Sept. 15, 1959 Z. H. WRIGHT, JR 2,903,718

AUTOMATIC MARKER BUOY

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Fig. 1

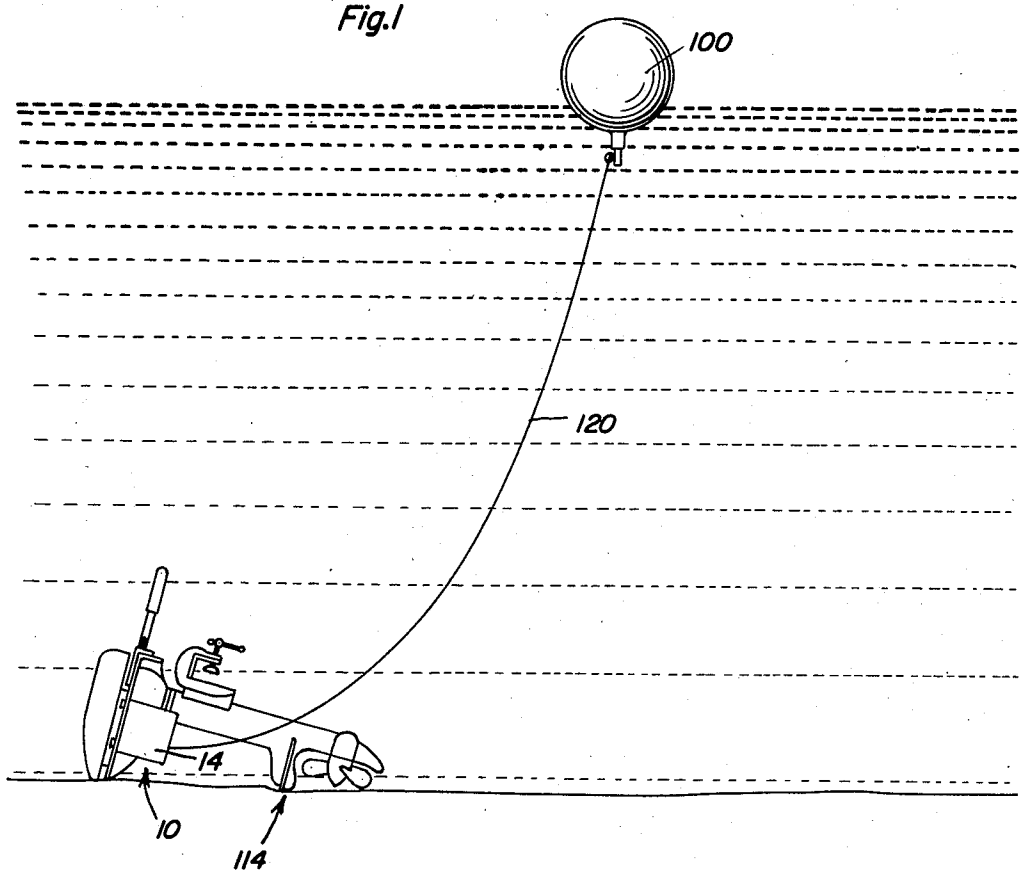
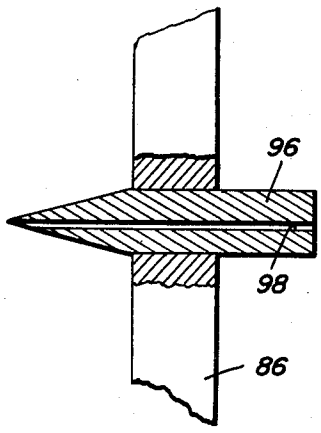


