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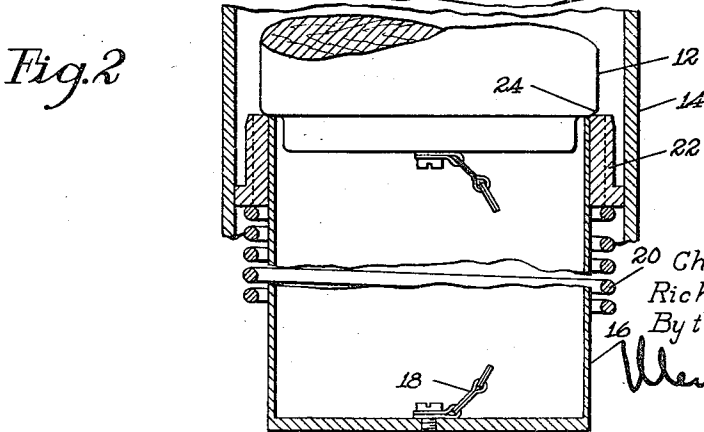
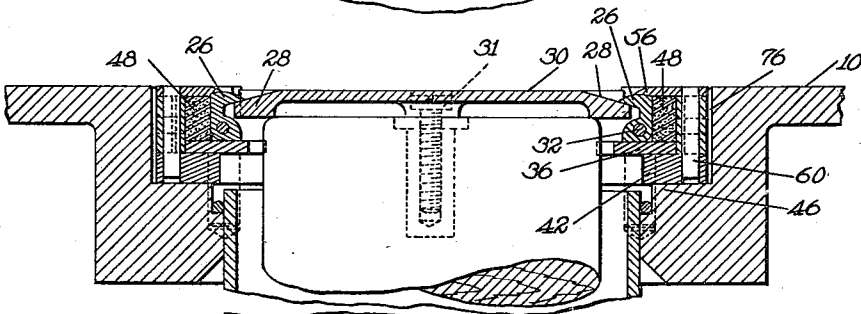
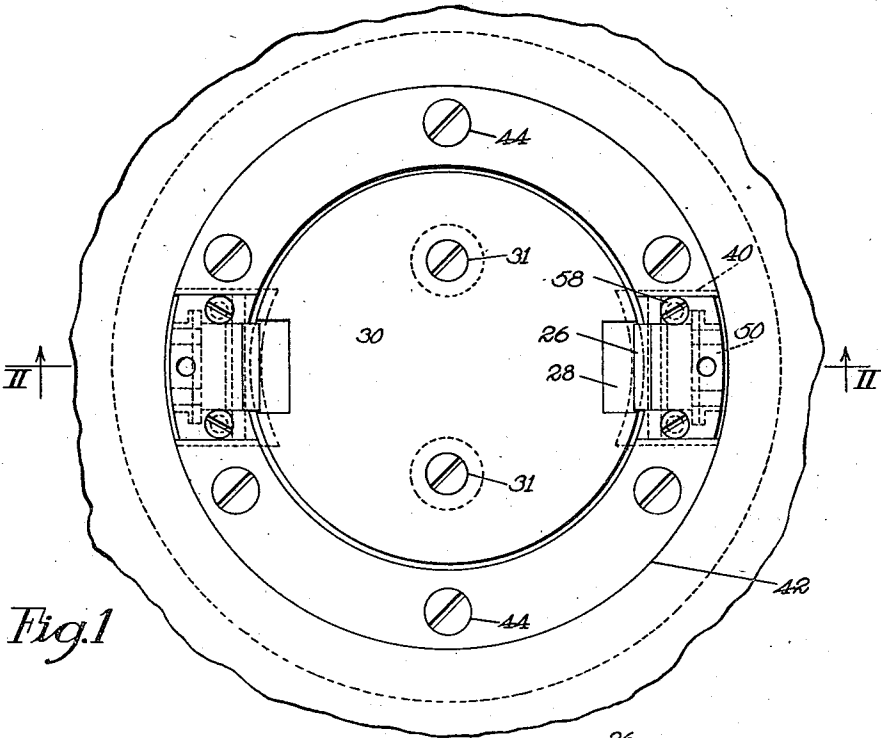
C. C. BELL ET AL

