M. M. MERRITT.

INCANDESCENT LAMP.

APPLICATION FILED MAR. 23, 1906.

995,077. Patented June 13, 1911.

FIG. 1.

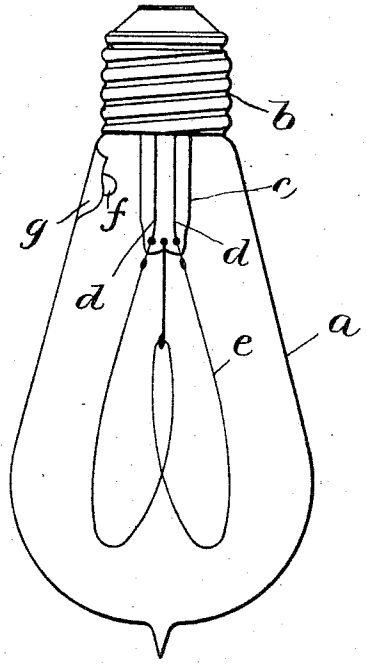
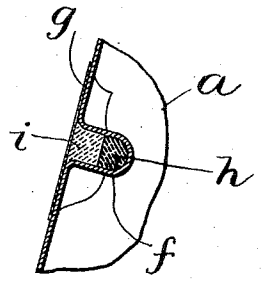


FIG. 2.



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UNITED STATES PATENT OFFICE.

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INCANDESCENT LAMP.

995,077. Specification of Letters Patent. **Patented June 13, 1911.**

Application filed March 23, 1906. Serial No. 307,638.

To all whom it may concern:

Be it known that I, MATTHEW M. MERRITT, a citizen of the United States, residing at Middleton, in the county of Essex and State of Massachusetts, have invented an Improvement in Incandescent Lamps, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention relates to improvements in incandescent lamps, having more particularly for its object the provision of a lamp so constructed as to prevent, or render commercially impracticable, its renewal, or, in other words, the substitution, or attempted substitution, of a new filament for the old one when the latter is burned out or otherwise rendered useless or inefficient.

My invention will be best understood by reference to the following description when taken in connection with the accompanying illustration of one specific embodiment thereof, while its scope will be more particularly pointed out in the appended claims.

Referring to the drawings,—Figure 1 shows a lamp embodying one form of my invention, and Fig. 2 shows an enlarged sectional detail thereof.

In the described embodiment of my invention I take advantage of the conditions under which certain parts of the renewal process are carried out and provide for the development of certain manifestations when those conditions are present which preferably result in injury of some kind to the lamp.

While other means than those described may be employed and other conditions relied upon to cause the desired manifestations, as well as other results relied upon to cause injury to the lamp or obstruction to the renewal process, in the embodiment of my invention here selected for illustration I so construct the lamp, or provide the same with such means, that, when subjected to a violent or abnormally high degree of heat, the bulb, stem or other essential part of the lamp is injured. In the case of the bulb or the stem the injury may consist of a puncture, due to fracture or other collapse, so as to render it impossible thereafter to maintain a commercial vacuum within the bulb space. This action can readily be effected, for during the process of renewal the lamp is repeatedly subjected to violent heating. For example, one of the characteristics of an old or burned-out lamp, and invariably where it has been used any length of time, is a darkening or clouding of the bulb, which is caused by a deposit of finely divided matter thrown off by the filament or joints during incandescence. This deposit is a considerable factor alone in reducing the effective candle power of a lamp and its removal constitutes one of the usual and first steps in the renewing process after the opening of the bulb tip. This is ordinarily accomplished by subjecting the lamp, while the latter is slowly revolved, to some intense heat, such as the heat of an alcohol or hydrogen vapor torch. The heat which is usually imparted to the lamp and necessary to volatilize and drive off the solid deposit is probably not less than 500° or 600° Fah., and, of course, abnormally in excess of any heat to which the lamp bulb is ever subjected during its customary and intended use and greatly in excess of the maximum heat which can be interiorly imparted to the bulb by the incandescent filament. For example the heating of the bulb of an ordinary sixteen candle power lamp can scarcely exceed 150° Fah. even when the filament is carrying the maximum current of which it is capable. The lamp is also subjected to excessive heating at other steps of the renewal process other than that involved in the "burning-out" of the deposit. For example, when the usual tubulature is welded on to the perforated bulb tip, the latter is heated in a blow pipe flame, which considerably raises the temperature of the lamp as a whole. Again, lamps are frequently subjected to the high heat of a drying oven prior to final exhaustion, and subsequently to further excessive heat to set the cement by which the lamp bulb neck is attached to the socket. In each instance mentioned the heat applied to the lamp is greatly in excess of the maximum heat which the lamp is ordinarily called upon to withstand during its intended use.

Referring to the embodiment of my invention shown in Fig. 1, there is shown a lamp of ordinary construction, but provided with means responsive to a high degree of heat for causing injury to the bulb.

