Sept. 22, 1964 A. I. APPLETON 3,149,785

FLOOD LAMP UNIT

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Fig. 1.

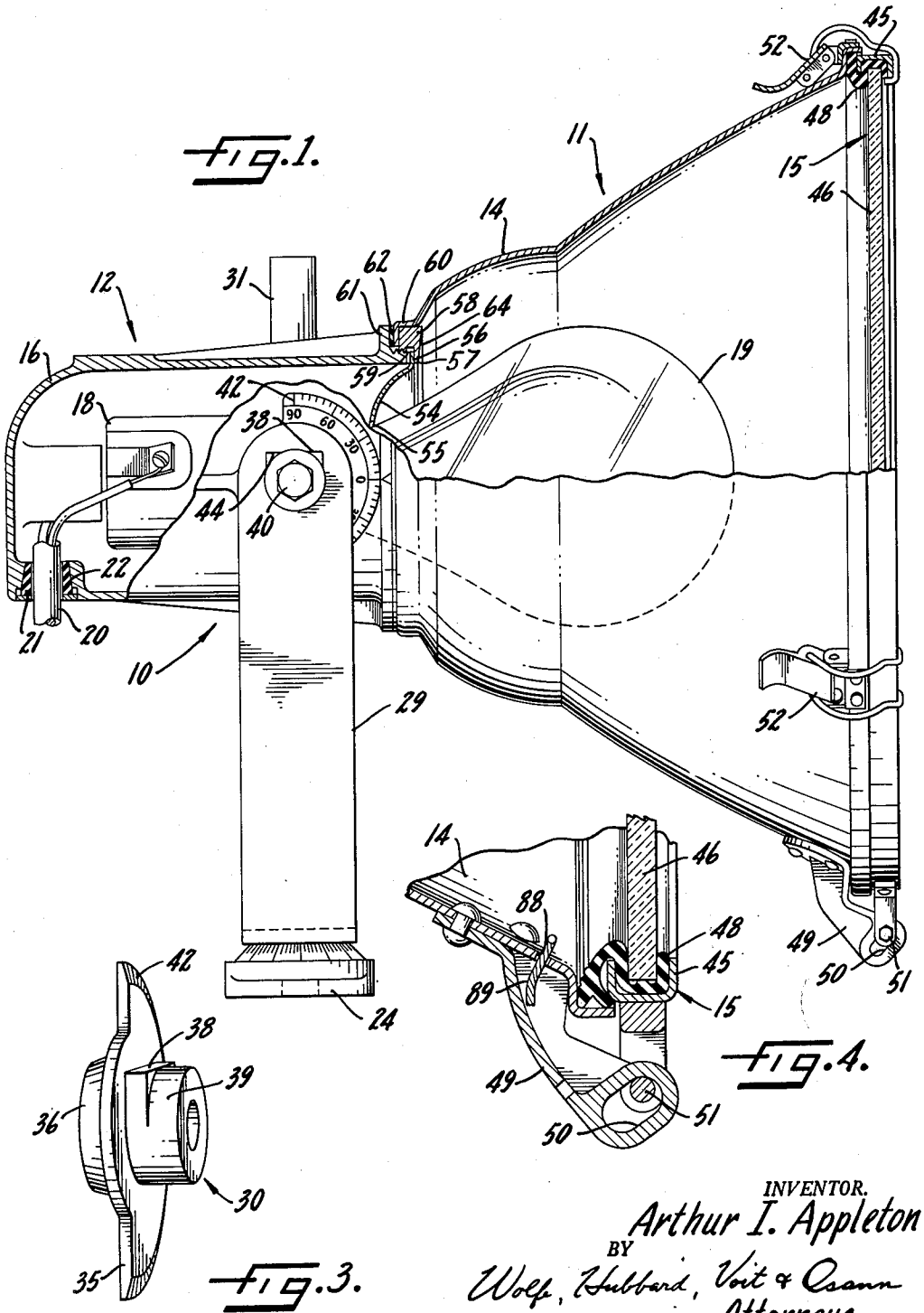


Fig. 3.

Fig. 4.

