

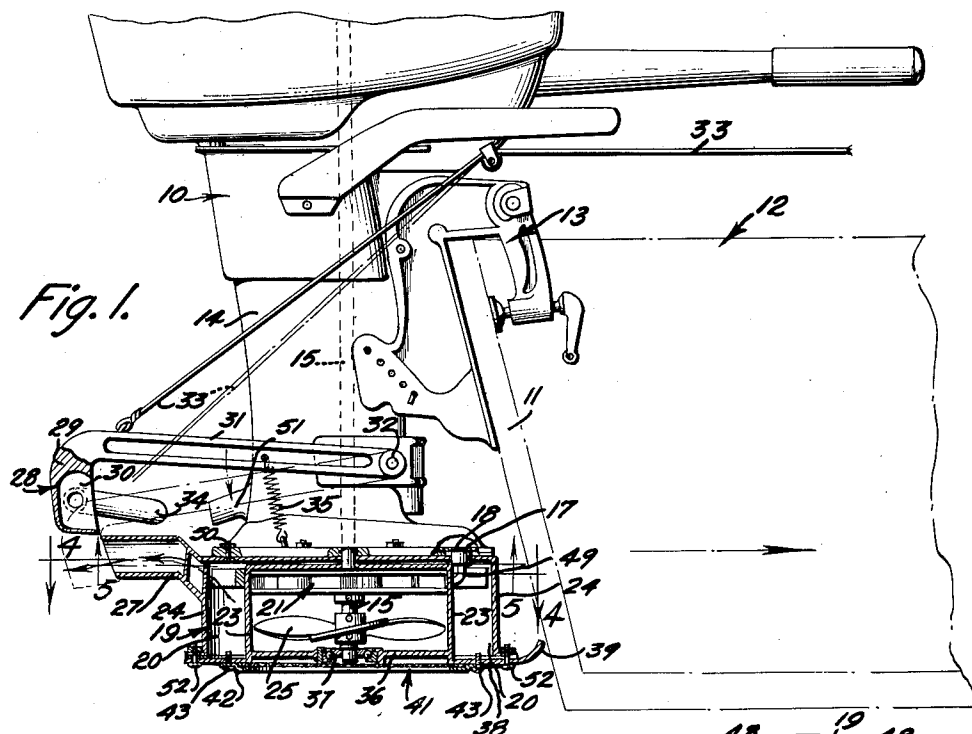
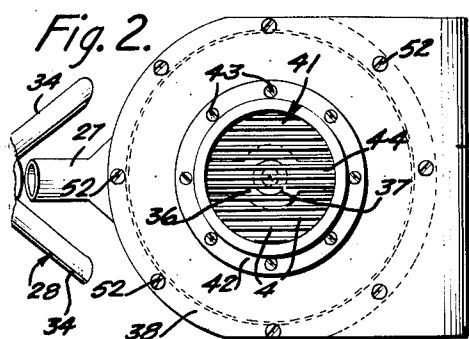
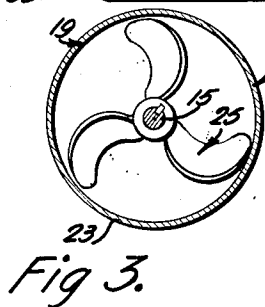
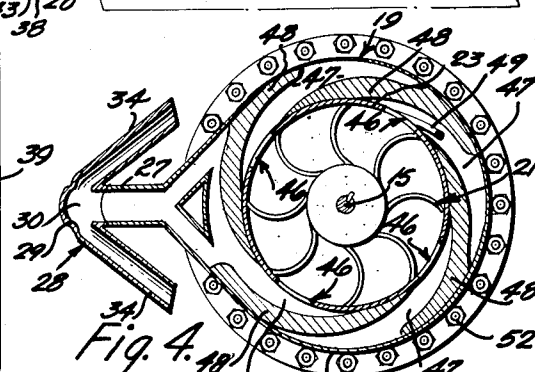
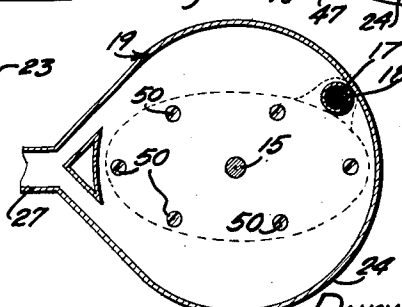
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MARINE PROPULSION MECHANISM

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This invention relates to a marine propulsion device, and more particularly to a mechanism for converting an outboard motor or engine so that it will provide jet thrust to a boat.