2,415,863

RECOVERY BUOY FOR HYDROBOMBS

Filed June 13, 1945

2 Sheets-Sheet 1



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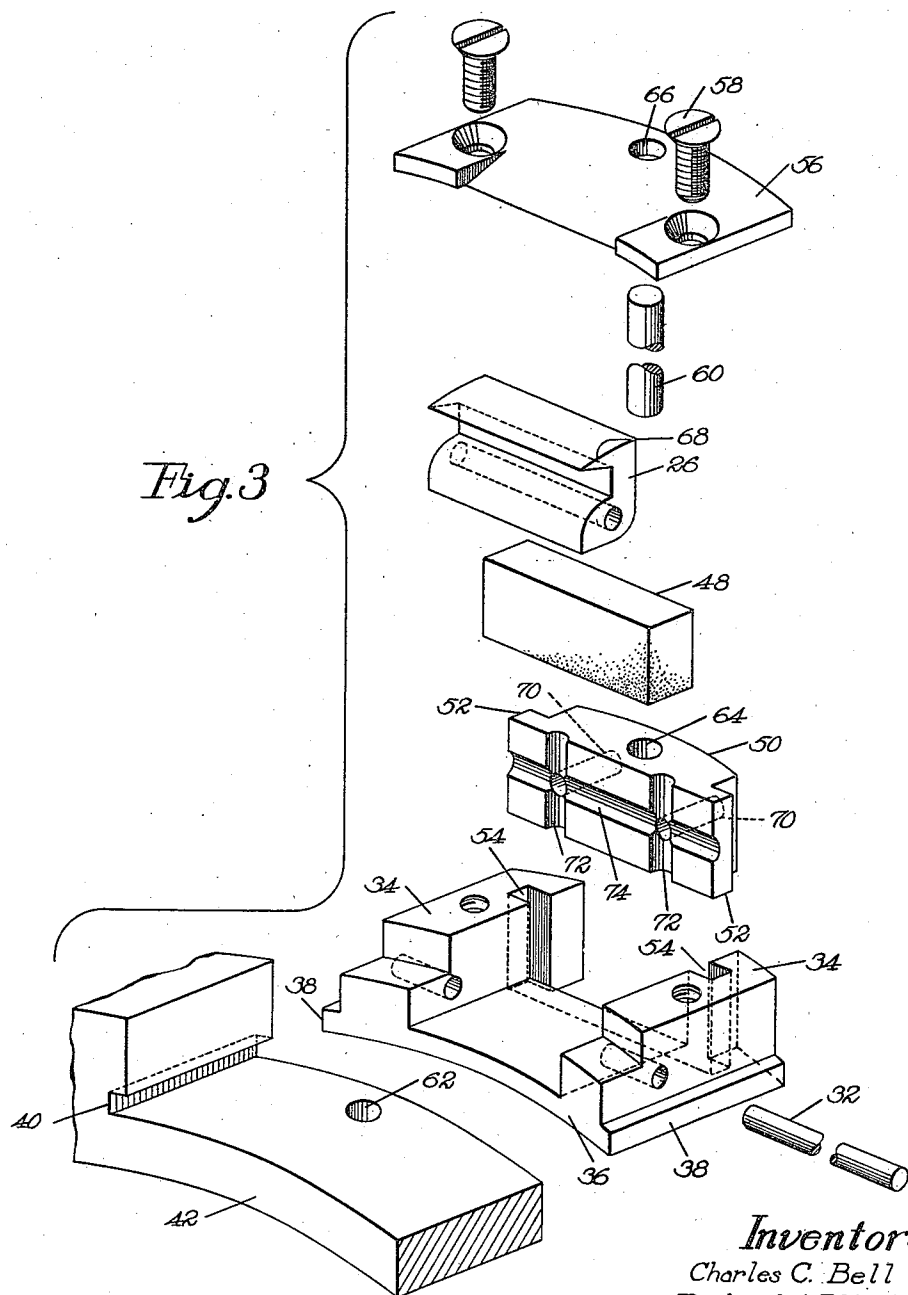
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RECOVERY BUOY FOR HYDROBOMBS

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,415,863

RECOVERY BUOY FOR HYDROBOMBS

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2 Claims. (Cl. 114—20)

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This invention relates to torpedoes and more particularly to means for facilitating the recovery of torpedoes.

