June 12, 1956 H. J. ANDERSON 2,750,491

SEALED BEAM LIGHT

Filed Feb. 8, 1955 2 Sheets-Sheet 1

Fig. 1.

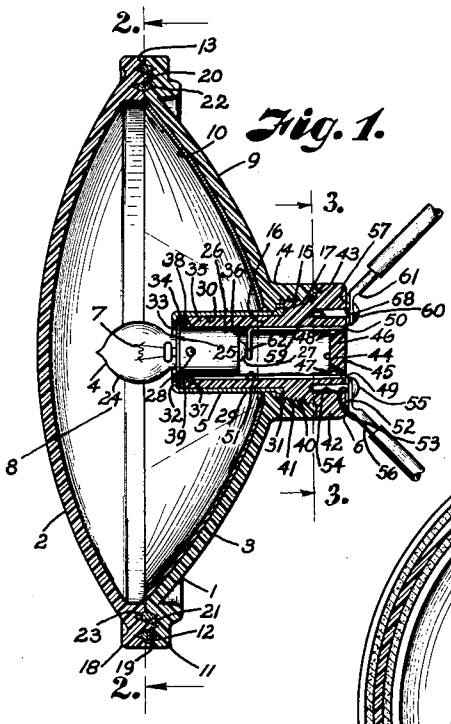


Fig. 2.

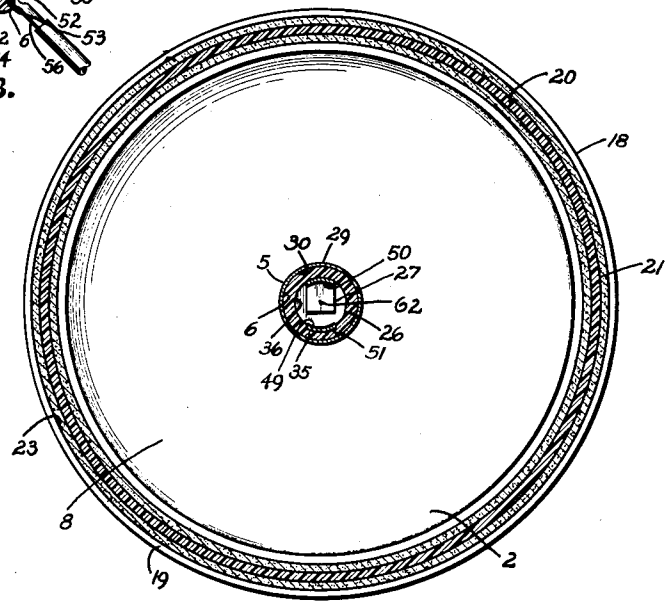
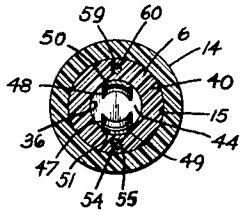


Fig. 3.



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Filed Feb. 8, 1955 2 Sheets-Sheet 2

Fig. 4.

