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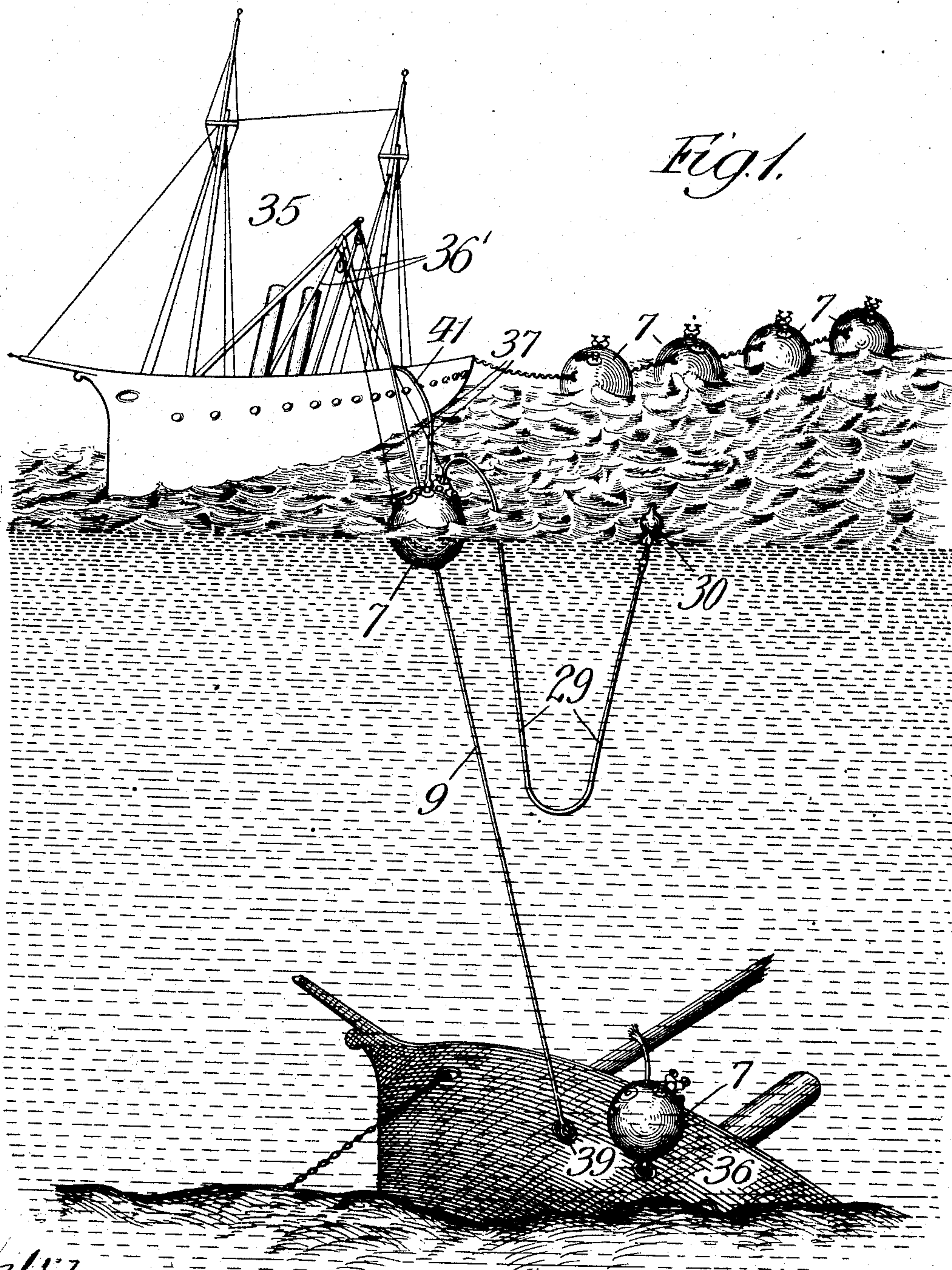
F. S. Y XIMÉNEZ.

PATENTED SEPT. 3, 1907.

APPARATUS FOR RAISING SUNKEN VESSELS.