The object of the invention is to provide a marine propulsion mechanism which can be operated with increased safety and convenience and wherein the reverse direction of the boat can be readily accomplished as desired.

A further object of the invention is to provide a marine propulsion mechanism which is extremely simple and inexpensive to manufacture.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings, forming a part of this application, in which like numerals are used to designate like parts throughout the same:

FIGURE 1 is an elevational view of the marine propulsion mechanism of the present invention, and with parts broken away and in section.

FIGURE 2 is a bottom plan view.

FIGURE 3 is a sectional horizontal view illustrating the propeller.

FIGURE 4 is a sectional view taken through the mechanism and showing the impeller.

FIGURE 5 is a fragmentary sectional view illustrating certain constructional details of the present invention.

Referring in detail to the drawings, the numeral 10 indicates an outboard motor or engine which is shown mounted on the portion or transom 11 of a conventional boat 12, as for example by means of the usual clamping mechanism 13, FIGURE 1. The motor 10 includes the generally vertical column 14 and a vertically disposed drive shaft 15 extends through the column 14 and is adapted to be rotated or actuated by the usual power mechanism of the engine 10. The numeral 17 indicates an opening whereby cooling water can be supplied to the motor through the opening 17, and a screen 18 extends over the opening 17 so as to prevent foreign matter or the like from entering the cooling system of the engine.

The numeral 19 indicates a hollow housing which is arranged below the column 14, and the housing 19 includes inner and outer cases 23 and 24, and a horizontally disposed impeller 21 is arranged in the upper portion of the inner case 23, there being a space 20 between the inner and outer cases 23 and 24 for a purpose to be later described. A propeller 25 is arranged in the lower portion of the inner case 23, and the propeller 25 is suitably affixed or connected to the lower end of the shaft 15. The impeller 21 is also suitably affixed to the shaft 15.

The numeral 27 indicates a tube which extends rearwardly from the upper portion of the outer case 24 and the tube 27 is secured to the case 24 or formed integral therewith, and as shown in the drawings the rear end of the tube 27 is open.

There is further provided a reversing mechanism which is indicated generally by the numeral 28, and the reversing mechanism 28 embodies a body member 29 which is provided with a recess or chamber 30 that is mounted for

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movement into and out of registry with the rear end of the tube 27. An arm 31 is suitably affixed to or formed integral with the body member 29, and the arm 31 is pivotally connected to the column 14 as at 32. A cable or line 33 is connected to the member 29 for moving the member 29 to the desired location.

A coil spring 35 is connected to the arm 31 as shown in FIGURE 1 so as to normally urge the body member 29 in a counter-clockwise direction, FIGURE 1. The cable 33 can be used for pivoting the member 29 in a clockwise direction, FIGURE 1, and the cable 33 may be actuated from a suitable convenient location in the boat 12. The reversing mechanism further includes a pair of angularly arranged conduits or pipes or tubes 34 which are arranged as shown in FIGURE 4 for example and the front ends of these conduits 34 are open, while the rear ends of the conduits 34 communicate with the recess 30, so that when the reversing mechanism 20 is in a lowered position as for example as shown in FIGURE 4, the water which passes out through the rear open end of the tube 27 will enter the recess 30 and then be directed out through the angularly arranged conduits 34 so that the boat can be reversed in direction. When the mechanism 28 is in a raised position as shown in FIGURE 1, the water will pass out directly through the rear end of the conduit 27 so that the boat will move forward in the desired manner so that there will be seen that according to the present invention there is provided a unique and efficient control mechanism for regulating the forward or reverse movement of the boat.

