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M. T. FORBES ET AL

2,908,242

VERTICALLY ADJUSTABLE MOUNT FOR AN OUTBOARD MOTOR

Filed Dec. 9, 1955

4 Sheets-Sheet 1

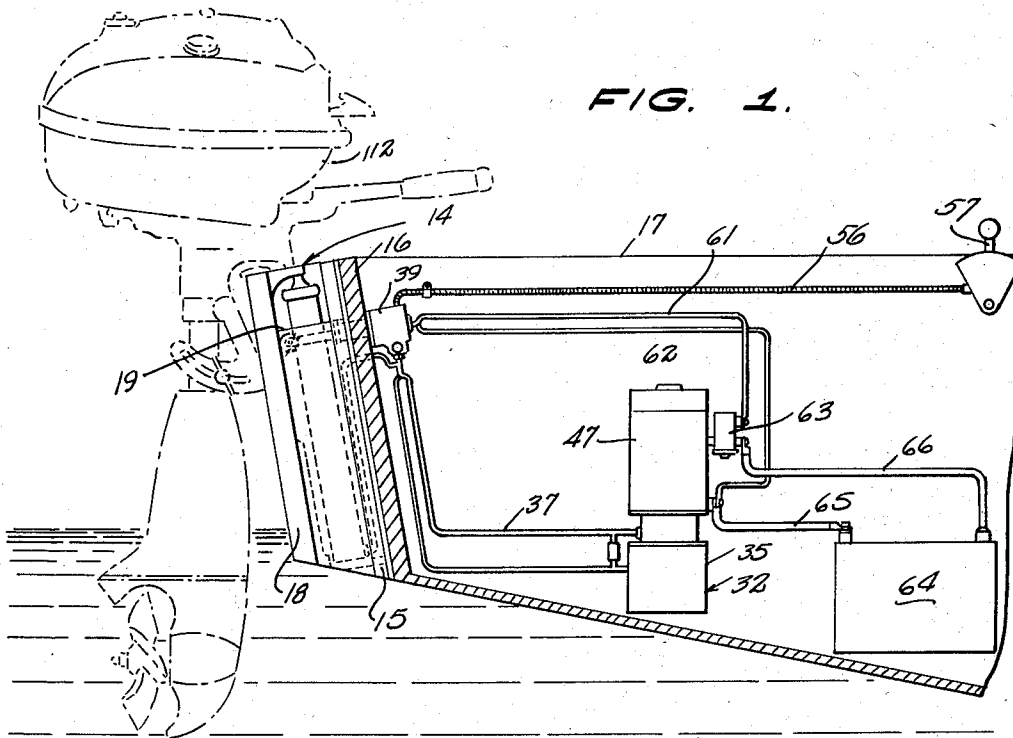
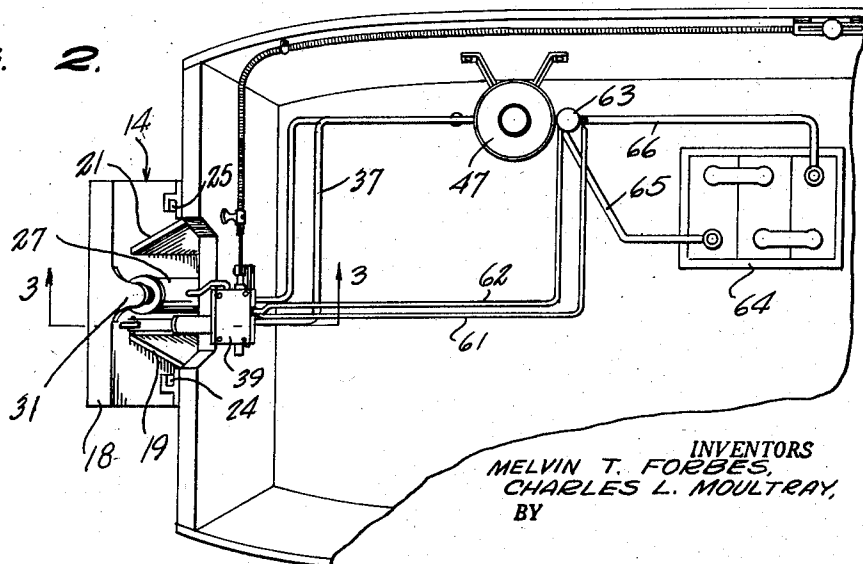


FIG. 2.