APPLICATION FILED AUG. 6, 1906.

2 SHEETS—SHEET 1.



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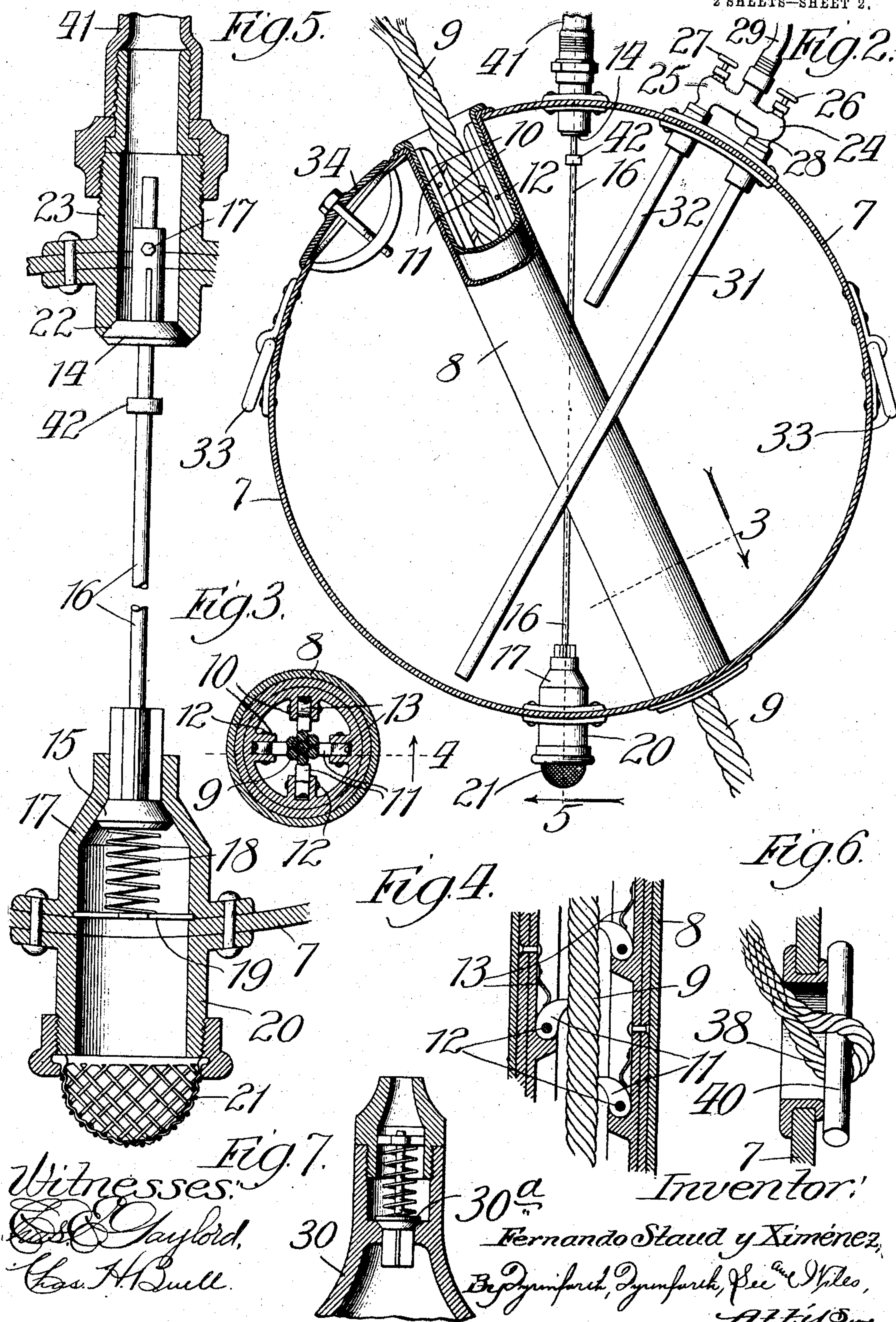
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2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

FERNANDO STAUD Y XIMÉNEZ, OF CHICAGO, ILLINOIS.

APPARATUS FOR RAISING SUNKEN VESSELS.

