United States Patent [19]

Hudson

[11] **3,874,013**

[45] **Apr. 1, 1975**

[54] **BUOY DEVICE FOR LOCATING AND RETRIEVING SUNKEN VESSELS**

[76] Inventor: **Gerald E. Hudson,** 815 S. 136th, Seattle, Wash. 98168

[22] Filed: **Jan. 21, 1974**

[21] Appl. No.: **435,275**

[52] **U.S. Cl.** **9/9,** 114/16.8, 114/51

[51] **Int. Cl.** **B63b 21/52**

[58] **Field of Search** ..... 9/8 R, 9; 114/16.8, 44, 114/50, 51, 52, 54

[56] **References Cited**

UNITED STATES PATENTS

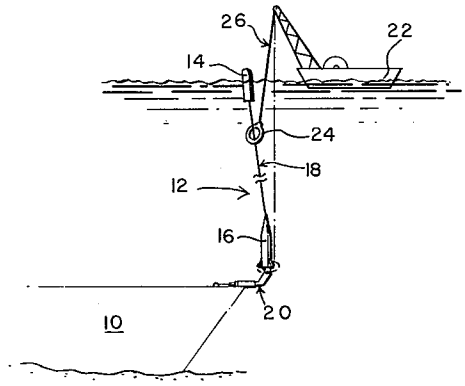
1,256,365	2/1918	Pettit	9/9
1,300,553	4/1919	Bartlett et al.	9/9
3,156,933	11/1964	Brooks	9/9
3,425,070	2/1969	Clark	9/9

Primary Examiner—Trygve M. Blix
Assistant Examiner—Jesus D. Sotelo
Attorney, Agent, or Firm—Graybeal, Barnard, Uhlir & Hughes

[57] **ABSTRACT**

A dual buoy rescue device is provided for locating and retrieving sunken vessels. An essentially cylindrical anchor buoy having a tapered end is secured to the vessel by buoy orientation device comprising a housing mounted to the vessel, a rotatable shaft mounted within the housing, and a shaft extension secured to the anchor buoy. The buoy orientation device is adapted to allow the anchor buoy to float freely above the vessel when the device is in operation, regardless of the orientation of the vessel or the manner in which it sinks. Spaced circumferentially about the anchor buoy and projecting angularly outwardly therefrom are a plurality of spring-loaded fingers which are adapted to move inwardly into the buoy yet remain in their outwardly projected position when subjected to a force directed towards the tapered end of the buoy. A marker buoy adapted to float freely on the surface of the water is connected to the anchor buoy by a long pilot line. The sunken vessel is retrieved by guiding a retrieving ring with a cable or chain attached thereto down along the pilot line over the anchor buoy and the projecting fingers. The ring is then lifted towards the surface by the cable or chain so as to engage the ends of the projecting fingers which maintain their outwardly projected position. The vessel is then towed to the surface by the chain or cable attached to the retrieving ring.

