June 23, 1953 C. R. CRAVER 2,642,591

LIFE PRESERVER AND ILLUMINATING MEANS THEREFOR

Filed May 24, 1951

Fig. 1.

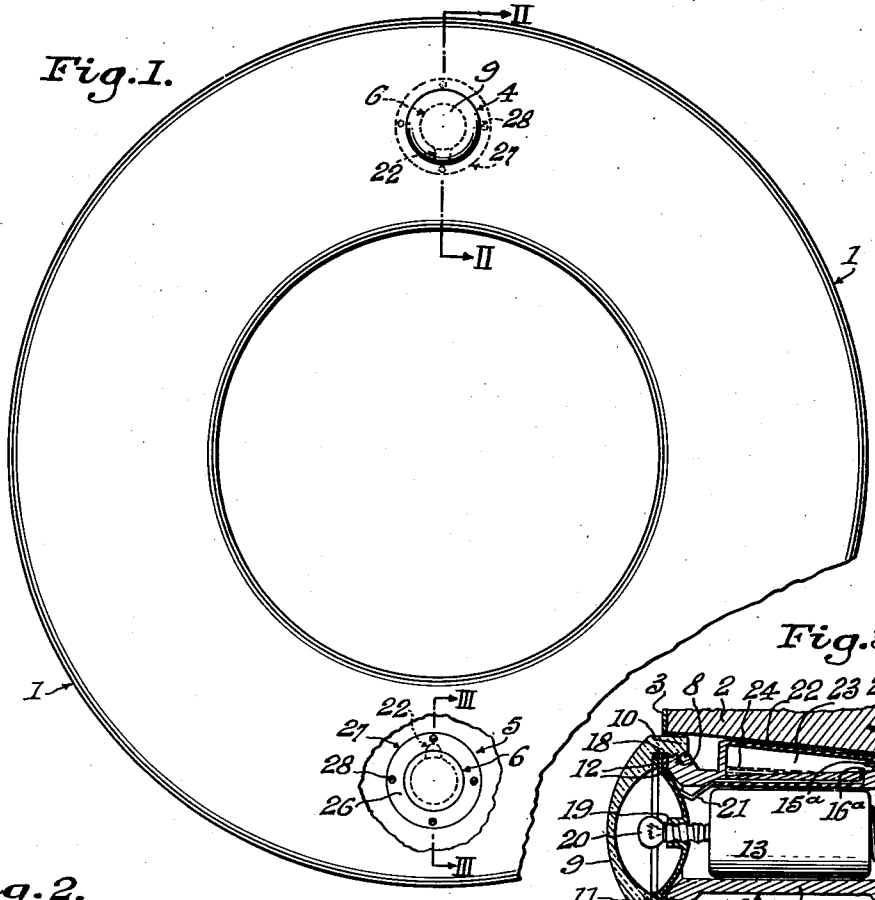


Fig. 3.

Fig. 2.

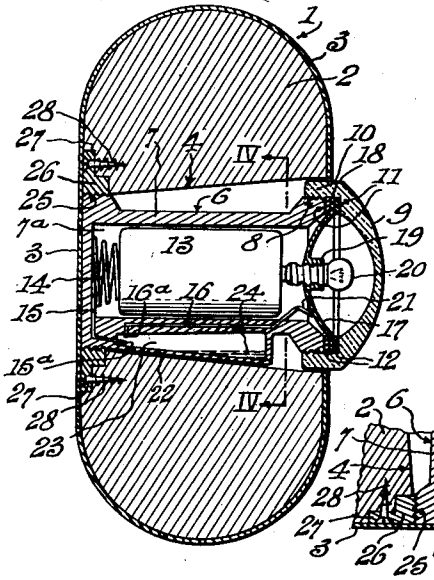


Fig. 4.

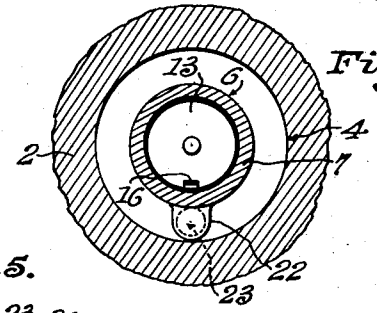
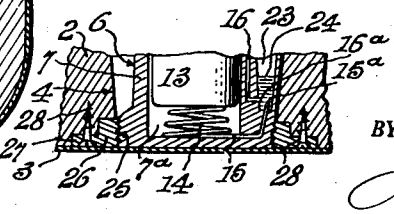


Fig. 5.



INVENTOR.
CLYDE R. CRAVER
BY James R. Mills
Joseph N. Cross

ATTORNEYS

Patented June 23, 1953

2,642,591

UNITED STATES PATENT OFFICE

2,642,591

LIFE PRESERVER AND ILLUMINATING MEANS THEREFOR

Clyde R. Craver, Mobile, Ala.

Application May 24, 1951, Serial No. 228,106

2 Claims. (Cl. 9—8.3)

(Granted under Title 35, U. S. Code (1952), sec. 266)

1

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without payment to me of any royalty thereon.

