

Dec. 16, 1941.

H. C. MEAD ET AL

2,266,329

HEAD LAMP MOUNTING (BALL AND SOCKET)

Filed July 27, 1939

4 Sheets-Sheet 1

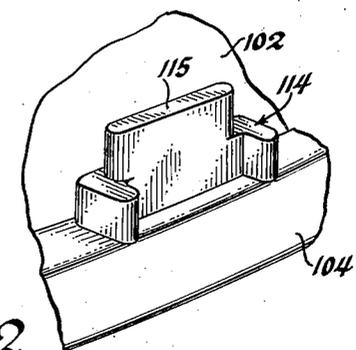
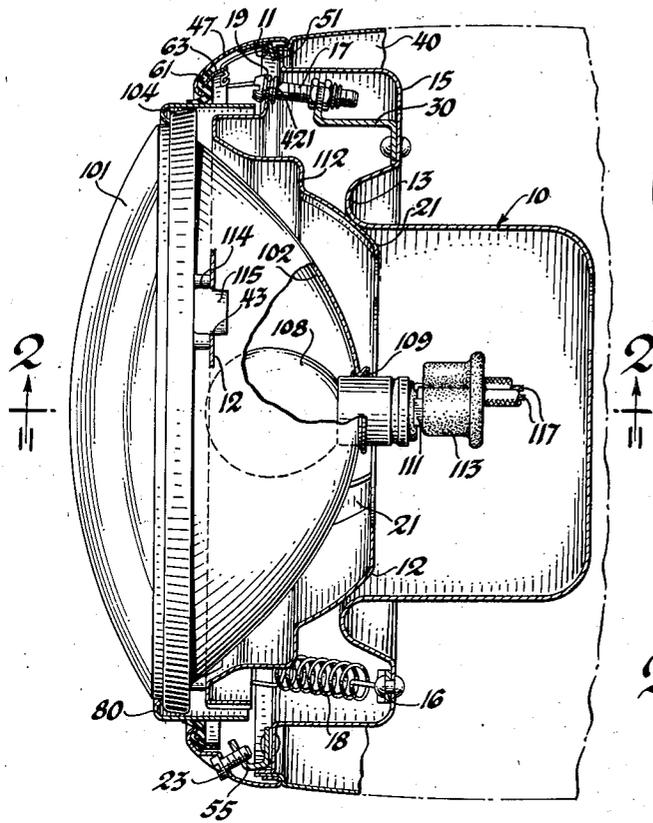


