Jan. 16, 1934. E. G. K. ANDERSON 1,943,852

HOLDER AND INCLOSURE FOR LAMPS

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Fig. 1.

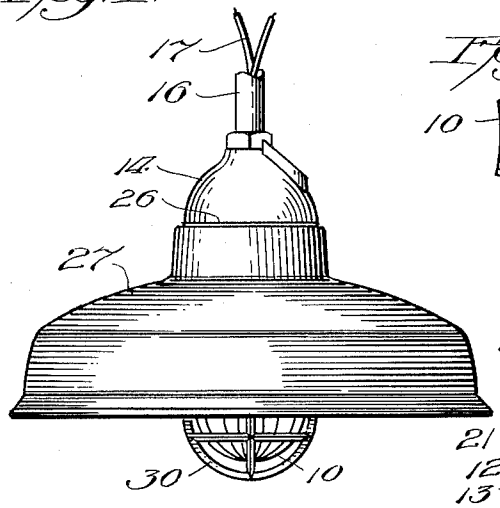


Fig. 4.

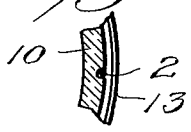


Fig. 2.

Fig. 3.

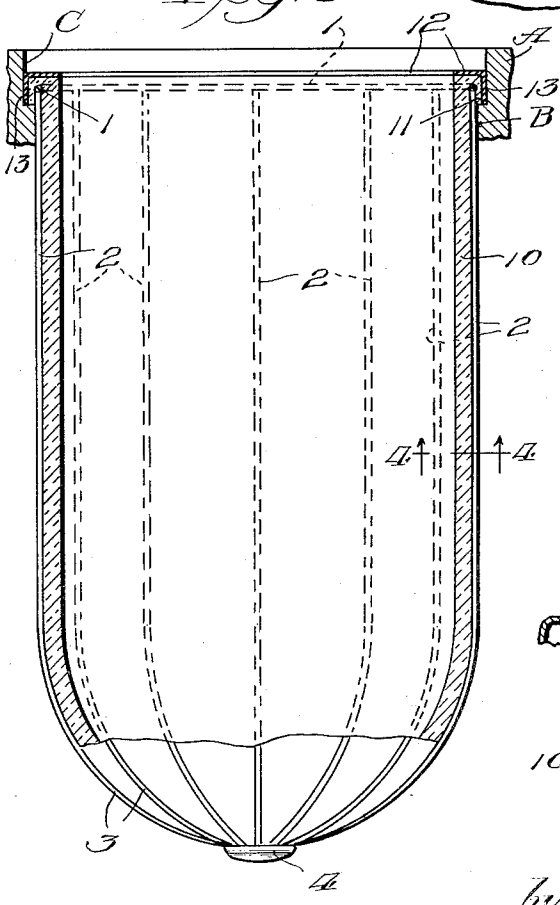
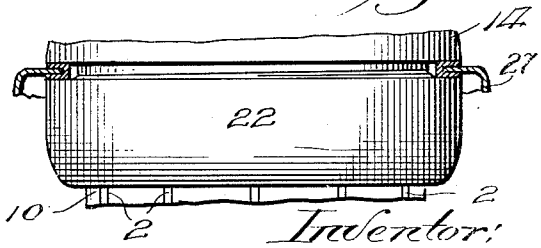


Fig. 5.



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HOLDER AND INCLOSURE FOR LAMPS

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Fig. 6.

