W. J. O'CONNOR.

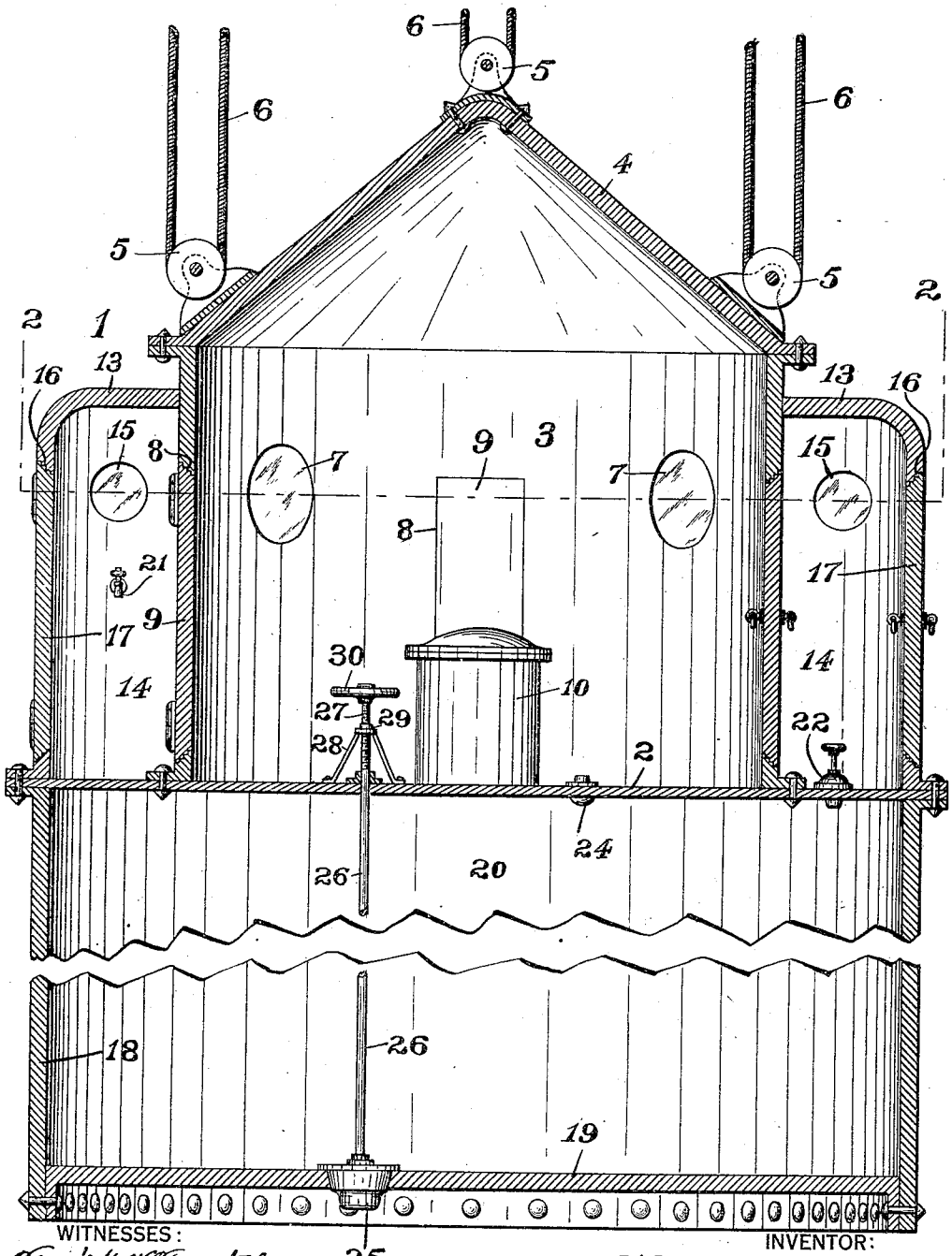
DIVING APPARATUS FOR MARINE EXPLORATION AND THE LIKE.

APPLICATION FILED JAN. 13, 1913.

1,069,281.

Patented Aug. 5, 1913.

2 SHEETS—SHEET 1.



WITNESSES:

Fredk. W. Frantzel

Clayton A. Cadmus.