Fig. 3

Fig. 1

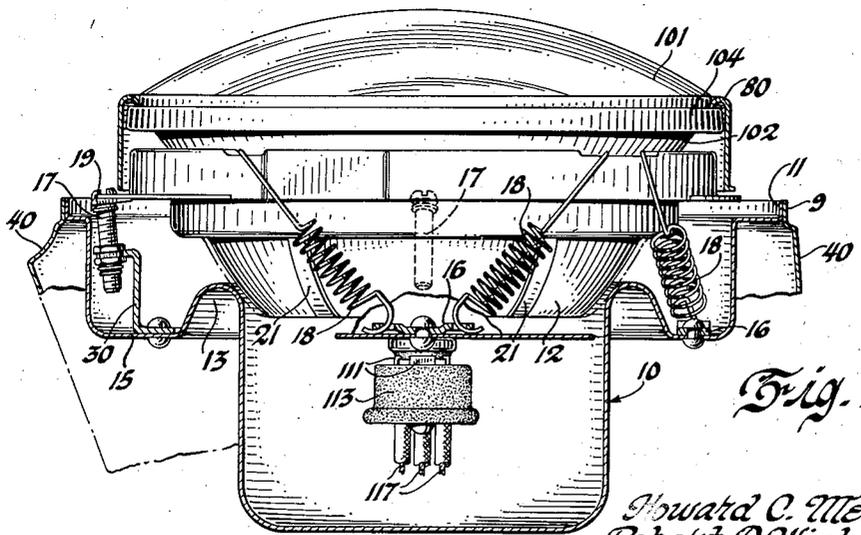


Fig. 2

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4 Sheets-Sheet 2

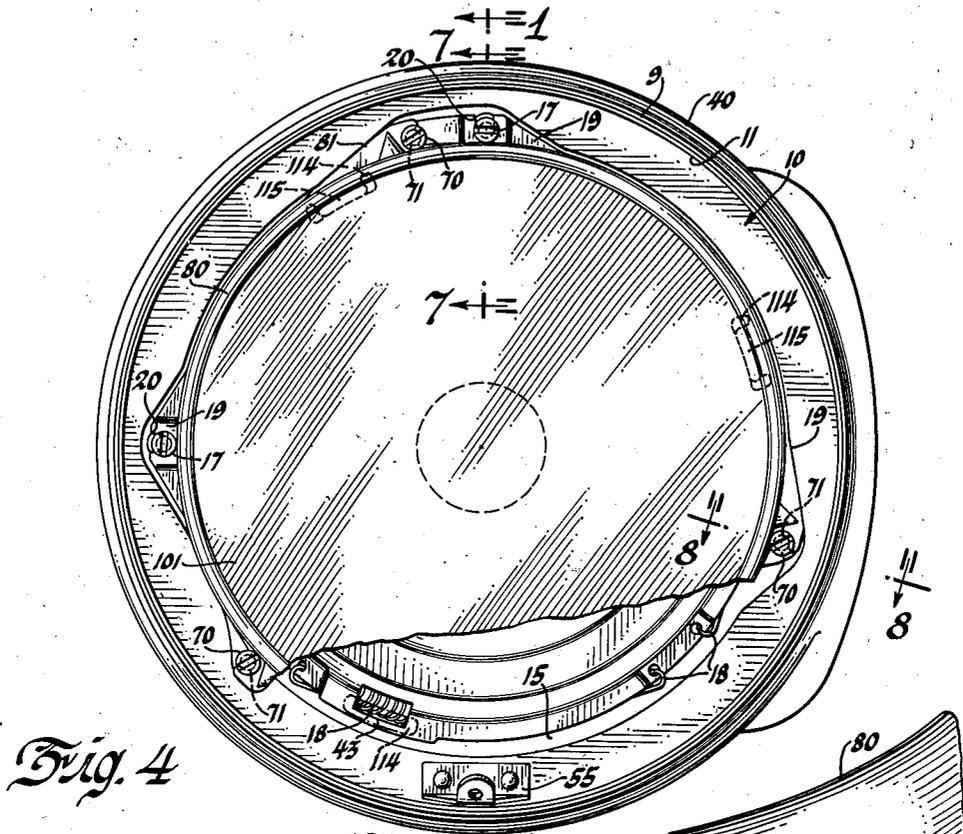


Fig. 4

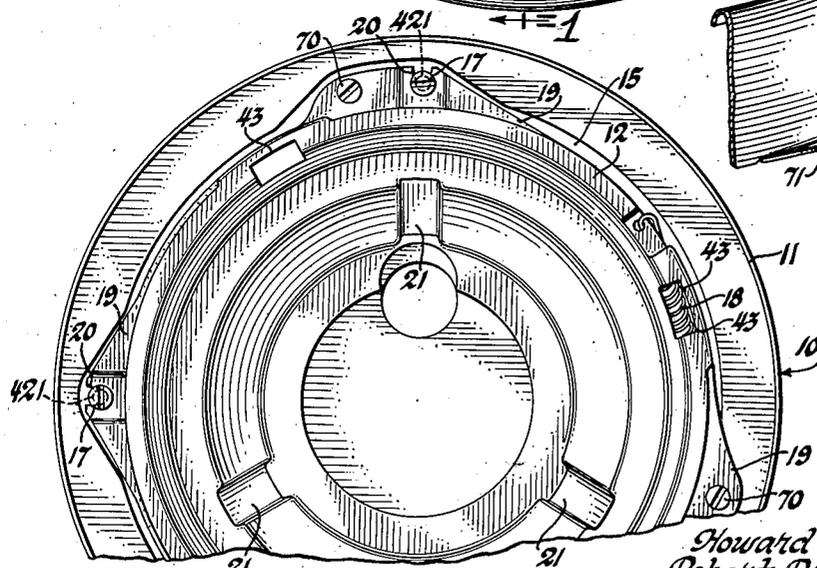


Fig. 5

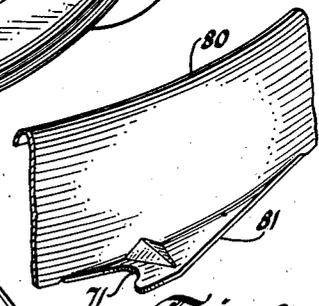