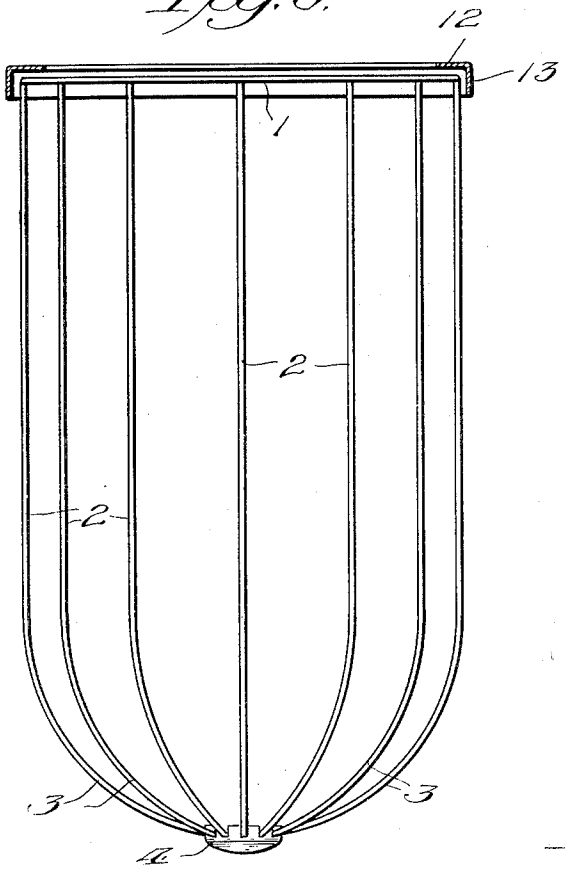


Fig. 8.

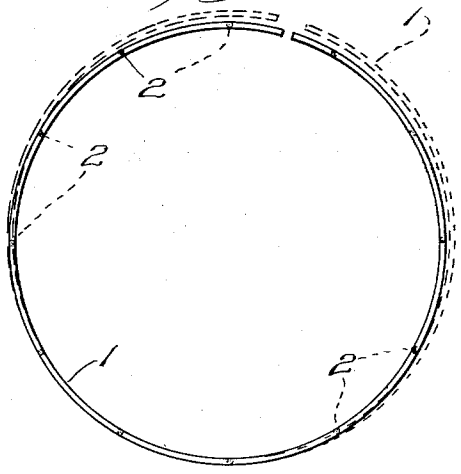


Fig. 9.

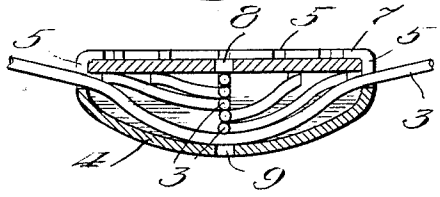


Fig. 11.

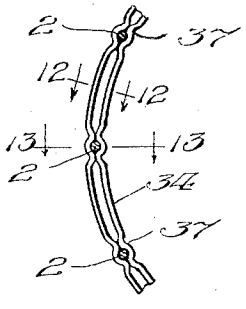


Fig. 10.

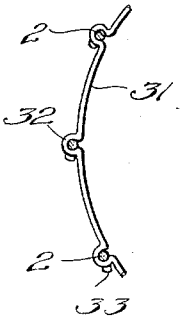


Fig. 7.

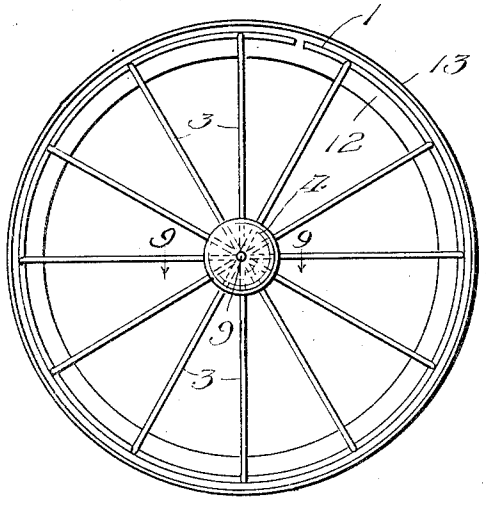
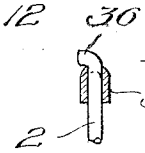


Fig. 12



Fig. 13



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UNITED STATES PATENT OFFICE

1,943,852

HOLDER AND INCLOSURE FOR LAMPS

Ernst G. K. Anderson, Evanston, Ill., assignor to Appleton Electric Company, a corporation of Illinois

Application November 12, 1932
Serial No. 642,419

12 Claims. (Cl. 240—11.2)

The present invention relates to means for supporting and inclosing electric light bulbs and, viewed in various of its aspects, the present invention may be said to have for its objects: to produce a strong glass globe effectively reenforced with metal; to produce a glass globe having a wide flat annular bearing surface or face at the open end; and to produce a holding and inclosing means which will be explosion-resistant and thereby prevent any danger of the ignition of gases in the surrounding atmosphere through sparks or flame generated within the inclosing means.

