

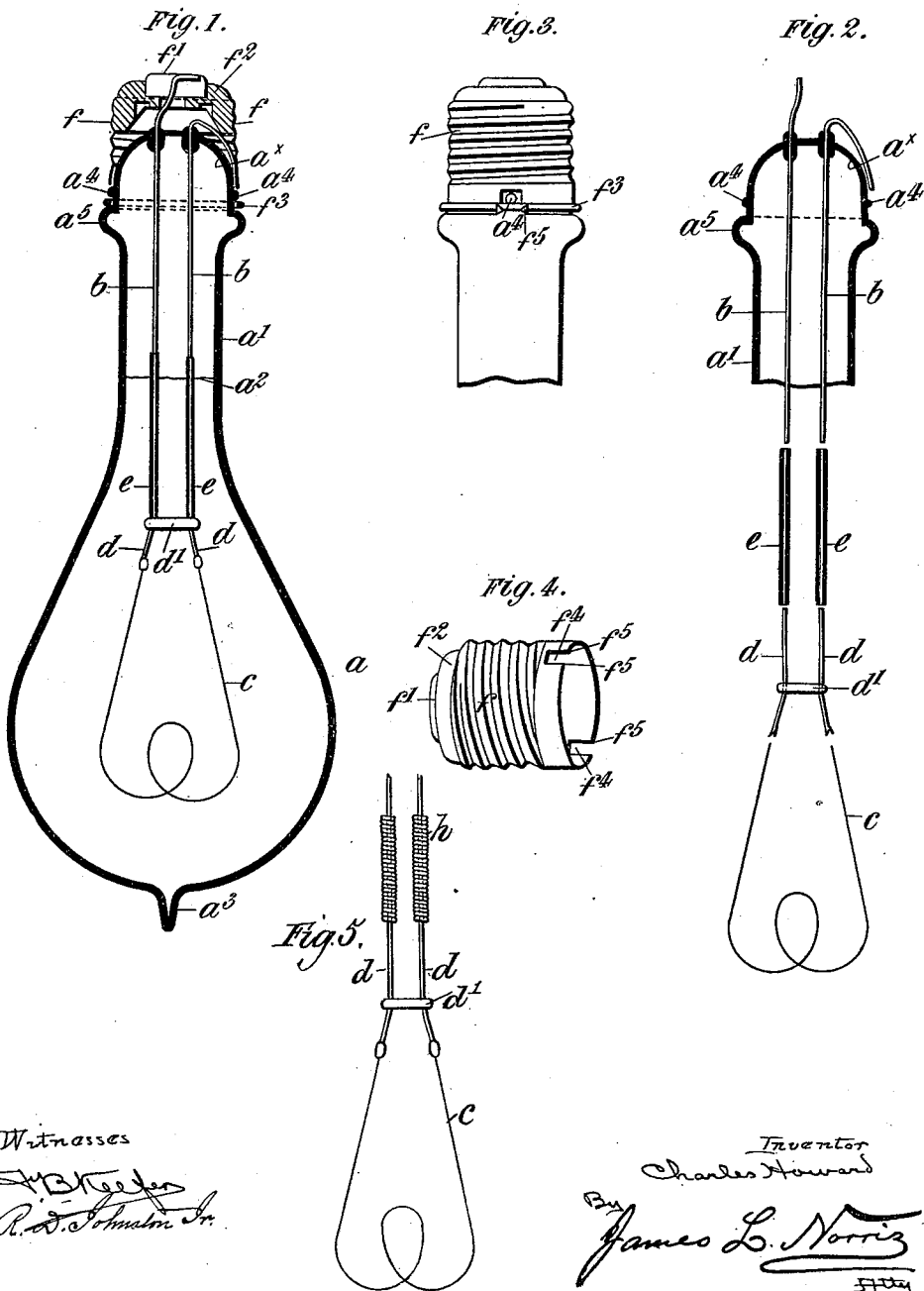
No. 622,151.

Patented Mar. 28, 1899.

C. HOWARD.
ELECTRIC INCANDESCENT LAMP.

(Application filed May 7, 1898.)

(No Model.)



Witnesses
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C. D. Schmalz, Jr.

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UNITED STATES PATENT OFFICE.

CHARLES HOWARD, OF LONDON, ENGLAND.

ELECTRIC INCANDESCENT LAMP.

SPECIFICATION forming part of Letters Patent No. 622,151, dated March 28, 1899.

Application filed May 7, 1898. Serial No. 680,056. (No model.)

To all whom it may concern:

Be it known that I, CHARLES HOWARD, a subject of the Queen of Great Britain, residing at 345 Fulham road, London, England, have invented certain new and useful Improvements in and Relating to Electric Incandescent Lamps, of which the following is a specification.

This invention relates to electric incandescent lamps, and has for its chief object to construct such lamps so that they can be repaired in a very simple and inexpensive manner after the filaments become broken.

A further object is to provide caps of a kind which can be effectually secured to the lamp without the use of cement.

