Aug. 22, 1967 F. M. NASH 3,337,725

UNDERWATER LIGHT ASSEMBLY

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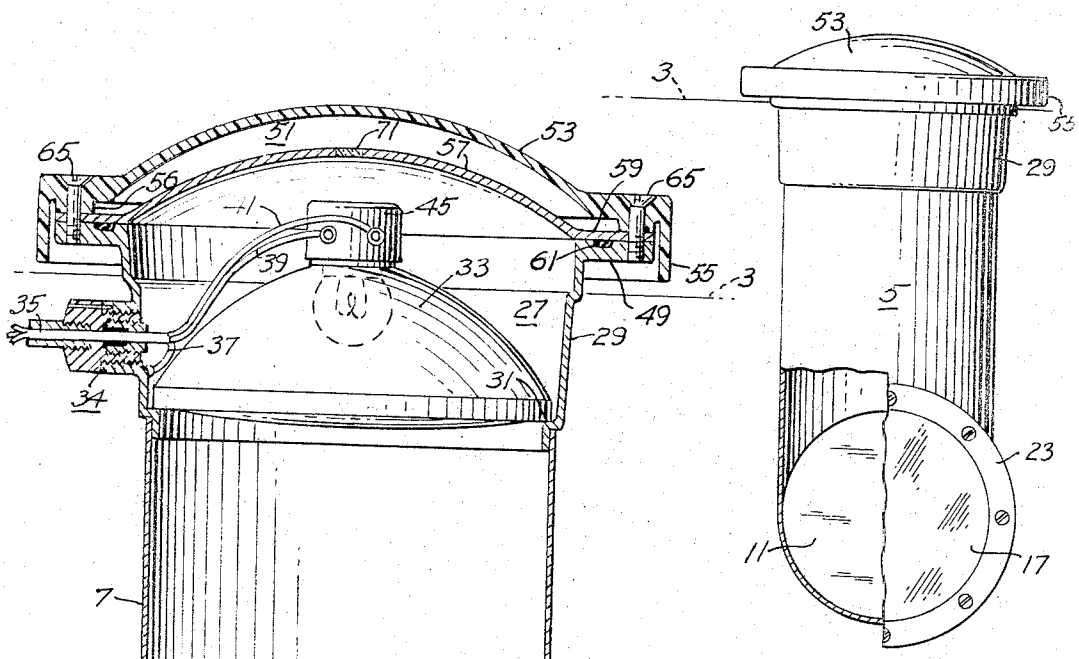


Fig. 2.

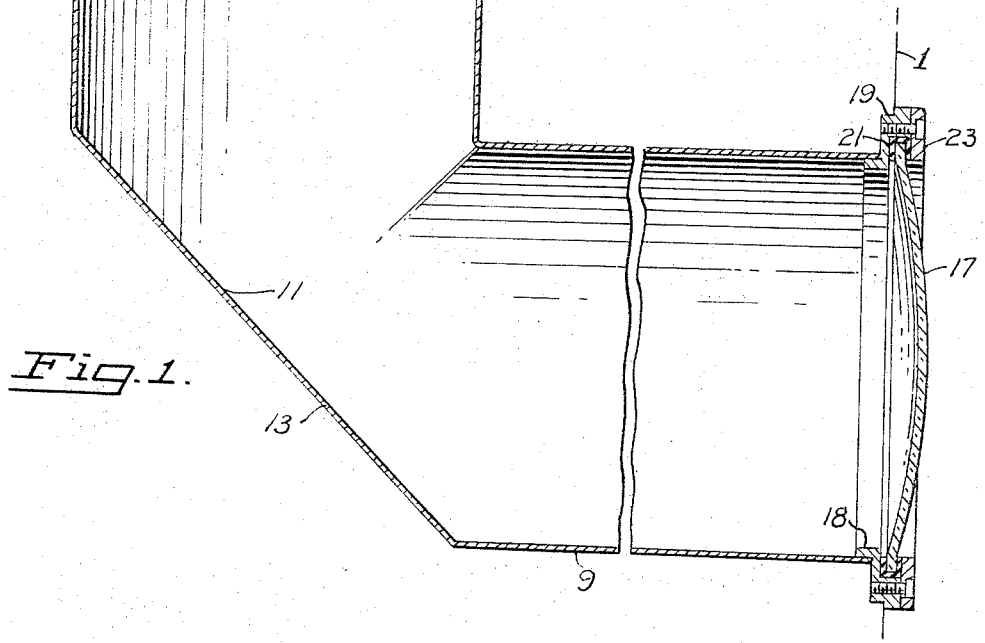


Fig. 1.

