(No Model.)

J. W. TURNBULL.

INCANDESCENT ELECTRIC LAMP.

No. 512,637. Patented Jan. 9, 1894.

Fig. 1.

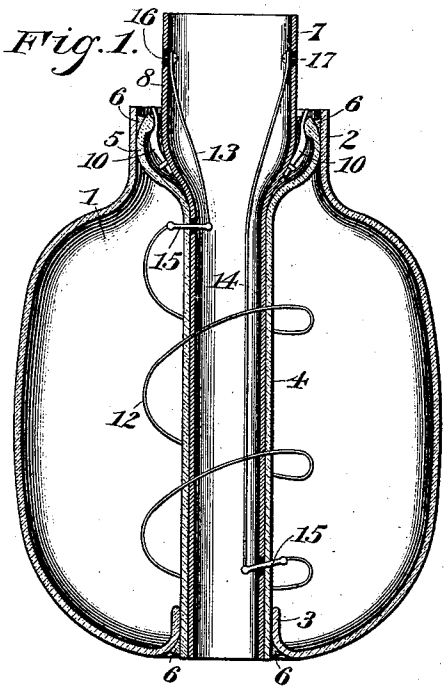


Fig. 2.

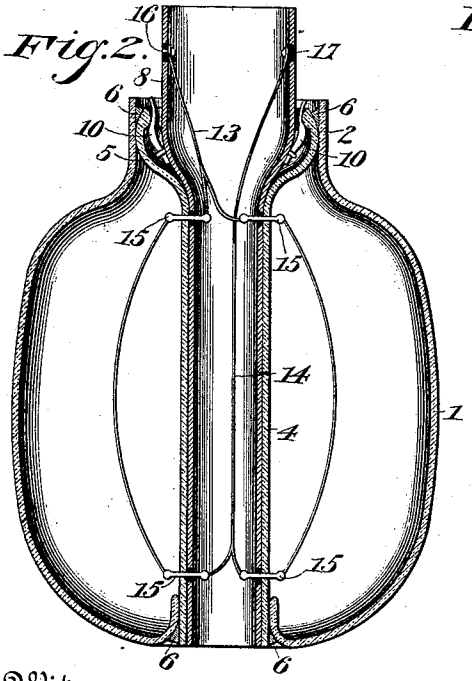
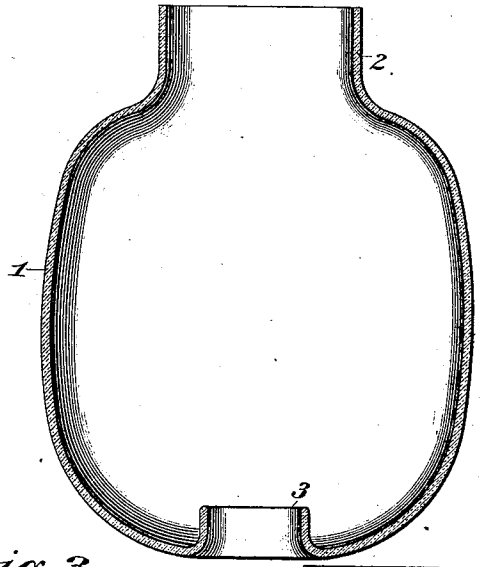
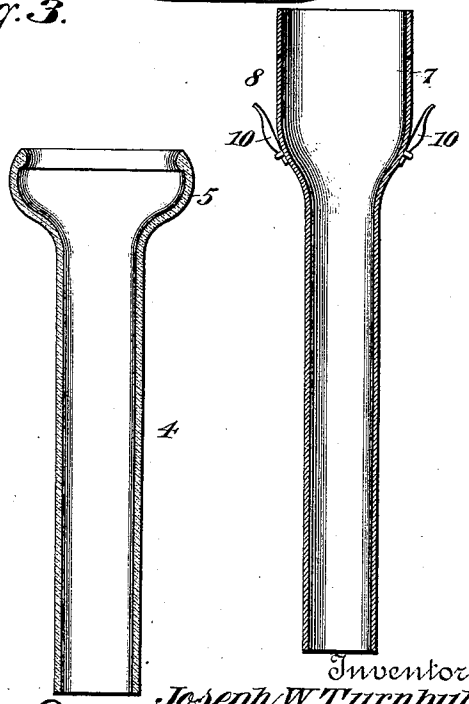


Fig. 3.





