No. 770,223. PATENTED SEPT. 13, 1904.

F. M. F. CAZIN.

INCANDESCENT LAMP BULB.

APPLICATION FILED MAR. 17, 1904.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

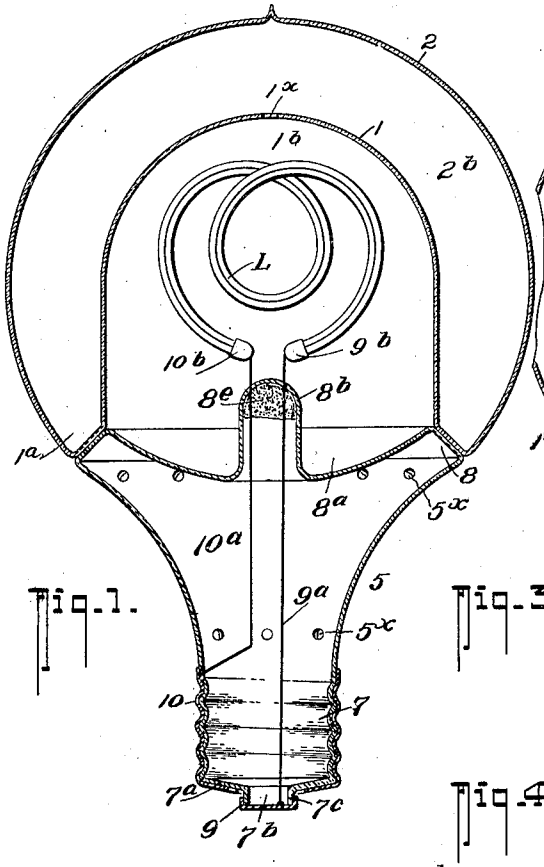


Fig. 2.

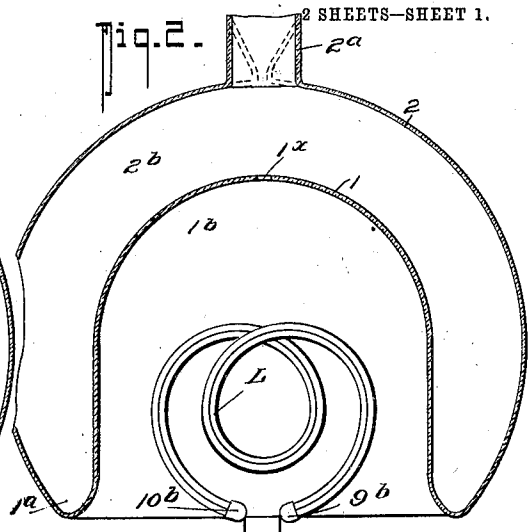


Fig. 3.

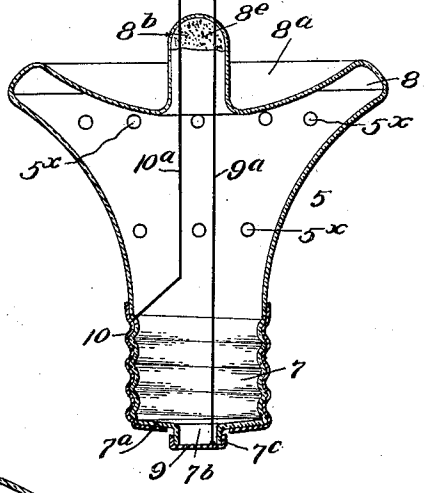
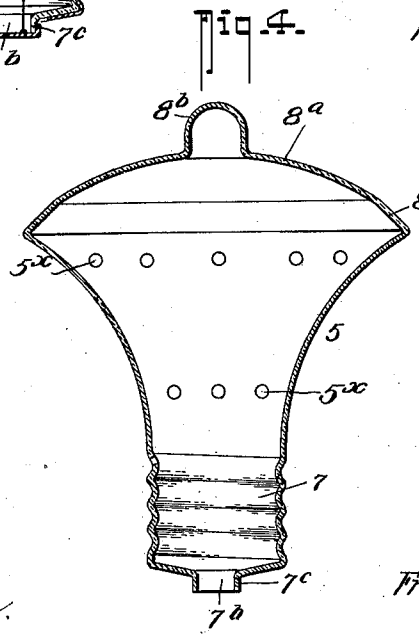


Fig. 4.