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Fig. 3.

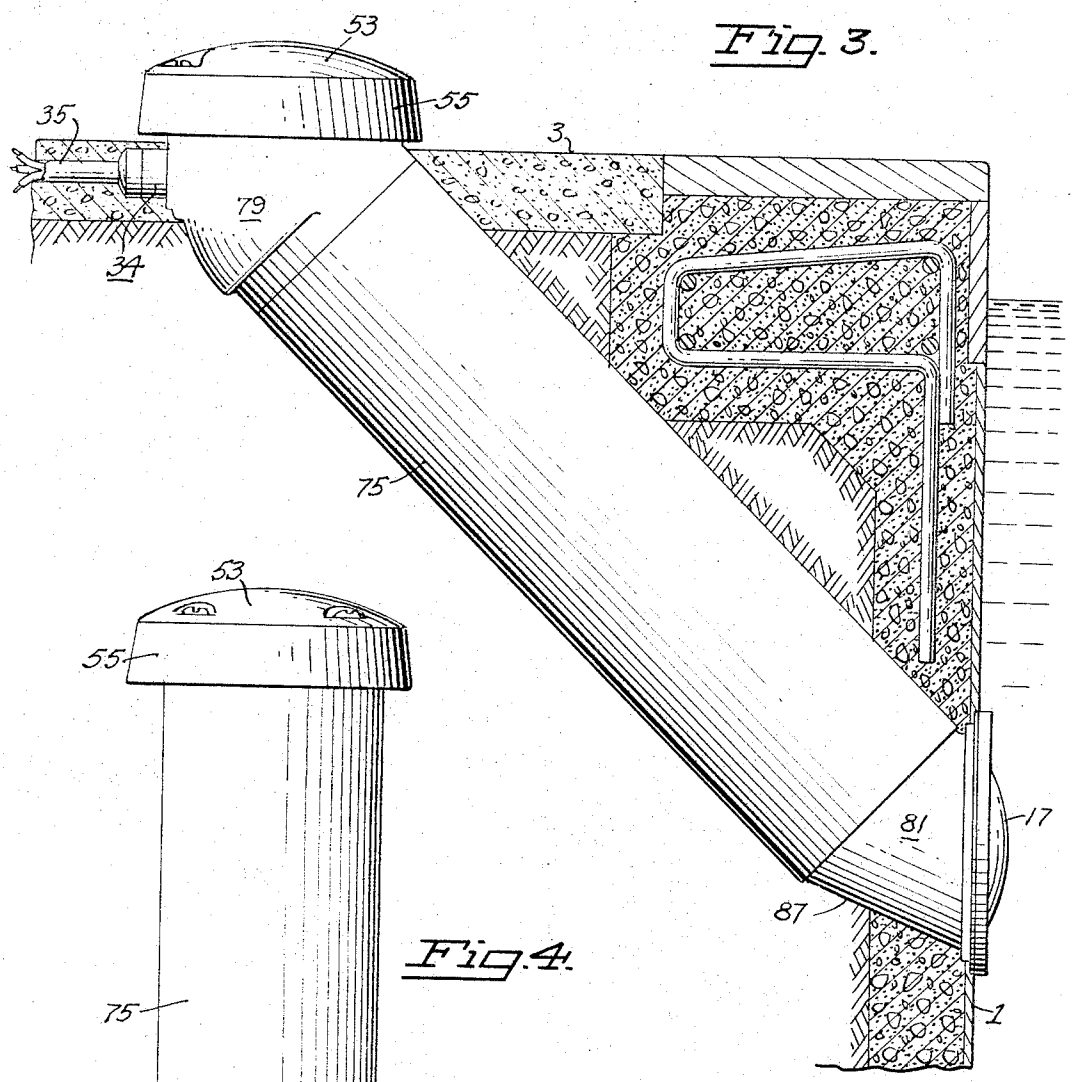


Fig. 4.

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Fig. 5.