10 Claims, 7 Drawing Figures



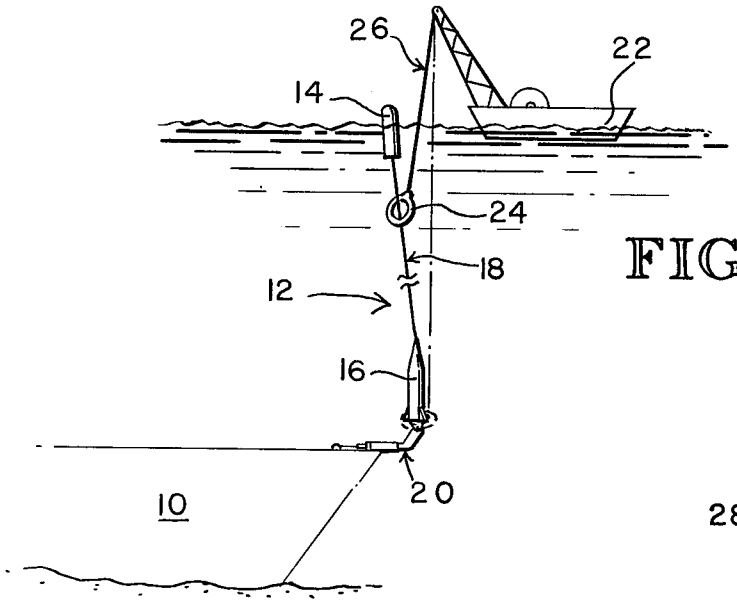


FIG. 1

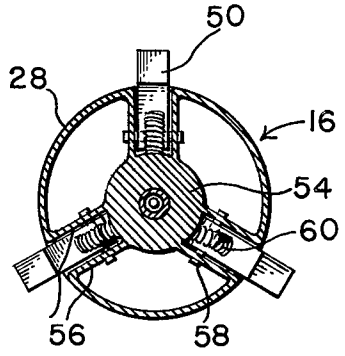


FIG. 3

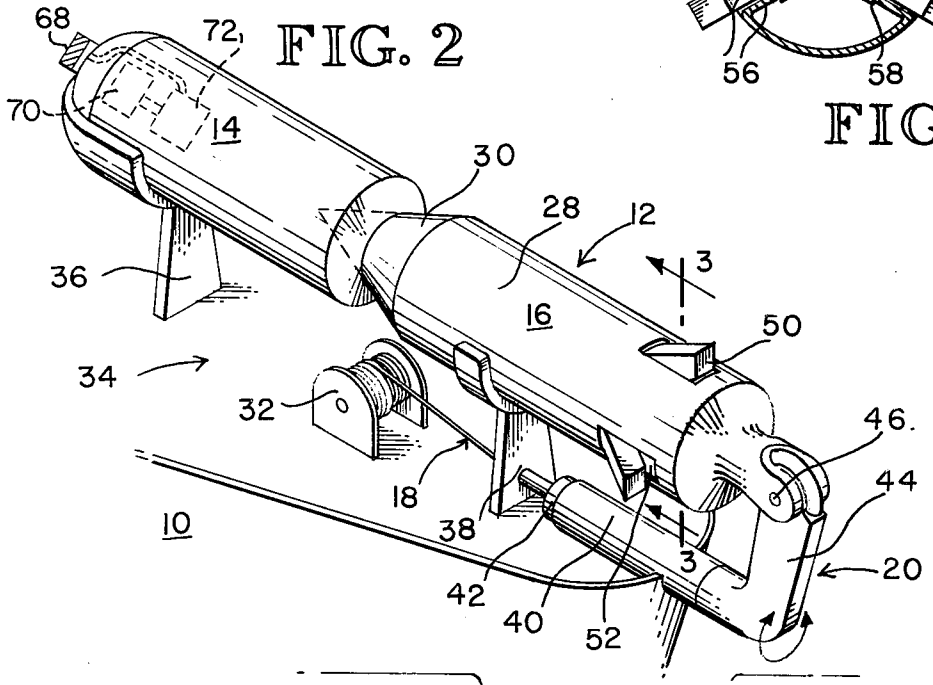


FIG. 2

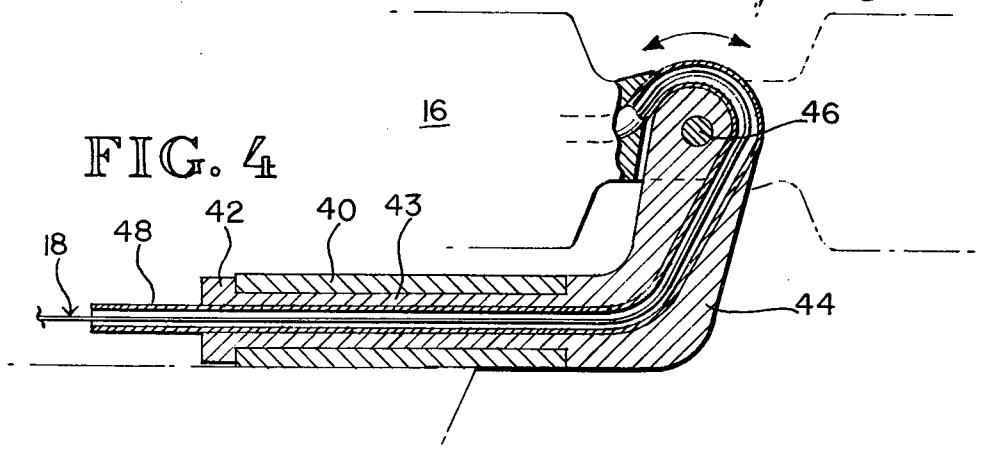


FIG. 4

FIG. 5

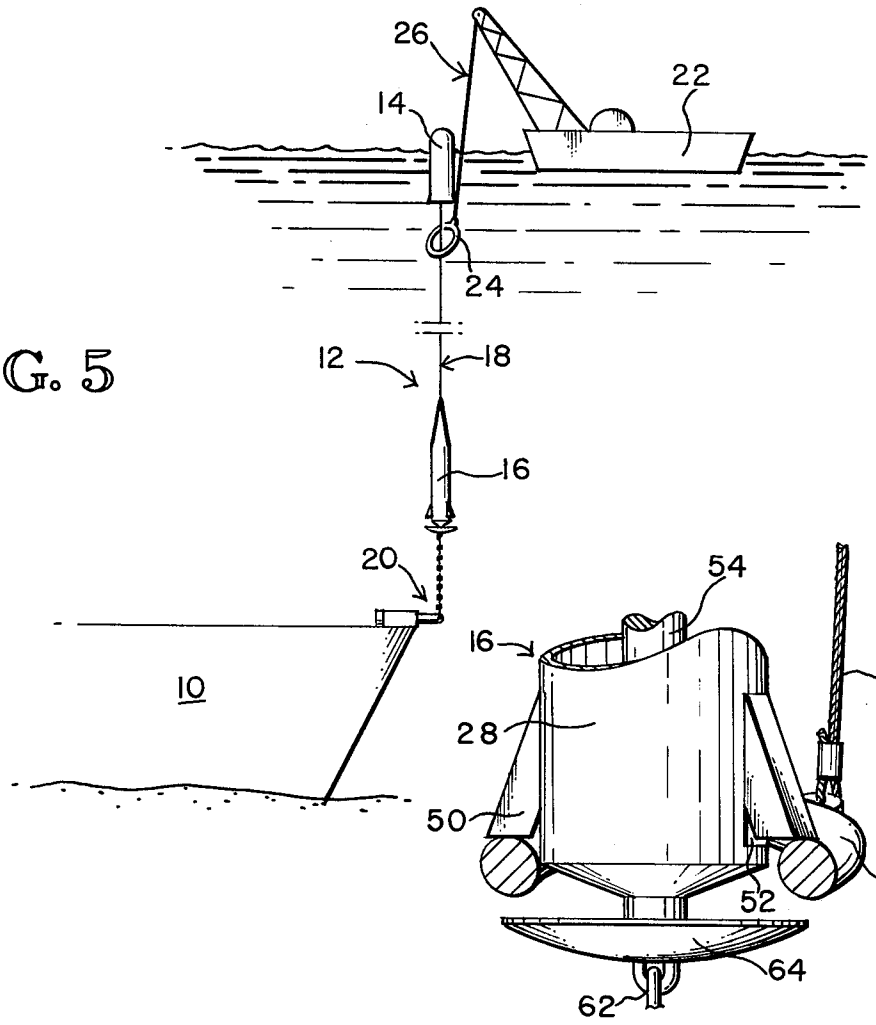


FIG. 6

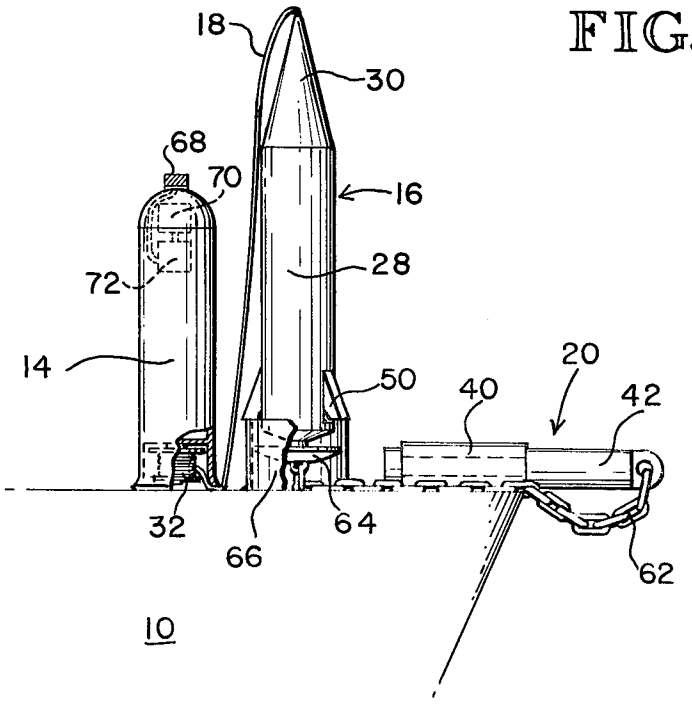


FIG. 7

BUOY DEVICE FOR LOCATING AND RETRIEVING SUNKEN VESSELS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to the recovery of submerged objects and more particularly to a device and method for locating and retrieving sunken ships.

2. Description of the Prior Art

Marker buoy systems have been utilized in conjunction with locating submerged objects and in particular sunken ships for a considerable period of time. An example of one such marker buoy system can be found in U.S. Pat. No. 801,777. In addition, such marker buoy systems often include means for aiding the retrieval of the submerged object or sunken ship. Examples of these types of systems can be found in U.S. Pat. Nos. 3,156,933 and 3,425,070.

