Nov. 2, 1926. 1,605,343

D. S. GOULD ET AL

APPARATUS FOR LOCATING AND RAISING SUNKEN VESSELS

Filed Feb. 1, 1926 2 Sheets-Sheet 1

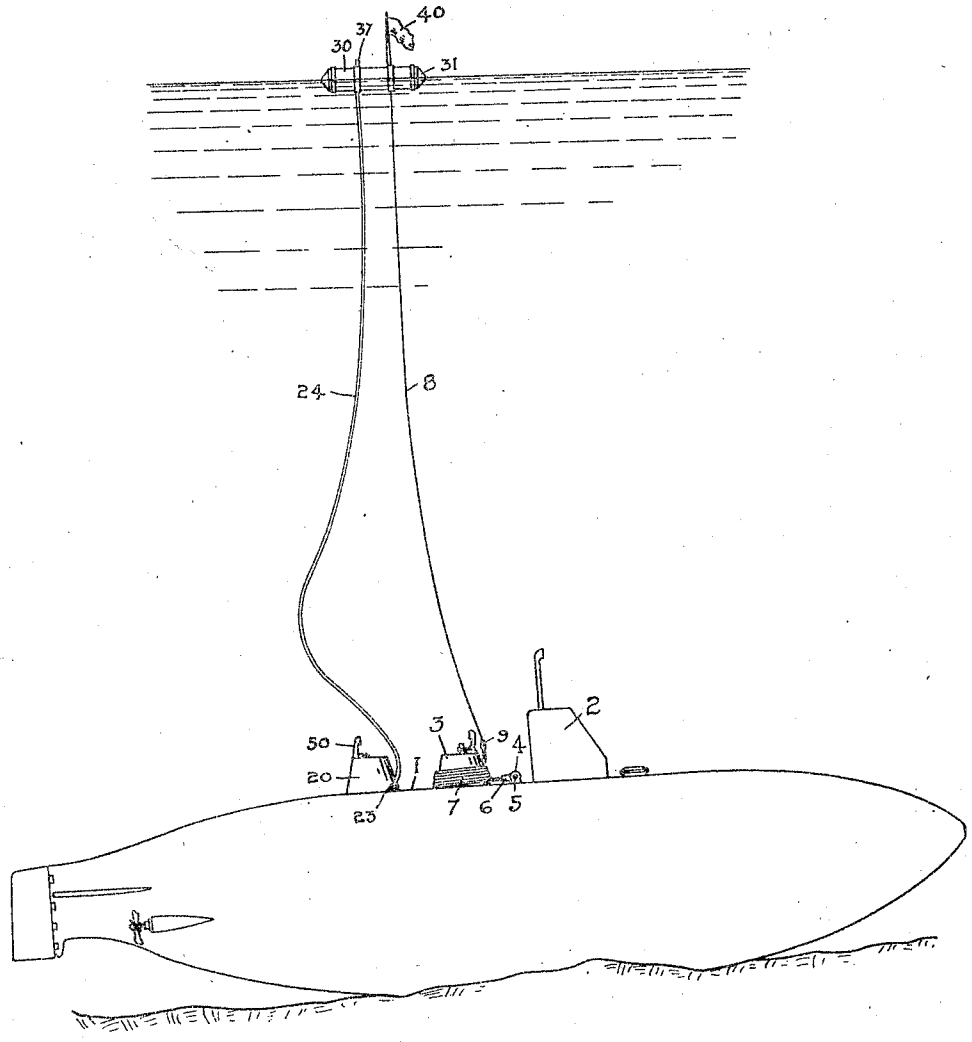



Fig. 1.

