

Aug. 25, 1942.

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2,294,296

PROTECTIVE MINE DEVICE

Filed July 23, 1940

3 Sheets-Sheet 1

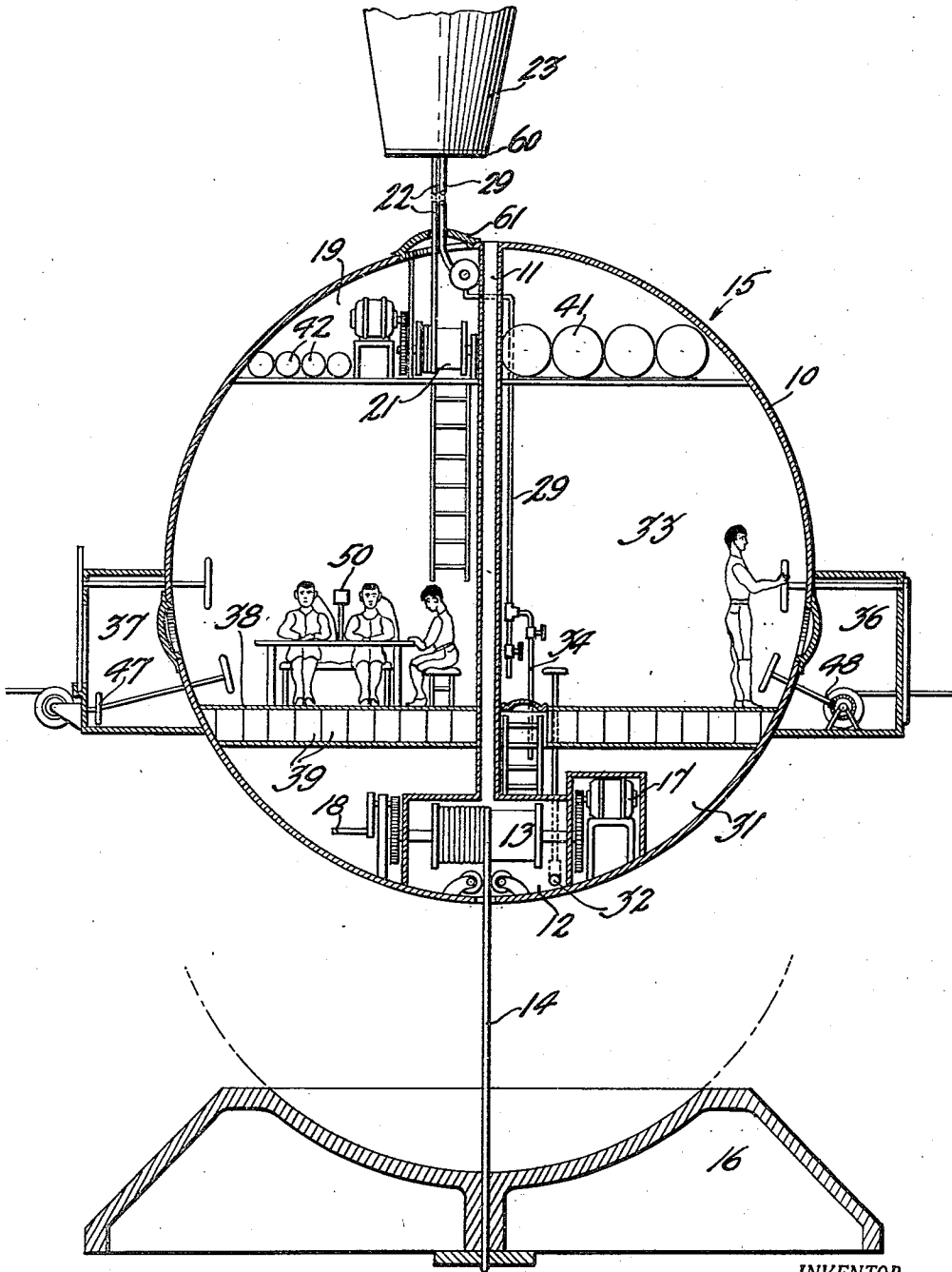


Fig. 1.

