

(No Model.)

E. P. THOMPSON.

MANUFACTURE OF INCANDESCENT ELECTRIC LAMPS.

No. 383,675.

Patented May 29, 1888.

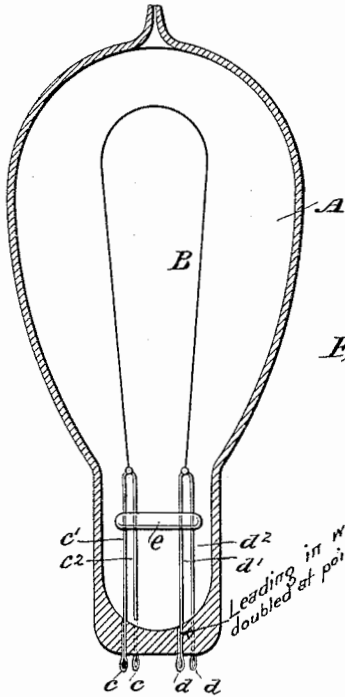


Fig. 1,

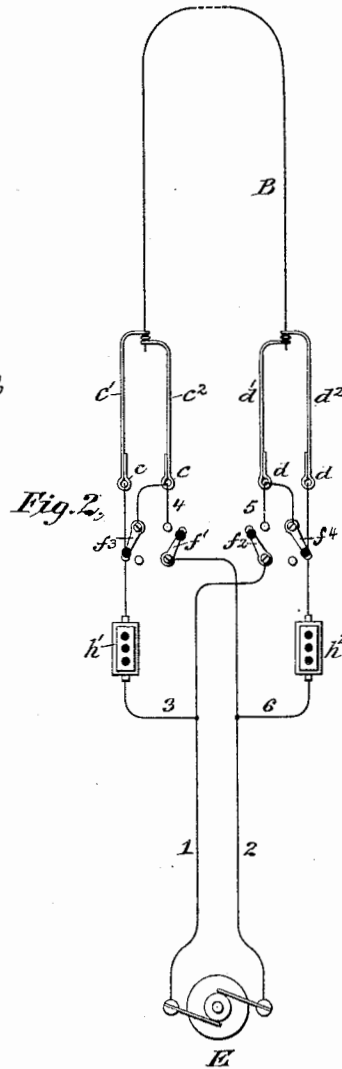


Fig. 2,

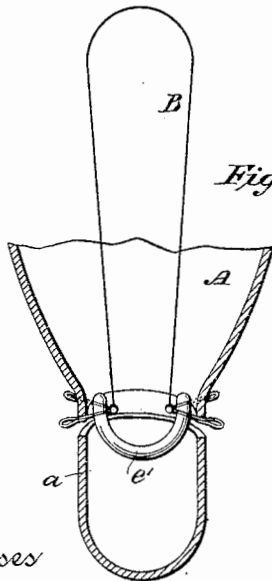


Fig. 3,

Witnesses

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MANUFACTURE OF INCANDESCENT ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 383,675, dated May 29, 1888.

Application filed January 22, 1887. Serial No. 225,117. (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 expelling gases from the leading-in wires of incandescent electric lamps and from the joints of these wires with the filaments.

The object of the invention is to provide means for passing electric currents through the leading-in wires at the respective extremities of the filaments during the process of evacuating the lamps independently of each other and independently of the filaments, and also in preventing the undue heating of the portions of the leading-in wires passing through the wall of the globe.

The invention consists, in general terms, in providing two independent arms for each leading-in wire. These extend through the outer wall of the lamp to the joint of the corresponding end of the filament. These wires may be independently included in an electric circuit by connecting their respective ends with a generator or other source of electricity.

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

Figure 1 is a section of a lamp embodying the features of the invention, and Fig. 2 illustrates the method of connecting the same in circuit during the process of evacuating. Fig. 3 illustrates a modification.

Referring to the figures, A represents the globe of the lamp, and B its filament.

