(No Model.)

G. A. FREI.

INCANDESCENT ELECTRIC LAMP.

No. 497,957. Patented May 23, 1893.

Fig. 1.

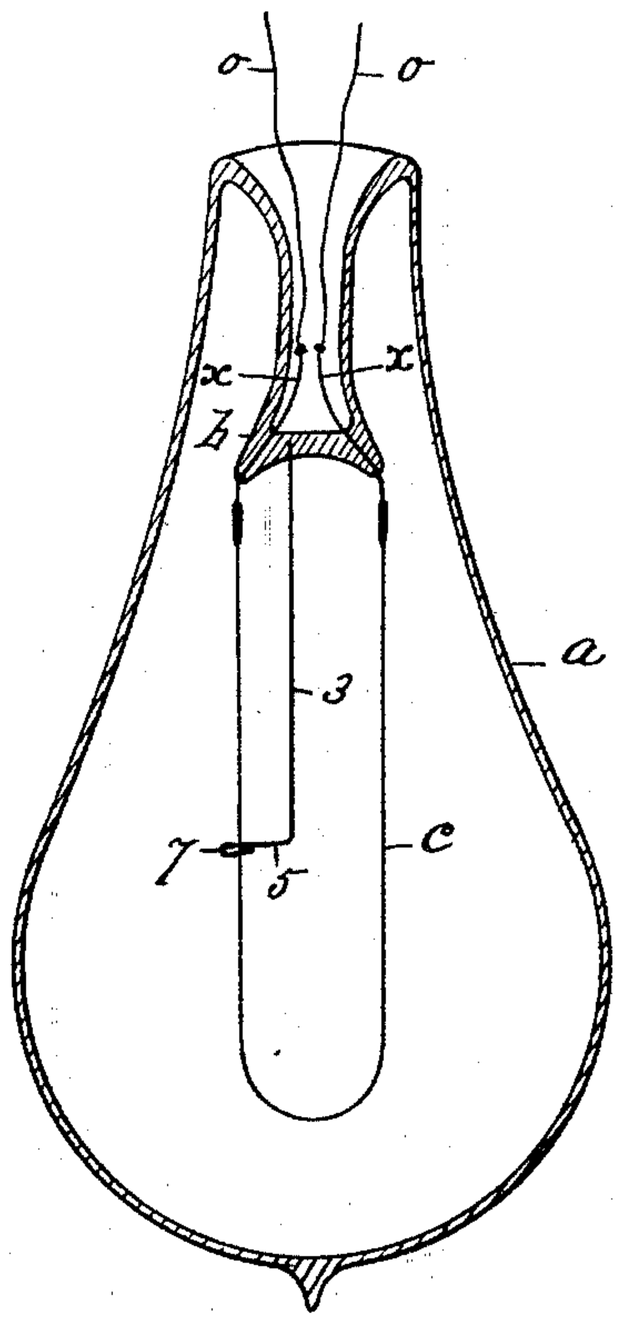


Fig. 3.

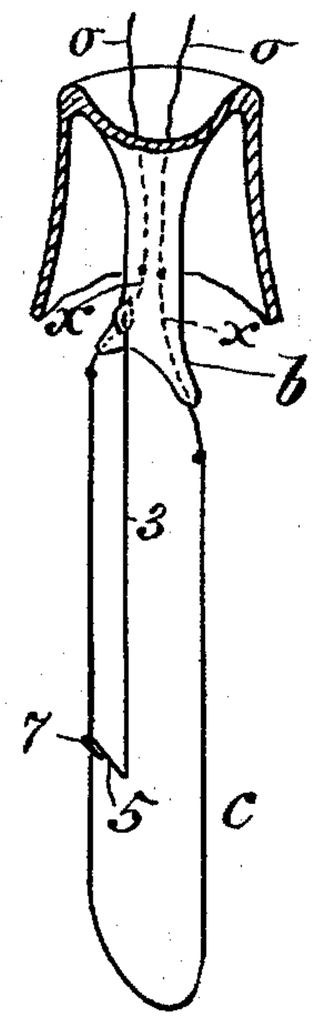
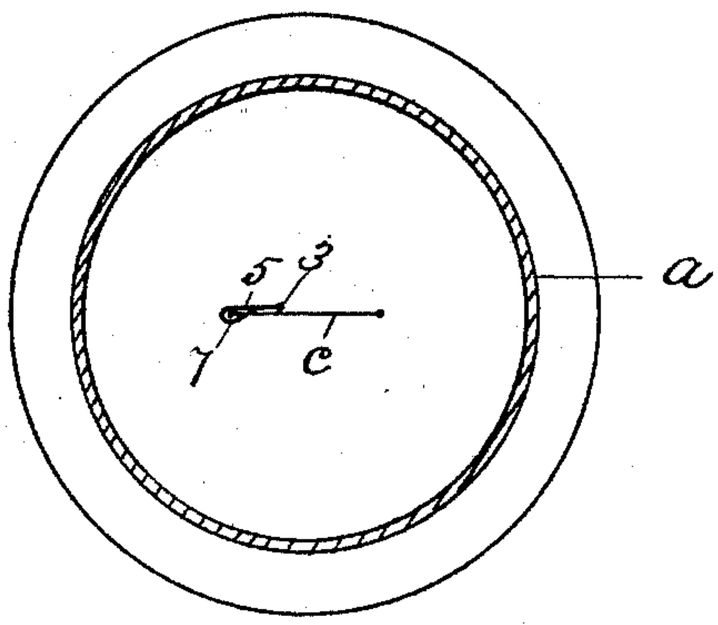


Fig. 2.



