

May 28, 1963

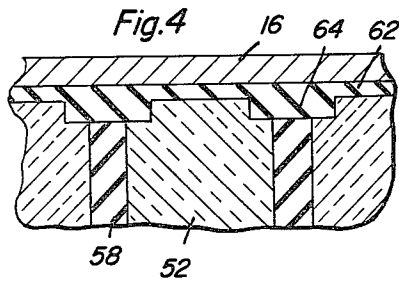
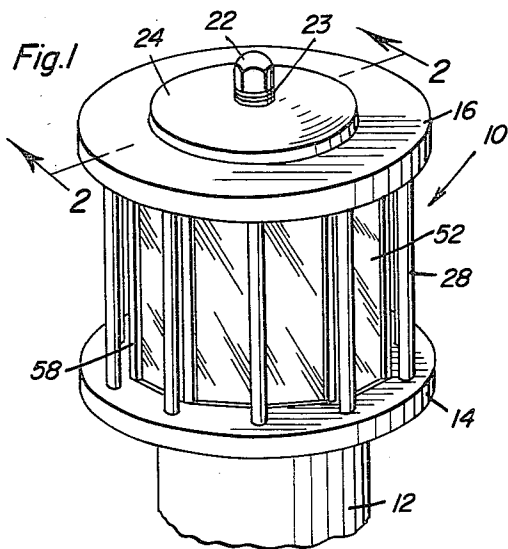
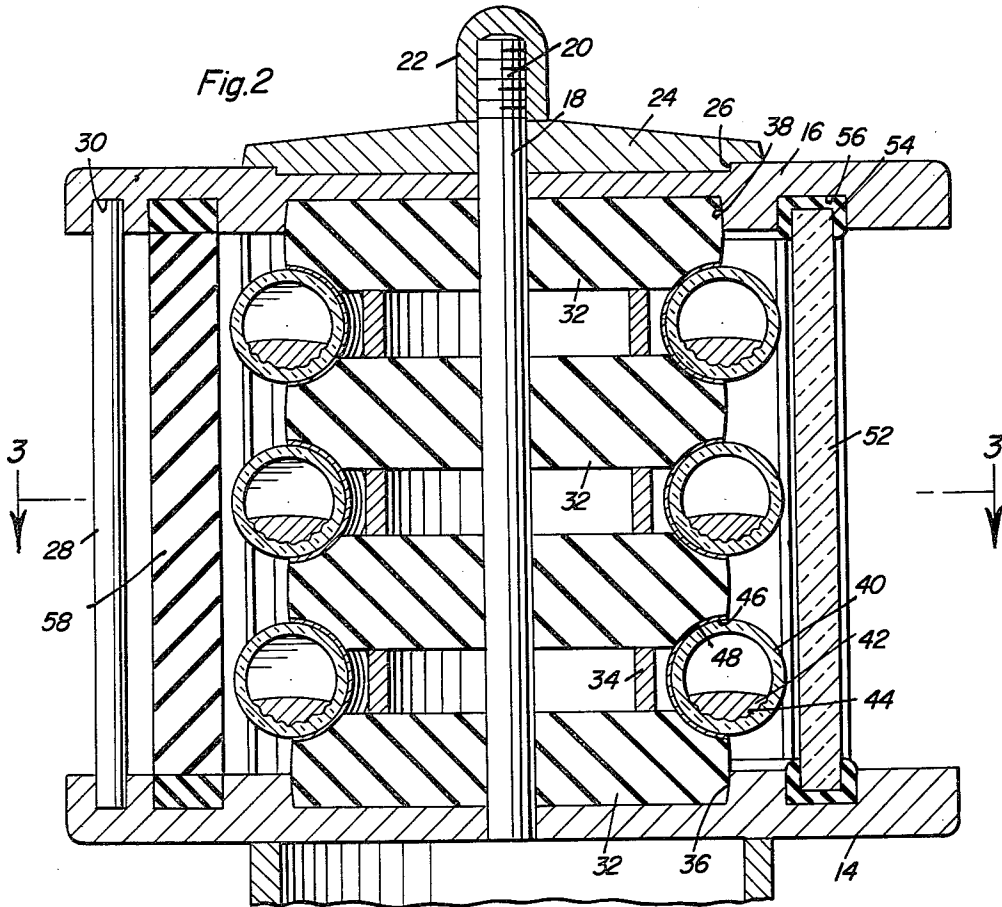
M. F. MURRAY

