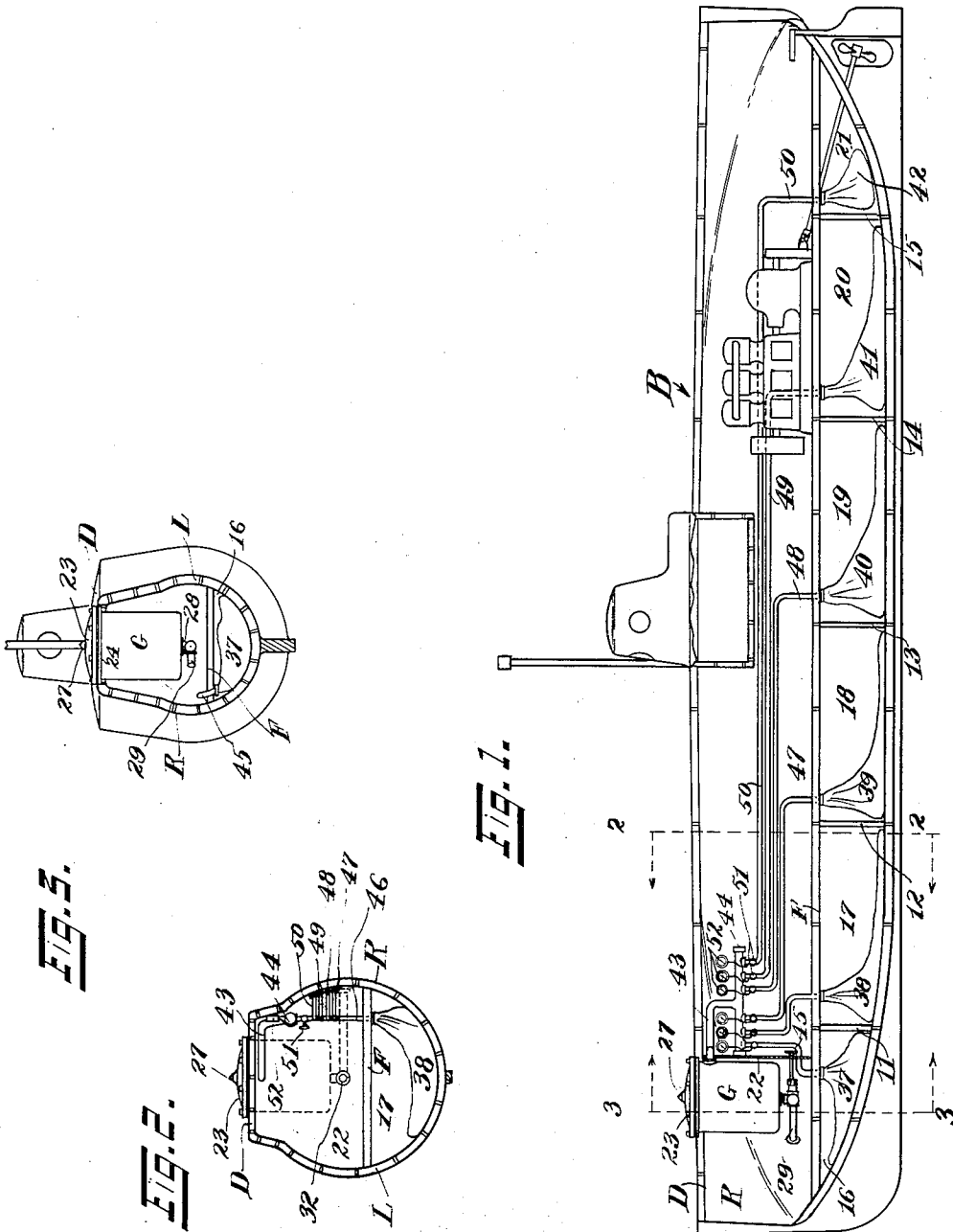


A. MUSOROFITI.
 MEANS FOR FLOATING OR RAISING FLUID SUPPORTED OBJECTS.
 APPLICATION FILED AUG. 18, 1915.

1,197,650.

Patented Sept. 12, 1916.
 3 SHEETS—SHEET 1.



