

(No Model.)

F. M. F. CAZIN.
ELECTRIC INCANDESCENT LAMP.

No. 523,461.

Patented July 24, 1894.

Fig. 1.

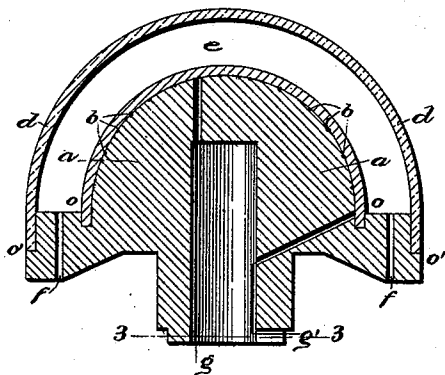
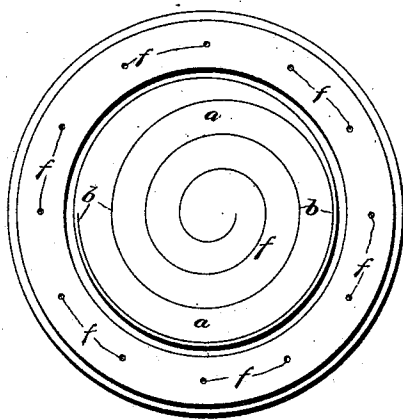


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

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ELECTRIC INCANDESCENT LAMP.

SPECIFICATION forming part of Letters Patent No. 523,461, dated July 24, 1894.

Application filed July 24, 1893. Serial No. 481,322. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS M. F. CAZIN, a citizen of the United States, residing at Hoboken, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Electric Incandescent Lamps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

In an application for Letters Patent of the United States, filed by me on the 7th day of December, 1892, and bearing the Serial No. 454,412, I have described an electric incandescent lamp, in which semi-conductive or carbonaceous matter intended and adapted to glow is closely, directly and hermetically embedded in non-conducting solid matter made up of two parts, one part being selected with reference to a high point of fusion, regardless of transparency, and the other part being selected with a view to transparency and luminosity. In the aforesaid application, I have described a process of embedding semi-conductive or carbonaceous matter in solid material, the said process consisting essentially in making first, by the use of a mold, a base of glass, porcelain or like substance, having been selected with regard to high point of fusion, which base has on its face or front-part an intaglio impression of linear shape, which impression is filled for its total length and to an adequate thickness with a film or linear mass of carbon or other matter, intended and adapted in substance and size to become incandescent under the electric current. The process is completed by then covering both the solid base-part and the inserted film with a cover or top part, that fits exactly onto both the solid base part and onto the inserted film the latter, if necessary, being achieved by linear relief on the inside of the cover or top-part precisely filling the intaglio impression on the base part, except for the space filled by the carbon or other film,—the said covering to be hermetical by causing the cover or top part to adhere to the base part by cementing or fusing the one to the other, the base part keeping its shape, when the cover reaches its point of fusion.

It is manifest, that the semi-conductive or carbonaceous matter is by means of my said invention protected from the ordinary effects of jarring, and it is also protected against combustion, because with my form of lamp neither air nor any other gaseous or fluid matter can get access to the carbonaceous matter.

My present invention is concerned with giving additional protection to the luminous or transparent cover or top-part portion of the solid body of my original lamp. And it is concerned with making the lamp as described still more effective by selecting the material for the cover or top-part, with a view to utilize aside of the incandescence of the film also the dark heat rays emanating therefrom under electric current for heating the said cover and causing thereby the cover to become luminous itself, thereby utilizing a higher percentage of the energy applied in the production of light, all of which is effected by making the cover of opaque or semi-opaque material. And in order to protect this cover-part from rapid cooling and consequent breaking and at the same time prevent any protecting transparent additional cover from becoming milky or light absorbing, I surround the outside of the cover portion of the lamp body with a sheet of air communicating with the atmosphere by means of a second cap or cover of highly transparent material outside of the air space. By means of these additional features I protect directly the heated portion of the lamp body, which as has been said, is in direct and immediate contact with the incandescent material, from the injurious effect of two great extremes or too sudden changes of temperature. By the presence of this sheet of air between the two covers it has become practicable to exclusively select material and dimensions for the inner cover specifically for the purpose of its becoming luminous by the dark heat rays emanating from the incandescent matter and again exclusively select the matter and dimensions of the outer cover with regard to transparency without the danger of this second cover becoming milky or opaque, but not luminous under the exterior cooling influence.

In order to enable those skilled in the art

to make and use my invention, I illustrate the same in the accompanying drawings, in which—

Figure 1 is a diametrical vertical section of one form of my improved lamp. Fig. 2 is a view of the same lamp taken from the side toward which the light is intended to be thrown.

Referring to the drawings by letter, *a* is the base of the lamp formed at its rear into a tube, which is adapted to inclose the insulated leading-in wires (*g, g'*) and to fit a suitable socket and make connection thereby with the main electric circuit. On the hemi-spherical surface of the base-part is a linear film or mass of semi-conducting or carbonaceous matter, *b*, the same being preferably embedded as already described in an intaglio impression on one of the adjoining faces of either the base-part or the cover-part the two in all cases hermetically fitting.

Outside the film or mass and closely fitting against the base and directly, closely and hermetically sealed or cemented thereto is a cover, *c*, the function of which has already been set forth. Now in order to protect this last named element from injury by reason of sudden change of temperature, and in order to protect the transparent second cover from the damaging influence of excessive heat, I have provided means, whereby an air space is formed outside of the said element, *c*, the whole being surrounded by a highly transparent additional cover, *d*. From such conditions it clearly follows, that, if the element *c*, which is exposed directly to the heat of the incandescent film or mass itself becomes luminous in part or in total, such luminosity will be transmitted without loss through the cap or cover *d*. As a support for the said cap or cover, I have provided an offset *o'* upon the base *a*, a second offset *o* providing for the air space *e*. Through that part of the base taken up by the offset, *o* perforations *f, f* are made for admitting air to the space *e*. As to the shape

of the different parts already described, I may use the greatest freedom, as it is not necessary for me to select or adopt the hemispherical form I may consult in such different selection different tastes or mere convenience for the purpose of beauty or novelty of design. The same holds true as to the shape given to the film or mass *b* of semi-conductive or carbonaceous matter. The form of a spiral or serpentine curve given to it in the drawings is simply one of innumerable shapes, which might be chosen. And I do not confine myself to the use of only one linear design in one lamp but intend to make use of two or more couples of inleading wires in the same lamp thus enabling me to use designs composed of several linear designs or part of designs.

As examples, merely, of the kind of materials which I may use, for the different parts of my lamp I may mention porcelain, for the base part, glass for the two covers, that cover next to the base and in immediate contact with the base being preferably of opaque glass, and the outer cover preferably of transparent glass. I do not, however, limit myself to these specific materials.

Having now described my invention, what I claim is—

An electric incandescent lamp, in which semi-conductive or carbonaceous matter is embedded in solid material consisting mainly of two parts, one selected for high point of fusion and the other with regard to transparency and luminosity under the action of both light and heat, the part of the said solid material intended to spread light being surrounded by an air space and by a cap or cover of highly transparent material.

In testimony whereof I have signed my name, in the presence of two witnesses, this 22d day of July, A. D. 1893.

FRANCIS M. F. CAZIN.

Witnesses:

G. H. STOCKBRIDGE,
C. L. BELCHER.