

April 14, 1931.

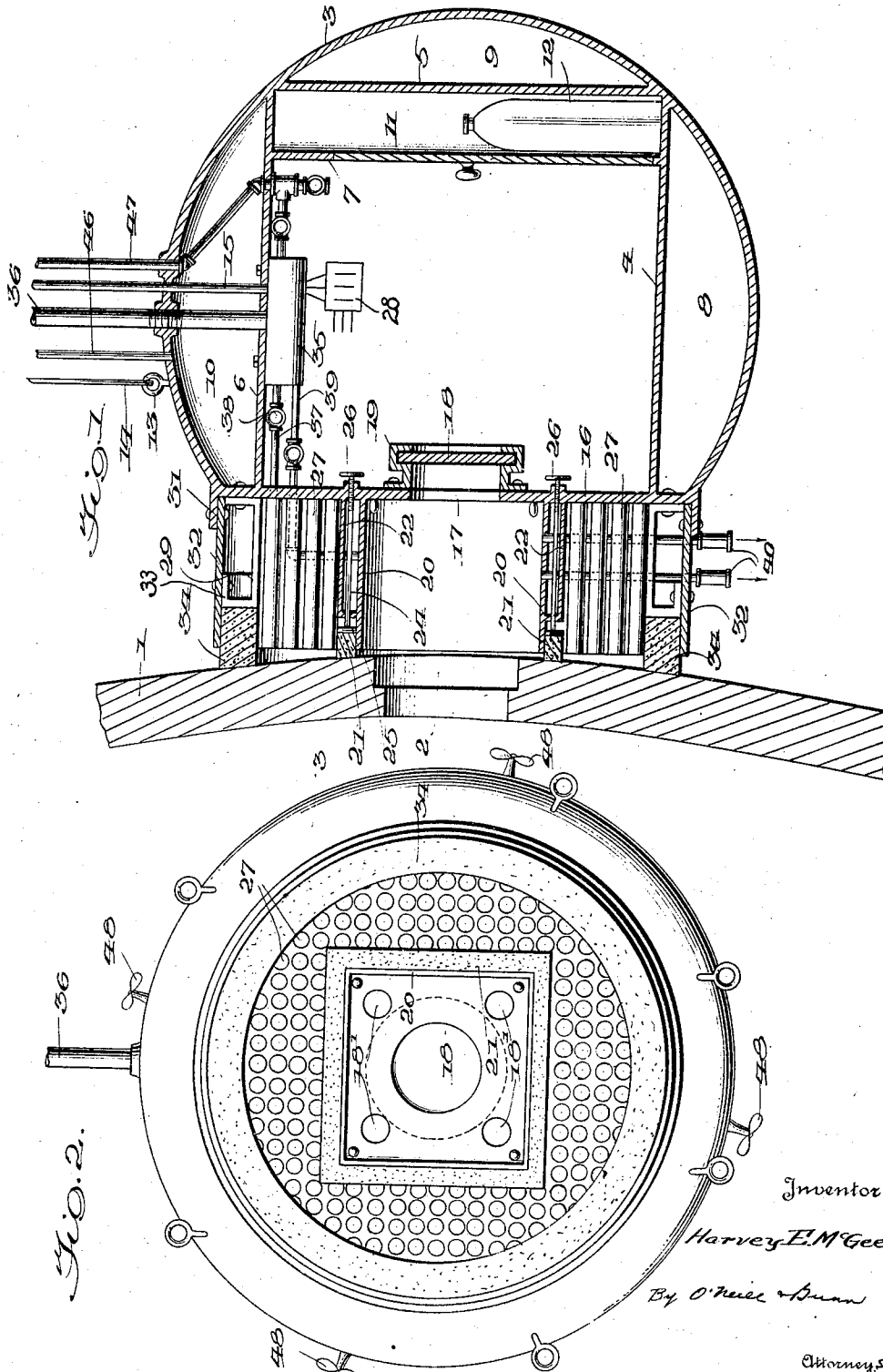
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LIFE SAVING APPARATUS