Witnesses:
 Charles H. Hinton
 H. J. Penney

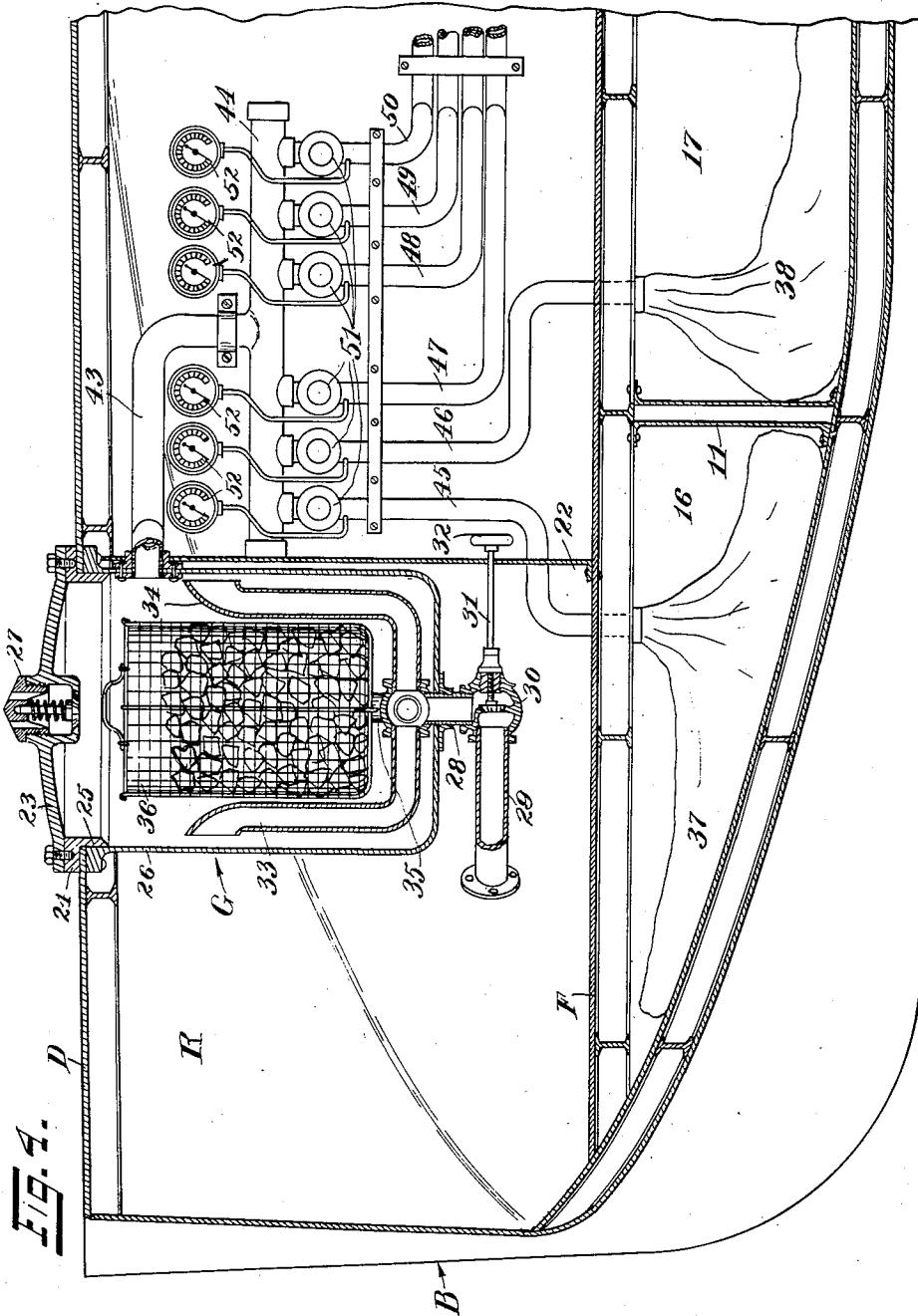
Inventor:
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3 SHEETS—SHEET 3.

FIG. 5.

