

VALVED CONTROLLING APPARATUS FOR OUTBOARD BALLAST AND FUEL TANKS.

1,399,263.

Fig. 1.

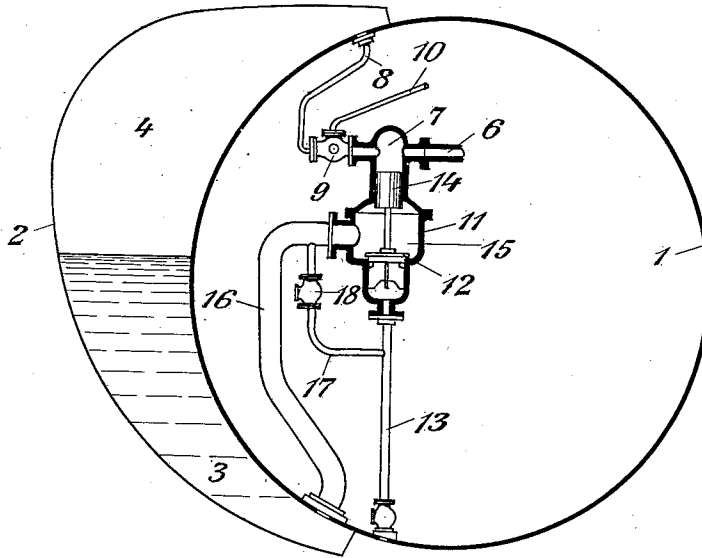
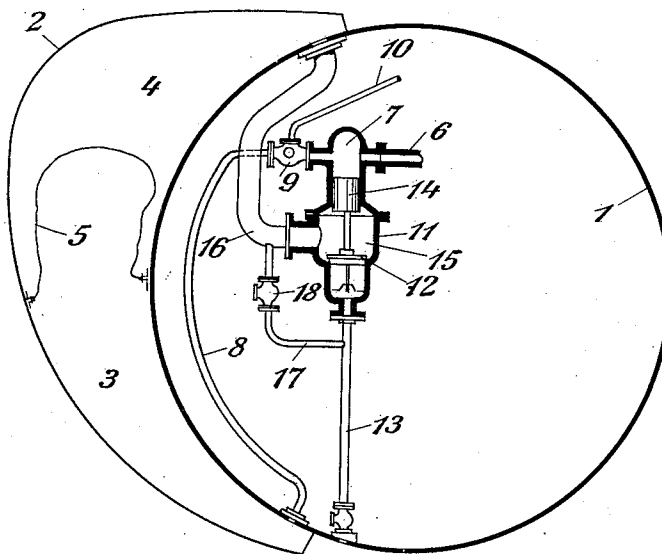


Fig. 2.



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UNITED STATES PATENT OFFICE.

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VALVED CONTROLLING APPARATUS FOR OUTBOARD-BALLAST AND FUEL-TANKS.

1,399,263.

Specification of Letters Patent.

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(GRANTED UNDER THE PROVISIONS OF THE ACT OF MARCH 3, 1921, 41 STAT. L., 1313)

To all whom it may concern:

Be it known that I, FERDINAND LANTZ, a citizen of the German Republic, and a resident of Hamburg, Germany, have invented certain new and useful Improvements in Valved Controlling Apparatus for Outboard-Ballast and Fuel-Tanks, (for which I have caused application to be filed in Germany on Jan. 22, 1917, by Johannes Schowalter,) of which the following is a specification.

In the previously known arrangements in submarine boats for the storage of fuel in the outboard tanks, said arrangements permitting an automatic access of outside water in the same proportion as fuel is withdrawn from said tanks, the interior of the tanks is in permanent direct connection with the outside water.

However, these known arrangements, in which the interior of the fuel tanks is under the pressure of the water surrounding the boat at any submerging depth of the latter, show the disadvantage that liquid fuel passes to the outside water as well through the direct connection, through which the filling water enters into the interior of the tanks, as through leaks in the tank walls, especially at the riveted joints. The fuel, once having passed to the outside water, is lost and indicates the direction of travel of the boat, as it floats on the surface of the water.

These disadvantages are substantially obviated in the present invention thereby, that the filling water can enter into the fuel tanks only through an automatically closing device and can return to the outside water only through another automatically closing device which is provided in a second or roundabout pipe line.

When the automatically closing device, through which only the filling water can enter into the tank, is weighted by a spring, weight or the like, the interior of the tank is held according to said weight under a subpressure in view of the water pressure. Then it is not possible that the fuel liquid can escape from the tank, because it cannot flow from a place with lower pressure (interior of the tank) to a place with higher pressure (outside water).

A special feature of my invention is seen therein, that the fuel is always flooded by water. In this case the fuel can be

heavier than the water. If, however, the fuel is lighter than water, a diaphragm is provided in the interior of the tank for the purpose of separating fuel and water. Accordingly the arrangement is independent of the specific weight of the fuel compared with that of the water.