A major problem with such buoy systems when utilized in conjunction with locating and retrieving sunken ships is that the apparatus which aids the retrieval of the sunken ship frequently gets entangled with the ship as it is sinking. Furthermore, such systems generally will not function properly unless the sunken vessel comes to rest on the bottom in an upright position. For example, the grapple head disclosed in U.S. Pat. No. 3,156,933 may easily get trapped beneath the sunken vessel if the vessel were to come to rest on the bottom in an upside down position. This would make retrieval of the vessel by the disclosed device essentially impossible.

SUMMARY OF THE INVENTION

It is, therefore, a primary object of the present invention to provide a dual buoy rescue device for locating and retrieving a sunken vessel wherein the means utilized for retrieving the vessel cannot become entangled in or trapped beneath the sunken vessel regardless of its orientation on the bottom or the manner in which it sinks.

In accordance with the present invention, an essentially cylindrical anchor buoy is provided having one tapered end with the other end connected to buoy orientation means. The buoy orientation means is securely mounted to the vessel and allows the anchor buoy to float freely above the vessel with its tapered end directed upwardly towards the surface of the water regardless of the orientation of the vessel on the bottom or the manner in which it sinks. In preferred form, the buoy orientation means includes a housing securely mounted to the vessel, a shaft secured within the housing and adapted to freely rotate therewithin, and pivoting means connecting the shaft to the anchor buoy.

A plurality of spaced apart, spring-loaded fingers are disposed circumferentially about and project angularly outwardly from the anchor buoy, the fingers diverging away from the tapered end of the buoy. The fingers are utilized during retrieval of the vessel and are adapted to move inwardly into the buoy when subjected to a force directed essentially towards the buoy orientation means yet remain immobile in the outwardly projected position when subjected to a force directed essentially towards the tapered end of the buoy.

Connected to the tapered end of the anchor buoy by a long pilot line is a marker buoy adapted to float freely on the surface of the water in which the vessel is submerged. In preferred form, the marker buoy contains a light beacon and an electronic signaling device to aid in locating the position of the sunken vessel. The pilot line permits the vessel to be retrieved by guiding a retrieving ring, which is secured to a cable or chain, down to the anchor buoy and over the projecting fingers, the fingers moving into the buoy when the ring passes thereover and then returning to their outwardly projecting position. The ring is then pulled up towards the surface by the cable or chain so as to engage the divergent ends of the fingers, the vessel then being lifted to the surface.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a schematic illustrating one embodiment of the present invention as it is being utilized to retrieve a sunken vessel;

FIG. **2** is an elevation view showing the present invention secured to a vessel and in a stored position;

FIG. **3** is a cross-sectional view taken essentailly along line **3—3** of FIG. **2** and showing the spring-loaded fingers which project outwardly from the anchor buoy;

FIG. **4** is an enlarged, cross-sectional view of the buoy orientation means shown in FIG. **2** and illustrating the pivotal relationship between the anchor buoy and the buoy orientation means;

FIG. **5** is a schematic illustrating a second embodiment of the present invention as it is being utilized to retrieve a sunken vessel;

FIG. **6** is an enlarged side elevation view of the lower portion of the anchor buoy illustrated in FIG. **5** with some parts in section;

FIG. **7** is a side elevation view of the second embodiment of the present invention in a stored position on a vessel.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. **1** and **5**, there is shown a sunken vessel **10** and a dual buoy rescue device designated generally by the number **12.** When device **12** is in operation, marker buoy **14** floats freely on the surface of the water and is secured to anchor buoy **16** by pilot line **18.** Buoy orientation means **20** is secured to vessel **10** and anchor buoy **16** and allows anchor buoy **16** to float freely above vessel **10** regardless of the orientation of vessel **10** on the bottom.

To retrieve vessel **10** from the bottom, a rescue or salvage ship **22** places a retrieving ring **24,** which is attached to a strong cable or chain **26,** over marker buoy **14** and around pilot line **18.** Ring **24** is then guided down along line **18** so that it passes over anchor buoy **16.** Ring **24** is then lifted upwardly to engage the ends of a plurality of fingers projecting outwardly from buoy **16,** as described hereinafter, and the anchor buoy and vessel **10** are then lifted to the surface by cable or chain **26.**

In FIGS. **2** and **4,** one embodiment of the present device is shown which is best utilized with submersible vehicles such as submarines. Marker buoy **14** is connected by line **18** to anchor buoy **16.** Anchor buoy **16** consists of an essentially cylindrical shell **28** which has a tapered end **30,** its other end being connected to the buoy orientation means **20.** In preferred form, line **18** is stored on a spool **32** which is mounted to the deck **34** of vessel **10.** Line **18** extends from spool **32** through the buoy orientation means **20,** through anchor buoy

and into marker buoy **14.** For convenient storage of e two buoys on the deck of the ship, an essentially nical recessed portion is provided at one end of arker buoy **14** into which tapered end **30** is inserted. oys **14** and **16** are then supported on deck **34** by ackets **36** and **38.** Since vessel **10** is submersible in is particular embodiment, the dual buoy rescue de- e **12** preferably is either manually released or acti- ted by pressure sensitive means preset to release the oys when the vessel reaches a certain depth, such as ash depth for a submarine.