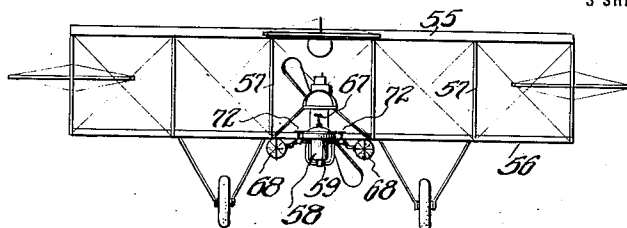


FIG. 6.

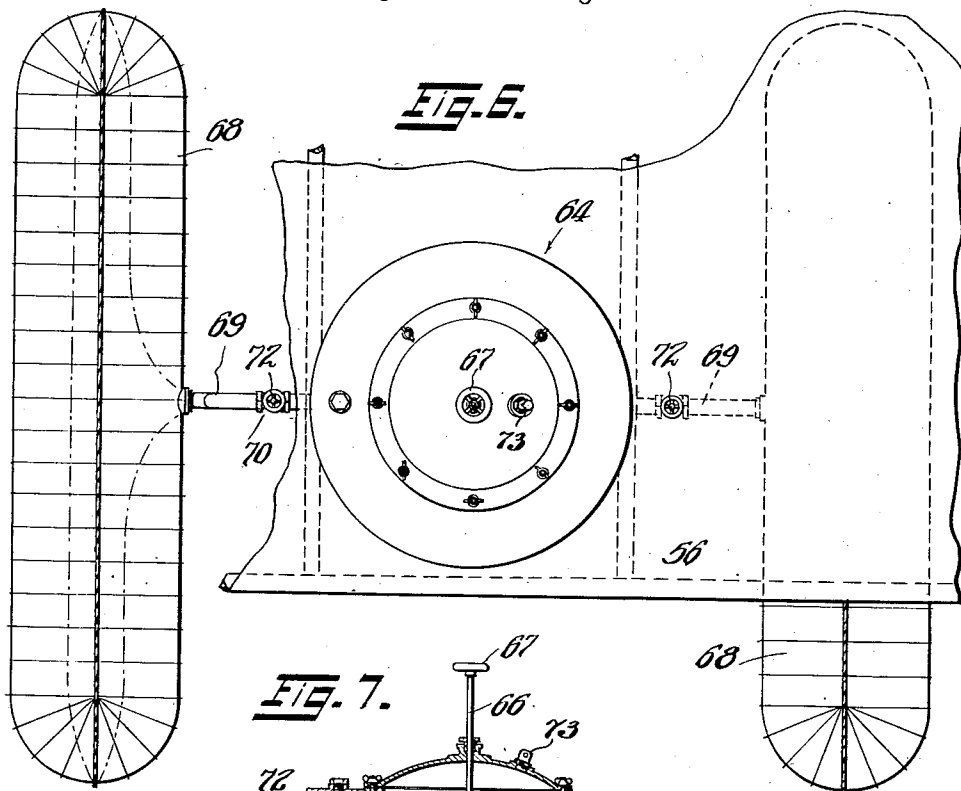
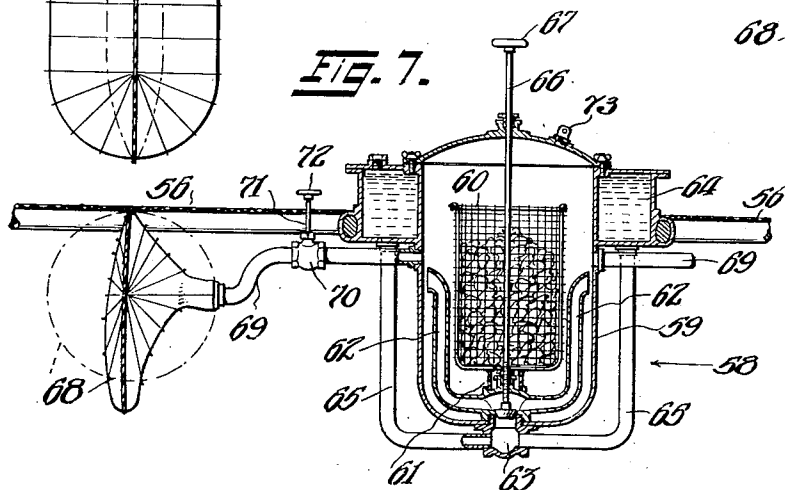


FIG. 7.