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3 Sheets-Sheet 2

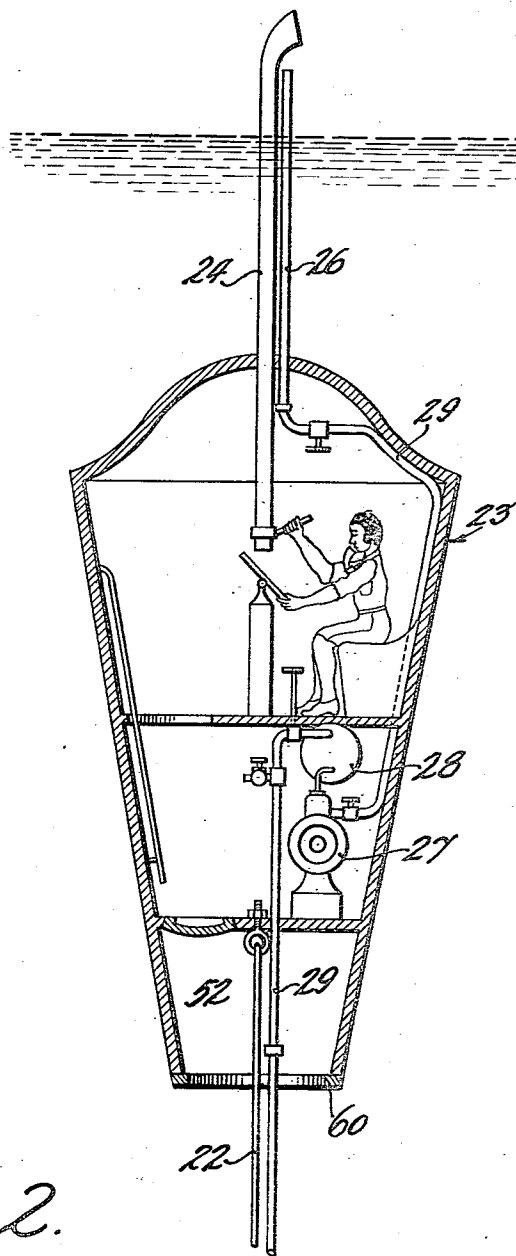


Fig. 2.

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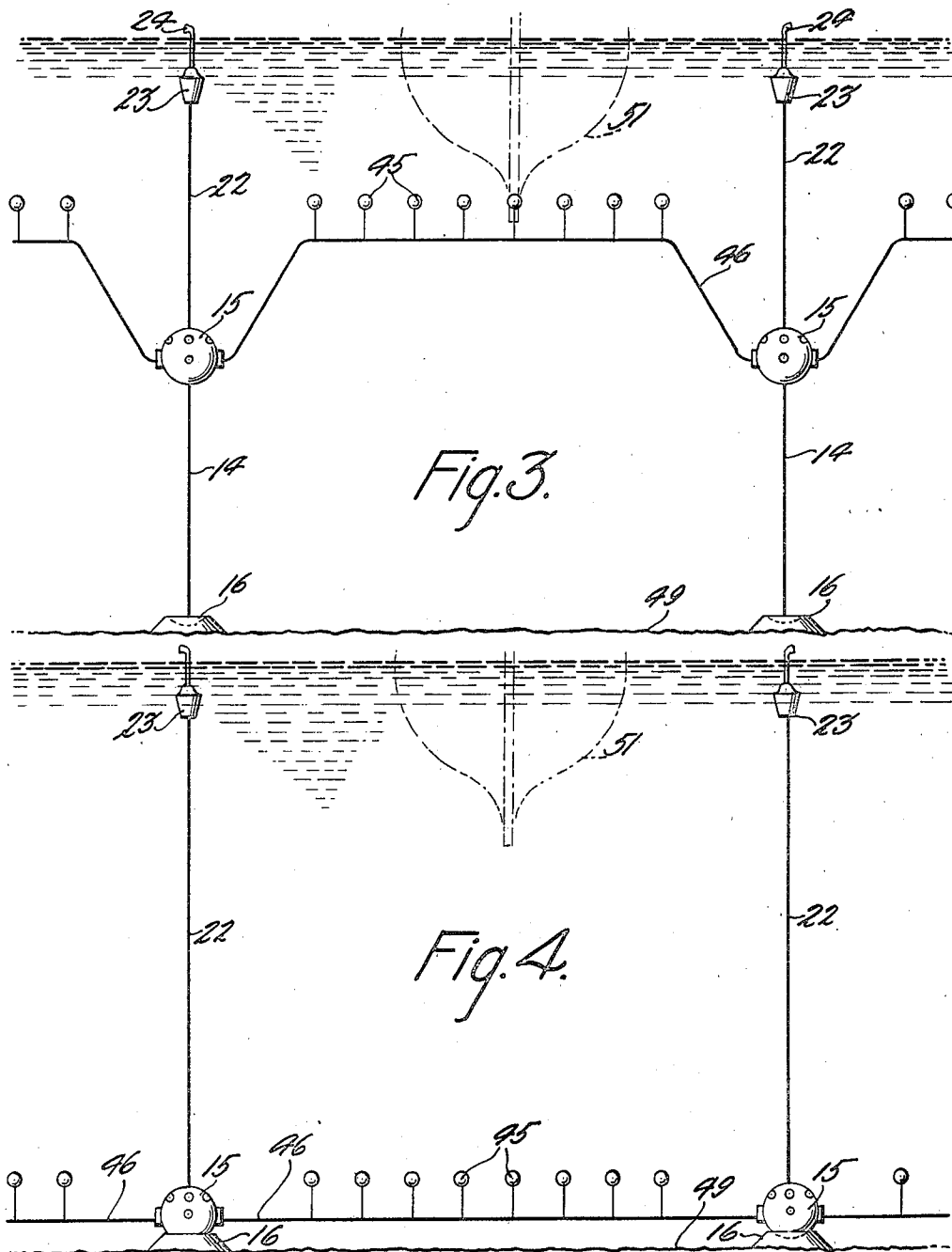
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PROTECTIVE MINE DEVICE

