

July 1, 1930.

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1,769,136

BILGE PUMP

Filed Dec. 1, 1928

2 Sheets-Sheet 1

Fig. 1.

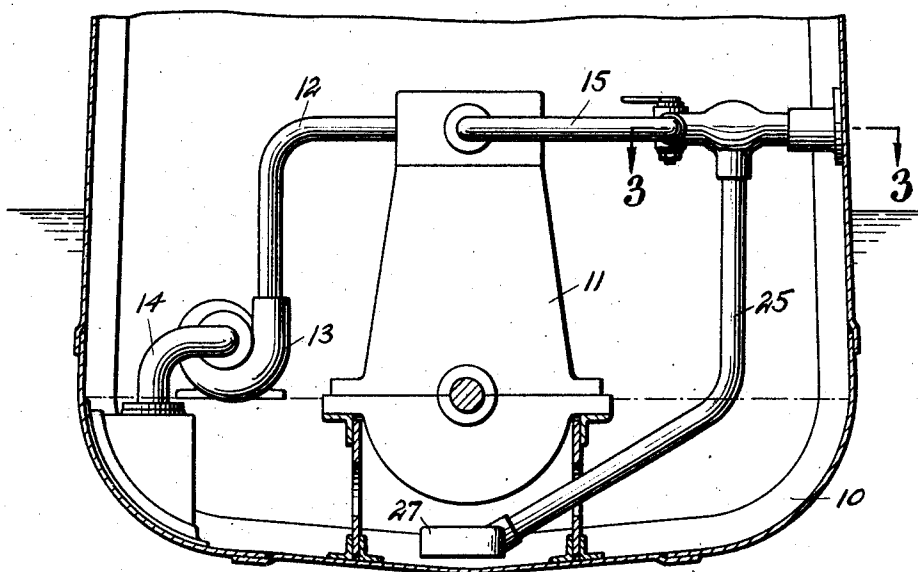
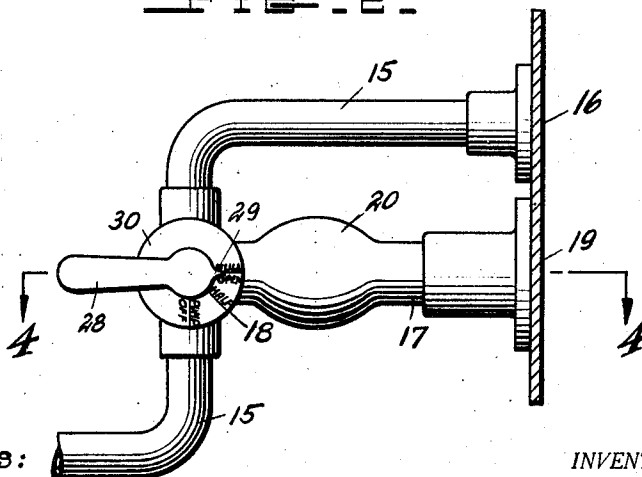


Fig. 2.



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FIG. 3.

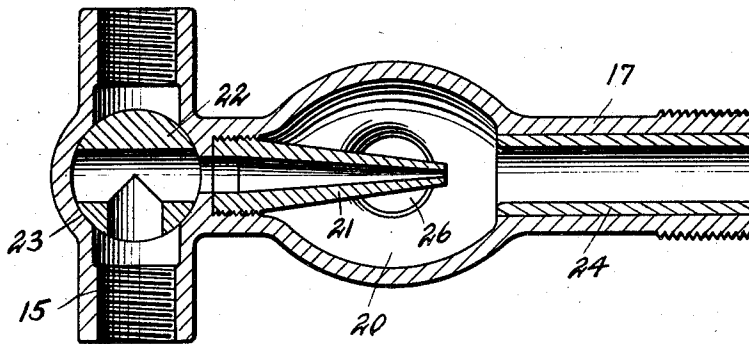
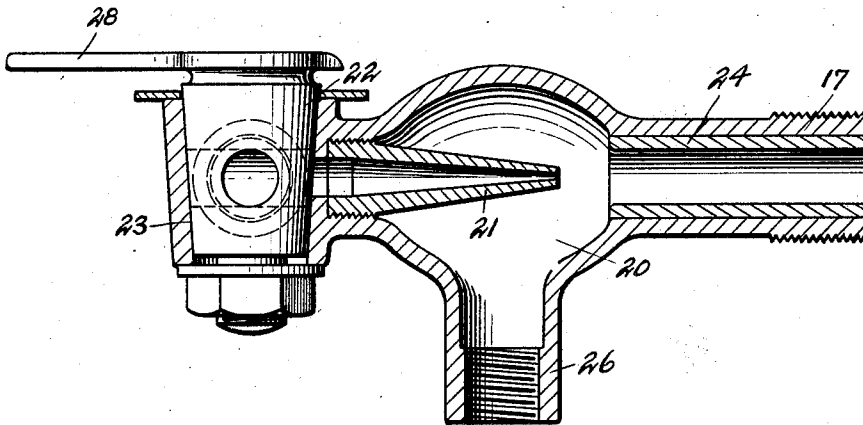


FIG. 4.



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## UNITED STATES PATENT OFFICE

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## BILGE PUMP

Application filed December 1, 1923. Serial No. 323,179.

The present invention relates to devices for removing fluids from vessels as the removal of bilge water from the hull of a ship.

An object of the invention is to utilize the force created by the flow of fluid through a cooling system for creating the necessary suction for removing fluid from a vessel.

