Sept. 8, 1931. G. FACCHIN 1,822,435

LIFE SAVING AND SALVAGE APPARATUS FOR SUBMARINES

Filed Oct. 9, 1929

Fig 2

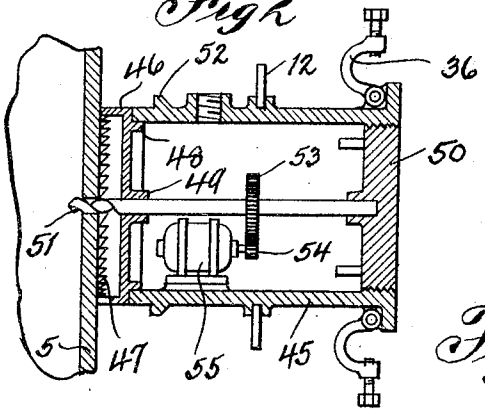
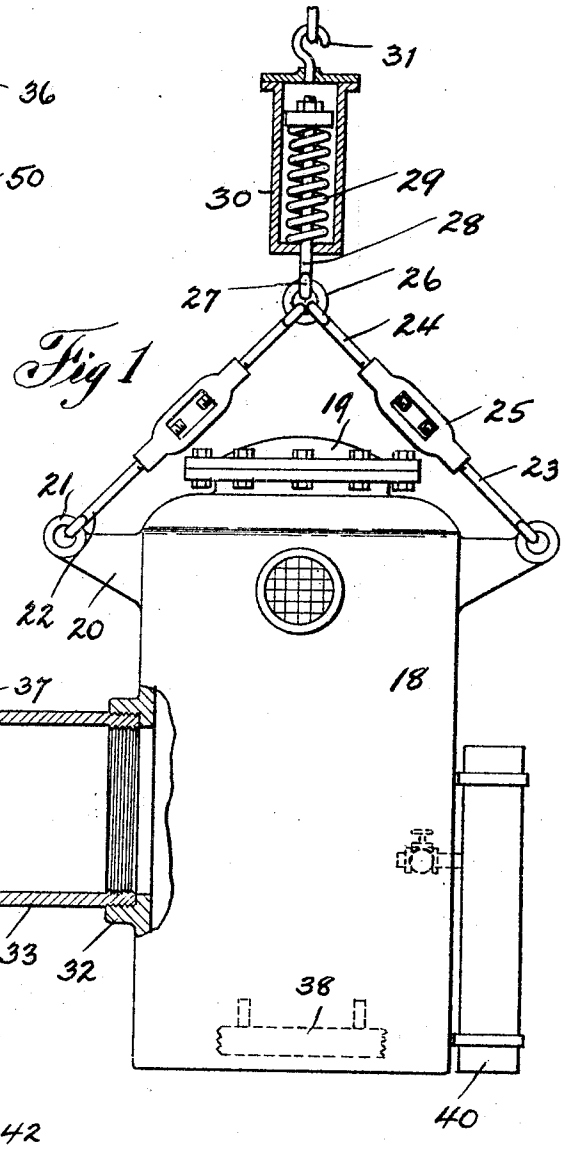


Fig 1



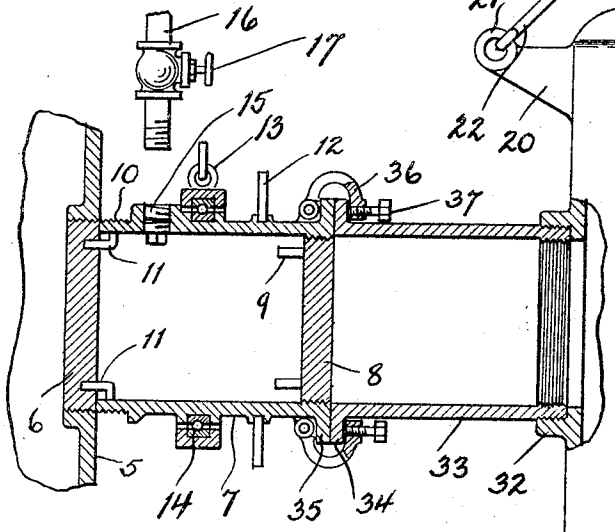
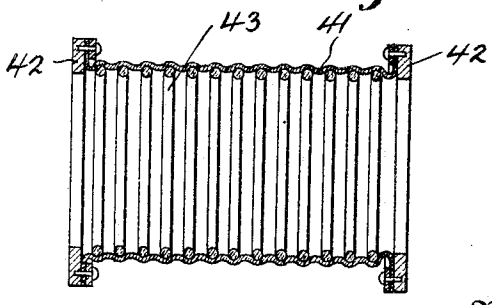


Fig 3



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UNITED STATES PATENT OFFICE

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LIFE SAVING AND SALVAGE APPARATUS FOR SUBMARINES

Application filed October 9, 1929. Serial No. 398,478.