Filed June 2, 1928

2 Sheets-Sheet 1



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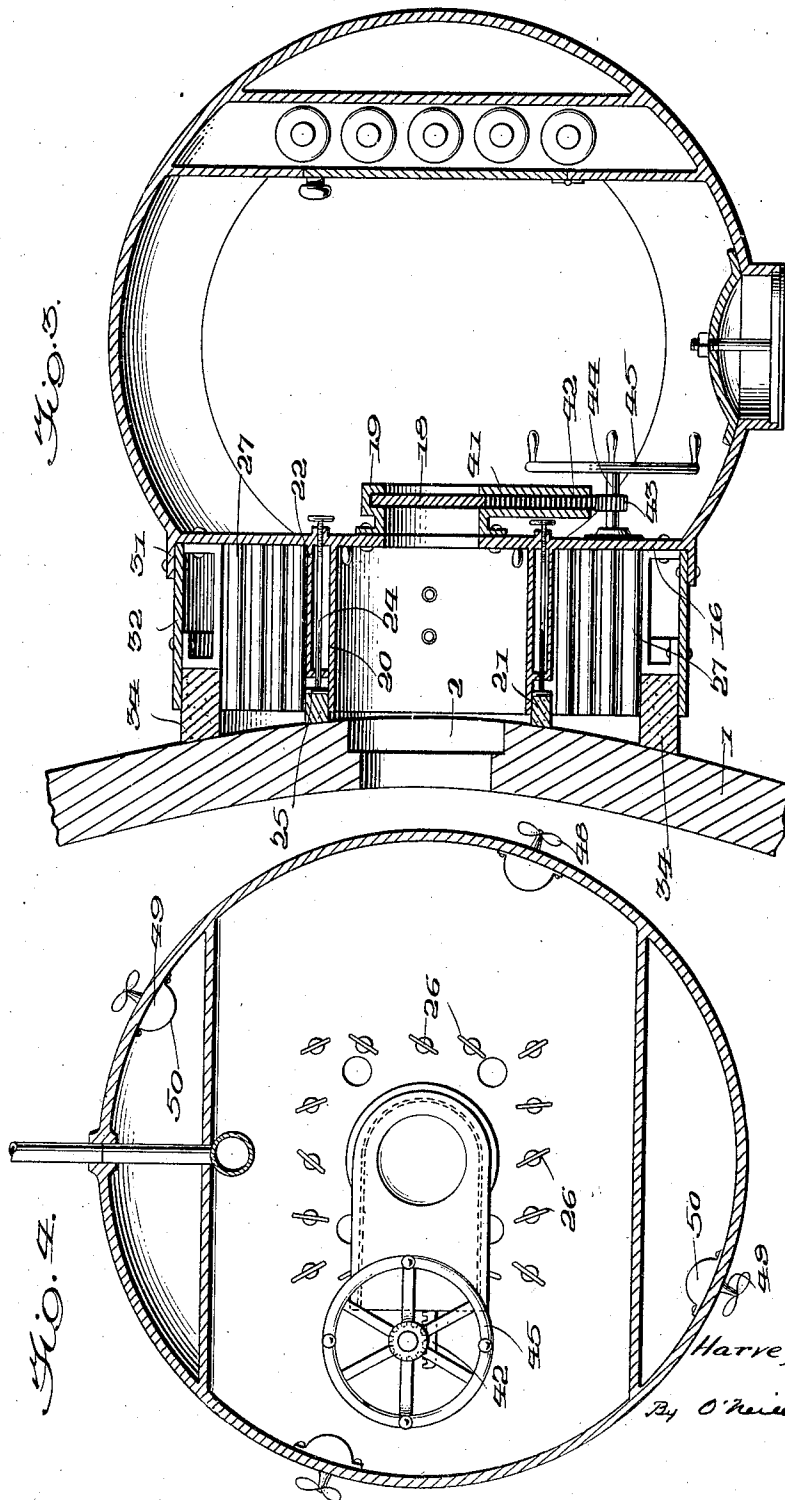
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LIFE-SAVING APPARATUS

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This invention relates to an apparatus adapted for utilization in the rescue of survivors on a wrecked submarine vessel, and more particularly to a diving bell adapted to be lowered into position adjacent and in contact with the submarine, and to means facilitating the transfer of any survivors from the wrecked vessel to the bell.

