

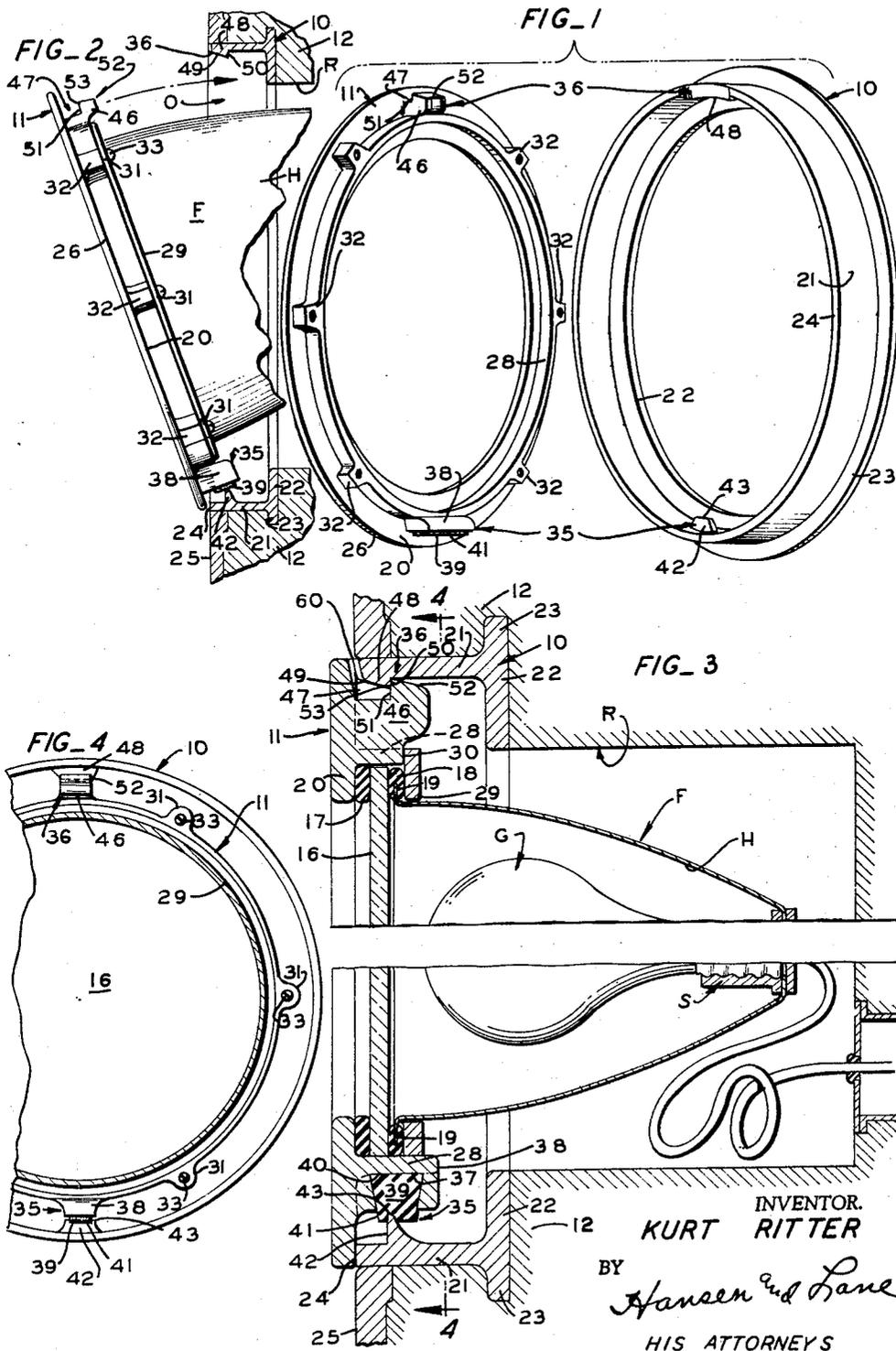
Sept. 29, 1959

K. RITTER

2,906,863

SWIMMING POOL LAMP FRAME LOCK

Filed Oct. 28, 1957



INVENTOR.
KURT RITTER
BY
Hansen and Lane
HIS ATTORNEYS

1

2,906,863

SWIMMING POOL LAMP FRAME LOCK

Kurt Ritter, Campbell, Calif.