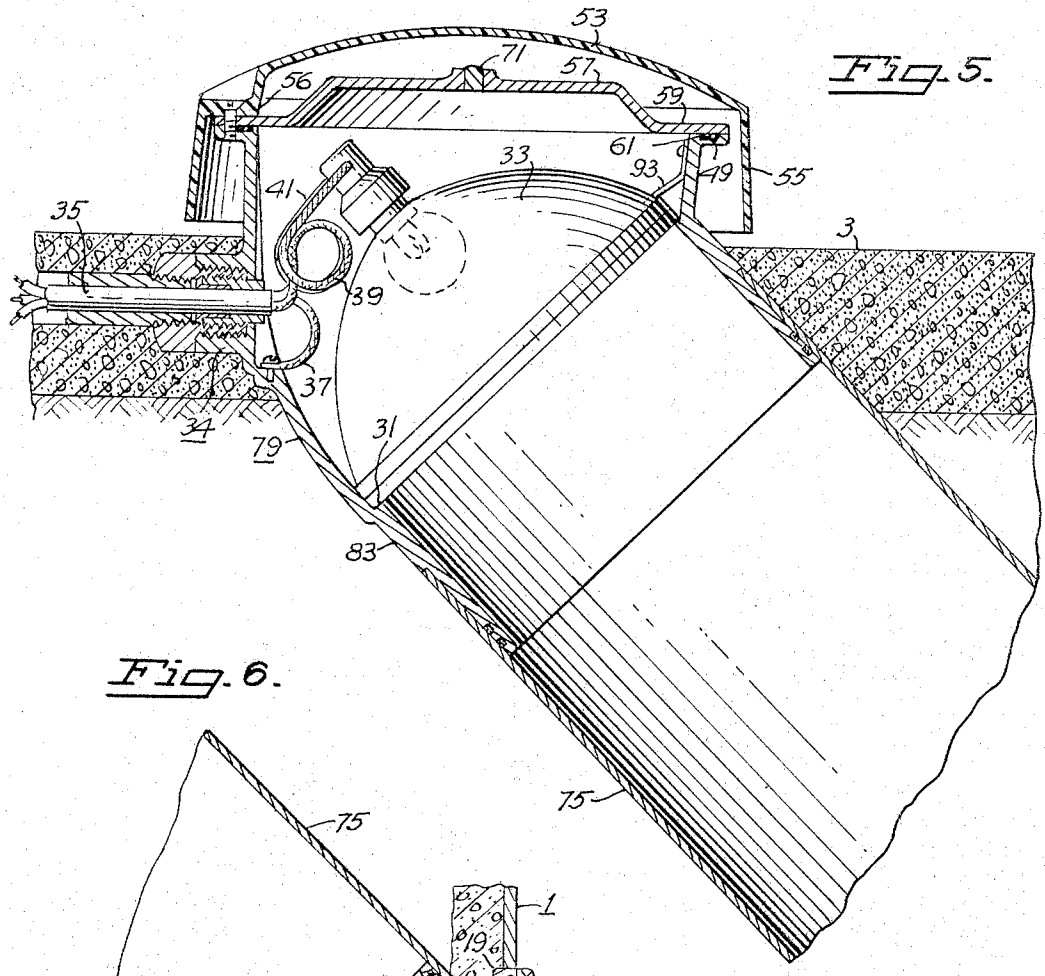
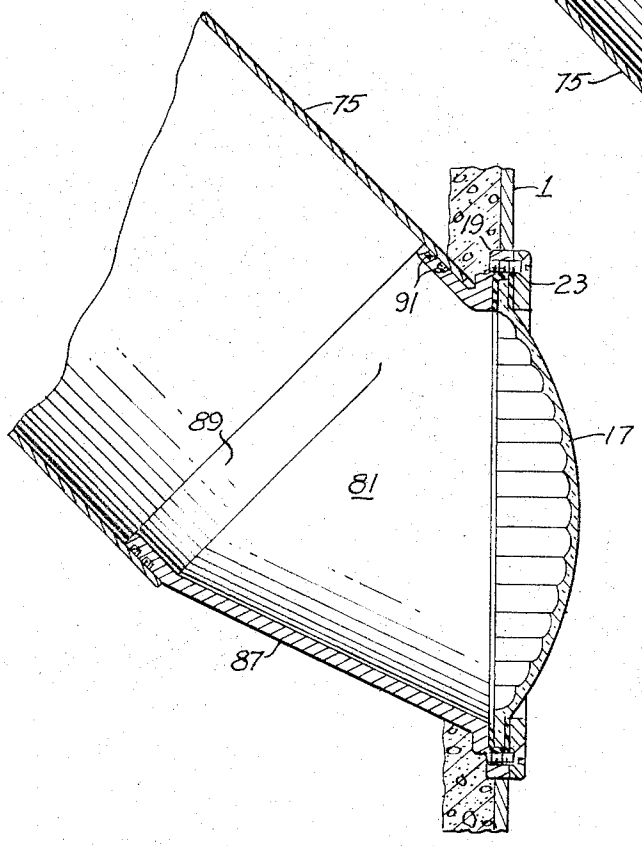


Fig. 6.