3,090,977

BUOY

Filed April 13, 1961

2 Sheets-Sheet 1



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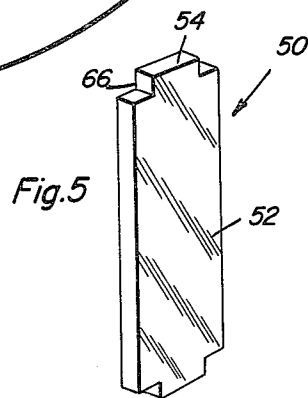
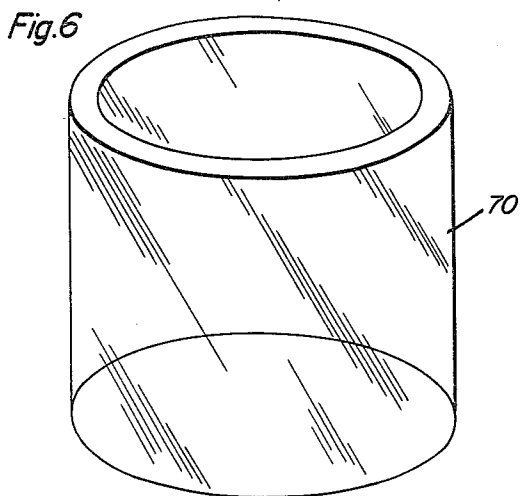
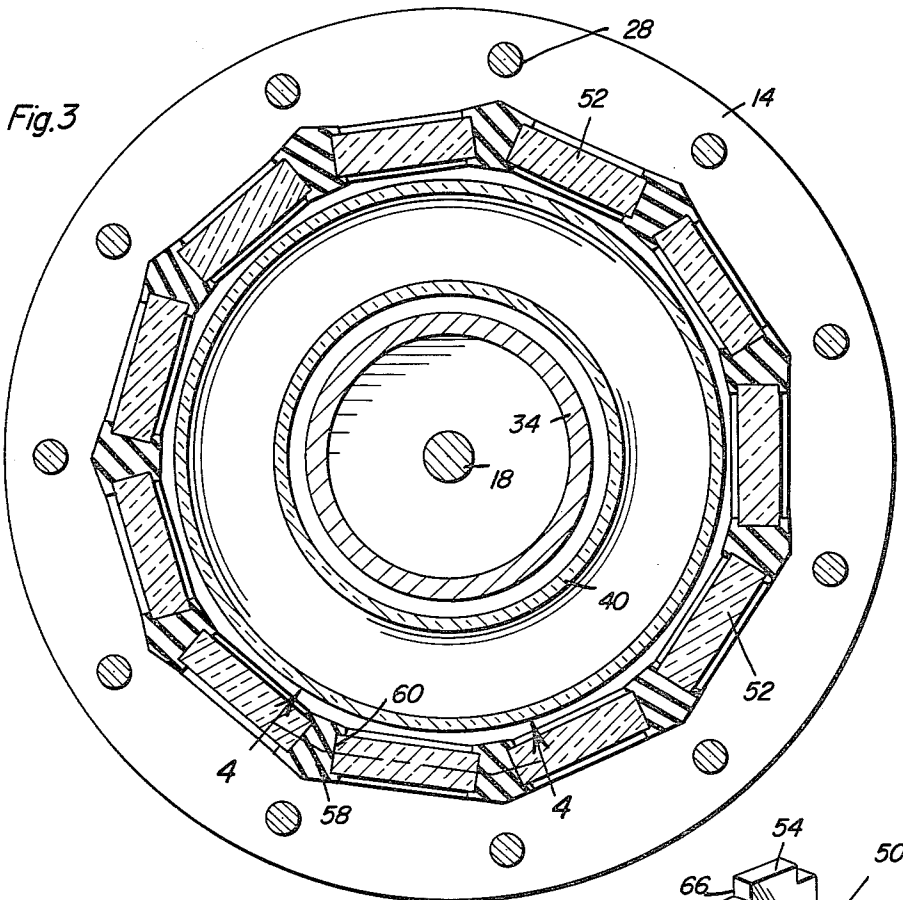
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BUOY

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9 Claims. (Cl. 9—8.3)

The present invention generally relates to a buoy construction and more particularly to such a buoy which is self-illuminable and does not require the use of any exterior source of electrical energy such as batteries and the like normally employed with such buoys.