The lamp there shown is provided with the usual glass bulb *a*, cemented or otherwise secured in the usual fashion to and within the metal socket *b* and having the usual form of glass stem *c*, through which pass the leading-in wires *d*, jointed to the filament *e*. The lamp shown differs from that of the ordinary and usual construction in having a pocket or recess *f*, formed in the walls of the bulb, preferably in the neck of the latter adjacent the socket and in about the spot to which the usual paper label *g* is customarily applied. In that position, the pocket, while presenting a relatively deep but narrow-mouthed cavity, is practically unnoticeable and if covered up by the label, as shown, is scarcely visible. Although the irregular formation of the bulb resulting from the pocket may be relied upon to cause fracture of the bulb when the latter is highly heated, as in the "burning-out" process, there is preferably placed at the bottom of the pocket a quantity of some expansible material or volatile explosive substance *h*, such, for example, as a few grains of gun powder, which, when heated to the required degree, will explode and crack or puncture the walls of the bulb, rendering the latter useless and ineffective in maintaining the necessary commercial vacuum. The mouth of the pocket, after the insertion of the chemical *h*, is closed by a quantity of hard cementitious material *i*, which is filled in flush with the outer face of the globe, after which, if desired, the cemented cavity may be covered by the label *g*.

Any suitable cement, or other closing means, for the mouth of the pocket may be used, such for example, as a cement having plaster of Paris for its base, or Portland cement, or a mixture of plaster of Paris and water glass, or, in fact, any of the numerous and well-known substances which will harden and present a wall or coating difficult to remove, and preferably water-tight. Although desirable, it is not absolutely necessary that this cementitious seal should be incapable of removal, for, if the trouble involved in removing, materially increases the expense of the renewal process, the object of hindering or discouraging the latter will be attained. If gun-powder, or other volatile substance is used at the bottom of the pocket, an explosion will take place along the lines of least resistance toward the exhausted interior of the lamp and, if the quantity of chemical is suitably proportioned, as may be readily done, with no further disastrous consequences than the fracture of the bulb at the pocket.

A pocket such as is shown can easily and quickly be formed in the bulb with the aid of a blow pipe flame. This can be accomplished at any time during the lamp manufacture, but may be equally well, and even more readily performed after the lamp has been exhausted and, in fact, after its final completion, since the unopposed external pressure assists in the formation of the pocket as soon as the glass of the bulb is softened under the heat of the blow pipe. This is of particular advantage for it permits the application of my invention after the final stage of lamp manufacture and after it is known that the lamp is perfect and in condition for sale. It therefore permits the renewal of the manufactured product at the manufactory or the re-subjecting of a defective lamp to any of the processes of lamp manufacture, whether or not the same require an excessively high heat, while rendering such lamps non-renewable after the invention has been applied thereto before they are placed in the hands of the users.

It is to be understood that my invention is not limited to the shape or position of the pocket shown, or in fact to its location upon the walls of the bulb, since the same may, if desired, be located in the stem, or within the socket, or may consist of the naturally existing or especially formed interstices between the socket and the bulb. My invention also may have useful application to an incandescent lamp as a thermostatic safety device for cutting out the lamp when the safe heating limit thereof has been exceeded. This, for example, may be desirable where the lamp is used in proximity to explosive or inflammable substances or where the danger from fire becomes great if the lamp be overheated from any cause, either normal or abnormal. For this purpose, there should preferably be deposited in the pocket, and preferably sealed in, as by the cement *i*, a deposit of some thermally responsive substance, such as the ordinary well-known fuse metal used for electric fuses or for automatic sprinklers, the exact composition of such material being chosen for the particular temperature at which it is desired to cut out the lamp, which obviously may be 200°, 300°, or any other desired temperature. With such a construction the lamp cannot maintain its current after the temperature limit has been reached, for at that point the fuse will blow, fracturing the bulb and causing the burning-out of the filament.

Claims:

1. A non-renewable incandescent lamp having a filament, a stem, a bulb and an outwardly opening pocket formed in the walls of the bulb and an expansive substance in said pocket.

2. A non-renewable incandescent lamp having a filament, a stem, a bulb, a pocket formed in the walls of the bulb and an expansive substance in said pocket.

3. A non-renewable incandescent lamp having a filament, a stem, a bulb, a pocket

formed in the walls of the bulb, fracturing means in said pocket, and means for preventing access to the fracturing means.

4. A non-renewable incandescent lamp having a filament, a stem, a bulb providing a lamp space a recess in the walls of the lamp space, fracturing means in said recess, and sealing means for preventing access to said fracturing means.

5. A non-renewable incandescent lamp having a filament, a stem, a bulb, a label, and fracturing means covered by the label.

6. A non-renewable incandescent lamp having a filament, a stem, a bulb and chemical means exterior to the lamp space for causing injury to the bulb on attempted renewal thereof.

7. A non-renewable incandescent lamp having a filament, a stem, a bulb and a pocket formed in the bulb thereof, said pocket being closed both exteriorly and interiorly and containing an expansive substance.

8. A non-renewable incandescent lamp having a filament, a stem, a bulb and chemical means applied externally to the lamp to cause injury thereto on the attempted renewal thereof.

9. An incandescent lamp having the filament "*e*", stem "*c*" bulb *a*, pocket *f* and fracturing material in said pocket.

10. An incandescent lamp having the filament "*e*", stem "*c*" bulb *a*, pocket *f* in the bulb, fracturing material in said pocket, and seal *i* over said pocket.

11. A non-renewable incandescent lamp having a bulb, a pocket formed in the walls of the bulb, and fracturing means located in the said pocket.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

MATTHEW M. MERRITT.

Witnesses:
M. F. WELCH,
N. B. SHIRLEY.