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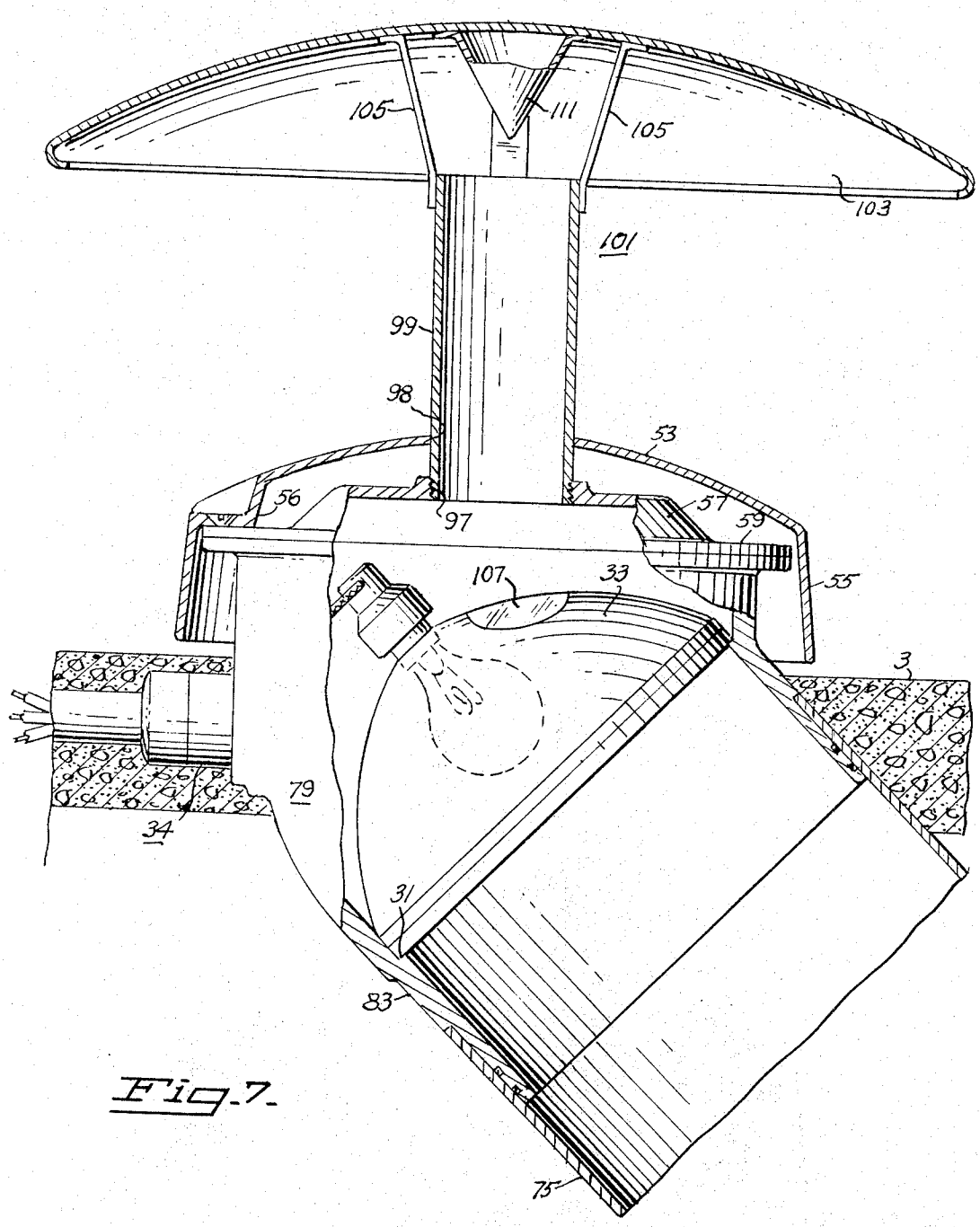


Fig. 7.