INVENTOR
Edward M. Rouze
David S. Gould
BY J. H. Rivers
ATTORNEY

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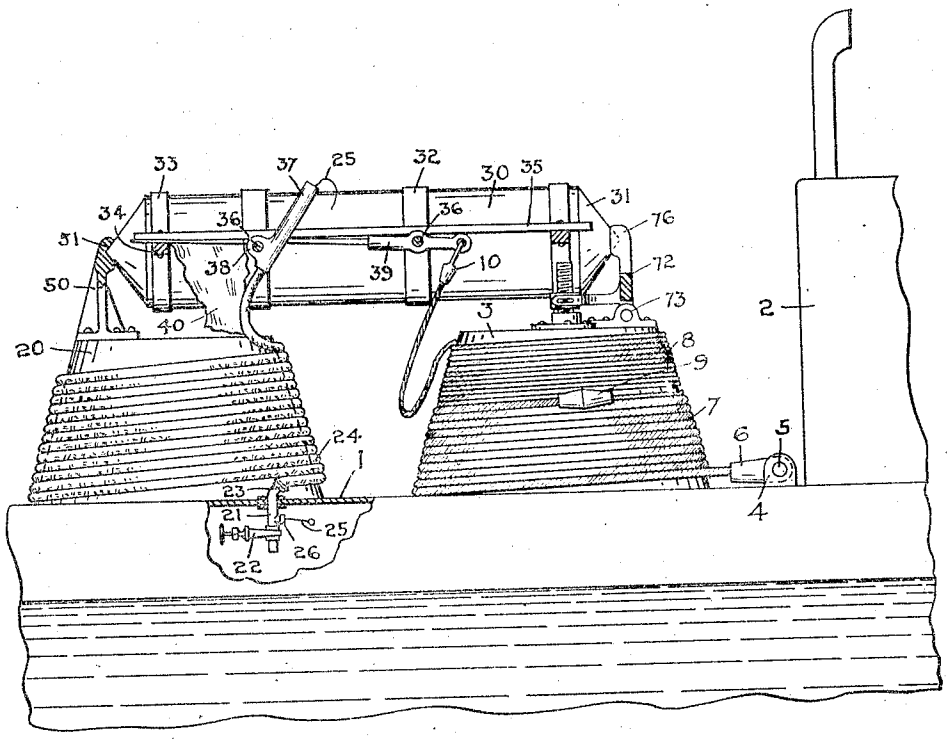



Fig. 2.

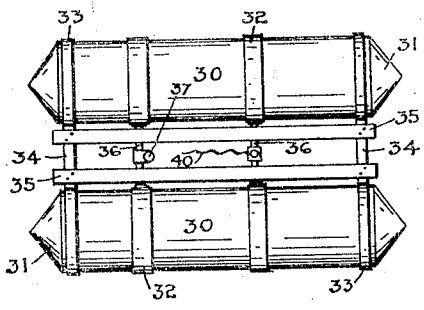



Fig. 3.

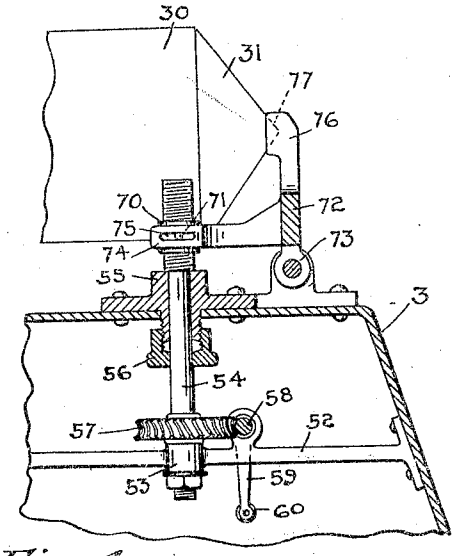



Fig. 4.

INVENTOR
Edward M. Rauze
David S. Gould
BY J. R. Rivers
ATTORNEY

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# UNITED STATES PATENT OFFICE.

DAVID S. GOULD AND EDWARD M. RAUZE, OF KENT, WASHINGTON.

## APPARATUS FOR LOCATING AND RAISING SUNKEN VESSELS.

Application filed February 1, 1926. Serial No. 85,210.

Our invention has more particular reference to improvements in devices for locating and raising vessels of the submarine type; and the objects of our improvement, generally stated, are, to provide a raft, detachably connected with a vessel, which can be released when occasion demands, and, rising to the surface of the water, will indicate the location of the vessel; to afford, through said raft, instrumentalities for supplying air to the vessel and establishing electrical communication therewith; and, to furnish means whereby the vessel can be raised to a position of comparative safety. Other objects may appear as the description of the invention progresses.

In the accompanying drawings—

Figure 1 is a view of a sunken submarine, the apparatus being in released position and the raft floating on the surface of the water;

Fig. 2, a sectional elevation of the apparatus as mounted on the outer deck of a submarine, including other portions of the submarine, in broken sections, to better illustrate the connection of the apparatus therewith;

Fig. 3, a plan view of said raft, indicating supporting elements for a signal, cable, a wire for conducting an electric current, and an air tube; and,

Fig. 4, a sectional elevation, broken away, of a hollow truncated cone, adapted to carry lengths of cable, and a jaw member and mechanism cooperating therewith for securing the raft to the submarine, or releasing it therefrom, one of the pointed terminals of the raft being outlined to illustrate its connection with said member.