Application October 28, 1957, Serial No. 692,595

6 Claims. (Cl. 240—26)

This invention relates to lens frames for lamps and more particularly to a lock for such frames and fixtures associated therewith.

The embodiment of the present invention is most suited for swimming pool lighting fixtures or the like adapted to be built into the wall of a pool below the water level therein. It is a principal object of the invention to provide a simple yet effective locking means between a lens frame and the fixture in such a manner as to enable removal of the lens when the light globe is to be removed and replaced.

Heretofore much difficulty was encountered in placement of swimming pool light fixtures and in the securing thereof in a manner facilitating ready removal thereof for repairs.

The present invention contemplates the provision of a novel locking means between a mounting frame on the pool wall and a lens frame on the light fixture itself. The object here is to provide a simple yet effective locking means by which the fixture cannot be pulled out or removed by children or swimmers, yet with the use of a simple tool the locking means can be disconnected to free the fixture for removal.

Swimming pool lights are usually a waterproof unit adapted to be submerged and inserted into a recess in the wall of the pool to water cool the fixture.

Another object is to provide in a two part lens frame structure a novel interlocking means employing yieldable-resilient means for maintaining the interlocking features in locking engagement with each other unless or until an outside force is applied in a particular manner to release the same.

More specifically the invention entails the provision of a stationary frame having an opening into which a lens must be placed and a removable lens frame adapted to fit the opening in the stationary frame together with diametrically opposed locking tabs and bolts affording quick connection and/or disconnection of one from the other.

These and other objects and advantages of the present invention will become apparent from a reading of the following description in the light of the accompanying drawings in which:

Fig. 1 is an exploded perspective view of the two principal parts of the lamp structure embodying the present invention.

Fig. 2 is a sectional detail view showing the two parts of Fig. 1 in relation to each other.

Fig. 3 is an enlarged foreshortened detail section of the parts of Figs. 1 and 2 in locked relation to each other.

Fig. 4 is a vertical section of Fig. 3 taken along line 4—4 thereof showing the locking means in elevation from the inner side of the assembly.

As best illustrated in Figs 2 and 3, the present invention is embodied in two main pieces 10 and 11. One piece 10 is adapted to be secured to a permanent structure whereas the piece 11 is movable relative to the first piece.

2

The two pieces 10 and 11 are each of annular shape, the part 10 being so configured as to receive a portion of the part 11. In the specific embodiment of the drawing piece 10 consists of a mounting flange adapted to be embedded in cement mixture during the pouring thereof so as to become anchored and firmly secured in the resulting concrete 12 to form a frame around an opening O. This opening O is so formed as to provide a mouth for a recess R in the concrete 12 for the reception of a lighting fixture F.

The lighting fixture which may be of any well known design consists of a water tight shell H housing a socket S for receiving a light globe G. Waterproof connections and conduits of the flexible type connected to the socket S convey electrical current thereto from a power line, not shown, under the control of a switch, likewise not shown.

The fore or open end of the shell H is secured to the piece 11 in such a manner as to become movable therewith. To this end the piece 11 comprises an annular frame for a lens 16 covering the open end of the shell H. Suitable seals 17 and 18 are provided between the flange 19 of the shell and a flange 20 on the frame piece 11 to prevent water from entering the shell housing H.

The mounting flange piece 10 is preferably of L shape in cross section, the leg 21 of the piece 10 forming a cylindrical portion and the foot 22 of the piece 10 constituting an inner flange, the heel or outer portion 23 of which becomes embedded or anchored in the concrete 12. The extreme end or outer face 24 of the leg 21 is disposed flush with the face 25 of the pool wall, i.e., the concrete 12. As seen in Fig. 3, this wall may be faced with tile if desired in which case the leg 21 extends beyond the rough concrete a distance to compensate for the thickness of the tile and the mastic by which it adheres to the concrete 12.

The lens frame piece 11 consists of an outer fascia 26 the outer diameter of which is comparable to the diameter of the cylindrical portion of the mounting flange 10, so as to overlie the extreme end or outer face 24 of the leg 21 which constitutes the cylindrical portion of the mounting flange.

