

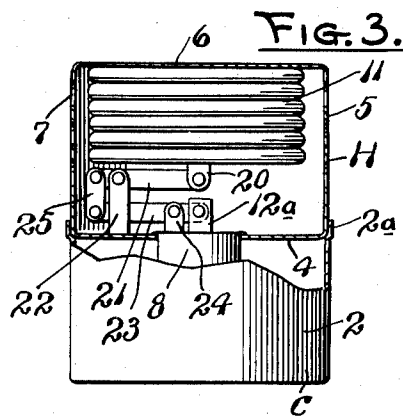
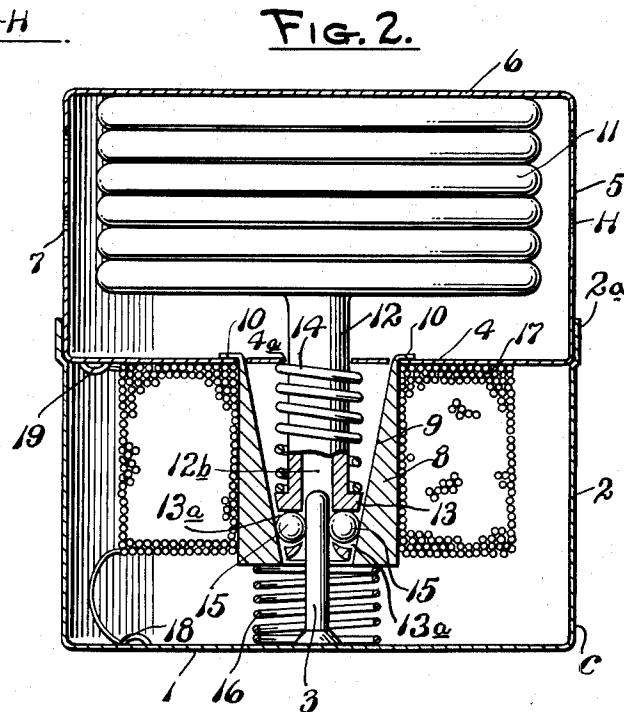
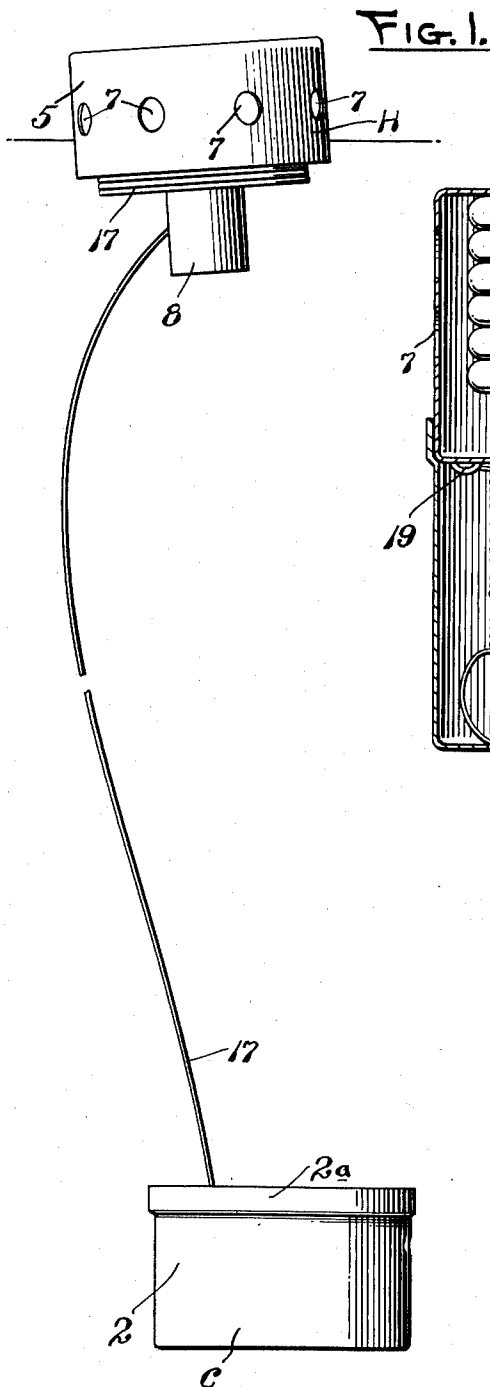
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RELEASABLE FLOAT

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## UNITED STATES PATENT OFFICE

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## RELEASABLE FLOAT

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This invention relates to a novel, releasable float which, in its assembled condition has a separable part of it, in use, securely fastened to an article which may sink or be lost in the water, with which a second member of the structure is secured and will remain secured thereto under normal conditions. But, if said article should fall into the water, an automatic separation by a release thereof is caused by increasing water pressure as it is carried below the surface of the water, and it thereupon rises to the top of the water and floats therein, an elongated line connected at one end to one of said members and at the other to the other thereof connecting the two members at all times. Therefore, when the article which has fallen into the water and sunk reaches the bottom, the float at the surface of the water has its connecting line reach the place where the article is located, and through the floating member and line the article at the bottom of the water is readily located and may be recovered.

