

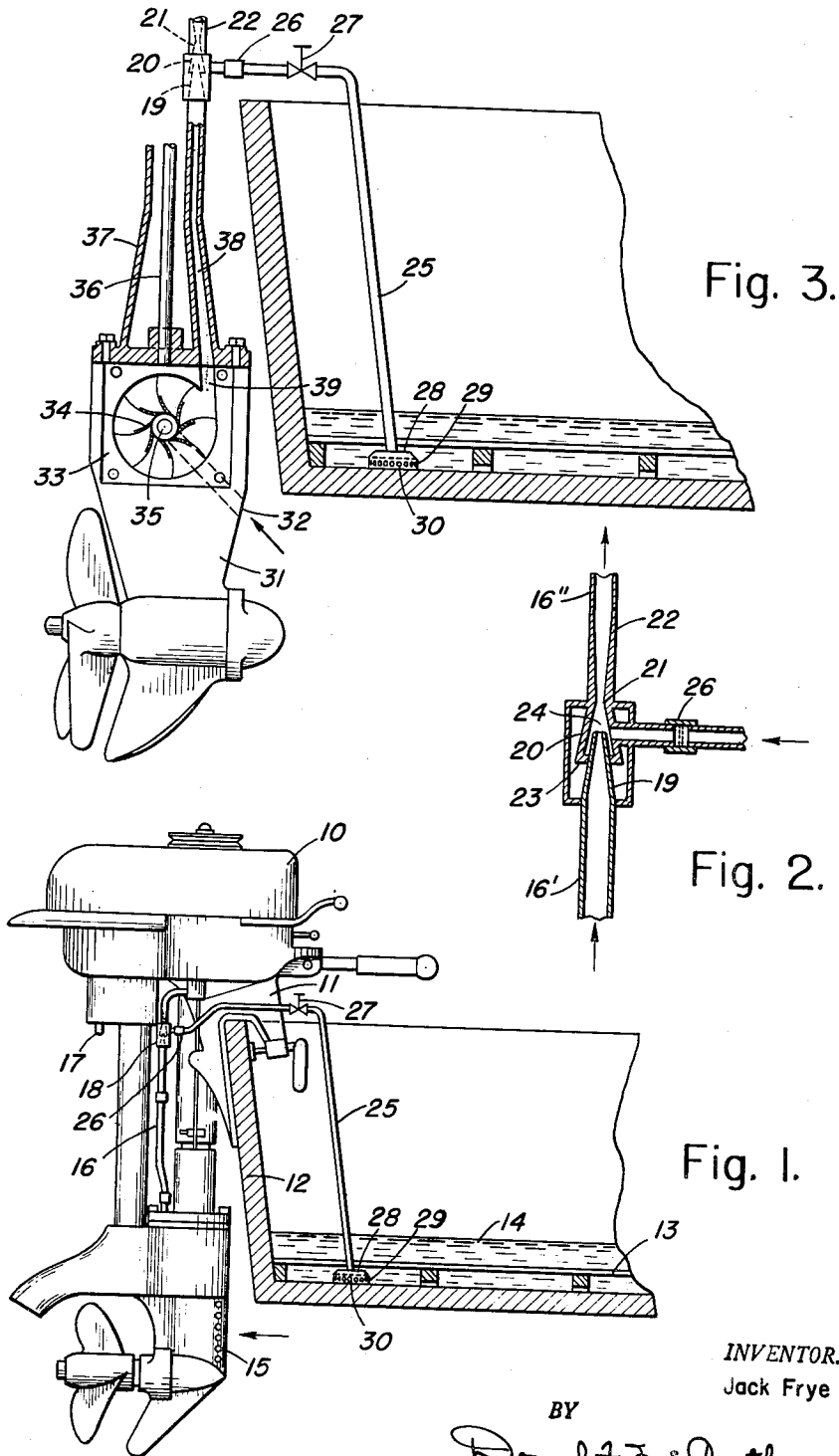
July 29, 1952

J. FRYE

2,604,867

BILGE WATER EJECTOR FOR OUTBOARD MOTORBOATS

Filed June 23, 1948



INVENTOR.
Jack Frye

BY

Donald F. McCarthy
ATTORNEY

UNITED STATES PATENT OFFICE

2,604,867

BILGE WATER EJECTOR FOR OUTBOARD MOTORBOATS

Jack Frye, Sedona, Ariz.