The inner extremity of this fascia 26 is the flange 20 herein previously mentioned. This flange 20 forms an opening comparable in diameter to the open outer end of the shell housing H of the fixture F. This inner extremity of the lens frame 11 is the flange 20 against which the lens 16 is pressed.

The lens frame piece 11 is substantially of T shape in cross section, the fascia 26 forming the cap of the T shape while the leg portion 28 thereof extends inwardly (see Fig. 1) toward the fixture F a depth sufficient to receive the lens 16 and the two sealing rings 17 and 18, previously mentioned.

As best seen in Fig. 3 the sealing ring 17 lies against the flange 20, the lens 16 having its outer extremity overlying the ring 17 itself being overlaid by the sealing ring 18. As illustrated in Fig. 3 the flange 19 at the open end of the shell H is embedded in the sealing ring 18 and the latter is pressed toward the lens 16 by a securing ring 29.

The securing ring 29 has an inner diameter such as to fit over the shell H from its inner end and to circumscribe the shell adjacent its flange 19. This ring 29 extends beyond the base end 30 of the leg portion 28 of the T shaped lens frame piece 11. The ring 29 also has a plurality of ears 31 at spaced intervals around its perimeter to overlie bosses 32 similarly spaced around the cylindrical face of the leg portion 28 of the frame piece 11. The ears 31 are bored to receive headed machine screws 33 and the bosses 32 are bored and tapped to receive the threaded ends of the machine screws 33. By tightening

the screws 33 into the tapped bores of bosses 32 the ring 29 is pressed firmly against the sealing ring 19. In this manner the lens 16 is likewise pressed against the sealing ring 18 and the sealings rings being preferably of rubber are compressed so as to establish a good water tight seal.

Having thus described the environment of the present invention the following is a clear and concise description of the salient features upon which invention is predicated. The invention herein resides in a locking means for the two part lens frame 11 and mounting 10 previously explained.

The locking means of the present invention comprises diametrically opposed keepers 35 and 36 each having component parts thereof on the mounting flange 10 and lens frame 11 respectively.

The keepers 35 and 36 are preferably arranged one above the other to facilitate ease of handling and assembly of the two parts to be joined. The keeper 35, which is lowermost, comprises a dovetail socket 37 provided in an enlarged projection 38 formed beneath the leg portion 28 of the T shaped cross section of the lens frame 11. This socket 37 is open on its lower surface to receive a wedge shaped rubber member 39 which becomes suitably anchored within the dovetail socket by reason of the spread end 40 of the rubber member 39 being compressed into the same. The rubber member 39 has its narrower end 41 extended slightly from the projection 38 so as to bear against a detent 42 formed integrally with the mounting flange 10 at a position to meet the rubber member 39. As best seen in Fig. 1 the detent 42 is preferably a projection up from the leg portion 21 of the L cross sectioned mounting flange 10. This projection terminates in an apex which is approximately the width of the rubber member so as to present a chordal ridge 43 adapted to press into the yieldable rubber member 39.

The keeper 36, which is uppermost, comprises a bolt-like extension 46 on the upper outer side of the leg portion 28 of the T shaped frame member 11. This bolt extension 46 has a notch 47 formed on its upper surface so as to receive a strike plate or extension 48 formed integrally with the leg portion 21 of the L shaped mounting flange 10.

As best illustrated in Fig. 3, the strike plate 48 is wedge shaped in cross section, i.e., along the diametric plane in which the two keepers 35 and 36 are disposed. The strike plate extension 48 is narrowest at its point of juncture with the outer face 24 of the mounting flange 10. The plate 48 increases in depth inwardly of the leg member 21 to provide a cam surface 49 as well as an abutment edge 50 on the same. The abutment edge 50 is adapted to engage behind the fore end 51 of the bolt 46 formed on the lens frame 11. This fore end 51 of the bolt 46 has a cam shaped upper surface 52 comparable to the cam surface 49 formed on the strike plate. Thus it will be seen that the fore end 51 of the bolt member 46 also presents an abutment edge 53 inside the notch 47 for engaging the abutment edge 50 behind the strike plate 48.

