Sept. 10, 1963 P. L. GAGNON 3,103,199

WEIGHTING DEVICE

Filed March 30, 1961

FIG.1.

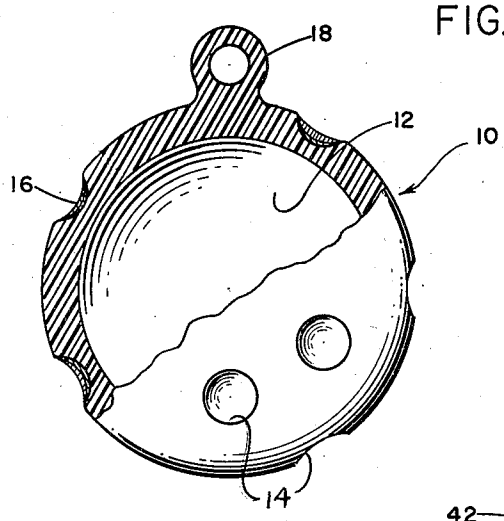
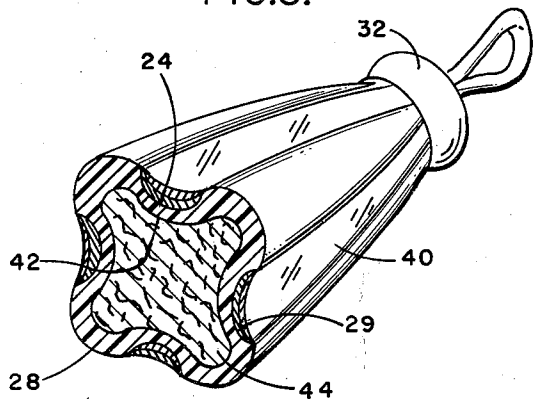


FIG.3.



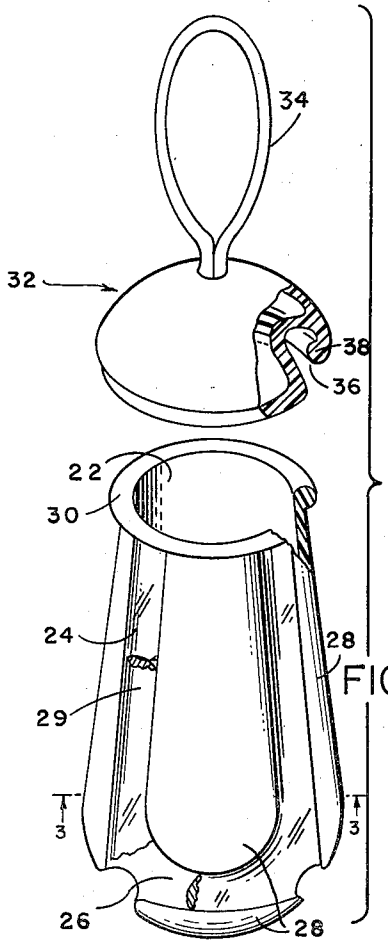


FIG.2.

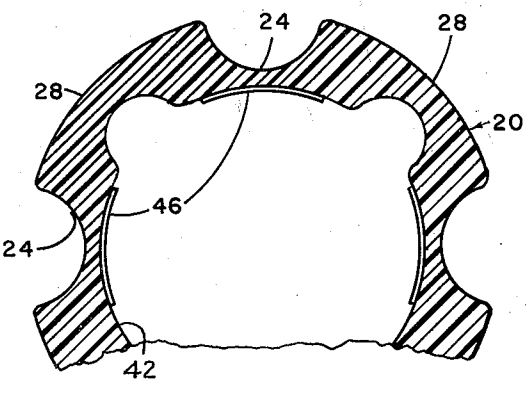


FIG.4.

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WEIGHTING DEVICE

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14 Claims. (Cl. 114—221)

My invention relates to a weighting device for a messenger or heaving line. More particularly, my invention relates to a weighting device for a heaving line which device can readily be seen in the dark.

For many years it has been the standard practice in the marine industry including all merchant ships, tugs, barges and other such vessels to employ some type of weight on the end of a heaving line in order to help transport the line in the desired direction and the proper distance when such line is heaved. Such a weighting device, generally comprising a metal ball wrapped with rope and spliced to the end of a heaving line, is commonly called a monkey fist. While the industry has been aware of the safety hazards involved in employing a monkey fist, previously there has been no satisfactory alternative suggested. As will be evident, it is extremely hazardous to employ such a heaving line when mooring during the hours of darkness and in fact many people employed in the marine industry have been severely injured when they have been hit by a monkey fist. In addition to the safety hazards to personnel, due to the very nature of monkey fists, the loss due to property damage, such as broken windows, has also been high.