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UNITED STATES PATENT OFFICE.

ANTHONY MUSOROFITI, OF BROOKLYN, NEW YORK.

MEANS FOR FLOATING OR RAISING FLUID-SUPPORTED OBJECTS.

1,197,650.

Specification of Letters Patent. Patented Sept. 12, 1916.

Application filed August 18, 1915. Serial No. 46,039.

To all whom it may concern:

Be it known that I, ANTHONY MUSOROFITI, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Means for Floating or Raising Fluid-Supported Objects, of which the following is a specification.

10 This invention relates to improvements in means for floating or raising fluid-supported objects or conveyances, and particularly to emergency floating means for submarines.

15 One of the main objects of the present invention is to provide emergency means for floating or raising fluid-supported objects or conveyances such as aeroplanes, hydroplanes and submarines, which means can be manipulated by the occupants of the conveyance to operate immediately at a moment's notice whenever any part of the controlling or operating means fails to operate, a particular object of the invention being to provide emergency means for floating or raising submarines when the air compressor becomes inoperative, or the ballast tanks begin to leak due to injuries and like causes, or the submarine should fail to rise for any other like reason.

20 Still another object of the invention is to provide an emergency means for raising fluid-supported conveyances which can be carried by the fluid-supported conveyance, will occupy a comparatively small amount of space, is light in weight, and which can be equipped on an ordinary fluid-supported conveyance without any extensive reconstruction.

25 A particular feature of the invention is the provision of a generator for generating floating substance, and a plurality of receptacles for receiving such floating substance, any one of which can be shut off from communication with such generator. The value of the latter feature becomes particularly significant when a receptacle leaks, since the supply of such receptacle with floating substance would be useless.

30 Still another feature of the invention is the provision of pressure gages with a submarine equipment, each connected with one

of the aforesaid receptacles whereby a leak can be quickly detected in the receptacle.

These and other features, capabilities and advantages of the present invention will more fully appear from the subjoined detail description of one specific embodiment thereof, in which—

Figure 1 is a diagrammatic view illustrating a submarine equipped with one embodiment of the present improvement. Fig. 2 is a transverse section along the line 2—2, of Fig. 1. Fig. 3 is a transverse section along the line 3—3, of Fig. 1. Fig. 4 is an enlarged fragmental view, partly in section, illustrating a part of a submarine equipped with the present improvement. Fig. 5 is a diagrammatic view of an aeroplane equipped with another embodiment of the present invention. Fig. 6 is an enlarged fragmental plan illustrating part of an aeroplane equipped with the embodiment shown in Fig. 5. Fig. 7 is a fragmental elevation, partly in section, illustrating part of an aeroplane equipped with the embodiment shown in Fig. 5.

In the embodiment shown in Figs. 1 to 4, there is provided a submarine B having an outer wall comprising shells L and R, and a floor member F secured to such shells L and R and dividing the submarine into an upper chamber part of which is used for the occupants of the submarine, and a lower chamber which is divided by the partitions 11, 12, 13, 14 and 15, to form the ordinary ballast tanks 16, 17, 18, 19, 20 and 21.

At the forward part of the upper chamber, there is provided a partition 22 forming a generator compartment which is separated by said partition from the compartment in which the occupants of the submarine are engaged. The deck D, disposed above the generator compartment, is preferably provided with an opening that is circular adjacent to the partition 22 through which the generator G extends. The cover 23 of the generator G has a collar 24 which is secured to the deck D surrounding the opening therein, and the collar 24 has a downwardly extending flange 25 (Fig. 4), to which flange 25 and the deck D the upper end of the cylinder 26 of the generator is secured. The cover 23 is provided with a safety valve 27.

The lower end of the cylinder 26 is provided with a centrally disposed opening through which extends the pipe 28, the lower end of which pipe 28 is connected to the pipe 29.