Arranged in the lower portion of the housing 19 is a support member 36 which has a bearing 37 in its central section for engagement with the lower end of the shaft 15. The numeral 39 indicates a plate or curved member which is positioned in the lower forward portion of the housing 19. There is also provided a filter unit 41 which consists of a plurality of spaced parallel bars and these bars are arranged adjacent a central open portion in the bottom of the housing, and the bars 44 have their longitudinal axis parallel to the longitudinal axes of the boat 12. The filter 41 is held in place by means of a retainer 42 which is connected to the plate 38 as for example by means of securing elements 43.

From the foregoing, it is apparent that there has been provided an improved marine propulsion mechanism, and with the parts arranged as shown in the drawings, it will be seen that when the motor 10 is actuated or operated, the shaft 15 will be rotated and this will cause the propeller 25 and the impeller 21 to turn or rotate since these members are affixed to the shaft 15. Thus, water will be pumped into the bottom of the case 23 since the bottom the case 23 is open, and this water will then pass upwardly through the case 23 and the water will be directed outwardly through the opening 46 in the case 23 and this water will then pass outwardly through the passageways 47 between the guide vanes 48 and this water will then enter and fill up the space 20 and then pass out through the tube 27 and out through the rear open end of the tube 27 so as to provide thrust for propelling or driving the boat such as the boat 12 forwardly. As long as the reversing mechanism 28 is in the raised position as shown in FIGURE 1, the water which passes out through the rear open end of the tube 27 will provide forward thrust to the boat 12. To cause the boat to go in a reverse direction, the tension on the line 33 is slackened whereby the spring 35 will move the

member 29 downwardly in a counter-clockwise direction, FIGURE 1, since the arm of the reversing mechanism is pivotally connected to the column 14 as at 32. The member 29 can move downwardly until the recess 30 is in registry with the rear open end of the tube 27, and with the reversing mechanism 28 in a lowered position, it will be seen that the water which is forced out the rear end of the tube 27 will enter the recess 30, and this water will then pass out through the front ends of the conduits or tubes 34 so that the boat will be moved in a reverse direction.

The water which enters the housing 19 passes through the filter unit 41 so that foreign matter, debris, or the like will be kept out of the system, and the bars 44 of the filter unit 41 have their longitudinal axes parallel to the longitudinal axis of the boat so as to minimize water resistance. The opening 17 provides a means whereby a portion of the circulating water can function to enter the cooling system of the motor through the pipe or tube 49 so as to cool the motor in the usual manner, and the screen 18 prevents foreign matter from entering the motor cooling system.

The parts can be made of any suitable material and in different shapes or sizes.

The impeller and propeller may be made of a desired size and pitch and the drive shaft can be driven at the proper speed. In addition, torque which may be present may be overcome by offsetting the jet tube. With the present invention, outboard motors or engines can be converted to jet thrust. The jet tube may be redirected under water. An important aspect or feature of the present invention is the lifting of the water vertically and discharging it horizontally to atmosphere. The motor cooling water inlet screen may be arranged so as to either feed or by-pass the cooling pump. The upwardly turned end portion or plate 39 is arranged as shown in the drawings. The support member 36 has its longitudinal axis parallel to the longitudinal axis of the boat so as to help minimize drag or frictional resistance. The screen 18 may be made of a suitable mesh like material.

The securing element 50 provide a means of attaching the mechanism to various types of existing motors. The member 39 functions as an antivortex plate. The screen 41 may be removable and in FIGURE 1 the numeral 51 indicates the motor exhaust.

Thus, according to the present invention it will be seen that there has been provided an outboard motor jet thrust which is adapted to be used for propelling a boat and it is adaptable to various existing motors. In use, the water is lifted through the screen or filter 41 by means of the propeller 25 and this water is forced into the impeller 21. The impeller 21 forces the water through the openings 46 and through the passageways 47, and then out through the tube 27 as previously stated, and the present invention provides a means for readily and conveniently converting the existing motor to jet thrust. The shaft 15 may be shortened somewhat and a new exhaust outlet 51 may be provided, and in some models of motors the water pump is adapted to have its location rearranged in order to permit the present invention to function properly.