This invention relates to improvements in apparatus and devices for salvaging sunken vessels particularly submarines and in addition contemplates a life saving apparatus whereby access may be had to the vessel when submerged in deep water.

One of the objects of my invention is to provide a life saving apparatus including a caisson constructed and arranged to be lowered in proximity to a vessel such as a sunken submarine, including provision for connecting said caisson and providing access thereto from the vessel.

More specifically my invention relates to means for connecting a cylindrical body to a manhole in the side of a submarine or to a compartment including provision for further attaching said body to a caisson in such manner that access, one to the other, may be had to either save the crew or salvage the vessel when in deep water.

To enable others skilled in the art to more fully understand my invention, reference is had to the accompanying drawings in which

Fig. 1 is a view partly in section showing the use and application of my invention.

Fig. 2 is a sectional view showing a modification.

Fig. 3 is a sectional view showing a flexible connecting means employed in connection with my invention under certain conditions.

Referring now to the drawings wherein like reference numerals designate corresponding parts throughout the several views, 5 designates the outer wall of a vessel such as a submarine, access to which is to be had when sunk in deep water. At various points in the outer wall or shell of the vessel, manhole closures or covers 6 are threaded in the wall or body as shown by Fig. 1 of the drawings.

As seen in this figure, 7 designates a substantially large cylindrical body, open at its forward end and of sufficient diameter to permit a member of the salvaging crew or crew of the sunken vessel to crawl therethrough. The opposite end of the cylindrical body 7 is threaded to accommodate an exteriorly threaded circular wall or plate 8 having handles 9 whereby said wall or plate may be subsequently removed, for the purpose as will be presently explained.

The exteriorly threaded end 10 of the cylindrical body is of the same diameter as the threaded manhole or opening in the vessel proper. This end of the body is equipped with two or more angularly bent prongs 11 which are adapted to fit into recesses of the manhole cover or closure so that when the body is lowered, a diver may attach the body to the manhole cover by means of the prongs. To remove the said cover and at the same time connect and attach the body to the threaded opening in the wall or shell of the vessel, hooks or handles 12 are provided whereby the diver may rotate said body and the closure or cover connected thereto. In this manner it will be seen that as the manhole cover is advanced inwardly into the compartment of the vessel, the threaded end follows the threads of the manhole opening and thus the body is attached to the vessel in such manner that a member of the crew of the vessel may crawl into the said body and toward the circular plate or closure. The body may be lowered in any suitable manner as by a cable attached to a ring 13, bearings 14 being also provided whereby the body may be conveniently rotated by the diver. The threaded opening 15 in the body 7 is equipped with a temporary plug which when removed after the feed pipe 16 is attached thereto permits of food or material to be passed into the body. The feed pipe is provided with a valve 17 for the obvious purpose.

Again referring to Fig. 1, numeral 18 designates a cylindrical, metal caisson having a removable top cover 19. The caisson is formed with brackets or extensions 20 having eyes 21 to which are attached the lower ends 22 of turnbuckle rods 23. The complementary turnbuckle rods 24 connected to the turnbuckles 25 are in turn connected to a ring 26. The lower hooked end 27 of a suspension rod 28 is connected to the ring, said rod 28 having a spring 29 in a spring housing 30, said housing having a hook 30

whereby the entire caisson may be conveniently lowered to the desired position in proximity to the vessel.

The caisson is provided with a flanged internally threaded extension 32 to which is connected a cylindrical body 33 of the same diameter as the first mentioned body 7. The outer end of the body 33 is formed with a flange 34 which abuts the flange 35 of the body 7. Pivoted hooks 36 connected to the end of the body 7 are adapted to be fastened to the flange 34 of the body 33 by means of threaded screws 37 thus connecting both of said bodies in alignment. Since each end of the body 33 is open, in order not to flood the caisson, a removable, threaded cover or closure 38 is provided for the inner end of the body 33, which cover may be disconnected from the inside of the caisson. It will of course be understood that a comparatively small amount of water will flow into the bottom of the caisson but not sufficient to impede or retard the work.