The combined action of the two diametrically opposed keepers 35 and 36 is as follows:

Referring to Fig. 2 note that the lens frame 11 is held in such a manner as to dispose the fixture F within the recess or chamber R formed in the concrete 12. The frame 11 is held on a slant with the rubber member 39 resting upon the ridge 43 of the detent 42. The frame 11 is then rocked (clockwise Fig. 2) toward the mounting flange 10 whereupon the cam surface 52 of the bolt 46 will contact the cam surface 49 on the strike plate 48.

It should here be noted that the distance between the extended narrow end 41 of the rubber member 39 and the cam surface 52 on the bolt 46 is slightly greater than the distance between the ridge 43 of the detent 42 and the cam surface 49 on the strike plate 48. Consequently, the upper end of the lens frame 11 must be pushed against the mounting flange 10 with considerable force. When

this is done the cam 49 on the stationary strike plate 48 forces the whole lens frame 11 downwardly causing the ridge 43 of the detent 42 to compress the rubber member 39. During compression of the rubber member 39 by the stationary detent 42 the frame 11 is still moving toward the mounting flange 10 (clockwise Fig. 2). However, as soon as the fore end 51 of the bolt 46 passes the strike plate 48 the rubber member 39 will expand to lift or force the entire frame 11 upwardly relative to the mounting flange whereupon the fore end 51 of the bolt 46 will be lodged behind the strike plate 48. Thus the abutment edge 53 on the fore end 51 of the bolt 46 engages the abutment edge 50 on the inner end of the strike plate 48.

In the foregoing manner the lens frame with fixture attached is firmly held by the mounting flange. It should here be noted that the flange 20 on the lens frame 11 does not afford a water tight seal against the outer face 24 of the mounting flange 10. Since the shell housing H is waterproof and a water tight seal is afforded at the open end of the fixture F the entire lighting unit within shell H, although below the water level, is isolated from the water. Consequently, although water may enter the recess or chamber R, since the shell H is water tight and all wires are of a waterproof character no contact of water with electrical conductors or units can occur.

Should replacement of a bulb be necessary it is a simple operation to remove the fixture from the mounting flange and recess. Note that the outer face 24 of the leg portion 21 of the mounting flange 10 has a cut away or gap 60 formed therein adjacent the strike plate 48. This is clearly shown in Fig. 1. In Fig. 3 the gap 60 leaves a crevice between the flange 20 of the lens frame 11 and the mounting flange 10. This crevice at gap 60 admits entrance of the tip of a screw driver or any other suitable flat tipped tool or bar. Such tool being rigid can be pressed down upon the bolt 46 to again press the rubber member 39 down upon the ridge 43 of the detent 42. The moment the abutment edge 53 on the fore end 51 of the bolt 46 is forced below the abutment edge 50 on the inner end of the strike plate 48 the lens frame 11 will be spread away from the mounting flange 10. This spreading or movement of the upper end of the frame 11 away from the mounting flange can be effected by a manual rocking or prying action of the tool or screw driver, previously mentioned. The lens frame 11 is thereby rocked away from the mounting flange 10 (counterclockwise Figs. 2 and 3). In either case, whether connecting or disconnecting the lens frame relative to the mounting flange, the ridge 43 of the detent 42 serves as a fulcrum about which the frame 11 rocks either toward or from the mounting flange 10.

Having thus described the lock for swimming pool lamps in specific detail it will be appreciated that the same may be altered, varied and/or modified without departure from the spirit of my invention. I therefore desire to avail myself of all modifications, variations and/or alterations as fairly come within the purview of the appended claims.

What I claim as new and desire to protect by Letters Patent is:

1. In a lens frame adapted to fit against a mounting flange, a locking means comprising a detent on said mounting flange and extending radially inward therefrom, a rubber cushion embedded in said lens frame to engage said detent to provide a fulcrum for said lens frame, a keeper diametrically opposite said fulcrum comprising a strike plate on said mounting flange having a cam surface terminating in an inner abutment edge, and a bolt on said lens frame having a cam surface engageable by the cam surface of said strike plate for compressing said rubber cushion onto said detent until said bolt passes said strike plate and engages behind the abutment ledge thereof.