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INCANDESCENT LAMP BULB.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 5.

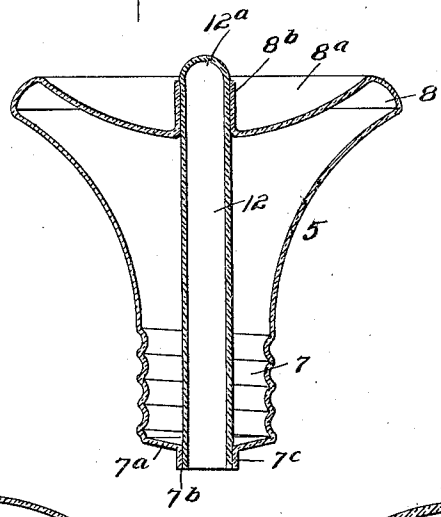


Fig. 6.

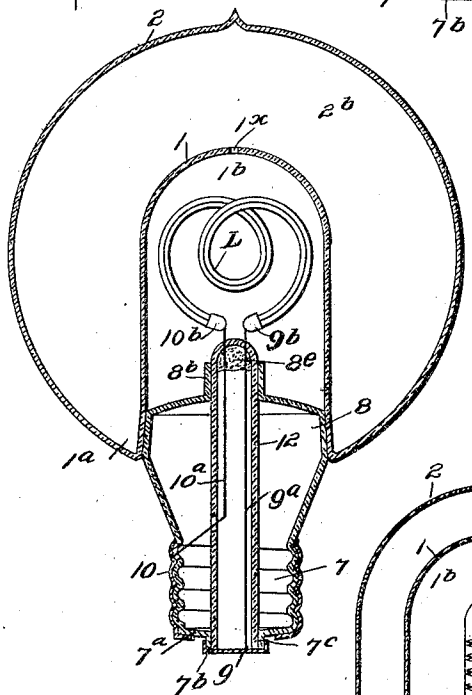


Fig. 7.

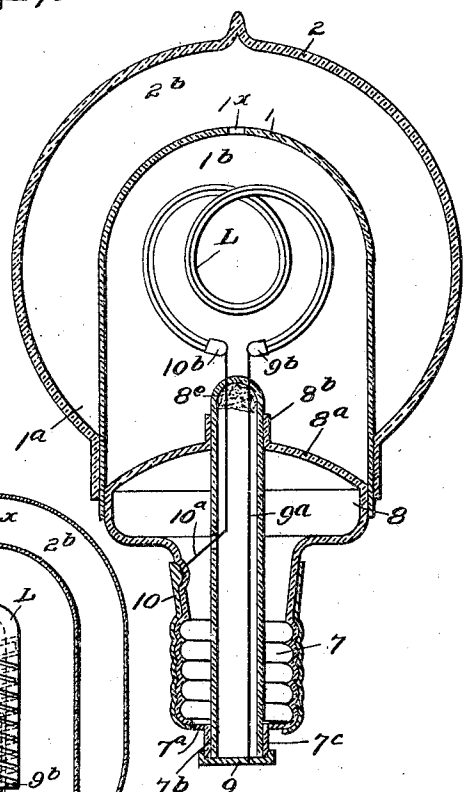
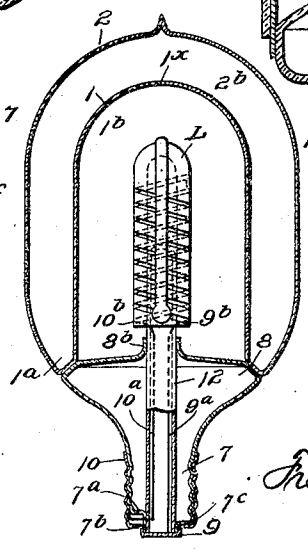


Fig. 8.