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FIG. 3

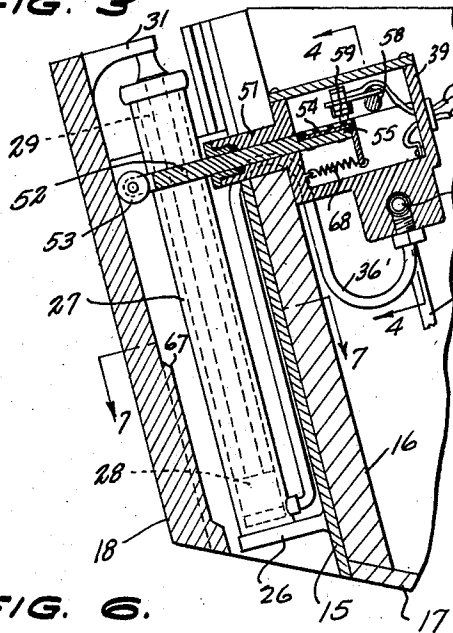


FIG. 6.

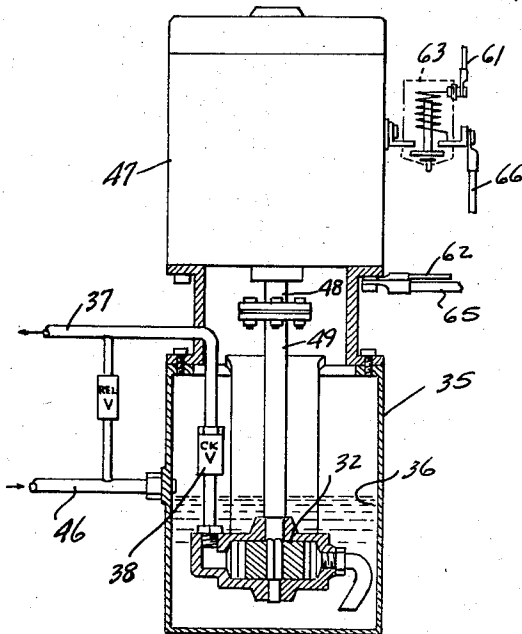


FIG. 4.

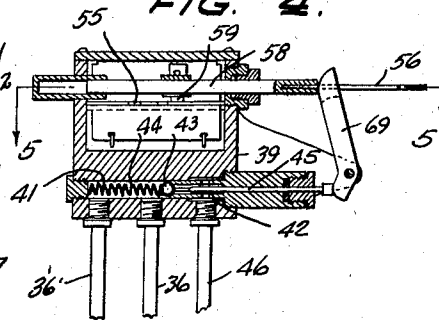


FIG. 5.

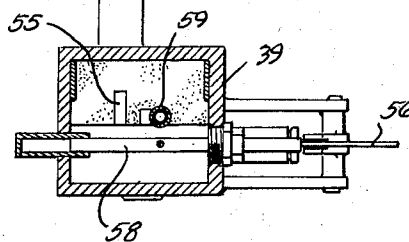
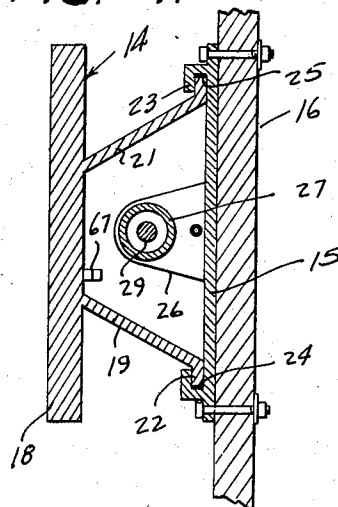


FIG. 7.