In this particular illustrated embodiment the buoy ientation means **20** includes a housing **40,** preferably lindrical in shape, which is securely mounted to deck of vessel **10,** preferably by heavy welding. It should noted that this mounting must be quite strong inas- ich as the weight of the sunken ship will be borne at s point when the vessel is being lifted to the surface. sposed within housing **40** is a shaft **42** which is apted to rotate freely therewithin, preferably by pro- ling a reduced neck **43** which is surrounded by hous- g **40.** An angular extension **44** of shaft **42** projects twardly therefrom and rotates therewith. The free d of extension **44** is pivotally connected to the end anchor buoy **16** in any desired manner, pivot pin **46** ing preferred so that the plane through which anchor oy **16** pivots is essentially parallel to the longitudinal is of shaft **42.**

In preferred form, a flexible housing **48** extends rough the center of shaft **42** and angular extension **44** d up into buoy **16,** line **18** passing through housing . Housing **48** protects line **18** from the effects of ather and corrosion. As can be seen from this pre- red construction, the 360° rotational capability of aft **42** and angular extension **44** and the pivotability anchor buoy **16** about angular extension **44** allows e ship to come to rest on the bottom in any position, t anchor buoy **16** will always be free to float away m the ship in an upward position with its tapered end directed upwardly towards the surface of the water which the ship has sunk. Therefore, buoy **16** cannot come entangled in or caught beneath the vessel as it sinking.

In FIGS. **2, 3** and **6,** there is illustrated a plurality of gers **50** which are circumferentially spaced about ell **28** of anchor buoy **16.** In their normal position, gers **50** project angularly outwardly from shell **28,** verging away from tapered end **30.** A plurality of lon- tudinal slots **52** are provided in shell **28** through ich fingers **50** pass into the center of buoy **16.** Cen- ally disposed within and extending the length of shell is an axial shaft **54,** and a plurality of paired brackets are provided for pivotally securing the radially in- ard ends of fingers **50** to shaft **54.** Each pair of brack- s **56** are welded to shaft **54** in longitudinal alignment th slots **52,** and each finger **50** extends between the o brackets of a pair of brackets **56** and is pivotally at- ched thereto by a cross-pin **58.** In this manner, fingers may pass into and out of buoy **16.** To achieve the oper function of fingers **50** during retrieval of a nken ship, a compressed resilient member **60** is se- ured between each finger **50** and shaft **54** subjacent oss-pin **58** in such a manner as to maintain constant utward pressure against fingers **50.** This pressure eps fingers **50** in the outwardly extended position so to contact the uppermost longitudinal ends of slots **52,** slots **52** being of sufficient length to enable fingers **50** to pass into buoy **16.**

When a force component directed essentially towards buoy orientation means **20** is exerted against fingers **50,** resilient members **60** are further compressed, and fingers **50** move inwardly into buoy **16.** When this force is removed, fingers **50** spring back to their outwardly projecting position as illustrated due to the pressure exerted by resilient members **60.** When fingers **50** are subjected to a force component that is directed essentially towards the tapered end **30** of buoy **16,** fingers **50** resist the force and do not move into buoy **16.** In this manner, the retrieval ring **24** may be guided over buoy **16** and fingers **50,** fingers **50** being pushed into buoy **16** as the ring passes thereover. After the ring has completely passed over fingers **50,** fingers **50** return to the illustrated outwardly projecting position. When line **26** (FIGS. **1** and **5**) is then drawn upwardly so as to pull ring **24** toward the surface, ring **24** engages the divergent ends of fingers **50** and exerts a force against fingers **50** that is directed essentially towards the tapered end **30,** thereby lifting buoy **16** and vessel **10** upwardly to the surface.