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No. 770,223. Patented September 13, 1904.

UNITED STATES PATENT OFFICE.

FRANCIS M. F. CAZIN, OF HOBOKEN, NEW JERSEY.

INCANDESCENT-LAMP BULB.

SPECIFICATION forming part of Letters Patent No. 770,223, dated September 13, 1904.

Application filed March 17, 1904. Serial No. 198,563. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS M. F. CAZIN, residing at 1108 Bloomfield street, city of Hoboken, Hudson county, and State of New Jersey, have invented certain new and useful Improvements in Incandescent-Lamp Bulbs, of which the following is a specification.

This invention, forming an improvement on my copending application filed December 17, 1903, Serial No. 185,491, relates to certain new and useful improvements in lamp-bulbs for electric incandescent lamps; and the invention more particularly seeks to provide for improved and more economical and practical means for the preservation in such lamp of the heat produced at the expense of current in such lamp and for the conversion of otherwise dark heat-rays into light-rays as a result of such preservation of heat and of consequent increase of temperature in the luminant proper of said lamp. As a means for such improved, more practical, and economical preservation of heat in electric lamps as against using one or two separate glass bulbs as the housing for the protection of the luminant proper of the lamp my invention discloses the use of a single but as such double bulb. If no dark heat would radiate from the outside face or faces of the bulb-lamp, an equivalent of light energy to the electric energy passing into the lamp by means of current would, with an unchanged luminant, be produced in the lamp. As present practice, art, and trade has it bulb-lamps are housed and protected in and by but one glass wall; yet it is a well-established scientific fact that glass passes light with but trifling loss, but resists to the passage of heat to a remarkable degree. Consequently a portion of heat is preserved or retained in the lamp-bulb. This heat retained is greater when there are two sheets of glass separating it from the atmosphere. The use of two separate factory-made bulbs increases the glass-blower's work and also results in a non-uniform product. Incidentally I have utilized and continue to utilize the presence of a double glass wall in housing the luminant for the purpose of differential cooling of a limited minor part of the inner glass wall exclusively exposed directly or indirectly to air circulation, such differential cooling having the new and useful effect of concentrating on the better-cooled minor part of the inner glass any and all condensation of vaporized matter escaping from the luminant under current. In my patent No. 621,292 I obtained protection for my invention of differential cooling by direct exposure to the atmosphere of a limited minor part of the inner glass wall, and by this application I seek protection also for my invention of indirect exposure coincidental with limiting and regulating such cooling by means of admitting to and regulating by apertures in the base part of the lamp a limited and regulated quantity of air.

Aside of the generical character, as hereinabove specified, my present invention further involves and does consist of or in certain novel construction and arrangement of parts, all of which will be hereinafter first described in detail and then specifically pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal section of the preferred form of bulb as applied for use. Fig. 2 is a similar view of the outer and inner bulbs before mounting on the base. Fig. 3 is a similar view of the base. Fig. 4 shows a slightly-modified form of base. Fig. 5 is a further modification thereof. Fig. 6 is a longitudinal section of a slightly-modified form of my invention. Fig. 7 is a section of the double housing, consisting, primarily, of two separate bulbs. Fig. 8 is a longitudinal section of a modified form of the same class of improved double bulbs and showing also one of my improved luminants as disclosed in prior applications.

Referring now to the accompanying drawings, in which like numerals of reference indicate like parts in all the figures, 1 designates the inner envelop or bulb, which when the parts are assembled is surrounded by a second or outer envelop or bulb 2, as shown in Fig. 1.

In the preferred form of my invention, as shown in Figs. 2, 3, and 8, inclusive, the outer and inner envelops 2 and 1, respectively, are formed of a single piece of glass, which is first blown or otherwise formed into "bottle"

shape, the inner envelop 1 forming a navel in the bottom 1^a of the bottle, which bottle is also formed with a "neck" 2^a, as clearly shown in Fig. 2. When in its first step toward completion, Fig. 2, the double bulb, it will be noticed, has two chambers 1^b 2^b, the chamber 1^b having a large mouth, while the mouth of the chamber 2^b is the neck 2^a.