No. 865,130.

Specification of Letters Patent.

Patented Sept. 3, 1907.

Application filed August 6, 1906. Serial No. 329,397.

To all whom it may concern:

Be it known that I, FERNANDO STAUD Y XIMÉNEZ, a subject of the King of Spain, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Apparatus for Raising Sunken Vessels, of which the following is a specification.

My invention relates to an improvement in the class of pontoons for raising sunken vessels.

My primary object is to provide a novel construction of submergible pontoon, in the class referred to, and equip it with a cable adapted to pass through the diagonal guide-tube in its shell, to afford therefor a taut guide by attaching one end of the guide-cable on a wrecking vessel and the opposite end immediately to the side of the sunken vessel at which the pontoon is caused to act by sinking it by the gravity of its own weight, when filled with water, toward the point of attachment of the cable to the sunken vessel; the pontoon being provided with means for forcing out of it, while so submerged, its contained water with air-pressure to replace the water for resisting the pressure of the surrounding body of water and cause the pontoon to exert its lifting action on the sunken vessel to the best advantage.

More specifically stated objects are to provide such a pontoon with novel and peculiarly effective means for securing it against rising independently of the lifting guide-cable when the latter has been attached to the hull of the boat to be floated; improved valve-mechanism for controlling the introduction into the pontoon of water for sinking it and of air-pressure for discharging and supplanting the water in the submerged and anchored pontoon; and means for indicating, above the surface of the body of water, the condition of the work in the procedure of expelling the water from the sunken pontoon with the supplanting air-pressure.

Referring to the accompanying drawings—Figure 1 is a perspective view, in the nature of a diagram, illustrating the practical application of my invention; Fig. 2, a sectional view showing my improved pontoon in one of the various forms in which it may be provided; Fig. 3, a section taken at the line 3 on Fig. 2 and viewed in the direction of the arrow; Fig. 4, a section taken at the line 4 on Fig. 3 and viewed in the direction of the arrow; Fig. 5, a broken section taken at the line 5 on Fig. 2, viewed in the direction of the arrow and enlarged; Fig. 6, a broken perspective view illustrating one way of attaching the pontoon-controlling guide-cable to the hull of a boat; and Fig. 7, an enlarged sectional view of a portion of the indicating-float detail, showing the valve thereof.

At 7 is represented the shell of my improved pontoon in the form of a hollow sphere, though it may be provided in oblong-spherical, cylindrical or other

form and of any desired dimensions, say from ten to thirty-five feet in diameter, when globular, or in length when of other form. The body of the pontoon may be best constructed of plate steel by riveting together the plates of proper shape and rendering the hollow body impervious to water and air. A tube 8, open at both ends, at which it has sealed connection with the shell 7, extends diametrically through the latter and affords means for stringing the pontoon on its guide-cable 9, for the guide-way purpose hereinafter described. Within this tube are shown to be provided four similar longitudinal ribs 10 at equal distances apart, each recessed centrally throughout its length to afford bearings for teeth 11 secured by pivot-pins 12 passed transversely through them and the ribs affording their bearings. These teeth are preferably provided in staggered order about the interior of the tube 8, from end to end thereof, and each is resiliently propped by a spring 13 tending to project its free end inwardly into the path of the cable. At two diametrically opposite points in the shell are provided, respectively, an inwardly-opening check-valve 14 and an outwardly-opening check-valve 15, the two being rigidly connected together by a rod 16, passing through a sleeve-extension of the valve 14, in which it is separably fastened, as by a set-screw 17, to permit the inlet-valve to be operated independently of the outlet-valve 15 when desired. The valve 15 seats inwardly in its casing 17 within the shell 7 and is resiliently held against its seat by a spring 18 on a spider 19 in the opening in the shell controlled by this valve, which opening is surrounded outside the shell by a spout-section 20 having a screen 21 secured over its outer end to prevent the opening from becoming clogged by the entrance of foreign matter. The spring 18 likewise serves to hold the valve 14, when secured to the rod 16, resiliently against its seat 22, which projects inwardly into the shell and registers with an outwardly projecting threaded nipple 23, with which to connect hose for the purposes hereinafter described. On the shell are further provided two three-way valves 24 and 25, of ordinary or any suitable construction, provided with hand-operated stems 26, 27, and having a T-connection 28 between their casings for attachment of one end of a hose 29 carrying on its opposite end a float-ball 30 equipped with an outwardly opening check-valve 30^a. A water-discharge pipe 31 is permanently connected with the casing of the valve 24 and extends therefrom nearly through the interior of the shell 7; and a shorter air-outlet pipe 32 extends into the interior of the shell from the casing of the valve 25.