The primary object of the present invention is to provide a motion luminescent buoy primarily constructed for use as an ocean buoy marker, harbor marker, tide inland waterway marker, navigational inland lakes and river marker and also the structure of the present invention may be employed on navigational ships as an emergency masthead light in case of power failure.

Still another object of the present invention is to provide a buoy having a particular construction which will produce a luminescent red glow generally of a flashing nature which does not require the use of batteries or other source of electrical energy thereby materially reducing the servicing of the buoy since it is only necessary to very infrequently clean the protective lens and also paint or otherwise protect the float which forms an unstable support for the buoy and whose movements produce the red glow in response to the natural movement of the buoy due to movement of the water.

Still another feature of the present invention is to provide a buoy which is quite simple in construction, easy to service and repair, long lasting, and generally inexpensive to manufacture.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a perspective view of the present invention;

FIGURE 2 is a longitudinal, vertical sectional view taken substantially upon a plane passing along section line 2—2, on an enlarged scale, illustrating the structural details of the buoy;

FIGURE 3 is a transverse, sectional view taken substantially upon a plane passing along section line 3—3 of FIGURE 2 illustrating further structural details of the buoy;

FIGURE 4 is a detailed sectional view taken substantially upon a plane passing along section line 4—4 of FIGURE 3 illustrating the manner in which the lens segments are interconnected;

FIGURE 5 is a perspective view of one of the lens segments; and

FIGURE 6 is a perspective view of an alternate type of lens.

Referring now specifically to the drawings, the numeral 10 generally designates the buoy of the present invention which is supported upon a suitable foundation or platform 12 in the form of any suitable type of float which may be anchored in any suitable manner so that it will float in the water with the buoy 10 projecting above the water surface but being subject to variations in position and various movements due to the movement of the water.

The buoy 10 includes a bottom plate or base 14 and a top plate or cover 16 disposed in spaced relation thereto. Rigidly affixed to the base 14 is an elongated centrally disposed rod 18 having the lower end rigidly secured to the base 14 and having a threaded upper end portion 20 receiving a cap nut 22 or any other suitable type of nut. The nut 22 tightens down against an adapter 24 which

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engages the upper surface of the top plate 16. A portion of the top plate 16 is recessed as at 26 receiving a corresponding projection on the adapter plate 24 thus serving to maintain the components in aligned relation.

Interconnecting the peripheral edge portion of the plates 14 and 16 is a plurality of spacer rods 28 having the ends thereof received in blind sockets 30 in the inner surfaces of the base plate 14 and the top plate 16.

Mounted on the central rod 18 is a plurality of circular spacers or cushions 32 which are retained in spaced relation by rigid annular collars 34. The lowermost spacer or cushion 32 is received in a recess 36 in the base plate 14 while the uppermost spacer or cushion 32 is received in a recess 38 in the inner surface of the top plate 16.

Supported by the spacers 32 is a plurality of annular glass members 40 having a hollow circular cross sectional configuration. The annular glass members 40 are generally in the shape of an enlarged doughnut and are constructed of Pyrex glass having a quantity of liquid mercury 42 therein which occupies approximately one-fourth of the volume of the interior of each annular hollow member 40. The bottom portion of the interior surface of each hollow annular member 40 is provided with transverse ribs or corrugations 44 whereby liquid mercury passing over such surface will be thoroughly agitated. The remaining volume of the interior of each annular ring is filled with inert neon gas and agitation of the liquid mercury in the presence of the neon gas will provide an effective red luminescent glow which will flash due to the movement of the liquid mercury.

Each annular member 40 is supported in and received by an arcuate corner notch 46 in adjacent corner edges of the spacer 32. Further, a reflective coating or member 48 is placed on the inner side of the exterior surface of each annular ring 40 for reflecting the red glow outwardly in such a manner that the red glow is magnified.