In the accompanying drawing two forms of construction of the subject matter of my invention are represented by Figures 1 and 2.

The fuel tank 2 is provided on the outside of the pressure body 1 and in the form of execution, shown in Fig. 1, the fuel is arranged in the upper chamber 4 and the filling water in the lower chamber 3 of the fuel tank 2; in this case the fuel floats on the filling water and accordingly must be lighter than water. In the form of execution, illustrated in Fig. 2, the fuel is arranged in the lower chamber 3 and the filling water in the upper chamber 4. If now the fuel is heavier than the water, the latter floats on the fuel. When emulsions of water and fuel are to be prevented, water and fuel can be separated from each other by means of a diaphragm 5; this is also true of the arrangement shown in Fig. 1. If, however, in the form of construction shown in Fig. 2, the fuel is lighter than water the provision of the partition 5 is necessary.

In both forms of construction shown in Figs. 1 and 2 the fuel is drawn through a pipe 6 from the chamber 7 of a valve-like structure. This chamber 7 is connected by means of a fuel pipe 8, in which is arranged a valve 9 for the fuel pipe 10 branching off from said pipe 8, with the upper chamber 4 (Fig. 1) or respectively with the lower chamber 3 (Fig. 2) of the fuel tank. Within the casing 11 of the valve-like structure a weighted and thereby automatically closing member 12 is arranged, which is opened by the sea-water, entering through the pipe 13 when the fuel is drawn off through the pipes 6 and 8. As said member 12 is weighted in both forms of construction, shown in the drawing, by a slidable weight, the same closes again after the entering water has passed into the chamber 15, thereby preventing said water from flowing back from said chamber into the pipe 13 and from there to the outside water. From the chamber 15 the water enters through the water fill pipe either into the lower chamber 3

(Fig. 1) or into the upper chamber 4 (Fig. 2) of the fuel tank 2. Accordingly while in Fig. 1 the filling water gradually fills the tank from the lower chamber toward the upper chamber in proportion to the quantity of fuel drawn off through the pipe 8, the filling water in Fig. 2 floods the fuel stored in the lower chamber 3, thereby gradually lowering the diaphragm 5 and always pressing upon the fuel level.

In a second or roundabout pipe 17 between the sea water pipe 13 and the water fill pipe 16 an automatically closing member 18 is interposed, which is similar to the member 12 in the main pipe, but can be opened in the opposite direction by a slight pressure or suction effect, accordingly the member 18 opens only then, when by any incident the pressure in the interior of the tank becomes greater than in the outside water. If the member is arranged to be opened by a suction effect, this may take place when a sucking member, pump or the like, is provided in the pipes 17 or 13.

Between the members 12 and 18 the liquids are tensioned within the tank 2 and are under a pressure, which is as much less than the water pressure surrounding the boat as the weight of the part 14 amounts to. By the above mentioned suction member (not illustrated) in the pipe 17 a further permanent or temporary reduction of pressure in the tank can be obtained, when this is desired.

For the purpose of filling the fuel tank 2 with liquid fuel a connection between the fuel fill pipe 10 and pipe 8 with the interior of the tank is established by means of the member 9. Under the pressure of the incoming fuel the water then escapes through the member 18 to the pipes 16, 17, 13 in the same proportion as it has entered by means of the member 12 and through the pipes 13, 15, 16 when fuel was drawn off.

Having now particularly described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In an arrangement in vessels, especially

submarine boats for the storage of fuel in outboard tanks a pipe system for filling and withdrawing the fuel into and from said tanks, a further pipe system for filling said tanks with sea water in proportion to the fuel drawn from the tanks, a valve-like structure connected to both said pipe systems and an automatically closing member in said valve structure through which only the filling water can enter into said fuel tanks.

2. In an arrangement in vessels, especially submarine boats, for the storage of fuel in outboard tanks, a pipe system for filling and withdrawing the fuel into and from said tanks, a further pipe system for filling said tanks with sea water in proportion to the fuel drawn from said tanks, a valve-like structure connected to both pipe systems, an automatically closing member in said valve like structure through which only the filling water can enter into said fuel tanks and a second automatically closing member, provided in the second or roundabout pipe system, through which only the filling water can leave the tanks.

3. In an arrangement in vessels, especially submarine boats, for the storage of fuel in outboard tanks, a pipe system for filling and withdrawing the fuel into and from said tanks, a further pipe system for filling said tanks with sea water in proportion to the fuel drawn from said tanks, diaphragms within the tanks serving as partitions to separate the fuel from the water, a valve like structure, connected to both pipe systems, an automatically closing member in said valve-like structure, through which only the filling water can enter into said tanks and a second automatically closing member, provided in the second or roundabout pipe system, through which only the filling water can leave the tanks.

In testimony whereof I affix my signature in the presence of two witnesses.

FERD. LANTZ.

Witnesses:

W. T. AIES,
V. WARNAN.