The shell 7 is shown to be provided at opposite points on its outer surface with rings 33, for purposes hereinafter explained, and it is also provided with a suitable manhole, indicated at 34, through which to gain access to the interior of the shell.

To apply my invention to its purpose of raising a sunken boat, the procedure is as follows: A suitable wrecking ship, represented at 35 in Fig. 1, or floating derrick, carrying divers and equipped with ordinary air and water pumps (not shown) and with suitable means for winding and unwinding ropes, chains or cables, transports to the place for raising a sunken boat a sufficient number of the pontoons. These may be towed by the ship by attaching thereto a line of the pontoons strung together at the rings 33, as represented in Fig. 1. On reaching the proximity of a submerged boat to be raised, represented at 36 in Fig. 1, a pontoon to be placed is suspended at its rings 33 from the ship 35, as from pulleys on booms 36', 36', by ropes 37, 37 connected with capstans, or the like. A diver takes the end of the guide-cable 9 which contains a loop 38 (Fig. 6), and leads it to a port-hole in the sunken boat, when he passes a pin 40 through the loop, inserts the pin lengthwise and with it the end of the cable, through the port-hole 39, at the inner side of which he turns the pin to cross the port-hole. The upper end of the cable is then passed through the tube 8 of the pontoon in the direction which will enable it to slip past the yielding gripping-teeth 11, and is fastened to a capstan on the ship 35 and made taut to anchor its attachment to the submerged boat. This describes one of various ways of attaching the lifting-cable 9 to the immediate side of the vessel to be raised. It is intended, however, to introduce the practice in ship-building to equip the hulls of ships with special means for facilitating the attachment to them of the pontoon guide-cables. With a guide-cable thus anchored to the sunken boat, a hose 41, connected with a water-pump on the ship 35, is coupled with the nozzle 23, and, the valve 14 being freed from the rod 16, to drop from its seat 22 and rest against a stop or collar 42 on the rod, the said pump is operated to fill the shell 7 with water for sinking the pontoon by gravity. The valve 25 is meantime open for the escape of air. The weight of the pontoon, in sinking, is sustained by the ropes 37 to take it off the guide-cable 9 and thus avoid subjecting the latter to possible injurious strain; and as the ropes 37 are paid out, they permit the gravity of the pontoon to sink it along the taut guide-cable close to the point of attachment of the latter to the sunken boat. On being thus submerged, and in sinking, the pontoon cannot slip backward on the cable 9, because the teeth 11 grip the cable in the direction of rise of the shell 7 and prevent it from slipping upward. With the pontoon thus attached to the boat 36, it is next in order to discharge the water from within the shell 7 and replace it with air under sufficient pressure to reinforce the shell from within against the pressure of the body of water without. To accomplish this, the diver first fastens the valve 14 against its seat by securing it to the rod 16, and the hose 41 is disconnected from the aforesaid water-pump and connected with an air-pressure pump on the ship 35, which is operated to force air past the valve 14 into the shell 7, thereby opening the valve 15 to permit the introduced air to discharge the water out of the shell and supplant it. During this operation, the valve 25 is closed. Some of the water will pass through the pipe 31 and discharge by way of the hose 29 at the float 30, thereby showing a discharging stream of water until all, or substantially all, of the water is out of the shell 7, after which air will discharge

from the float; and the accompanying noise of this air-discharge furnishes indication that the pontoon is emptied of its water-contents and ready for its lifting work. Thereupon the diver disconnects the air-pump from the shell 7, also the ropes 37, and he may sever the cable 9, as represented of the submerged pontoon in Fig. 1, or its upper end may be disconnected from the capstan and attached to a suitable float (not shown) for supporting it and taking its weight off the sunken pontoon.