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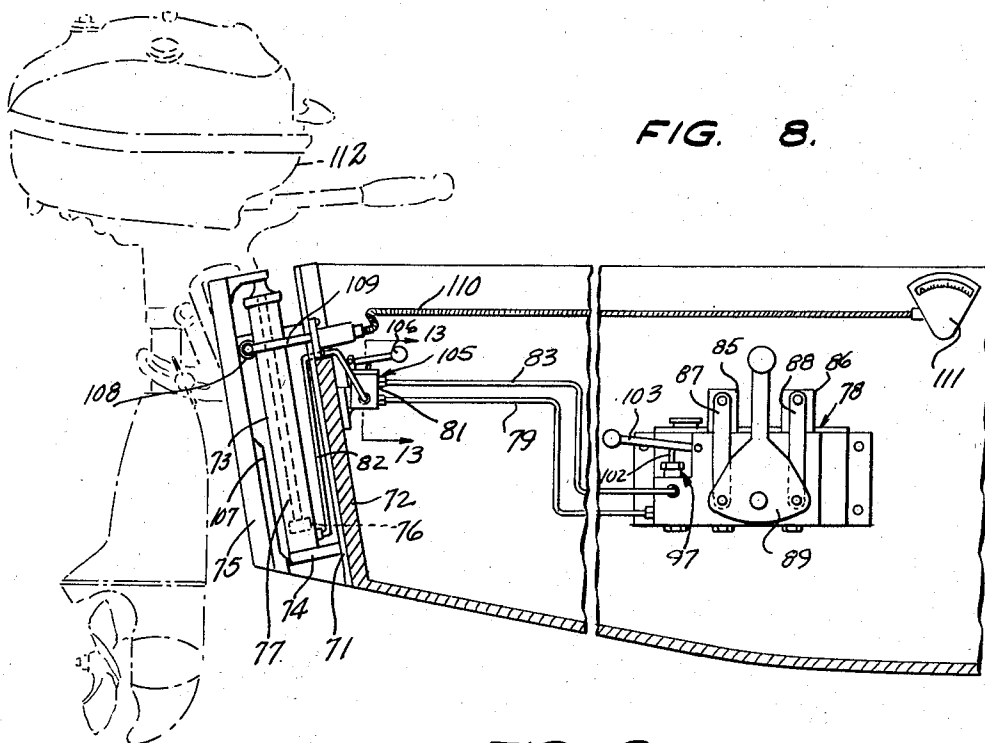


FIG. 8.

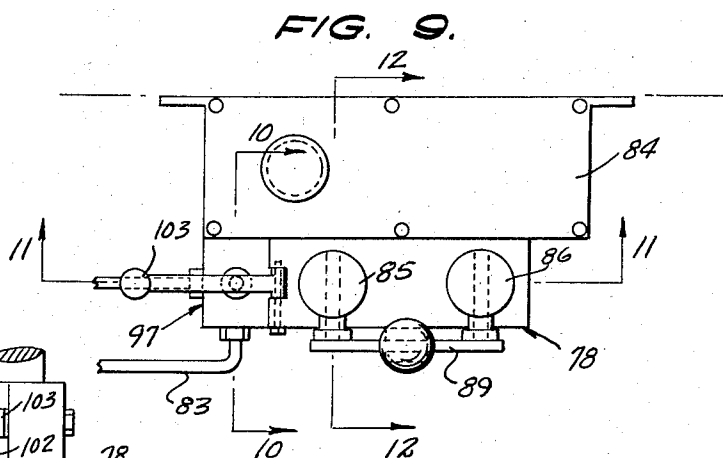


FIG. 9.

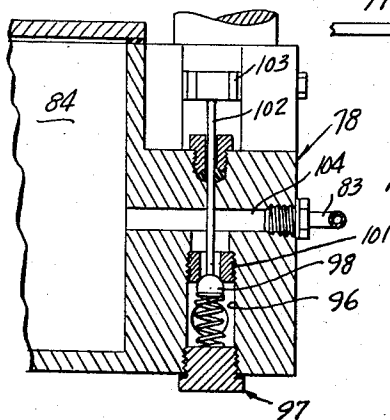


FIG. 10.