In different sizes of the structure which embodies the present invention, it may be used in conjunction with fishing rods and reels, outboard motors and many other articles which are frequently lost and are hard to recover because their location is not marked. It is also available for use in conjunction with life rafts on ships, one or more of the float structures having one member of each permanently secured to the raft, the other member securely connected to the ship. Should the ship sink, the raft is disconnected and floats on the surface of the water. The lines either may or may not be used. If not used the raft is disconnected completely from the ship. If the lines are used, the raft remains connected to the ship by such line or lines, if more than one of the devices is used with a raft, so as to hold the raft in a desired proximity to the ship as wanted, the lines being cut when the raft is to be moved away. There are many other manners of use of the invention which will occur to others.

It is an object and purpose of the present invention to provide a very practical, serviceable, effective and economically constructed releasable device of the character stated, understanding of a preferred structure of which will be had from the following description, taken in connection with the accompanying drawing, in which:

Fig. 1 shows the two parts of the releasable float separated with one floating at the surface of the water and connected by the played-out line to the other part submerged in the water.

Fig. 2 is an enlarged vertical central section through the releasable float, and

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Fig. 3 is a similar partial section and elevation at a reduced scale of a modification in structure serving the same purpose.

Like reference characters refer to like parts in the different figures of the drawing.

In the structure, a cup member C made of sheet metal has a flat bottom 1 and cylindrical walls 2 which at the upper open end are slightly enlarged or off-set outwardly as indicated at 2a. A pin 3 is attached at the upper side of the bottom 1 in permanent connection therewith, at the center of the bottom, and extends upwardly part way to the upper open end of such cup-like member.

A housing H of substantially the same diameter, also of sheet metal, has a horizontal bottom 4, cylindrical, vertical walls 5 and a horizontal top 6 making an enclosure. The walls 5 have openings 7 therethrough for water entrance.

A cylindrical generally sleeve-like member 8 has an axial opening through it, the diameter of which progressively decreases from the upper to the lower end to provide a tapered or conical inner surface 9 in the sleeve. The axes of the member 8 and of the pin 3 substantially coincide when the upper housing is inserted at its lower side into the lower cup member, within the outwardly pressed rim 2a. The sleeve member is attached permanently to the bottom 4 below it, by ears 10 at the upper end of the member 8 passing through slots in the bottom 4 and then bent as shown.

Within the upper housing a corrugated bellows 11, preferably of corrugated metal, is located and permanently secured at its upper end of the top 6. At the center of the bottom of the bellows a stem 12 extends downwardly through an opening 4a in the bottom 4 and into the axial opening of the sleeve 8. It has a longitudinal passage 12b at least in its lower end portion so that the upper end of the pin 3 extends into the spindle 12. At the lower end of the spindle 12 a generally conical head 13 is integrally formed which, at its lower end, may have approximately the same diameter as the diameter of the spindle 12 but progressively enlarged upward so that the head has conical sides corresponding in general to the lower end conical interior surfaces at 9 of the sleeve 8. A coiled compression spring 14 around the sleeve 12 presses at its upper end against the bottom 4, and bears at its lower end against the head 13, tending to force or move the head 13 downwardly. A plurality of balls 15 located in passages 13a through the sides of the head 13 when the parts are assembled as described, and as shown in Fig. 2, are wedged by the force of the spring 14, at their inner sides,

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against the pin 3; and at their outer sides against the inclined or conical surfaces at 9. A second coiled compression spring 16 is located around the pin 3, seated at its lower end on the bottom 1 and at its upper end bearing against the lower end of the sleeve 8.

When the two parts of the float structure described are assembled together as in Fig. 2, spring 16 is compressed to bring the bottom 4 of the upper housing to the annular shoulder at the lower edges of the rim 2a, tending to cause the pin 3 to withdraw when free to do so. But the force of the spring 14 pushing the head 13 and the balls 15 in a downward direction causes the balls to grip the pin 3 and provide a secure connection between the two parts of the float structure which has been described.

A line 17 is wound around the sleeve 8 as a core. The lower end of the line is attached securely to the bottom 1 by any suitable connection indicated at 18. The upper end of the line is similarly connected by a similar connection 19 to the bottom 4.

