Oct. 4, 1938. W. J. GEIGER 2,132,368

ELECTRIC LAMP AND METHOD OF MANUFACTURE THEREOF

Filed March 13, 1936

Fig. 1.

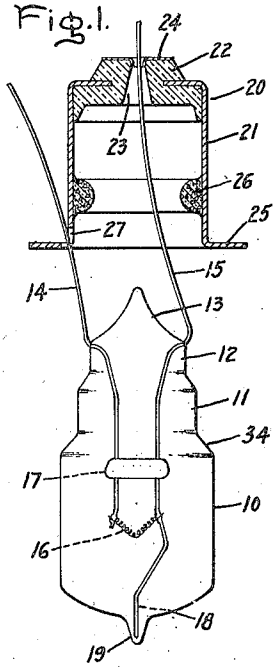


Fig. 2.

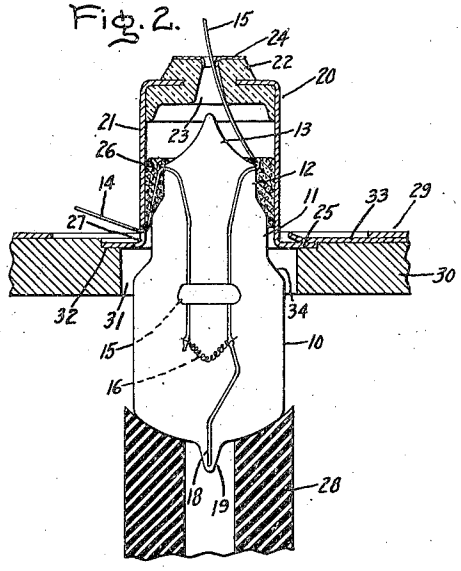


Fig. 3.

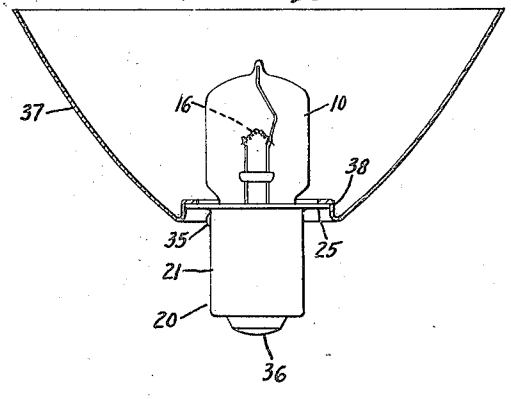
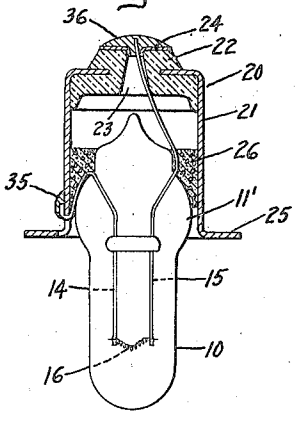


Fig. 4.



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2,132,368

ELECTRIC LAMP AND METHOD OF MANUFACTURE THEREOF

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5 Claims. (Cl. 176—32)

My invention relates to electric lamps and more particularly to improvements in methods of manufacture thereof having as their object the production of lamps having their filaments or other light sources in uniformly accurate relation and alignment to their bases or portions thereof.

Lamps are made at the present time with bulbs having basing shoulders against which the bases are seated, thereby locating the bases definitely with respect to the bulbs. If the shoulders are crooked or if the filament is not properly located in the bulb, the said filament will not be properly located with respect to the base. Hence while this method serves very well for the ordinary large lamps, it has disadvantages for the manufacture of lamps to be used for projection purposes where reflectors or other light-concentrating means are employed and the light source must bear a definite relation to the said reflector or other means. The positive seating of the lamp bulb against the base is necessary with present basing methods since the cement for uniting the said base and bulb will run out if any space is left between the base and bulb. This would happen because all basing is done with the base above the bulb and the cement runs down toward the bulb shoulder as it is heated and cured. If an attempt were made to perform the basing with the bulb above the base it would necessitate having the base filled almost completely with cement since the cement would run down away from the bulb upon heating. This in turn would interfere with the feeding of the lead wires through the base and would therefore be impractical for production work.