Fig. 6

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4 Sheets-Sheet 3

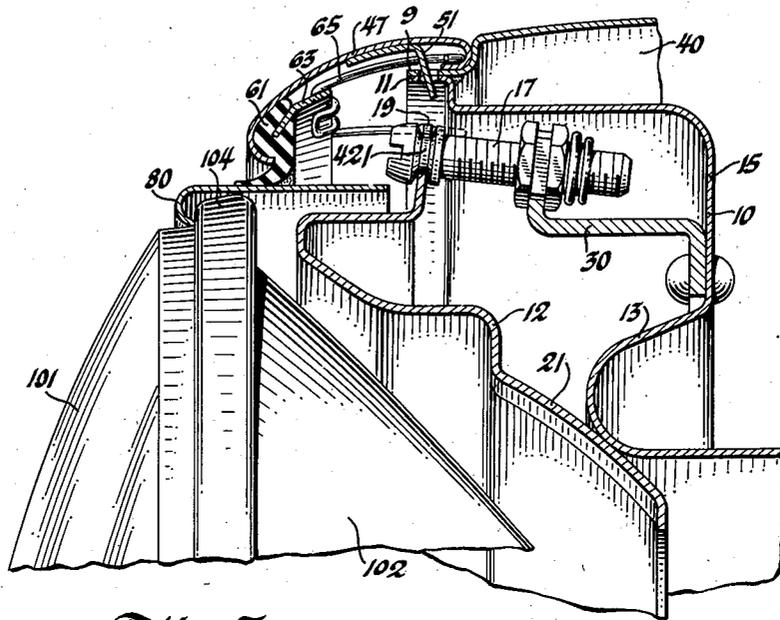


Fig. 7

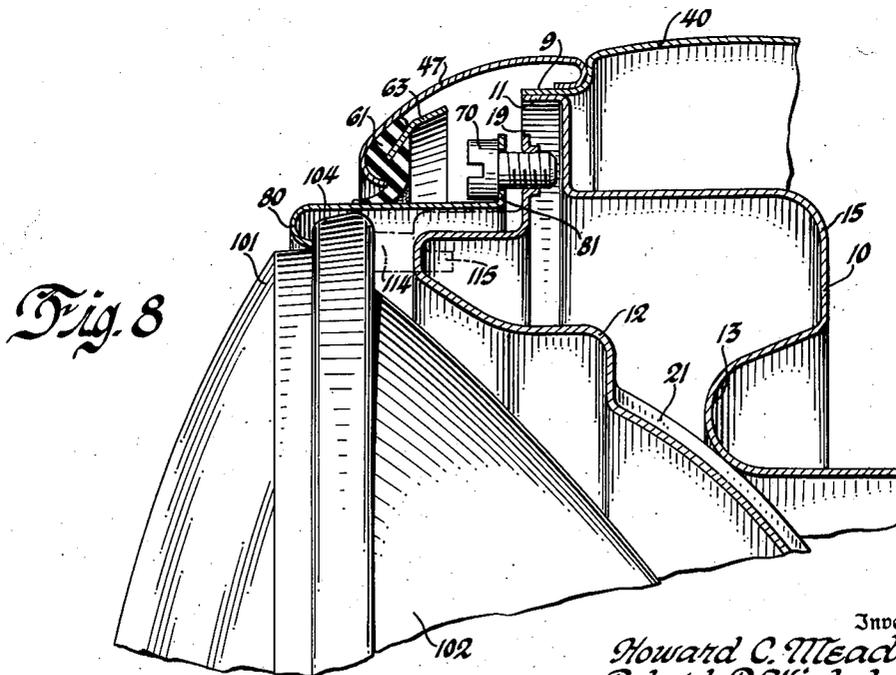


Fig. 8

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HEAD LAMP MOUNTING (BALL AND SOCKET)

