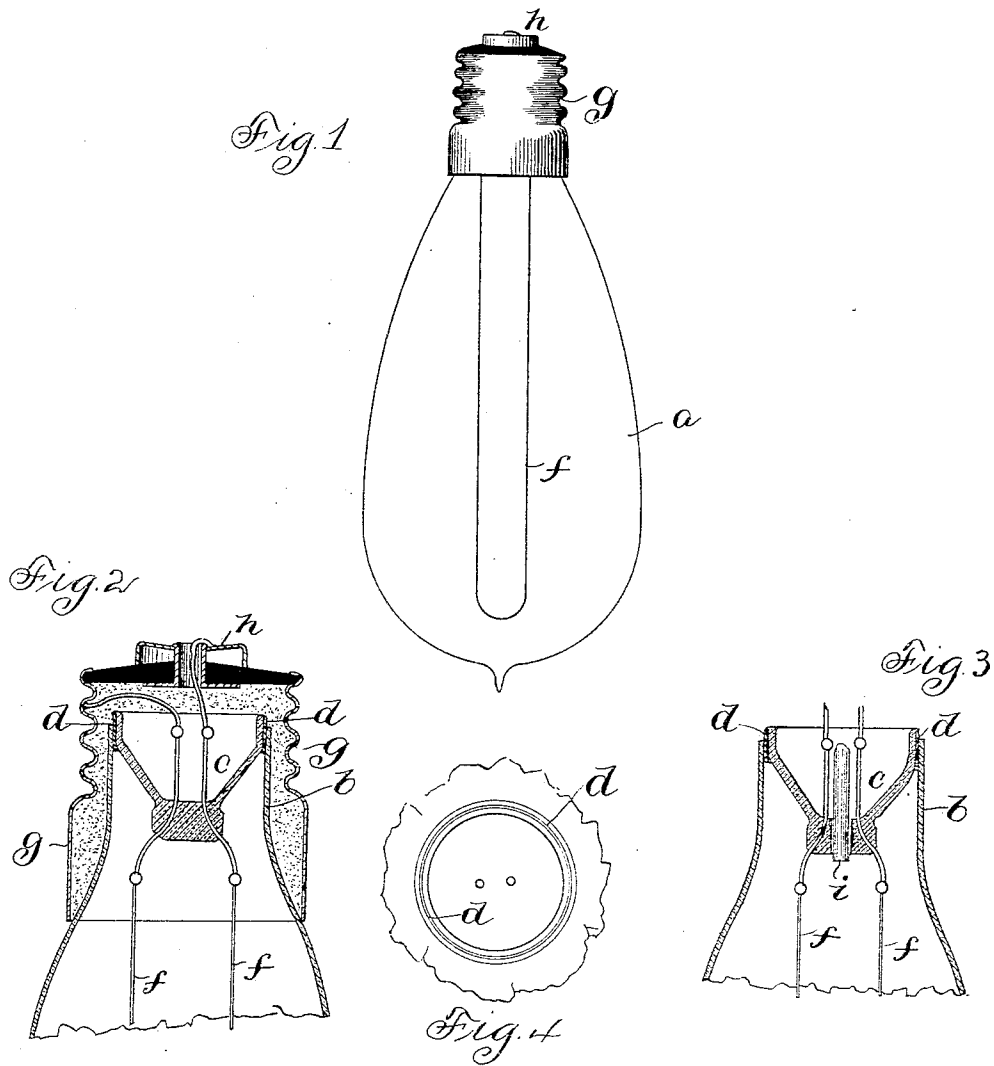


(No Model.)

E. W. APPLGATE.
INCANDESCENT ELECTRIC LAMP.

No. 495,620.

Patented Apr. 18, 1893.



Witnesses
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UNITED STATES PATENT OFFICE.

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INCANDESCENT ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 495,620, dated April 18, 1893.

Application filed January 8, 1893. Serial No. 458,780. (No model.)

To all whom it may concern:

Be it known that I, EUGENE W. APPLGATE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Incandescent Electric Lamps, (Case No. 4,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to incandescent electric lamps and more particularly to that type of incandescent electric lamps in which the inclosing receiver of vacuum chamber is made up of separable or independent parts.