One end of the pipe 29 passes through the shell R, affording entrance for sea-water which is to be supplied to the generator through the pipe 28. Either the pipe 28 or the pipe 29 is provided with a valve for controlling the passage therethrough. In the present instance, the valve 30 is provided at the connection between the two pipes, which valve is equipped with a controlling stem 31 which extends through the partition 22 and is provided at its inwardly extending end with a handle 32 by means of which the valve 30 can be controlled and manipulated by the occupants of the submarine. The upper end of the pipe 28 is connected to the two pipes 33 and 34, which extend upwardly, the upper ends of which pipes 33 and 34 are open to permit sea-water that has been fed into the same to be discharged into the cylinder 26 of the generator.

In the cylinder 26, and in the present instance secured to the union 35 between the pipes 33 and 34, is suitably mounted the holder 36. In this holder 36 is contained a suitable chemical compound such as carbide or the like, which will generate a gas that is lighter than water when coming into contact with water. This holder 36 is preferably composed of a reticulated material such as wire mesh, which mesh will be fine enough to adequately support the carbide and yet permit the free passage of water therethrough from the outside into contact with such carbide. The gas generated in such cylinder 26 is to be conveyed to the bags 37, 38, 39, 40, 41 and 42 contained in the tanks 16, 17, 18, 19, and 21, respectively. The bags 37 to 42 inclusive are composed of any suitable material such as canvas, rubberized cloth or the like, which is flexible and sufficiently gas-tight to prevent leakage of such gas while the bags are submerged. For the purpose of conveying the gas from such generator to such bags, there is provided a pipe 43 one end of which is in communication with the cylinder 26 connected with the upper end of such cylinder 26, such pipe 43 thereupon passing through the partition 22 and connecting with the manifold 44 disposed adjacent to the shell R, (Fig. 2). The manifold 44 is in the present instance provided with six branch pipes, 45, 46, 47, 48, 49 and 50, which connect with the bags 37, 38, 39, 40, 41 and 42, respectively, the pipes 45 to 50 inclusive being preferably disposed along one side of the inner compartment, and in the present instance shown as disposed adjacent to the shell R. Each of the pipes 45 to 50 inclusive is provided with a valve 51 and a pressure gage 52. By means

of the pressure gages 52, any leaks in the bags 37 to 42 inclusive can be readily detected and thereupon the valve 51 connected to the leaky bag turned off to prevent the loss of gas that may be fed thereto.

The operation of the arrangement is as follows: In case of emergency, as for instance when the pressure pump, for ordinarily supplying the tanks 16 to 21 inclusive with pressure, had become inoperative or any of the tanks 16 to 21 inclusive had been damaged and were leaking, or for any other reason the submarine while submerged cannot be raised by the ordinary floating means, then the handle 32 is operated to open the valve 30 to permit sea-water to pass through the pipes 29, 28, 33 and 34 into the cylinder 26, whereupon the sea-water contacts with a gas-producing chemical compound contained in the holder 36. Upon sufficient water having been received into the cylinder 26, the water supply is shut off by automatic means, not shown, or by turning the valve 32. Upon the generation of the gas, the valves 51 are opened and thereupon the gas, generated in the cylinder 26 passing into the pipe 32, manifold 44, and pipes 45 to 50 inclusive, is conveyed to the bags 37 to 42 inclusive, which become inflated and fill up the tanks 16 to 21 inclusive thereby to extrude the water that may be contained in such tanks, the bags being conformed to the respective tanks so that they will completely fill up such tanks and also be supported by the framework of such tanks to withstand any abnormal difference in pressure between its contents and the outside as may occur when the submarine rises to a higher level where the outside pressure is less than the outside pressure of the level where the submarine formerly was located. Furthermore, when the pressure gages 52 indicate that the pressure contained in the bags has increased the proper amount, the valves 51 may be manipulated to shut off the further supply of gas. Again, when any of the gages 52 indicate that the pressure in a certain bag does not rise a degree corresponding to the others, this will indicate, other parts being in order, that the bag has suffered injury and is leaking and thereupon its valve can be manipulated to shut off the supply of gas to such bag thereby to prevent the loss of gas. When the valves 51 are shut off, or when the generator is producing gas, at such a rate that the pressure in the cylinder 26 rises too high, the safety valve 27 will permit such excess pressure to blow off and reduce the pressure to normal.