Fig. 1

INVENTOR:

William J. O'Connor,

BY

Frantzel and Richards,

ATTORNEYS

W. J. O'CONNOR.

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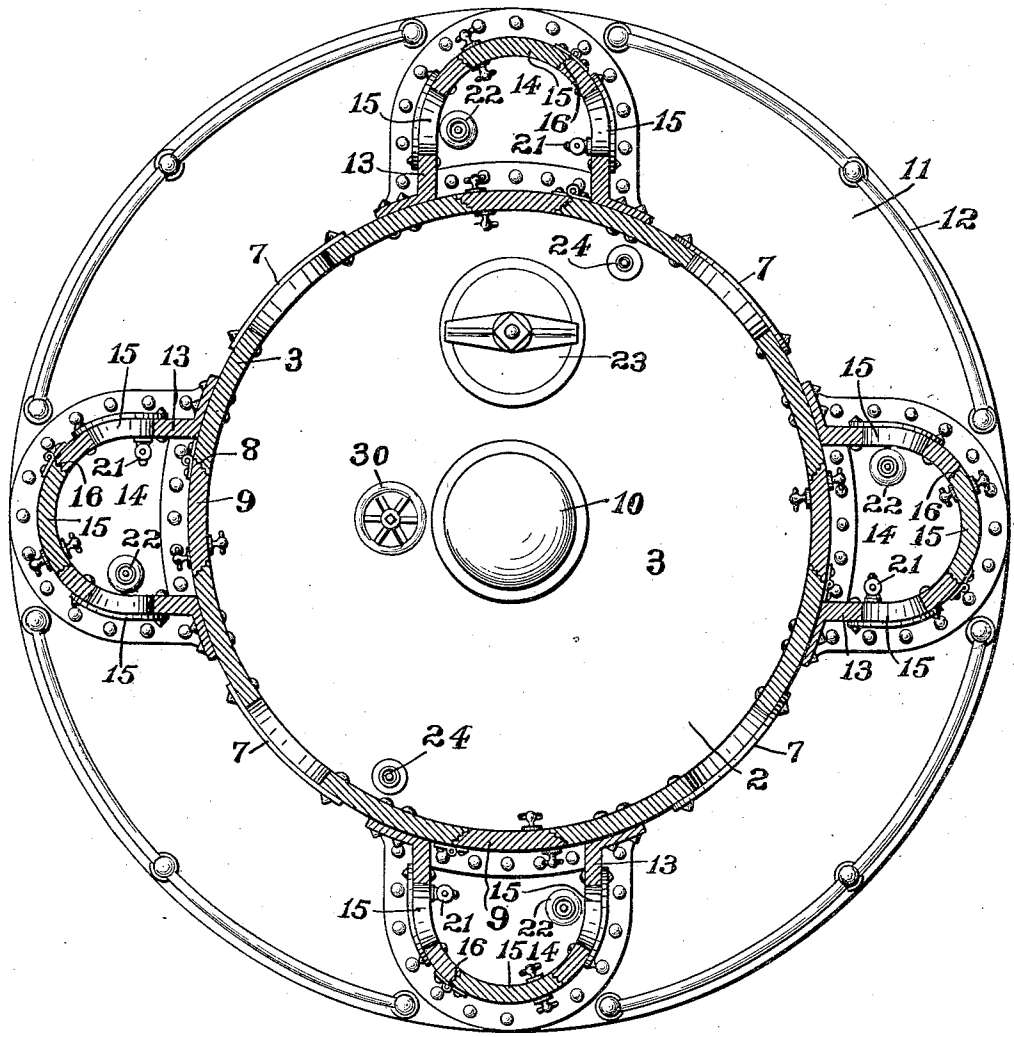

Fig. 2

WITNESSES:

Fredk W. Fraentzel

Clayton L. Cadmus.

INVENTOR:

William J. O'Connor,

BY

Fraentzel and Richards.

ATTORNEYS

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM J. O'CONNOR, OF NEWARK, NEW JERSEY, ASSIGNOR OF ONE-HALF TO DENNIS O'CONNOR, OF NEWARK, NEW JERSEY.

DIVING APPARATUS FOR MARINE EXPLORATION AND THE LIKE.

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To all whom it may concern:

Be it known that I, WILLIAM J. O'CONNOR, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Diving Apparatus for Marine Exploration and the Like; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

This invention relates, generally, to improvements in diving apparatus; and, the present invention has reference, more particularly, to a novel device or apparatus for diving purposes and which may be used especially for submarine explorations, being of such construction, that a corps of men can be carried in a main central air-containing chamber or compartment, the said main central compartment having access to a series of smaller compartments, into which may be admitted a person from the said main central compartment, and from which smaller compartments, persons can be admitted into the surrounding water, the persons, it will be understood, and as a matter of course, carrying the usual air-producing apparatus and wearing the usual air-containing helmet.