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4 Sheets-Sheet 4

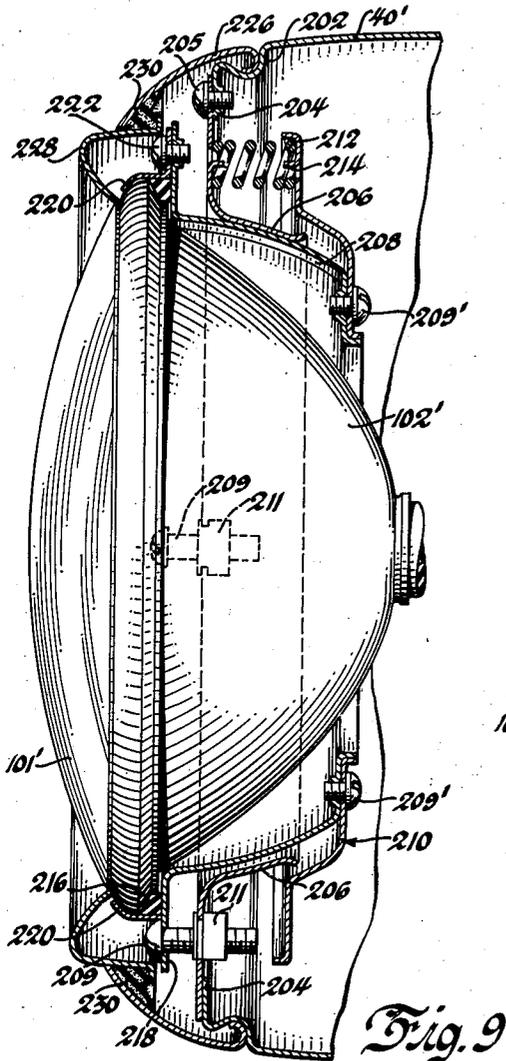


Fig. 9

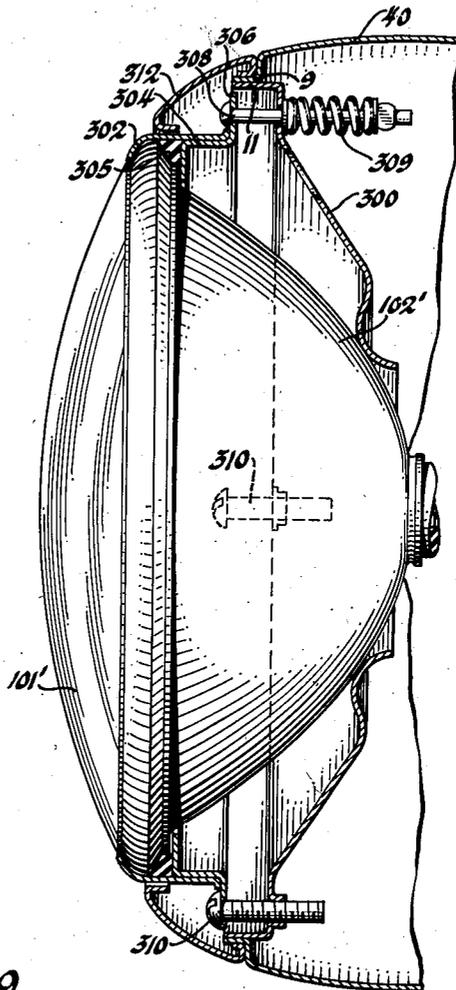


Fig. 10

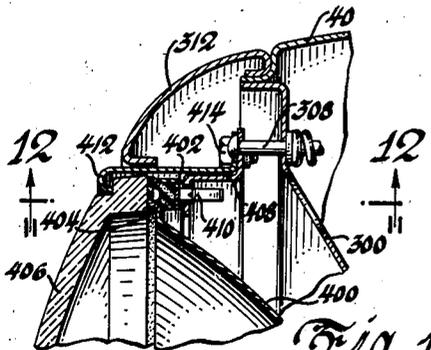


Fig. 11



Fig. 12

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# UNITED STATES PATENT OFFICE

2,266,329

## HEAD LAMP MOUNTING (BALL AND SOCKET)

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Application July 27, 1939, Serial No. 286,820

9 Claims. (Cl. 240—41.5)

This invention has to do with mountings for lamp units consisting of reflector, lens and light source, such as are commonly used in automobile headlamps. Such units, when permanently sealed against entrance of dust, are commonly referred to as package lamps.

According to one form of construction, features of which are described and claimed in the co-pending application of Robert N. Falge Serial No. 286,819 filed July 27, 1939, the package lamp consists of a metal reflector and lens permanently connected by a sealing ring, with a gasket interposed between the reflector and lens, and a light source in the form of an incandescent lamp sealed in the reflector. Another form of package lamp, known as the all-glass unit, consists of a glass reflector and lens integrally joined, a filament or filaments being sealed within the reflector.

In the mounting of such units for use in modern automobiles it is necessary to provide for adjustment permitting the proper aiming of the unit both up and down and sidewise. According to the present invention this adjustment is made possible by employing a ball and socket type of universal joint. The package lamp itself, or in combination with a member in which it is mounted, constitutes the ball assembly of the joint which is adjustably secured in a socket fixed in the lamp housing or in an aperture in the automobile fender or body panel. Springs are provided yieldingly holding the ball assembly in the socket, and adjusting means is provided for tilting the ball assembly up and down or sidewise in the socket.