In carrying out my invention in its most highly developed form, all of the foregoing objects, as well as other objects, will be attained, although in some forms of the invention it is not essential that means be present for carrying out each and every object. The various features of novelty whereby my invention is characterized will hereinafter be pointed out with particularity in the claims; but, for a full understanding of my invention and of its objects and advantages, reference may be had to the followng detailed description taken in connection with the accompanying drawings, wherein:

Figure 1 is a side elevation of a lamp holder and inclosing means, including a reflector, embodying the present invention; Fig. 2 is a central longitudinal section, on a larger scale; Fig. 3 is a view of the globe, partly in section and partly in elevation, on a still larger scale, before removing it from the mold, a fragment of the mold being shown; Fig. 4 is a section on line 4—4 of Fig. 3; Fig. 5 is a view, partly in section and partly in elevation, showing a fragment of the holder in which the supporting ring for the globe does not have thereon the protective metal cage shown in Figs. 1 and 2; Fig. 6 is an elevation of the metal parts entering into the manufacture of the globe, in the positions which they occupy relatively to each other in the mold, before the glass is applied; Fig. 7 is a bottom plan view of the parts shown in Fig. 6; Fig. 8 is a top plan view of the cage-like metal reenforcing structure, showing it in full lines as it appears in the mold and in dotted lines in an expanded condition; Fig. 9 is a section, on an enlarged scale, on line 9—9 of Fig. 7; Fig. 10 is a plan view of a fragment of a modified form of end ring for the cage-like reenforcing structure; Fig. 11 is a view similar to Fig. 10, showing a further modification; and Figs. 12 and 13 are sections taken, respectively, on line 12—12 and line 13—13 of Fig. 11.

In the construction of my improved globe, I preferably employ shatterproof glass suitably reenforced with metal. I prefer that the metal reenforcing structure be in the form of a ring 1 of small cross sectional area, adapted to lie within the annular wall of the globe in proximity to the open end of the latter; this ring having connected thereto a series of wires extending lengthwise of the globe and meeting at the apex of the latter. The globe that I have illustrated is in the form of a cylindrical shell open at one end and having the other end closed by an approximately hemispherical dome-like part. Each longitudinal wire therefore conveniently consists of a straight portion 2 and a curved portion 3, joined to the section 2, in the form of a quadrant of a circle; the two sections of each wire lying in a plane containing the long axis of the globe. Where an even number of wires are employed, as shown, each straight section and corresponding curved section may be integral with and form part of the same wire as the diametrically opposite straight and curved sections. In other words, each wire, in this form, extends continuously from the ring to a point on the ring diametrically opposite. It is necessary that some means be provided for connecting the wires where they cross each other at the tip of the globe. In the arrangement shown, I have provided a small sheet metal cup 4 having a curved bottom. The side walls of the cup are slotted, as indicated at 5, from the free edge downwardly. The wires all pass through the cup, each wire lying in the proper diametrically opposed slots. A small metal disk 6 is set in the cup on top of the wires, and the marginal portion of the cup around the mouth or open end is then flanged inwardly, as indicated at 7, to hold the disk down against the wires. The disk and the bottom wall of the cup are provided with central registering openings 8 and 9, respectively, to permit the escape of gases at the time the glass body is being molded about the metal structure, and thus avoid the formation of bubbles in the glass.

The ring 1 must be of small cross-sectional area in order to avoid cracking of the glass upon the cooling of the globe following the molding operation. In some instances the ring is made divided instead of being continuous, as shown in Figs. 7 and 8. This not only facilitates expansion in the circumferential direction, without increase of radius, under temperature changes; but, if the ring be more or less resilient, it may be employed frictionally to hold the metal reenforcing structure properly positioned in the mold. In other

words, if the ring tends to open, as shown in dotted lines in Fig. 8, and must be partially closed, as shown in full lines, in order to enter the mold. some part of the metal reenforcing structure will be yieldingly pressed against the surrounding wall of the mold. In Fig. 3 there is shown a fragment of the mold, indicated at A. The diameter of the main portion of the mold cavity, indicated at B, is such that the ring 1 will be closed, as shown in full lines in Fig. 8, at the time that the wires 2 engage with the wall of the cavity B.

The parts are so proportioned that the button-like connector 4 for the wires rests in a suitable depression, not shown, in the bottom of the mold, while the longitudinal wires engage with the mold walls. Also, the bottom of the mold is provided with a vent to register with the opening 9 in the member 4.