One of the objects of my invention is to provide a lamp design and method of basing which will overcome the above-mentioned disadvantages. Another object is to make possible the basing of a lamp with the base above the bulb without the base being butted directly against the bulb. Another object is to so construct the bulb and base as to make possible a shifting and rocking of the bulb with respect to the base prior to the cementing thereof so that the base can be accurately located in a predetermined position with respect to the light source in the bulb.

Further advantages and features of my invention will appear from the following description of species thereof.

In the drawing, Fig. 1 is an elevation of a lamp bulb and a base in section, the parts being so proportioned as to permit relative adjustment therebetween to properly locate the base with respect to the filament in the bulb; Fig. 2 is an elevation, partly in section, showing the united base and bulb and a portion of apparatus for holding the parts during basing; Fig. 3 is an elevation, partly in section, of a completed lamp located in a reflector; and Fig. 4 is an elevation, partly in section, of a lamp having a modified bulb shape.

Referring to the drawing, the particular lamp illustrated is of the butt-sealed miniature type used, for example, in flash lights. The lamp in Figs. 1–3 comprises a bulb 10 having a reduced cylindrical neck portion 11 and, preferably, a further reduced portion 12 to which is sealed an exhaust tube 13. A pair of leading-in wires 14, 15 have portions thereof sealed in the joint formed by the bulb 10 and exhaust tube 13. A filament 16 is mounted on the leading-in wires 14, 15 which are held in spaced relation within the bulb by a bead 17 of insulating material. In order to accurately locate the filament 16 in a predetermined position in the bulb, one of the leading-in wires (15) is preferably extended at 18 to a hollow tip 19 at the end of the bulb, as shown and claimed in U. S. Patent 1,983,362, Geiger et al., issued December 4, 1934.

The base 20 comprises a cylindrical metal shell 21 having at its rear end a body of insulating material 22, preferably glass, having an opening 23 therein and a metal eyelet 24 fused to the end thereof. The front end of the base shell 21 has an integral annular flange 25 turned outwardly therefrom. The said base shell 21 is partially filled with a ring of cement 26. The leading-in wire 15 is threaded through the opening 23 and the wire 14 through a slot 27 at the front of the base shell. The internal diameter of the base shell 21 is slightly larger than the diameter of the reduced neck portion 11 of the bulb 10 to permit rocking and shifting of the bulb in the base.

For accurately locating the base, the bulb is held by vacuum in a movable chuck 28 while the base 20 is held above the bulb in a holder 29 comprising a metal support plate 30 having an opening 31 for the bulb 10 and an annular seating shoulder 32 around the upper end of said opening. The flange 25 on the base shell 21 is held in the said shoulder 32 by one or more radially movable spring members 33. The leads 14, 15 are then connected to a source of current supply so as to project an image or images of the filament 16 upon a screen and the chuck 28 is moved up or down or sideways to shift or tilt

the bulb 10 in the base 20 until the filament 16 is properly located at a predetermined distance and in a predetermined plane with respect to the flange 25. The neck portion 11 is made of sufficient length to permit adjustment of the bulb into or out of the base without causing the base to abut against the shoulder 34 formed by the said reduced neck portion 11. The entire bulb could of course be made the same diameter as the neck portion 11 thus entirely eliminating the shoulder 34. In other words, while in some cases a part of the inner surface at the front end of the base shell 21 may be in contact with the neck portion 11 in order to properly align the filament, the front end of the base in no event abuts against any part of the bulb.

After the correct optical positioning of the filament, the base shell 21 is heated, either by direct gas flame or by means of an electric resistance coil surrounding it, to cure the cement 26. During the baking operation, the cement expands and tends to flow down through the clearance between the base shell 21 and bulb neck 11. However, as it approaches the end of the base shell, the cement is hardened because the flange 25 and the end of the shell are kept cool by the comparatively heavy metal support plate 30 with which the said flange is in contact. Actually the cement just begins to flow into the said clearance when it is hardened. If a base without a flange were used, as for example, one having the conventional bayonet pins or other form of outwardly extending projection, the front end of the base adjacent the bulb should be cooled to secure the same effect. This cooling is an important feature of my invention.