According to the said invention the bulbs are provided with elongated or tubular necks, which instead of being blown in one piece with the bulb are connected thereto by fusing or otherwise, so that the said neck can be readily cut or divided along the line of contact to enable a broken filament to be removed and replaced by a fresh one. The said filament instead of being secured directly to the terminal wires is attached to two short lengths of wire distinct from the said terminal wires, and means are provided whereby these short lengths of wire can be readily connected to or detached from the corresponding terminal wires, thus securing the advantage of a wire connection only being required when the filament is to be secured in place and obviating the use of paste, cement, or the like. The caps above referred to are formed substantially in the manner usual with caps having a central terminal, but are adapted to be secured in position by wires, bands, or the like tied tightly around them and engaging small projections or lugs of the neck of the lamp.

In order that the invention may be clearly understood and readily carried into effect, I will proceed to describe the same fully by aid of the accompanying drawings, in which—

Figure 1 is a vertical central section of one construction of lamp according to the invention. Fig. 2 is a part section showing the filament and its connections separate from each other. Fig. 3 is a detail view in elevation showing the mode of securing the cap to the lamp. Fig. 4 is a perspective view of the cap

detached. Fig. 5 is a vertical section showing another arrangement, in which a spring is employed for effecting this connection. 55

a is the bulb of the lamp, and a' is the elongated or tubular neck thereof, which consists of two parts fused together around their line of contact a^2 . The main purpose of making the neck in this way is so that on account of its length and comparatively small diameter the two parts thereof can be readily separated by cracking or cutting the neck on line a^2 , say by means of a hot wire, and can afterward be fused together without injuring the bulb or disturbing the terminal wires where they pass through the glass. 65

$b b$ are the terminal wires, and c is the filament of the lamp. It will be seen that this filament instead of being secured directly to the said terminal wires is secured to a pair of short wires d , of platinum, nickel, or other suitable metal, which are held together by a small bead of glass d' , the affixing of the filament to these short wires being effected prior to the insertion thereof in the lamp, thus rendering the manipulation much simpler than that required in cases where the filament has to be secured to the wires while inside the bulb in the ordinary manner. A supply of filaments thus attached to wires d may, for instance, be kept in stock ready for insertion in the lamps. 75

The means for connecting the wires d to the terminal wires b comprise two capillary tubes $e e$, of copper or other suitable metal. These tubes are adapted to fit tightly on the ends of the terminal wires, and their free ends serve as sockets to receive and retain the ends of the short wires carrying the filaments. The tubes $e e$ thus provide an efficient mechanical and electrical connection without resorting to any fusing or soldering of the ends together, while such connection can, however, be readily detached, if desired, by simply drawing out the short wires d . 95

Supposing the lamp to have been in use and the filament to have been broken, it is only necessary to crack the glass around the line a^2 and to separate the part carrying the terminal wires and filament from the bulb, thus withdrawing the said filament from the latter. It is then only necessary to withdraw the short wires d from the capillary tubes and 100

to insert therein the corresponding wires of a new filament. The two parts of the neck can then be fused together again on the line a^2 and the lamp be reëxhausted, which latter
5 operation can be performed in a manner which will be readily understood by breaking the tip or point a^3 of the lamp.

f is the cap of the lamp or, rather, the outer metallic portion or shell of the said cap, f' being
10 the central terminal thereof and f^2 the insulating material in which the said terminal is set. It will be seen that the shell f is formed with a screw-threaded surface, so that it can be readily secured in a holder in the ordinary
15 manner.

The connection between the cap and the lamp is effected by means of a wire f^3 in the following manner: In the closed end a^x of the
20 lamp-neck are formed two small projections or lugs a^4 , which are adapted to enter two notches or recesses f^4 in the lower edge of the cap, so that the said edge extends beyond these projections or bosses and rests upon a collar or shoulder a^5 . The wire f^3 is then
25 passed around the cap and twisted up tightly below the said projections, so as to press the lower edges of the cap tightly against the glass. The corners f^5 of the notches f^4 are next turned or bent up over the said wire,
30 which being thus in engagement both with the projections f^4 and with the cap serve to lock the latter securely to the lamp.

In the arrangement shown in Fig. 5 the connection between the terminal wires and
35 the short wires attached to the filament is effected by means of fine coiled springs h ,

which take the place of the capillary tubes above referred to. The advantage of these springs is that they possess a greater amount of flexibility than the said tubes. In other
40 respects the arrangement is substantially the same as those hereinbefore described.

What I claim is—

1. In an electric lamp, the combination with a bulb having an elongated neck, of circuit-
45 terminal wires fused in said neck, a filament, supplemental conducting-wires to which said filament is secured and tubes surrounding said terminal and supplemental wires, frictionally engaging the same and capable of
50 longitudinal movement with respect to both of said wires.

2. In an electric lamp the combination of a bulb, an elongated neck on said bulb, projections on said neck, a cap having notches or
55 gaps to receive said projections, and means external to the cap for locking said cap to said projections substantially as described.

3. In an electric lamp the combination of an elongated neck, projections on said neck, a
60 cap having notches or gaps to receive said projections, a wire extending around the lower edge of said cap below such projections, and turned-up corners on such edge to engage said wire substantially as described.
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In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CHARLES HOWARD.

Witnesses:

CHAS. B. BURDON,
H. ASHBY NORRIS.