By having the longitudinal wires and the connecting member therefor at the apex of the globe in contact with the walls of the mold, they will be kept reasonably cool when the molten glass is disposed in the mold and pressed into the desired shape; thereby permitting the use of metal of a lower melting point than would otherwise be feasible, and preventing the formation of bubbles in the glass, along the wires. The glass portion of the completed globe is indicated at 10, the wall thereof being outwardly thickened at the open end to provide there an annular external flange 11. The longitudinal reenforcing wires pass into this flange or, at least into the glass at the base of the flange.

The edge of the globe, at the open end, must have a wide metal bearing face to make it possible to secure a tight joint between the end of the globe and a supporting fitting. I therefore place in the mold, before depositing the molten glass in the latter, a suitable cap ring that may conveniently be a flat ring 12 of sheet metal as wide as the width of the edge of the wall of the globe at the open end. The ring 12 has a peripheral flange 13 wide or deep enough to cover the peripheral edge of the glass flange 11. In order to cause the attachment of the cap ring to the globe, I enlarge the mold cavity in the upper end of the mold in which the globe is cast, as indicated at C in Fig. 3, so as to permit the cap ring to be set into the same after the wire reenforcing structure has been inserted in the mold. Then, when the molten glass is forced upwardly by a plunger descending into the mold, it flows laterally into engagement with the annular wall 13 of the cap ring as well as upwardly against the under side of the flat part 12 of the cap ring. When the glass becomes cool the cap ring remains attached to the globe.

The globe may be supported in any suitable way in proper relation to a light bulb or lamp. In the arrangement shown, there is a metal fitting in the form of a dome-like box 14 open at the lower end and having at the upper end a hub 15 into which may be screwed a pipe to support the same and serve as a conduit for conductors 17. These conductors lead to a lamp receptacle 18 fitted across an opening in a transverse horizontal partition 19 in the box and separating the latter into upper and lower chambers. The lower end of the box is in the form of an annular wall 20, provided with comparatively fine external screw threads 21. Screwed upon the part 20 is a wide ring or short sleeve 22 having at one end an internal annular ledge or lip 23 that permits the body of the globe to pass through the ring but underlies the flange on the globe and supports the globe therefrom. The flange on the globe is held against the annular ledge or lip 23 by a ring 24 screwed into the ring or sleeve 22 and having, on the under side at least, a flat face whose radial width is equal to the width of the cap ring 12 on the globe. Consequently, after the parts have been assembled, there can be no interchange of gases or other fluids between the interior of the globe and the exterior through the joint between the end edge of the globe and the ring 24. Furthermore, by proportioning the parts so that the ring or sleeve 22 is screwed upon the box member of the fitting for a distance corresponding to a considerable number of threads, it will be very difficult for any leakage to occur between the interior and the exterior through the screw joint between the box and the ring or sleeve 22.

If a reflector for a lamp, such as indicated at 25 in Fig. 2, arranged within the holder, be desired, it may be provided with a central opening so as to permit it to be clamped between the ring or sleeve 22 and an overhanging shoulder 26 on the box above the screw-threaded part 20; such a reflector being shown at 27 in Figs. 1 and 2.

After the fixture has been wired, the upper compartment in the box may be filled or partially filled with a suitable sealing compound, such as indicated at 28 in Fig. 2; this compound being introduced through an opening in the upper part of the box adapted to be closed by a pipe plug 29.

If desired, the ring or sleeve 22 may have fixed thereto or form part thereof a heavy, sturdy metal cage 30 that encloses the globe. On the other hand, as shown in Fig. 5, no such cage or guard need be employed, particularly where the service is such that the reenforced globe will be strong enough to withstand the shocks or blows to which it may be subjected.

As heretofore described, the ring 1 consists of a comparatively light wire to which the longitudinal wires are welded or brazed. In Fig. 10 there is shown a wire 31, crimped at intervals, as indicated at 32, to receive the ends of the longitudinal reenforcing wires, the extreme ends of which may be bent laterally, as indicated at 33. Instead of employing a wire to connect together the free ends of the longitudinal reenforcing wires, I may employ an annular trough 34 of light sheet metal, as shown in Fig. 11. This trough may be perforated at intervals to provide openings for the passage of the longitudinal reenforcing wires. These wires may have their extreme ends bent laterally, after emerging through the bottoms of the troughs, as shown at 36 in Fig. 13. Furthermore, the side walls of the trough may be pinched inwardly, as indicated at 37, on opposite sides of each of the wires 2, thereby causing the wires to be frictionally gripped.