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3 Claims. (Cl. 114—0.5)

This invention relates in general to explosive marine protective mine devices and more particularly to mines whose operation is controlled to an effective or ineffective position from a point of observation.

An object of the invention is to provide a marine protective device adapted to prevent unauthorized entrance to any predetermined prohibited area by enemy shipping of either surface or under surface craft.

One of the principal objects of the invention is to provide means of the character described in which the explosive elements commonly known as mines can be advanced to or retracted from an effective position by a person or persons in charge of the control apparatus so as to permit shipping of a nonhostile nature to proceed without danger of contacting the mines.

Whereas there is shown and described in the present instant mines of the contact variety it should be understood that mines electrically or otherwise detonated are considered operable in conjunction with the apparatus herein set forth and accordingly reside within the scope of the invention.

Conventional methods of marine defense consists chiefly of providing harbors and other restricted areas with a multiplicity of contact mines broadcast to effectively forestall any attempt at entrance generally but with a secret passage or channel provided therein that is known only to certain pilots the location of said channel being subject to frequent change.

With the present invention it is contemplated to arrange the mines in series preferably between several observation points across an entrance to any restricted area in such a manner that said mines can be lowered to a noninterfering position in order that friendly shipping may pass safely over the mines.

Various objects and advantages other than those mentioned will be in part obvious from an inspection of the accompanying drawings and a careful consideration of the following particular description and claims of one form of mechanism embodying my invention.

In the drawings:

Figure 1 is a sectional view of a hollow sphere forming the central control station of the present invention. Figure 2 is a sectional view of an observatory station drawn on a relatively larger scale than Fig. 1. Figure 3 is a reduced scale diagrammatic view showing the invention in its effective defensive position. Figure 4 is a dia-

grammatic view showing the mines retracted to a noneffective position.

With reference to the drawings, 10 designates a floatable hollow sphere constituting a central control station 15 provided with a vertically extended centrally located passage 11 adapted to permit the entrance of sea-water into a watertight compartment 12 serving as a ballast tank in which is disposed a winch 13. On this winch is wound a cable 14 that is attached to an anchorage 16. Since the sphere 10 is floatable in water the operation of the winch 13 by means of the motor 17 or crank 18 will tend to either raise or lower the sphere to any desired location above its anchorage 16 for purposes more fully described hereinafter.

In an upper compartment 19 there is arranged a further motor driven winch 21 operating a cable 22 secured to the lower portion of a hollow elongated floatable chamber 23 having several compartments and adapted to form the observatory station of this invention from which the control station 15 will receive its instructions. A periscope 24 and an air tube 26 extend to a point above the water-line. An air pump 27 and pressure tank 28 are disposed in a lower compartment and connect with the tube 26 said pump drawing air from above the water and conveying it to any conveniently located outlet within either the sphere 10 or the chamber 23 by means of piping 29. Seawater can also be admitted to a further ballast tank 31 by means of a valve 32 operable from the compartment 33 directly above. The water thus admitted to said tank can be discharged if so desired by means of air pressure through the medium of an air pipe extension 34. Trimming tanks 36, 37 are provided to extend laterally from the sphere 10.