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3,337,725

UNDERWATER LIGHT ASSEMBLY

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Filed Feb. 5, 1965, Ser. No. 430,563
13 Claims. (Cl. 240—26)

My invention relates to swimming pool installations and the like, and more particularly to an underwater light assembly for such installations.

In connection with the underwater lighting of swimming pools and the like, it has been the practice in the past to mount the lamp elements in a watertight enclosure, with the lens portion installed in the pool wall. In the event of leakage with such type of installation, the resulting electrical conductivity with the water of the pool presents a real hazard, and in the past has caused many fatalities to persons using such pools.

Among the objects of my invention are:

(1) To provide a novel and improved underwater light installation for swimming pools and the like;

(2) To provide a novel and improved underwater light installation which is free of the hazards of prior conventional type installations;

(3) To provide a novel and improved underwater light installation which may be readily serviced;

(4) To provide a novel and improved underwater light installation which may be fabricated as an assembly;

(5) To provide a novel and improved light assembly for swimming pools and the like;

(6) To provide a novel and improved underwater light assembly for swimming pools and the like, which light assembly includes means for adding a lighting effect to the proximate deck area of the pool when installed;

(7) To provide a novel and improved lighting effect means for a swimming pool deck and the like.

Additional objects of my invention will be brought out in the following description of a preferred embodiment of the same, taken in conjunction with the accompanying drawings wherein:

FIGURE 1 is a view in section to an underwater light assembly of the present invention;

FIGURE 2 is a front view in elevation of such an assembly, partly broken away to expose some of the inside details;

FIGURE 3 is a view in side elevation of a modification of the embodiment of the assembly of FIGURE 1 and depicting it in its installed environment;

FIGURE 4 is a front view in elevation of the embodiment of FIGURE 3 with the lens partially broken away;

FIGURE 5 is an enlarged fragmentary view in section, through the upper end of the embodiment of FIGURE 3;

FIGURE 6 is an enlarged fragmentary view in section, through the lower end of the embodiment of FIGURE 3; and

FIGURE 7 is a view in section through a lighting feature of the present invention.

Referring to the drawings for details of my invention in its preferred form, the same is for installation in a swimming pool or like pool, having a wall **1** and a deck **3** along the upper rim of such wall.

The assembly of FIGURE 1 involves an angular tube adapted to substantially extend between a location on such deck and a location on such wall below normal level of water in such pool.

The tube is formed with sections **7** and **9** at right angles to each other. Intermediate the ends of the tubes, interiorly thereof, is a planar surface **11** so located as to be capable of receiving light from one end of the tube and directing it toward the other end.

In this embodiment of the invention, this is accomplished by introducing at the bend in the tube, a planar wall section **13** at an angle of 45 degrees to each section of the tube. The inner surface **11** of this planar section, and preferably the entire inner surface of the tube may be provided with high light reflecting characteristics such as may be realized by chrome plating, or by any other means which will produce a high polish over the surfaces in question.

At one end of the tube is a lens **17** which is affixed to the tube in a manner to render it watertight and leak proof. A means for accomplishing such sealing of the lens may involve a lens flange assembly including a flange **18** having a snug fit with the proximate end of the tube, to which it may be welded or otherwise sealed. Into this flange, the lens, surrounded by an edge seal ring **21** is positioned and tightly clamped by a clamping ring **23** bolted to the flange.

At the remaining or opposite end of the tube is a housing **27** for a light source, such housing including a substantially cylindrical body section **29** having a cylindrical portion **30** removably affixed to the proximate end of the tube, by a friction fit or the like, and having an internal shoulder **31** in proximity to the tube, and on which a light source **33** of the sealed beam type may be positioned.

Such light source should preferably be one capable of producing a concentrated light beam made up, in large part, of substantially parallel rays. The beam therefore will strike in large measure, within the area of the planar surface **11**, whereby such portion of the light will be reflected thereby, directly through the lens without intermediate reflections from the other tube walls.

However, a percentage of the light from the light source may strike surfaces other than or in addition to the planar surface in question, and will eventually after multiple reflections, pass through the lens. For this reason and in the interest of maintaining high efficiency, the entire inner surfaces of the tube are preferably given high light reflecting characteristics.

In the wall of the body section **29** of the light housing, is a gland **34** through which to bring a power supply for the light source, in the form of a cable **35** carrying three wires, one **37** for grounding to the body section of the housing, and the remaining two **39** and **41** for connection to a plug **45** adapted to be applied to the pin terminals with which such light source is conventionally provided.

