(No Model.)

# T. B. ATTERBURY.

## MANUFACTURE OF INCANDESCENT ELECTRIC LAMPS.

No. 574,370. Patented Jan. 5, 1897.

*Fig. 2.*

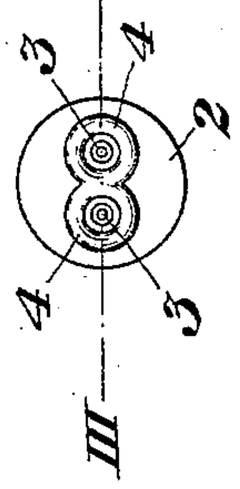



*Fig. 3.*

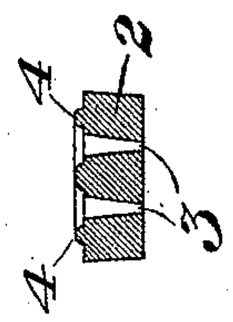
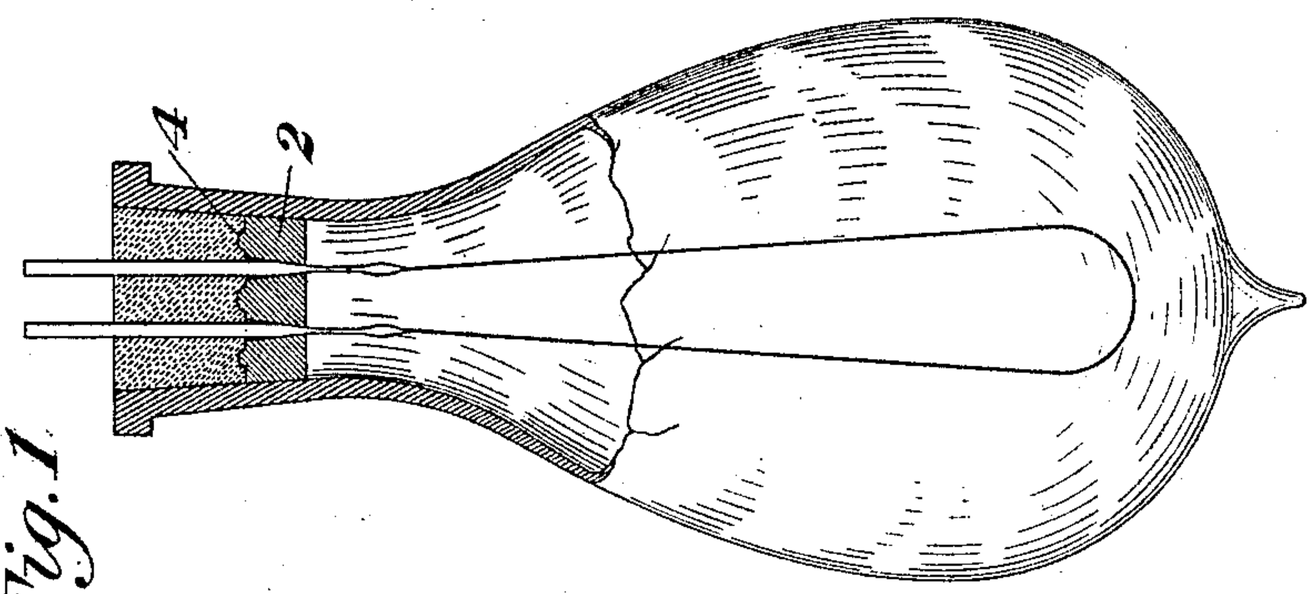



*Fig. 1.*




WITNESSES

N. B. Corwin

H. M. Corwin

INVENTOR

Thomas B. Atterbury
by his attorneys
Bakewell & Serrs

# UNITED STATES PATENT OFFICE.

THOMAS B. ATTERBURY, OF PITTSBURG, PENNSYLVANIA.

## MANUFACTURE OF INCANDESCENT ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 574,370, dated January 5, 1897.

Application filed December 18, 1894. Serial No. 532,207. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS B. ATTERBURY, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in the Manufacture of Incandescent Electric Lamps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a sectional view of an incandescent electric lamp constructed in accordance with my invention and partly broken away, and Figs. 2 and 3 are top plan and vertical views of the stopper employed by me.

