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(54) TWO PIECE VIEW PORT AND LIGHT HOUSING

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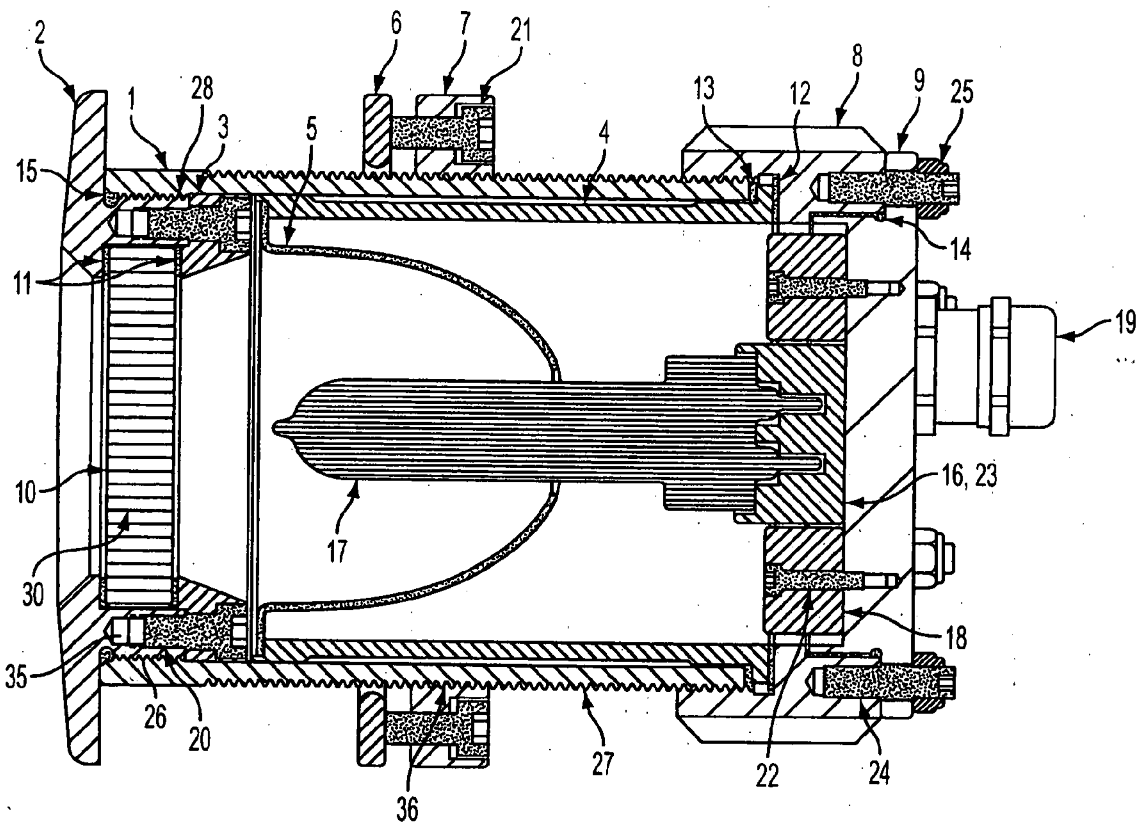
(57) ABSTRACT

The present invention is a view port suitable for installation under the water line of a vessel wherein the view port comprises a flange made from a corrosion resistant material and a body made from a heat resistant material. An alternative embodiment of the invention is an underwater light in which a high intensity light and ballast is completely installed into the above mentioned view port.