If vessel **10** is a surface ship, it would be highly desirable for device **12** to automatically be put into operation merely by contacting water. This would eliminate the necessity for manually activating the device as well as the delay which would be incurred if the device were activated by pressure sensing means. FIGS. **5, 6** and **7** illustrate a second embodiment of the present invention which is adapted for activation by water contact. In this embodiment, line **18** is preferably stored on a spool **32** which is located within buoy **14** in lieu of being attached to the deck of vessel **10.** This storage location for line **18** simplifies the construction of buoy orientation means **20.** Orientation means **20** includes a cylindrical housing **40** and a shaft **42** which is freely rotatable therewithin, as in the previously described embodiment. Secured to the end of shaft **42,** however, is a chain **62** which is free to pivot at least 180° about the point of attachment to shaft **42,** chain **62** also being attached to buoy **16.** As can be seen, this construction of the buoy orientation means will also enable buoy **16** to float freely away from and above vessel **10** regardless of the orientation of vessel **10** as it sinks and as it finally comes to rest on the bottom. Due to the use of chain **62,** a ring retainer disk **64** is preferably mounted to the end of anchor buoy **16** subjacent the divergent ends of fingers **50** and preferably at the approximate position of attachment between buoy **16** and chain **62.** Disk **64** has a diameter greater than the diameter of buoy **16** so that it will stop the downward progression of ring **24** after it has passed over fingers **50** as well as aid in orientating ring **24** for proper engagement against the ends of fingers **50.** Buoys **14** and **16,** when not in use, are preferably stored in an upright position on the deck of vessel **10** without being secured thereto. The bottom end of anchor buoy **16** preferably is placed within a cylindrical container **66** with the divergent ends of fingers **50** resting on the upper edge thereof. In this manner, when vessel **10** begins to sink, the buoyant buoys **14** and **16** are free to immediately float upwardly, buoy **14** proceeding to the surface and buoy **16** maintaining its freely floatable position immediately above the vessel **10.** Therefore, the location of the ship is marked by buoy **14,** and the means for retrieving the ship (fingers **50**) are kept free of the ship by buoy **16.**

Buoys **14** and **16** may be made buoyant by any means known to the art. While line **18** need not be especially strong, such as 5/16 inch nylon, cable or chain **26** and chain **62** must be of sufficient strength to withstand the weight of sunken vessel **10** during retrieval thereof. In addition, no part of buoy orientation means **20** or of anchor buoy **16** can be weaker than the tow cable or chain **26** on the rescue ship. It should be noted that in order to aid in locating the position of the sunken vessel **10,** marker buoy **14** may contain a light signaling device **68,** such as a light beacon, as well as an electronic signaling device **70,** along with means **72** for energizing both. It should further be noted that if vessel **10** is of sufficiently large size and weight, two rescue ships with bridging therebetween may be required to lift vessel **10.** With smaller vessels, however, the anchor chain and winch of most any ship should be sufficient to lift the sunken vessel to the surface.

As can be seen from the above detailed description, the present invention provides a simple yet efficient means for locating and retrieving sunken vessels. The invention may be embodied in other specific forms without departing from the spirit or central characteristics thereof. It will be understood, therefore, that the invention is not to be limited to the details given herein but that it may be modified within the scope and spirit of the appended claims.

What is claimed is:

1. A dual buoy rescue device for locating and retrieving sunken vessels comprising:

an essentially cylindrical anchor buoy having one end tapered and the other end connected to buoy orientation means mounted to said vessel and adapted to allow said anchor buoy to float freely above said vessel when said rescue device is in operation regardless of the orientation of said vessel, said tapered end being directed upwardly towards the surface of the water in which said vessel is submerged;

a plurality of spaced apart fingers disposed about and projecting angularly outwardly from said anchor buoy, diverging away from said tapered end, said fingers being adapted to move inwardly towards said buoy when subjected to a force component directed essentially towards said buoy orientation means and to resist movement when subjected to a force component directed essentially towards said tapered end; and

a buoyant marker buoy connected to said anchor buoy's tapered end by a long pilot line, said marker buoy being free to float on the surface of the water in which said vessel is submerged when said rescue device is in operation, said pilot line permitting said vessel to be retrieved by guiding a retrieving ring down to said anchor buoy and over said fingers so as to engage the divergent ends thereof.

2. The device according to claim **1,** wherein said buoy orientation means comprises a housing securely mounted to said vessel, a shaft secured within said housing and adapted to freely rotate therewithin, and an angular extension of said shaft disposed to rotate therewith, said anchor buoy being pivotally connected to said angular extension, the plane through which said anchor buoy pivots being essentially parallel with the longitudinal axis of said shaft.

3. The device according to claim **2,** wherein a flexible housing extends through said anchor buoy, said angular extension and said shaft, and said pilot line passes through said flexible housing and is stored on a spool mounted to the surface of said vessel, said marker buoy including an essentially conical recessed portion in one end thereof wherein the tapered end of said anchor buoy is engaged when said device is not in operation, there being brackets located on the surface of said vessel to releasably hold said engaged buoys when not in operation.