A secondary problem relating to personnel hazards during the hours of darkness aside from being hit directly by a monkey fist occurs when the heaving line is thrown in a direction away from the man receiving the line thus requiring him to grope with his hands in the dark in order to find the line.

It is an object of my invention to provide a weighting device for heaving lines which can be readily seen in the dark.

It is another object of my invention to provide a weighting device for heaving lines which is composed of a material having resilient properties which will not readily injure personnel or damage property.

These and other objects of my invention will become evident from the description which follows.

Briefly the weighting device of my invention comprises a generally hollow, rounded, closed, buoyant body having indentations in the surface thereof. Phosphorescent or luminous material is placed in the surface indentations and such indentations containing the phosphorescent or luminous material are provided in sufficient number and disposed about the surface of the body such that the phosphorescent or luminous material is visible when the weighting device is viewed from any direction. This device, as just described, is also provided with a means, such as an eye, for attaching a line to the weighting device.

Advantageously, in order to protect the phosphorescent or luminous material from sea water, it can be applied to the surface indentations and then covered with a transparent protective coating. Alternatively, the phosphorescent material can be applied to the interior of the hollow body member provided the portions of the hollow body member defining the indentations or grooves is composed of translucent material. In another embodiment, the phosphorescent material can be disposed in preformed passageways composed of translucent material, the outer surfaces of which define the inner surfaces of the grooves or indentations. The purpose of the indentations is twofold. First, the indentations provide a

relatively protected location in which to place the phosphorescent material on the surface of my weighting device so that such phosphorescent material will not be worn away by the normal handling and abrasion to which my device is subject. Second, in the embodiments of my invention in which the phosphorescent material is covered with a transparent or translucent coating, the phosphorescent material is applied to the interior of the body member or disposed in preformed transparent or translucent passageways, the transparent or translucent portions of the body member overlying the phosphorescent material are protected from abrasion which would mar such surfaces.

The body member of my device can be fabricated from any suitable material such as wood, rubber or plastic or a combination of such materials. Preferably, the body member of my device is fabricated from a soft, resilient resin material such as poly-butadiene, butadiene-styrene copolymers and polyamide resins. Particularly advantageous materials which can be employed include polyethylene and polypropylene.

The body member of my device can be constructed such that the exterior surface of the body member is divided by the indentations into raised lands and depressed grooves in which the lands comprise a major portion of the exterior surface of the body member. Alternatively, the construction can be such that the grooves comprise a major portion of the exterior surface of the body member. The grooves can also be interconnected so as to provide one continuous groove in the exterior surface of the body member.

The eye means for attaching a heaving line to the device of my invention can be an integral part of the body member. Thus, when the body member is fabricated from a resin material the eye means can be molded along with the body member. The eye means can also be a separate member bonded to the body member or attached by mechanical means such as a pin or socket or by being screwed into the body member.

The weighting device can also be constructed such that an opening is provided in one end of the body member permitting access to the interior of the body but such opening must be provided with a closure means for sealing the opening. In a particularly advantageous embodiment of my invention the closure means for sealing the opening and the eye means for attaching a heaving line are integrally associated in the same element.

When the device of my invention is provided with an opening as just described, the interior of the hollow body member can be filled with a solid porous material having a density of less than about 0.5. As will be understood when the device of my invention is of such weight and volume that it will float in water the total weight of the device can be increased by adding such solid porous material without substantially affecting the buoyant quality as a whole. Illustrative of the type of solid porous material with which the hollow body member can be wholly or partially filled are kapok, polyurethane foam and foam rubbers.

The member comprising the closure means can be composed of any material adaptable to the particular closing or sealing method which will be obvious to those skilled in the art. Thus, for example, it can be composed of the same type of soft resilient material as the hollow body itself and sealed in place by any of the well known water-insoluble organic bonding agents. Such member can also be composed of a more rigid material such as polystyrene when it is held in sealing relation with said opening by "snap on" means. It is desirable however to employ a material of substantial rigidity and strength in this member when such member includes both the closure means and the eye means for attaching a line.