In Fig. 1 the filament is represented as supported upon two pairs of leading-in wires, as shown at $c' c^2$ and $d' d^2$. The wires are each constructed with a loop, $c c d d$, at the outer ends. Preferably the ends of each wire extend back in contact with the portions which pass through the glass of the wall, as shown, rendering such portions of each leading-in wire of greater conductivity than the remaining portion. By reason of this construction the main portions of the leading-in wires may be heated by electric currents to a very high

temperature, by reason of the resistance which they offer, without raising the temperature of the portions passing through the walls to such an extent as to do injury thereto, as such portions allow the current to pass more readily. The heat which would pass to these latter portions by conduction is transmitted so slowly that no injury occurs therefrom. The wires are united at their upper ends to form any suitable form of joint with the filament. The two arms may be formed from a single wire, the upper end or loop being wound upon the end of the filament, as shown in Fig. 2, or in any other suitable manner united therewith. A bridge-piece, e , preferably unites the several parts together and holds them securely in their respective positions.

It is designed that the leading-in wires shall be heated during the process of evacuating by means of currents derived from a suitable source of electricity—as, for instance, a generator, E, (shown in Fig. 2.) The respective poles of this are first connected with the terminals $c c$ of the conductor $c' c^2$ by conductors 1 3 and 2 4, the latter being connected by a switch, f' . At the same time or subsequently the terminals $d d$ of the leading-in wire $d' d^2$ may in like manner be connected with the respective terminals of the generator E by conductors 2 6 and 1 5, the latter being connected by the switch f^2 . It may be desirable in some instances to open the switches f' and f^2 for conveniently completing the circuit-connections with one terminal of each of the leading-in wires independently of the other, and thus cause a current to pass through the filament. The wires 3 4, leading to the respective terminals of the wires $c' c^2$, may be connected together by the switch f^3 , and likewise the switch f^1 will serve to connect the wires 5 and 6, leading to the terminals of the wires $d' d^2$. This renders it convenient to send a current through both wires of the leading-in wires and the filament itself to heat it when it is at the proper stage in the process of evacuating. Adjustable artificial resistances h' and h^2 are inserted in the respective conductors 3 and 6 for the purpose of regulating the current sent through the wires and through the filament.

In Fig. 3 a modified form of lamp is shown, in which the respective terminals of the lead-

ing-in wires are led through the joint of the part forming the neck *a* of the lamp to the globe A, instead of sealing the end by flattening it upon itself, as shown in Fig. 1. The wires are shown in this instance as being held by a curved bridge-piece, *e'*, extending downward into the neck of the lamp. The method of heating the wires is the same as shown in Fig. 2.

The leading-in wires, it is evident, may be employed independently of each other in operating the lamp, if desired; but usually it is preferred to make them of such size that when the two leading to one terminal of the filament are placed in the circuit the resistance will be approximately the same as is usually employed in the lamps employing but a single leading-in wire for each terminal.

An advantage incident to this construction is that it gives a larger amount of contact surface for making electrical connections outside the globe by reason of the four terminals *c c* and *d d*. Another result follows, namely: that the gases which remain within the globe after the lamp has been exhausted to the utmost extent will be absorbed to a more or less extent by the leading-in wires when they are allowed to cool.

I claim as my invention—

1. The hereinbefore-described method of manufacturing incandescent electric lamps, which consists in attenuating the atmosphere within the globe and heating the leading-in wires independently of the filament to a higher temperature during the process of evacuating than they are heated after the lamp is sealed.

2. The hereinbefore-described method of manufacturing incandescent electric lamps, which consists in exhausting the globe and in heating the leading-in wires and their joints independently of the filament during the

process of evacuating to a temperature greater than that which they acquire while the lamp is normally operated.

3. The hereinbefore-described process of manufacturing incandescent electric lamps, which consists in passing a current through each leading-in wire independently of the other and independently of the filament, thereby heating the same to an abnormal temperature during the process of evacuating and thereby expelling the gases therefrom.

4. In an incandescent electric lamp, a filament and two leading-in wires extending from each terminal thereof through the walls of the globe, forming four independent exterior terminals.

5. In an incandescent electric lamp, the combination, with the filament, of a double leading-in wire for each terminal of the filament, the respective arms of which are in electrical connection only at the joint.

6. In an incandescent electric lamp, the combination, with the filament, of a double leading-in wire for each terminal, and a loop at each end of each leading-in wire formed by passing the ends of the wire back through the wall of the globe.

7. The hereinbefore-described process of expelling the atmosphere from the leading-in wires of a filament, which consists in heating to incandescence the portions of the wires within the globe independently of the filament and independently of the wire passing through the wall of the globe.

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

EDWARD P. THOMPSON

Witnesses:

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CHARLES A. TERRY.