(No Model.)

E. P. THOMPSON.

MANUFACTURE OF INCANDESCENT ELECTRIC LAMPS.

No. 370,999. Patented Oct. 4, 1887.

Fig. 2,

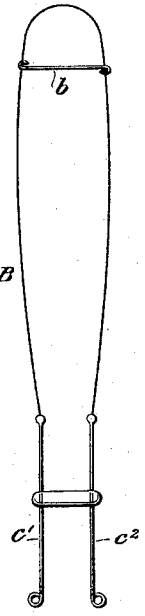


Fig. 1,

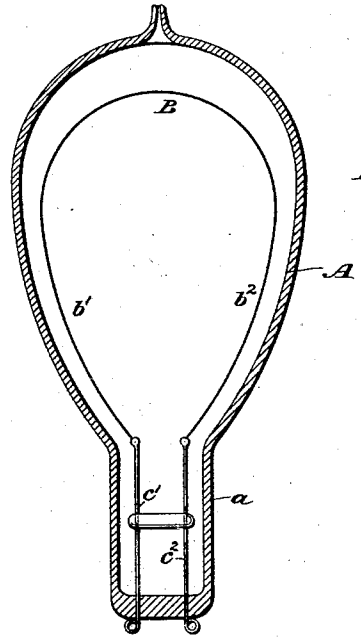


Fig. 3,

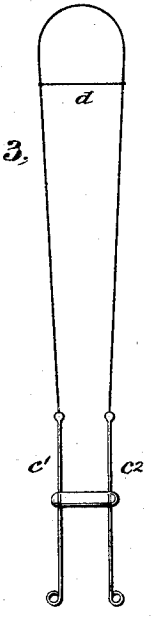


Fig. 4,

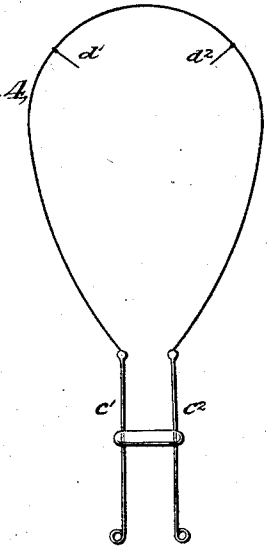
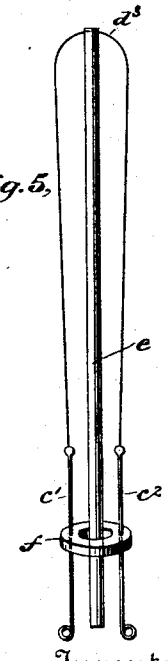


Fig. 5,



Witnesses

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UNITED STATES PATENT OFFICE.

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MANUFACTURE OF INCANDESCENT ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 370,999, dated October 4, 1887.

Application filed January 22, 1887. Serial No. 225,120. (No model.)

To all whom it may concern:

Be it known that I, EDWARD P. THOMPSON, a citizen of the United States, residing in Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in the Manufacture of Incandescent Electric Lamps, of which the following is a specification.

The invention relates to the method of inserting the filaments into the globes of incandescent electric lamps.

The object of the invention is to provide a lamp in which the filament has greater width or the limbs of the filament are separated a greater distance than the diameter of the opening through which it is inserted. To accomplish this the limbs of the filament are bent toward each other before it is inserted, and held by means of a band or thin strip of any suitable material, which may be removed by the heat of the filament after it is inserted in the lamp. The filament itself is preferably made of a peculiar shape, which permits it to be bent in the required form without danger of breaking.

The invention will be described more particularly in connection with the accompanying drawings, in which—

Figure 1 illustrates the completed lamp, and Fig. 2 illustrates the filament before it is inserted and after it has been bent preparatory to its insertion. Figs. 3 and 4 illustrate a modified method of carrying out the invention. Fig. 5 illustrates another modification in the method of bending the filament.