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FIG. 11.

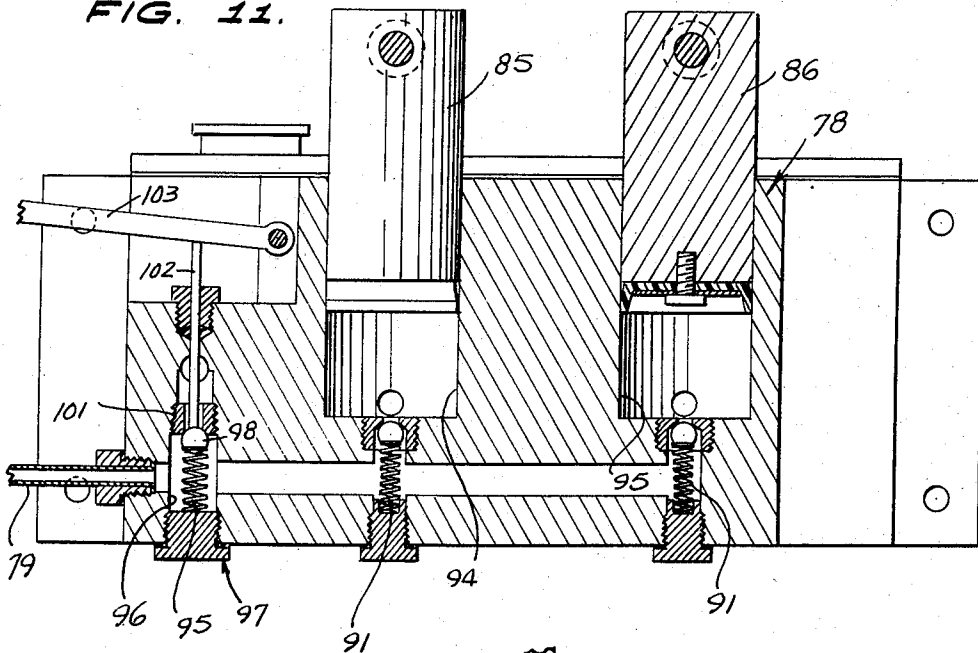


FIG. 12.

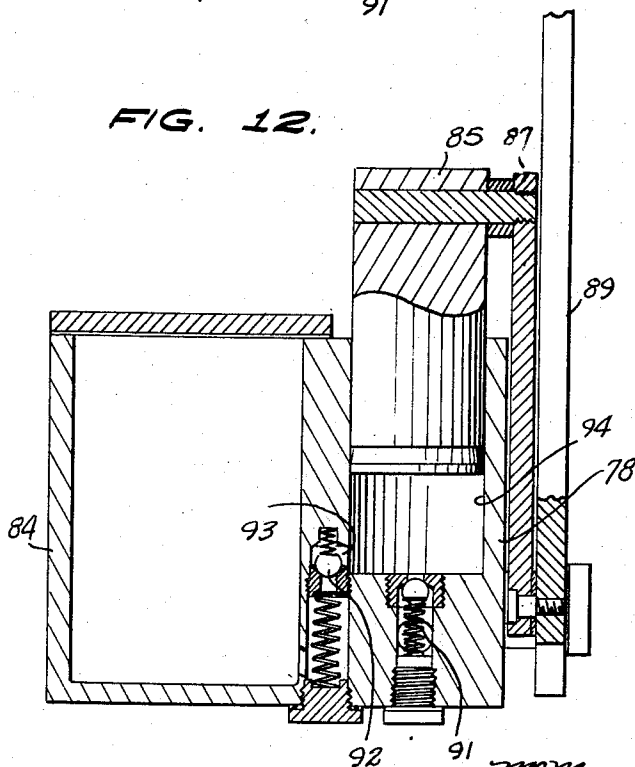
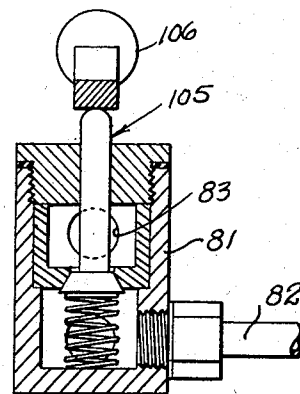


FIG. 13.