The present invention has for its principal object to provide a novel and simply constructed diving apparatus of the general character hereinafter more fully stated, which is adapted to carry a corps of men, who can pass freely from a main central air-containing compartment into the surrounding water, and back again from the water into the air-compartment, without any water rushing from without into the main central air-compartment.

The invention has for its further object to provide a diving apparatus of the general character stated which is especially adapted for sub-marine exploration, but which is also adapted to be used for lowering men down the side of a ship, within the surrounding water, when it becomes necessary to make repairs, the apparatus being easily carried on board of the ship, and by means of suitable mechanism being readily lowered into the water, or raised therefrom on board the ship.

Other objects of this invention not at this time more particularly enumerated will be clearly understood from the following detailed description of the present invention.

With the various objects of the present invention in view, the said invention consists, primarily, in the novel diving apparatus for sub-marine exploration hereinafter set forth; and, the invention consists, furthermore, in the novel arrangements and combinations of the several devices and parts, as well as in the details of the construction of the same, all of which will be more fully described in the following specification, and then finally embodied in the clauses of the claim which are appended to and which form an essential part of this specification.

The invention is clearly illustrated in the accompanying drawings, in which:—

Figure 1 is a transverse vertical sectional representation of a diving apparatus made according to and showing one embodiment of the principles of the present invention; and Fig. 2 is a horizontal section of the same, said section being represented as being taken on line 2—2 in said Fig. 1.

Similar characters of reference are employed in all of the above described views, to indicate corresponding parts.

Referring now to the said drawings, the reference-character 1 indicates the complete diving apparatus, the same comprising a suitably formed plate or platform, as 2, usually of a circular marginal configuration. Suitably mounted and secured upon said plate or platform 2 is the previously mentioned main central compartment 3, this compartment being preferably made of cylindrical conformation and being surmounted by a cone-shaped top, as 4. Suitably affixed to the said top are suitably constructed sheaves, as 5, around the wheels of which are passed suitable cables or flexible connections 6, by means of which the apparatus may be lowered from the deck of a vessel into the water, or may be raised and lifted from the water onto the deck of the vessel, by means of suitably constructed lowering and raising devices, as will be clearly understood. The said compartment 3 may also be provided in its vertical walls with glass or other trans-

parent port-holes or windows 7, and suitably shaped openings, as 8, which are adapted to be closed by means of suitably constructed sealing-doors 9, which, when closed, form with the walls of the compartment 3, the platform 2, and the top 4, a watertight chamber, large enough for the reception of a corps of men prior to being lowered into the water. Fresh air is supplied within the compartment 3 by means of any suitably constructed and well-known producer, as 10, with which the compartment 3 is provided.

As shown, the plate or platform 2 is made larger than the lower part of the compartment 3, so as to provide walking spaces, in the form of a balcony 11, which may be provided with a railing 12. Suitably located upon and secured to said balcony and to the outer surface of the vertical walls of the compartment 3, are shells or casings 13, each shell or casing 13 being of such size that they will provide with portions of the plate or platform 2 and with the compartment 3, at the points where the sealing-doors 9 are located, a series of small chambers or compartments 14, each chamber or compartment being of such size so as to comfortably receive a man. The said compartments 14 are provided in their vertical walls with glass or other transparent port-holes or windows, as 15, and with suitably shaped openings, as 16, which are adapted to be closed by means of suitably constructed sealing-doors 17, which, when closed, also form with the walls of the shells or casings 13, the outer wall-portions of the compartment 3, and the platform-portions, the said water-tight compartments 14 herein-above mentioned. Directly below the plate or platform 2 and the balcony 11 is a cylindrical or other suitably shaped element or member 18, which is provided with a bottom-plate 19, and which provides with the said plate or platform 2 and the balcony 11, a suitable receiving compartment or chamber 20, substantially as shown in said Fig. 1 of the drawings, and for the purposes to be presently more fully set forth. In the sides of the said shells or casings 13, so as to admit water from without into the interior of the chambers or compartments 14, are suitably constructed inlet-valves or cocks, as 21; and, in order to empty the chambers or compartments 14 of the water contained therein, when necessary, each chamber or compartment 14 is provided in its bottom or those parts of the balcony 11 upon which the shells or casings rest, with suitably formed outlet-valves, as 22, which can be manually opened, when desired, so that any water contained within a compartment 14 may be permitted to flow into the receiving chamber or compartment 20.