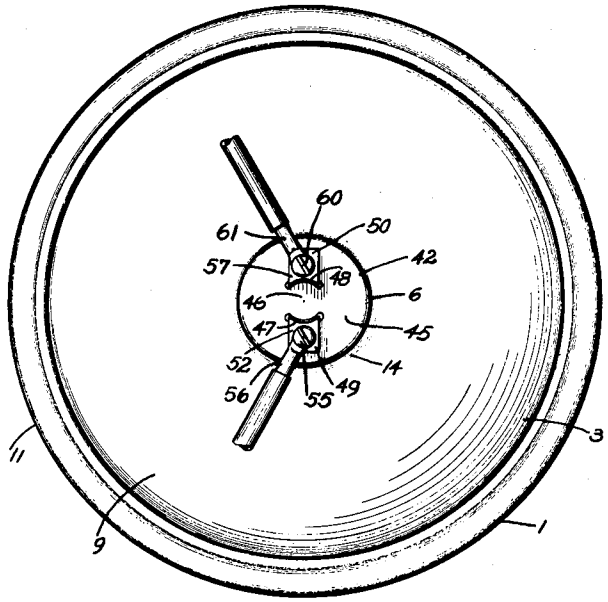
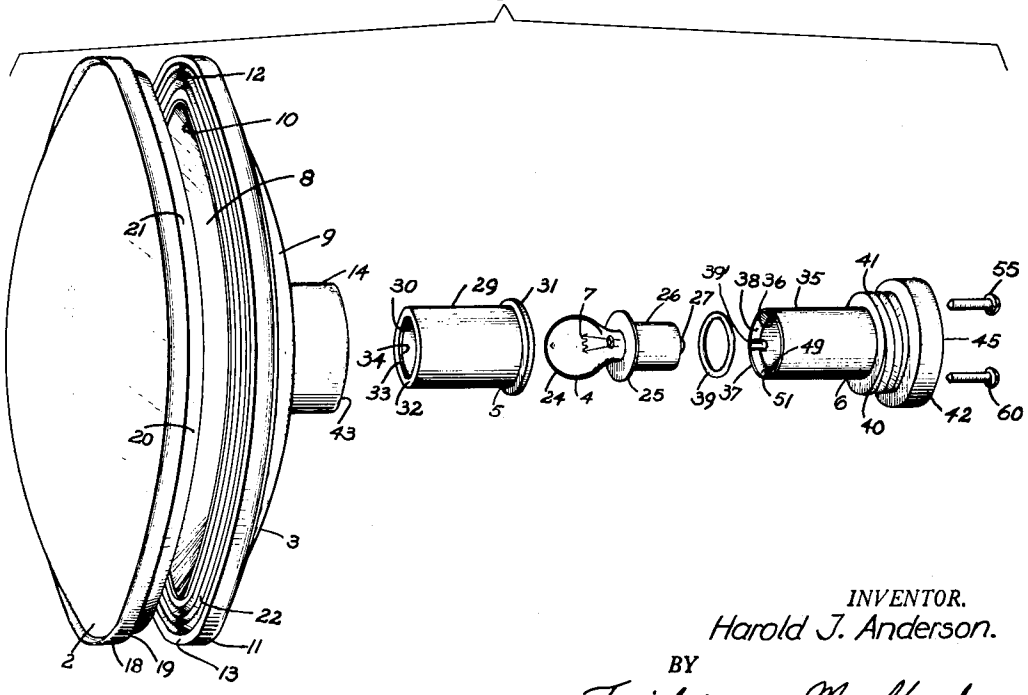


Fig. 5.



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SEALED BEAM LIGHT

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Application February 8, 1955, Serial No. 486,781

4 Claims. (Cl. 240—41)

This invention relates to sealed beam lights and more particularly to such a light structure wherein the filament is enclosed within a glass envelope that is independent of the reflector and lens assembly.

Various so-called sealed beam lights have been manufactured and sold and used for vehicle headlights and other lighting purposes wherein the lens and reflector are sealed at their peripheries to form a filament containing chamber which is substantially evacuated, the lens and reflector being the only envelope enclosing the filament. With such structures burning out of the filament, cracking or perforating the lens as by gravel, or the like, results in complete failure of the light requiring replacement of the entire expensive assembly. There have been various attempts to provide a sealed beam light with replaceable filaments but such structures have been inefficient due to inability to dissipate heat generated by the filament and also due to the number of parts and joints involved in the removal and replacement of the filament.

The objects of the present invention are to provide a sealed beam light structure utilizing a filament in an independent glass envelope wherein the filament and envelope may be easily removed and replaced; to provide such a light structure that overcomes the difficulties and disadvantages of conventional sealed beam lights; to provide such a light structure wherein the lens and reflector are of the same or compatible material such as synthetic resin whereby they are hermetically sealed at their peripheries to define a chamber with a substantially tubular portion extending inwardly from the reflector for receiving a prefocussed flange-type lamp bulb which extends into the chamber together with removable means for retaining the bulb in selected position; and to provide a sealed beam light that is economical to manufacture, easily assembled, efficient in operation wherein the filament may be removed and replaced without damage to the remaining part of the structure.

In accomplishing these and other objects of the present invention, I have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawing wherein:

Fig. 1 is a longitudinal sectional view through the sealed beam light assembly.

Fig. 2 is a transverse sectional view through the sealed beam light assembly on the line 2—2, Fig. 1.

Fig. 3 is a transverse sectional view through the sealed beam light assembly on the line 3—3, Fig. 1.

Fig. 4 is a partial rear elevation of the sealed beam light assembly.

Fig. 5 is a disassembled perspective view of the parts of the sealed beam light assembly.

Referring more in detail to the drawings:

1 designates a sealed beam light assembly generally consisting of a lens 2, a mirror or reflector 3, a lamp bulb 4, a lamp receiver 5, and a retaining member 6, all assembled whereby the lamp bulb 4 has a filament 7 therein located in a chamber 8 defined by the lens and reflector and substantially at the focal point of the reflector.