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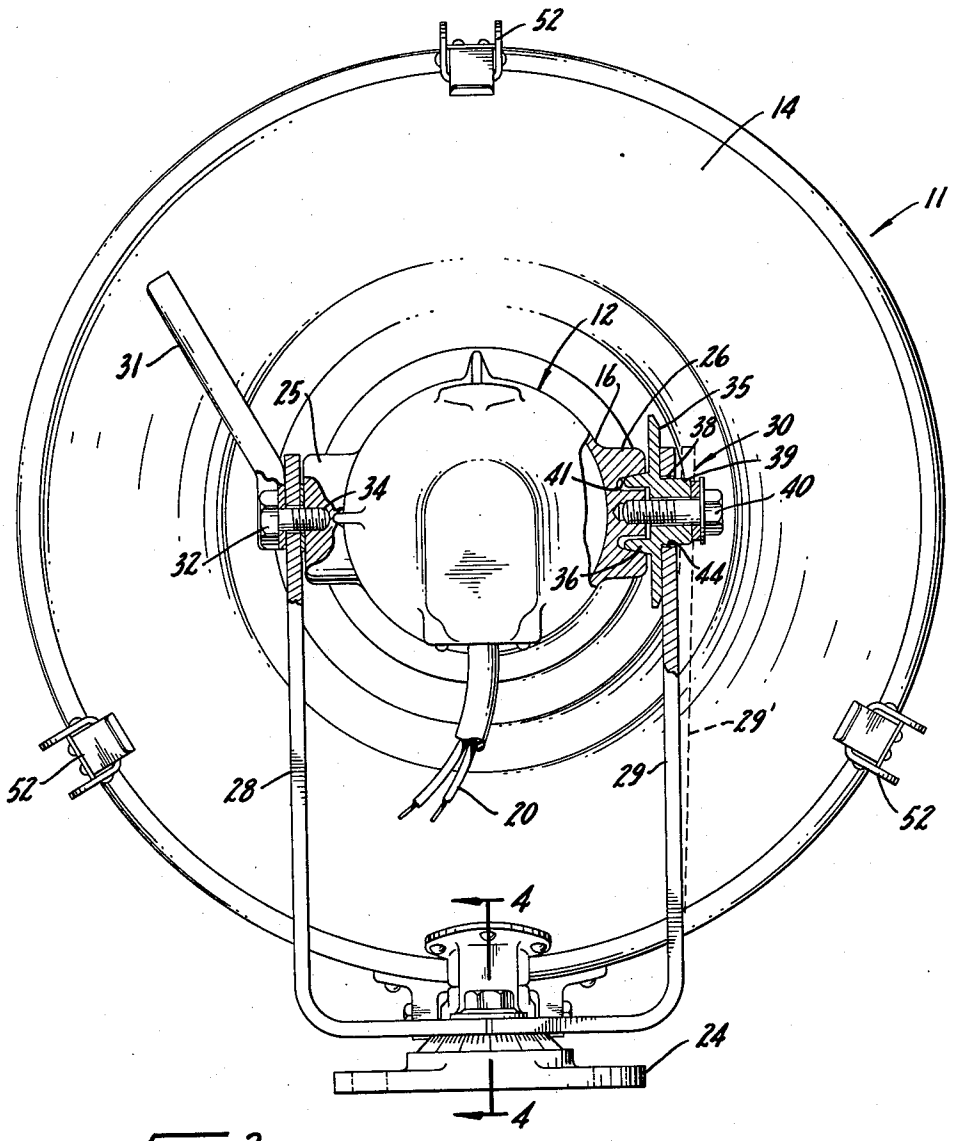


Fig. 2.

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Fig. 5.