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2,908,242

VERTICALLY ADJUSTABLE MOUNT FOR AN OUTBOARD MOTOR

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Application December 9, 1955, Serial No. 552,164

3 Claims. (Cl. 115—41)

The present invention relates to a mounting structure for an outboard motor and in particular to a vertically adjustable mounting structure for raising and lowering an outboard motor relative to the boat on which the motor is mounted and for supporting the motor at selected positions of elevation relative to the boat.

An object of the present invention is to provide a vertically adjustable mounting structure for an outboard motor the raising and lowering of which is controlled from a forward position in the boat carrying the motor, one which may be used with all outboard motors which clamp to the transom of a boat without alteration either to the boat or to the motor, and one which may be left installed on the boat when the motor is removed.

A further object of the present invention is to provide a mount for an outboard motor which may be raised to permit the boat on which it is installed to be operated in shallow water and to pass over weed beds and other obstacles in the water.

A still further object of the present invention is to provide a vertically adjustable mount for an outboard motor which is simple in structure, sturdy in construction, one easily and economically manufactured and assembled, and one which is highly effective in action.

These and other objects and advantages of the present invention will be fully apparent from the following description when taken in connection with the annexed drawings, in which:

Figure 1 is an elevational view of the outboard motor mounting structure of the present invention with a portion of the body of a boat in cross-section and with an outboard motor indicated in dotted lines and shown installed on the structure of the present invention,

Figure 2 is a plan view of the mounting structure of the present invention as installed on the transom of a boat, the boat being partially shown,

Figure 3 is a greatly enlarged sectional view taken on the line 3—3 of Figure 2,

Figure 4 is a sectional view on the line 4—4 of Figure 3,

Figure 5 is a sectional view on the line 5—5 of Figure 4,

Figure 6 is an elevational view partially in cross-section and greatly enlarged showing the electric motor and hydraulic pump of the apparatus of Figure 1,

Figure 7 is a sectional view on the line 7—7 of Figure 3,

Figure 8 is an elevational view similar to Figure 1 showing another form of the means for raising and lowering the outboard motor and its mounting structure,

Figure 9 is a plan view greatly enlarged of a portion of the apparatus of Figure 8,

Figure 10 is a greatly enlarged sectional view taken on the line 10—10 of the Figure 9,

Figure 11 is a greatly enlarged sectional view taken on the line 11—11 of Figure 9,

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Figure 12 is a greatly enlarged sectional view taken on the line 12—12 of Figure 9, and

Figure 13 is a greatly enlarged sectional view taken on the line 13—13 of Figure 8.

Referring in greater detail to the drawings in which like numerals indicate like parts throughout the several views, the vertically disposed adjustable mount for an outboard motor of the present invention is indicated generally by the reference numeral 14 and comprises an upright guideway 15 adapted to be fixedly secured to the outside face of a boat transom 16, the boat being indicated by the reference numeral 17.

An upright plate 18 is arranged in face to face spaced relation with respect to the guideway 15 and is connected thereto by means of a pair of vertically disposed support members 19 and 21 for upward and downward movement. The support members 19 and 21 are arranged in diverging spaced relation with respect to each other and have adjacent and converging ends spaced inwardly from the adjacent side edges of the plate 18 and are welded or otherwise fixedly secured thereto, the diverging adjacent ends of the support members 19 and 21 having outwardly bent flanges 22 and 23, respectively, received in the grooves 24 and 25, respectively, in the side edges of the guideway 15.