More of the pontoons, to the number required, are handled and attached to the sunken boat at different points of its hull, in the same manner as described of the one. Thus attached, they are applied at the points of greatest advantage, because of the greatest efficiency, by reason of being submerged substantially to the depth to which the sunken boat is submerged, of being each independent of the others in operation (though they may, if desired, be tied one to the other, in series, at their rings 33) and of being beyond interference from wave-disturbance. Moreover, and particularly, by providing for the attachment of the guide-cable immediately to the side of the sunken vessel to which the submerged pontoon is adjacent, the difficult operation is avoided of passing the cable transversely under the keel of the vessel.

By providing a construction of pontoon in which the water-outlet and air-inlet valves may be rigidly connected together to operate simultaneously, the expulsion of its water-contents is rendered more certain during the air-filling operation, since the water-outlet valve and air-inlet valve are unseated simultaneously at each stroke of the air-pump, thereby insuring the discharge of water from the pontoon by introducing the air-pressure into it.

The provision of a spouting indicator operating above the surface of the body of water for showing whether or not the water is being properly expelled from the pontoon while undergoing the air-filling operation, and when the water has been all expelled, is an important feature, since it tends, in case the water-outlet valve for any reason fails to act, to prevent injury to the pontoon from the great pressure forced into it.

The described clutch-construction insures secure holding of the pontoons on their anchored guide-cables under all conditions to which they may be subjected, thereby enabling them to be placed regardless of the rough condition of the water in which they are sunk.

What I claim as new, and desire to secure by Letters Patent, is—

1. A submergible pontoon for the purpose set forth, comprising a shell equipped with an air-pressure and water inlet valve and a water outlet valve, said valves being connected together to adapt them to work simultaneously, and a guide-tube through the shell for a lifting-cable to direct the shell, by filling it with water for sinking it, toward the point of attachment of said cable to a sunken vessel to be raised.

2. A submergible pontoon comprising a shell having a guide-tube extending through it for a lifting cable attachable to a sunken vessel to be raised, an air-and-water inlet valve, a water outlet valve and an air-vent, a rod carried by the water outlet valve, and means for releasably connecting said inlet valve to said rod, whereby said inlet valve may be operated independently of or simultaneously with said outlet valve.

3. A submergible pontoon comprising a shell, having a

- guide-tube extending through it for a lifting-cable attach-
able to a sunken vessel to be raised, an air and water inlet
valve carrying a sleeve, a water outlet valve and an air-
vent, a rod carried by the water outlet valve extending
5 into said sleeve and provided with a stop below the same,
and means for releasably fastening said sleeve to said rod,
whereby the air and water valve may be operated inde-
pendently of or simultaneously with said water outlet
valve.
- 10 4. A submergible pontoon comprising a valve-equipped
shell, a tube extending through the shell and adapted to
receive a lifting-cable for directing the shell toward the
point of attachment of said cable to a sunken vessel to be
raised, longitudinal ribs on the inner wall of said tube, and
15 clutch-mechanism comprising series of spring-pressed teeth
pivoted to said ribs and adapted to normally extend
laterally into the path of the cable to permit the pontoon
to be lowered and prevent it from rising thereon.
5. A submergible pontoon comprising a shell provided
with an air inlet valve and a water outlet valve, and 20
means for attaching the shell to a sunken vessel to be
raised, a tube extending into the shell, through which a
portion of its water-contents is expelled, a conduit leading
from said tube, and a valved float on the end of said con-
duit, for the purpose set forth. 25
6. A submergible pontoon comprising a shell, means for
attaching the shell to a sunken vessel to be raised, an
air-and-water inlet valve and a water outlet valve on the
shell, a valved air-outlet tube and a valved water-outlet
tube extending into said shell and having a pipe-connec- 30
tion, and a conduit leading from said common pipe and
terminating in a valved float, for the purpose set forth.

FERNANDO STAUD Y XIMÉNEZ.

In presence of—

A. U. THORIEN,
J. H. LANDES.