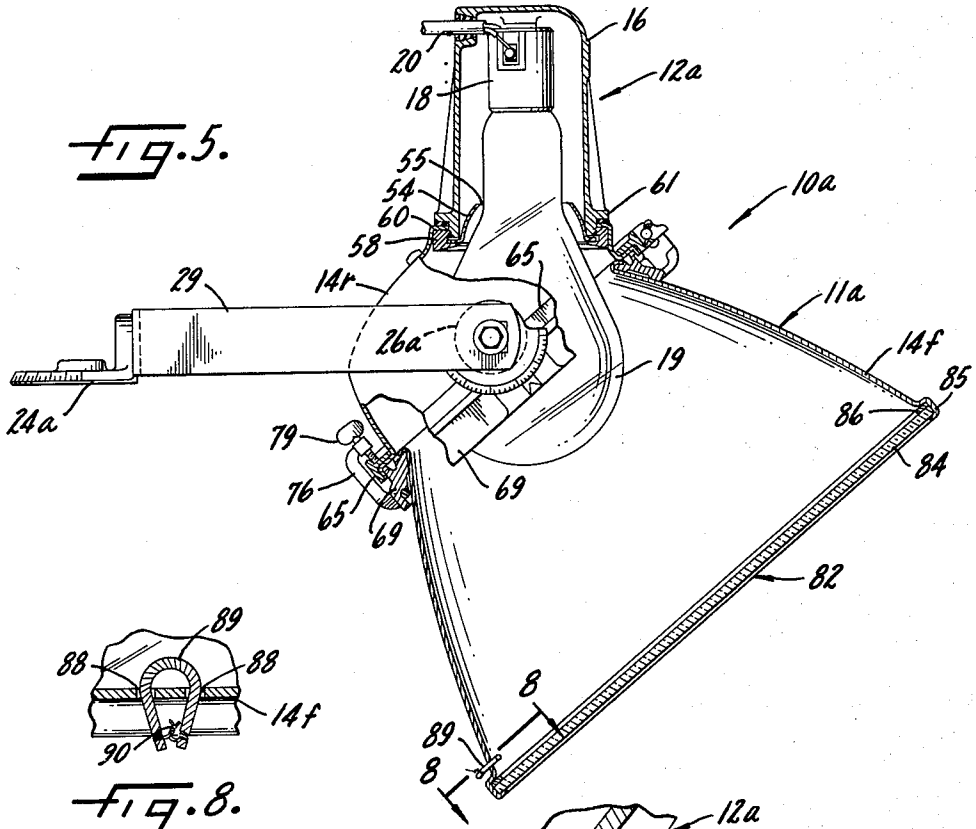


Fig. 8.

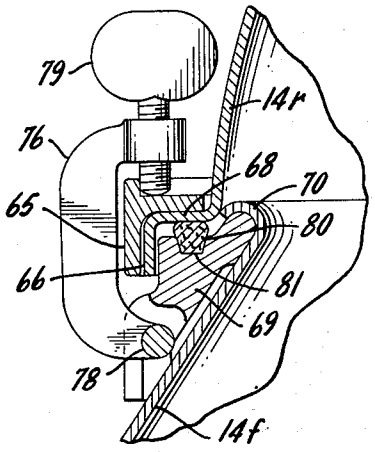


Fig. 7.

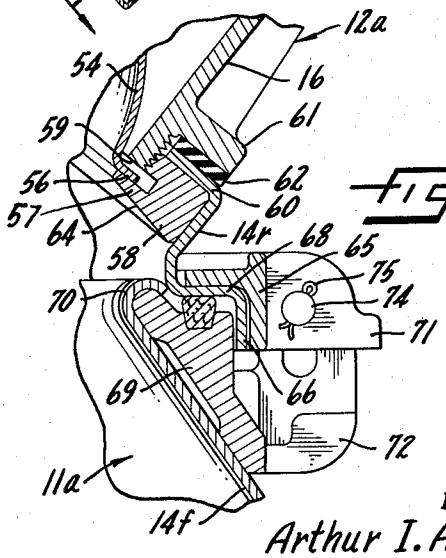


Fig. 6.

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3,149,785

FLOOD LAMP UNIT

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2 Claims. (Cl. 240—3)

The present invention relates generally to flood lamp fixtures, and more particularly, to an improved fixture suitable for use in outdoor lighting applications.

In recent years there has been an ever increasing demand for a lighting fitxure which may be utilized, for example, in illuminating sports events, or for illuminating outdoor advertising displays or the like. Such fixtures require accurate alinement when in use. Servicing and relamping of this type of lighting fixture more often than not interferes with the present alinement of the flood lamp, thus resulting in much wasted time and expense in realining the fixture. Moreover, such outdoor lighting fixtures are generally subjected to a great deal of heat emanating from the light source, occasionally causing deterioration of the lamp socket or the electrical wiring and thus increasing the amount of servicing required by the fixture.