2. In a lens frame adapted to fit against a mounting flange a locking means comprising a detent on said mounting flange and extending radially inward there-

5

from, a rubber cushion embedded in said lens frame for engaging said detent to provide a fulcrum for said lens frame, a keeper diametrically opposite said fulcrum comprising a strike plate on said mounting flange having a cam surface terminating in an inner abutment edge, and a bolt on said lens frame having a cam surface engageable by the cam surface of said strike plate for compressing said rubber cushion onto said detent during movement of said lens frame toward said mounting flange until said bolt passes said strike plate whereupon said rubber cushion expands to urge said bolt behind the abutment ledge of said strike plate.

3. In a lens frame adapted to fit against a mounting flange a locking means comprising a detent extending inwardly from said frame having a ridge, a rubber cushion embedded in said lens frame to engage the ridge of said detent to provide a fulcrum for said lens frame, a cam-like strike plate formed on said mounting flange diametrically opposite said fulcrum terminating in an inner abutment edge, and a bolt on said lens frame diametrically opposite said rubber cushion for engaging the cam surface of said strike plate for compressing said rubber cushion onto said detent until said bolt passes said strike plate and engages behind the abutment ledge thereof.

4. The combination with a mounting flange having a cylindrical portion embedded in a wall and a lens frame having a cylindrical leg portion receivable within the cylindrical portion of said flange including a fascia portion disposed to abut and cover the open end of the latter, a locking means comprising a detent extending radially inward from the cylindrical portion of said flange, a rubber cushion member secured to the cylindrical leg portion of said frame for bearing engagement with said detent, a cam-like keeper formed on the cylindrical portion of said flange diametrically opposite said detent provided with an abutment edge inwardly of the open end of said flange, and a bolt formed on the cylindrical leg portion of said lens frame diametrically opposite said rubber cushion member for compressing the latter down upon said detent upon engagement of said bolt with said cam-like keeper, said bolt being adapted to lodge behind said keeper and to be urged upwardly into latching engagement with the same by expansion of said rubber cushion member.

5. In an underwater light fixture for swimming pools and the like, a mounting flange having a cylindrical por-

6

tion embedded in a wall of said pool, a lens frame having a cylindrical leg portion receivable within the cylindrical portion of said flange, said lens frame having an integral fascia portion disposed to abut and cover the open end of the cylindrical leg portion of said mounting flange, and means for releasably locking said frame to said flange comprising a detent extending radially inward from the cylindrical portion of said flange, a rubber cushion member secured to the cylindrical leg portion of said frame for bearing engagement upon said detent, a cam-like keeper formed on the cylindrical portion of said flange diametrically opposite said detent provided with an abutment edge inwardly of the open end of said flange, and a bolt formed on the cylindrical leg portion of said lens frame diametrically opposite said rubber cushion member for compressing the latter onto said detent during engagement of said bolt with said cam-like keeper as it passes the latter.

6. The combination with a fixed mounting flange having a cylindrical portion and a lens frame having a cylindrical leg portion receivable within the cylindrical portion of said flange and an integral fascia portion disposed to abut and cover the open end of the latter; a projection on the outer periphery of the cylindrical leg portion of said lens frame provided with a dovetailed socket facing the cylindrical portion of said flange, a wedge shaped rubber cushion member having its spread end anchored in said dovetailed socket, a detent on the inner periphery of the cylindrical portion of said flange provided with a chordal ridge adapted to provide fulcrum engagement with the rubber cushion member on said lens frame, a bolt formed on the periphery of the cylindrical leg portion of said lens frame diametrically opposite said projection, and a cam-like keeper formed on the inner periphery of the cylindrical portion of said flange for engagement by said bolt when said lens frame is rocked about the fulcrum between said detent and rubber cushion member for compressing the latter onto said detent and for latchingly engaging said bolt member when the latter is elevated behind said keeper upon expansion of said rubber cushion member.

References Cited in the file of this patent

UNITED STATES PATENTS

| | | | |
|----|-----------|---------------------|---------------|
| 45 | 1,075,565 | Harter et al. ----- | Oct. 14, 1913 |
| | 1,792,398 | Rothen ----- | Feb. 10, 1931 |
| | 2,777,940 | Spiro et al. ----- | Jan. 15, 1957 |