To fully understand the above construction, a short explanation at this point is necessary as to the manner in which it is employed. Assuming that a sunken submarine is immediately located, and the crew have signaled the location of a compartment that is not flooded, the cylindrical body 7 is first lowered in proximity to a manhole cover. A diver is then lowered and attaches the body 7 to the sunken vessel and thus contact is made between the crew and the rescue or salvage crew, when the pipe is connected. The amount of water flowing from the body 7 into the compartment of the submarine will not be sufficient to damage or impair the work. The caisson is then lowered and the diver connects the body 33 to the body 7 by means of the pivoted hooks. The closure 38 is then removed by a member of the crew in the caisson; thus communication between the vessel and the caisson can be had by the removal of the wall of plate 8 by one of the submarine crew. Additional handles may be provided on the outside of the plate 8 so that a member of the salvage crew may assist in making contact between the respective crews. The caisson may be equipped with an air or oxygen tank 40 and constructed on its interior to accommodate all necessary equipment and conveniences for its crew.

When it is found that the work must be done in a heavy rolling sea, a flexible bellows 41 fastened to two end rings 42 and provided with an expansion spring 43 may be employed to connect the bodies 7 and 33.

In the modified form of the invention shown by Fig. 2, I have shown a construction to be employed when access is desired to be had to a compartment of a vessel not equipped with a removable manhole cover. In this form of the invention, the body 45 is provided at its inner end with a circular plate 46 having a circular saw tooth arrangement in which the teeth 47 are capable of cutting metal. The flange 48 of the plate revolves within the body proper which is held by the diver against the side of the vessel. The plate is provided with a bearing 49 for a rotatable shaft, the opposite end of the shaft being rotatable in the end closure 50. The drill end 51 of the shaft advances as the saw teeth cut through the metal so that the forward end of the body follows into the opening being cut until the shoulder 52 abuts the vessel wall. The body being held stationary by the diver, as the hole is cut into the metal, the body advances toward the vessel wall. The shaft is rotated by means of meshed gears 53, 54 driven by an electric motor 55. After the hole in the vessel is cut, the shaft and motor are dissembled so that access may be easily had to the end closure plate, after the body attached to the caisson is connected in the manner above described.

Having shown and described my invention what I claim as new and desire to secure by Letters Patent is:

1. A life saving and salvage apparatus for submarines, in combination with a caisson, comprising a cylindrical body open at one end, a removable closure at its opposite end, and independent means in which said cylindrical body is substantially horizontally and freely rotatably suspended, means for simultaneously removing a manhole cover and attaching said open end in the opening of said manhole cover by rotation of said cylindrical body, a second cylindrical body connected at one end to the caisson and and means for clamping the opposite ends of said cylindrical sections together.

2. A life saving and salvage apparatus for submarines, in combination with a caisson, comprising a cylindrical body squared off and threaded at one open end and having a removable closure at its opposite end, means carried at the open end of said body for angularly fixedly engaging upon, for coaxially aligning said body with, and for removing a manhole cover and simultaneously threading the said body in the opening of the manhole cover, a second cylindrical body connected at one end to the caisson and clamping members for attaching the opposite ends of said cylindrical sections together.

3. A life saving and salvage apparatus for submarines, in combination with a caisson, comprising a cylindrical body threaded at one open end and having a threaded removable closure at its opposite end, handles for rotating said body, hooks carried by and protruding from said body adjacent its square open end for angularly

fixed and axially aligned connection to a manhole cover whereby said cover may be simultaneously removed and the threaded end of the body fastened in the manhole opening, a second cylindrical body connected at one end to the caisson and clamping members for attaching the opposite ends of said cylindrical sections together.

4. In a life saving and salvaging apparatus for submarines, a round, square-faced, externally threaded closure adapted to be alignedly positioned in the wall of a submarine in engagement upon a threaded edge surrounding an opening in said wall, a hollow, cylindrical body, externally threaded to fit said threaded opening, and hooks longitudinally protruding from the squared end of said body, fitting into recesses in one of the faces of said closure, and holding said closure and said body in axial alignment and the respective external threads in registry with each other, when said body squarely abuts upon said closure and when said hooks extend into and are angularly fixedly disposed in said recesses.

In testimony whereof I affix my signature.

GIOACHINO FACCHIN.