The mirror or reflector 3 is preferably formed of a suitable synthetic resin and has an arcuate wall 9 provided with a parabolic forward or inner face 10. The outer marginal portion of the wall 9 terminates in a peripheral flange 11 having a plurality of annular concentric spaced grooves 12 extending rearwardly in the flange from the forward face 13 thereof. The reflector is provided with a rearwardly projecting axial boss or extension 14 having a threaded bore 15 extending therein from the rear end of the boss. The threaded bore terminates in a bore 16 of reduced diameter whereby the bores cooperate to define a shoulder 17. The surface 10 is coated with a suitable reflecting or mirror material preferably by what is called a vacuum plating process. In such a process the surface 10 is coated with a suitable lacquer and then the reflector placed in an evacuated plating chamber and plated with aluminum. In this process the aluminum adheres only to the lacquered surface. After the plating, the aluminum coating is covered with another coating of suitable lacquer to protect the mirror surface.

The lens 2 is preferably formed of a transparent synthetic resin or the like and preferably has a wall of substantially spherical contour having marginal portions terminating in a flange 18 having a rear face 19 adapted to engage the front face 13 of the flange 11 on the reflector. An annular rib 20 extends rearwardly from the face 19 of the lens and is of the same cross-section as one of the grooves 12 in the flange 11 whereby the rib 20 will extend into said groove and the side faces 21 of the rib will engage the side faces 22 of the groove when the face 19 substantially engages the face 13. The flange 18 is preferably provided with grooves 23 on each side of the rib and concentric therewith and said grooves register with selected grooves in the flange 11. The lens is secured to the reflector and hermetically sealed around the periphery thereof. In the assembly operation it is preferable that a suitable solvent or adhesive be applied to the groove 12 which is to receive the rib 20 and then the lens is moved toward the reflector whereby the rib 20 enters the groove and then pressure is applied and maintained until the flanges of the reflector and lens are adhered together in hermetically sealed relation. Any excess solvent is forced from the groove by the rib 20 into the adjacent grooves and forms a further weld or adherence of the flanges of the lens and reflector.

The lamp 4 is preferably of the conventional flanged type wherein the filament 7 is enclosed in a glass envelope 24 of smaller diameter than the flange 25. A cylindrical shank 26 extends from the opposite side of the flange relative to the bulb or envelope 24 and has a center terminal or contact 27 at the rear end. In such lamps there is usually a spot of solder 28 on the side of the shank 26 adjacent the flange 25 to anchor one wire leading to the filament 7 whereby the shank is one terminal of the lamp, the other wire from the filament being connected to the center terminal 27 which is insulated from the exterior of the shank 26.

A lamp receiving member 5 is arranged in the light assembly to receive and position the lamp 4 whereby the filament is substantially at the focal point of the parabolic reflector. In the present structure, the bulb receiver 5 consists of a cylindrical tubular member having a cylindrical wall 29 of exterior diameter substantially corresponding to the diameter of the bore 16 in the reflector. The wall 29 defines a bore 30 having a diameter slightly larger than the diameter of the flange 25. One end of the wall 29 terminates in an outwardly directed radial flange 31 adapted to engage the shoulder 17, the outer diameter of the flange being slightly less than the root

diameter of the thread of the threaded bore 15. The other end of the wall 29 terminates in an inwardly directed flange 32 defining an opening 33 of suitable size to pass the glass envelope 24 of the lamp 4 but of smaller diameter than the flange 25 whereby the bulb side of the flange will engage the shoulder 34 formed by the flange 32. It is preferable that the lamp receiver 5 be permanently secured to the reflector and therefore it is preferable that the lamp receiver be formed of a suitable synthetic resin and that suitable solvent be placed in the bore 16 and on the shoulder 17 and the receiver then be assembled in place and pressure applied until the receiver is secured to the reflector in sealed relation thereto.

The lamp is held in the lamp receiver by means of a retaining member or nut 6 having a cylindrical portion 35 of suitable size to closely fit in and be movable into the bore 30 of the bulb receiver. The cylindrical portion of the retainer has a bore 36 extending therein from the end 37, said bore being of suitable size to receive the shank 26 of the lamp 4. The end 37 is provided with a bevel 38 adapted to engage a suitable gasket or seal ring 39. The seal ring 39 preferably is a Neoprene O-ring sleeved over the shank 26 and engaging the flange 25. A groove 39' preferably extends into the wall 35 from the end 37 thereof to receive the solder 28. The other end of the cylindrical member 35 terminates in an enlarged portion 40 having exterior threads 41 thereon adapted to be screwed into the threaded bore 15. The threaded portion 40 terminates in an enlarged flange 42, the peripheral surface of which is knurled or otherwise roughened to provide a gripping surface for screwing the nut into position. It is preferable that the cylindrical portion 35 and the enlarged threaded portion 40 be of such length that when the nut is screwed in place, the bevel 38 engages the seal ring 39 and presses same to make a tight seal between the bulb and receiver and the end of the threaded portion 40 toward the cylindrical portion 35 will be spaced slightly from the flange 31 and the flange 42 will be adjacent to or almost engaging the rear face 43 of the boss 14.