The primary object of the invention is the provision of means whereby, after locating the position of the wrecked vessel, the rescue work may be easily and expeditiously effected.

Other objects of the invention will be made apparent in the following specifications, when read in connection with the accompanying drawings forming a part thereof.

In said drawings:

Fig. 1 is a vertical section taken through the diving bell, showing the latter magnetically attached to the hull of a sunken submarine.

Fig. 2 is a front elevation of the bell.

Fig. 3 is a horizontal section taken through the bell, looking downwardly thereinto, and,

Fig. 4 is a vertical section taken through the bell, and looking towards the front thereof.

Now referring specifically to the drawings, in which like reference numerals indicate like parts throughout the several views, 1 indicates the hull of a sunken submarine, or other wrecked vessel, supposed to contain survivors, said vessel being provided with a port 2, and 3 indicates the diving bell, hereinafter referred to as the bell.

As clearly indicated in Fig. 1, the bell 3 is generally spherical in formation, except for the front portion thereof, and is formed of metal sufficiently strong to resist any pressure to which it may be subjected when submerged, and of sufficient internal dimensions to comfortably house the occupants thereof and the mechanisms necessary to the salvage work. As here illustrated the bell is provided with a floor 4, a vertical wall 5, a top wall 6, and a partition 7, said walls providing ballast tanks 8, 9 and 10, respec-

tively, the partition 7 also providing, with the wall 5, a tank room 11 adapted to contain oxygen and acetylene tanks 12.

As illustrated in Fig. 2, the outer periphery of the bell 3 carries a plurality of properly spaced anchors 13, adapted to receive guy line cables 14 leading to the mother boat (not shown) on the surface. As will be clearly understood, proper manipulation of the cables 14 from said mother boat will result in the bell 3 being brought to working position at the side of the wrecked boat, telephonic, or other signalling devices, being in connection between the bell and the mother boat, through wiring in the conduit 15.

The front end of the bell 3 is closed by a flat wall 16, and is provided with a port 17, normally closed by a door 18, provided with glass covered peep holes 18', said door being slidably mounted in runways formed by a housing 19 secured to the wall 16 and surrounding the port 17. On the outer face of the wall 16 is an integrally-formed tubular, preferably cylindrical extension 20, of a diameter sufficient to surround the port 2 on the submarine 1. On the outer surface of the front end of the extension 20 is slidably mounted a rubber cushion 21, which is concentric with the extension and projects beyond the outer end thereof. A tubular envelope 22 concentrically surrounds the outer surface of the extension 20, said envelope being provided with an outer end wall 23. Extending through the wall 16 of the bell, and the wall 23 of the envelope 22, are a plurality of rods 24, each carrying a presser foot 25 bearing against and secured to the rear face of the slidable cushion 21, the inner portion of the rods 24 being in screw-threaded engagement with an aperture in the wall 16, and terminating in a hand wheel 26, whereby rotation of said wheel may advance or retract said cushion 21, as desired. It will be understood that a sufficient number of the rods 24 will be provided to insure an even movement of the cushions 21, throughout and around the entire periphery of the extension 20.

The extension 20 is surrounded by a very

powerful magnet 27, in circuit with wires carried by the conduit 15, and controlled by the switches 28, see Fig. 1. Brackets 29 are mounted over the magnet 27, said brackets being secured to the wall 16, the latter being provided with a forwardly-extending, annularly-projecting flange 31, secured to a plate 32, which is, in turn, secured to a flange 33 carried by the bracket 29, as shown in Fig. 1. The outer ends of the plates 30 and 32 provide a socket for the reception of a circular cushion 34, adapted for contact with the side of the sunken vessel 1, and beveled to conform to the contour thereof, as herein illustrated.

In the top of the bell 3 is mounted a pump 35, secured to the wall 6, compressed air for operating said pump being fed through the flexible conduit 36 extending through the top of the bell, or, if more desirable, the pump may be electrically operated and in connection with the circuit wires leading through the conduit 15, and adapted to draw air through the pipe 36. In any event the pump is equipped with pipes 37, leading to the space between the magnetic cells, whereby to direct a flow of cooling air around said cells while the magnet is in operation, as will be hereinafter referred to. The pipes 37 are provided with hand valves 38 to control the flow of air, as will be understood.