In the embodiment illustrated in Figs. 5, 6 and 7, there is shown an aeroplane of ordinary construction having an upper plane 55 and a lower plane 56 suitably connected to the uprights 57. The floating or raising

means 58 are preferably disposed on and secured to the lower plane 56. The floating means for a conveyance, such as an aeroplane, as illustrated in Figs. 5, 6 and 7, consists essentially of a cylinder 59 in which gas is generated, a gas-producing chemical compound container or holder 60 disposed in said cylinder 59 and preferably mounted on a union 61 of the two upwardly extending pipes 62, the union 61 communicating with the inlet valve 63, which valve 63 is connected to and in communication with the water-reservoir 64 encircling the upper portion of the cylinder 59 by pipes 65. The valve 63 is provided with an upwardly extending controlling rod 66 which extends through the cylinder 59, the holder 60, and terminates in a handle 67 at its upper end, which handle 67, as shown in Fig. 5, extends up above the lower plane 56 within reach of the occupant of the conveyance to be grasped and manipulated by such occupant. To each side of the cylinder 59 there is provided a gas-receiving receptacle comprising an inflatable bag 68 which is secured along its upper edge to the lower plane 56. Each of the bags 68 is connected and in communication with the cylinder 59 by a pipe 69. Each of the pipes 69 is provided with a valve 70 having an upwardly extending controlling rod 71 terminating in a handle 72 at its upper end by means of which the communication through such pipe 69 is controlled, such pipes permitting the passage of the gas generated in the cylinder 59 to be conveyed to the bags 68. The handles 72 of the valves 70 also extend above the plane 56 to permit the occupant of such conveyance to operate the same.

The operation of the foregoing arrangement is as follows: In case of emergency, the handle 67 is manipulated to open the communication between the water-reservoir 64 and the cylinder 59 through the pipes 65 and 62 whereupon the water from the reservoir 64 will pass into the cylinder 59 and upon coming into contact with the gas-producing chemical substance contained in the holder 60, gas will be generated. Thereupon, the valve 70 being open, the gas will pass into the bag 68 and inflate the same. Upon the passage of a sufficient quantity of gas into the bag 68, the valves 70 may be shut off. The cylinder 59 is provided with the safety valve 73 to take care of the excess pressure.

It is obvious that various changes and modifications may be made to the details of construction without departing from the general spirit or scope of the invention.

I claim:

1. The combination with a submarine, of an emergency floating means comprising a gas generator carried by said submarine and

comprising a cylinder, a pipe extending from said cylinder outside of said submarine to form a communication whereby to permit sea-water to pass into such cylinder, controlling means for controlling the passage through said communication, a holder in said cylinder containing a chemical compound the contact with which by water forms a gas, and gas-receiving means on said submarine connected to said gas generator to be filled by the gas generated thereby when said gas generator is operating, said gas receiving means being spaced from and separate and distinct from said generator so that the water for generating said gas will not enter said gas receiving means.

2. The combination with a submarine, of an emergency floating means comprising a gas generator carried by said submarine and comprising a cylinder, a pipe extending from said cylinder outside of said submarine to form a communication whereby to permit sea-water to pass into such cylinder, controlling means for controlling the passage through said communication, a holder in said cylinder containing a chemical compound the contact with which by water forms a gas, gas-receiving means on said submarine, and connections for connecting said gas-receiving means with said generator by means of which the gas generated may be conveyed to such gas-receiving means to fill the same, said gas receiving means being spaced from, and separate and distinct from said generator so that the water for generating said gas will not enter said gas receiving means.

3. The combination with a submarine having a partition dividing such submarine into an upper compartment and a lower compartment, a second partition dividing said upper compartment into a compartment for the occupants of the submarine and a generator compartment, of an emergency floating means comprising a gas generator disposed in said generator compartment, connections whereby water may be conveyed into said generator, a gas-producing chemical compound in said generator adapted to form a gas when coming in contact with water, controlling means for said connections extending into the compartment for the occupants of said submarine there to be manipulated, partitions in said lower compartment dividing said lower compartment into a plurality of tanks, a plurality of bags one in each of said tanks, connections between said generator and said bags whereby the gas generated by said generator may be conveyed to said bags and fill the same, and controlling means on said latter connections extending into the submarine occupants' compartment so that said connections independent of one another

may be controlled by the occupants of the submarine.