It is the general aim of the present invention to provide a new and improved lighting fixture in which servicing operations are held to a minimum, yet wherein the light output of the fixture is higher than has heretofore been possible. A related object of the invention is to provide an improved flood lamp fixture wherein the heat and light directed towards the lamp socket are reflected outwardly, thus simultaneously cooling the fixture and increasing its light output.

It is another object of the invention to provide a relatively low cost flood lamp fixture that may be readily disassembled for servicing purposes and which enjoys a greater life expectancy than do conventional lighting fixtures.

While the present invention is concerned with decreasing the servicing requirements for a light fixture, it is, nevertheless, an object of the invention to provide an improved fixture which more readily permits relamping and other servicing operations. In this connection, it is a further object of the invention to provide an indexing mechanism which can be quickly released when the need for relamping arises, yet wherein the lighting fixture may be immediately returned to its prealined condition upon completion of a relamping operation.

Other objects and advantages of the invention will appear from the following description taken in conjunction with the accompanying drawings in which:

FIGURE 1 is a side elevation, partly in section, of an exemplary flood lamp fixture embodying the features of the present invention;

FIG. 2 is a rear view of the flood lamp shown in FIG. 1 with portions thereof shown in section;

FIG. 3 is a perspective view of the rigid indexing element used with the present invention;

FIG. 4 is a fragmentary sectional view, taken substantially along the line 4—4 of FIG. 2;

FIG. 5 is a sectional view illustrating a modified lighting fixture embodying the features of the present invention;

FIG. 6 is an enlarged fragmentary section of the hinged connection between the reflector and socket assemblies of the fixture illustrated in FIG. 5;

FIG. 7 is an enlarged fragmentary section of the releasable securing means utilized to hold the reflector and socket assemblies of the flood lamp illustrated in FIG. 5 together; and

FIG. 8 is a fragmentary sectional view taken substantially along the line 8—8 of FIG. 5 showing the details of the moisture removing wick.

While the present invention is susceptible of various modifications and alternative constructions, illustrative embodiments are shown in the drawings and will herein be described in detail. It should be understood, however, that it is not to be intended to limit the invention to the particular forms disclosed, but, on the contrary, the intention is to cover all modifications, equivalents, and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

Referring now to FIGS. 1 and 2, an exemplary flood lamp lighting fixture, generally indicated at 10, is illustrated, the fixture including a reflector assembly 11 and a socket assembly 12. As here shown, the reflector assembly 11 comprises a generally parabolic reflector 14 which is closed at its larger end by a lens cover assembly 15 and which is mounted at its smaller end on the socket assembly 12 to form a lamp housing or enclosure. The socket assembly includes a hood 16 within which is mounted a lamp receiving socket 18, the latter serving to securely mount a standard flood lamp 19. A power cord 20 is snugly received within a rubber bushing 21 positioned in an opening 22 formed in the hood 16. In this instance, the entire fixture 10 is rotatably mounted on a fixed support 24.

In accordance with one of the important aspects of the present invention, provision is made for locking the lighting fixture 10 in any desired indexed position, yet wherein the fixture can be readily released and pivoted to a position more suitable for cleaning or relamping, and later returned to its preset indexed position without requiring any realining adjustments. This is accomplished by forming the fixture with a pair of oppositely disposed trunnions 25, 26 (FIG. 2), here shown as integral with socket hood 16, and pivotally mounting the trunnions 25, 26 on a pair of laterally spaced yoke arms 28, 29 respectively, the arms being rotatably mounted on the fixed support 24. In the exemplary apparatus, the trunnion 26 is pivotally mounted on and releasably locked to the arm 29 by means of an indexing mechanism 30 (FIGS. 2 and 3), while the trunnion 25 is pivoted to the arm 28 by a locking handle 31 having an integral threaded fastener 32 coaxially mounted in a threaded bore 34 formed in the trunnion 25.