The body section **29** preferably terminates at its exposed end in a flange **49** for the application of a cover assembly **51**, including an outer cover **53**, preferably convex in form and bounded by a lip flange **55** adapted to overhang the peripheral edge of the body section flange **49**. Said outer cover has integrally formed internal spacer bosses **56** for supporting the cover on the body flange **49**.

An inner cover **57** also preferably convex, is provided with a peripheral flange **59** adapted to match the flange **49** of the body section of the housing and contact an O-ring seal **61** recessed into the body section flange. By means of flange screws **65** passing through the cover assembly by way of the bosses, the cover assembly may be clamped to the flange of the body section, and in conjunction with the O-ring seal **61**, may be effectively sealed thereto.

The cover assembly is designed as a heat protective measure, for which purpose, the inner cover is preferably of rust resistant metal, and provided with a porous plug **71** to permit breathing in either direction while preventing water or dirt from entering the space beneath.

The outer cover is of poor heat conductive material, being preferably molded of fiber glass or other plastic for this purpose. It serves as a shell to prevent physical contact with the inner metal cover, while permitting ade-

quate air space and circulation contact with the outside atmosphere to effect dissipation of heat from within.

The underwater light assembly, when employed in a swimming pool or like pool installation, is installed with the lens frame embedded in the concrete of the wall **1** of the pool, and with the body section of the light source housing **27** sufficiently embedded in the deck **3** of the pool to bring the lip flange **55** of the outer cover in close proximity to such deck when the cover assembly is installed.

When so installed, the body section flange **49** will be sufficiently spaced above the deck level as to be out of contact with water accumulating thereon, while the lip flange of the cover will protect the seal at this point against splashing and dripping of water.

Being of poor heat conductive material, the outer cover will protect a bather's feet from the higher temperatures apt to develop within the cover assembly, and the provision for adequate air circulation in the space between the outer and inner covers, will serve to minimize the accumulation of heat therein and the building up of excessive temperatures in the first place.

With an installation as described, a light source may be readily and conveniently installed, merely by removing the cover assembly and substituting a new light source for the one to be discarded.

Inasmuch as all electrical wiring and connections leading to the light, will always be above the maximum water level in the pool, the probability of the light circuit ever being grounded through the water of the pool becomes practically an impossibility, even should the water gain free access to the tube, as by accidental cracking of the lens for example.

In the embodiment of the invention depicted in FIGURES 3 to 6, there is involved a tube **75** which is straight and with a light housing **79** and a lens installation flange **81** modified to accommodate the same for use with such straight tube.

In the light housing, a cylindrical portion **83** is disposed at an angle of approximately 45 degrees to the upper portion of the housing structure, whereby the lamp **33** will rest on a shoulder in an angular position such as to direct its beams generally parallel to the longitudinal axis of the tube.

At the lens end of the tube, the lens flange **81** is formed with a section **87** angularly disposed with respect to the lens **17**, the lowermost longitudinal dimension at **88** preferably making an angle of approximately 15 degrees to the longitudinal axis of the tube **75**. This angular section then terminates in a rim **89** concentric with the longitudinal axis of the tube **75**, and of a diameter to provide a sliding fit in the end of said tube.

The flange rim is provided with one or more O-rings **91** to effect a seal between the lens flange and the tube, while permitting a certain amount of adjustability, so as to adapt the underwater light installation to slight deviations in dimensions apt to be met with in pool installations.

When the light source is resting at an angle, as it does in the embodiment of FIGURES 3–6, a clip **93** may be employed to provide positive retention, though it would be stable without such retention means.

With an installation such as depicted in FIGURES 3 to 6, a portion of the rays emanating from the light source will pass directly through the lens, without deflection, toward the bottom of the pool, while a portion of the light rays will strike the light flange and be deflected and dispersed in various directions. To enhance the reflective power of the lens flange, the reflecting surface thereof may be chrome plated or otherwise provided with a highly polished light reflecting surface.

In lieu of the O-ring seals, the lens flange along its rim, may be welded or otherwise affixed to the proximate end of the tube.

In lieu of the breather plug **71**, aligned openings **97**, **98** in the inner cover **57** and outer cover **53** respectively, may be provided, the wall of inner cover opening being threaded to threadedly receive the hollow stem **99** of a reflector assembly **101** which includes a cap **103** mounted on the stem by spaced brackets **105**.