Referring now more particularly to Fig. 3, it will be seen the base 5 consists of a hollow member formed with an integrally-threaded end 7 and an annular portion 8, having a concaved or flat upper face 8^a, in the center of which is a nipple 8^b, which may be in the nature of a sealed tubular section, as shown in Fig. 3, or an open tubular section, as shown in Fig. 5. The lower face 7^a of the threaded end 7 is apertured, as at 7^b, which aperture is surrounded by a tubular extension or flange 7^c to receive the metallic contact-cap 9, to which one of the inleading wires, 9^a, is attached, the other inleading wire, 10^a, being attached to the metallic covering 10 over the threaded part of the end 7 in the usual manner. The inleading wires in the form shown in Figs. 1 and 3 pass through the nipple 8^b and are hermetically sealed thereto, as at 8^c, in any suitable manner, and the said inleading wires 9^a and 10^a are connected to the terminals 9^b and 10^b of the luminant L, which luminant L may be of any approved construction, as the same *per se* forms no part of my present invention.

Instead of making the base with the concaved upper surface 8^a the said surface may be convex, as shown in Figs. 4, 6, and 7, or flat, as shown in Fig. 8, and when the nipple 8^b is an unsealed tubular part I insert through the opening 7^b in the lower face 7^a and through the nipple-tube 8^b a tubular member 12, the end 12^a of which adjacent the nipple 8^b being closed. The tubular member 12 is sealed to the nipple-tube 8^b, and through the end 12^a of the said tube 12 the inleading wires 9 and 10 pass and are sealed thereto, as before explained and as clearly shown in Fig. 5.

In Fig. 7 I have shown a slightly-modified form of my invention in which the inner and outer bulbs 1 and 2 are formed separately. They may then be joined together and afterward joined to the base 5 in any approved manner.

In practice in the preferred form of my invention the inner envelop or bulb 1 is apertured, as at $1^\times$, so that when the parts are assembled and secured together by attaching any suitable exhausting apparatus (not shown) to the neck 2^a the two chambers 1^b 2^b may be exhausted, after which the outer envelop 2 is sealed in the usual manner.

By constructing the bulbs and base as shown and described they can be easily and cheaply manufactured, and the bulbs and base can be readily joined together by any suitable process—such, for instance, as was disclosed in the original specification of my copending application, filed December 16, 1903, Serial No. 185,491, from which the subject-matter of this application was divided and which now forms the subject-matter of another copending application, filed March 16, 1904, Serial No. 198,340. The apparatus used in assembling the parts of my improved bulb is likewise disclosed in said application of December 16, 1903.

In the practical construction of my invention I prefer to make the base as well as the bulb of glass or other vitreous substance, as also the tubular member 7, (when such member is used.)

Whenever it may be found desirable I may provide the base with apertures $5^\times$ $5^\times$ (see Fig. 3) to allow a circulation of air therethrough to cool the face 8^a. The base being hollow forms an air-chamber, which will cool the face 8^a to cause any vapors which may form in the lamp during its operation to become deposited on said surface 8^a, and hence avoid deposition on the major part of the bulbs.

From the foregoing description, taken in connection with the accompanying drawings, it is thought the complete construction of parts and manner of assembling the same, as well as the many advantages of my present invention, will be readily understood by those skilled in the art to which it belongs.

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

1. The hereinbefore-described lamp-bulb consisting of an inner and an outer envelop the mouth of the inner envelop being provided with a conical seat for the purposes specified.

2. The hereinbefore-described lamp comprising a base having a conical shoulder, a lamp-bulb consisting of an outer and an inner envelop, said inner envelop having a conical seat for engaging the conical shoulder of the base, said outer envelop completely inclosing said inner envelop.

3. The hereinbefore-described lamp-bulb consisting of an outer and inner bulb the one integral with the other, the mouth of the inner bulb being provided with a conical seat, for the purposes specified.

4. The hereinbefore-described lamp consisting of a bulb composed of an integral outer and inner envelop, the inner envelop having a conical seat, a base provided with a conical shoulder adapted to fit within the conical seat of the inner envelop and a luminant within the inner envelop.