In order to securely lock the fixture 10 in any desired prealined position, the indexing mechanism 30 includes a rigid indexing element or quadrant 35 having a tapered annular rib 36 formed on one face and a "semi-square" locking boss 38 formed on its opposite face (FIGS. 2 and 3). As illustrated in FIGS. 1 and 3, the "semi-square" shape of the locking boss 38 is a combination of a semicircle and half a square. However, as used herein, the term will connote any non-circular cross sectional shape suitable for indexing relatively rotatable members together. As best shown in FIG. 3, the locking boss 38 terminates in a cylindrical bearing surface 39. The quadrant 35 is adjustable mounted on the trunnion 26 by a suitable threaded fastener 40, with the tapered annular rib 36 frictionally engaged with and received in a complementary tapered groove 41 formed in the face of the trunnion 26. To hold the fixture 10 in any desired angular position, as indicated by angular scale markings 42 (FIGS. 1 and 3) formed on the indexing quadrant 35, the semi-square locking boss 38 is received within a complementary semi-square opening 44 formed in the yoke arm 29.

Accordingly, when the locking handle 31 and its threaded fastener 32 are tightened in the trunnion 25 and the threaded fastener 40 is tightened in the trunnion 26, the lighting fixing 10 is securely locked at a selected angle of vertical elevation. When it is desired to change

the vertical elevation of the fixture 10, it is merely necessary to back off slightly on the locking handle 31 and the quadrant adjusting fastener 40. The fixture is then pivoted to the desired angular position, as indicated by the quadrant scale 42, and the locking handle 31 and fastener 40 are retightened. Since the semi-square locking boss 38 is received with the complementary opening 44 in the arm 29, the rigid indexing quadrant 35 remains in a stationary position as the fixture is moved to the desired angular elevation.

In carrying out the present invention, provision is made for releasing the quadrant 35 from locked engagement with the yoke arm 29 while retaining the quadrant in frictional engagement with the trunnion 26, thus enabling both the fixture 10 and the indexing quadrant to be quickly moved to a servicing or relamping position. To this end, the yoke arm 29 is formed of a resilient, spring-like material, for example, hot rolled strip steel. When it is desired to perform a servicing operation, it is merely necessary to loosen the locking handle 31 and to flex the arm 29 outwardly into the dotted line position 29' indicated in FIG. 2. When this occurs, the semi-square locking boss 38 is disengaged from the complementary opening 44 in the arm 29 and the cylindrical bearing surface 39 is engaged therewith, thus freeing the lighting fixture 10 and the indexing quadrant 35 for simultaneous angular pivotal movement to a relamping position. Upon completion of the servicing operation, the lighting fixture and the quadrant need only be pivoted back towards the preset position and when the semi-square locking boss 38 is once again properly alined with the complementary opening 44, the arm 29 will spring back into its normal locking engagement with the indexing quadrant. Thus, it will be appreciated that the resilient arm 29 serves as a flexible indexing element which cooperates with the rigid indexing element 35 to insure that there is no need for any realining adjustments to be made after a servicing operation has been performed.

Provision is also made for facilitating relamping and other servicing operations. In furtherance of this aim, the lens cover assembly 15 (FIG. 1) includes a circumferential frame 45 having a generally C-shaped cross section which receives and supports the heat resistant glass lens 46. The periphery of the lens 46 is here shown as surrounded by one leg of an S-shaped sealing gasket 48, the other leg of which is interposed between the frame 45 and the large end of the parabolic reflector 14 (FIG. 4). To retain the cover assembly 15 captive on the light fixture 10, a bracket 49 having an enlarged transverse slot 50 is rigidly mounted on the reflector 14 with the slot positioned to receive a hinge pin 51 integral with the frame 45. A plurality of over-center toggle clamps 52 (three such clamps being shown in FIG. 2) are used to retain the cover assembly 15 snugly on the reflector assembly 11.