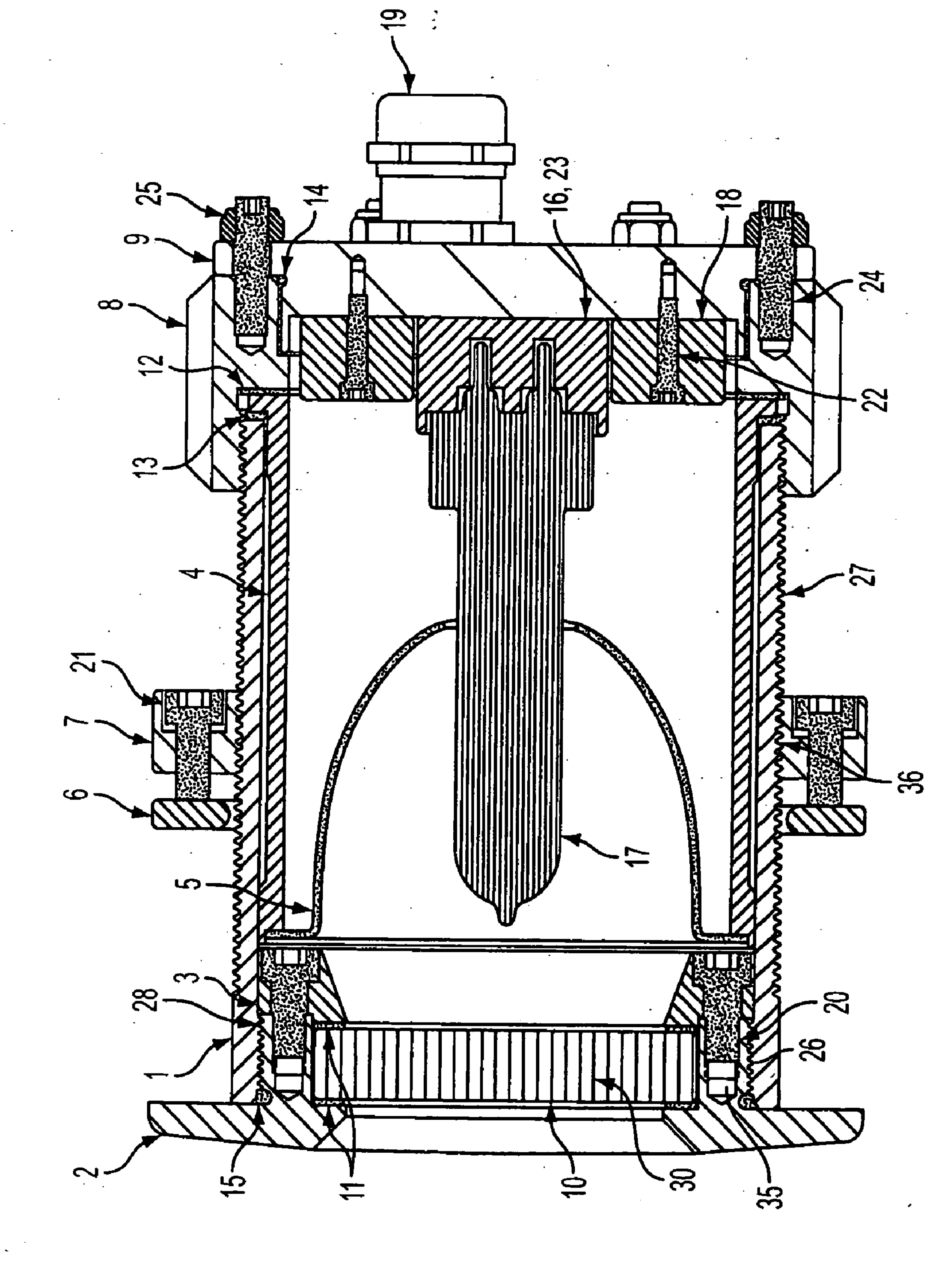

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FIG. 1

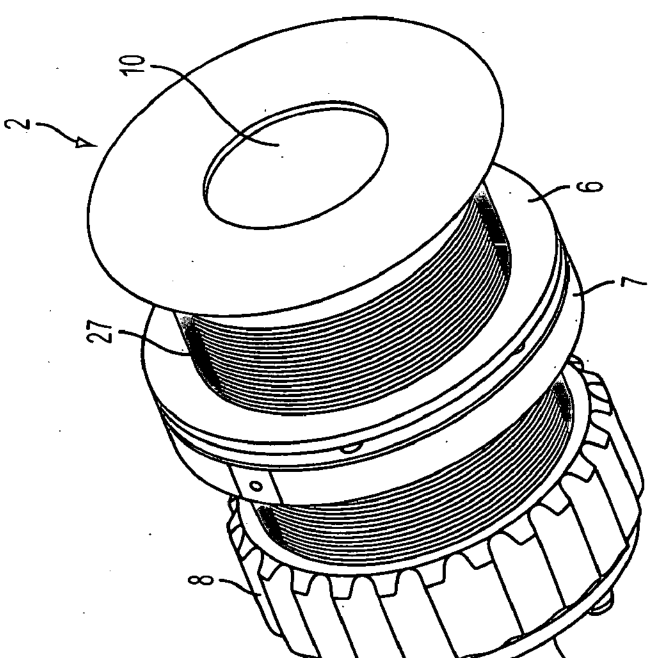

FIG. 2A

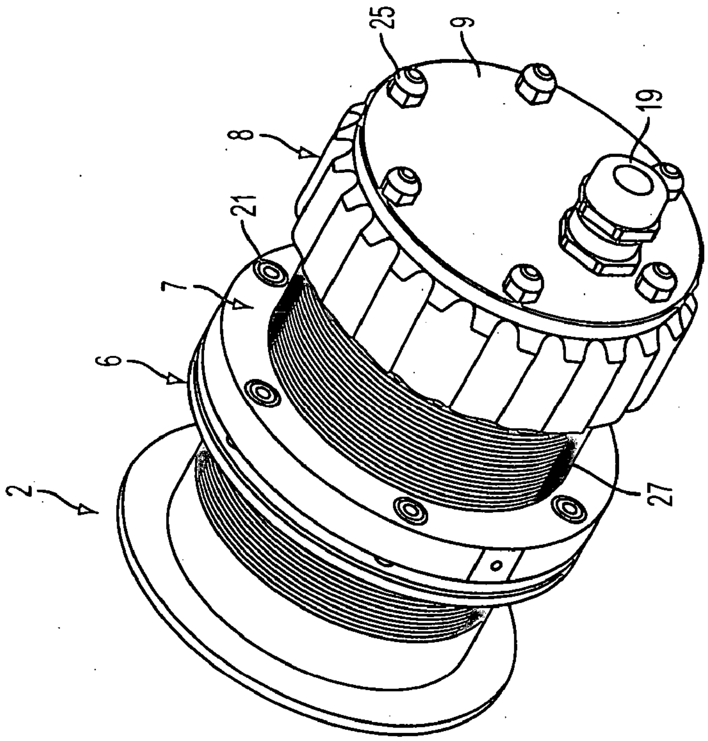

FIG. 2B

TWO PIECE VIEW PORT AND LIGHT HOUSING

[0001] This application claims priority to provisional patent application No. 60/715,625 filed on Sep. 9, 2005 and to provisional patent application No. 60/781,678 filed on Mar. 13, 2006, the contents of which are incorporated by reference in their entirety

BACKGROUND OF INVENTION

[0002] Underwater view ports have been used on ships, boats or other watercraft for decorative and safety purposes as well as to aid exploration of the surrounding water. Similarly lighting has been applied to these same watercraft to improve visibility during the dark hours or during periods of overcast or cloudy conditions. Lights have been applied so as to illuminate the sides of the watercraft in order to better visualize the watercraft from a distance, to further enhance the appearance of the watercraft, and to illuminate the surrounding water area. Lights have been mounted in various locations on the deck or hull of the watercraft to accomplish this purpose.

[0003] Conventional view ports use a frame to mount a substantially transparent window to the hull. Smaller view ports have used a single piece through hull having a mechanically or chemically fastened window inside the thru-hull fitting.

[0004] Thru-hull mounted lights are often in the form of light strips composed of a string of high intensity light bulbs contained within a housing or a plurality of individual lights within a housing applied externally along the perimeter of the hull and oriented to shine downwards along the hull. Various applications of the housings and light shields are used to redirect the light rays from the light source downward along the surface of the hull (including the ability to adjust the housings in order to project beams along a desired path). Although such configurations provide substantial illumination of the hull sides, they are not waterproof or watertight