According to the preferred embodiment of the invention the package lamp is clamped in an assembly consisting of a member having a ball-shaped surface by means of a suitable clamping ring, the whole constituting the ball assembly. This assembly is then secured in the socket by means of springs and adjusting devices as previously described. A suitable bezel is provided, preferably secured to the headlamp housing or socket member, and overlying the joint between the ball assembly and its housing to give the whole an attractive appearance. There must, of course, be sufficient clearance between the bezel and the ball assembly to permit the required adjustment.

Details of the invention and various modifications thereof will be pointed out in the course of the following description, taken in connection with the accompanying drawings in which:

Figure 1 is a vertical section through the improved lamp mounting.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a fragmentary view of a portion of the sealing ring of the package lamp showing one of the locating lugs.

Figure 4 is a front view of the lamp mounting with the package lamp in place but with the finish ring removed.

Figure 5 is a similar view with the package lamp removed and the lamp mounting removed from its support.

Figure 6 is a fragmentary view of a portion of the clamping ring which holds the package lamp in the mounting.

Figure 7 is a fragmentary section on line 7—7 of Figure 4.

Figure 8 is a fragmentary section on line 8—8 of Figure 4.

Figure 9 is a vertical section through a modified form of mounting.

Figure 10 is a similar section through a further modification.

Figure 11 is a fragmentary sectional view corresponding to the top of Figure 10 but showing a modified construction.

Figure 12 is a fragmentary sectional view taken on line 12—12 of Figure 11.

The package lamp illustrated is one of the type described and claimed in the said Falge application Serial No. 286,819, consisting of a lens 101, reflector 102, sealing ring 104 and bulb 108. After being adjusted to properly position the filament with respect to the focus of the reflector the bulb is secured in the reflector in any suitable manner as by solder 109. A gasket, not shown, is interposed between the lens and reflector. This type of unit possesses the advantage that the reflector is sealed against the entrance of dust and moisture and retains its reflecting efficiency throughout substantially the entire life of the filaments. While this type of package lamp is shown, the mounting herein disclosed is equally useful with other types of units such as the all glass package lamp illustrated in Figures 9 and 10.

The sealing ring 104, which is preferably made as a die casting, is provided with unequally spaced stepped lugs 114 comprising locating projections 115.

Bulb 108 is provided with terminals 111 to which current is supplied through a suitable connector 113 and wires 117.

40 indicates the lamp support which may be either a conventional headlamp housing as shown

or a fender or body panel apertured to receive the lamp assembly.

10 indicates a cup-shaped stamping fitted in an opening in the lamp support and secured to the support by any suitable means. In the construction illustrated contacting flanges 9 and 11 on the support and stamping, respectively, are welded together.

Stamping 10 consists as shown of a central cup-shaped portion having a rolled brim 13 surrounded by an annular channel 15 on the outer periphery of which is formed the flange 11. Within the channel 15 at one side and at the top are secured Z-shaped stampings 30, the outer surfaces of which are provided with threaded apertures to receive adjusting screws 17.

Within the cup 10 is seated a stamping 12 constituting a ball cooperating with cup 10 to provide a universal joint. Ball member 12 is provided with spaced outwardly pressed ribs 21 which rest against the rolled brim 13 of the cup 10, thereby providing a universal ball and socket joint.

The ball member 12 is provided with an irregular peripheral flange 19 and at the top and at one side the flange is slotted as indicated at 20 to engage grooves 421 in adjusting screws 17 as best shown in Figure 7. Attention is called to the fact that the grooves 421 have bevelled edges and the bevels are of such angles as to permit movement of the ball 12 to any angle necessary for aiming.

Within the channel 15 at the bottom and at the side opposite one adjusting screw 17 are secured stampings 16 which serve as anchorages for coil springs 18, the other ends of which are hooked in apertures in the periphery of the ball member 12. Four springs are provided, two at the bottom and two at one side, and these are arranged at an angle in order to get the strong spring action desired.

Within the ball member 12 is seated the package lamp previously described with the projections 115 of its stepped lugs 114 seated in openings 43 in the periphery of the member 12. The steps in the lugs hold the package lamp spaced from the periphery of the stamping 12 thereby giving three point support and permitting the package lamp to readily find its seat.

