June 29, 1954 H. H. PINCH 2,682,245

SIGNAL AND RECOVERING MEANS FOR UNDERWATER CRAFT

Filed Nov. 7, 1952

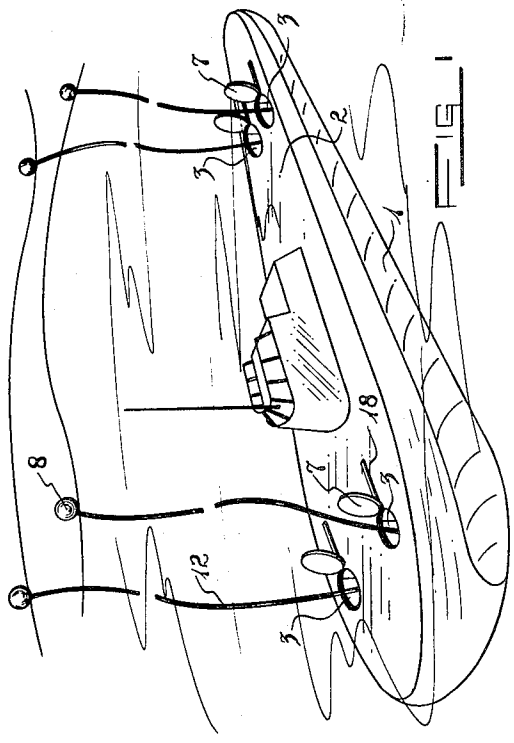


FIG. 1

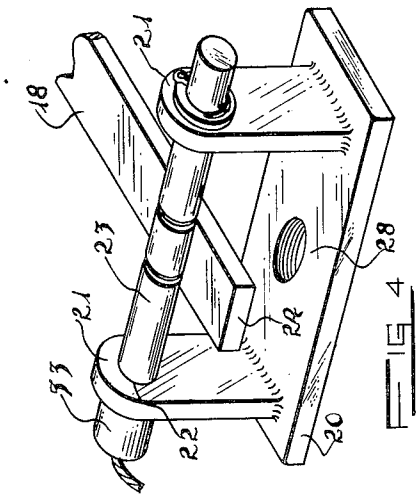


FIG. 4

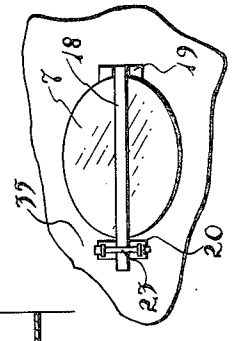


FIG. 3

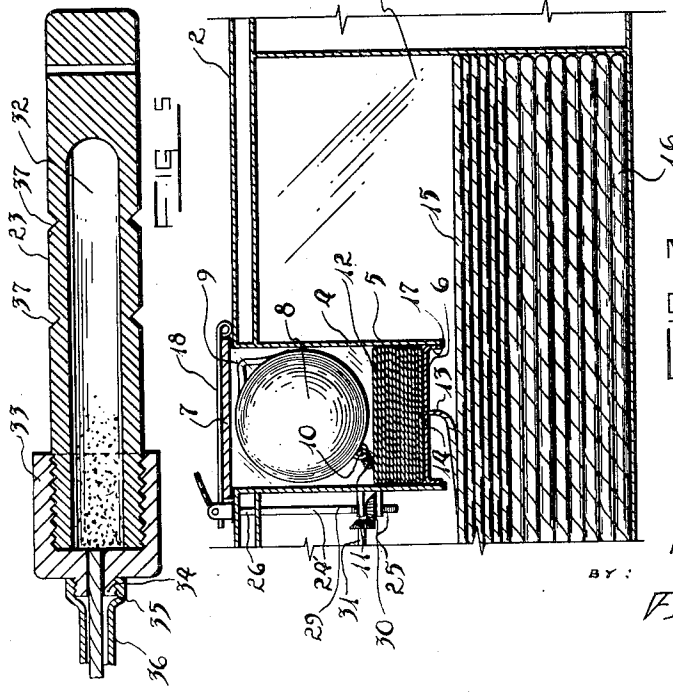


FIG. 2

FIG. 5

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Patented June 29, 1954 2,682,245

UNITED STATES PATENT OFFICE

2,682,245

SIGNAL AND RECOVERING MEANS FOR UNDERWATER CRAFT

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Application November 7, 1952, Serial No. 319,402

1 Claim. (Cl. 114—16.5)

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My invention relates to new and useful improvements in means for signalling the location of and assisting in the subsequent recovery of underwater craft such as submarines which may be unable to surface due to mechanical or other difficulties, an object of my invention being to provide a device of the character herewithin described which enables searching vessels to locate the sunken vessel and also to raise same.