Referring more particularly to the drawings, the outer deck and the conning tower of the submarine are designated as 1 and 2 respectively. A cable support 3, in the form of a hollow truncated cone, is fixedly secured to the outer deck and, preferably, about centrally thereof. Adjacent said support, a pair of spaced eyes 4, of heavy construction and secured to said deck in a substantial manner, carry a bolt 5, the same providing a pivotal connection for the eye terminal 6 of a large cable 7 wound around the lower portion of said support. A smaller cable 8, secured to the first-named cable by a spliced link 9, is wound around the upper portion of the support, as indicated in Fig. 2. The larger cable is designed to be of a strength and so secured to the vessel that it can be utilized for lifting the vessel in the water, and the smaller cable, carrying a spliced link 10 at its outer end, should be of a length which will approximate the maximum depth from which it is expected that the vessel may be raised, as will be hereinafter more particularly described.

A support 20 for an air tube, also in the form of a hollow truncated cone, is secured to the deck adjacent the cable support. A pipe 21 extends through and is fixedly secured to the deck, its lower portion carrying a gate valve 22, and its upper terminal 23 having means for coupling on an air tube 24, preferably of the flexible metallic variety. This tube is designed to be wound around said support, when the apparatus is in closed position, as indicated in Fig. 2. A wire 25, disposed in said tube, and adapted to permit electrical communication therethrough, has its lower terminal extending below the deck, through the opening 26 in the pipe.

The raft, detachably mounted on the two supports just described, comprises a pair of cylinders 30, having conical ends 31, and provided with a plurality of encircling bands, denoted as 32 and 33. A pair of metallic cleats 34, secured to the bands 33, serve to space the cylinders in parallel relation and also function as supports for a pair of floor boards 35. A pair of rods 36, disposed between the bands 32, afford supports for the pipe 37, adapted to carry the outer terminals of the air tube and said wire, and which is pivotally connected with one of the rods through the ear 38, and the member 39, which is pivotally connected with the other rod and the link 10, and carries at its free end a flag 40.

The means for securing the raft to said supports, comprise a pair of standards 50 secured to the support 20, each having a concaved head 51 and so located as to accommodate the conical terminals of the cylinders on one end of the raft. The support 3 is provided interiorly with a plate 52, extending transversely and adjacent one side, in which is mounted a socket member 53. A vertical shaft 54, exteriorly threaded at its upper end, is rotatably mounted in said member and a riveted flange section 55, which section carries a stuffing box 56. 57 denotes a worm gear wheel fixedly attached to the shaft, 58 a worm gear pinion rotatably mounted and supported by

said plate, 59 a crank, and 60 a handle for rotating the crank and actuating the pinion. A collar 70, provided on either side with a projecting pin 71, is threadedly engaged with said end of the shaft. A jaw member 72, in pivotal connection with the top of the support 3, as indicated by 73, is provided at one portion with a yoke 74 having a slot 75 on either side, said yoke being adapted to slidably embrace the collar and permit the pins to engage the slots, and at another portion with a head 76, having a recess 77 in form complementary to a pointed terminal of a cylinder of the raft. Said support 3 is also provided at the other side with a vertically extending and pivoted jaw member likewise having a head with a recess adapted to accommodate a pointed terminal of the adjacent cylinder, said last-named member being operatively connected with the jaw member 72, as indicated by the sectional lines, and working in unison therewith. In construction, it is identical with the member 72, the portion bearing the yoke, however, being omitted. Any suitable opening can be provided through the deck so that access may be had to the interior of the support 3, for the purpose of manipulating the gear mechanism.

As will be obvious, the raft is supported in the position shown in Fig. 3, by the standards on one side engaging the pointed terminals of the cylinders, and the jaw members on the other side also engaging the opposite pointed terminals of said cylinders, and the proper actuation of the gearing and the other mechanism just described will throw the jaw members outwardly and release the raft, said mechanism being positive in its action, either in securing the raft to the vessel or in releasing it to function for the purposes intended.