When this float having its lower cup like member secured, for example, to an out-board motor is submerged in the water, as would occur if the motor was detached from a boat and sank, the upper housing is drawn downwardly into the water. Water passes through the openings 7 and through its continually increasing pressure, compresses the bellows 11, the lower side of the bellows being forced upwardly to lift the stem 12, head 13 and balls 15 as soon as the pressure is sufficient to overcome spring 14. On such lifting, the wedging of the balls against the pin 13 is broken, releasing spring 16 which throws the lower cup member C away from the upper member H. The bellows being sealed against entrance of water, and containing air or other gas, has the effect of causing the upper released member to rise and come to the surface. The two parts of the structure will move in opposite directions one rising to the surface of the water and the other attached, for example, to an out-board motor, going to the bottom. The line 17 is unwound as such separation in distance occurs. When the article to which the lower cup-like member is fastened reaches the bottom and stops there, the line 17 reaches to the float which is at and extends above the surface of the water as shown in Fig. 1, marking the approximate position of the motor in the water.

In Fig. 3 the releasing of the latch is through a linkage connection between the latching means and the bellows. At the center of the under side of the bellows 11, a short post 20 is located to which one end of a horizontal link 21 is pivotally connected. Link 21, near its other end, is pivotally mounted, between its ends, at the upper end of a vertical post 22 secured to the bottom 4. A second horizontal link 23, paralleling the link 21, is pivotally connected at one end to the upper end of the stem 12a of the latching means comprising the described sleeve 8 bellows attached pin 12a with its axial opening 12b therein the head 13 and the balls 15 and compression spring 14 which has a releasable gripping or latching engagement with the pin 3 and between its ends to a short post 24 secured to the bottom 4, near the opening therein through which the stem 12a (like stem 12) passes. The two parallel links 21 and 23 are connected by a vertical connecting link 25 as shown. The compression of the bellows 11 by the pressure of water entering through the openings 7, actuates the several links so as to disconnect

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the wedging balls from the pin 3 and release the two parts of the float device the same as previously described.

The float described is readily manufactured, is accurate and sure in its operation, and is of utility in locating lost articles which have fallen into deep water, or may also be used for automatically releasing articles like life rafts or other things should a ship sink. There are other ways of using the device which will occur.

The invention is defined in the appended claims and is to be considered comprehensive of all forms of structure coming within their scope.

I claim:

1. A device as described comprising, a cup having an open end, a hollow housing having inner and outer sides and walls between the sides extending at its inner side partly into said cup, a pressure responsive gas containing buoyant member located within said housing secured at one end to the outer side thereof, latching means connected to the inner side of the housing and to said pressure responsive member at its opposite side, a cooperating latching member attached to the cup adapted to be detachably gripped by said latching means to hold said cup and housing member together, said pressure responsive member being adapted to be decreased in length between its inner and outer sides by fluid pressure thereon during submergence of said device in liquid, said housing having passage for liquid entrance therinto, thereby automatically releasing the latching means and freeing said housing from the cup member, whereby said housing and attached pressure responsive member rises to the surface of the liquid.

2. A structure as defined in claim 1, and an elongated line attached at one end of the cup member and at the other end to the housing.

3. In a structure as described a cup member having an upper open and a closed lower end, a pin axially located within the cup member permanently secured to the lower end thereof, a hollow housing having lower and upper sides and walls between them adapted to be inserted at its lower side into the open end of the cup member, a sleeve secured to the lower side of said housing extending into the cup member having an axial opening with progressively converging sides away from the lower side of the housing, into which said pin is adapted to extend, a compressible bellows secured at its upper side to the upper side of said housing and located within the housing, a stem secured at one end to the lower side of said compressible bellows, said stem at its opposite end having a fustro-conical head and said head having an axial opening into which said pin is adapted to extend, a compression spring between the lower side of said housing and said head, and gripping balls carried by said head adapted to grip at their inner sides against said pin and at their outer sides against the converging sides of the opening in said sleeve.

4. A structure as defined in claim 3, and a second coiled compression spring located between the closed end of said cup member and the free end of said sleeve, said spring being located around the pin.

5. A structure as defined in claim 3, and a line having one end connected to said cup member and the other to said housing, said line being wound around the outside of the sleeve.

6. A device as described comprising, a cup member and a hollow housing member, both of thin metal, the housing member being removably

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mounted within the open end of the cup member for a distance, means for releasably securing said members together, said means including a hollow part attached to the housing and extending into the cup member, a gas containing sealed pressure responsive means within the housing and attached at its upper end to said housing, said pressure responsive means comprising an expansible and contractable sealed bellows adapted to vary in length in accordance with the differences in pressure interiorly and exteriorly of the bellows, a tubular stem having wedge members carried at its lower end portion, said stem being attached to the lower end of said pressure responsive means and extending into said hollow part, a pin secured in said cup member and extending into said tubular stem and cooperating with said wedge members to urge the latter into engagement with said hollow member to releasably

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bly secure said members together, said bellows on compression to a predetermined shorter length to release the members automatically from each other, said housing member having openings for entrance of water thereinto to subject the bellows to varying pressure in accordance with the depth in which the device is submerged.

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