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INCANDESCENT ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 497,957, dated May 23, 1893.

Application filed February 7, 1893. Serial No. 461,309. (No model.)

To all whom it may concern:

Be it known that I, GUSTAV A. FREI, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Incandescing Electric Lamps, of which the following is a specification.

This invention relates to incandescing electric lamps, the object being to provide an improved filament support for such lamps, all as hereinafter fully described.

In the drawings forming part of this specification, Figure 1 is a vertical section of an incandescing electric lamp having a filament support or anchor applied thereto constructed and arranged in relation to the filament and the mount of the lamp, according to my invention. Fig. 2 is a transverse sectional view of the lamp showing the lower end of the filament, and the arm of the anchor in engagement therewith, Fig. 3 is a perspective view of a section of the lamp-bulb, the filament and the mount, and the filament-anchor attached to the latter,

In the drawings, *a* indicates the bulb of the lamp, *b* the mount, and *c*, the filament thereof.

The above referred to main parts of the lamp are constructed in the usual manner, the conducting wires, *o*, *o*, entering the mount, as shown, and having united thereto the usual platinum leading-in wires, *x*, *x*, passing through the lower end of the mount and having said filament attached to said wires, *x*, in the usual manner.

Incandescent lamps, used in street cars or other places where they are subjected to vibration, are usually made with supported filaments. The supports or anchors are usually fastened to the walls of the bulb, either directly opposite the bend of the filament or at an angle of forty-five degrees thereto. But in most cases this support or anchor prevents the filament from expanding when brought to an incandescent state by the electric current and prevents, more or less, its free contraction when the filament is cooling off. Such is the case, especially if the loop of an anchor surrounds the base of the U of the filament, said anchor being suitably supported in that position, for the anchor thus attached to the filament prevents the above mentioned free expansion and contraction thereof. All lamps containing such filament anchors are useless, after the filament is burned out, as it is impossible to renew the filament when it is anchored against the walls of the bulbs.

To obviate the above mentioned inconveniences, I construct the filament anchor, 3, of a piece of suitable wire, preferably of steel, one end of which I bend at right angles to the main portion of the wire, thus forming a filament supporting arm, 5, thereon, on the end of which is formed an open loop, 7. The said filament support or anchor, 3, is attached, by one end, to the mount, *b*, of the lamp by fusion, the support, when so attached extending, or hanging, in substantially the same direction as does the filament, or substantially parallel with the longitudinal portions of the latter. This manner of attaching the support, or anchor, 3, to the glass mount constitutes such a firm connection of the support to the mount that no ordinary movement or vibration of the lamp can displace it. It will be understood that the mount, *b*, the filament, *c*, and the said wires connected to the filament are constructed preparatory to uniting the mount to the neck of the bulb, in the usual manner, and that the support, or anchor, 3, is applied to the mount and to the filament before the mount and its connected parts are attached to the neck of the bulb, *a*. The length of the anchor, 3, is generally arranged in such a way that the loop, 7, thereon will be brought about midway between the ends of the filament, or, if preferred, slightly nearer the curved lower end of the latter than to its opposite end. Thus the said location of the supporting coil of the anchor about midway between the ends of the filament provides an improved support therefor. The manner of attaching one end of the anchor, 3, to the outer side of the mount, is clearly illustrated in Fig. 3.

In assembling the filament and the anchor on the mount preparatory to putting the latter into the bulb the anchor is first attached to the lower end of the mount, as described, and one arm of the filament is passed through the loop, 7, on the anchor and the ends of the filament are then cemented to the leading-in wires, *x*, *x*. Thus it will be seen that the sealing of the filament, including the support or

anchor, is no more difficult to effect than it is in lamps in which the filament is not anchored, while the peculiar construction and arrangement of the anchor, relative to the filament, allows the latter to expand and contract with perfect freedom, and the filament is easily renewed after one shall have been burned out.

In renewing the filament in burned out lamps of the last named construction, the lamps are opened in the usual way, washed, and the old filament taken out. The new filament, with one side slipped through the loop of the supporting wire, is then fastened to the leading-in wires in the usual way.

What I claim as my invention is—

1. In an incandescing electric lamp, a metallic filament-anchor having one end attached to the lamp-mount, and extending therefrom toward the opposite end of the lamp, and having a loop on its free end to receive one arm of the filament, substantially as set forth.

2. The combination with the filament of an incandescing electric lamp, of a filament-anchor attached by one end to the lamp-mount and extending therefrom toward the opposite end of the lamp, and having a loop on its free end to receive one arm of the filament, substantially as set forth.

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