and therefore are placed substantially higher than the waterline. Therefore, little to no illumination of the surrounding water area is provided as the light intensity fades considerably from the light source as it reaches the waterline. Furthermore, because the light rays are directed downward along the surface of the hull, illumination is restricted primarily to the line of the watercraft and therefore does not deviate outward into the surrounding water and may be easily obstructed by other accessories attached to the hull of the watercraft that are closer to the waterline. Also, lights mounted on the exterior of the boat often require replacement and repair from outside the boat rather than from the inside of the boat which usually is fairly cumbersome.

[0005] In order to better project the light onto the surface of the water from a light source placed above the waterline, the lights have been extended outward such that they are spaced away from the hull surface. For example, U.S. Pat. No. 5,355,149 discloses a utility light apparatus that is mounted on a gunwale of a boat by applying the light to the distal end of a conventional fishing rod holder such that the light extends out over the side of the boat in an arm-like fashion. Therefore, the extended light pathway illuminates more of the water's surface and is less likely to be obstructed by other appurtenances placed on the side of the boat. However, unless the height of the boat is relatively shallow, the depth to which the light penetrates the water is still very limited by the light intensity as the light source is placed well above the waterline at the gunwale of the boat. Thus, the conventional hull or deck mounted lights do not provide sufficient lighting for visualizing harmful objects within the path of the watercraft or exploring the water around and below the watercraft. Furthermore, lights extending outward from the surface of the boat are easily damaged in comparison to lights which are integrated into the surface area of the boat such that they are only slightly protruding or not protruding at all.