The bore 36 terminates as at 44 in spaced relation to the outer or rear face 45 of the retainer 6 to form a wall 46. Spaced slots 47 and 48 extend through the wall 46 whereby contact strips 49 and 50 can extend through the slots 47 and 48 respectively. The slot 47 preferably aligns with a groove 51 in the inner surface of the cylindrical portion 35, the groove being of a depth slightly less than the thickness of the contact strip 49 whereby said strip will lie in the groove for substantially the full length of the bore 36 and project therefrom into contact with the side surface of the shank 26 forming a ground contact therefor. The contact strip 49 is preferably arcuate in cross section to conform to the radius of the shank 26. The strip 49 extends through the slot 47 and terminates in an outwardly directed ear 52 having an aperture 53 therein aligning with a threaded bore 54 for receiving a screw 55 which serves to hold the contact strip in place and also is adapted to receive a terminal 56 of a wire leading to a ground connection of an electrical circuit adapted to energize the filament 7. A contact strip 50 extends through the slot 48 and has an ear 57 turned outwardly thereon and provided with an aperture 58 adapted to align with a bore 59 for receiving a screw 60 for holding the strip in place and also serving as a connection for a connecting terminal 61 of a wire leading to a source of current in a circuit adapted to energize the filament 7. The other end of the strip 50 extends in the bore 36 and is bent inwardly to form a contact 62 resiliently engaging the center terminal 27 of the lamp 4.

In using a sealed beam light constructed and assembled as described, the light is assembled in a suitable housing (not shown) mounted on a vehicle or other device adapted to carry the light and when the electrical circuit to the filament 7 is energized, the light therefrom is reflected by the reflecting surface and is directed through the lens 2.

If the filament 7 should be burned out, the screws 55 and 60 are loosened and the terminals from the electric circuit disconnected therefrom. Then the flange 42 is grasped and the retainer unscrewed from the threaded bore 15 and the lamp 4 removed from the receiver 5. The seal ring 39 is then removed from the shank 26 and placed on the shank of the new lamp. The shank of the new lamp is then inserted in the bore 36 and the lamp and cylindrical portion 35 inserted in the bore 30 of the receiver 5 and the retainer rotated to screw same into the threaded bore 15 until the seal ring 39 is compressed to form a tight seal between the flange and shank of the lamp and bore 30 of the receiver 5. The terminals from the electric circuit are again connected to the screws 55 and 60 and said screws tightened and then the light is ready for further use. In the event the lens 2 should be cracked or otherwise perforated, the light will continue to operate efficiently until the reflector coating on the reflector deteriorates thereby providing suitable operation until the user has an opportunity to obtain a replacement assembly.

It is believed obvious I have provided an efficient sealed beam light with a replaceable filament that is economical to manufacture and maintain in operation.

What I claim and desire to secure by Letters Patent is:

1. A sealed beam light comprising, a lens and a parabolic mirror permanently sealed together at the marginal portions thereof and enclosing an open space between them, the focal point of the parabolic mirror being within said open space, a tubular member extending axially from the parabolic mirror into said open space and terminating in an inwardly projecting flange defining an axial opening communicating with said open space, the portion of said tubular member adjacent the parabolic mirror being permanently sealed thereto, a lamp having a bulb with a filament therein and a shank extending therefrom with electrical terminals connected to the filament, an outwardly projecting flange on the lamp shank adjacent the bulb and slidable into the bore of said tubular member and engaging said inwardly projecting flange with the lamp bulb extending through the axial opening whereby the filament is positioned substantially at the focal point of the parabolic mirror, a plug member removably secured to the parabolic mirror and having a portion extending into the tubular member with a bore in said plug portion receiving the lamp shank, compressible means in the tubular member and between said plug portion and lamp flange and forming a tight seal between the tubular member and lamp shank when the plug is secured to the parabolic mirror, and contacts in the plug connectable with an electric circuit and having portions extending longitudinally of the bore in the plug and in circuit making engagement with the terminals of the lamp filament.