Some of the advantages of the jet thrust of the present invention are as follows:

It provides increased safety since there are no open whirling blades to cut or accidentally maim persons. Also, there will be possible level turning, since the jet pushes the boat in a level turn whereas the present devices exert tremendous pressure on the bottom of the boat which causes heavy tilt. In addition, no extension below the boat is necessary and this is advantageous since such extensions catch or strike on underwater obstructions so as to jar the boat and occupants.

In addition the present invention is highly convenient, as for example, launching and loading of boats is made easier because the motor gear box, propeller and skeg

have been eliminated and the jet thrust does not extend more than an inch or so below the boat. Also, the boat can be propelled to shallow water and there is no open propeller or shear pins to be damaged.

Cost is an important advantage since there are less working parts and there is a simple construction as compared to existing designs and there will be minimum wear and repair.

Reverse direction of the boat is accomplished by the mechanism 28 which changes the flow from the water passing out rearwardly through the tube 27 through a condition such that the water is discharged just in back of the boat.

The impeller 21 is of a type that is enclosed and has vanes of considerable pitch and these feed into the main volute through diverging guide rings such as the vanes 48 and the impeller is constructed so as to have a high conversion or kinetic energy to working pressure.

The screen 18 for the motor cooling water is arranged so that the impeller will feed it with a positive force through the pipe 49.

The present invention discharges into atmosphere through a diffuser type jet tube. Flanges on the inner and outer cases are secured as for example by means of bolts 52 together, FIGURE 1. The inner case may have a solid top which is bolted with the outer case to the motor housing as at 50.

Minor changes in shape, size and rearrangement of details coming within the field of invention claimed may be resorted to in actual practice if desired.

What is claimed is:

1. In a marine propulsion mechanism, an outboard motor including a generally vertical column having a vertically disposed drive shaft, a housing positioned below said column and said housing including inner and outer cases, a propeller positioned in the lower portion of said inner case and said propeller being connected to said shaft, an impeller arranged above said propeller and said impeller being connected to said shaft, a tube extending rearwardly from the upper portion of said outer case and said tube having its rear end open, a reversing mechanism comprising a body member including an arm pivotally connected to said column, a cable connected to said body member, said body member further including a central portion provided with a recess for selectively registering with the rear open end of the tube, and a pair of angularly arranged conduits communicating with said recess, an upwardly curved plate on the lower front end of the housing, and a filter contiguous to the bottom of said housing.

2. In a marine propulsion mechanism, an outboard motor including a generally vertical column having a vertically disposed drive shaft, a housing positioned below said column and said housing including inner and outer cases, a propeller positioned in the lower portion of said inner case and said propeller being connected to said shaft, an impeller arranged above said propeller and said impeller being connected to said shaft, a tube extending rearwardly from the upper portion of said outer case and said tube having its rear end open, a reversing mechanism comprising a body member including an arm pivotally connected to said column, a cable connected to said body member, said body member further including a central portion provided with a recess for selectively registering with the rear open end of the tube, and a pair of angularly arranged conduits communicating with said recess, an upwardly curved plate on the lower front end of the housing, and a filter contiguous to the bottom of said housing, said filter including a plurality of spaced parallel bars which have their longitudinal axes parallel to the longitudinal axis of the boat on which the marine propulsion is mounted so as to minimize drag and frictional resistance.

3. In a marine propulsion mechanism, a drive shaft,

a hollow housing surrounding the lower portion of said shaft, a propeller and impeller on said shaft in said housing, a tube extending rearwardly from the upper portion of said housing, and a reversing mechanism including a member mounted for movement into and out of registry with the rear end of said tube, resilient means including a coil spring connected to said reversing mechanism, and an actuating cable connected to said reversing mechanism.

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