5. The hereinbefore-described lamp, consisting of a bulb composed of an integral outer and inner envelop, the inner envelop having a seat, a base provided with a shoulder adapted to fit said seat of the inner envelop, and a luminant within the inner envelop, substantially as shown.

6. The hereinbefore-described lamp comprising a hollow base, and an inner and outer integral bulb secured to the said base, said

outer bulb completely surrounding said inner bulb.

7. An incandescent lamp comprising a hollow base and a bulb consisting of integrally-formed outer and inner walls, said bulb and base being so arranged as to form inner and outer chambers, means for cooling a portion of the wall of the inner chamber for the purposes specified.

8. In an electric incandescent lamp, a base, an inner and an outer integrally-formed bulb secured to said base, said outer bulb completely inclosing said inner bulb, and means for effecting a differential cooling of said base and bulbs for the purposes specified.

9. The hereinbefore-described lamp consisting of a bulb, composed of an integrally-formed inner and outer envelop, the inner envelop having a conical seat, a hollow base composed of a single piece, and having a conical shoulder to fit within the conical seat of the envelop, and a luminant within the inner envelop.

10. In a lamp of the character stated, a hollow base having a threaded shank to coöperate with the lamp-socket, said base having an outer annular portion and a curved upper face, a nipple integrally formed with said upper face, inleading wires passing through said base and nipple, and a filament secured to said inleading wires.

11. In a lamp of the character stated, a hollow base having a threaded shank to coöperate with the lamp-socket, said base having an outer annular portion and a curved upper face, a nipple integrally formed with said upper face, inleading wires passing through said base and nipple, a filament secured to said inleading wires, a lamp-bulb having an annular seat to receive said annular base portion, and secured thereto, and surrounding said luminant, for the purposes specified.

12. In a lamp of the character stated, a hollow base having a threaded shank to coöperate with the lamp-socket, said base having an outer annular portion and a curved upper face, a nipple integrally formed with said upper face, inleading wires passing through said base and nipple, a filament secured to said inleading wires, a lamp-bulb consisting of an inner and outer integrally-formed envelop, said inner envelop having a seat to receive said annular base portion and adapted to be permanently secured thereto, said inner bulb having an aperture and said inner and outer envelops being so correlatively arranged with respect to each other and the base to provide an inner and outer communicating chamber.

13. In a lamp of the character described, a hollow base having a threaded shank to coöperate with the lamp-socket, said base having an outer annular portion and a suitably-formed upper face, a nipple integrally formed with said upper face, inleading wires passing through said base and nipple, a filament secured to said inleading wires, a lamp-bulb consisting of an inner and outer integrally-formed envelop, said inner envelop having a seat to receive said annular base portion and adapted to be permanently secured thereto, said inner bulb having an aperture and said inner and outer envelops being so correlatively arranged with respect to each other and the base to provide an inner and outer communicating chamber, said hollow base forming an air-chamber, and adapted to receive condensed gases on its upper surfaces, for the purposes specified.

14. In a lamp of the character stated, a hollow base having a threaded shank to coöperate with the lamp-socket, and, an annular portion and a curved upper face, said base having apertures to permit the ingress and egress of air to the same for the purposes specified.

15. In a lamp of the character stated, a base formed with an air-chamber and having a threaded shank to coöperate with the lamp-socket, said base having an outer annular portion and a curved upper face, a nipple integrally formed with said upper face, said base having an air-chamber, and apertures communicating with the air-chamber and the atmosphere to permit of air circulation within the chamber to cool the upper face of the base for the purposes specified.

16. The hereinbefore-described lamp consisting of a bulb composed of an inner and an outer envelop, the inner envelop having a conical seat, a hollow base composed of a single piece having a conical shoulder to fit within the conical seat of the envelop, said base including an integrally-formed nipple serving as a luminant-support and a luminant mounted thereon within the inner envelop.

FRANCIS M. F. CAZIN.

Witnesses:
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C. F. HESSER.