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A MARKER BUOY

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The present invention relates to an arrangement for locating the position of a sunken craft.

When a craft sinks in a harbour or in another waterway, it is desirable to salvage the craft either for repairs, insurance purposes or to clear the waterway to maintain navigational safety.

Before the sunken craft can be salvaged, the position of the sunken craft must be accurately determined so as to minimise the time taken to conduct the costly salvage operation. The position of the sunken craft has traditionally been determined by scanning using sonar equipment. One exception to this rule is that craft that have sunk while docked at a wharf can usually be located by reference to the mooring position or visually.

The cost of a scanning operation using sonar equipment can be quite costly. The size of the area to scan depends on the accuracy of the reported position at the time of sinking, the tidal streams and the depth of water at the sinking position. The greater the area to be searched, the greater scanning time and therefore the scanning costs. The sonar equipment required for this scanning operation is very expensive to hire or operate.

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It is accordingly an object of the present invention to provide an alternative method and arrangement for locating the position of a sunken craft, which in most instances will avoid the requirement to scan for the craft using sonar equipment.

According to the present invention there is provided an arrangement for locating the position of a sunken craft in a body of water comprising a buoyant member which is secured to the craft via a flexible elongate element, wherein the buoyant member is held in a fixed location on board the craft by a fixing means until the craft sinks, at which point the buoyancy of the buoyant member causes the buoyant member to overcome the fixing means and float to the surface of the water, the buoyant member thereafter defining a marker indicating the position of the sunken craft.

As it will be appreciated to persons skilled in the art of the invention, this arrangement provides a very costeffective alternative for enabling the position of a sunken craft to be determined.

Preferably, the flexible elongate element is arranged such that the buoyant member can float freely when the craft sinks after the buoyant member has overcome the fixing means. In the case where the flexible elongate element comprises a rope or chain or the like, the rope or chain could be coiled underneath the buoyant member in such a way that knotting of the rope or chain as the buoyant member rises in the water is avoided.

Preferably, the buoyant member and the flexible elongate element are housed within a housing fixed to the craft which provides a shield for the buoyant member and the flexible elongate element. For example, if the

flexible elongate element is coiled underneath the buoyant member, the coiled flexible elongate element and buoyant member can be conveniently shielded or protected by a housing which avoids or inhibits the rope and the buoyant member from being knocked about.

The fixing means that keeps the buoyant member held in a fixed location on board the craft may be in the form of a variety of different mechanisms. For one example, the marker buoy could be physically attached by a connector such as a wire, a thread or the like to the craft or to the housing. The fixing force holding the buoyant member in place must be capable of being overcome by breaking the connector when the buoyant member rises as the craft sinks.

However, preferably, the fixing means is in the form of a housing and a cover, and the buoyant means and the flexible elongate element are held within the housing until the cover is displaced by the buoyant member rising and forcing the cover open as the craft sinks. This arrangement is advantageous since the covered housing arrangement protects and shields the buoyant member and flexible elongate element from tampering or accidental damage.

Preferably, the cover is coupled to the housing by a coupling means which can be broken by the force of the buoy rising as the craft sinks. More preferably, the cover cannot be removed from the housing without breaking the coupling means to thereby provide a tamper-indicating feature. For one example only, the coupling means may be in the form of a thin wire or plastic thread that can be broken by the force of the buoyant member rising as the craft sinks.

Preferably, the flexible elongate element is in the form of a rope or chain.

5 More preferably, the rope or chain is at least 50 metres in length. The rope or chain may also be provided with a sinker fitted a distance of about 10 metres from the end of the rope or chain attached to the buoyant member.

10 Preferably, the arrangement is located at a position remote from cargo storage areas and designated passenger areas. This will minimise the risk of the arrangement being deliberately or accidentally damaged or tampered with.

15 Preferably, the arrangement is secured to the craft at a position remote from the gunwale of the craft so as to avoid the arrangement becoming damaged or unfixed by waves.

20 The present invention will now be described in further detail with reference to the drawings of the preferred embodiment of the invention in which:

25 Figure 1 is a perspective view of the arrangement of the preferred embodiment of the present invention;

Figure 2 is a cross-sectional view of the arrangement illustrated in Figure 1; and

30 Figure 3 is a schematic illustration of a sunken craft with the arrangement of Figure 1 indicating the position thereof.

35 The arrangement for locating the position of the sunken craft 1 in a body of water 2 according to the preferred embodiment illustrated comprises a buoyant member

in the form of a buoy 3, which is secured to the craft via a flexible elongate element in the form of a rope 4.

The buoy 3 has a diameter of at least 30cm and preferably is painted a bright colour such as yellow or orange. The buoy is also marked with retro-reflective tape on the top half to facilitate location of the buoy. In addition, the buoy is marked with the craft number on the top half so that persons observing the buoy can record the craft number and report to the local authorities.

The rope 4 is at least 50 meters in length. The rope 4 of the preferred embodiment of the invention is an 8mm diameter polypropylene rope. The rope is attached to one end to the buoy and at the other end to a secure point on board the craft.