If desired, the plate or platform 2 may be formed with a suitable opening which can be sealed by means of a removable cover-plate, as 23, so as to provide a man-hole, for the admission, when necessary, of a person from the compartment 3 into the compartment or chamber 20. Air-valves, as 24, may also be arranged in the plate or platform 2, if desired, so as to allow air to pass from the chamber 20 into the compartment 3, and to readily allow the water to flow from the compartments 14 into the chamber 20, when the outlet-valves 22 have been opened.

As shown, the bottom-plate 19, herein-above mentioned, is also provided with an opening in which is arranged a closing device, as 25, and from which extends a stem 26 having a screw-threaded part 27 which is adapted to work in the nut-portion 29 of a standard 28 within the chamber or compartment 3, said stem 26 being provided within the compartment 3 with a hand-wheel 30 for operating the stem 26, so as to raise or lower the closing device 25, at will and as will be clearly evident.

Having in the foregoing described the general construction of the diving apparatus for marine explorations, I will now briefly set forth the manner of using the same.

A complement of men is admitted through the compartments 14 into the main compartment 3, and all doors 9 and 17 are firmly closed, thereby providing all the compartments 3 and 14 with sufficient air to enable the men to remain therein, fresh air or oxygen being readily produced by the device 10 within the compartment 3. All the inlet-valves or cocks 21, as well as the outlet valves 22, and the closing device 25 having also been closed, the device is now lowered over the side of the ship into the water. After the apparatus has been lowered to the point desired, the water and parts outside of the apparatus can be observed through the windows 7, and when it is necessary for a man to go outside upon the balcony 11, or into the surrounding water, for exploration or for repairs to the side of a ship, the person or diver opens a door 9 from the compartment 3 and enters one of the smaller compartments 14, securely closing the door 9 after him. He now opens the inlet-valve or cock 21, and thereby fills the compartment 14 with water from the outside. As soon as the compartment 14 is filled with water, the door 17 in the shell or casing 13 can be readily opened, as the pressure upon both sides of the door 17 has become equalized. The man now passes either upon the platform 11 or into the water. Any number of men can thus pass from the compartment 3 into any one or more of the compartments 14 and thence to the platform or into the surrounding water, the men upon the outside of the apparatus being observed by those remaining within the compartment 3,

through the windows 7. After a man has returned into the compartment or chamber 14, he again firmly closes the door 17, and also the inlet-valve or cock 21, but opens the outlet-valve 22, thereby permitting the water to flow from the compartment 14 into the receiving chamber or compartment 20. As soon as the compartment 14 has been emptied of the water, the door 9 is again opened, to permit the man to once more enter the main compartment 3. Thus, it will be evident, that a man or any number of men may pass from the compartment 3 into the water, and may return from the water into the compartment 3, without the admission of water into the main compartment 3. After the apparatus has again been raised out of the water, all doors may be opened for the exit of the men; and, also, the device 25 may be raised from its seat in the bottom-plate 19, so as to allow water contained in the compartment or chamber 20 to pass out therefrom.

From an inspection of the drawings, it will be clearly seen, that the arrangement of the various openings 8 and 16, and of the doors 9 and 15 is such, that any water-pressure against the doors will tend to more tightly hold the doors closed, so that the doors are tightly sealed in the respective openings of the walls of the compartment 3 and the shells or casings 13, whereby the possibility of any water leaking into the main compartment 3 is fully overcome. A pump may also be provided for removing the water from the diving apparatus.

I am fully aware that various arrangements may be made in the general arrangement and combinations of the various devices and parts, as well as in the details of the construction of the said parts, without departing from the scope of the present invention. Hence, I do not limit my invention to the exact arrangements and combinations of the various devices and parts as described in the foregoing specification, nor do I confine myself to the exact details of the construction of the said parts as illustrated in the accompanying drawings.

I claim:—

1. A diving apparatus comprising a main compartment adapted to receive a corps of men, an auxiliary compartment and a means of communication between said compartments, means for normally closing said means of communication, said auxiliary compartment being provided with an outlet, means for normally closing said outlet, means connected with said auxiliary compartment for flooding the same with water, all combined with a main water-receiving compartment, means connected with said auxiliary compartment for conducting the water from said flooded compartment into said main water-receiving compartment, said main water-receiving compartment being provided with an outlet, a closing device normally seated in said outlet for closing the same, and means connected with said closing device and extending into the main compartment for the manipulation of said closing device.