[0006] U.S. Pat. No. 7,044,623 discloses a similar light to the present invention but does not utilize the two piece design and requires the use of expensive sapphire glass for adequate dispersion of heat. Additionally, the device in U.S. Pat. No. 7,044,623 requires the use of a thermostatic shutoff switch to prevent overheating.

[0007] More recently, lights have been integrated into the hull surface area of a watercraft by placing them into the thru-hull fittings of the hull thereby providing a watertight lighting apparatus which may be positioned below the waterline in order to provide a significantly improved visualization of the surrounding water area and to enhance the aesthetics of the boat. Also, by placing the light assembly inside a thru-hull, replacement or repair can be done from the inside of the boat where access is normally much simpler than outside the boat. Typically, a light bulb or lamp supporting means is placed inside the thru-hull from inside the boat and a secured lens is placed between the lamp and the exterior opening of the thru-hull such that the light passes through the lens and into the water. The light bulb supporting means is surrounded by a housing that is either cylindrical for secure fit against the sides of the thru-hull or is a conical, tapered piece which narrows towards the interior of the boat. A flange placed flush against the outside surface of the thru-hull and one or a series of O-rings or watertight sealants or adhesives are used to provide a watertight seal between the lens and the exterior opening of the thru-hull. The exterior flange is usually cast as one piece with a housing which penetrates the hull. The single casting then requires considerable machining to allow for placement of lenses and accessories which make use of the view port. Alternative constructs include manufacture of the housing and flange in two pieces which are then welded together. Welded configurations have the drawback in that if identical materials are not used, welding is difficult and the integrity of the weld may be suspect when used in an underwater environment where failure could be catastrophic. Furthermore, the use of discrete components in assembling the view port allows for replacement of individual parts in the event of a defect instead of replacement of an entire welded assembly.

[0008] The flange may be formed with the light housing as one piece or may be separate from the housing such that it is removably attached to the side of the hull by screws that are screwed into holes bored into the hull surface or snapped.

[0009] Also, it is desirable to form the light housing and flange of two different types of metals in order to obtain the highest heat dissipating light housing on the interior of the hull and the most anti-corrosive flange on the exterior of the hull where the assembly comes into contact with the water.

A one-piece configuration limits the entire assembly to one type of metal. Even where the flange and light housing are welded together, there are many metals which cannot be welded tightly to one another. Where the flange must be attached to the hull by screws, several screw-holes must be bored into the hull thereby damaging the hull surface and providing additional inlets where water moisture may create damage. Where the flange is snapped into place, it is difficult to obtain a substantially watertight seal between the flange, lens and the exterior opening of the thru-hull.

[0010] It is an object of this invention to provide a two-piece thru-hull light in which the flange and light housing are two separate pieces such that numerous combinations of metals may be used for their construction in order to provide a highly efficient assembly. Furthermore, the flange has a threaded surface which is screwed into the exterior surface of a cylindrical light housing thereby not damaging the hull surface and providing a substantially watertight seal.

[0011] It is also an object of this invention to secure the lighting apparatus to the hull in such a way that the hull is not damaged. The flange is comprised of a flanged mushroom-head shaped portion that is placed flush against the exterior surface of the hull opening. On the interior side of the hull opening, a compression ring surrounding the exterior surface of the light housing is compressed against the hull's interior surface by a threaded locking ring thereby securing the hull between the flange and compression ring. The locking ring compresses the compression ring against the hull by way of several screws whose ends abut the surface of the compression ring. It is also an object of this invention that the cylindrical light housing may be adjustable so as to adapt to slight angle variations of the thru-hull sides with respect to the actual thru-hull opening on the exterior surface of the hull. Many thru-hull configurations use a ball and socket type of joint in order to allow the light housing angle to be adjusted. In the present invention, the screws which are threaded through the locking ring that serve to secure the compression ring against the interior surface of the hull may be threaded individually at different heights thereby tilting the compression ring at various angles in order to accommodate the thru-hull shape.

[0012] It is also an object of this invention that the assembly may be alternatively used to house a camera rather than a light. Many thru-hull light configurations use a concave lens to diverge the light rays for greater light dispersion through the water. However, such a lens would distort a camera view and therefore a flat lens is utilized in the present invention.

[0013] It is also an object of this invention that the assembly may alternatively house an integral ballast assembly such that a high intensity discharge (HID) lamp may be used as the light source without compromising the necessary ballast assembly to moisture outside the watertight assembly. The use of an HID lamp is preferable over incandescent or fluorescent lamps as HID lamps are more energy efficient, longer lasting, and provide a greater area of illumination despite its smaller size.