Witnesses;

J. M. Witherow.

G. Thayer.

Inventor,

Joseph W. Turnbull.

By Joseph Priestley Atkins

Attorney

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOSEPH W. TURNBULL, OF PASCAGOULA, MISSISSIPPI.

INCANDESCENT ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 512,637, dated January 9, 1894.

Application filed May 2, 1893. Serial No. 472,673. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH W. TURNBULL, of Pascagoula, county of Jackson, State of Mississippi, have invented certain new and useful Improvements in Incandescent Electric Lamps, of which the following is a specification, reference being had to the accompanying drawings.

The object of my invention is to produce an improved incandescent electric lamp in which a central tube or inclosed passage is employed as a means of ventilation for keeping the lamp cool and as a reflector introduced within the filaments, and in which the central tube is made a separable part to provide for the renewal, at a comparatively small cost, of the filaments when they shall have burned out. By the use of the central tube also a new and preferred form of wiring may be employed, wires connected immediately with the filaments being used within the tube.

In the accompanying drawings: Figure 1 is a central vertical section of my lamp, showing the parts assembled and illustrating one method of wiring. Fig. 2 is a similar view, showing another method or wiring. Fig. 3 illustrates a group of the several parts separated.

Referring to the figures on the drawings: 1 indicates a transparent bulb or body part, which may be made of any suitable construction, shape and dimensions.

2 indicates a neck preferably projecting outwardly and 3 a collar of smaller dimensions than the neck and preferably projecting inwardly. The neck and the collar are designed to receive a tube 4, fitted at one end to the collar 3 and having an enlarged head 5 fitted to the inside of the neck 2. The tube is made of glass and is, in practice, accurately fitted to the neck and collar by suitable means, as for instance, grinding. In uniting the bulb to the tube, the former is first expanded by a moderate heat and the tube is slipped into place. When the bulb cools a perfect joint will be formed between the outside of the tube and the inside of the neck and collar, respectively. The parts being so united a vacuum may be created within the bulb by tapping it in the usual manner.

If it is preferred to unite the tube and bulb without heating, a wax joint or seal 6 may be employed between the ends of the tube and the neck and collar, respectively, the object in this connection being to produce a vacuum chamber between the walls of the tube and the walls of the bulb.

7 indicates a wire supporting connection or reflector tube preferably made of a metal cylinder having an outer silvered or burnished coating and adapted to fit within the tube 4 and to form within the same a reflector. It is provided with a socket head 8 to which the line connections may be made. It is also provided with suitable means for retaining it in position, as for instance, spring clips 10 adapted to engage with an annular rim 11 of the head 5.

12 indicates a carbon or filament. It is connected to electric wires 13 and 14 adapted to convey an electric current. These wires are preferably united to connecting pieces 15 preferably made of platinum and embedded in the glass walls of the tube 4. They are also preferably located near the top and bottom of this tube, respectively. The filament may be coiled around the tube, as shown in Fig. 1, having connecting pieces 15 at its lower and upper ends united to the wires 13 and 14; or separate filaments upon opposite sides of the tube may be employed, having both their upper ends connected to the wire 13, for example, and both their lower ends connected to the wire 14, as shown, for instance, in Fig. 2 of the drawings.

In assembling the parts, as above explained, the bulb and tube having been properly fitted, the former is expanded by heat and the latter slipped into place, the filaments having been adjusted before the tube is inserted. Afterward, by tapping the bulb the air may be exhausted from it in the usual manner.