By leaving a section **107** of the light reflecting surface of the light source **33**, in line with the axis of the stem, uncoated, a portion of light originating within the light source, will pass through the stem, either directly or by reflection from the inner surface thereof, and strike the undersurface of the cap to be dispersed downwardly and cast a glow upon the surrounding surface of the deck.

It will be appreciated from the foregoing, that the present invention satisfies all the objects attributed thereto, and while I have illustrated and described the same in its preferred form, it will be apparent that the same is subject to alteration and modification without departing from the underlying principles involved, and I accordingly do not desire to be limited in my protection to the specific details illustrated and described, except as may be necessitated by the appended claims.

I claim:

1. An underwater light assembly installation for a swimming pool or the like having a wall and a deck along the upper rim of such wall, comprising

a tube,

a lens at one end of said tube,

means for sealing said lens to said tube in a water tight seal,

a light housing mounted on the remaining end of said tube for housing a light source, said light housing including

a heat protective cover assembly,

said underwater light assembly being installed in a pool with said tube passing through said wall, and with said lens sealed in said wall and with said light housing in said deck.

2. An underwater light assembly installation for a swimming pool or the like having a wall and a deck along the upper rim of such wall, comprising

a tube,

a lens at one end of said tube,

means for sealing said lens to said tube in a watertight seal,

a light housing mounted on the remaining end of said tube for housing a light source, said housing including

a body section having an internal shoulder on which to rest a light source of the sealed beam type, a gland in the wall thereof, above said shoulder, through which to bring a power source for connection to such light source,

and a heat protective cover assembly for said body section,

said underwater light assembly being installed in a pool with said tube passing through said wall, and with said lens sealed in said wall and with said light housing in said deck.

3. An underwater light assembly installation for a swimming pool or the like having a wall and a deck along the upper rim of such wall, comprising

a tube extending substantially from a location on said deck, and through said wall at a location on said wall below normal water level of said pool,

a lens adjacent one end of said tube, and substantially flush with the water exposed surface of said wall,

means for affixing said lens to said tube,

a light housing mounted on the opposite end of said tube for housing a light source and exposable through the deck of said pool, and

means in said housing for supporting a light source.

4. An underwater light assembly installation for a swimming pool or the like having a wall and a deck along the upper rim of such wall, comprising

a tube extending substantially from a location on said

deck, and through said wall at a location on said wall below normal water level of said pool,
a lens adjacent one end of said tube, and substantially flush with the surface of said wall,
means for affixing said lens to said tube in sealed relationship thereto,
a light housing mounted on the opposite end of said tube and exposable through the deck of said pool, said housing including
a body section having an internal shoulder and a body portion affixed to said opposite end, with means for supporting a light source, a gland in the wall of said body section, above said shoulder, through which to bring a power source for connection to such light source, and
a heat protective cover assembly for said body section.

5. An underwater light assembly installation for a swimming pool or the like having a wall and a deck along the upper rim of such wall, comprising
a tube in said wall and extending substantially between a location on said deck, and a location on said wall below normal water level of said pool,
a lens adjacent one end of said tube, and substantially flush with the surface of said wall,
means for affixing said lens to said tube in sealed relationship thereto,
a light housing mounted on the opposite end of said tube and exposable through the deck of said pool, said housing including
a body section having a substantially cylindrical body portion affixed to said opposite end, with an internal shoulder on which to rest a light source of the sealed beam type, a gland in the wall of said body section, above said shoulder, through which to bring a power source for connection to such light source, and a flange bordering the upper edge of said body section, and
a heat protective cover assembly for said body section,
said heat protective cover assembly including an inner cover of good heat conductive material and an outer cover of poor heat conductive material,
said inner cover being supported by said flange and having a breather plug therethrough,
said outer cover having a lip flange overhanging the peripheral edges of said inner cover flange and body section flange, and
means for affixing said cover assembly to said housing section flange, with said outer cover in spaced relationship to said inner cover.

6. An underwater light assembly adapted for installation in a swimming pool or the like having a wall and a deck along the upper rim of such wall above the normal water level, said underwater light assembly comprising
a tube of a length extending substantially from a location on such deck, through such wall to a location on such wall below normal water level of such pool,
a lens adjacent one end of said tube, and
means for affixing said lens to said tube in sealed relationship thereto,
a light housing mounted on the opposite end of said tube, and means in said housing for supporting a light source.

