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2,821,725

FLOTATION DEVICE

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FIG. 1

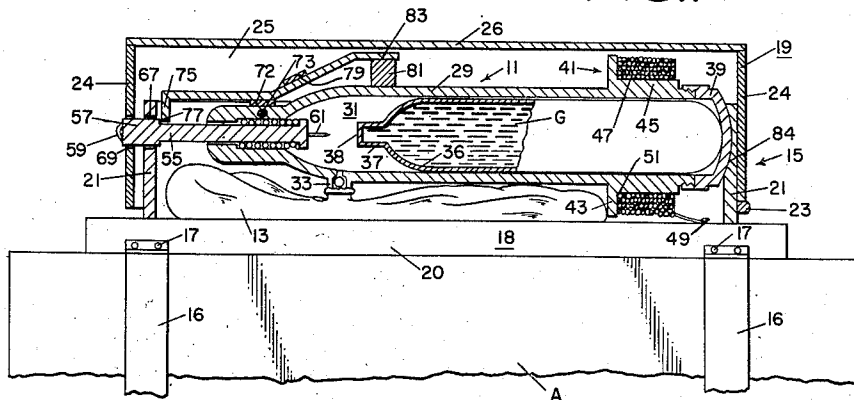


FIG. 2

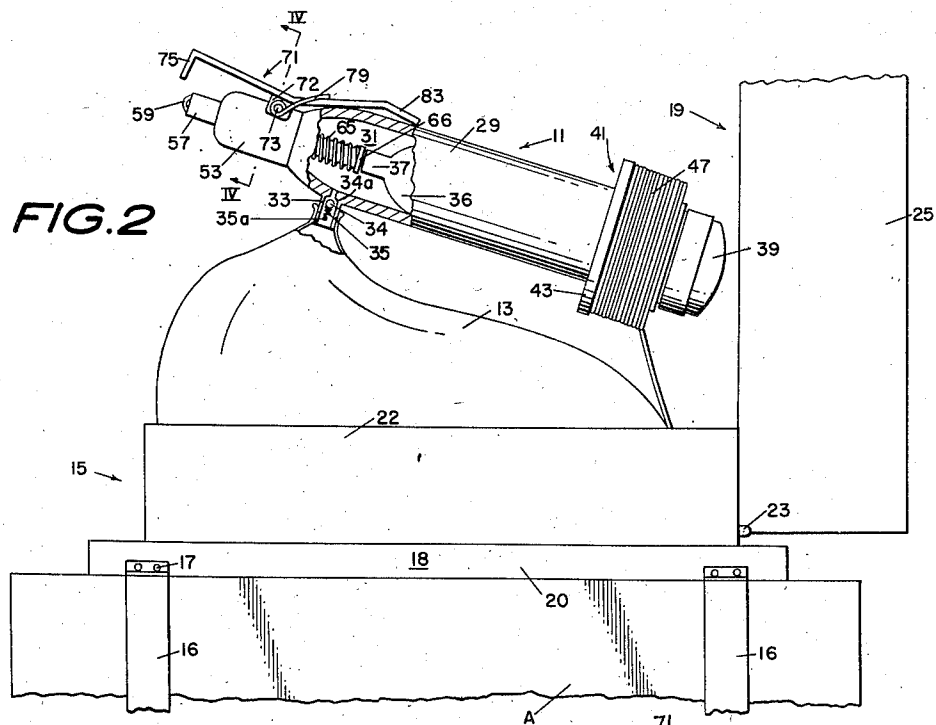


FIG. 3

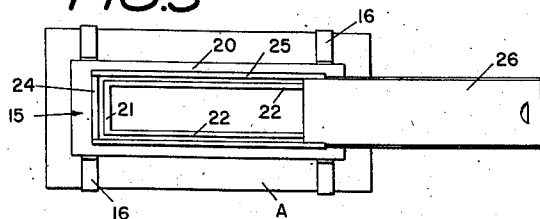
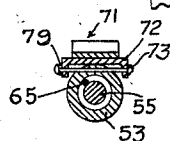


FIG. 4



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1

2,821,725

FLOTATION DEVICE

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7 Claims. (Cl. 9—9)

This invention relates to a flotation device adapted to be attached to various objects for preventing the loss of the object in water or other liquids, and which additionally may be used in conjunction with automatically inflating life preservers or other like or related devices.