With reference to Fig. 1 there is shown beneath the floor portion 38 a multiplicity of storage batteries 39 for the operation of the various electrical devices such as the winches 13, 21. Tanks of compressed air and oxygen respectively 41, 42 are provided for an emergency. Numerous other devices either electrical or mechanical such as are common to undersea craft may be employed wherever they may be found convenient or necessary. It is obvious that where human beings are expected to inhabit any type of submarine craft over a protracted period certain provisions and requirements for the proper maintenance of life and health are requisite and since such equipment is commercially available it has not been either shown or described.

With reference to Figs. 3 and 4 a series of ex-

plosive mines 45 are strung along on one or more cables 46 the ends of said cables being connected respectively to the operating devices 47, 48 which form part of the control mechanism of the stations 15 (Fig. 1). These operating devices are adapted to pay out or to take up the slack in said cables to allow for the rise and fall of the water due to tides so that the mines will always have a definite spacing below the surface of the water.

As previously referred to, the control stations 15 are attached to their respective anchorages 16 in a manner as to permit the stations to be moved vertically by means of the winches 13 either towards or away from the ocean floor 49 thus permitting the mines to float to an effective position as shown in Fig. 3, or retracting them to an ineffective position as in Fig. 4. During this vertical movement of the control stations 15 in either direction the observation stations 23 are permitted to float, due to their natural buoyancy, near the surface of the water. If it is desired to withdraw these observation stations to a point below the surface of the water, the winch 21 will be brought into effect to reel in the cable 22. Suitable declutching mechanism (not shown) may be provided for the winch 21 to permit free unwinding of the cable 22 when the control stations 15 are lowered. The observation chambers may thus be permitted to float at their initial setting without interference. It might be found advisable to ballast these observation stations with water or other means in order that they may maintain their upright position when any slack occurs in the connecting cable 22. A lower compartment 52 has been provided for this purpose.

In operation:

Where the extent of the area to be protected is relatively great, a multiplicity of mine defense units as shown in Figs. 3 and 4 are arranged in series across any navigable section thereof. The initial setting of the control stations 15 would be about as shown in Fig. 3 with the mines 45 afloat at a depth where they may be readily contacted by a vessel 51. As the tide rises or falls the position of the mines is changed to conform with the same. When it is desired to permit friendly shipping to pass safely over the mines, the control stations 15 are notified by the observers in the stations 23 and as a consequence lowered to a neutral point together with the mines as shown in Fig. 4, or the slack may be taken out of the cable 46 (Fig. 3) and only the position of the mines changed to a safe distance below the surface of the water.

To revert to Figs. 1 and 2 for a moment, attention is directed to a gasket 60 attached to the lower portion of the chamber 23 which acts as a seal when the chamber 23 is drawn by the winch 21 to a position against the hollow sphere of the control station 15 to permit passage, by means of the port 61, from one station to another by the persons stationed therein. Compressed air may be employed to prevent entrance of water at this point.

Variations may be resorted to within the scope of the invention and portions of the improvements may be used without the others, whilst not departing from the spirit of the invention.

Having thus described my invention, I claim:

1. In an explosive submarine mine system, in combination, a series of hollow spheres constituting buoyant control stations each confined for operation with a sea-floor anchor and adapted for vertical movement relatively thereto, a series of independently floatable observatory stations each connected to one of said control stations in a flexible manner and adapted for vertical movement thereabove, cable means extending substantially horizontal from one control station to another and operable therefrom, and a series of mines connected to said cable means.

2. In submarine apparatus of the class described, in combination, a plurality of horizontally spaced apart buoyant control stations, retractable cable means extending substantially horizontal from one control station to another, explosive mines arranged in series with said cable means, a plurality of buoyant observatory stations in operative connection with said control stations, and further retractable cable means attached to an anchor means thus permitting said control and observatory stations to be raised or lowered at the will of an operator.

3. In submarine apparatus of the class described, in combination, a hollow sphere constituting a buoyant control station adapted for vertical up and down movement under water by means of a retractable cable operated from within said station, a cable disposed substantially horizontal extending from said control station and operable therefrom, a series of mines connected to said cable, an observatory station floatable independently above said control station, and means of communication between said control and said observatory stations.

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