The package lamp is held in place by means of clamping ring 80 having an out-turned flange 81 secured to the flange 19 of the stamping 12 by means of threaded fasteners 70. The flange of the clamping ring 80 instead of being provided with apertures to receive fasteners 70 is preferably provided with circumferential slots or notches 71 so that by unscrewing fasteners 70 clamping ring 80 may be slightly rotated to release it from the fasteners so that it can then be readily removed thereby permitting removal of the package lamp.

Finish ring 47 is provided at the top with a tang 51 engaging in aligned apertures in the flanges 9 and 11 of cup 10 and housing 40 and is provided at its lower end with a fastener 23 having threaded engagement with stamping 55 riveted to the outer radial flange of the cup 10. Attention is called to the fact that the inner periphery of finish ring 47 engages support 40, making a neat joint.

Finish ring 47 has its edges inturred and within the outer end of the channel so formed is secured a rubber sealing gasket 61 having a slot within which is received one edge of an annular metal stiffening strip 63, the other edge of which is engaged by spaced U-shaped clips 65 made of

spring wire and having their ends seated within the opposite inturred flange of the finish ring. The purpose of the metal strip 63 is to stiffen the rubber gasket so as to insure a good seal as well as to assist in holding it in place, as best shown in Figure 7.

With the parts assembled it is apparent that to adjust the aim of the lamp it is necessary to first remove the finish ring 47 by unscrewing fastener 23. Thereafter the vertical aim may be adjusted by turning the upper aiming screw 17 and the horizontal aim may be adjusted by turning the side adjusting screw 17. Such adjustment is resisted by the springs 18 which continually urge the ball-shaped stamping 12 into its socket member 10. In practice it will probably prove desirable to apply special lock nuts for the adjusting screws 17, these lock nuts being fixed to the members 30 so as to prevent their turning.

If it is desired to remove the package lamp it is but necessary to unloosen fasteners 70, slightly rotate and then remove clamping ring 80 and then lift out the lamp. The connector 71 may be readily removed from the lamp terminals.

In the modifications shown in Figures 9 and 10 the package lamp illustrated is of the all glass type consisting of lens 101' and reflector 102' integrally joined together forming a housing for the filaments, not shown.

According to the construction shown in Figure 9 the lamp housing or other support 40' is apertured to receive the headlamp mounting as before and is provided about its periphery with an annular groove 202 and an inturred flange 204.

To the inturred flange there is secured by bolts 205 or other suitable means a cup member 206 within which is seated ball member 208 forming a universal ball and socket joint therewith. To the inner end of ball member 208 is secured by suitable fasteners 209' an annular element 210.

Coil springs 212, of which one only is shown, are provided at top and one side of the assembly and tend to yieldingly urge the ball member 208 into the cup member 206. As shown at the top of Figure 9,

tangs 214 are pressed out of the parts to locate the springs. At the bottom and opposite side the ball member 208 is held in the socket by means of adjusting screws 209 having threaded engagement with lock nuts 211 secured in openings in the flange of the cup member 206.

The package lamp is secured in the ball member 208 with its flange resting on gasket 216 seated on flange 218 on the ball member 208. Clamping ring 220 engages the outer surface of the flange of the package lamp and fastening devices, such as threaded fasteners 222, secure the clamping ring to the ball member.

Any suitable means may be provided to give a finished appearance to the front of the lamp.

There is illustrated a contracting band type of bezel 226 having its outer rounded edge seated in groove 202 in the support 40'. In the bezel 226 is fitted finish ring 228, a gasket 230 of rubber or other suitable material being provided between them to prevent rattling. Or, if desired, the gasket 230 may be vulcanized or otherwise secured to the bezel and finish ring to hold them in proper relation.

In the modification shown in Figure 10 the ball-shaped member is dispensed with and the package lamp seats directly in the cup to afford the desired universal adjustment. Here 40 indicates the support and 300 the cup member secured in the opening in the support in the same manner as in the form first described. The pe-

70 ball-shaped member is dispensed with and the package lamp seats directly in the cup to afford the desired universal adjustment. Here 40 indicates the support and 300 the cup member secured in the opening in the support in the same manner as in the form first described. The pe-

ripheral flange of the package unit is clamped between the rings 302 and 304, a resilient gasket 305 being interposed to prevent injury to the package lamp. Clamping ring 304 has a peripheral flange 306 which is apertured at the top and bottom and at opposite sides. Through the apertures in the top and one side pass headed pins 308 which also pass through suitable slots or apertures in the cup member 300. Springs 309 encircling the pins 308 react against the rear of the cup member 300 and suitable abutments carried by the pins to yieldingly urge the package unit into the cup. At the bottom and at the opposite side adjusting screws 310 connect the clamping ring 304 to the cup member 300. By adjusting these screws the package lamp may be tilted up or down or to one side or the other as may be necessary for aiming. As in the forms previously described, a bezel 312 is mounted on the housing 40 in any suitable manner to give to the assembly a finished appearance.

