

(No Model.)

H. GREEN.
INCANDESCENT LAMP.

No. 553,673.

Patented Jan. 28, 1896.

Fig. 1.

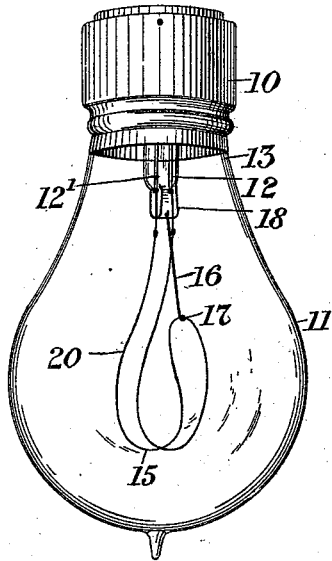


Fig. 2.

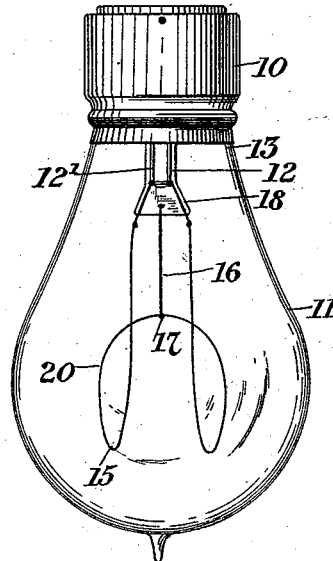


Fig. 3.

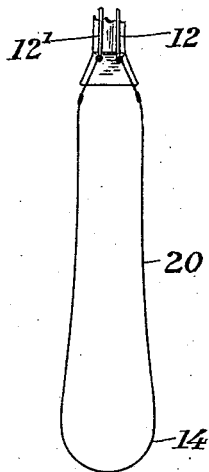
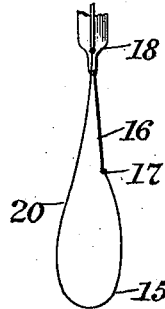


Fig. 4.



Witnesses:
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Inventor:
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UNITED STATES PATENT OFFICE.

HENRY GREEN, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE ÆTNA
ELECTRIC COMPANY, OF SAME PLACE.

INCANDESCENT LAMP.

SPECIFICATION forming part of Letters Patent No. 553,673, dated January 28, 1896.

Application filed April 16, 1895. Serial No. 545,849. (No model.)

To all whom it may concern:

Be it known that I, HENRY GREEN, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Incandescent Lamps, of which the following is a specification.

This invention relates to an improvement in electric lamps of that class commonly known as "incandescent" lamps, as distinguished from "arc" lamps.

The object of the invention is to dispose a filament in the bulb so that the same will constitute a loop bent upon itself, and by such disposition of the filament practically free the same from vibration, and so that a much larger filament with relation to its length, together with a much smaller bulb than is now in ordinary use, can be obtained with a corresponding increase of light; and a further object of the invention is to provide means whereby said filament will remain in bent abnormal position.

In the accompanying drawings, forming part of this specification, Figure 1 is a side perspective view of the improved filament as disposed in an electric-lamp bulb. Fig. 2 is a front elevation of the same as shown in Fig. 1. Fig. 3 is a view showing the filament detached from the bulb and before the same is bent in transverse direction. Fig. 4 is a side elevation of the same, showing the filament after the same has been bent in its transverse direction and having the anchor or holding-piece attached thereto.

Similar characters indicate like parts in all the figures of the drawings.

The invention consists, in the preferred form thereof herein shown and described, of the metallic bulb-holder 10, provided with a bulb 11, supported thereby.

The filament (designated in a general way by 20) is connected in the ordinary manner to the positive and negative conductors 12 and 12' of the ordinary construction, said conductors leading from the shank 13 of the bulb and connecting with the usual contact-pieces, (not shown,) whereby the current is conducted to and away from the lamp.