The phosphorescent or luminous material employed in the device of my invention can be any of the well known compounds which exhibit the property of luminescence after removal of the exciting agent. Preferably, such compounds are of the type exhibiting the property of photo-luminescence or radio-luminescence. Particularly advantageous compounds are those exhibiting the property of photo-luminescence including sulfides of calcium, barium, zinc and strontium either alone or with a radioactive substance or with an activator, such as strontium sulfide activated with bismuth. Other such compounds include the silicates of zinc, calcium and cadmium activated with manganese, zinc silicate activated with bismuth and a small quantity of arsenic (As_2O_5), cadmium borate activated with manganese, and tricalcium orthophosphate-calcium fluoride activated with antimony and manganese. Such compounds as mentioned above can be employed alone or can be in the form of a paint which is applied to the body member of the device of my invention.

The overall weight of the device of my invention is generally in the range of about 8 to 10 ounces. Thus, a device according to my invention provides an adequate concentration of weight at the end of a heaving line in order to control the direction and distance of the line when heaved and yet is sufficiently resilient and soft to prevent injury and damage and is of great enough volume for its weight that it will float.

To illustrate more fully the device of my invention reference is made to the attached drawing in which:

FIGURE 1 is a partially sectioned view of an embodiment of the device of my invention.

FIGURE 2 is an exploded perspective view of another embodiment of my invention.

FIGURE 3 is a perspective view of the embodiment illustrated in FIGURE 2 showing the section taken along the line 3—3 of FIGURE 2.

FIGURE 4 is a fragmentary, enlarged, sectional view of a device similar to that of FIGURES 2 and 3 showing an alternate embodiment thereof.

FIGURE 1 shows a generally spherical body member **10** composed of a soft resilient material such as polyethylene and enclosing an interior chamber **12**. In the exterior surface of body member **10** are located a plurality of quasi spherical indentations **14**. In each of the indentations **14** is deposited a quantity of phosphorescent or luminous material **16**, such as phosphorescent paint containing a sulfide of calcium, barium or zinc. Also shown is a plastic eye bolt **18** affixed to body member **10** at the upper end thereof.

In FIGURE 2 is shown a hollow body member **20** having an opening **22** in the upper end thereof. In the exterior surface of body member **20** are a plurality of vertically disposed indentations or grooves **24**. Located on the exterior surface of hollow body member **20** near the lower end thereof is a horizontally disposed indentation or groove **26**, which interconnects with vertical grooves **24**. The grooves **24** and **26** thus define a plurality of lands **28** on the exterior surface of body member **20**. A quantity of phosphorescent or luminous material **29**, such as a phosphorescent paint, is deposited in the grooves **24** and **26**.

At the upper end of body member **20** and positioned about opening **22** is an annular bead **30**. Also shown in FIGURE 2 is sealing member **32** having a loop or eye member **34** attached at the upper surface of sealing member **32**. As can be seen from the partially sectioned portion of sealing member **32**, the under surface thereof is provided with an annular groove **36** disposed adjacent the periphery of sealing member **32**. The outer surface of annular groove **36** is provided with an inwardly extending annular bead **38**. Thus it will be understood that when it is desired to seal the opening **22** in body member **20** with sealing member **32**, the portion of the bottom surface of sealing member **32** enclosed within annular groove **36** will be received in opening **22** while the annular bead **30** will be received in annular groove **36** and held therein by annular bead **38**.

Referring now to FIGURE 3 it can be seen that sealing member **32** is positioned in opening **22** in the manner in which this embodiment of my invention will normally be employed. As shown in this figure, the phosphorescent material **29** is disposed within vertical grooves **24** and is sealed therein by means of transparent film **40**. The transparent film **40** can be applied as a strip and bonded to the body member **20** by any of the methods well known in the art. Alternatively, the transparent film **40** can be applied by spraying after the phosphorescent material **29** has been deposited in the grooves **24** and **26**. In spraying on the film it may be necessary to apply several coatings in order to build up a transparent film **40** of sufficient thickness. It is also possible to bond a strip of transparent film **40** in place over the grooves **24** and **26** leaving a space between the transparent film **40** and the bottom of the grooves **24** and **26** thereby defining a plurality of passageways or one continuous passageway within body member **20**. These passageways can then be filled with the phosphorescent material **29**. In any event all that is necessary is to provide a transparent film **40** that will hold the phosphorescent material **29** in place and at the same time protect it from contact with injurious materials, e.g. salt water.