It will thus be seen that I have produced a rugged transparent globe, reenforced in a simple manner that avoids the formation of air or gas bubbles in the glass and also avoids the setting up of internal stresses apt to cause the glass to crack either upon cooling or when subjected to blows or shocks that otherwise are not injurious. It will further be seen that I have produced a simple fitting for supporting the globe and a lamp or light bulb and making it practically impossible for any interchange between gases to take place between the interior of the globe and the space surrounding the globe; thereby greatly lessening the fire hazard when devices of this kind are employed.

While I have illustrated and described with particularity only a single preferred form of my invention, with a few minor modifications, I do not desire to be limited to the exact structural details thus illustrated and described; but intend to cover all forms and arrangements which come within the definitions of my invention constituting the appended claims.

I claim:

1. A globe closed at one end and open at the other end, reenforcing wires extending from the middle of the closed end to the open end, the wires being sunk at least partially into the glass.

2. A glass globe closed at one end and open at the other end, the rim of the globe being thickened in the outward direction, and reenforcing wires extending from the middle of the closed end of the globe to the open end, the wires being at least partially embedded in the glass in the body portion of the globe and extending down into the outwardly thickened part.

3. A glass globe closed at one end and open at the other end, said globe having a series of external open grooves extending from a point in the closed end lengthwise of the globe, and reenforcing wires lying in said grooves.

4. A glass globe closed at one end and open at the other end, said globe having at said open end a thickened part producing a peripheral flange, there being external open grooves extending lengthwise of the globe from the closed end to said flange, and reenforcing wires lying in said grooves and extending into the body of said flange.

5. A glass globe closed at one end and open at the other end, a metal ring embedded in the glass at said open end, and reenforcing wires extending from said ring lengthwise of the globe to the closed end.

6. A glass globe closed at one end and open at the other end, the globe having at its open end a thickened part producing a flange surrounding the end, a metal ring embedded in said thickened part, and reenforcing wires extending from said ring along the exterior of the globe to the closed end.

7. A glass globe closed at one end and open at the other end, the globe having at its open end a thickened part producing a flange surrounding that end, a metal ring embedded in said thickened part, a member at least partially embedded in the closed end of the globe and exposed on the outer side of the latter, there being grooves in the periphery of the globe extending lengthwise thereof from said flange to said member, and wires lying in said grooves and extending from said ring to said member.

8. A glass globe closed at one end and open at the other end, the globe having at its open end a thickened part producing a flange surrounding that end, and a thin flat metal cap ring covering the edge face of the globe at said open end and providing the open end of the globe with a flat annular bearing face of considerable width, said ring having a part surrounding and engaged with the periphery of the flange.

9. A glass globe in the form of a cylindrical shell having a dome-shaped closed end and the other end being open, and a metal reenforcing structure for the globe comprising a series of external at least partially embedded wires extending over the dome and along the cylindrical body of the globe and each lying in a plane containing the long axis of the cylinder.

10. A glass globe in the form of a cylindrical shell having a dome-shaped closed end and the other end being open, the globe being thickened at its open end thereby producing at that end an annular peripheral flange, a metal ring embedded in the thickened part of the globe at the open end, there being grooves in the exterior of the globe extending from the flange to the top of the dome, reenforcing wires extending from said ring along said grooves and forming an openwork sheathing for the globe.

11. A glass globe in the form of a cylindrical shell having a dome-shaped closed end and the other end being open, the globe being thickened at its open end thereby producing at that end an annular peripheral flange, a metal ring embedded in the thickened part of the globe at the open end, there being grooves in the exterior of the globe, each lying in a plane containing the axis of the cylinder and extending from the flange across the dome and back to the flange on the opposite side of the globe, and a series of continuous reenforcing wires each lying in one of said grooves and connected at its ends to said wires.

12. A reenforcing device for a glass globe adapted to be molded about the same, composed of a ring, a series of wires connected to and rising from the ring in spaced relation to each other, said wires forming a cage having a dome-shaped top, and a button-like element securing the wires together at the top of the dome, said element having a hole through the center.

ERNST G. K. ANDERSON.