A further object of my invention is to provide a device of the character herewithin described, which can either be actuated manually or can be pre-set when submerging to release itself after a predetermined length of time has elapsed.

A further object of my invention is to provide a device of the character herewithin described, which will enable the sunken vessel to be raised by hoisting rather than the flotation method.

Still another object of my invention is to provide a device of the character herewithin described which eliminates the necessity of divers descending the vessel before raising operations can begin.

A yet further object of my invention is to provide a device of the character herewithin described which enables the salvaging operations to begin as soon as the search vessels arrive at the scene, thereby ensuring that the occupants of the sunken vessel remain below for the minimum length of time.

Still another object of my invention is to provide a device of the character herewithin described which is relatively simple to install on submarines, is simple in operation, and otherwise well suited to the purpose for which it is designed.

With the foregoing objects in view, and such other objects and advantages as will become apparent to those skilled in the art to which this invention relates as this specification proceeds, my invention consists essentially in the arrangement and construction of parts all as hereinafter more particularly described, reference being had to the accompanying drawings in which:

Figure 1 shows a perspective view in reduced form of a submarine with the four buoys floating upon the surface of the water.

Figure 2 is an enlarged sectional view of one of the compartments, together with one of the storage compartments for the hoisting cable.

Figure 3 is a top plan fragmentary view showing the cover panel and release means.

Figure 4 is a fragmentary perspective view of part of the release means.

Figure 5 is an enlarged sectional view of the retaining pin.

In the drawings like characters of reference indicate corresponding parts in the different figures.

Many systems have been tried for the effective rescue of personnel trapped in sunken vessels such as submarines and some of these methods

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include means for locating the vessel and subsequent recovery thereof.

However, most of these systems contain several disadvantages, the principal one of which being the fact that very often the personnel is incapable of releasing the signalling means after the accident has occurred.

My invention overcomes this disadvantage inasmuch as a manual release means is provided together with an automatic release means which can be set in motion for a predetermined time factor before the craft submerges.

Proceeding now to describe my invention in detail, it will be seen upon reference to the accompanying drawings that I have illustrated a submarine schematically shown by the reference character 1, which submarine is to be understood as being submerged and unable to surface. At four strategic points upon the deck 2 of the submarine are located one of my devices collectively shown by the reference character 3. Reference to the remaining figures of the drawings show details of this recovery device and will be described in detail hereinafter.

I have provided a compartment 4 situated below the deck 2 of the submarine but communicating therewith, said compartment including the vertical side walls 5, a detachable base panel 6, and a cover panel 7 which is hingedly secured to the deck 2 and is adapted to cover and close off the compartment 4.

Within this compartment is normally stored a buoy 8 having the usual flotation characteristics, said buoy having a hoisting ring 9 secured to the surface thereof. Also secured to the surface of the buoy and preferably diametrically opposite to the hoisting ring 9, is a further ring 10 to which is secured one end 11 of a retaining line 12 coiled in the bottom portion of the compartment 4 as clearly illustrated.

The opposite end 13 of the retaining line passes through an aperture 14 within the base panel 6 and is connected to a relatively heavy cable 15 which is stored below the compartment 4 within the hull of the vessel. This line 15 is in turn connected to a main hoisting cable 16 of relatively heavy construction, said hoisting cable also being stored below the compartment 4 and it will be appreciated that the other end of the hoisting cable is secured to the hull of the submarine by any conventional means (not illustrated).

From the foregoing, it will be appreciated that if the buoy 8 is upon the surface of the water as illustrated in Figure 1, the retaining line 12 will extend from the buoy downwardly to the submarine. Furthermore, it will be seen that if the buoy is then secured to a winch on the rescue vessel by means of the hoisting ring 9, the retaining line 12 may be hauled in which in turn raises the cable 15.

As cable 15 is extended, this in turn will lift the hoisting cable 16 to the surface which hoisting cable can then be secured to the winch and salvage operations can commence. In this connection, it should be observed that the bottom or base panel 6 of the compartment is made detachable so that the larger diameter of the hoisting cable 16 will not foul the aperture 14. Rather, the hoisting cable rips out the base panel 6 which is formed with a down-turned edge 17 to facilitate such displacement.

Dealing now with the means to release the buoys 8 together with the retaining cables 12, reference should be made to the drawings which show the afore-mentioned cover panel 7 covering the compartment 4. It will be seen that what I define as a closure bar 18 spans the cover panel 7 and is hingedly secured as at 19 to the deck 2 adjacent one side of the cover panel. This bar overlies the panel when in the closed position and prevents displacement thereof due to the retaining means hereinafter to be described.