A further object is to provide means whereby the utilization of the force of the cooling system may be controlled for creating suction as set forth above.

The device by which the above objects are accomplished comprises apparatus adapted to be connected in a system having a fluid flowing therethrough such as a cooling system used in connection with an engine, and operated by the flow of fluid therethrough for drawing fluid from a vessel by suction. An important accessory to the above device, as outlined, is that of means, as a three-way valve, for selectively directing the flow of fluid to its customary outlet or through the suction device.

An embodiment of the above principles herein illustrated and described show an adaptation thereof to the cooling system of an engine used to propel a vessel and as used for the removal of bilge water from the hull of the vessel and consists in a vacuum chamber having an outlet separate from the outlet of the cooling system and means therein for creating a vacuum when fluid from the cooling system is permitted to flow therethrough. The flow of fluid through the system and through its usual outlet is controlled by a three-way valve and a hose or pipe is provided connected with the vacuum chamber and having a head adapted to be lowered into the bilge water. When the device constructed as above is set in operation it effectively exhausts fluid from a vessel incident to the flow of the cooling fluid of the engine to the outlet.

In the drawings,

Figure 1 illustrates an embodiment of my invention as applied to the cooling system of the engine of a ship.

Figure 2 is a detail on an enlarged scale showing how the suction device of my invention is connected in the cooling system.

Figure 3 is a horizontal sectional view on the line 3—3 of Figure 1 through the suction device, the same being represented on a still further enlarged scale over Figure 2.

Figure 4 is a section on line 4—4 of Figures 2 and 3 showing the vacuum creating or suction mechanism from a different point of view.

Referring to the drawings in detail, a numeral 10 designates the whole vessel, 11 the engine for propelling the same, the engine being provided with the usual water jacket arrangement which is not specifically illustrated in the present embodiment inasmuch as it involves none of the principles of the invention. To this jacket is connected an inlet conduit 12 having a pump 13 connected therewith and adapted to draw water from the floating medium for the vessel through the conduit 14 leading from a suitable opening in the side of the vessel. After the fluid has been forced through the jacket of the engine it is allowed to escape through the outlet conduit 15 having an opening communicating in the side of the vessel as at 16.

A branch outlet conduit 17 is connected to the conduit 15 as at 18 and the vessel is provided with an aperture 19 similar to that at 16 in the side of the vessel with which this conduit communicates as in the case of the branch 15 and the outlet 16. The conduit 17 has formed therein an enlargement providing a chamber 20 which may be known as a vacuum chamber in which a vacuum or suction may be created by a suitable device as a nozzle 21 projected thereinto from the side of said chamber connected with the conduit 15.

The flow of fluid through the conduit 15, apertures 16 and 19 may be selectively controlled through a three-way valve 22 positioned in a suitable seat 23 formed in the conduit 15 opposite the connection thereof with the conduit 17. This valve when turned to one position will permit the customary flow of fluid in the conduit 15 to the opening 16 and when in another position, will direct the flow through the nozzle 21 by which it will be projected into the Venturi tube 24 and out through the opening 19. The valve 22 may be provided with a handle 28 for turning the

same and with a pointer 29 movable over a dial 30 secured to the valve seat and having indications marked thereon instructive of the position of the openings through the valve within its seat.

A suitable conduit 25 in the nature of a pipe or a flexible hose may be provided and connected to a stem 26 having its bore in communication with the vacuum chamber 20 and preferably in a position below the nozzle 21. The lower end of this pipe or hose may be provided with a head 27 of any suitable character for admitting the bilge water to the conduit 25 and preferably for preventing large particles from passing therethrough. The end of the nozzle 21 which is of the type known as the high speed nozzle is preferably projected slightly into the mouth of the Venturi tube or as shown in the drawings may extend to a point short of the Venturi tube.

In operation, when there is bilge water to be removed, the pump 13 is operated in the usual manner drawing water from the floating medium for the vessel and forcing the same through the water jacket of the engine and out through the conduit 15 by which it is discharged back into the floating medium through the aperture 16, the valve 22 being turned to a position so that the flow will be cut off from the branch conduit 17. Whenever it is desired to use the force of the flow of fluid through the cooling system to draw the bilge water from the bottom of the vessel, the valve is turned to a position as shown in Figure 3 in which position the fluid is projected through the nozzle 21 into the Venturi tube 24, thereby creating a vacuum in the chamber 20 and causing a suction at the head 27 whereby the bilge water is discharged together with that of the cooling system through the aperture 19 in the side of the vessel.

It is to be understood that the principles of the invention may be applied wherever flowing fluid is directed through a conduit having a discharge. However, the principles are especially adapted to systems which are in constant operation for other purposes as for the cooling of an area such as that defined by an engine as in the present instance. I do not, therefore, wish to be limited in the scope of my invention to the specific embodiment here disclosed and believe that I am entitled to broad protection on the application of the principles of the invention as herein set forth.

I claim:—

The combination with a water craft having motive power embodying a water jacket and a pump for forcing water through the jacket, a pipe leading from the jacket and discharging outboard, a branch conduit comprising a domed fitting, an outflow pipe communicating with the dome, a pipe from the bilge to said dome, a nozzle inserted into and extend-

ing partly across the dome but stopping short of complete traverse, said nozzle having a conical passage in axial alinement with and the apex directed toward the outflow pipe, and means to variably by-pass water from said discharge pipe through said nozzle into the outflow pipe.

In testimony whereof I have signed my name to this specification.

LOUIS LE ROY HEPBURN.