The loss overboard of fishing and boating equipment, such as tackle box and motor, can be costly and inconvenient without a means for retrieving the equipment. Heretofore other devices have been contemplated for preventing this loss, but all of these devices have had certain disadvantages which limited their utility for one reason or another. For example, some of the devices are cumbersome and not versatile while others are unreliable due to their lack of protection from the weather which causes corrosion and non-functioning of the parts.

The present invention is directed towards overcoming the disadvantages of previous types of flotation devices and is directed towards providing a device which is characterized by simplicity and versatility.

The present device is protected from the weather by locked container which is automatically unlocked when the device is submersed in water or other liquids. Additionally the device of the present invention is useful as a life preserver or kindred device which is automatically inflatable.

The principal object of the present invention is to provide an improved flotation device which is automatically operable responsive to water or other liquids.

A further object is to provide such a flotation device which is adapted to be attached to an object for preventing the loss thereof when submerged in water or the like.

A further object is to provide such a flotation device which is additionally adapted to be attached to a person and which acts as an automatically inflating life preserver.

A further object is to provide such a flotation device comprised of an inflatable envelope and inflating means housed together in a container, including a container body and lid hinged thereto, with the lid normally being locked by the inflating means and being unlocked responsive to immersion in a liquid.

A further object is to provide such inflating means including a casing, a replaceable cartridge carried in the interior thereof, a pointed plunger, triggering means for releasing the plunger to puncture the cartridge and actuating means for releasing the triggering means.

A further object is to provide such actuating means which comprises an element disposed normally to maintain the lever of the triggering means in a position to retain the pointed plunger in cocked disposition, with said element being soluble in water or other liquids whereby to release the lever of the triggering means when submerged in water or the like.

A further object is generally to improve the design and construction of flotation devices.

The means by which the foregoing and other objects of the present invention are accomplished and the manner of their accomplishment will be readily understood

2

from the following specification upon reference to the accompanying drawings, in which:

Fig. 1 is a partly sectionalized fragmentary elevational view of the flotation device of the present invention before being actuated and illustrated as being attached to an object.

Fig. 2 is a similar view illustrating the flotation device after being actuated.

Fig. 3 is a top plan view on a reduced scale of the container of the present invention illustrated as attached to an object and with the top of the container in open or loading position.

Fig. 4 is a transverse sectional view taken as on the line IV—IV of Fig. 2.

Referring now to the drawings in which the various parts are indicated by numerals, the device of the present invention in general comprises inflating means, herein generally designated as at 11, an inflatable, preferably plastic, envelope 13, a container 15 for the inflating means and envelope, and attachment means for attaching the device of the present invention to an object or to a person. Said attachment means may comprise any suitable means of attaching, as for example, straps 16 which may be connected to container 15 as by rivets 17.

Container 15 is preferably of box-like construction and comprises a body 18 and a lid 19. Body 18 includes a base 20, opposing upstanding end members 21, and opposing upstanding sides 22. Lid 19 is hingedly attached to body 18, as at 23, whereby lid 19 is swingable from and to a closed position, as best illustrated in Fig. 1, in which the lid overlaps the sides and ends of body 18 and covers the top thereof; and shiftable to and from an open position, best illustrated in Fig. 2, in which the lid uncovers the top of body 18. Lid 19 includes opposing depending ends 24, opposing depending sides 25 and a top 26, which is joined with sides 25 by a conventional tongue and groove arrangement whereby the top is longitudinally slidable from and to a closed position, best illustrated in Fig. 1; and to and from an open or loading position, best illustrated in Fig. 3.