To retain the bar in this position I have provided a plate 20 which is secured to the deck 2 by means hereinafter to be described, upon the opposite side of the cover panel to the hinge means 19. This plate includes a pair of upstanding supports 21 which are apertured as at 22 to receive a pin 23 transversely and it will be observed that when in the closed position, the pin 23 effectively restrains the outer end 24 of the bar 18, thus preventing the opening of the closure panel 7.

It will be seen, therefore, that in order to release the cover panel and hence the buoy 8, the pin 23 has to be removed or disrupted, thus allowing the buoyancy of the buoy 8 to lift the panel 7.

Dealing first with the manual means of release for the pin 23, reference should be made to Figure 2 which shows a vertical rod 24' carried by bearings 25, the upper end 26 of the rod being screw threadably engageable within an aperture 28 within the plate 20. This screw threaded attachment of the rod 24' to the plate 20 is the means whereby the plate 20 is anchored to the deck 2 of the submarine.

The lower end of rod 24' is screw threaded as at 29 and engaged upon these threads is a bevel gear 30. A further bevel gear and shaft 31 engages the bevel gear 30 and extends via conventional rod and linking means to the interior control room of the submarine. As these linkage means are conventional, these details have not been illustrated.

The bevel gear 30 is prevented from vertical movement by the fork bearing 25 so that it will be observed that if bevel gear 30 is rotated, the rod 24' will move vertically so that it will be seen that the upper end 26 of the rod may be caused to disengage from the screw threaded aperture 28, thus permitting the buoyancy of the buoy 8 (when submerged) to force the lid or cover panel 7 upwardly, as the bar 18 is no longer restrained by the pin 23, which is carried by plate 20.

However, to ensure that the buoys will rise if trouble is encountered while submerged and the crew is unable to operate the manual release means hereintofore described, I have provided automatic means for the disruption of pin 23. This pin, which is cylindrical in shape, is drilled internally as at 32 to receive a charge of explosive and a screw scap 33 is provided to close off the drillings after the charge has been loaded.

A shoulder 34 is provided upon the cap 33 and is

screw threaded to receive an armoured and waterproof conduit 35 which in turn carries a slow burning fuse 36 of conventional construction and it will be seen from Figure 5 that this fuse extends through the cap and communicates with the explosives, in the conventional manner.

The conduit and fuse 35 and 36 respectively extend from the cap 33 to a location within the interior of the submarine and it is intended that a conventional time fuse setup be incorporated with this device. As these time fuse elements are well known, details are not being shown in this application, but it should be pointed out that the principle behind the use of the time fuse element is that when the submarine is submerging, the fuse can be set to be ignited automatically after a predetermined lapse of time, which lapse of time should be slightly in excess of the expected sojourn of the submarine below the surface.

If the submarine surfaces on or before the time limit, then the time fuse can be rendered inoperative, but if trouble is encountered, the fuse will be ignited after the time limit whereupon the pin 23 will explode thus disrupting same and causing release of the bar 18. In order to ensure that the disruption occurs positively, a pair of annular recesses 37 are provided around the casing of the pin 23 and adjacent the location of the bar 18.

From the foregoing it will be seen that the pin 23 can be disrupted either manually or automatically thus permitting release of the buoys 8 and the subsequent recovery of the vessel.

Since various modifications can be made in my invention as hereinabove described, and many apparently widely different embodiments of same made within the spirit and scope of the claim without departing from such spirit and scope, it is intended that all matter contained in the accompanying specification shall be interpreted as illustrative only and not in a limiting sense.

What I claim as my invention is:

In a submarine salvage device, including a compartment in the submarine hull, and a closure lid therefore, said lid being hingedly secured to the hull and a bar projecting from the cover, means to release said cover; said means including means to effect release explosively and means to effect release manually as desired, said means to release said cover explosively from said compartment including a plate secured adjacent said closure lid, a pair of supports upstanding from said plate, an explosive pin spanning said supports, the outer end of said closure bar being retained in position by said pin, and means to effect the explosive disintegration of said pin, said manual means to release said buoy from said compartment including a vertical rod screw-threadably engageable within said plate, said rod detachably securing said plate adjacent to said closure lid, and means selectively to rotate said rod thereby disengaging the end thereof from said plate.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
993,205	Shea	May 23, 1911
1,918,405	Koumoutsakos	July 18, 1933
2,302,280	Warren	Nov. 17, 1942

FOREIGN PATENTS

Number	Country	Date
419,137	France	Dec. 27, 1910
427,559	France	Aug. 8, 1911