As is well known to those skilled in the art, there are two principal types of incandescent lamps. One type includes lamps having a receiver in one piece made entirely of glass and in which glass receiver the leading-in wires are directly hermetically sealed. This type has been brought to a very efficient condition so far as the completeness of the vacuum and therefore the life of the carbon are concerned; but the serious objection to this type of lamp is that when once the carbon is injured or destroyed, all the other parts of the lamp become useless and not capable of being used over again. The other type of incandescent lamps comprises those lamps in which the inclosing chamber is made up of several separable parts. Hitherto this type of lamp has not been capable of being constructed in a commercially efficient way because the union between the various parts of the vacuum chamber has hitherto been so imperfect and crude that there has been a leakage of air into said chamber, which thereby destroys the carbon strip or rod in a very short period of time. I have been enabled by my invention to construct a separable or stopper lamp of such accuracy and completeness of design that a commercially efficient lamp is the result, a lamp in which the vacuum is substantially as perfect as the vacuum which is found in the present forms of the first type. This result is most important for the following reasons: When the relative cost of the various parts of a lamp is considered it is obvious that in a lamp whose receiver or cham-

ber is in one piece made entirely of glass, when the carbon breaks, or is injured, or becomes inefficient or useless in any way whatever, the entire lamp becomes useless, and this, of course, entails waste, and therefore expense. The carbon strip, moreover, is by no means the most expensive part of the lamp, and when made in large quantities, and by proper processes, it becomes possible to make it very cheaply, so that as a result it does not form such an expensive item in a lamp. By my invention as I have before stated, it is possible to make an incandescent lamp of separable parts, and yet maintain a perfect vacuum. When in my lamp the carbon strip becomes inefficient or useless, the other parts of the lamp can be used over again one or more times, and this results in great economy, and hence much higher efficiency in electric lighting systems.

My present invention consists in the employment of a glass bulb for that part of the vacuum chamber which covers the carbon strip or burner, one end of said bulb being left open to admit of the insertion of a plug, which plug carries the leading-in wires to which the carbon strip or burner is joined. The leading-in wires may be composed of platinum, and are sealed in the stopper or plug in the usual way. Any other material having the same coefficient of expansion, or substantially the same coefficient of expansion as platinum, may be used instead of the platinum. Between the glass bulb, and the plug or stopper a strip or ring of platinum foil, or a metal having substantially the same coefficient of expansion as platinum, is introduced, and this strip serves to separately attach the said plug or stopper, to the said bulb, and to make the entire chamber air tight. It is to be distinctly understood that this strip of platinum or kindred metal forms a separation between the bulb and the stopper so that the bulb and the stopper do not make contact to any important extent. This prevents fusion or adhesion between the bulb and stopper.

My invention will be more readily understood by referring to the accompanying drawings in which—

Figure 1 is an elevation of an incandescent electric lamp made in accordance with my invention. Fig. 2 is a sectional view of the upper portion thereof. Fig. 3 is a sectional view of the upper portion of an incandescent electric lamp with the exhaust tube passing through the plug. Fig. 4 is a top view of the upper portion of the lamp shown in Fig. 1.

A bulb *a* of the usual form is employed provided with a neck *b* of any convenient shape. This neck is made open to admit of the insertion of a plug or stopper *c*. This stopper is preferably composed of glass, but any other material having the same coefficient of expansion as glass may be used. Between the plug *c* and the bulb, or globe *a* is placed a strip of platinum, or of metal having a similar coefficient of expansion *d*.

To insure a perfect mechanical union between the strip and the contiguous glass parts means such as a pair of pinchers may be used to compress the parts together, in the meanwhile heat being applied to them, in order to sufficiently soften the glass to cause it to adhere perfectly to the surface of the strip. Leading-in wires are passed through the plug or stopper *c*, and are sealed therein in the usual manner. A carbon strip is attached in the usual manner to these leading-in wires. A suitable head *g*, is cemented to the neck of the bulb. One of the leading-in wires, may be connected electrically to the button *h*, while the other may be connected to the metallic shell *g*.