A casing 29, which forms a part of inflating means 11, is preferably cylindrical and defines a chamber 31 in the interior thereof, is provided with a nipple 33 which is in communication with chamber 31 and on which is placed the neck of envelope 13. Valve means, interposed in nipple 33, permits gas flow through the nipple to the envelope 13, but does not permit gas flow in the opposite direction towards chamber 31, whereby after the envelope is inflated, as hereinafter described, the envelope will so remain without danger of leakage from casing 29. Said valve means may comprise a ball 34 urged against a seat 34A by means of a spring 35 interposed between the ball and a pin 35A extending transversely of nipple 33. Casing 29 is preferably open adjacent one end thereof. A cartridge 36 containing a compressed gas as carbon dioxide or the like is contained in chamber 31 with the reduced neck 37 and sealed end 38 of the cartridge facing away from the open end of casing 29. The compressed gas in cartridge 36, which is generally in liquid form and is so shown in the present drawings, is herein designated as at G. A cap 39 is threadedly engaged on the open end of casing 29 to enclose the open end thereof and is removable for replacement of cartridge 36 when the gas therein is expended, as hereinafter described.

An open end spool 41 is integrally formed externally on casing 29, the spool having a flange 43 and a cylindrical base portion 45. Securing means or line 47 is wound around spool 41 so that the line will unwind when a force is exerted towards the open end of the spool or to the right, as viewed in Fig. 1. One end of line 47 is anchored to container 15, as at 49, and the other end of the line is anchored to casing 29 as at 51.

3

The end of casing 29 remote from cap 39 is provided with a reduced hollow neck portion 53, in the throat of which a plunger 55 is shiftably mounted. The outer end of plunger 55 is provided with an enlarged portion 57, which has an eyelet 59 formed on the extreme outer end thereof, the function of which will be more apparent in the later description. The inner end of plunger 55 is provided with a point 61 which is in alignment with the sealed end 38 of cartridge 36. Plunger 55 is shiftable from and to an extended or cocked position, best illustrated in Fig. 1, in which point 61 is spaced from sealed end 38, and shiftable to and from a puncturing or actuated position, best illustrated in Fig. 2, in which point 61 has punctured sealed end 38 to permit compressed gas to escape from cartridge 36 through chamber 31 and into the interior of envelope 13. A spring 65, surrounding plunger 55, is interposed between casing 29 and a flange 66, formed adjacent the inner end of the plunger, to urge the plunger towards said actuated position. In said extended position plunger 55 extends through aligned apertures 67, 69 respectively provided in body 18 and lid 19 to lock the lid in the closed position, best illustrated in Fig. 1.

Triggering means is provided on casing 29 and preferably comprises a lever 71 pivotally mounted from casing 29, as by means of a pin 73 extending through aligned apertures in the casing and a depending mid-portion 72 of the lever. The outer end of lever 71 is bent downwardly to form a depending portion 75 which engages the lip 77 formed at the juncture of enlarged portion 57 and the main body portion of plunger 55, whereby to maintain plunger 55 in the cocked position, as best illustrated in Fig. 1. Suitable resilient means, as a spring 79, engages casing 29 and lever 71 to urge the lever in a clockwise direction, as viewed in Fig. 1.

Actuating means, as an element 81, is placed between casing 29 and the end 83 of lever 71 which is remote from depending portion 75, whereby the lever is held in engagement with plunger 55 during the cocked disposition of the device. Element 81 is preferably soluble in water or any other liquids with which the present device is desired to be used. As for example, element 81 may be formed of sugar for use in water.

To load the device of the present invention, top 26 is pushed back, as illustrated in Fig. 3, to form an opening in lid 19 whereby to gain access to the interior of container 15. Cartridge 36, filled with compressed gas, is placed in casing 29 and cap 39 threaded thereon. Casing 29 is placed in container 15 through the opening made by top 26 with the rounded end of cap 39 seated in a concave portion 84 provided in one of end members 21 and with plunger 55 extending through aligned apertures 67, 69. It will be understood a hook or other device may be engaged in eyelet 59 to aid in cocking the device and in pulling the plunger through apertures 67, 69. After casing 29 is in position in container 15 with plunger 55 in cocked disposition, top 26 is shifted to close container 15 and is sealed in the closed position as by glue or other means.