As illustrated in this FIGURE 3 the lands **28** are of such shape and disposition with relation to grooves **24** that when resting or in contact with a flat surface only the lands **28** are in contact with the surface while the grooves **24** are removed therefrom thus keeping the phosphorescent material in a relatively protected position. It will be understood that the lands **28** are also disposed so as to afford similar protection to groove **26**. As can be seen by referring to the portion of body member **20** shown in section, the interior chamber **42** is filled with a solid porous material **44** such as those mentioned previously.

FIGURE 4 shows an embodiment of my invention in which the body member **20** has the same general configuration as in FIGURES 2 and 3 including grooves **24** and lands **28**. In this particular embodiment of my invention, however, it is required that the portions of body member **20** underlying the grooves **24** and **26** be composed of a transparent or translucent material. For ease of construction the entire body member **20** can be composed of such transparent or translucent material as illustrated in this figure. As mentioned above, the lands **28** are so shaped and disposed that they absorb all of the abrasion to which the device of my invention is subject. It will be evident, therefore, that while the entire body member **20** may be initially transparent or translucent surface scratches on the lands **28** will soon render them opaque. Thus, it is economically advantageous to provide a coating of phosphorescent material **46** only on the portions of interior chamber **42** which underlies the grooves **24** and **26**. The coating of phosphorescent material **46** is shown underlying the grooves **24** in this figure.

In addition to the phosphorescent material employed to improve the visibility of my weighting device during the hours of darkness, those portions of the body member other than the indentations or grooves can be brightly colored so as to improve the visibility of my weighting device during daylight hours. Thus, in the embodiment of my invention illustrated in FIGURES 2 and 3, the portions of the body member **20** comprising lands **28** can be of a suitable bright color such as red or orange.

I claim:

1. A weighting device for a heaving line which device includes an elongated, generally rounded, hollow, closed, resilient buoyant body member, said body member having means defining a plurality of indentations along the exterior surface of said body member thereby dividing said exterior surface of said body member into raised lands and depressed grooves, the portions of said body member

defining said grooves being translucent, the interior surface of said body member underlying said grooves being coated with a phosphorescent material, said grooves being sufficient in number and positioned such that the phosphorescent material is visible when the weighting device is viewed from any direction, and eye means for attaching a line to said device.

2. The device of claim 1 in which said hollow body member includes an opening in one end thereof providing communication between the interior and exterior of said body member and in which said eye means for attaching a line includes closure means positioned to seal said opening.

3. The device of claim 2 in which said hollow body member is filled with a solid porous material having a density of less than about 0.5.

4. The device of claim 1 in which said lands comprise a major portion of said exterior surface of said body member and said grooves comprise a minor portion of said exterior surface of said body member.

5. The device of claim 1 in which said lands comprise a minor portion of said exterior surface of said body member and said grooves comprise a major portion of said exterior surface of said body member.

6. The device of claim 4 in which said grooves are interconnected.

7. The device of claim 5 in which said grooves are interconnected.

8. A weighting device for a heaving line which device includes an elongated, generally rounded, hollow, closed, resilient buoyant body member, said body member having means defining a plurality of indentations along the exterior surface of said body member thereby dividing said exterior surface of said body member into raised lands and depressed grooves, translucent means disposed completely within said indentations and spaced intermediate the top and bottom of said grooves thereby defining a

plurality of passageways between said translucent means and the bottom of said grooves, said passageways having phosphorescent material disposed therein, said grooves and passageways being sufficient in number and positioned such that the phosphorescent material is visible when the weighting device is viewed from any direction, and eye means for attaching a line to said device.

9. The device of claim 8 in which said hollow body member includes an opening in one end thereof providing communication between the interior and exterior of said body member and in which said eye means for attaching a line includes closure means positioned to seal said opening.

10. The device of claim 9 in which said hollow body member is filled with a solid porous material having a density of less than about 0.5.

11. The device of claim 8 in which said lands comprise a major portion of said exterior surface of said body member and said grooves comprise a minor portion of said exterior surface of said body member.

12. The device of claim 8 in which said lands comprise a minor portion of said exterior surface of said body member and said grooves comprise a major portion of said exterior surface of said body member.

13. The device of claim 11 in which said grooves and said passageways are interconnected.

14. The device of claim 12 in which said grooves and said passageways are interconnected.

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