In Figs. 1 and 2, I have shown a lamp, the air from a bulb of which may be exhausted from the lower part of the bulb or globe. In Fig. 3, I have shown an exhaust tube, *i*, integral with the plug *c*. When a lamp has become unfit for use, the plug or stopper *c*, and the bulb or globe *a*, may be separated by reheating, one of the parts; or this separation may be effected in any other convenient manner. To facilitate the separation, I cause the plug *c*, and the strip *d*, to extend slightly above the glass receiver. It is to be clearly understood that in no case, are the plug *c*, and the bulb *a*, to come into intimate and perfect contact, at the surface of sealing, and in order to prevent any union whatever, I cause that portion of the plug which extends below the metal strip to slant abruptly away from the bulb. It is usually preferable to heat the platinum, to a considerable high temperature, in a flame, or by other means, before it is interposed between the bulb and the stopper.

To recapitulate, my invention consists in a stopper incandescent electric lamp, which has interposed between a stopper and a globe, a separating metallic ring, which is homogeneous. This is composed of either a metal, or an alloy, which is practically similar throughout its entire extent, that is, the ring is not composed of materials which are heterogeneous, or composed of materials, which are arranged in layers, said layers being com-

posed of dissimilar metals, having different coefficients of expansion. I consider however, that separate platinum rings united together by metal, having substantially the same coefficient of expansion, said rings being united before they are interposed, would be within the scope of my claims. Of course it is understood that alloys, or metals which have substantially the same coefficient of expansion, as platinum, may be used.

Although this lamp is usually constructed, so as to contain, a very high vacuum any gases, which do not combine with carbon may be injected into the globe before sealing. I desire it to be distinctly noted, that my ring forms, before interposition between the bulb and the stopper, a single entire piece, which is substantially homogeneous, as far as its efficiency of expansion is concerned.

Having described my invention, I claim and desire to secure by Letters Patent—

1. In an incandescent electric lamp, the combination of an inclosing globe or bulb, a plug or stopper adapted to fit the neck of said globe, or bulb, and a separating strip or ring of metal, or metallic alloy, which ring or strip is interposed between the said plug or stopper, and the said bulb or globe, so as to separate them at the surface of sealing, and yet form with them, a complete, inclosing air tight chamber.

2. In an incandescent electric lamp, the combination of an inclosing globe or bulb, a plug or stopper adapted to fit the neck of said bulb or globe, and a homogeneous separating strip, or ring of metal, or metallic alloy, which ring or strip is interposed between the said plug or stopper and the said bulb or globe, so as to separate them at the surface of sealing, and yet form with them a complete inclosing air tight chamber.

3. In an incandescent electric lamp, the combination of an inclosing globe or bulb, a plug or stopper adapted to fit the neck of said globe or bulb, and a separating strip or ring of platinum inserted or interposed between the said plug and the said bulb, so as to separate them, at the surface of sealing, and yet form with them, a complete and practical, inclosing air tight chamber.

4. In an incandescent electric lamp the combination of an inclosing globe or bulb, a plug or stopper adapted to fit the neck of said bulb, and a separating strip or ring of platinum interposed between the said plug, and the said bulb, the said plug and strip extending slightly, above the glass bulb, to facilitate the separation of the parts of the lamp.

5. In an incandescent electric lamp the combination of an inclosing globe or bulb, a plug or stopper adapted to fit the neck of said bulb, and a separating strip or ring of platinum interposed between the said plug and the said bulb, so as to separate them at the surface of sealing, and yet form with them, a complete inclosing air tight chamber, and lead-

ing-in wires passing through, and properly sealed within the said plug.

6. In an incandescent electric lamp, the combination of an inclosing bulb of a plug
5 which fits the neck of the said bulb, and whose part which extends below the metal strip, slants abruptly away from the bulb, and a separating ring or strip of platinum, or metal
10 interposed between the said plug, and the

said receiver, so as to separate them, and yet form with them, a complete inclosing air tight chamber.

In witness whereof I hereunto subscribe my name this 7th day of January, A. D. 1893.

EUGENE W. APPLEGATE.

Witnesses:

GEORGE W. McMAHON,
GEORGE L. CRAGG.