In the use of the device of the present invention, the device is attached to an object A by attachment means 16, as best illustrated in Fig. 1. When object A becomes lost overboard it will sink to the bottom carrying with it the device of the present invention. When the water flows into the interior of container 15, as between body 18 and lid 19, water soluble element 81 will become dissolved, releasing the lever for rotation under the urging of spring 79 in a clockwise direction, as best illustrated in Fig. 2, whereupon to disengage depending portion 75 from lip 77 and to allow plunger 55 to move inwardly to the puncturing position, thereby breaking sealed end 38 which in turn permits compressed gas G to escape from cartridge 36 through chamber 31 and into envelope 13. When plunger 55 moves to the puncturing position the plunger is concurrently retracted from apertures 67, 69 to unlock

4

lid 19 and permit the lid to pivot to an open position, as best illustrated in Fig. 2. As envelope 13 is inflated by the compressed gas the casing 29 with the envelope will be expelled from the open container and will float to the surface of the water while unwinding line 47, thus providing visible means for indicating the location of the sunken article. If desired, spring means may be provided to urge the lid 19 into an open position, or the spring may be omitted as in the present drawings, in which case the opening of lid 19 will be effected by the expulsion of casing 29 and envelope 13.

If the device of the present invention is to be used as an automatically inflating life preserver, envelope 13 may be formed in any suitable shape, as for example, the shape of water wings in which two separate intercommunicated air compartments are employed. Also in employing the device as a life preserver securing means 47 is preferably of a reduced length. As a life preserver the device of the present invention may be worn at any desired place on the body, as for example, it may be worn about the waist of the user and attached thereto as by attachment means 16. It will be understood that the flotation device when used as a life preserver has particular utility from a standpoint of safety. Thus for example, when the wearer has been thrown into the water in an unconscious condition, as in a shipwreck or planewreck, the envelope 13 will automatically inflate, as heretofore described, whereupon the person will be held up by the buoyancy of the envelope until he is rescued.

From the foregoing it is apparent that a novel flotation device is provided which is useful as a means for preventing the loss of an object in the water and which is additionally useful as an automatically inflating life buoy. Additionally, it is apparent that such means is compact in size and may be easily re-charged. In addition, it is apparent that the device of the present invention is fully protected from the weather by the novel container thereof which is automatically unlocked concurrently with the actuation of the inflating means.

I claim:

1. A flotation device comprising a container including a container body, a lid hinged to said body, said body and lid being bored to provide aligned apertures therein, attachment means connected to said container for attaching said container to an object, a hollow casing removably carried in said container, a coiled securing means connected at one end to said container and at the other end to said casing, an inflatable envelope coupled to said casing and in communication with the interior of said casing, a cartridge carried in the hollow interior of said casing, said cartridge being sealed and containing compressed gas therein, a spring loaded pointed plunger shiftably mounted in said casing in alignment with the seal of said cartridge, said plunger being shiftable from and to an extended cocked position and to and from a retracted puncturing position, spring means urging said plunger towards said puncturing position, said plunger when in said extended cocked position extending through said aligned apertures to lock said lid in closed condition, said plunger when in said puncturing position being withdrawn from said aligned apertures to permit opening of said lid, triggering means engaging and maintaining said plunger in said extended cocked position against the force of said spring means, actuating means coupled to said triggering means for releasing said triggering means from said plunger to permit said plunger to shift under influence of said spring means to said puncturing position in which the point of said plunger pierces said cartridge and releases the gas therefrom to inflate said envelope, said actuating means being liquid-soluble, whereby when said flotation device is immersed in liquid said actuating means dissolves to start the chain of action which unlocks said lid and inflates said envelope, where-

5

upon the envelope, being released from the container, floats and said securing means is uncoiled.

2. A flotation device comprising a container including a container body, a lid hinged to said body, said body being bored to provide alined apertures therein, a hollow casing removably carried in said container, an inflatable envelope coupled to said casing and in communication with the interior of said casing, a cartridge carried in the hollow interior of said casing, said cartridge being sealed and containing compressed gas therein, puncturing means shiftably mounted in said casing, said puncturing means being shiftable from and to an extended cocked position and to and from a retracted puncturing position, means urging said puncturing means towards puncturing position, said puncturing means when in said extended cocked position extending through said alined apertures to lock said lid in closed condition, said puncturing means when in said puncturing position being withdrawn from said alined apertures to permit opening of said lid, triggering means engaging and maintaining said puncturing means, actuating means coupled to said triggering means for releasing said triggering means from said puncturing means to permit said puncturing means to shift under influence of said urging means to said puncturing position in which said puncturing means pierces said cartridge and releases the gas therefrom to inflate said envelope, said actuating means being soluble in liquid, whereby when said flotation device is immersed in liquid said actuating means dissolves to start the chain of action which unlocks said lid and inflates said envelope, whereupon the envelope is released from the container.