The guideway 15 is provided with an outwardly projecting shelf 26 on its confronting face adjacent the lower end of and intermediate the side edges of the guideway 15. A closed upright cylinder 27 has its lower end above and supported on the shelf 26. A piston 28 within the cylinder 27 is normally disposed adjacent to and spaced from the lower end of the cylinder 27 and is mounted in the cylinder 27 for upward and downward movement. A piston rod 29 has one end fixedly secured to the piston 28 and has its other end exteriorly of the upper end of the cylinder 27 and operatively connected to the plate 18 for upward movement of the latter in response to upward movement of the piston 28 by means of a bracket 31 which projects from the confronting face of the plate 18 adjacent the upper end of the latter and intermediate the adjacent ends of the support members 19 and 21.

A fluid pump 32 is shown in Figures 1 and 6 and has an inlet 33 and an outlet 34, the space within the housing 35 which surrounds the pump 32 providing a reservoir 36 for hydraulic fluid. A main conduit 37 having a check valve 38 therein is connected by one end to the outlet of the pump 32 and has its other end connected to the lower end of the cylinder 27. A valve housing 39 is secured to the upper end of the guideway 15 and has a bore 41 extending through its lower end forming a bypass which connects the main conduit 37 to the reservoir 36, the connection of the main conduit 37 being connected as shown in detail in Figure 4 with the reference numeral 36' indicating the portion of the conduit 37 which connects the cylinder 27 to the bore 41 in the housing 39. A plug 42 in one end of the bore 41 has a passage therethrough normally closed at its inner end by a ball 43 biased to the closed position by a spring 44. A plunger 45 slides in the passage in the plug 42 to unseat the ball from its position closing the plug passage to permit the flow of fluid from the bore 41 to a bypass conduit 46 connecting the other end of the bore 41 to the reservoir 36. The plug 42, the ball 43, and the plunger 45 constituting a normally closed valve operable when open to permit the flow of fluid from the cylinder 27 to the reservoir 36.

An electric motor 47 has its shaft 48 directly connected to the shaft 49 of the pump 32 for operating the latter. The housing 39 is secured to the upper end of the guideway 15 by means of a tubular member 51 through which slides an actuating bar 52 having a cam roller 53 on one

end thereof and bearing on its other end an insulating block 54 having a plurality of contacts imbedded therein, the contacts being indicated by the reference numeral 55 as shown most clearly in Figures 4 and 5. A control cable 56 extends forwardly of the transom 16 in the boat 17 and has its one end operatively connected to the lever 57 shown pivotally mounted on the side of the boat 17 in Figure 1. The other end of control cable 56 is operatively connected to one end of a bar 58 journaled in the walls of the housing 39 and carrying intermediate its ends a contact member 59 for contacting selectively the contacts 55 to close the circuit which includes the wires 61 and 62 connected to the electric motor 47 through the solenoid switch 63 mounted upon the side of the motor 47 and shown in detail in Figure 6. A storage battery indicated by the reference numeral 64 in Figures 1 and 2 is connected in circuit with the solenoid switch 63 and the motor 47 by means of electric cables 65 and 66.

The confronting face of the plate 18 as seen in Figure 3 carries a cam structure indicated by the reference numeral 67 engaged by the cam roller 53 on the actuating bar 52, a spring 68 urging the cam roller 53 into engagement with the cam structure 67 to shift the contacts 55 as the plate 18 is moved upwardly when fluid is admitted to the lower end of the cylinder 27, beneath the piston 28. As will be seen in Figure 5, the contacts 55 are of such length that they are proportionate to the height of the levels of the cam structure 67 so that the motor 47 is deenergized when the plate 18 reaches a predetermined height indicated by the portions of the cam structure 67, thus assuring that the plate 18 will rise to the desired height, the contact 59 being shiftable by means of the control cable 56 to engage the proper one of the contacts 55 for the selected height. A lever 69 pivotally mounted on the external end of the plunger 45 connects the plunger 45 to the bar 58 so that upon pulling movement of the control cable 56 to its farthest point in the direction indicated by the arrow in Figure 4 will operate the valve in the by-pass conduit 46, the valve being the ball 43 within the bore 41 in the housing 39.