DESCRIPTION OF THE DRAWINGS

[0014] FIG. **1** is a cross sectional view of a view port housing having a lamp.

[0015] FIG. **2***a* and **2***b* are oblique views of a view port showing an internal water tight end cap.

DETAILED DESCRIPTION OF THE INVENTION

[0016] The present invention is a two-piece thru-hull view port assembly constructed to have a watertight fit in the hull or deck of a vessel. Uses for the view port assembly include, but are not limited to, viewing using the eye, as a housing for lights or as a camera housing for still or video cameras. The view port assembly can be used to provide a viewing window. Referring to FIG. **1**, a flange **2** having an inner and outer face is used as the exterior mounting to the vessel. A substantially transparent lens **10** having a top and a bottom surface is removably mounted on the inner surface of the flange **2** and provides the window for viewing.

[0017] Lens **10** is in the shape of a disc with ground edges and is preferably composed of heat and pressure resistant borosilicate. As will be appreciated by one of skill in the art, any substantially transparent material that is resistant to high temperature and high pressure and is resistant to erosion and chemicals can be used. Suitable materials include chemically hardened or tempered and impact resistant materials such as quartz glass, tempered (Pyrex), borosilicate, or sapphire crystal may also be used. The glass disc is retained in place by glass retaining ring **3** and front flange **2** which is connected to the circumference of the glass retaining ring via cap screws **20**. The interior surface of ring **3** is tapered such that the proximal end is of narrower diameter than the distal end. The hollow interior of the mushroom-head shaped portion of the front flange is tapered inward such that the proximal end is of wider diameter than the distal end and the distal end is of narrower diameter than the threaded portion of the front flange. The diameter of the distal end of the mushroom-head shaped portion of the front flange is equal to the diameter of the proximal end of the glass retaining ring thereby forming a retaining groove for capturing the glass disc between the mushroom-head shaped portion of the front flange and the glass retaining ring. Glass gaskets **11** are placed on both sides of the glass disc for a watertight seal between the disc and the front flange and the disc and glass retaining ring. Gaskets **11** are preferably 1/16" thick and composed of compressed Aramid/Buna-N sheet gasket material. The inner surface of flange **2** contains a plurality of threaded screw holes **35** to which a glass retaining ring **3** having a circumferential body defining a lens opening **30** is affixed using bolts **20** threaded into screw holes **35**. Glass gaskets **11** are used on either side of the lens to provide a watertight seal. Main body **1** of the assembly is a hollow cylinder with a proximal end having internal threads **26** and a distal end having external threads **27** which is attached to the external threads **28** of the flange **2** by means of the internal threads **26**. A polymer o-ring **15** or other suitable sealing means such as silicone, polyether, polyurethane or other sealants acceptable for use below the waterline are used for forming a watertight seal between the flange **2** and main body **1**.

[0018] The assembly is secured to the inside of the vessel hull using a locking ring **7** having internal threads **36** which are sized to screw down on the external threads **27** of the main body **1**. Locking ring **7** pulls flange **2** into position against the outside of the vessel hull. Optionally, in order to adapt the entire lighting assembly to slight angular variations in hull shapes, a compression ring **6** in combination with locking ring **7** is provided along the exterior mid-portion of main body **1**. Although the mushroom-head shaped portion of front flange **2** must stay flush against the side of the boat at the hull opening, the compression ring and locking ring may be adjusted such that the main body of the assembly may tilt slightly in order to accommodate angle variations in the hull. The compression ring is preferably composed of aluminum and has a smooth interior and exterior surface. The compression ring surrounds the exterior of the mid-portion of the main body and acts as a washer separating the main body from the walls of the hull. The corners of the compression ring are beveled so as to provide smooth contact with the walls of the hull. At the distal side of the compression ring, locking ring **7** is screwed onto the mid-portion of the main body via its threaded interior surface. The locking ring is also preferably composed of aluminum. Along the circumference of the locking ring are six cap screws **21** whose bodies extend past the locking ring and abut the distal side of the compression ring. Thus, in order to vary the angle at which the compression ring aligns the assembly with the walls of the hull, each of screws **21** may be individually threaded in the bores of the locking ring at different heights so as to change the angle of the abutting compression ring.

[0019] The advantage of using a two piece thru hull to define a view port is that the individual components can be manufactured from the most preferred materials for the environment and/or application. Certain material choices for the present invention require the use of metals having sufficient structural strength and corrosion resistance to maintain a water tight seal below the waterline. Materials used inside the hull must have sufficient mechanical strength for secure fastening to the flange and should have appropriate heat transfer properties to minimize heat buildup in the view port. Table 1 is a list of the galvanic potential of various common metals starting with magnesium which is the most reactive and ending with platinum which is the least reactive.