Referring to the figures, A represents the globe of an incandescent electric lamp, and *a* the neck through which the filament B is inserted. The filament is made, preferably, with its sides extended, as shown at $b' b^2$, to conform somewhat to the surface of the walls of the globe. The upper portion of the filament B is preferably flattened, and does not extend so near the wall as the side portions or limbs of the filament. The filament is supported upon leading-in wires c' and c^2 in the usual manner. The neck *a* of the globe, it will be observed, is much narrower than the distance between the two limbs of the filament. In order to insert a filament of this shape it is necessary to bend the limbs together. To accomplish this at the time it is inserted would be a matter of considerable difficulty, if not entirely impracticable, and it is therefore first desired to prepare the filament by bending the limbs together and holding them in the required position, and this is accomplished by bending the loop portion together by hand or in any convenient manner, preferably after the filament is mounted upon the leading-in wires, and holding the same in position by means of a thin ligature, which may consist of a thin wire of platinum, *b*, having its ends bent round the respective limbs of the filament; or it may be of fine glass wire or thread or a strip of magnesium. In either case, after the filament is inserted and properly secured in position, a current of electricity sent through the filament will cause the thread or ligature to fuse and drop from the filament. In case it is magnesium it may be desirable to fuse it after the lamp has been evacuated and sealed, for the reason that the burning of the magnesium will absorb a certain amount of oxygen, and thus increase the vacuum.

In Figs. 3 and 4 the invention is illustrated as having the ligature composed of a thin filament, *d*, of carbon, which has a resistance greater than that of the filament itself, and which will therefore be fused by a high current. This filament, when broken, will leave small projecting points $d' d^2$, which serve as discharge-points for the static electricity with which the filament is charged when the lamp is lighted and extinguished, and they serve to lengthen the life of the lamp.

Instead of bending the limbs of the filament together by means of ligatures, in some instances it may be preferred to use a method as shown in Fig. 5, which consists in pressing the loop of the filament upward by means of a suitable rod, *e*, extending between the leading-in wires and the arms of the filament against the loop portion d^3. By pressing this upward the loop may be narrowed. The rod is removed after the filament is inserted, and thereupon the filament assumes its natural position. This is facilitated by the employment of an annular bridge-piece or support, *f*, for holding the wires $c' c^2$ in their proper relative positions.

The light from the widened loop of the fila-

ment is more diffused than it is from a filament of the usual narrow form, and is therefore less trying to the eyes. An advantage is secured by having the upper portion of the loop farther removed from the glass wall than the other portions, because the point of sealing, which is more likely to break under the influence of heat, is subjected to less heat.

I claim as my invention—

1. The hereinbefore-described method of inserting filaments into incandescent electric lamps, which consists in bending the arms of the filament toward each other and temporarily securing them in such position by a ligature, inserting them into their globes, and subsequently removing the retaining-ligature by heat.

2. The hereinbefore-described method of inserting a filament of greater width than the opening into an incandescent electric lamp, which consists in bending the arms of the filament together, holding them together by a ligature, inserting the filament while so bent, and after it is inserted within the globe allowing the arms to separate.

3. A filament for incandescent electric lamps, having its limbs bound together, substantially as described.

4. A filament for incandescent electric lamps, having its loops bent and the limbs drawn toward each other, and a ligature holding the same, consisting of a material adapted to be broken by heat.

5. The combination, with the globe of an incandescent electric lamp, of a filament inserted within the same of greater width than the opening, and flattened across its upper portion, substantially as described.

6. The hereinbefore-described process of forming incandescent electric lamps, which consists in binding the limbs of the filament together, before it is inserted, by a glass ligature, inserting the filament while so bound through the neck of the globe of the lamp and securing it in position, and in melting such ligature, thereby allowing the filament to expand, substantially as described.

In testimony whereof I have hereunto subscribed my name this 19th day of January, A. D. 1887.

EDWARD P. THOMPSON.

Witnesses:
DANL. W. EDGECOMB,
CHARLES A. TERRY.