In the form of the invention shown in Figures 8 to 13, inclusive, the adjustable mount for an outboard motor comprises a guideway 71 similar to the guideway 15 of the mounting structure shown in Figures 1 to 3, and Figure 7, and consists in an upright plate having opposed grooves extending along each side edge, the plate being fixedly secured to the outside face of a boat transom 72. A closed upright cylinder 73 has its lower end fixedly secured to a shelf 74 which projects from the confronting face of the guideway 71. An upright plate 75 is arranged in face to face spaced relation with respect to the plate of the guideway 71 and connected thereto for upward and downward movement by a pair of support members arranged in diverging spaced relation and having their converging ends fixedly secured to the plate 75 and having outwardly bent flanges on their diverging ends received in the opposed grooves in the plate which constitutes the guideway 71.

A piston 76 is normally disposed adjacent to and spaced from the lower end of the cylinder 73 and is mounted in the cylinder for upward and downward movements. A piston rod 77 has one end fixedly secured to the piston 76 and has its other end exteriorly of the upper end of the cylinder 73 and operatively connected to the plate 75 adjacent the upper end of the latter for effecting the upward movement of the plate 75 upon execution of upward movement of the piston 76.

A fluid pump shown in elevational view in Figure 8 and indicated by the reference numeral 78 is connected by a conduit 79 to a valve housing 81 and a conduit 82 connects the valve housing 81 to the lower end of the cylinder 73 to effect the injection of fluid into the cylinder. A bypass conduit 83 connects the valve housing 81 to the reservoir 84 which is formed on one side of

the housing of the pump 78 as shown most clearly in Figures 10 and 12.

The structure of the pump 78 is shown in Figures 9 to 12, inclusive, and consists in a pair of pistons 85 and 86 vertically disposed in the housing of the pump 78 and connected by their upper ends to the upper ends of the arms 87 and 88, respectively, the lower ends of the latter being connected to a manually-operated lever 89 mounted for oscillation about a horizontal axis on the pump 78. Check valves 91 in the housing of the pump 78 prevent reverse fluid flow from the main conduit 79 and a check valve 92 in each of the passages 93 which connect the pump cylinders 94 and 95, respectively, to the reservoir 84 prevent the flow of fluid from the pump cylinders 94 and 95 back to the reservoir 84.

As seen in Figures 10 and 11, the housing of the pump 78 is provided with a vertically extending bore 96 constituting a bypass connecting the conduit 79 with the reservoir 84 and a valve indicated generally by the reference numeral 97 having a ball 98, and a spring 99 biasing the ball upwardly in the bore 96 to close a passage through a plug 101. A plunger 102 extends through the plug 101 and has its upper end connected to an operating handle 103, the valve 97 being normally closed and when open serving to permit the flow of fluid from the cylinder 73 to the reservoir 84 by way of the conduit 79, the bore 96 and a passage 104 in the housing on the pump 78.

A second bypass valve indicated by the reference numeral 105 in Figure 13 is positioned in the valve housing 81 adjacent the upper end of the latter and has an operating handle 106 for moving the valve 105 from its normally closed position to an open position permitting the flow of fluid from the conduit 82 to the conduit 83 and thence back to the reservoir 84.

The plate 75 has a cam structure 107 on its confronting face engageable with a cam roller 108 connected to one end of a plunger 109, the other end of the plunger 109 being operatively connected to a flexible cable (not shown) operating within a cable sheath 110 as shown in Figure 8, the other end of the flexible cable being connected to a pointer within an indicator housing indicated by the reference numeral 111.

In the operation of the form of the invention shown in Figures 8 to 12, inclusive, the pump 78 is manually operated to force liquid through the conduit 79 into the lower end of the cylinder 73 to raise the piston therein and to carry the plate 75 upwardly to move an outboard motor shown in dotted lines in Figure 8 and indicated by the reference numeral 112 to an elevated position.

The cam structure 107 through the cam roller 108 and the flexible cable will move the pointer of the indicator 111 to indicate the height of the outboard motor 112 relative to the boat on which the outboard motor is mounted. When it is desired to lower the motor, either the valve 97 or the valve 105 may be opened to permit the flow of fluid from the cylinder 27 back to reservoir 84. The operation of the second form of the invention is similar to that of the operation of the form of the invention shown in Figures 1 to 7, inclusive, the difference being that an electric motor supplies the power to the pump 32 to raise the piston within its associated cylinder and to raise the outboard motor 112, the latter also being shown in dotted lines in Figure 1.