TABLE 1

Galvanic Properties	
Most Reactive	Least Reactive
MAGNESIUM	COPPER (CA102)
MAGNESIUM ALLOYS	MANGANESE BRONZE (CA 675),
ZINC	TIN BRONZE (CA903, 905)
ALUMINUM 5052, 3004,	SILICON BRONZE
3003, 1100, 6053	NICKEL SILVER
CADMIUM	COPPER - NICKEL ALLOY
ALUMINUM 2117, 2017,	90-10
2024	COPPER - NICKEL ALLOY
MILD STEEL (1018),	80-20
WROUGHT IRON	430 STAINLESS STEEL
CAST IRON, LOW ALLOY	NICKEL, ALUMINUM,
HIGH STRENGTH STEEL	BRONZE (CA 630, 632)
CHROME IRON (ACTIVE)	MONEL 400, K500
STAINLESS STEEL, 430	SILVER SOLDER
SERIES (ACTIVE)	NICKEL (PASSIVE)
302, 303, 304, 321,	60NI—15CR (PASSIVE)
347, 410, 416,	INCONEL 600 (PASSIVE)
STAINLESS STEEL	80NI—20CR (PASSIVE)
(ACTIVE)	CHROME IRON (PASSIVE)
NI - RESIST	302, 303, 304, 321, 347,
316, 317, STAINLESS	STAINLESS STEEL (PASSIVE)
STEEL (ACTIVE)	316, 317, STAINLESS STEEL

TABLE 1-continued

Galvanic Properties	
Most Reactive	Least Reactive
CARPENTER 20 CB-3	(PASSIVE)
STAINLESS (ACTIVE)	CARPENTER 20 CB-3
ALUMINUM BRONZE	STAINLESS (PASSIVE),
(CA 687)	INCOLOY 825
HASTELLOY C (ACTIVE)	NICKEL - MOLYBDEUM -
INCONEL 625 (ACTIVE)	CHROMIUM - IRON ALLOY
TITANIUM (ACTIVE)	(PASSIVE)
LEAD - TIN SOLDERS	SILVER
LEAD	TITANIUM (PASS.)
TIN	HASTELLOY C & C276
INCONEL 600 (ACTIVE)	(PASSIVE), INCONEL
NICKEL (ACTIVE)	625(PASS.)
60NI—15CR (ACTIVE)	GRAPHITE
80NI—20CR (ACTIVE)	ZIRCONIUM
HASTELLOY B (ACTIVE)	GOLD
BRASSES	PLATINUM

[0020] It is preferred to use materials from the least reactive materials in Table 1 that have the appropriate mechanical properties for the application. Standard marine fittings are generally made of bronze or 316 or 317 stainless steel for both their strength and corrosion resistance when used below the waterline. While these materials offer excellent corrosion resistance, they do not dissipate heat well. As such, they are less preferred for use in applications where heat may be generated such as in a light or camera housing. When the assembly will hold a heat emitting device, it is preferred that the body of the assembly be made from materials capable of rapidly dispersing the heat such as aluminum or copper. Most grades of aluminum however create a galvanic cell and corrode rapidly when immersed in an aqueous environment in the presence of any other metals. In the marine environment other metals are always present in the form of standard bronze through hull plumbing fittings, bronze and stainless propellers, rudder hardware, etc. Furthermore, saltwater is an excellent electrolyte and fosters the creation of galvanic currents. As such, aluminum is a poor choice for any external use on any vessel hull and in no instance should aluminum be directly welded or affixed to steel hull vessels. While plastics do not corrode and have been used in through hull devices, they lack sufficient strength and durability for use in below the waterline applications. They are also cosmetically unappealing in comparison to highly polished metals.

[0021] The present invention allows for the use of corrosion resistant materials on the wet outside of the vessel hull and the use of heat dissipating materials on the dry inside of the vessel hull. For example, the flange can be made of a corrosion resistant metal such as bronze, stainless steel, or titanium. The body is preferably made of a strong heat dissipating metal such as aluminum, titanium or brass or alloys thereof.

[0022] In one embodiment of the view port, the flange **2** can be directly welded to the vessel hull. When welded, there is no need to bed the flange to the hull to reduce leaks and the internal locking and compression rings are eliminated.