My invention relates to the manufacture of stopper incandescent lamps; and it has for its objects, first, to dispense with the trouble and expense of grinding the stopper and the bulb-neck of the lamp, as has been usual heretofore in the construction of lamps of this character; second, to greatly decrease the expense of making the stopper; third, to prevent the formation of bubbles about the leading-in wires, and, fourth, to provide a lamp which is as durable and efficient as an all-glass lamp and also permits of the removal of the stopper and the insertion of a new stopper and filament, if found necessary or desirable.

In carrying out my invention in its preferred form I first press the stopper shown in Figs. 2 and 3, a mold being preferably employed for this purpose which forms a large number of these articles simultaneously. This stopper, as shown, consists of a disk 2, having holes 3 for the insertion of the leading-in wires with which the filament is connected. These holes are preferably tapered, as shown, to fit the correspondingly-tapered base portions of the wires, and around each hole is preferably formed an annular rim or boss 4 for the purpose of retaining the cementing material in position about the wires. The wires are then placed in the holes and the stopper inserted in the bulb-neck of the lamp. Vitrifiable enamel or cement is then filled in above the stopper and around the leading-in wires and the article is heated to fuse and vitrify the enamel, which then serves to both secure the wires in the stopper and the stopper in the neck of the lamp, as indicated in Fig. 1.

The vitrifiable enamel or cement which I employ in carrying out my invention may be of any composition well known in the arts which is found to be suitable for use in connection with the particular kind or quality of glass of which the lamp-bulb is composed, and it may be applied in such form as is found most advantageous in practice, both as regards convenience of manipulation and ready fusibility. The particular enamel employed in any case must obviously be fusible at a lower temperature than the glass of which the bulb-neck and stopper are composed, and it should also obviously have substantially the same coefficient of expansion when subjected to changes in temperature, for the reason that any inequality in the expansion of the enamel and the parts which it unites would tend to result in rupture of the parts and consequent destruction of the vacuum in the lamp-bulb.

The advantages of my invention will be apparent to those skilled in the art, since the formation of bubbles between the glass and the leading-in wires, which often occurred when the stopper was pressed about the wires, is entirely obviated.

A less quantity of glass is employed in making the stopper, and as no such accuracy in fit between the stopper and the bulb-neck is required as is necessary when the stopper and bulb-neck are ground together the expense of manufacture is greatly reduced.

My invention not only enables me to dispense with the grinding of the stopper and the bulb-neck, but also permits of the melting of the enamel by a suitable application of heat, and the substitution of a fresh filament for one that has been burned out, if such repairing is found necessary or desirable.

The wires may be cemented into the stopper before placing it in the lamp. If desired, the enamel used may be in the form of dry powder or other mixture, and many variations in the shape and size of the stopper, the bulb-neck, &c., may be made without departing from my invention.

I desire it to be also understood that my invention is not limited to cementing the leading-in wires into holes in the stopper, it being intended to cover the cementing of the stopper into the bulb-neck irrespective of the char-

acter of the union between the stopper and leading-in wires.

I claim as my invention—

1. The method of making incandescent lamps consisting in cementing an unground perforated stopper in the lamp by vitrifiable enamel or cement, and then heating to vitrify said enamel, substantially as described.

2. The method of making incandescent lamps consisting in forming an unground stopper with holes therein, placing wires in these holes, inserting the stopper in the lamp, filling in vitrifiable enamel or cement above the stopper, and heating to vitrify the enamel, substantially as described.

3. The method of making incandescent lamps, consisting in pressing an unground stopper with tapered holes therein, placing the wires in these holes, inserting such unground stopper in the lamp, filling in enamel above the stopper, and heating the same, substantially as described.

4. The improvement in the art of manufacturing incandescent electric lamps which consists in applying vitrifiable enamel or cement to the joint between the unground stopper and bulb-neck of a lamp and then heating the said parts until the enamel becomes fused and hermetically cements the stopper and bulb-neck together, substantially as described.

5. An incandescent electric lamp comprising an unground stopper or filament-support, an unground bulb-neck, and a body of vitreous enamel hermetically uniting the said parts, substantially as described.

6. An incandescent electric lamp comprising an unground stopper or filament-support, a bulb-neck and a body of vitreous enamel intermediate said stopper and bulb-neck hermetically uniting said parts.

In testimony whereof I have hereunto set my hand.

THOMAS B. ATTERBURY.

Witnesses:

W. B. CORWIN,

H. L. GILL.