Fig. 5



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Fig. 2

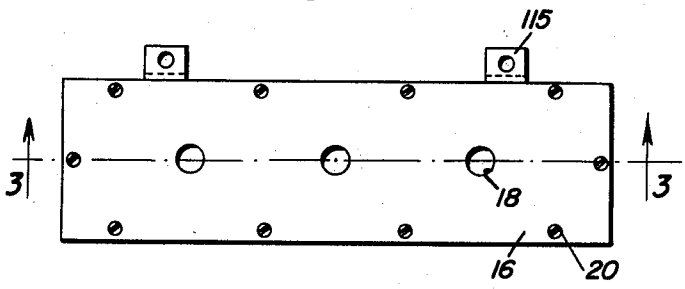


Fig. 4

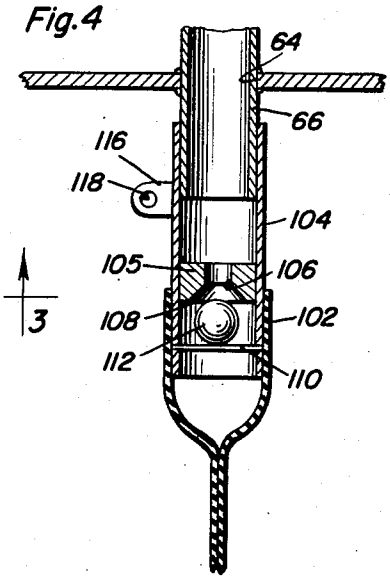
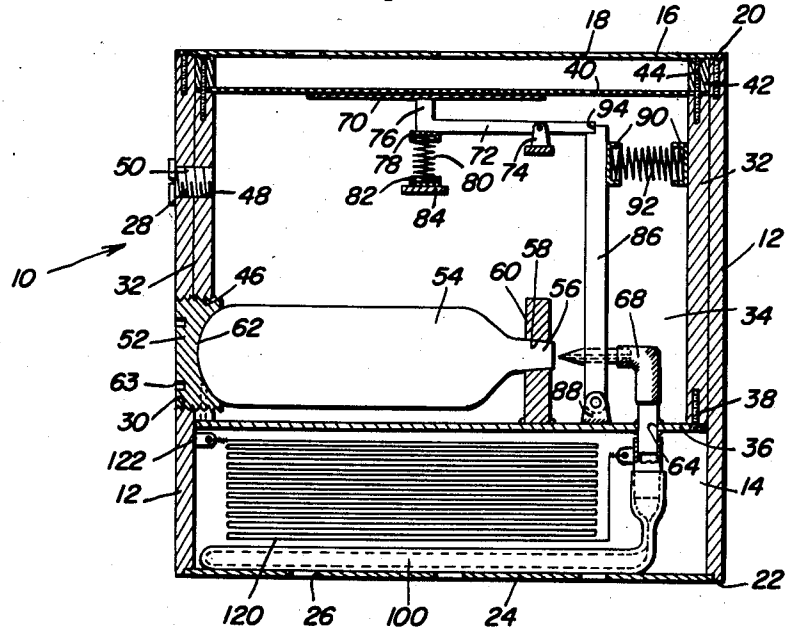


Fig. 3



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AUTOMATIC MARKER BUOY

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2 Claims. (Cl. 9—9)

This invention relates generally to buoys for detecting the presence of submerged articles, and more particularly to an automatic inflatable marker buoy.

It has often been a problem when going boating with an outboard motor boat, to retrieve an outboard motor if per chance it happens to fall or be pulled from the transom of the boat and drop into the water. This is liable to occur when the outboard motor is detachably fastened to the transom of a boat as by clamping screws and a very sharp turn is made when the boat is going at a substantially high rate of speed. This has the effect of pulling the motor at an angle on the transom and eventually disengaging it therefrom. Therefore, it is the primary object of this invention to provide an automatic marker buoy which may be attached to outboard motors to provide a floating marker buoy which will aid in the locating of submerged motors.

Another object of this invention is to provide a device of the character described wherein the water pressure will act on this apparatus and cause the automatic inflating of the buoy, with the eventual release of the buoy from the apparatus so that it may float.

A further object of this invention is to provide a device of the character described wherein the pressure at which the automatic inflating will take place may be varied, so that it may be predetermined at which depth the inflating of the buoy will initiate.

Yet a further object of this invention is to provide a simple and inexpensive device yet one which is exceedingly effective for the purpose for which it is designed.

This invention contemplates the use of a housing having a waterproof casing located therein. One wall of the casing is a diaphragm which will be urged inwardly by the pressure of water acting thereon when the housing is submerged. A container of compressed gas is located within the casing, and a hollow spike is aligned therewith, and engaged within a flexible tube which leads exteriorly of the casing. A mechanism is provided for forcing the spike to puncture the container when the diaphragm has been depressed a predetermined amount. Gas escaping from the container will flow through the spike and into the tube, and thence into a deflated buoy which is detachably affixed to the tube. A strand is connected between the housing and the buoy. The buoy is disposed within the housing, and a detachable door encloses the same. However, the door is loosely mounted so that upon inflation of the buoy, the door will be removed from the housing, and when the air pressure within the buoy is sufficient to remove the buoy from the tube, the buoy will float to the surface and act as a marker for the submerged outboard motor, or any other article to which this apparatus is connected.