[0023] When used with a light or camera, a reflector housing **4** is slip fit or optionally threaded into the inside of the main body. While primary water resistance is provided by the flange **2** and the o-ring **15**, secondary water resistance can be provided by use of a threaded cap which is screwed onto the distal end of the main body. This cap may be a single piece or preferably two pieces comprising a threaded connecting ring **8** and a lid **9**. The cap may be made out of any suitable metal or polymer material although marine grades of aluminum are most preferred due to their corrosion resistance and strength when used inside the vessel and their ability to rapidly dissipate heat compared to other materials having suitable mechanical properties. Connecting ring o-rings or gaskets **12** and lid o-rings or gaskets **14** are used to maintain a water tight seal between the connecting ring and the main body and the lid and the connecting ring. When used it is most preferred that the lid **9** is secured to the distal end of the connector ring **8** via a plurality of screws **24** in combination with locknuts **25** placed around the lid's circumference as shown in FIG. **2***b. The external surface of the cap or connector ring may be shaped for use with tools or contain ridges or other means to improve a hand grip when screwing or unscrewing the connector ring or cap from the main body. The connector ring and cap can also assume any design which does not interfere with its mechanical function. Such designs include aesthetically pleasing designs and designs to improve the heat dissipation of the cap or connector ring. Heat dissipation may be improved by the inclusion of a plurality of cooling fins, ridges or other means to increase the surface area for heat dissipation or to facilitate additional air flow around or through portions of the cap, connector ring or lid.*

[0024] When used with a wired device such as a lamp or camera, the lid contains a cable strain relief structure **19** for coupling to a cable that originates from inside the boat and provides power to and/or a signal from the device mounted inside the view port assembly. Signals transmitted include still or video images, infrared or other sensors capable of receiving data through a view port. Porcelain terminal blocks **18** serve to electrically and mechanically connect the lamp socket **16**, camera or sensor structure to the lid via cap screws **22**. The lamp socket may be elongated as necessary to place the lamp in the optimal location within the reflector housing for light and heat dissipation or alternatively the socket can be position using spacers between the socket and the lid. Also, non conducting standoff bodies may be placed between the terminal block and projector lid so as to change the placement of the terminal block with respect to the projector lid when needed. The lamp socket contains a lamp **17** which may be of one of several types including halide, halogen or xenon gas.

[0025] For lamp or camera replacement, the connector ring **8** is accessed from inside the hull and is unscrewed such that the connector ring and lid assembly, which is connected to the lamp or camera, may be removed in the distal direction. The remaining components of the lighting assembly remain in the thru-hull thereby leaving a sealed viewing hole in place during repair.

[0026] When used as a lamp, a reflector tube **4** is mounted inside and adjacent to the hollow interior of the main body and adjacent to the interior surface of the main body. The reflector tube **4** houses lamp **17** and supports a reflector **5** at its proximal end. The reflector tube is preferably composed of a heat dissipating material such as aluminum and is shaped such that the distal end of the reflector tube is affixed between the distal end of the main body and the connector ring and the proximal end is secured between the proximal end of the reflector tube and a glass retaining ring **3**. While any suitable mechanical means is acceptable, the use of a lip on the proximal and distal end of the reflector housing is most preferred.

[0027] A watertight connection within the reflector housing is maintained by gasket **12** between the lip of the reflector tube and connecting ring. Any heat and water resistant gasket material such as Aramid/Buna-N sheet gasket material can be used for the gasket. A resilient polymer o-ring **13**, preferably composed of nitrile rubber, lies between the distal ends of the reflector tube and main body so as to ensure a watertight seal between the reflector tube and adjacent components. Reflector **5** has a parabolic curved surface which protrudes rearward into the hollow interior of the assembly towards the distal end. Lamp **17** extends through the circular aperture at the center of the parabolic surface such that the reflector serves to provide maximum light projection and brightness from lamp **17**.

[0028] A 12v, 50 watt metal halide light having an integrated ballast was installed in a light housing having a reflector and body made from aluminum and a bronze head. The light assembly was installed in a test tank and run to simulate average night usage. The initial test tank temperature was 21 degrees C., room temperature was 20 degrees C., relative humidity was 40%. The results are shown in Table 2.

TABLE 2

Time	Reflector T	Ballast T	Body T
11:46 am	28	27	24
1:35 pm	52	60	45
2:10 pm	57	72	51
3:10 pm	58	72	53
4:15 pm	60	72	54
5:05 pm	62	72	56

[0029] The test of Table 2 was conducted with similar lights without an integrated ballast to show the effects of housing material on heat accummulation. Table 3 below was conducted under substantially the same conditions as the test in Table 2. The same type of high intensity discharge bulb was used.