The present invention relates to improvements in marine accessories such as life preservers, ring buoys, and similar objects that are provided with illuminating means for facilitating locating and retrieving such objects, particularly under conditions of reduced visibility.

Illuminated accessories of the foregoing character have heretobefore been constructed with the illuminating device attached by a cable which allows such a device to be separably attached to such an accessory and to become operable responsively to the launching of the accessory for enabling detection and recovery of the assembly in darkness or conditions of reduced visibility. This type of illuminated accessory presents the problems of damage to the illuminating device, the separation of the device from the floating object and the failure of the device to mark the exact position of the said floating object as well as imparting difficulties in the casting or launching of the assembly.

An important object of the invention is to provide a marine accessory, such as a life preserver, for example a ring buoy with lights, normally extinguished, but automatically illuminated to act as marker lights when the buoy is afloat, the said lights being housed in the floatable body of the life preserver and disposed so as to assure one of the said lights being visibly operative independently of the floating position of the said life preserver.

A further object of this invention is to provide a ring buoy with marker lights that are permanently housed within the body of the buoy and thereby are protected from physical damage resulting from sharp contact of the buoy with the surface of the water onto which the buoy is thrown, or with other bodies.

A further object of this invention is to provide ring buoy marking lights permanently housed within the buoy and so arranged as to assure full visibility thereof, and which will automatically be illuminated responsively to launching of the buoy.

A further object of this invention is to provide a ring buoy with marker lights that will identify the exact position of the buoy when that buoy is afloat.

A still further object of this invention is to provide a light for a ring buoy that will become illuminated and fully visible independently of any position of the body of the buoy when floating.

2

Other objects and advantages of this invention will become apparent as the description proceeds and the features of novelty will be pointed out in particularity in the appended claims.

The invention will be understood more readily by reference to the accompanying drawings, which show the construction of an illustrative embodiment of the invention, and in which:

Fig. 1 is an elevation of a ring buoy embodying the improvements of the present invention; the view showing the buoy in an inoperating position such as a position of storage;

Fig. 2 is a vertical section through the ring buoy and one light unit taken on the line II—II of Fig. 1, looking in the direction of the arrows;

Fig. 3 is a vertical section taken on the line III—III of Fig. 1, looking in the direction of the arrows;

Fig. 4 is a vertical section through a light unit and a portion of the buoy as taken on line IV—IV of Fig. 2, looking in the direction of the arrows; and

Fig. 5 is a fragmentary vertical sectional view, partly in elevation, of one end of either of the light units and surrounding portions of a ring buoy, showing the switch closed for illuminating the light in response to floating position of the buoy subsequent to launching.

In the drawings, wherein for the purposes of illustration there is shown a preferred embodiment of the improved construction of the present invention, the ring buoy is indicated generally by reference numeral 1 and includes a body 2 of buoyant material and a protective covering 3. The ring buoy 1 is provided with two diametrically opposed and oppositely facing pockets 4 and 5, each extending through the covering 3 on one side of the buoy and entirely through the material 2.

Each pocket 4 and 5 contains an identical light unit or assembly, indicated generally by 6, having a lens portion exposed to view at the open side of the pocket and with the perimeter of the lens substantially flush with the body of the buoy, each light being exposed on a different side surface of the ring buoy and diametrically opposite with respect to the whole buoy so as to retain the balance of the ring buoy.

Each light unit or assembly 6 is composed of a cylindrical casing 7 open at one end and closed at the other or base end defining a battery chamber 7a. The open end of casing 7 terminates in exterior threads as at 8. Arcuate lens 9 is provided with a flange 10 directed inwardly of the curvature and having screw threads on the interior

surface of the projections mating with threads 8 of the case. The casing 7 and lens 9 have bearing surfaces 11 facing each other in the assembled unit. Gaskets or washers 12 are located between bearing surfaces 11 to effect a water-tight seal between the lens and case. Casing 7 also contains a battery 13 of the type commonly used in flashlights with the bottom of the battery contacting spring contact 14 which is extended to form conductor 15. Arcuate reflector 17, mounted within the case by means of integral flange 18 extending between gaskets 12, includes socket 19 carrying an electric lamp or bulb 20. The electrical circuit includes conductor 16 terminating at one end in spring 21 contacting the reflector 17.

Exteriorly of the casing 7 but integral with it and approximately parallel to the casing 7 and generally in the same plane as conductors 15 and 16 (as indicated by lines II—II and III—III of Fig. 1) is the switch device including mercury barrel 22 approximately circular in cross-section having mercury chamber 23 which is approximately in the shape of a frustum of a cone with the larger end toward the lens and the smaller end toward the closed end or base of the casing 7. Mercury chamber 23 contains the exposed ends 15*a* and 16*a* respectively of conductors 15 and 16 which are spaced slightly apart at the smaller end of the mercury chamber 23 and a small quantity of mercury 24.