In the modification shown in Figure 11 the mounting of Figure 10 is employed with a conventional assembly of lens and reflector instead of with a package lamp. Here 400 indicates the reflector having its outer periphery grooved at 402 to receive gasket 404 which may be of rubber. The gasket is shown as of hollow construction to increase its resiliency. 406 indicates a conventional lens. The reflector 400 is detachably secured to clamp ring 408 by means of resilient fasteners 410 having U-shaped portions 410' snapping through aligned apertures in the clamp member 408 and in the reflector as best shown in Figure 12. The gasket 404 is then inserted in position as shown and the lens 406 is engaged with it whereupon the assembly may be held together by means of clamping ring 412 secured to clamping ring 408 by suitable bolts 414 or the like. The reflector is, of course, provided with the usual detachable bulb and the assembly of reflector and lens, clamped together as above described, may be mounted in the same manner as shown in Figure 10; that is, by means of pins 308 extending through aligned apertures in the outer flange of clamping ring 408 and in the socket member 300 which is secured in the lamp housing 40 in the manner previously described. 312 indicates the bezel or finish ring concealing the joints between the parts. Adjusting devices, such as shown at 310 in Figure 10, may be provided to tilt the reflector and lens for aiming, as described in connection with the preceding form, it being understood, of course, that the reflector 400 seats in the socket member 300 in the same manner as does the reflector 102' of the package lamp shown in Figure 10.

The form of the invention shown in Figure 11 is simply illustrative of the way in which the mountings shown in the other figures may be used for conventional assemblies of reflector and lens not sealed together.

Various other modifications as well as other uses for the invention will occur to those skilled in the art. Thus, for example, the mounting illustrated may be used with conventional lamps consisting of a separable reflector, lens and bulb.

We claim:

1. The combination of a lighting unit comprising a reflector, lens and light source within the reflector, and a mounting therefor comprising a cup-shaped member extending over the reflector and having a spherical seating surface having its center substantially on the reflector axis, a ring overlapping the front edge of the unit, means for

securing the ring to the cup-shaped member and clamping the unit between them to form a sub-assembly, a support for the subassembly having an annular seat within which the spherical seating surface of the cup-shaped member is engaged to provide a universal joint, means yieldingly urging the subassembly into engagement with the support at one side and adjustable means connecting the subassembly and the support at the other side to permit aiming of the lighting unit.

2. The combination of a lighting unit comprising a reflector, lens and light source within the reflector, and a mounting therefor comprising a cup-shaped member extending over the reflector and having a spherical seating surface having its center substantially on the reflector axis, a ring overlapping the front edge of the unit, means for securing the ring to the cup-shaped member and clamping the unit between them to form a sub-assembly, a support for the subassembly having an annular seat within which the spherical seating surface of the cup-shaped member is engaged to provide a universal joint, means yieldingly urging the subassembly into engagement with the support at one side, adjustable means connecting the subassembly and the support at the other side to permit aiming of the lighting unit, said yielding means comprising a pair of tension springs having one pair of ends adjacent each other and the other pair spaced apart to steady the unit in place.

3. The combination of a lighting unit comprising a reflector, lens and light source within the reflector, and a mounting therefor comprising a cup-shaped member extending over the reflector and having a spherical seating surface having its center substantially on the reflector axis, a ring overlapping the front edge of the unit, means for securing the ring to the cup-shaped member and clamping the unit between them to form a subassembly, a support for the subassembly having an annular seat within which the spherical seating surface of the cup-shaped member is engaged to provide a universal joint, means yieldingly urging the subassembly into engagement with the support at one side, adjustable means connecting the subassembly and the support at the other side to permit aiming of the lighting unit, said spherical seating surface being interrupted to reduce the area of contact with the seat and prevent binding.