Before torpedoes are used in actual service they are commonly put through a series of practice runs to check the control apparatus and calibrate it in order to insure the accuracy of the torpedo when in actual use. During these practice runs the usual war head of the torpedo is replaced by what is known as an exercise head which may be filled with water to the extent that its weight is the same as that of the war head. The torpedo sinks at the end of its practice run and in order to facilitate recovery of the torpedo it is common to employ a valve mechanism responsive to the hydrostatic pressure which operates to permit the entrance of air into the war head causing expulsion of the water therefrom whereupon the torpedo becomes sufficiently buoyant to rise to the surface where it can be readily found.

An object of the present invention is to provide a simplified apparatus to facilitate locating the torpedo at the end of its practice run, which mechanism does not depend upon hydrostatic pressure so that the torpedo, at the end of its practice run, may as readily be found in shallow water as in deep water.

To this end and in accordance with the present invention the torpedo is provided with one or more recovery buoys which are normally housed within the torpedo and each of which is held in place therein by latches against the force of a spring tending to urge the buoy out of the torpedo. These latches are held in locking engagement with the buoy by members which are soluble in water and are exposed to the action of the water when the torpedo is submerged so that after a predetermined length of time these members dissolve, permitting retraction of the latches whereupon the buoy is forced outwardly of the torpedo by the spring and rises to the surface, it being connected to the torpedo by a cable so that the torpedo may be readily found by divers and recovered.

The above and other features of the invention including various details of construction and novel combinations of parts will now be described in detail by reference to the accompanying drawings and pointed out in the claims.

In the drawings,

Fig. 1 is a plan view of a portion of the exercise head of a torpedo in which the present invention is embodied, illustrating the mechanism by which a recovery buoy is confined therein;

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Fig. 2 is a section on the line II—II of Fig. 1, and

Fig. 3 is an exploded view of one of the latch assemblies.

While the invention is described herein as applied to a single recovery buoy it will be understood that in practice two of these buoys may be confined in opposite sides of the torpedo so that, regardless of the position of the torpedo when it finally comes to rest, at least one of the buoys will find its way to the surface of the water.

A buoy 12 is preferably confined in the exercise head 10 of a torpedo, the buoy consisting of a block of light-weight material such as balsa wood, although it will be understood that the buoy may be of any suitable form and material as long as it is sufficiently buoyant to rise to the surface of the water at the proper time. The buoy is housed within a tube 14 extending inwardly from the wall of the torpedo and within the tube is secured a receptacle 16 to the bottom of which is secured one end of a cable 18, the other end being secured to the bottom of the buoy 12. The cable is of sufficient length to permit the buoy to rise to the surface of the water in which the torpedo travels in its practice run after the torpedo has sunk to the bottom.

The buoy is urged outwardly of the torpedo by a compression spring 20 which acts upon a collar 22 which in turn engages a shoulder 24 at the inner end of the buoy. For holding the buoy within the torpedo against the force of the spring 20, until the torpedo has been submerged for a predetermined time, a pair of latches 26 are held in engagement with beveled surfaces 28 of a cap 30 secured by screws 31 to the outer end of the buoy.

Each of the latches 26 is pivoted on a pin 32 carried by spaced walls 34 (Fig. 3) of a support 36 having outwardly extending flanges 38 received in grooves 40 of a ring 42. The ring 42 is secured by screws 44 (Fig. 1) to a circular flange 46 surrounding the hole in the wall of the torpedo through which the buoy is expelled. The latches 26 are held in locking engagement with the cap 30 by elements 48 which may be in the form of tablets of salt or other suitable material. These tablets are held against the rearward surfaces of the latches 26 by members 50 (Fig. 3) having flanges 52 received in vertical ways 54 in the support 36. Each member 50 and the associated element 48 is held in position by a cover 56 secured by screws 58 to the walls 34 of the support 36. A locating pin 60 passes through apertures 62, 64, 66 in the ring 42, the member 50

and the cover 56 respectively, to facilitate assembly of the parts in the proper positions.