The closed or base end of the casing 7 has exterior screw threads 25 mating with threads on the interior of the annular retainer ring 26 to which it is removably secured. Annular retainer ring 26 has an integral flange 27 that overlies a stepped annular recess cut in the buoyant material 2 adjacent to the pocket, 4 or 5, and is secured thereto by screws 28. The retainer ring 26 is placed under the outer covering 3 as shown in Figs. 2 and 3.

When the buoy is suspended in a vertical plane, that is to say in storage position as shown in Fig. 1, the mercury 24, as shown in Figs. 2 and 3, flows by gravity away from contacts 15*a* and 16*a*, thus opening the switch and preventing discharge of the batteries. When the buoy is disposed in a horizontal plane, as would be the case when it is afloat, the two light units or assemblies 6 will be in vertical positions, one with the lens up, the other with the base end and retaining ring 26 up. The mercury 24 in the light unit having the lens up will flow to the smaller end of the chamber 23 and close the space between contacts 15*a* and 16*a* completing the electrical circuit and lighting the lamp 20 while the mercury in the other or base end up unit will rest in the larger end of the mercury chamber 23 away from contacts 15*a* and 16*a*. It may be seen from the structure of the mercury barrel 22 that the light unit becomes activated only when the unit is in a vertical position with the lens at the top. This structure therefore provides a light unit and a ring buoy combination that will be illuminated automatically on use regardless of whichever side of the buoy is above the surface. Additionally, it may be seen that the light unit with the lens on the underside of a floating buoy forms a reserve light that may be put in operation by the inversion of the buoy to prolong the time of illumination beyond the life of the battery of one light unit.

It is to be understood that the form of the invention herein shown and described is a preferred example of the same and that various changes

in size, shape and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the following claims.

Having thus described my invention, what I claim as new and wish to secure by Letters Patent is:

1. A ring buoy assembly having automatic signal means comprising a buoyant body having diametrically opposed and oppositely facing pockets in opposite sides thereof, a retainer ring secured at the base of each pocket, each pocket containing a light unit including a casing defining a battery chamber having a closed end and an open end, the said casing being removably secured at its closed end to said retainer ring, each of said casings having an integrally attached external barrel extending parallel to the casing with a common wall therebetween and defining a switch chamber, a coiled compression spring forming a resilient battery support and battery contact mounted against the interior of the closed end of each casing with one end of the spring forming a first conductor extending through the casing into the adjacent end of the switch chamber terminating therein as a first contact, the open end of each casing terminating in a smooth flat bearing surface substantially in the same plane as the exterior surface of the buoy body, a first annular gasket, a flanged arcuate reflector, a second annular gasket and an outwardly bowed arcuate lens secured in that order in superimposed relationship against the said bearing surface by means of a threaded connection between the lens and the casing to provide a waterproof closure of the unit, said arcuate reflector projecting into the battery chamber and having a centrally located electric lamp socket, an electric lamp secured in the said socket, and a second conductor in the common wall between the battery chamber and the switch chamber with one end extending into the battery chamber adjacent the said reflector and terminating in a spring contact biased against the reflector and with the other end thereof extending into the same end of the switch chamber as the said first conductor and terminating in a second contact spaced slightly from the said first contact, and sufficient mercury in the switch chamber for connecting and breaking the contact therein, whereby each light unit when provided with a battery in electrical contact with the said coiled compression spring and said electric lamp illuminates and marks the buoyant body in response to a predetermined position of the said body.

2. An automatic signal means for a ring buoy comprising a retainer ring adapted to be secured to a buoy body at the base of a pocket therein and a light unit including a casing defining a battery chamber having a closed end and an open end, said casing being threadedly secured at its closed end within said retainer ring, said casing having an integrally attached external barrel extending parallel to the casing with a common wall therebetween and defining a switch chamber, said switch chamber containing a small amount of mercury, a coiled compression spring forming a resilient battery support and battery contact mounted against the interior of the closed end of the said casing with one end of the spring forming a first conductor extending through the casing into the adjacent end of the switch chamber terminating therein as a first contact, said open end of the said casing terminating in a smooth flat bearing surface, a first annular gasket, a flanged arcuate reflector, a second annular

gasket and an outwardly bowed arcuate lens secured in that order in superimposed relationship against the said bearing surface by means of a threaded connection between the lens and the casing to provide a waterproof closure of the unit, said arcuate reflector projecting into the battery chamber and having a centrally located electric lamp socket, an electric lamp secured in the said socket, and, a second conductor in the common wall between the battery chamber and the switch chamber with one end extending into the battery chamber adjacent the said reflector and terminating in a spring contact biased against the reflector and with the other end thereof extending into the same end of the switch chamber as the said first conductor and terminating in a second contact spaced slightly from the said first contact whereby the light unit may be removably

secured to a buoy body by means of the retainer ring and when provided with a battery in electrical contact with the said coiled compression spring and said electric lamp illuminates in response to the light unit assuming a position in which the arcuate lens is uppermost.

CLYDE R. CRAVER.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
2,109,813	Winckler	Mar. 1, 1938
2,578,030	Ambrose	Dec. 11, 1951

FOREIGN PATENTS

Number	Country	Date
23,581	Great Britain	1896
238,522	Germany	Sept. 27, 1911