After the lamp is otherwise completed the stopper may be inserted in place and the wires 13 and 14 connected to it, as through insulated screws or contact pieces 16 and 17. In this manner I provide for the perfect ventilation of the lamp, the renewal of the fiber when it is burned out, and means for fastening it to a socket without the use of plaster or any similar permanent joints.

I do not confine myself to the details of construction herein shown and described, but re-

serve the right to modify and vary them at will within the scope of my invention.

What I claim is—

1. The combination with a bulb, of a separable tube, open at both ends, inserted therein and forming therewith a vacuum chamber, substantially as specified.

2. The combination with a bulb, of a separable tube therein, open at both ends, extending entirely through the bulb, and supporting filaments forming thereby a ventilated bulb, and readily removable filament support therein, substantially as specified.

3. The combination with a bulb and tube open at both ends, of a separable open ended reflector therein, substantially as specified.

4. The combination with a bulb and a separable hollow open ended tube extending entirely therethrough, and supporting filaments, of a likewise hollow and open ended burnished tube therein adapted to constitute a ventilated reflector, substantially as specified.

5. The combination with a bulb and tube therein open at both ends, of a separable wire supporting tube in said first named tube, substantially as specified.

6. The combination with a bulb and separable tube, open at both ends, extending entirely therethrough, of another likewise open ended tube within the first named tube adapted to constitute a ventilated reflector and to support connecting wires, substantially as specified.

7. The combination with a bulb and an open ended separable tube, extending therethrough, and supporting filaments, of a wire supporting burnished tube therein, and wires supported thereby, said tube constituting a ventilated reflector, and said wires being adapted to connect the filaments with the circuit wires, substantially as specified.

8. The combination with a bulb, of a separable tube therein, filaments secured upon the exterior of the tube by connecting pieces, a separable wire supporting connection tube upon the interior thereof, and connecting wires within said connection tube adapted to connect said connecting pieces with the circuit wires, substantially as specified.

9. The combination with a bulb provided with an everted neck, of a tube extending therethrough having an enlarged upper end or head adapted to fit within said neck, substantially as specified.

10. The combination with a bulb having an everted neck, of a tube therein having an enlarged head adapted to fit within the neck, and a burnished reflector tube within said first named tube and provided with an enlarged end or socket head adapted to fit within the enlarged head thereof, substantially as specified.

11. The combination with a bulb having a neck and collar at opposite ends thereof, respectively, of a tube adapted to be inserted into the same to form with the walls of the neck and collar an air tight joint, substantially as and for the purposes set forth.

12. The combination with a bulb provided with an everted neck, and an inverted collar, of a separable tube therein supporting filaments, substantially as specified.

13. The combination with a bulb provided with an everted neck and an inverted collar, of a separable filament supporting tube therein, and a hollow reflector within said tube, substantially as specified.

14. The combination with a bulb provided with an everted neck and an inverted collar, of a separable filament supporting tube open at both ends extending entirely therethrough, and a hollow open ended burnished tube supporting connecting wires, said tube constituting a ventilated reflector, and said wires being adapted to connect the filaments with the circuit wires, substantially as specified.

15. The combination with a bulb, of a tube extending therethrough, and another tube inserted therein, said tubes being provided with co-operating mechanism adapted to sustain their proper relations, substantially as specified.

16. The combination with a bulb and a tube extending therethrough, and a superimposed tube thereupon, adapted to constitute the inner wall of a cylindrical vacuum chamber within the bulb, of a plurality of filaments within the vacuum chamber, wires within the inner tube, means for connecting the wires with the opposite ends, respectively, of the filaments, and means for connecting each of said wires with the circuit wires, substantially as specified.

In testimony of all which I have hereunto subscribed my name.

JOSEPH W. TURNBULL.

Witnesses:
ROBERT H. YOUNG,
CHAS. W. BLACKWOOD.