In accordance with another important aspect of the present invention, provision is made for reflecting heat and light away from the socket assembly 12 even when the lamp 19 is skewed relative to the axis of the socket assembly, thereby increasing the light output of the fixture 10, minimizing damage to the lamp, and increasing the lift expectancy of the entire fixture. To accomplish this, an annular baffle 54 (FIG. 1) is mounted in the lighting fixture 10 with freedom for limited universal movement. In the exemplary apparatus, the baffle is formed with a centrally disposed, axial opening 55 and a circumferentially disposed, outwardly projecting, radial flange 56, with the opening 55 being slightly larger than the reduced neck portion of the lamp 19.

In order to insure that the baffle 54 is mounted with freedom for limited universal movement, an annular clamping ring 58, which serves two distinct functions, is utilized, the ring having an inwardly projecting lip 57 defining an enlarged internal groove 59 disposed about the inner periphery thereof. First, the ring 58 serves to securely clamp the reflector assembly 11 to the socket assembly 12. Thus, when the ring 58 is threaded on the end of the hood 16, it engages an inwardly directed circumferential flange 60 formed on the small end of the parabolic reflector 14 and urges the flange 60 and the reflector 14 towards a circumferential shoulder 61 integral with the hood 16. In the illustrative form of the invention, a suitable sealing ring or gasket 62 may be interposed between the flange 60 and the shoulder 61. Secondly, the enlarged internal groove 59 receives the baffle flange 56, thereby retaining the baffle 54 captive but permitting limited universal movement of the baffle flange within the enlarged groove.

Accordingly, when the lighting fixture 10 is assembled and the lamp 19 is mounted in the socket 18, the reduced neck portion of the lamp passes through the baffle opening 55. Should the lamp be misalined for any reason, for example, if the socket mounting is bent or if the lamp envelope contains any manufacturing irregularity, the baffle 54 is free to float in the direction of misalinement due to the presence of the enlarged groove 59. In this manner, damage to the lamp 19 is prevented even should the lamp be misalined and therefore in contact with the baffle 54. The baffle serves to simultaneously reflect heat and light radiated from the lamp, thus cooling the socket assembly 12 and increasing the light output of the fixture 10. Moreover, the reflective ability of the reflector assembly is further enhanced by virtue of the fact that the face 64 of the ring 58 provides a smooth reflecting surface free of any threaded fastener heads such as are normally employed to secure the reflector assembly to the socket assembly. And, of course, the use of a continuous clamping ring and a continuous gasket also insures a full circumferential seal between the two assemblies.

Turning next to FIGS. 5, 6 and 7, there is shown a slightly modified type of lighting fixture 10*a* which is somewhat similar in construction and operation to the lighting fixture 10 described above and also embodying the present invention. In view of the similarity between the two exemplary fixtures of the invention, like parts in both fixtures will be designated by identical reference numerals and those parts not common to the two fixtures will be designated by different reference numerals.

As shown particularly in FIG. 5, the reflector assembly 11*a* of the lighting fixture 10*a* includes a two piece, generally parabolic, reflector having a front reflector 14*f* and a rear reflector 14*r*. In this instance, the rear reflector 14*r* is provided with an internal flange 60 identical to the flange formed on the reflector 14 of the lighting fixture 10. As more clearly illustrated in FIGS. 5 and 6, the reflector assembly 11*a* is secured to the socket assembly 12*a* in a manner identical to that described above for the fixture 10.

In order to facilitate relamping and other servicing operations, the front reflector 14*f* is pivotally mounted to the rear reflector 14*r*. Referring particularly to FIGS. 5 and 6, it will be noted that the reflector 14*r* has formed thereon a radial flange 68 which terminates in an axial flange 66, the two flanges defining a substantially cylindrical opening in the forward end of the rear reflector. A clamping ring 65 having a generally L-shaped cross section, is rigidly mounted on the large end of the reflector 14*r* in abutment with the cylindrical opening. A tapered annular trunnion ring 69 is mounted on the rear end of the front reflector 14*f* and retained in place thereon by curling the reflector 14*f* over, as indicated at 70 (FIGS. 6 and 7). The clamping ring 65 is here shown as including a radially projecting lug 71 (FIG. 6) which is pivotally connected to a similar lug 72 formed on the trunnion ring 69 by means of a pivot pin 74, the latter being retained in place by any suitable fastening means, for example, a cotter pin 75.