2. A diving apparatus comprising a base-plate forming a platform and a balcony, a main chambered body or compartment mounted upon said base-plate, a series of smaller auxiliary compartments mounted upon balcony, a means of communication between each auxiliary compartment and said main compartment, means for normally closing said means of communication, each auxiliary compartment being provided with an outlet, and means for normally closing each outlet, a water-inlet cock connected with each auxiliary compartment for flooding the same, and a water-outlet valve connected with each auxiliary compartment.

3. A diving apparatus comprising a base-plate forming a platform and a balcony, a main chambered body or compartment mounted upon said base-plate, a series of smaller auxiliary compartments mounted upon balcony, a means of communication between each auxiliary compartment and said main compartment, means for normally closing said means of communication, each auxiliary compartment being provided with an outlet, and means for normally closing each outlet, a water-inlet cock connected with each auxiliary compartment for flooding the same, all combined with a chambered water-receiving compartment connected with and extending downwardly from said platform and balcony, and a water-outlet valve connected with each auxiliary compartment for conducting the water from said flooded compartments into said water-receiving compartment.

4. A diving apparatus comprising a base-plate forming a platform and a balcony, a main chambered body or compartment mounted upon said base plate, a series of smaller auxiliary compartments mounted upon balcony, a means of communication between each auxiliary compartment and said main compartment, means for normally closing said means of communication, each auxiliary compartment being provided with an outlet, and means for normally closing each outlet, a water-inlet cock connected with each auxiliary compartment for flooding the same, all combined with a chambered water-receiving compartment connected with and extending downwardly from said platform and balcony, and a water-outlet valve connected with each auxiliary compartment for conducting the water from said flooded compartments into said water-receiving compartments, said main water-receiving compartment being provided with

an outlet, a closing device normally seated in said outlet for closing the same, and means connected with said closing device and extending into the main compartment for the manipulation of said closing device.

5. The herein described diving apparatus comprising a base-plate forming a platform and a balcony, a cylindrical shell mounted upon said platform, a cone-shaped top connected with said shell, sheaves connected with said top, and cables running upon said sheaves, said cylindrical shell being formed with openings, a door hinged in each opening, a series of auxiliary casings mounted upon said balcony and connected with the outer surface of said cylindrical shell, so as to provide smaller auxiliary compartments, an opening connected with each auxiliary compartment and a door hinged in each opening, a water-inlet cock connected with each auxiliary compartment for flooding the same, and a water-outlet valve connected with each auxiliary compartment.

6. The herein described diving apparatus comprising a base-plate forming a platform and a balcony, a cylindrical shell mounted upon said platform, a cone-shaped top connected with said shell, sheaves connected with said top, and cables running upon said sheaves, said cylindrical shell being formed with openings, a door hinged in each opening, a series of auxiliary casings mounted upon said balcony and connected with the outer surface of said cylindrical shell, so as to provide smaller auxiliary compartments, an opening connected with each auxiliary compartment and a door hinged in each opening, a water-inlet cock connected with each auxiliary compartment for flooding the same, all combined with a chambered water-receiving compartment connected with and extending downwardly from said platform and balcony, and a water-outlet valve connected with each auxiliary compartment for conducting the water from said flooded compartments into said water-receiving compartment.

7. The herein described diving apparatus comprising a base-plate forming a platform and a balcony, a cylindrical shell mounted upon said platform, a cone-shaped top connected with said shell, sheaves connected with said top, and cables running upon said sheaves, said cylindrical shell being formed with openings, a door hinged in each opening, a series of auxiliary casings mounted upon said balcony and connected with the outer surface of said cylindrical shell, so as to provide smaller auxiliary compartments, an opening connected with each auxiliary compartment and a door hinged in each opening, a water-inlet cock connected with each auxiliary compartment for flooding the same, said main water-receiving compartment being provided with an outlet, a closing device normally seated in said outlet for closing the same, and means connected with said closing device and extending into the main compartment for the manipulation of said closing device.

In testimony, that I claim the invention set forth above I have hereunto set my hand this 10th day of January, 1913.

WILLIAM J. O'CONNOR.

Witnesses:
FREDK. C. FRAENTZEL,
FREDK. H. W. FRAENTZEL.