The buoy 3 is held in a fixed location with respect to the craft by a fixing means in the form of a housing 5 and cover 6. In some circumstances, the cover could be frictionally engaged to the housing so that a significant force must be applied to the cover to displace the cover and enable the buoy to be removed from the housing. Alternatively, and according to the preferred embodiment illustrated, the cover 6 is coupled to the housing by a coupling means in the form of thin wire 10. The thin wire couplings 10 must be capable of breaking under the force of the buoy rising as the craft sinks. The wire couplings are advantageous since they define a tamper-indicating feature.

The housing 5 provides a further advantage of shielding the buoyant member and the flexible elongate element to thereby prevent the rope 4 and the buoy 3 from being knocked about on the surface of the craft. In this regard, the buoy should be secured to the craft at a

position remote from cargo storage areas and designated passenger areas. This minimises the risk of the arrangement being deliberately or accidentally damaged or tampered with. The location of the arrangement must also
5 be such that the buoy 3 is allowed to float free when released from the housing. Accordingly, location of the arrangement within a cabin of the craft would not be appropriate. According to the preferred embodiment illustrated, the arrangement is affixed to the roof of the
10 craft. This position is also sufficiently remote from the gunwale of the craft so as to avoid the arrangement becoming damaged or unfixed by waves washing over the gunwale. The arrangement is affixed to the upper surface 7 of the craft 1 by a bolt 8. The bolt securely fixes the
15 housing to the craft 1. The end of the rope is passed through the housing and is led from the housing and fixed to a strong point on the craft. For one example, the end of the rope is fixed to the engine bed. For another example, the end of the rope is fixed to the keel of the craft.

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In the event that the craft 1 having this arrangement sinks (as illustrated in Figure 3), the buoyancy of the buoy 3 causes the buoy to overcome the wire couplings 10 holding the cover 6 in place and the buoy 3 is
25 released from the housing 5. The buoy floats to the surface of the water 2 and thereafter defines a marker indicating the position of the sunken craft 1.

As is illustrated in Figure 3, the rope is
30 provided with a sinker 9 of at least 1Kg in weight fitted at a distance of about 10 metres from the buoy.

The rope 4 in the housing is in a coiled arrangement so that knotting of the rope as the buoy rises
35 in the water is in most instances avoided. The marker buoy 3 can then be identified visually, and the salvage

operation can be conducted without the requirement of using expensive sonar equipment.

Many modifications may be made to the preferred embodiment illustrated without departing from the spirit and scope of the invention. For one example only, the buoy need not be located in a housing with a cover. Instead, another arrangement keeping the buoy in a fixed location with respect to the craft until the craft sinks could be used. However, it will be understood that further advantages are obtained when a housing is provided.



THE CLAIMS DEFINING THE

INVENTION ARE AS FOLLOWS:

1. An arrangement for locating the position of a sunken craft in a body of water comprising a buoyant member
5 which is secured to the craft via a flexible elongate element, wherein the buoyant member is held in a fixed location on board the craft by a fixing means until the craft sinks, at which point the buoyancy of the buoyant member causes the buoyant member to overcome the fixing
10 means and float to the surface of the water, the buoyant member thereafter defining a marker indicating the position of the sunken craft.

2. The arrangement as claimed in claim 1 wherein the
15 flexible elongate element is arranged such that the buoyant member can float freely when the craft sinks after the buoyant member has overcome the fixing means.

3 The arrangement as claimed in claim 1 or claim 2
20 wherein the buoyant member and the flexible elongate element are housed within a housing fixed to the craft which provides a shield for the buoyant member and the flexible elongate element.

25 4 The arrangement as claimed in any one of claims 1, to 3 wherein the fixing means is in the form of a housing and a cover, and the buoyant means and the flexible elongate element are held within the housing until the cover is displaced by the buoyant member rising and forcing
30 the cover open as the craft sinks.

5 The arrangement as claimed in claim 4 the cover is coupled to the housing by a coupling means which can be broken by the force of the buoy rising as the craft sinks.

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6. The arrangement as claimed in claim 5, wherein



the cover cannot be removed from the housing without breaking the coupling means to thereby provide a tamper-indicating feature.

- 5 7. The arrangement as claimed in any one of claims 1 to 6, wherein the flexible elongate element is in the form of a rope or chain.
8. The arrangement as claimed in claim 7, wherein
10 the rope or chain is at least 50 metres in length.
9. The arrangement as claimed in claim 8, wherein the rope or chain is provided with a sinker fitted a distance of about 10 metres from the end of the rope or
15 chain attached to the buoyant member.
10. The arrangement as claimed in any one of claims 1 to 9, wherein the arrangement is located at a position remote from cargo storage areas and designated passenger
20 areas of the craft.
11. The arrangement as claimed in any one of claims 1 to 10, wherein the arrangement is secured to the craft at a position remote from the gunwale of the craft so as to
25 avoid the arrangement becoming damaged or unfixed by waves.
12. The arrangement for locating the position of a sunken craft substantially as herein described with reference to the drawings.