What is claimed is:

1. A vertically disposed adjustable mount for an outboard motor comprising an upright guideway adapted to be fixedly secured to the outside face of a boat transom, an upright plate arranged in face to face spaced relation with respect to said guideway and connected thereto for upward and downward movement, said plate being adapted to support an outboard motor thereon, a shelf carried by said guideway adjacent the lower end of and intermediate the side edges of said guideway, a closed upright cylinder having its lower end supported upon said shelf, a piston normally disposed adjacent to and

spaced from the lower end of said cylinder and mounted in said cylinder for upward and downward movements, a piston rod having one end fixedly secured to said piston and having its other end exteriorly of the upper end of said cylinder and operatively connected to said plate for effecting the upward movement of the latter upon execution of upward movement of said piston, a fluid pump having an inlet and an outlet, a reservoir for fluid, a main conduit connecting said outlet of said pump to said lower end of said cylinder to effect the injection of fluid into said cylinder, a bypass conduit connecting said main conduit to said reservoir, a normally closed valve in said bypass conduit, and means operatively connected to said valve to shift it to open position to permit the return flow of fluid to said reservoir from said cylinder.

2. A vertically disposed adjustable mount for an out-board motor comprising an upright guideway adapted to be fixedly secured to the outside face of a boat transom, an upright plate arranged in face to face spaced relation with respect to said guideway, a pair of vertically disposed support members arranged in diverging spaced relation with their converging and adjacent one ends spaced inwardly of the adjacent side edges of said plate and fixedly secured to said plate, said support members having their diverging and adjacent other ends connected to said guideway for upward and downward movement, a shelf carried by said guideway adjacent the lower end of and intermediate the side edges of said guideway, a closed upright cylinder having its lower end supported upon said shelf, a piston normally disposed adjacent to and spaced from the lower end of said cylinder and mounted in said cylinder for upward and downward movements, a piston rod having one end fixedly secured to said piston and having its other end exteriorly of the upper end of said cylinder and operatively connected to said plate for effecting the upward movement of the latter upon execution of upward movement of said piston, a fluid pump having an inlet and an outlet, a reservoir for fluid, a main conduit connecting said outlet of said pump to the lower end of said cylinder to effect the injection of fluid to said cylinder, a bypass conduit connecting said main conduit to said reservoir, a normally closed valve in said bypass conduit, and means operatively connected to said valve to shift it to open position

to permit the return flow of fluid to said reservoir from said cylinder.

3. A vertically disposed adjustable mount for an out-board motor comprising an upright plate having opposed grooves extending along each of its side edges and adapted to be secured to the outside face of a boat transom, an upright second plate arranged in face to face spaced relation with respect to said first-named plate, a pair of vertically disposed support members arranged in diverging spaced relation with their converging and adjacent one ends spaced inwardly of the adjacent side edges of said second plate and fixedly secured to said second plate, said support members having their diverging and adjacent other ends provided with flanges receivably engaged in said grooves in said first-named plate for upward and downward movement, a shelf carried by said first-named plate adjacent the lower end of and intermediate the side edges of said first-named plate, a closed upright cylinder having its lower end supported upon said shelf, a piston normally disposed adjacent to and spaced from the lower end of said cylinder and mounted in said cylinder for upward and downward movements, a piston rod having one end fixedly secured to said piston and having its other end exteriorly of the upper end of said cylinder and operatively connected to said second plate for effecting the upward movement of the latter upon execution of upward movement of said piston, a fluid pump having an inlet and an outlet, a reservoir for fluid, a main conduit connecting said outlet of said pump to the lower end of said cylinder to effect the injection of fluid to said cylinder, a bypass conduit connecting said main conduit to said reservoir, a normally closed valve in said bypass conduit, and means operatively connected to said valve to shift it to open position to permit the return flow of fluid to said reservoir from said cylinder.

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