4. A device according to claim **3,** wherein said anchor buoy comprises an essentially cylindrical outer shell having one end tapered and its other end pivotally connected to said angular extension, said shell containing a plurality of longitudinal slots circumferentially spaced thereabout through which said fingers angularly pass, and a centrally disposed axial shaft extending the length of said shell, the radially inwardly ends of said fingers being pivotally connected to said shaft, with a compressed resilient member disposed between each of said fingers and said shaft subjacent the pivotal connections of said fingers so as to exert a radially outwardly force on said fingers, said slots being of sufficient length to enable said fingers to pass radially inwardly into said shell when subjected to a force component directed essentially towards said angular extension.

5. A device according to claim **2,** wherein said marker buoy includes a signal light device, an electronic signaling device, and means for energizing said devices.

6. A device according to claim **1,** wherein said buoy orientation means comprises a housing securely mounted to said vessel, a shaft secured within said housing and adapted to freely rotate therewithin, and a length of chain connected to said shaft, there being a ring retainer disk mounted to the end of said anchor buoy subjacent the divergent ends of said fingers and at the approximate position of connection between said anchor buoy and said chain, the diameter of said disk being greater than the diameter of said anchor buoy.

7. A device according to claim **6,** wherein said pilot line is stored on a spool disposed within one end of said marker buoy, said buoys being carried on the surface of said vessel adjacent each other when not in operation so as to allow water contact to activate said device.

8. A device according to claim **7,** wherein said anchor buoy comprises an essentially cylindrical outer shell having one end tapered and its other end pivotally connected to said chain, said shell containing a plurality of longitudinal slots circumferentially spaced thereabout through which said fingers angularly pass, and a centrally disposed axial shaft extending the length of said shell, the radially inwardly ends of said fingers being pivotally connected to said shaft, with a compressed resilient member disposed between each of said fingers and said shaft subjacent the pivotal connections of said fingers so as to exert a radially outwardly force on said fingers, said slots being of sufficient length to enable said fingers to pass radially inwardly into said shell when subjected to a force component directed essentially toward said retainer disk.

9. A device according to claim **6,** wherein said marker buoy includes a signal light device, an electronic signaling device, and means for energizing said devices.

10. A rescue device for locating and retrieving sunken vessels comprising:

first buoy means connected to buoy orientation means mounted on said vessel and adapted to en-

able said first buoy means to float freely above said vessel when said rescue device is in operation regardless of the orientation of said vessel;

finger means disposed about said first buoy means and adapted to move inwardly towards said first buoy means when subjected to a force component directed essentially towards said buoy orientation means and to resist movement when subjected to a force component directed essentially away from said buoy orientation means; and

second buoy means connected to said first buoy means by a line, said second buoy means being free to float on the surface of the water in which said vessel is submerged when said rescue device is in operation, said line permitting said vessel to be retrieved by guiding a retrieving ring down to said first buoy means and over said finger means for engagement therewith.

* * * * *

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,874,013 Dated April 1, 1975

Inventor(s) Gerald E. Hudson

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Columns 3 and 4 should appear as shown on the attached sheets.

FORM PO-1050 (10-69)

USCOMM-DC 60376-P69
U.S. GOVERNMENT PRINTING OFFICE : 869-930

16 and into marker buoy 14. For convenient storage of the two buoys on the deck of the ship, an essentially conical recessed portion is provided at one end of marker buoy 14 into which tapered end 30 is inserted. Buoys 14 and 16 are then supported on deck 34 by brackets 36 and 38. Since vessel 10 is submersible in this particular embodiment, the dual buoy rescue device 12 preferably is either manually released or activated by pressure sensitive means preset to release the buoys when the vessel reaches a certain depth, such as crush depth for a submarine.

In this particular illustrated embodiment the buoy orientation means 20 includes a housing 40, preferably cylindrical in shape, which is securely mounted to deck 34 of vessel 10, preferably by heavy welding. It should be noted that this mounting must be quite strong inasmuch as the weight of the sunken ship will be borne at this point when the vessel is being lifted to the surface. Disposed within housing 40 is a shaft 42 which is adapted to rotate freely therewithin, preferably by providing a reduced neck 43 which is surrounded by housing 40. An angular extension 44 of shaft 42 projects outwardly therefrom and rotates therewith. The free end of extension 44 is pivotally connected to the end of anchor buoy 16 in any desired manner, pivot pin 46 being preferred so that the plane through which anchor buoy 16 pivots is essentially parallel to the longitudinal axis of shaft 42.

In preferred form, a flexible housing 48 extends through the center of shaft 42 and angular extension 44 and up into buoy 16, line 18 passing through housing 48. Housing 48 protects

line 18 from the effects of weather and corrosion. As can be seen from this preferred construction, the 360° rotational capability of shaft 42 and angular extension 44 and the pivotability of anchor buoy 16 about angular extension 44 allows the ship to come to rest on the bottom in any position, yet anchor buoy 16 will always be free to float away from the ship in an upward position with its tapered end 30 directed upwardly towards the surface of the water in which the ship has sunk. Therefore, buoy 16 cannot become entangled in or caught beneath the vessel 10 as it is sinking.