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 an elevational view of a submerged outboard motor having the present invention attached thereto, and illustrating the marker buoy floating on the surface and attached by a strand to the motor;

Figure 2 is an elevational plan view of the housing within which the buoy is located;

Figure 3 is a vertical sectional view taken substantially along the plane defined by reference line 3—3 of Figure 2, illustrating details of construction thereof;

Figure 4 is an enlarged vertical sectional view of the buoy check valve, a portion of the buoy, and a portion of the tube; and

Figure 5 is a partial sectional view of the hollow spike used in conjunction with the present invention to puncture the compressed gas container.

Referring now more specifically to the drawings, the numeral 10 generally designates the housing which is to enclose the present invention. The housing is constructed of end walls 12 and side walls 14, which are connected together to form a substantially rectangular enclosure. A top 16 having a plurality of apertures 18 formed therein, is connected to the upper edges of end walls 12 and side walls 14, by bolts 20 which pass through openings in top 16 and are threaded into blind threaded bores formed in the upper edges of the side and end walls 14 and 12 respectively. The bottom inner edges of the side and end walls are grooved as at 22, to accommodate a bottom 24 having apertures 26 formed therein. This bottom 24 is not fastened to the walls in any other manner, and it is only the fit between the bottom 24 and the grooves 22 which hold this bottom in place. One of the end walls 12, has a threaded aperture 28 formed therein, and located therebelow is a second and larger threaded opening 30 formed therein.

A waterproof casing is located within the housing and this casing is constructed of end walls 32 and side walls 34 sealed together at the edges so as to prevent the entry of water thereinto. This casing is of the same shape as housing 10, but of slightly smaller dimensions. A bottom 36 is fixed to the bottom edges of the casing walls 32 and 34, as by bolts 38. A diaphragm 40 is fixed to the upper edges of the casing walls, and secured thereto by plates 42 which are disposed peripherally about the edges of the diaphragm 40, and located between housing top 16, and the diaphragm, and in alignment with the casing walls 32 and 34. Bolts 44 are passed vertically through these plates 42, and extend through diaphragm 40 and into the upper edges of casing walls 32 and 34. In casing end wall 32 which underlies the housing end wall 12 having the opening 30 therein, is formed a large threaded opening 46 in alignment with opening 30. Located thereabove and slightly smaller is a threaded aperture 48 which is in alignment with threaded aperture 28. A bolt 50 is threaded into the aligned apertures 28 and 48, so as to lock the housing and the casing together. A plug 52 is threaded into the aligned openings 30 and 46, and is used for a purpose which will be explained below. However, it is to be noted that this plug also serves to lock the casing and housing together.

Interiorly of the casing is mounted a compressed gas container 54 having a neck 56, which is disposed in an opening 58 in bracket 60 provided for the purpose and projecting upwardly from casing bottom 36. The rear or bottom of the container 54, is engaged in a recess 62 provided interiorly of plug 52, so that the container 54 is firmly positioned within the casing. It is to be noted that special openings 63 are provided in plug 52, so that the plug 52 may be unthreaded and removed when desired. Thus, the compressed gas container 54 may be replaced and access may be gained to the interior of the casing whenever desired. A vertical opening 64 is formed in bottom 36 on the opposite side of the casing from the plug 52. In this opening 64 is engaged and firmly seated a vertical hollow tube 66, which extends from the interior of the casing to the exterior. A flexible elbow 68 is locked to the tube 66 interiorly of the casing.

A thin flat plate 70 is disposed within the casing and directly underlies and is secured to the diaphragm 40,

An L-shaped lever 72 pivoted to bracket 74 has its short leg 76 in contact with the plate 70. Bracket 74 is mounted to casing side wall 34. A spring seat 78 is fixed to the bottom of short leg 76, and a spring 80 seated therein. The free end of spring 80 is disposed within another spring seat 82, mounted on a bracket 84 which is in turn fixed to casing wall 34. It may thus be seen that because of spring 80 urging the short leg 76 upwardly, the plate 70 and thus the diaphragm 40 is forced to a position outwardly of the casing. A vertical lever 86 is pivoted to bracket 88 which is disposed on bottom 36. The upper end of the lever has a spring seat 90, affixed to it and another spring seat 90 in alignment therewith is affixed to the inner surface of casing end wall 32. A spring 92 is located therebetween, so as to constantly urge the vertical lever 86 to the left as viewed in Figure 3. The upper portion of vertical lever 86 has a notch 94 formed therein, into which the end of lever 72 fits, so that while the spring 92 urges vertical lever 86 to the left, it is retained from movement to the left because of being engaged with lever 72. It will be realized, however, that upon depression of the diaphragm 40, against spring 80, the lever 72 will tilt about its pivotal axis, and the end engaging notch 94 will move upwardly, thus releasing the lever 86 and allowing the spring 92 to move lever 86 to the left.

A spike 96 having an off center bore 98 formed horizontally therethrough, is attached to the lower end of vertical lever 86, in alignment with container neck 56, and elbow 68. In fact, the rear portion of spike 96 is telescopically engaged within the flexible elbow 68. Thus, upon movement of the lever in the previously mentioned direction, the spike 96 will be engaged in the container 56, and compressed gas therein may flow out of the container through bore 98, through elbow 68, and out of the casing through tube 66.

A deflated balloon like buoy 100 is disposed within the housing between casing bottom 36 and housing bottom 24. The mouth 102 of this buoy is disposed about a tube 104 and firmly affixed thereto. This tube 104 is of slightly larger dimensions than tube 66, and is encircled thereabout. A reinforced circular portion 105 is formed centrally of tube 104 and has a bore 106 formed vertically therethrough, which opens up into a valve seat 108. A plurality of pins 110 are located below valve seat 108, and a ball 112 is locked in the area between the valve seat 108 and the pins 110. So, upon the entry of compressed gas downwardly through tube 66, the ball 112 will also be moved downwardly and this gas may enter the buoy 100. However, after the buoy 100 has left the housing, and is free from tube 66, the air within the buoy will force the ball 112 upwardly against valve seat 108 and this air will be sealed therein.

In use, an outboard motor 114, or other object which it is desired to have a marker buoy attached to, will have the housing 10 affixed thereto, as by attachment to the outboard motor 114 by means of brackets 115 which are attached to the side walls of housing 10. Then, any time the outboard motor 114 comes off the transom of a boat and is dropped into the water, the water pressure will enter through apertures 18 and exert a pressure upon diaphragm 40. When the pressure upon diaphragm 40 is great enough to overcome the pressure of spring 80, the trigger or lever 72 will have its right end moved upwardly thus releasing the lever 86 and causing, by means of spring 92, the spike 96 to puncture the neck 56 of the compressed gas container. It is to be noted that by changing the spring 80, the amount of force to be exerted before the releasing of the trigger may be varied, so that the depth at which the buoy will be automatically released, may be preselected. Upon the puncturing of the container 54, gas will escape therefrom and pass through bore 98 of spike 96, through elbow 68, the tube 66 and into the buoy. A projection 116 having an opening 118 formed therein is attached to tube 104, and has a strand 120 connected thereto. The other end of strand 120 is connected to a similar type of projection 122 fixed to one of the housing end walls 12. Thus, as the buoy is inflated it will fill up the space between casing bottom wall 36 and housing bottom wall 24, and eventually force the bottom 24 out of the groove 22, and when the air pressure within the buoy is sufficient, the buoy will be released from tube 66, and the ball 112 will seal the air within the buoy from escaping. Then, the buoy 100 may rise to the surface as seen in Figure 1, while the strand 120 is still connected from one end of the buoy 100 to the housing 10. When it is desired to locate the submerged outboard motor 114, it is merely necessary to look for the surfaced buoy 100, and then follow the strand 120 down to the motor where it is located on the bottom of the lake, stream, or other body of water where the motor is submerged.

It may now be seen that there has been shown and described a new and improved type of automatic inflating marker buoy which is extremely useful for submerged outboard motors.

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. An automatic marker buoy comprising a housing having walls, a detachable bottom door, and a perforated top for admitting water therethrough under pressure, a casing fixed in said housing and having a top diaphragm flexible in response to the pressure of water admitted through said perforated top, said casing having a bottom spaced from and forming with the detachable door and said walls a bottom chamber in said housing, a deflated buoy in said chamber inflatable in response to gas pressure to detach said door and escape from said chamber, a container for compressed gas fixed in said casing and adapted for puncturing to release the gas, a spring loaded lever in said casing having one end pivoted to said bottom for swinging of the lever toward said container, a hollow spike in said casing fixed to said lever and movable thereby into puncturing engagement with said container to discharge gas from the container in response to swinging of said lever, tubular means extending through said bottom from said spike to said buoy for conveying gas discharged from said spike to said buoy and being flexible within said casing to compensate for movement of said spike, and a trigger in said casing engaged with the other end of said lever and disengageable therefrom in response to flexing of said diaphragm for controlling swinging of said lever.

2. The combination of claim 1, said trigger comprising a spring loaded lever pivotally mounted between its ends on one of said walls.

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