A lens assembly is provided in surrounding relation to the annular members 40 for maintaining the entire assembly water-tight and maintaining transparency. The lens assembly includes a plurality of lens segments 50 each including a generally rectangular transparent member 52 having a centrally disposed axial rectangular projection 54 on each end thereof. The end edges of the lens segments 50 are received in sockets 56 in the top and bottom walls 16 and 14. Also, the adjacent side edges of the lens segments 50 are received in seal members 58 having channel-shaped grooves 60 formed in each side edge thereof for receiving the edges of the rectangular panels 52.

As illustrated in FIGURE 4, the top and bottom ends of the lens segments 50 are sealingly engaged by a continuous seal member 62 having enlargements or projections 64 which extend down into the notches 66 defined by the axial projections 54. The seals 58 and 62 which are of channel-shaped configuration as illustrated in FIGURE 2 are preferably constructed of neoprene for sealingly engaging the lens segments 50 and the cushions or spacers 52 may be constructed of the same material thereby maintaining the interior of the lens assembly free from contamination by water and enabling the surfaces to be retained in a desired cleaned state or condition.

In lieu of the lens assembly illustrated in FIGURES 1—5, a single cylindrical lens 70 may be employed in which the top and bottom edges would be received in a continuous groove in the top and bottom plates respectively.

By removing the nut 22 and a plurality of washers indicated by numeral 23 positioned thereunder, the adapter plate 24 and top plate 16 may be removed for assembly or disassembly of the structure. Once the structure has been assembled, the particular light producing means for producing a red luminescent flashing light is substantially permanent and needs no service or maintenance. The

lens assembly will protect the annular rings from damage from the exterior while the cushions or spacers 32 effectively cushion the annular members. Of course, the exterior surface of the lens will have to be cleaned infrequently and routine maintenance will require that the float be painted or otherwise serviced depending upon the conditions which it encounters during operation.

The normal agitation of a buoy caused by movement of water in rivers, harbors, lakes, and the ocean produce a luminescent red glow as the liquid mercury passes over the corrugations and is agitated sufficiently that the neon gas and the liquid mercury articles become somewhat intermingled thereby providing a luminescent flashing red glow.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A buoy comprising a top and bottom plate, a lens assembly extending between the top and bottom plate and sealing the space enclosed thereby, and more than one means within said space for producing a luminescent glow in response to agitation caused by normal movement of water, said means being completely independent of any external power source.

2. The structure as defined in claim 1 wherein said last named means includes at least one continuous annular hollow member of transparent glass, a quantity of liquid mercury in said glass, the remainder of the volume of the annular member being filled with neon gas for producing a red glow when intermingled with liquid mercury.

3. The structure as defined in claim 2 wherein said lens assembly includes a cylindrical transparent member encircling the annular member in concentric relation.

4. The combination of claim 2 wherein said lens means includes a plurality of lens segments, neoprene seals engaging the edges of the segments, the end edges of the segments being received in grooves in the top and bottom plates, and sealing material between the ends of the segments and the plates.

5. The combination of claim 1 wherein said last named means includes a plurality of annular hollow glass rings, cushions spacing the rings apart, and reflectors on the inner portion of the exterior surface of the rings for reflecting the luminescent glow outwardly.

6. A buoy comprising a platform carried by a float, a top plate spaced vertically from the platform, a lens assembly disposed intermediate the platform and top plate and sealingly engaging with the platform and top plate, and illumination means enclosed by the lens assembly, said means including a plurality of continuous annular hollow rings of transparent material, and a quantity of neon gas and liquid mercury in each hollow ring for producing a red glow when agitated.

7. The combination of claim 6 wherein the bottom portion of the interior surface of each ring is provided with corrugations for agitating the liquid mercury during movement of the buoy.

8. A buoy comprising a watertight body forming a compartment therein and a self-illuminating means rigidly disposed within said compartment, said body including a top and bottom plate, a lens assembly disposed intermediate said plates and sealingly engaging therewith, and a central rod rigidly fixed to and extending from the bottom plate through said compartment and top plate and ending in a receiving cap whereby said plates and lens assembly are held in fixed engagement.

9. A buoy comprising a watertight body forming a compartment therein and a self-illuminating means rigidly disposed within said compartment, said self-illuminating means comprising a plurality of continuous annular hollow rings of transparent material, each said hollow ring containing therein a quantity of neon gas and liquid mercury for producing a red glow when agitated.

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