4. The combination of a lighting unit comprising a reflector, lens and light source within the reflector, and a mounting therefor comprising a cup-shaped member extending over the reflector and having a spherical seating surface having its center substantially on the reflector axis, a ring overlapping the front edge of the unit, means for securing the ring to the cup-shaped member and clamping the unit between them to form a subassembly, a support for the subassembly having an annular seat within which the spherical seating surface of the cup-shaped member is engaged to provide a universal joint, means yieldingly urging the subassembly into engagement with the support at one side, adjustable means connecting the subassembly and the support at the other side to permit aiming of the lighting unit, and a bezel secured to the support and extending into sealing engagement with the periphery of said assembly.

5. The combination of a lighting unit comprising a reflector, lens and light source within the reflector, and a mounting therefor comprising a

cup-shaped member extending over the reflector and having a spherical seating surface having its center substantially on the reflector axis, a ring overlapping the front edge of the unit, means for securing the ring to the cup-shaped member and clamping the unit between them to form a subassembly, a support for the subassembly having an annular seat within which the spherical seating surface of the cup-shaped member is engaged to provide a universal joint, means yieldingly urging the subassembly into engagement with the support at one side, adjustable means connecting the subassembly and the support at the other side to permit aiming of the lighting unit, means yieldingly urging the subassembly into engagement with the support at a point substantially midway between said last-named sides, and adjustable means connecting the subassembly and the support opposite said last-named point to permit aiming of the lighting unit in another plane.

6. The combination of a lighting unit comprising a reflector, lens and light source within the reflector, and a mounting therefor comprising a cup-shaped member extending over the reflector and having a spherical seating surface having its center substantially on the reflector axis, a ring overlapping the front edge of the unit, means for securing the ring to the cup-shaped member and clamping the unit between them to form a subassembly, a support for the subassembly having an annular seat within which the spherical seating surface of the cup-shaped member is engaged to provide a universal joint, means yieldingly urging the subassembly into engagement with the support at one side, adjustable means connecting the subassembly and the support at the other side to permit aiming of the lighting unit, means yieldingly urging the subassembly into engagement with the support at a point substantially midway between said last-named sides, adjustable means connecting the subassembly and the support opposite said last-named point to permit aiming of the lighting unit in another plane, each of said yielding means comprising a pair of tension springs having one pair of ends adjacent each other and the other pair spaced apart to steady the unit in place.

7. The combination of a lighting unit comprising a reflector, lens and light source within the reflector, and a mounting therefor comprising a cup-shaped member extending over the reflector and having a spherical seating surface having its center substantially on the reflector axis, a ring overlapping the front edge of the unit, means for securing the ring to the cup-shaped member and clamping the unit between them to form a subassembly, a support for the subassembly comprising a cup-shaped member having

a rolled brim surrounded by an annular channel, said brim constituting an annular seat with which the spherical seating surface of the cup-shaped member is engaged to provide a universal joint, means housed in said channel yieldingly urging the subassembly into engagement with the support at one side and adjustable means housed in said channel at the other side connecting the subassembly and the support to permit aiming of the lighting unit.

8. The combination of a lighting unit comprising a reflector, lens and light source within the reflector, and a mounting therefor comprising a cup-shaped member extending over the reflector and having a spherical seating surface having its center substantially on the reflector axis, a ring overlapping the front edge of the unit, means for securing the ring to the cup-shaped member and clamping the unit between them to form a subassembly, a support for the subassembly comprising a cup-shaped member having a rolled brim surrounded by an annular channel, said brim constituting an annular seat with which the spherical seating surface of the cup-shaped member is engaged to provide a universal joint, means housed in said channel yieldingly urging the subassembly into engagement with the support at one side, adjustable means housed in said channel at the other side connecting the subassembly and the support to permit aiming of the lighting unit, and a headlight connector engaged with said unit and housed within said cup.

9. The combination of a lighting unit comprising a reflector, lens and light source within the reflector, and a mounting therefor comprising a cup-shaped member extending over the reflector and having a spherical seating surface having its center substantially on the reflector axis, a ring overlapping the front edge of the unit, means for securing the ring to the cup-shaped member and clamping the unit between them to form a subassembly, a support for the subassembly comprising a cup-shaped member having a rolled brim surrounded by an annular channel, said brim constituting an annular seat with which the spherical seating surface of the cup-shaped member is engaged to provide a universal joint, means housed in said channel yieldingly urging the subassembly into engagement with the support at one side, adjustable means housed in said channel at the other side connecting the subassembly and the support to permit aiming of the lighting unit, a headlight connector engaged with said unit and housed within said cup, and a bezel secured to the support and extending into sealing engagement with the periphery of said assembly.

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