In utilizing the apparatus, the raft is released in the manner heretofore described, and when it rises to the surface of the water, the pull of the smaller cable on the member 39 will raise the flag, indicating that an emergency exists and help is desired. The weight of the air tube and the wire will cause the pipe 37 to assume a vertical position, and said tube, filled with water through the movement of the raft, can be emptied from the vessel through the gate valve 22. The raft, which is of substantial construction, may be boarded, and by means known to those skilled in the art, and which constitute no part of the present invention, electrical communication can be established with the vessel through the wire 25, and air supplied to the vessel through the tube. The smaller cable, designed to be of a length which will permit it to follow the raft to the surface without exerting any lifting force on the larger cable, may then be used for the purpose of hauling the latter cable to the raft and through it well known means may be employed for raising the vessel and bringing it to a secure position. As is evident, if the larger cable should not be of sufficient length to reach the surface, the smaller cable and the link 9 between the cables will be useful as a guide and contact for a suitable grappling device. Also, if deemed desirable, an insulated wire may be disposed within the cables, through which electrical communication can be established with the vessel, or a check valve mounted on the outer terminal of the air tube to prevent water from gaining entrance therein.

We claim:

1. An apparatus of the class described, comprising in combination with a vessel, a support, defining a hollow truncated cone, a manhole therefor, a cable wound on the support, having one end secured to the vessel, a smaller cable spliced to the first-named cable and wound on the support, a second support, defining a hollow truncated cone, an air tube wound on the last-named support, a pipe extending through the outer deck of the vessel, having a lateral opening therein and a valve located below said deck, a wire disposed within the tube, having its lower terminal extending through said opening, a raft, means for detachably securing the raft to said supports, a member, adapted to carry a signal, pivotally connected with the raft, a pivotal connection between the free end of the smaller cable and said member, a signal carried by the member, and a housing for the upper portions of the tube and wire pivotally connected with the raft.

2. An apparatus of the class described, comprising in combination with a vessel, a cable support, an air-tube support, a raft detachably mounted on said supports, a cable, having one end secured to the vessel, a lighter cable spliced to the other end of the first-named cable, said cables being mounted on the cable support, an air tube, a wire disposed within the tube, said tube and wire being mounted on the air-tube support, a member, adapted to carry a signal, pivotally connected with the raft, a signal secured thereto, means for pivotally connecting the lighter cable with the member, and a housing, enclosing the outer terminals of the tube and wire, pivotally connected with the raft.

3. An apparatus of the class described, comprising in combination with a vessel, a float having pointed ends, a standard for supporting one end, a jaw for supporting the other end, means for moving the jaw laterally to release the float from said supports, a cable connected with the float, means for supporting the cable in coiled position on the vessel, means for securing one end of the cable to the vessel, an air tube connected with the float, means for supporting said tube in

coiled position on the vessel, and a valve connected with the tube.

4. An apparatus of the class described, comprising in combination with a vessel, a float, a standard for supporting one portion of the float, a member for supporting an oppositely disposed portion of the float, means for moving the member laterally to release the float from said supports, a cable connected with the float, means for supporting the cable in coiled position on the vessel, and means for securing one end of the cable to the vessel.

5. In an apparatus of the class described, in combination with a vessel, a raft, including a pair of closed cylinders, with conical ends, disposed in spaced paralled relation, and means for detachably securing the raft to the vessel, comprising a pair of fixed standards having recessed heads complementary to said ends, adapted to support one end of the raft, a support, a vertical shaft journaled therein, exteriorly threaded at its upper end, a worm gear wheel fixedly secured to the shaft, a worm gear pinion operatively connected with the wheel, means for actuating the pinion, a collar, having on either side a projecting pin, threadedly engaged with said end of the shaft, a jaw member pivotally connected with the support, provided at one portion with a yoke having slots, adapted to slidably engage the collar and pins, and at another portion with a jaw for engaging an end of one cylinder, and a second jaw member pivotally connected with the support, adapted to engage the adjacent conical end of the other cylinder, and a rod connecting said members whereby the motion of the first-named jaw member is communicated to the second jaw member.

6. In an apparatus of the class described, in combination with a vessel, a float having pointed ends, a standard for supporting one end of the float, a support, a vertical shaft journaled therein, exteriorly threaded at its upper end, a worm gear wheel fixedly secured to the shaft, a worm gear pinion operatively connected with the wheel, a crank, having a handle, for actuating the pinion, a collar, interiorly threaded, mounted on said end of the shaft, a pin projecting from either side of the collar, a member pivotally connected with the support, comprising a body carrying a yoke, having slots, adapted to slidably engage the collar and pins, and provided with a socket for engaging the other end of the float.

DAVID S. GOULD.
EDWARD M. RAUZE.