United States Patent

Worobel

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[54] **MARKING BUOY**

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[52] **U.S. Cl.** .....**9/8.3 E**

[51] **Int. Cl.** **B63b 51/02**

[58] **Field of Search**.....98/8, 8.3; 204/2 C

[56] **References Cited**

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[57] **ABSTRACT**

The disclosed buoy is lightweight and portable and comprises an elongate tubular body of tough but resilient plastic material which is partially filled with light porous plastic material, the bottom end having a detachable connection with a receptacle which may be filled with sand or other ballast material, the open top end of the body carrying signaling means, such as a photoelectrically-controlled flashing light which is operated by a replaceable electric battery contained within the body of the buoy, there being means whereby the buoy may be attached to a boom for controlling oil spillage for instance or to an anchor.

1 Claim, 2 Drawing Figures

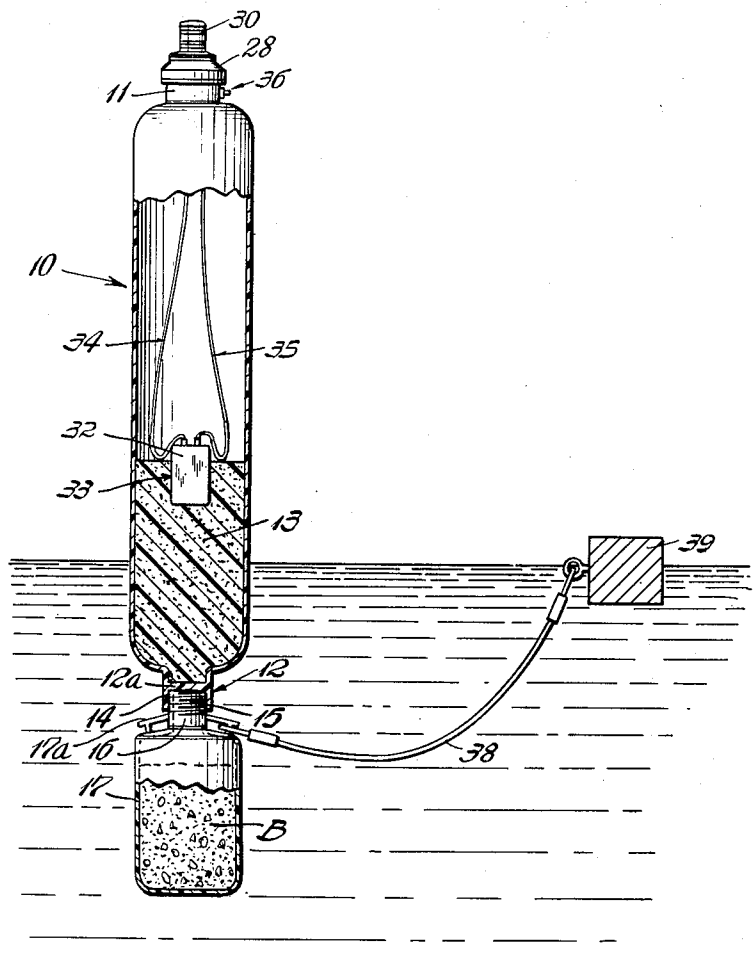


Fig. 1

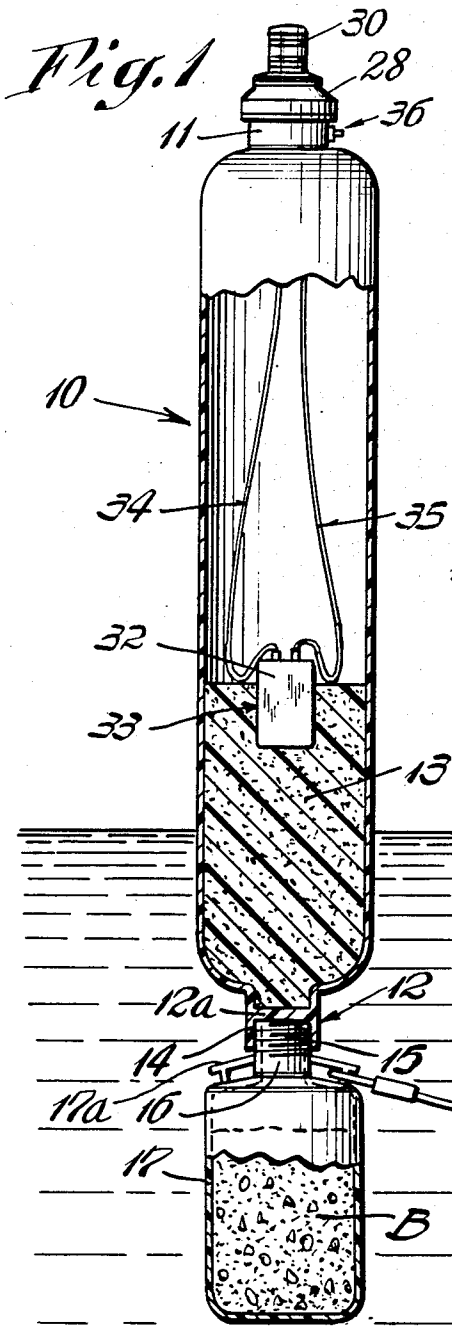
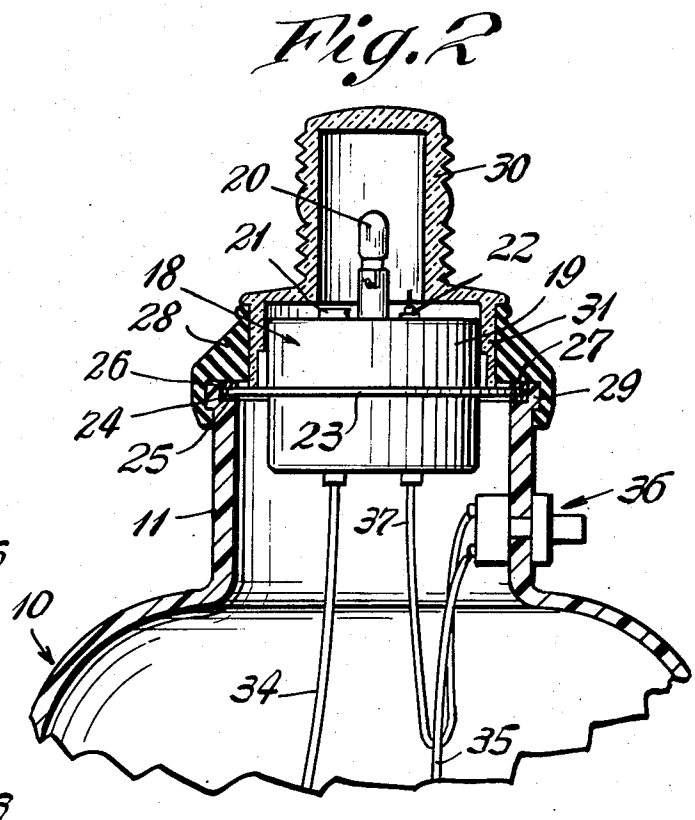
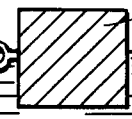


Fig. 2





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MARKING BUOY

This invention relates to navigation and obstruction buoys, and more particularly to marking buoys adapted for temporary or emergency use.

Such marking buoys, it has been found, are necessary in the vicinity of marine operations, particularly in the case of oil spillage in which barrier booms are placed in the water to confine the oil thereon to a limited area from which the oil, or at least some of it, may be removed. Very little of such barrier booms projects above the water level, and therefore they are difficult to see even in daylight and invisible at night. Therefore, the presence and position of such obstructions must be marked off to avoid collision with, and damage to, the booms and any vessels in collision with them.

The marking buoys heretofore available for such use were large, heavy and bulky, and hence difficult to transport and handle, and particularly difficult to set out in a small boat and in tight surroundings. Besides, the available buoys were very expensive.

An object of this invention is to provide a marking buoy which is tall enough to be easily seen and yet light in weight and easily transported whereby it may be quickly and easily placed where needed with the use of a small boat if necessary, and hence may be advantageously employed,particularly in exigencies or temporary emergency situations.

Another object of this invention is to provide such a marking buoy with a simple and inexpensive battery-operated flashing light controlled by a photoelectric cell.

Another object is to provide a marking buoy which is capable of withstanding damage to itself from collision with other objects or damaging other objects.

Still another and equally important object of this invention is to provide a serviceable marking buoy which is inexpensive compared with buoys of this general type heretofore produced.

These and other objects and advantages of the present invention are accomplished by providing an elongate tubular body of hard but somewhat yieldable plastic material which has in its open top end a photoelectrically-controlled flashlight unit and on its bottom end a lightweight detachable receptacle or container for ballast material. This container, which is also made of plastic material, is detachable and may be transported empty to be filled on location with sand, stones or any heavy material and reattached to the body before the latter is installed, thereby avoiding the necessity of transporting the ballast material. Means are also provided for conveniently attaching a mooring line to the buoy,preferably to the ballast container, so that it may be attached to a boom or to an anchor depending on whether the buoy is to be used as an obstruction buoy or as an aid to navigation.

The marking buoy of the present invention, being light in weight and relatively small, may be handled by one able-bodied man and several may be carried in relatively small boats. For instance, a marking buoy of the present invention, having a wall thickness of about 0.125 inch, a diameter of about 9 inches and an overall height of 64 inches and having a weight of 11½ lbs., exclusive of ballast, which may be carried separately in its container, has been found convenient and satisfactory for the purpose intended.

Other features and advantages will hereinafter appear.

In the accompanying drawings which illustrate one form of this invention, that at present preferred:

FIG. 1 is a view of the buoy of the present invention, portions being shown in section, and illustrating the menner in which the buoy may be attached to a float.

FIG. 2 is a sectional view of the upper end of the buoy showing the light means.

As shown in the accompanying drawings, the marking buoy of the present invention comprises an elongate tubular body **10** which preferably has reduced neck portions **11** and **12** at the top and bottom ends respectively.

In the broader aspects of this invention, the body **10** may be made of aluminum or other lightweight metals; but at the present time it is preferable to make the body of hard plastic material, such as ABS plastic, which is lightweight and yet sufficiently yieldable to avoid being damaged when struck by anything, such as a boat, and to avoid damaging the boat or other object with which it may collide.

To reenforce the tubular body against such damage, the interior of the tubular body **10** is partially filled with a mass of plastic foam material **13**, such as urethane, which will resist the collapsing of the tubular body when it is severely struck by an object. The foam material **13** is introduced into the body through the open neck portion **11**, and is preferably poured into the body as a liquid and molded in situ in the body to unite with or become adhered to the inside wall of the body.

The neck **12** at the bottom of the body **10** has detachable connection means such as screw threads **14** to receive threads **15** on the neck **16** of a container **17** which preferably, considering storage and shipping problems, is of substantially the same diameter as or less than that of the body. Above the threaded portion, the neck **12** may have a partition **12a** to act as a stopper for the contents of the body **10** and the container **17**.

The container **17** preferably is empty as shipped and stored for use. When the buoy is to be used, the container may be unscrewed from the body **10** and filled with sand or other ballast material **B**, such as stones, gravel, etc. obtained in the vicinity of the place where the marking buoy is to be used or from which the buoy is to be transported for immediate use.

With the container **17** loaded with ballast material and attached to it, the body **10**, when placed in the water, had a substantial part of it, say two-thirds of its length, projecting above the level of the water, so that it may be clearly observed by an approaching craft. The body of the buoy may be painted or otherwise provided with luminous material to improve its visibility in the darkness; and, to attract attention to it or identify the buoy at night, there is provided, according to the present invention, on the open end **11** of the body, a light unit **18** comprising a body **19**, a lamp **20**, a light-sensitive device **21**, and a flash control **22**.

The body **19** has a flange **23**, the marginal edge of which rests on a resilient washer **24** which in turn rests on a shoulder **25** in the neck **11**. A washer **26** rests on the upper surface of the flange **23** and is engaged by a shoulder **27** on a cap **28**. The cap **28** is made of resilient material, such as soft rubber or rubber-like material, so that when it is applied to the neck **11** it will stretch and snap over a flange **29** on the neck and thus attach itself to the neck and hold the light unit **18** in place thereon.

Supported on the body 19 is a lens 30 of translucent material, which may be of any desired or authorized color, which surrounds the lamp 20. The lens 30 has a sleeve 31 which has a force-fit within the resilient cap 28 so that it may be removed by hand with some little effort when it is desired to replace the lamp 20 or adjust the flasher control lever 22. The lens 30 may be cylindrical and may be a Fresnel type lens.

The light unit 18 is energized by an electric battery 32 which, in the form of the invention herein illustrated, is supported in a pocket 33 molded in the foam material 13. The battery 32 is connected to the light unit 18 by a wire 34 and by a wire 35 to an on-and-off switch 36 which is connected to the light unit 18 by a wire 37.

To replace the battery, it is merely necessary to remove the cap 28 and light unit 18 from the top of the neck 11, pull the used battery out of the pocket 33 and through the neck 11 by the wire 34, disconnect the used battery from the wires 34 and 35, connect the new battery thereto, drop the battery into the pocket 33 and replace the light unit and cap.

In the broader aspects of this invention, the buoy may be anchored or secured in desired position in any suitable manner. However, it is preferable to provide the ballast container 17 with loops 17a to which may be secured a mooring line 38 which may be attached to a

suitable structure, for instance a boom 39.

Variations and modifications may be made within the scope of the claims and portions of the improvements may be used without others.

I claim:

1. A marking buoy comprising a unitary easily portable elongate hollow cylindrical body formed of tough, flexible lightweight plastic material having a closed bottom neck portion and an open top neck portion; a ballast container formed of tough lightweight plastic material having a neck portion having an opening through which ballast material may pass to load and unload the ballast container; screw-threaded means for detachably connecting the open end of the ballast container to the bottom neck portion of the body and thereby retain said ballast material in said container; cushion means partially filling the lower portion of the body and comprising porous plastic material molded in situ in said body and adhered thereto; closure means; screw-threaded means for detachably mounting said closure means on the open top neck portion of the body to close the same, said closure means including electric warning signal means; and a battery mounted within the body and supported in a pocket in said cushion means to energize said signal means.

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