After the cement has hardened, the lamp is completed by trimming the leading-in wires 14, 15 and soldering them to the base shell 21 and eyelet 24 as shown at 35 and 36 respectively in Fig. 3. The completed lamp is shown in Fig. 3 mounted in a reflector 37 having an annular recess or boss 38 which is engaged by the base flange 25 thereby accurately locating the filament 16 with respect to the focus of said reflector.

The lamp shown in Fig. 4 has a modified bulb shape in that the cylindrical bulb 10 has an enlarged bulbous or spherical neck portion 11' of slightly smaller diameter than the base shell 21, thereby permitting considerable rocking of the bulb within the base to adjust the filament 16 with respect to the flange 25.

Obviously my invention is not limited to the butt-sealed type of lamp shown in the drawing. It is also not essential to have a continuous flange 25 on the base. Instead, a plurality of lugs or wings may be formed from the base shell or bayonet pins may be substituted therefor.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. An electric lamp comprising a bulb having a neck portion, a light source in said bulb, a cylindrical base surrounding said neck portion of said bulb and having an internal diameter slightly larger than the diameter of said neck portion of said bulb, the end of said base adjacent said bulb being out of abutting contact with any part of said bulb, and an outwardly extending projection on said base located at a predetermined distance and in a predetermined plane with respect to said light source, said base being only partially filled with a ring of cement surrounding at least a portion of said bulb neck and securing it to said base.

2. An electric lamp comprising a bulb having a cylindrical neck portion, a light source in said bulb, a cylindrical base surrounding said neck portion of said bulb and having an internal diameter slightly larger than the diameter of said neck portion of said bulb, the end of said base adjacent said bulb being out of abutting contact with any part of said bulb, and an outwardly extending projection on said base located at a predetermined distance and in a predetermined plane with respect to said light source, said base being only partially filled with a ring of cement surrounding at least a portion of said bulb neck and securing it to said base.

3. An electric lamp comprising a bulb having a spherical neck portion, a light source in said bulb, a cylindrical base surrounding said neck portion of said bulb and having an internal diameter slightly larger than the diameter of said neck portion of said bulb, the end of said base adjacent said bulb being out of abutting contact with any part of said bulb, and an outwardly extending projection on said base located at a predetermined distance and in a predetermined plane with respect to said light source, said base being only partially filled with a ring of cement surrounding at least a portion of said bulb neck and securing it to said base.

4. An electric lamp comprising a bulb having a neck portion, a light source in said bulb and a base comprising a cylindrical metal shell surrounding said neck portion of said bulb and having an internal diameter slightly larger than the diameter of said neck portion of said bulb, the end of said base shell adjacent said bulb having an integral outwardly turned flange thereon, said end of said base shell being out of abutting contact with any part of said bulb and said flange being located at a predetermined distance and in a predetermined plane with respect to said light source, said base shell being only partially filled with a ring of cement surrounding at least a portion of said bulb neck and securing it to said base.

5. An electric lamp comprising in combination a substantially cylindrical base having an end contact, a bulb having a light source therein and lead-in wires extending through said bulb and connected to said light source, said bulb having a substantially cylindrical neck portion of slightly smaller diameter than the internal diameter of said base and an adjacent substantially cylindrical reduced portion of smaller diameter than said neck portion, said base surrounding said reduced bulb portion and at least part of said neck portion but being out of abutting contact with any part of said bulb, said base having an outwardly extending projection located at a predetermined distance and in a predetermined plane with respect to said light source, and a ring of cement within and only partially filling said base and surrounding said reduced portion and said neck portion of said bulb for securing said bulb and base together, one of said lead-in wires extending to said base end contact.

WALTER J. GEIGER.