TABLE 3

	Aluminum		Bronze		Stainless Steel	
Time	Body	Cap	Body	Cap	Body	Cap
12:15 pm	24c	23c	24c	23c	24c	23c
1:10 pm	49c	50c	39c	67c	59c	100c
2:15 pm	52c	53c	41c	73c	64c	110c
3:05 pm	53c	53c	40c	74c	65c	110c
4:30 pm	49c	47c	40c	62c	60c	96c

[0030] Table 3 shows that stainless steel is an unacceptable housing material for a device having an integrated light and ballast as it would allow the ballast to reach in excess of 80 degrees C., the maximum heat rating for the ballast, at the cap. Similarly, bronze is only marginally acceptable because it reaches temperatures close to the maximum heat rating for the ballast and may in warmer water or temperatures lead to overheating of the ballast.

[0031] As is apparent to one of skill in the art that various details of the present invention can be modified without deviating from the spirit of the invention. The use of alternative materials such as metals, sealants, polymers and transparent glasses and polymers is both contemplated and expected as improvements are made in the relevant art.

We claim:

1. A thru-hull housing comprising:

an annular external flange having an annular opening,

a cylindrical, hollow main body removably attached to the external flange;

a lens sized to fit the annular opening of the external flange,

a means for securing the lens to the external flange,

a means for providing a watertight seal on both sides of said lens; and

a means for securing the housing to a vessel.

2. The thru-hull assembly of claim 1 wherein the means for securing the housing is selected from bonding, welding or mechanical fastening.

3. The thru-hull assembly of claim 2 wherein the mechanical fastening means is a locking ring.

4. The thru-hull assembly of claim 3 wherein the locking ring is used with a compression ring.

5. The thru-hull assembly of claim 1 wherein the means for securing the lens to the external flange is selected from bonding or mechanical fastening.

6. The thru-hull assembly of claim 5 wherein the mechanical means for securing the lens to the external flange is a glass retaining ring.

7. The thru-hull assembly of claim 1 where the means for providing a water tight seal is selected from sealants, o-rings, gaskets or mechanical seals.

8. The thru-hull assembly of claim 7 where the means for providing a water tight seal is a gasket.

9. The thru-hull assembly of claim 1 further comprising a cap threaded onto the distal end.

10. The thru-hull assembly of claim 9 further comprising a source of light.

11. The thru-hull assembly of claim 10 wherein the light is selected from halogen and metal halide.

12. The thru-hull assembly of claim 9 further comprising a camera.

13. The thru-hull assembly of claim 1 wherein the flange and the housing are comprised of two different metals.

14. The thru-hull assembly of claim 13 wherein the flange is selected of a highly corrosion resistant material.

15. The thru-hull assembly of claim 13 wherein the housing is comprised of a heat dissipating metal.

16. A thru-hull light comprising:

an annular external flange having an annular opening,

a cylindrical, hollow main body removably attached to the external flange;

a light housing removably attached to the main body,

a lens sized to fit the annular opening of the external flange,

a means for securing the lens to the external flange,

a means for providing a watertight seal on both sides of said lens disc; and

a means for securing the housing to a vessel.

17. The thru-hull light of claim 16 wherein the means for securing the housing is selected from bonding, welding or mechanical fastening.

18. The thru-hull light of claim 17 wherein the mechanical fastening means is a locking ring.

19. The thru-hull light of claim 18 wherein the locking ring is used with a compression ring.

20. The thru-hull light of claim 16 wherein the means for securing the lens to the external flange is selected from bonding or mechanical fastening.

21. The thru-hull light of claim 20 wherein the mechanical means for securing the lens to the external flange is a glass retaining ring.

22. The thru-hull light of claim 16 where the means for providing a water tight seal is selected from sealants, o-rings, gaskets or mechanical seals.

23. The thru-hull light of claim 22 where the means for providing a water tight seal is a gasket.

24. The thru-hull light of claim 16 wherein the lamp is selected from halogen or metal halide.

25. The thru-hull light of claim 16 further comprising a camera.

26. The thru-hull light of claim 16 wherein the flange and the housing are comprised of two different metals.

27. The thru-hull light of claim 26 wherein the flange is selected of a highly corrosion resistant material.

28. The thru-hull light of claim 26 wherein the flange is selected from stainless steel, bronze or titanium.

29. The thru-hull light of claim 26 wherein the housing is comprised of a heat dissipating metal.

30. The thru-hull light of claim 26 wherein the housing is comprised of aluminum, titanium or brass.

* * * * *