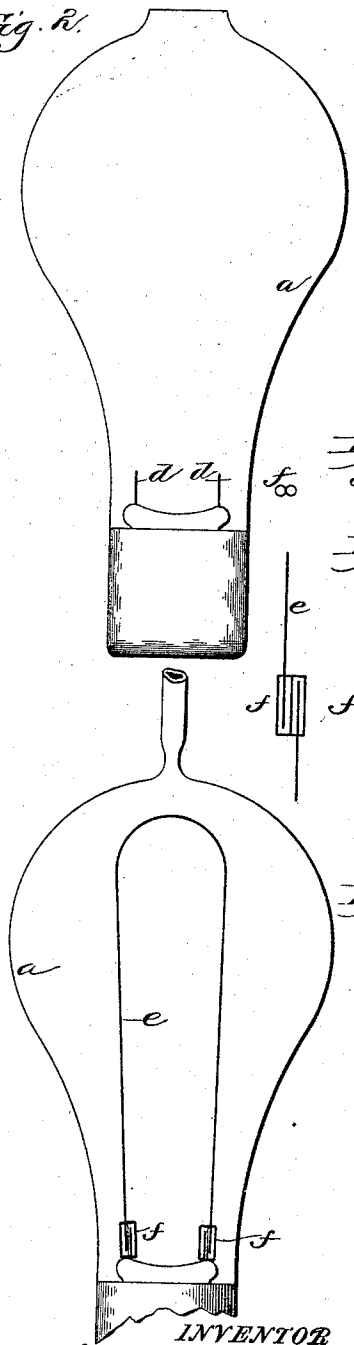

Fig. 6.

Fig. 5.

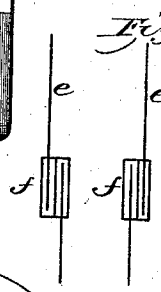

Fig. 4.

WITNESSES

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INCANDESCENT ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 470,471, dated March 8, 1892.

Application filed August 3, 1891. Serial No. 401,567. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTUS C. CAREY, a citizen of the United States, residing at Lake Pleasant, in the county of Franklin and State of Massachusetts, have invented a certain new and useful Improvement in Incandescent Electric-Light Lamps, of which the following is a full, clear, and exact description.

When the carbon filament of an incandescent lamp is exhausted or burned out, the lamp is said to be "dead" and is thrown into the waste heap.

The object of my invention is to save the bulb and its appurtenances and supply a new filament at considerably less cost than an entirely new lamp.

In attaining the object of my invention I open the bulb at its teat end, remove the exhausted filament, replace it by a new filament, and again exhaust and seal the bulb, all as I will proceed now more particularly to describe and finally claim.

In the accompanying drawings, illustrating my invention, in the several figures of which like parts are similarly designated, Figure 1 is an elevation of a dead lamp. Fig. 2 illustrates the first step in practicing my invention; Fig. 3, the second, but showing a form of sleeve not here claimed; and Fig. 4, the final step, this last figure showing the preferred form of joint for securing the new filament to the leading-in wires. Figs. 5 and 6 show in longitudinal and cross-section this preferred form of joint.

In practicing my invention I take an exhausted or dead lamp *a* (such as shown in Fig. 1) and by heat reduce the teat *b* to a plastic state, push a tool through it, and enlarge the opening, as shown in Fig. 2. The exhausted filament *c* is then withdrawn and the leading-in or circuit wires *d d* cleansed of adhering parts. If the bulb be foul, it may be cleansed by brushes or other means. I then take a new filament *e* and fasten to its ends by cement or other means metallic joints—such as sleeves *f*—and inserting the filament thus prepared into the bulb I connect the sleeves with the leading-in wires *d d* and complete the joint by pinching the sleeves about the leading-in wires, or by adding cement in those portions of the sleeves which are to receive the leading-in wires, or by soldering or electric welding, or other means. A glass tube *g*, Fig. 3, is then attached to the opened bulb, the air exhausted from the bulb, and the bulb sealed by melting the tube, as usual, (see Fig. 4,) when the lamp is renewed and ready for service.

I make the sleeves double by folding the metal upon itself in the shape of an eight (**8**), as shown in Figs. 5 and 6, and insert the filament's ends in the outer tubes and the leading-in wires in the inner tubes in order to have the two legs of the filament-loop as far apart as may be. These sleeves or tubes may be made of thin platinum or of thin sheet metal coated with solder, and can be soldered or made fast to the platinum circuit-wires in the bulb by means of heated pinchers or other suitable appliances, thus making a sure and perfect union of the parts, insuring a perfect electrical contact.

My improved means of applying filaments effects a great saving in the use of incandescent electric lamps, for the reason that the exhausted carbon filament may be replaced again and again in the old bulbs, heretofore considered useless, so as to be substantially equal to the original lamp in illuminating power and time of endurance. The number of times that the carbon filament may be renewed is practically unlimited. A renewed lamp is not nearly so liable to break as a new one, for the reason that in consuming the original carbon filament the bulb has been heated many times and has become partially annealed, and therefore much tougher, and the brass cap or butt, the plaster, and the glass have all become adjusted each to the other and therefore less liable to break.

In the original construction of such lamps the carbon filament may be applied to the circuit-wires by means of sleeves, as above described, and the whole inserted into the bulb through the butt of the lamp and sealed therein, after which the air is exhausted and the lamp sealed.

What I claim is—

In an electric-light lamp, leading-in or circuit wires, an incandescent filament, and a joint therefor composed of a double tube in which the ends of the filament and leading-in or circuit wires are secured, substantially as described.

In testimony whereof I have hereunto set my hand this 19th day of June, A. D. 1891.

AUGUSTUS C. CAREY.

Witnesses:
DANA MALONE,
JOHN D. BOUTER.