In order to securely clamp the front reflector **14***f* to the rear reflector **14***r*, the ring **69** includes three C clamps **76** (only one of which is shown in FIGS. 5 and 7). Each clamp **76** is pivoted at **78** to the ring **69** and the clamps are equally spaced about the periphery of the ring. When it is desired to clamp the two reflector portions together, it is merely necessary to swing the C clamps **76** into position overlying the clamping ring **65** and to tighten an adjustable thumb screw **79** (FIG. 7). To provide a suitable seal between the two reflector portions, an O-ring type sealing element **80** may be securely mounted in a groove **81** formed in the trunnion ring **69**. Thus, when the thumb screws are tightened, the O-ring seal is brought into intimate sealing engagement with the radial flange **68** on the rear reflector **14***r*. When it is desired to perform a relamping or other servicing operation, it is merely necessary to loosen the thumb screws **79** and swing the C clamps **76** out of engagement with the clamping ring **65**, thus permitting the rear reflector **14***r* to swing about the pivot pin **74** and providing access to the interior of the lighting fixture **10***a*.

The fixture **10***a* also includes a cover assembly **82**, here shown as a glass lens **84** wihch is retained in place in the forward end of the front reflector **14***f* by curling the reflector over, as shown at **85** (FIG. 5). In the exemplary apparatus, a sealing gasket **86** is interposed between the lens **84** and the front reflector **14***f*.

Referring to FIG. 5, it will be noted that the lighting fixture **10***a* is supported by yoke arms identical to those described in connection with the lighting fixture **10** shown in FIG. 1 (one such arm **29** being shown in FIG. 5). However, in this instance, the supporting trunnions are formed integrally with the trunnion ring **69** rather than on the socket hood **16**, one such trunnion **26***a* being shown in FIG. 5. In the form of the invention here shown, the yoke arms are integrally mounted on a rotatable support **24***a* for movement in a substantially horizontal plane.

To insure that the interior of the lighting fixtures **10** and **10***a* remain substantially dry, provision is made for discharging any moisture or condensation accumulated therein. To this end, a pair of small apertures **88** (FIG. 8) are formed in the reflector **14***f* (or the reflector **14**) at what normally would be the lowest point of the reflector assembly when in use. An elongated wick **89** is bent into a generally U-shape and its projecting ends passed through the openings **88** with the bight portion of the wick **89** retained within the reflector **14***f*. To prevent the wick from dropping out of the reflector assembly, its projecting ends may be tied together, as shown at **90** (FIG. 8). Thus, when moisture collects outside the reflector assembly **11***a* (or the reflector assembly **11** in FIG. 1), it is absorbed by the wick **89** and discharged from the lighting fixture.

I claim as my invention:

1. For use with a flood lamp fixture of the type having a fixed support, a housing, and a pair of trunnions mounted on the housing; an indexing mechanism comprising, in combination, a rigid indexing element mounted on one of said trunnions and frictionally engaged therewith, said rigid indexing element having an axially projecting locking boss terminating in a cylindrical bearing surface, and a flexible indexing element mounted on said support, said flexible indexing element having an opening formed therein complementary to said boss for receiving the latter when said flexible element is in the unflexed state whereupon said housing is nonrotatably coupled to said support, said bearing surface being received within said opening when the flexible indexing element is in its flexed state whereupon said housing is rotatably coupled to said support.

2. A flood lamp fixture comprising, in combination, a support, a lamp receiving socket assembly, a reflector mounted on one end of said socket assembly and defining therewith a housing, an annular baffle mounted in said housing adjacent asid one end of the socket assembly with freedom for limited movement in a direction normal to the axis of said housing, first and second trunnions formed on opposite sides of said housing, an indexing element mounted on said first trunnion, said element having a locking boss and a bearing surface, means for selectively urging said element into frictional locked engagement with said first trunnion, and means for pivotally mounting said housing on said support including a yoke mounted on said support, said yoke having first and second spaced arms, said second arm pivotally coupled to said second trunnion, said first arm being made of normally unflexed resilient material with said first resiilent arm nonrotatably connected to said boss when in the unflexed state and pivotally coupled to said bearing surface when in the flexed state.

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