4. The combination with a submarine having a partition dividing such submarine into an upper compartment and a lower compartment, a second partition dividing said upper compartment into a compartment for the occupants of the submarine and a generator compartment, of an emergency floating means comprising a gas generator disposed in said generator compartment, connections whereby water may be conveyed into said generator, a gas-producing chemical compound in said generator adapted to form a gas when coming in contact with water, controlling means for said connections extending into the compartment for the occupants of said submarine there to be manipulated, partitions in said lower compartment dividing said lower compartment into a plurality of tanks, a plurality of bags one in each of said tanks, connections between said generator and said gas-receiving means whereby the gas generated by said generator may be conveyed to said bags and fill the same, controlling means on said latter connections extending into the submarine occupants' compartment so that said connections independent of one another may be controlled by the occupants of the submarine, and gages on said connections to indicate the pressure in said bags thereby to detect injuries to such bags.

5. The combination with a fluid-supported conveyance, of an emergency floating means comprising a gas generator carried by said conveyance and comprising a cylinder, a pipe connection forming a direct communication between such cylinder and the outside of said conveyance whereby water may be conveyed to said cylinder from the outside thereof, controlling means for controlling said water supply, a holder in said cylinder containing a chemical compound the contact with which by water forms a gas, gas-receiving means on said conveyance, connections for connecting said gas-receiving means with said generator by means of which the gas generated may be conveyed to such gas-receiving means to fill the same, and means for controlling such connections whereby said connections may be shut off when desired independent of one another, said gas receiving means being spaced from, and separate and distinct from said generator so that the water for generating said gas will not enter said gas receiving means.

6. The combination with a submarine, of an emergency floating means comprising a gas generator carried by said submarine, connections forming a direct communication between said generator and the outside of the said floating means, whereby the outside sea-water may be conveyed to said gener-

ator, controlling means on said submarine for said connections, and gas-receiving means on said submarine connected to such gas-generator to be filled by the gas generated thereby when said gas generator is operating, said gas receiving means being spaced from, and separate and distinct from said generator so that the water for generating said gas will not enter said gas receiving means.

7. The combination with a submarine, of an emergency floating means comprising a gas generator carried by said submarine, connections forming a direct communication between said generator and the outside of the said floating means, whereby the outside seawater may be conveyed to said generator, a gas-producing chemical compound contained in said gas generator adapted to form a gas when coming in contact with water, controlling means for said connections on said submarine, and gas-receiving means on said submarine connected to such gas generator to be filled by the gas generated thereby when said gas generator is operating, said gas receiving means being spaced from, and separate and distinct from said generator so that the water for generating said gas will not enter said gas receiving means.

8. The combination with a submarine, of an emergency floating means comprising a gas generator carried by said submarine, connections forming a direct communication between said generator and the outside of said floating means, whereby the outside seawater may be conveyed to said generator, a gas-producing chemical compound contained in said generator and adapted to form gas when coming in contact with water, controlling means for said connections mounted on said submarine, a plurality of tanks disposed in the lower portion of said submarine, inflatable bags each disposed in one of said tanks and connected to such gas generator to be filled by the gas generated thereby when said gas generator is operating, and controlling means for controlling the supply of gas to said bags independently of one another, said tanks being spaced from, and separate and distinct from said generator so that the water for generating said gas will not enter said tanks.

9. The combination with a submarine, of an emergency floating means comprising a gas generator carried by said submarine, connections forming a direct communication between said generator and the outside of said floating means, whereby the outside seawater may be conveyed to said generator, a gas-producing chemical compound contained in said generator and adapted to form gas when coming in contact with water, controlling means for said connections mounted on said submarine, a plurality of tanks dis-

posed in the lower portion of said submarine, inflatable bags each disposed in one of said tanks and connected to such gas generator to be filled by the gas generated there-
5 by when said gas generator is operating, said bags conforming to said tanks to completely fill the same when inflated thereby to extrude the water that may be contained in said tanks and the tanks in turn reinforcing
10 said bags when the difference in pressure between the outside and inside of said

bags becomes abnormal, and controlling means for controlling the supply of gas to said bags independently of one another, said tanks being spaced from, and separate and
15 distinct from said generator so that the water for generating said gas will not enter said tanks.

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Witnesses:

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