Application June 23, 1948, Serial No. 34,753

2 Claims. (Cl. 115—0.5)

1

This invention relates to the removal of bilge water from boats, and more particularly to devices for bailing out boats of the outboard motor driven type.

The removal of bilge water from ships and boats has been a problem of long standing in the art. Numerous solutions have been suggested, ranging from very simple but ineffectual devices to efficient, yet bulky, complicated and expensive apparatus. None of the suggestions made thus far, however, have taken into account the specific ramifications of the problem presented by outboard motor driven boats. The comparatively small size of these boats and their usually not too sturdy construction, frequently result in a continuous accumulation of bilge water which has to be removed. On the other hand, the lack of an engine and accessory mechanism within the boat, and the arrangement of the motor outside the boat proper and its connection to the boat by way of adjustable connections, preclude such simple utilization of the engine or accessory parts thereof for purposes of removing the bilge water, as have been suggested in the prior art. Separate pumping mechanism for transporting and discharging the bilge water is undesirable in the case of outboard motor driven boats where space must not be wasted and weight must not be increased.

Accordingly, it is one of the primary objectives of the invention to provide a device for removing the bilge water from outboard motor driven boats, which does not require additional, separate apparatus for conveying and discharging the bilge water but utilizes existing mechanism without interference with the established functions thereof.

It is another major object of the invention to provide a simple accessory device whereby the cooling system of the outboard motor assumes the additional function of transporting and discharging the bilge water from the boat.

A further object of the invention is to provide simple and inexpensive means whereby the outboard motor is enabled, either continuously or intermittently as may be desired, to remove the bilge water from the boat without there being any interference with the established characteristics and functions of the motor, including the adjustable connection to the boat.

Other objects, and the manner in which the same are obtained, will appear as this specification proceeds.

In the drawing, which illustrates the invention diagrammatically by way of example,

Fig. 1 shows, partly in cross-section, the stern

2

of a boat with an outboard motor attached thereto;

Fig. 2 shows, in cross-section, a detail of Fig. 1, and

Fig. 3 shows, partly in cross-section, the lower unit of a different type of outboard motor.

Referring now to the drawing and first to Figs. 1 and 2, the outboard motor, generally indicated at 10, is shown connected, by way of a conventional clamp structure 11, to the boat body indicated at 12. Within the boat body 12 there is the usual floor or decking 13 which is spaced from the bottom of the boat, and it is in the vicinity of this floor 13 that the bilge water, indicated at 14, accumulates.

The outboard motor shown in Fig. 1 includes a cooling system comprising apertures 15 located in front of the propeller, a pipe system 16 connected to the apertures 15 and leading to the cooling jacket of the motor (not shown), there being an outlet from the cooling jacket, indicated at 17. This cooling system is of a conventional type which relies on the entry of water into the apertures 15 during operation of the boat, and the passage of water through the cooling system in view of the force imparted to the water at any but the lowest propeller speeds.

The invention contemplates to utilize the flow of cooling medium through the cooling system just described, by inserting at a point generally indicated at 18 in Fig. 1, a nozzle and Venturi tube system connected to the bilge, as more fully apparent from Fig. 2.

As shown in Fig. 2, the pipe 16', forming part of the pipe system indicated at 16 in Fig. 1, terminates in a nozzle 19. The top part of the nozzle 19 is surrounded by the lower flared or expanded portion 20 of a Venturi tube which also includes a restricted part 21 and an upper flared portion 22. The upper portion 22 in turn leads to a pipe 16'' which also forms part of the pipe system 16 shown in Fig. 1. The lower flared portion 20 of the Venturi tube is sealed to the walls of the nozzle 19 by a bottom closure 23 so as to create in this lower flared portion 20 and in the vicinity of the opening of nozzle 19, a suction chamber 24. This chamber 24 is connected, by a conduit generally indicated at 25, to the bilge of the boat. The conduit 25 which, for purposes later to be described, preferably is made flexible at least in part, is provided with a first filter indicated at 26 and located in proximity to the nozzle and Venturi system. As shown in Fig. 1, the conduit 25 also includes a manual control valve 27, a second filter 28 at or near the other terminal of the conduit, and a stand or support

29, which is provided with apertures 30 for the purpose of permitting the bilge water to enter the conduit.

Referring now to Fig. 3, the device of the invention, indicated by the same reference numerals as in Figs. 1 and 2, is shown applied to an outboard motor of a different type, wherein the cooling system includes a pump and the positive action of the pump is relied upon to convey and discharge the bilge water in addition to providing for a continuous flow of cooling medium. In Fig. 3, the lower unit 31 of an outboard motor comprises a water inlet 32 which leads to the rotary vane type of pump generally indicated at 33 and comprising rotary vanes 34 mounted on a shaft 35 which, by a gear connection (not shown), is driven by the shaft 36 of the outboard motor. A casting 37 mounted on the lower unit and surrounding the shaft 36 incorporates a passage 38 for the cooling medium which connects with the discharge channel 39 of the pump 33.

According to the invention, at a suitable point of the casting 37 there is inserted, in the cooling passage 38, the nozzle and Venturi tube system of Fig. 2, the parts of this system as well as the accessory structure leading to the bilge of the boat being precisely as described in connection with Figs. 1 and 2.

In the operation of the boat bailing device according to the invention, when the outboard motor is operating, water is taken in through apertures 15 or water inlet 32, respectively, and passed through pipe system 16 or cooling passage 38, respectively, to the water jacket of the motor, to be discharged therefrom in a conventional manner. The passage of the cooling medium from the nozzle 19 into the lower flared portion 20 of the Venturi tube, coupled with the flow of cooling medium through the restricted portion 20 and the upper flared portion 22 of the Venturi tube, combine to create a low pressure or partial vacuum condition in the chamber 24 surrounding the opening of nozzle 19. In this manner, sufficient suction is created at the end of conduit 25 to transport the bilge water 14 through apertures 30, filter 28, valve 27 and the other filter 26, into the stream of cooling medium passing through the pipe system 16, with the result that as long as valve 27 is open, there is a continuous removal of water from the bilge. At times when no water remains in the bilge, the valve 27 is shut so as to prevent air from being fed into the stream of cooling medium passing through the nozzle and Venturi system, the valve 27 being opened again whenever sufficient water has accumulated in the bilge to make the removal thereof desirable or necessary.

The conduit 25 may be a flexible hose or the like which may be suitably supported on the clamp by which the outboard motor is attached to the stern of the boat. If desired, most of the conduit 25 may be provided rigid, only that

part being made flexible which if rigid, would interfere with the adjustability of the motor mount on the boat. The additional filter indicated at 26 is desirable for the reason that the filter 28 may be broken or damaged, in view of its more exposed location in the bottom of the boat, and to forestall any entry of undesirable material into the channels of the cooling system where it might lead to clogging. The filter 26 is located at a point where it can be easily cleaned or exchanged, and where it is not exposed to the danger of breakage or other damage. The valve 27 is located in close proximity to the operating levers of the outboard motor so as to be within easy reach of the operator at all times.

I wish it to be understood that I do not desire to be limited to the exact details of construction, design and operation shown and described as numerous modifications falling within the scope of the appended claims may be devised which would entail no sacrifice in the advantages of the invention, nor deviate from the essential concept thereof.

I claim:

1. A boat bailing device for removing bilge water, particularly for boats propelled by an outboard motor having a forced water cooling system including a cooling water inlet pipe exterior to the motor and a cooling water outlet pipe, said device comprising a Venturi aggregate inserted in said inlet pipe, a water conduit connected to said aggregate and extending into the bilge of the boat, whereby the bilge water is caused to flow through said cooling system, and filters in said conduit for preventing foreign matter accumulated in the bilge from entering the cooling system.

2. A boat bailing device for removing bilge water particularly for boats propelled by an outboard motor having a forced water cooling system including a cooling water inlet pipe exterior to the motor and a cooling water outlet pipe, said device comprising a Venturi aggregate inserted in said inlet pipe, a water conduit flexible in part, connected to said aggregate and extending into the bilge of the boat, a valve in said conduit, whereby the bilge water may be drained and caused to flow through said cooling system, and filters in said conduit for preventing foreign matter accumulated in the bilge from entering the cooling system.

JACK FRYE.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,769,136	Hepburn	July 1, 1930
2,151,225	Newton	Mar. 21, 1939
2,404,202	Winslow	July 16, 1946