7. An underwater light assembly adapted for installation in a swimming pool or the like having a wall and a deck along the upper rim of such wall above the normal water level in such pool, said underwater light assembly comprising
a tube of a length extending substantially from a location on such deck, through such wall to a location on such wall below normal water level of such pool,
a lens adjacent one end of said tube,
means for sealing said lens to said tube,
a light housing mounted on the remaining end of said tube, said light housing including
a body section, and

a heat protective cover assembly for said body section.

8. An underwater light assembly adapted for installation in the wall of a swimming pool or the like having a deck along the upper rim of such wall above the normal water level in such pool, comprising
a tube of a length extending substantially from a location on such deck, and passing through such wall at a location on such wall below normal water level of such pool,
a lens adjacent one end of said tube,
means for sealing said lens to said tube in a watertight seal,
a light housing mounted on the remaining end of said tube, said housing including
a body section having an internal shoulder on which to rest a light source of the sealed beam type, a gland in the wall thereof, above said shoulder, through which to bring a power source for connection to such light source,
and a heat protective cover assembly for said body section.

9. An underwater light assembly adapted for installation in the wall of a swimming pool or the like having a deck along the upper rim of such wall, comprising
a tube of a length adapted to extend substantially between a location on such deck, and a location on such wall below normal water level of such pool,
a lens adjacent one end of said tube,
means for sealing said lens to said tube in a watertight seal,
a light housing mounted on the remaining end of said tube, said housing including
a substantially cylindrical body section removably affixed to said remaining end and having an internal shoulder in proximity to said tube and on which to rest a light source of the sealed beam type, a gland in the wall thereof, above said shoulder, through which to bring a power source for connection to such light source, and a flange bordering the upper edge of said body section,
and a heat protective cover assembly for said body section,
said heat protective cover assembly including an inner convex cover with a vent therethrough, and an outer convex cover,
means supporting said cover assembly on said body section flange, with said outer cover in spaced relationship to said inner cover.

10. An underwater light assembly adapted for installation in the wall of a swimming pool or the like having a deck along the upper rim of such wall, comprising
a tube of a length adapted to extend substantially between a location on such deck, and a location on such wall below normal water level of such pool,
a lens at one end of said tube,
means for sealing said lens to said tube in a watertight seal,
a light housing mounted on the remaining end of said tube, said housing including
a body section having an internal shoulder in proximity to said tube and on which to rest a light source of the sealed beam type, a gland in the wall thereof, above said shoulder, through which to bring a power source for connection to such light source, and a flange bordering the upper edge of said body section,
and a heat protective cover assembly for said body section,
said heat protective cover assembly including an inner cover and an outer cover,
means supporting said cover assembly on said body section flange, with said outer cover in spaced relationship to said inner cover,
said inner cover having venting means therein, and
said outer cover being of poor heat conductive material and having a lip flange adapted to enclose the

peripheral edge of said inner cover flange and said body section flange.

11. A swimming or like pool construction comprising
a pool deck above the water level in such pool,
a light source installed in said pool deck and casting a light in a substantially vertical direction when lit,
a cover for said light source for protecting said light source from water above deck,
light dispersion means carried by said cover and extending above said deck, said light dispersion means receiving light from said source and dispersing it about the surrounding deck surface.

12. A swimming or like pool construction comprising
a pool deck above the water level in said pool,
a light source installed in said pool deck and casting a light in a substantially vertical direction when lit,
a cover for said light source for protecting said light source from water above deck,
light dispersion means carried by said cover and extending above said deck, said light dispersion means receiving light from said source and dispersing it about the surrounding deck surface, said light dispersion means including,
a hollow stem extended upwardly from said cover in line with rays from said light source,
a reflecting cap, and bracket means supporting the same above said stem.

13. A swimming or like pool construction comprising
a pool deck above the water level in said pool,
a light source installed in said pool deck and casting a light in a substantially vertical direction when lit,

a cover for said light source for protecting said light source from water above deck,
light dispersion means carried by said cover and extending above said deck, said light dispersion means receiving light from said source and dispersing it about the surrounding deck surface, said light dispersion means including,
a hollow stem extended upwardly from said cover in line with rays from said light source,
a reflecting cap, and bracket means supporting the same symmetrically above said stem, and
an inverted cone suspended from said reflecting cap in line with the axis of said hollow stem to provide lateral deflection of light impinging thereon.

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