The outer surfaces of the latches 26 are curved at 68, the center of curvature coinciding with the axis of the pin 32 and the cover plate 56 has correspondingly curved portions on its under side. Thus the latches are free to swing outwardly of the cap 30 under the force exerted thereon by the spring 20 acting through the cap 30 and the beveled surfaces 28, when the salt tablets are dissolved. It will be noted that the surfaces of the latches which engage the cap 30 are inclined so that they are readily cammed into inoperative positions when free to be thus moved. To facilitate the dissolving of the tablets, each member 50 is provided with a pair of bores 70 extending front to back in the member 50, the forward portions communicating with vertical and horizontal passageways 72, 74 in the wall of the member 50 adjacent to the salt tablet 48. Water enters the bores 70 through a space 76 (Fig. 2) between the wall of the torpedo and the outer surface of the member 50 passing through the bores into the passageways 72, 74 thereby coming in contact with the salt tablets causing them gradually to dissolve.

As long as the torpedo is out of the water, the tablets 48 are effective to maintain the latches 26 in their locking positions but as soon as the torpedo enters the water the tablets starts to dissolve. The size and arrangement of the passageways by which water is admitted to the soluble tablets are such that these tablets will not dissolve sufficiently to release the latches from their engagement with the cap 30 until the torpedo has been in the water a sufficient length of time to have completed its trial run. Shortly after completion of the trial run the tablets 48 are sufficiently dissolved to permit the latches to be moved away from the cap 30 under the force exerted thereon by the spring 20 whereupon the buoy is expelled by the spring from the torpedo and rises to the surface of the water. The buoy may be painted a bright color which contracts with the color of the water, thereby facilitating its location. The connection between the buoy and the torpedo afforded by the cable 18 enables divers readily to locate the torpedo whereupon it may be recovered. Inasmuch as the release of the buoy is determined solely by the length of submergence of the torpedo in the water and not by hydrostatic pressure there is no danger of losing the torpedo if it comes to rest in shallow water in which the hydrostatic pressure might

be insufficient to operate the means by which water is expelled from the exercise head in the arrangement in common use as referred to previously. It will be understood that the recovery buoy arrangement described herein may be used in combination with other recovery means, such as the means for expelling the water from the head referred to above, in which case the recovery buoy would be effective if the other means failed properly to operate.

Having thus described our invention what we claim as new and desire to secure by Letters Patent of the United States is:

1. In combination, a torpedo, a buoy housed within the torpedo, means urging said buoy outwardly of the torpedo, latches engageable with the buoy to prevent its emergence from the torpedo, and soluble members engageable with said latches for holding the latches in place, said members being exposed to the action of the water when the torpedo is submerged whereupon the latches are rendered ineffective to hold the buoy within the torpedo after the torpedo has been submerged a predetermined length of time.

2. In combination, a torpedo, a buoy housed within the torpedo, means urging said buoy outwardly of the torpedo, latches engageable with the buoy to prevent its emergence from the torpedo, said latches being arranged to be cammed outwardly into inoperative positions in response to the force exerted thereon by the outwardly urged buoy, and soluble members for holding said latches in inoperative positions, said members being exposed to the action of the water when the torpedo is submerged whereupon the buoy is released upon submergence of the torpedo for a predetermined length of time.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,626,794	Dieter -----	May 3, 1927
1,252,876	Barrett -----	Jan. 8, 1918
1,252,877	Barrett -----	Jan. 8, 1918
2,317,285	Marple -----	Apr. 20, 1943
2,357,417	Marple -----	Sept. 5, 1944
1,216,132	Joyce -----	Feb. 13, 1917
1,860,327	Kuhn -----	May 24, 1932