3. A flotation device comprising a container including a container body, a lid hinged to said body, said body and lid being bored to provide alined apertures therein, attachment means connected to said container for attaching said container to an object, a hollow casing removably carried in said container, an inflatable envelope coupled to said casing and in communication with the interior of said casing, a cartridge carried in the hollow interior of said casing, said cartridge being sealed and containing compressed gas therein, a pointed plunger shiftably mounted in said casing, said plunger being shiftable from and to an extended cocked position and to and from a retracted puncturing position, said plunger when in said extended cocked position extending through said alined apertures to lock said lid in closed condition, said plunger when in said puncturing position being withdrawn from said alined apertures to permit opening of said lid, said plunger when in said puncturing position piercing said cartridge to release the gas therefrom to inflate said envelope, said plunger normally being in said extended cocked position, means operably coupled to said plunger to shift the plunger to said puncturing position, whereby to inflate said envelope and unlock said lid.

4. A flotation device comprising a hollow casing, an inflatable envelope coupled to said casing and in communication with the interior of said casing, a cartridge carried in the hollow interior of said casing, said cartridge being sealed and containing compressed gas therein, a pointed plunger shiftably mounted in said casing, said plunger being shiftable from and to a cocked position in which the point of said plunger is spaced from said cartridge and being shiftable to and from a puncturing position in which the point of said plunger pierces said cartridge, a spring engaging said casing and said

6

plunger to urge the plunger towards said puncturing position, a lever pivotally mounted on said casing, one end of said lever engaging said plunger to retain said plunger in said cocked position, resilient means engaging said lever to urge the other end of said lever towards said casing and said one end away from engagement with said plunger, actuating means interposed between said other end of said lever and said casing to maintain said lever in engagement with said plunger against the force of said resilient means, said actuating means being liquid-soluble whereby placement of said device in a liquid is effective to dissolve said actuating means, whereupon said lever is disengaged from said plunger under influence of said resilient means and said plunger is released and shifted to said puncturing position to release said compressed gas and inflate said envelope.

5. A flotation device comprising a hollow casing, an inflatable envelope coupled to said casing and in communication with the interior of said casing, a cartridge carried in the hollow interior of said casing, said cartridge being sealed and containing compressed gas therein, a pointed plunger shiftably mounted in said casing, said plunger being shiftable from and to a cocked position in which the point of said plunger is spaced from said cartridge and being shiftable to and from a puncturing position in which the point of said plunger pierces said cartridge, a spring engaging said casing and said plunger to urge the plunger towards said puncturing position, a lever pivotally mounted on said casing, one end of said lever engaging said plunger to retain said plunger in said cocked position, resilient means engaging said lever to urge said one end away from engagement with said plunger, means holding said lever in engagement with said plunger against the force of said resilient means, said holding means being releasable from said lever whereby to disengage said lever from said plunger, whereupon said plunger is released and shifted to said puncturing position to release said compressed gas and inflate said envelope.

6. A flotation device comprising a container including a container body and a lid hinged to said body, inflating means carried in said container, an inflatable envelope coupled to said inflating means, actuating means connected to said inflating means for the actuation thereof, said actuating means being operable responsive to liquid, said inflating means normally locking said container lid in closed position, said inflating means unlocking said container lid when actuated by said actuating means upon immersion in liquid, actuation of said inflating means by said actuating means being additionally effective to inflate said envelope which expels said envelope and inflating means from the unlocked container.

7. A flotation device comprising a container including a container body and a lid hinged to said body, inflating means carried in said container, an inflatable envelope coupled to said inflating means, actuating means connected to said inflating means for the actuation thereof, said inflating means normally locking said container lid in closed position, said inflating means unlocking said container lid when actuated by said actuating means, actuation of said inflating means by said actuating means being additionally effective to inflate said envelope which expels said envelope and inflating means from the unlocked container.

No references cited.