2. A sealed beam light comprising, a lens and a parabolic mirror sealed together at the marginal edges thereof and enclosing an open space between them, a projection on the parabolic mirror and extending axially therefrom into said open space toward the lens, said projection having an axial bore therein opening to the rear of the parabolic mirror, said bore terminating adjacent the inner end of the projection in said open space in an axial opening of smaller size communicating said open space to the exterior through the bore in the projection on the parabolic mirror, said axial bore and opening defining a shoulder adjacent the inner end of the projection, a lamp having a bulb with a filament therein and a shank extending therefrom with electrical terminals for the filament therein, an outwardly projecting flange on the shank adjacent the bulb slidable into the bore of the projection on the parabolic mirror and engaging said shoulder with the lamp bulb extending through the axial opening whereby the filament is positioned substantially at the focal point of the parabolic mirror, a plug member removably secured to the parabolic mirror adjacent the rear opening of the bore in the projection, an extension on the plug

member extending into the axial bore of said mirror projection and having a bore receiving the lamp shank, compressible means between the plug extension and the lamp flange forming a seal between the lamp shank and mirror projection when the plug member is secured to the parabolic mirror, and contacts in the plug connectable with an electric circuit and engaged with the terminals of the lamp filament when the plug and lamp are assembled in the parabolic mirror and projection thereon.

3. A sealed beam light comprising, a lens and a parabolic mirror sealed together at the marginal edges thereof and enclosing an open space between them, a rearwardly extending projection integral with and axially of the parabolic mirror, said rearwardly extending projection having a threaded bore therein, a tubular member having an enlarged portion fixed in said bore of the rearwardly extending projection and extending therefrom into said open space axially of the parabolic mirror, said tubular member terminating at the end thereof in said open space in an inwardly projecting flange defining an axial opening communicating said open space to the exterior through the tubular member and threaded bore, a lamp having a bulb with a filament therein and a shank extending therefrom with electrical terminals for the filament therein, an outwardly projecting flange on the shank adjacent the bulb slidable into the bore of the tubular member and engaging said inwardly projecting flange with the lamp bulb extending through the axial opening whereby the filament is positioned substantially at the focal point of the parabolic mirror, a plug member having a threaded portion for removably securing same to the rearwardly extending projection of the parabolic mirror, an extension on the plug member extending into the tubular member and having a bore receiving the lamp shank, compressible means between the plug extension and the lamp flange forming a seal between the lamp shank and tubular member when the plug is secured to the rearwardly extending projection of the parabolic mirror, and contacts in the plug connectable with an electric circuit and engaged with the terminals of the lamp filament when the plug and lamp are assembled in the parabolic mirror and tubular member.

4. A sealed beam light comprising, a substantially circular shell having a light reflecting inner surface, a lens having marginal portions permanently sealed to the marginal portions of the shell and cooperating therewith to define a cavity therebetween, a projection on the shell with one portion extending rearwardly therefrom and the other portion extending into the cavity, said projection being substantially axially of the reflecting surface, said projection having an axial bore therein with one end opening to the rear and the other terminating in an axial opening of smaller size communicating said cavity to the exterior through said bore, said bore and axial opening cooperating to define an internal shoulder adjacent the inner end of said other portion of the projection, a lamp having a bulb with a filament therein and a shank extending therefrom with electrical terminals for the filament therein, an outwardly projecting member on the shank and slidable into the axial bore and engaging the shoulder with the lamp bulb extending through the axial opening whereby the filament is positioned in the cavity forwardly of said other projection portion, a plug member in the bore of the rear portion of the projection, said plug member and rear portion of the projection having interengaging means removably securing said plug member in said bore, an extension on the plug member extending in the bore toward the cavity and terminating adjacent the outwardly projecting member on the lamp shank, said extension on the plug member having an axial recess receiving the lamp shank, compressible means between the plug extension and the outwardly projecting member on the lamp shank forming a seal between the shell projection and lamp shank when the plug member is secured in the bore of said projection in the shell, and contacts in the plug member connectible with an electric circuit and engaged with the terminals of the lamp filament when the plug member and lamp are assembled in the shell and projection thereon.

References Cited in the file of this patent

UNITED STATES PATENTS

2,314,735	Portnow	Mar. 23, 1943
2,678,996	Johnson	May 18, 1954

FOREIGN PATENTS

816,202	Germany	Oct. 8, 1951
699,019	Great Britain	Oct. 28, 1953