In view of the foregoing it will be clear that, divers having first located the sunken boat, the bell is lowered as nearly as calculations will permit, to a position adjacent the most exposed side thereof. The boat 1 is in view of the operators within the bell, through the glass 18', and by signalling the mother boat, the bell may be so moved vertically and laterally that the cushions 21 and 34 will contact the sides of the boat 1, and the end of the extension 20 be positioned concentrically around the port 2 on the sunken boat. In this position the switches 28 are manipulated to throw the magnet 27 into operation, the result being that the magnet will exert a very powerful pull upon the metallic side of the boat 1, and compress the cushions 21 and 34 thereagainst, preventing the ingress of water to the extension 20, and the hand wheels 26 are then all turned to more tightly compress the cushion 21 against the side of the submarine 1. The pump 35 is then thrown into operation to force compressed air through the pipe 39, leading into the interior of the extension 20, whereby to eject water from the latter, through the check valves 40. When the extension 20 is cleared of water, the door 18 is moved from its closed position, as follows:

As illustrated in Figs. 3 and 4, the door 18 is of elongated construction, and is slidably mounted within a housing 41, secured

to the wall 16, the rear edge of the door structure being provided with a bar 42 carrying ratchet teeth adapted to engage a pinion 43, mounted on a rotative shaft 44 secured to the said wall. A handwheel 45 is rigidly secured to the shaft 44, and rotation of said wheel will obviously cause the engaged teeth on the pinion and door to pull the front portion 18 of the door out of its housing, a reverse rotation of the wheel restoring the door 18 to its position, suitably packed to prevent entrance of water into the bell.

The door 18 having been opened access may be had to the port 2 of the submarine 1, and the survivors of the wreck apprised by tapped signals that the port should be opened. In case of no response the port may be opened by an acetylene torch. In any event entrance to the cells of the wrecked boat may be effected in this manner and the survivors or their bodies, taken into the bell 3, through the extension 21, and subsequently delivered to the surface. A pipe 46 leads into and supplies the bell with fresh air, the foul air being taken off by a pipe 47.

In order to further facilitate the manipulation of the bell 3 so that the cushions 21 and 34 may be brought to a position where they may contact the hull 1 concentrically of the port 2, I prefer to provide a plurality of small propellers 48 having a shaft 49 extending through the hull of the bell 3, each propeller being rotated by a separate motor 50, electrically connected to the wires in the conduit 15, and controlled by the switches 28.

From the foregoing it is obvious that I have provided an apparatus adapted to greatly facilitate the salvaging of the occupants of wrecked submarines. The glass-covered peep-holes 18' permit inspection of the hull of the sunken boat as it is approached by the bell 3, and the movements of the bell, before being magnetically secured to the hull 1, may be accurately controlled by operators in the mother boat, upon signals from the bell. Furthermore, the interior of the bell is equipped with all devices necessary in the operation of cutting through the port 2, or of providing an aperture elsewhere in the hull 1, or for delivering water, oxygen, fresh air or food to the occupants of the hull 1, before they are removed. All metal adjacent the magnet 27, must of course be of non-magnetic material.

Modifications of the structure herein disclosed may be suggested to those skilled in the art, but my invention covers all embodiments falling fairly within the scope of the appended claims.

I claim:—

1. Salvaging apparatus adapted for operation in connection with a sunken boat having a metallic hull, comprising a hollow

bell, a tubular extension projecting from said bell and leading thereinto, a slidably-mounted, resilient cushion surrounding the outer end of said extension and projecting therefrom, a magnate surrounding said extension and adapted to retain said cushion in close contact with said hull, and means in said bell adapted for operation to automatically adjust the position of said cushion.

2. Salvaging apparatus for operation in connection with a sunken boat having a metallic hull, comprising a hollow bell, a tubular extension projecting from said bell and leading thereinto, two concentrically mounted circular cushions carried by the outer end of said extension and adapted for contact with said hull, means in said shell adapted for operation to move one of said cushions longitudinally of said extension whereby to increase or decrease the pressure thereof upon said hull, and magnetically operated means adapted to retain said cushions in contact with said hull.

In testimony whereof I affix my signature.
HARVEY E. McGEE.