The filament 20, after the same is attached to the conductors, is first bent into the form

of a single loop 14, preferably enlarged at its lower end, as shown, for instance, in Fig. 3, whereby the middle portion of the filament is brought under considerable tension in one direction and under some tension around its entire length. The filament at or below the middle portion of its length is then bent in a transverse direction, (shown, for instance, in Figs. 1, 2, and 4,) forming a second loop 15, likewise preferably enlarged at its lower end. By this second bending of the filament in a direction transverse to the first loop said filament is brought under a further tension, so that when the anchor or holding-piece, hereinafter described, is disposed in position connecting said filament with the holder said filament is under a tension in two directions transverse to each other, and by its second flexure from its practically normal to its abnormal position it has a constant tendency, owing to its construction, to spring from such abnormal bent position (shown, for instance, in Figs. 1, 2, and 4) toward its normal position. (Shown, for instance, in Fig. 5.) Therefore, owing to its high spring-tension, the vibration thereof, when brought to a state of incandescence, is very materially restricted and practically eliminated, except by violent movement of the bulb or support, so that in use the lamps made in accordance with this invention are much longer lived than those in which the filament is brought under tension in only one direction or in two directions, but without such a tension as would cause it to spring back toward its normal position unless positively held in such abnormal position. Moreover, in practice the tension exerted on the filament by bending the same in two directions also operates as a test for detecting weak filaments, as such bending causes filaments having weak spots therein to break, thereby saving in practice the work and time usually expended in completing such lamps having filaments with weak spots.

The filament is so constructed, as before stated, that when bent under relatively-high spring-tension into its abnormal position, forming the second loop, it has a constant tendency to spring back toward its normal first-loop position, (shown, for instance, in Fig. 5,) and in order to keep said filament in

such abnormal bent position, (shown, for instance, in Figs. 1, 2, and 3,) and therefore under relatively-high spring-tension, an anchor or holding-piece 16 is provided, having one end connected to the free end of the loop, as at 17, preferably at the middle thereof, and its other end sealed in the seal 18 of the bulb or holder, whereby the filament is held with such high spring-tension out of its normal position that vibration thereof is practically eliminated, as before stated.

I claim as my invention—

1. In an electric lamp, the combination with a bulb having electric conductors therein; of a filament connected to said conductors, and bent to form an enlarged loop under tension, and bent out of its normal first-loop position into abnormal transverse position to form a second enlarged loop, under relatively-high spring tension, whereby said filament has a constant tendency to spring back toward its normal first-loop position; and means for holding said filament in its abnormal position, and thereby prevent said filament from springing back toward its normal first-loop position, and whereby vibration thereof is substantially eliminated, substantially as described.

2. In an electric lamp, the combination with a bulb having electric conductors therein; of a filament connected to said conductors, and bent to form an enlarged loop under tension, and bent out of its normal first-loop position into abnormal transverse position to form a second enlarged loop, under relatively-high

spring tension, whereby said filament has a constant tendency to spring back toward its normal first-loop position; and an anchor having one end connected to said filament adjacent to its free upper portion, and its other end connected to said bulb, whereby said filament is held in its abnormal bent position under high spring tension, and is prevented from springing back toward its normal first-loop position, and whereby vibration thereof is substantially eliminated, substantially as described.

3. In an incandescent electric lamp, the combination with a bulb having electric conductors therein, of a filament connected to said conductors and bent to form a loop under tension, and whereby said filament will be under tension in one direction; and bent out of its normal first-loop position into abnormal position to form a second loop under relatively-high spring tension, and whereby said filament will be under tension in another direction and whereby said filament has a constant tendency to spring back toward its normal first-loop position; and means for holding said loop in its abnormally-bent second-loop position, and thereby prevent its springing back toward its normal first-loop position, and whereby vibration of said filament is substantially eliminated, substantially as described.

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