In FIGS. 2, 3 and 6, there is illustrated a plurality of fingers 50 which are circumferentially spaced about shell 28 of anchor buoy 16. In their normal position, fingers 50 project angularly outwardly from shell 28, diverging away from tapered end 30. A plurality of longitudinal slots 52 are provided in shell 28 through which fingers 50 pass into the center of buoy 16. Centrally disposed within and extending the length of shell 28 is an axial shaft 54, and a plurality of paired brackets 56 are provided for pivotally securing the radially inward ends of fingers 50 to shaft 54. Each pair of brackets 56 are welded to shaft 54 in longitudinal alignment with slots 52, and each finger 50 extends between the two brackets of a pair of brackets 56 and is pivotally attached thereto by a cross-pin 58. In this manner, fingers 50 may pass into and out of buoy 16. To achieve the proper function of fingers 50 during retrieval of a sunken ship, a compressed resilient member 60 is secured between each finger 50 and shaft 54 subjacent cross-pin 58 in such a manner as to maintain constant outward pressure against fingers 50. This pressure keeps fingers 50 in the outwardly extended position so as to contact the uppermost longitudinal ends of slots 52, slots 52

being of sufficient length to enable fingers 50 to pass into buoy 16.

When a force component directed essentially towards buoy orientation means 20 is exerted against fingers 50, resilient members 60 are further compressed, and fingers 50 move inwardly into buoy 16. When this force is removed, fingers 50 spring back to their outwardly projecting position as illustrated due to the pressure exerted by resilient members 60. When fingers 50 are subjected to a force component that is directed essentially towards the tapered end 30 of buoy 16, fingers 50 resist the force and do not move into buoy 16. In this manner, the retrieval ring 24 may be guided over buoy 16 and fingers 50, fingers 50 being pushed into buoy 16 as the ring passes thereover. After the ring has completely passed over fingers 50, fingers 50 return to the illustrated outwardly projecting position. When line 26 (FIGS. 1 and 5) is then drawn upwardly so as to pull ring 24 toward the surface, ring 24 engages the divergent ends of fingers 50 and exerts a force against fingers 50 that is directed essentially towards the tapered end 30, thereby lifting buoy 16 and vessel 10 upwardly to the surface.

If vessel 10 is a surface ship, it would be highly desirable for device 12 to automatically be put into operation merely by contacting water. This would eliminate the necessity for manually activating the device as well as the delay which would be incurred if the device were activated by pressure sensing means. FIGS. 5, 6 and 7 illustrate a second embodiment of the present invention which is adapted for activation by water contact. In this embodiment, line 18 is preferably stored on a spool 32 which is located within buoy 14 in lieu of being attached to the

deck of vessel 10. This storage location for line 18 simplifies the construction of buoy orientation means 20. Orientation means 20 includes a cylindrical housing 40 and a shaft 42 which is freely rotatable therewithin, as in the previously described embodiment. Secured to the end of shaft 42, however, is a chain 62 which is free to pivot at least 180° about the point of attachment to shaft 42, chain 62 also being attached to buoy 16. As can be seen, this construction of the buoy orientation means will also enable buoy 16 to float freely away from and above vessel 10 regardless of the orientation of vessel 10 as it sinks and as it finally comes to rest on the bottom. Due to the use of chain 62, a ring retainer disk 64 is preferably mounted to the end of anchor buoy 16 subjacent the divergent ends of fingers 50 and preferably at the approximate position of attachment between buoy 16 and chain 62. Disk 64 has a diameter greater than the diameter of buoy 16 so that it will stop the downward progression of ring 24 after it has passed over fingers 50 as well as aid in orientating ring 24 for proper engagement against the ends of fingers 50. Buoys 14 and 16, when not in use, are preferably stored in an upright position on the deck of vessel 10 without being secured thereto. The bottom end of anchor buoy 16 preferably is placed within a cylindrical container 66 with the divergent ends of fingers 50 resting on the upper edge thereof. In this manner, when vessel 10 begins to sink, the buoyant buoys 14 and 16 are free to immediately float upwardly, buoy 14 proceeding to the surface and buoy 16 maintaining its freely floatable position immediately above the vessel 10. Therefore, the location of the ship is marked by buoy 14, and the means for retrieving the ship (fingers 50) are kept free of the ship by buoy 16.

Signed and Sealed this

twenty-second **Day of** *July 1975*

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks