May 19, 1953 LE ROY A. KIEBLER ET AL 2,638,863

VERTICALLY ADJUSTABLE MOUNT FOR OUTBOARD MOTORS

Filed Aug. 21, 1951

2 Sheets-Sheet 1

Fig. 1.

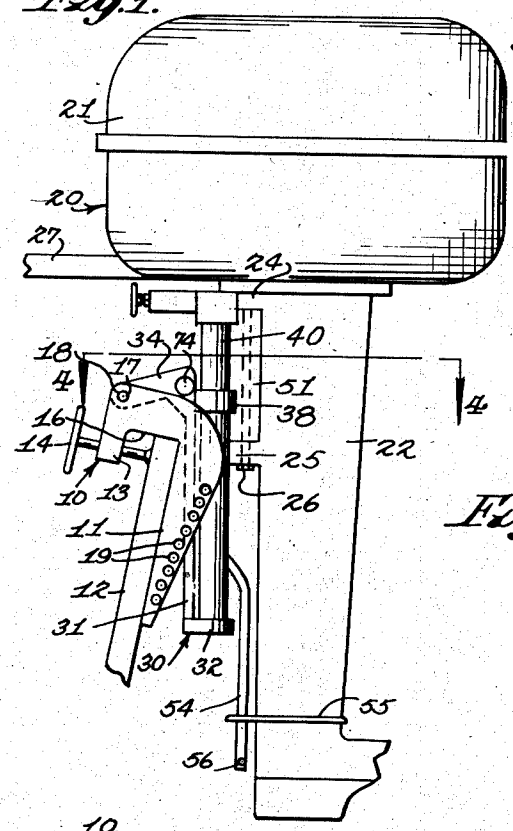


Fig. 2.

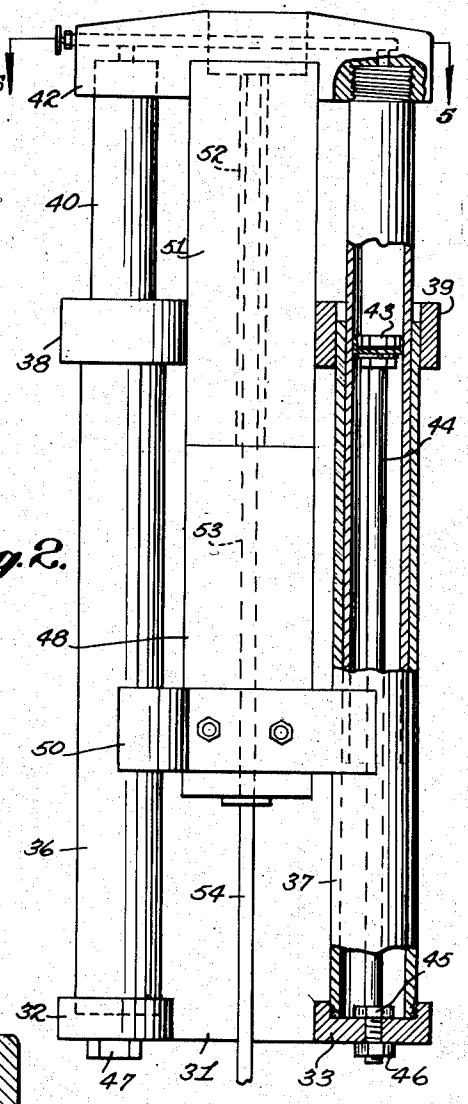


Fig. 4.

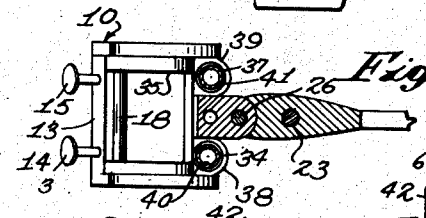


Fig. 3.

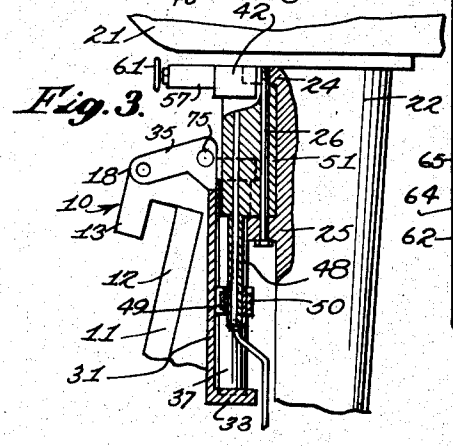
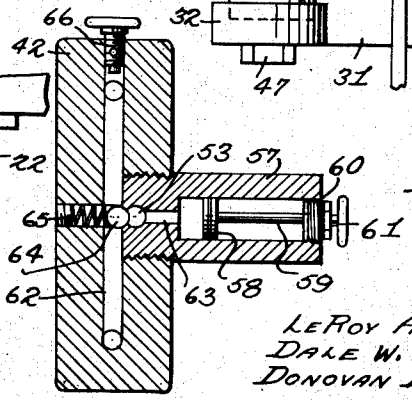


Fig. 5.



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Fig. 6.

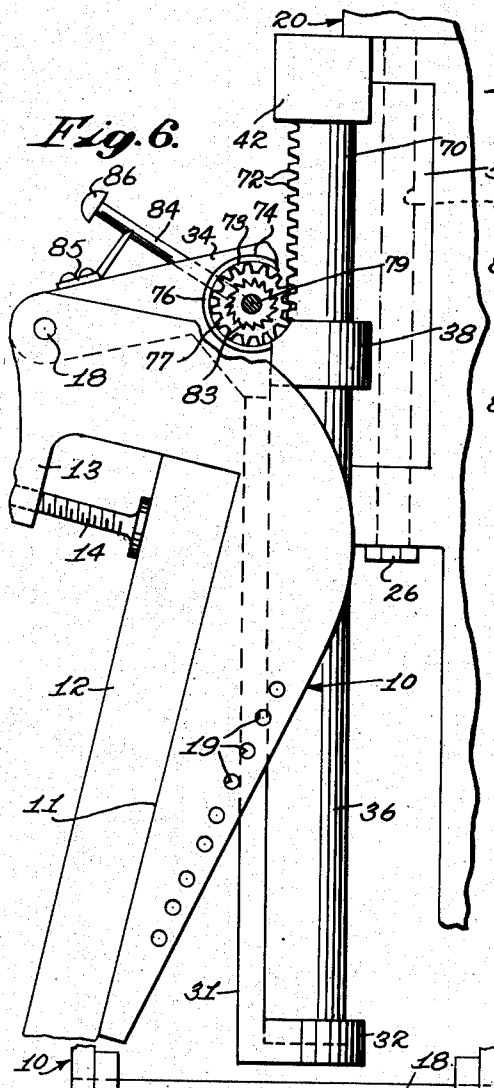


Fig. 7.

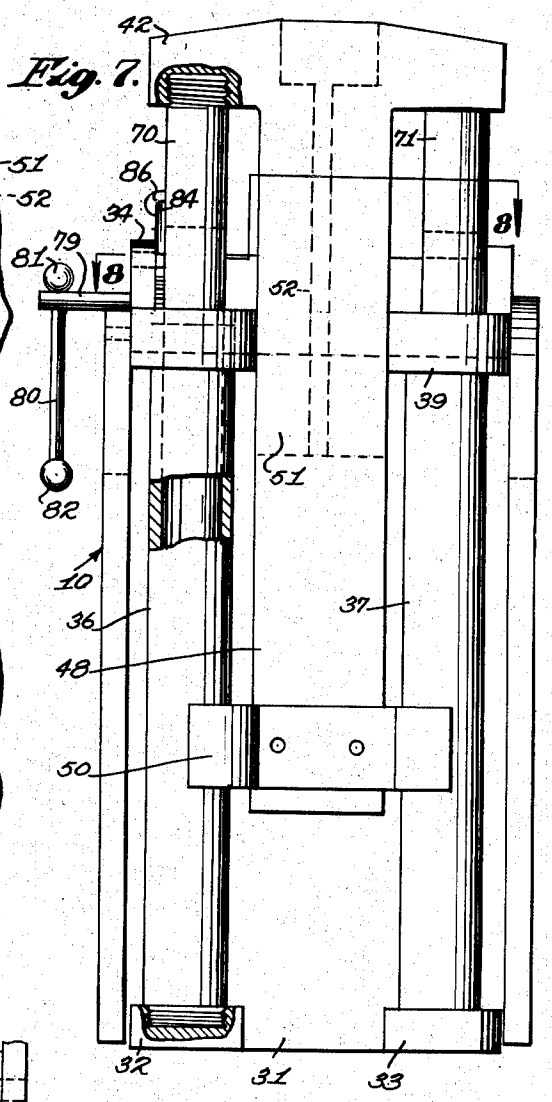
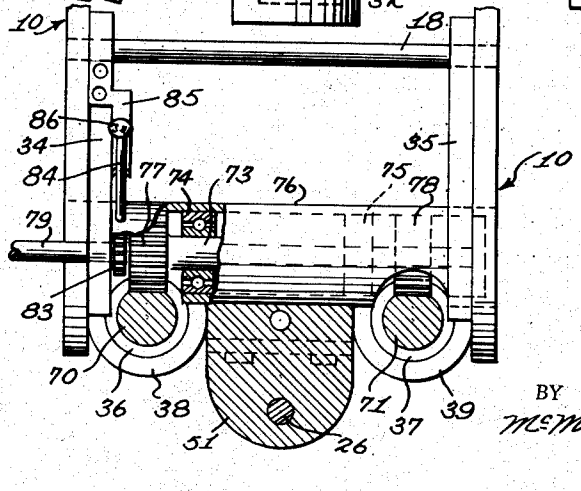


Fig. 8.



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VERTICALLY ADJUSTABLE MOUNT FOR OUTBOARD MOTORS

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4 Claims. (Cl. 115—18)

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This invention relates to mounting structures for outboard motors and more particularly to a vertically adjustable mounting structure for raising and lowering an outboard motor relative to a boat on which the motor is carried and for supporting the motor at selected positions of elevation relative to an associated boat.

It is among the objects of the invention to provide an improved mounting structure for an outboard motor which structure can be manually operated or power operated under manual control to raise or lower the motor relative to a boat carrying the motor, so that the motor can be raised for operation in shallow water or to pass over weed beds and other obstructions and lowered for efficient operation in open water of sufficient depth; which can be connected to an existing motor and motor bracket with no material modification of the motor or bracket construction; which firmly supports the motor for operation at selected positions of elevation relative to an associated boat; and which is simple and durable in construction, economical to manufacture and easy to install, and positive and effective in operation.

Other objects and advantages will become apparent from a consideration of the following description and the appended claims in conjunction with the accompanying drawings wherein:

Figure 1 is a diagrammatic side elevational view of an outboard motor supported on a motor bracket by a support structure illustrative of the invention;

Figure 2 is a rear elevational view on an enlarged scale of the motor support structure, a portion being broken away and shown in cross section to better illustrate the construction thereof;

Figure 3 is a fragmentary side elevational view of the support structure and adjacent portion of the motor with parts broken away and shown in cross section to better illustrate the construction thereof;

Figure 4 is a transverse cross sectional view on the line 4—4 of Figure 1;

Figure 5 is a transverse cross sectional view on the line 5—5 of Figure 2;

Figure 6 is a side elevational view of a modified form of motor mounting structure with associated parts of the motor and motor mounting bracket;

Figure 7 is a rear elevational view of the modified form of supporting structure illustrated in Figure 6 with parts broken way and shown in cross section to better illustrate the construction thereof; and

Figure 8 is a transverse cross sectional view on the line 8—8 of Figure 7.

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With continued reference to the drawings, the numeral 10 generally indicates an outboard motor mounting bracket of known construction having a flat face or pad 11 adapted to bear against the outer surface of a boat transom 12, a lug structure 13 spaced from and opposed to the face 11 to receive the upper portion of the boat transom between the lug structure and the face or pad and clamp screws 14 and 15 threaded through spaced apart, tapped holes in the lug structure and opposed to the pad of the bracket to bear against the inner surface of the boat transom and clamp the boat transom against the face or pad of the bracket. Between the lugs and the pad the bracket is provided with an abutment surface 16 which rests upon the upper edge of the transom to support the weight of the motor and is provided near its upper front corner with bearing openings, as indicated at 17, to receive a pivot bolt 18 for pivotally connecting the motor to the bracket. The bracket is also provided with series of spaced apart apertures 19 extending along the pad thereof to receive a fastening element for supporting the motor in selected positions of inclination relative to the bracket.

The outboard motor, generally indicated at 20, has an engine 21 and a stem 22 depending from the engine and carrying a propeller, not illustrated, at its lower end, a vertical shaft extending through the stem from the engine to the propeller shaft.

The motor is ordinarily pivotally mounted directly on the bracket 10 for swinging movements about a substantially horizontal axis, so that the motor can be set at selected positions of inclination relative to the bracket, and means are also provided to give the motor freedom of steering movement about a substantially vertical axis.

In the arrangement illustrated, the motor stem 22 is provided with forwardly projecting lugs or ears 24 and 25, one of which is disposed at the lower side of the engine 21, and the other of which is spaced from the upper lug 24 along the stem in a direction from the engine. These ears are apertured to receive a pivot bolt 26 which extends through the lugs and through an element pivotally secured to the bracket 10 by the pivot bolt 18 to provide a hinge connection between the motor and the bracket, so that the motor can be turned about a generally vertical axis by the steering handle 27 projecting forwardly from the engine 21, to steer the boat on which the motor is mounted. Various other means, well known to the art, are used to provide a generally vertical pivotal connection between the motor and the motor mounting bracket.

When the motor is mounted directly on the mounting bracket in the usual manner, the propeller, carried at the bottom of the motor stem 22, cannot be raised sufficiently for operation of the motor in very shallow water and to pass over submerged obstructions, such as weed and grass beds, submerged logs and stones. The present invention contemplates the interposition of manually operated or manually controlled means between the mounting bracket and the motor for elevating the motor sufficiently to bring the propeller adjacent the bottom of the boat, so that the motor can operate in water of a depth only sufficient to float the boat and can be operated over submerged obstructions, such as those indicated above.

The motor elevating mechanism is generally indicated at 30 and, in the form illustrated in Figures 1 to 5 inclusive, includes a flat support bar 31, base receptacles 32 and 33 secured to one end of the supporting bar, one at each side thereof and projecting perpendicularly from the bar at the lower end of the latter when the structure 30 is operatively mounted on the bracket 10, as illustrated in Figure 1. A pair of arms 34 and 35 are joined, each at one end, to the end of the bar 31 remote from the receptacles 32 and 33, one at each side of the bar and extend from the bar in a direction opposite that in which the receptacles extend from the bar. These arms are provided near their ends remote from the bar with aligned apertures which receive the pivot bolt 18 to pivotally connect the auxiliary bracket structure including the bar 31, the base receptacles 32 and 33, and the arms 34 and 35 to the motor mounting bracket 10.

Hollow cylindrical plunger guides or tubes 36 and 37 have their lower ends threaded into internally screw threaded recesses in the upper sides of the base receptacles 32 and 33, respectively, and extend upwardly from these base receptacles along the bar 31 in spaced apart and substantially parallel relationship to each other. Apertured ears 38 and 39 extend laterally from the bar 31, one at each side of the bar, and receive the upper ends of the guide tubes 36 and 37 to rigidly secure these tubes to the support bar 31.

Cylindrical plungers 40 and 41 are slidably received in the guide tubes 36 and 37 respectively, and project from the upper ends of these guide tubes. At their upper ends the plungers 40 and 41 are threaded into screw threaded recesses in the lower side of a yoke 42 which spans the distance between the plungers and rigidly interconnects the plungers at their upper ends.

In the form of the invention illustrated in Figures 1 to 5 inclusive, the plungers 40 and 41 are hollow cylinders and pistons, as indicated at 43 in Figure 2, are slidably disposed, one in each of the cylinders 40 and 41. These pistons are held in position adjacent the upper ends of the corresponding guide tubes 36 and 37 by rods, as indicated at 44, which extend from the pistons downwardly of the guide tubes and through apertures provided in the base receptacles 32 and 33, these rods being rigidly secured to the base receptacles by clamp nuts, as indicated at 45 and 46 for the rod 44, threaded onto the screw threaded lower ends of the rods and disposed one at each side of the corresponding receptacle. The lower nut for the rod in the guide tube 36 is indicated at 47.

A tongue 48 of elongated, rectangular cross sectional shape, depends from the yoke 42 between the guide tubes 36 and 37 and a pair of plates 49

and 50 are secured to this tongue near the end thereof remote from the yoke 42, one at each side of the tongue and partly surround the guide tubes 36 and 37 to provide a guideway for the lower end of the tongue. A projection 51 extends rearwardly from the upper portion of the tongue and has a length equal to the distance between the ears 24 and 25 on the motor stem. This projection is received between the ears 24 and 25 and is provided with a longitudinally extending bore 52 which receives the pivot bolt 26 to pivotally connect the motor stem to the tongue 48.

The tongue is provided with a second bore 53 extending longitudinally therethrough and spaced from the bore 52 and an inlet tube 54 is connected at one end to the lower end of the tongue in communication with the bore 53 and depends from the tongue to a location adjacent the bottom end of the motor stem 22, this tube being connected near its lower end to the stem by a hoop 55 which surrounds the tube and the stem. A check valve 56 is disposed in the lower end of the tube 54 and is effective to admit water into the tube while precluding passage of water out of the tube at the lower end of the latter.

A pump cylinder 57 is formed on the yoke 42 and projects forwardly from the yoke substantially at the mid-width location of the latter and a pump piston 58 is slidably mounted in the pump cylinder and connected to one end of a pump rod 59 which extends through a packing gland 60 threaded into the outer end of the pump cylinder and carries a hand knob 61 on its outer end.

The yoke 42 is provided with a longitudinal bore 62 which communicates at its opposite ends with the interiors of the cylinders 40 and 41 and communicates at its mid-length location with the bore 53 and with the interior of the pump cylinder 57 through a passage 63. A check valve including a valve ball 64 and a spring 65 is mounted in the yoke with the ball 64 engaging a valve seat at the intersection of the passage 63 with the bore 62 in the yoke.

With this arrangement, when the hand knob 61 is pulled outwardly, water will be drawn from the body of water in which the lower end of the motor stem is submerged through the tube 54, the bore 53 and the passage 63 into the interior of the pump cylinder 57. When the hand knob 61 is then forced inwardly, the water in the pump cylinder will be forced past the check valve ball 64 into the bore 62 in the yoke, passage of this water outwardly through the tube 54 being precluded by the check valve 56 and from the bore 62 in the yoke into the upper ends of the cylinders 40 and 41 where it will react against the pistons in these cylinders and, filling the space between the pistons and the yoke, will force the pistons upwardly relative to the guide tubes 36 and 37, raising the motor 20.

The bore 62 is extended to one end of the yoke and a manually controlled relief valve 66 is threaded into this end of the bore 62. When it is desired to lower the motor, the relief valve 66 is opened to allow the water to flow from the spaces in the cylinders 40 and 41 between the pistons and the yoke 42, thus permitting the tongue 48 and the motor carried thereby to settle or descend relative to the guide tubes 36 and 37.

Suitable means, such as pins, are connected to the guide tubes 36 and 37 and are engageable in selected apertures 19 in the motor bracket 10 to secure the support structure 30 and the motor 20

at desired angles of inclination relative to the boat.

Where the motor is provided with a pressure pump for forcing cooling water past the engine cylinders, the outlet of this pump may be connected by a suitable tube to the bore 62 in the yoke 42 through a manually operated two-way valve which may be substituted for the pump described above, so that the power of the outboard motor can be used to raise the motor.

In the form of the invention illustrated in Figures 6, 7 and 8, the structure is the same as that illustrated and described above, except that the plungers 70 and 71 in the modified form of the invention, instead of being hollow cylinders, as are the cylindrical plungers 40 and 41, of the above described form of the invention, are cylindrical elements, each of which has rack teeth 72 extending along the front side thereof and a pinion member 73 is rotatably mounted in bearings 74 and 75 received in a cylindrical housing 76 mounted at its ends in the auxiliary bracket arms 34 and 35. This pinion member has gear formations 77 and 78 thereon which respectively mesh with the rack teeth 72 on the cylindrical plungers 70 and 71.

The pinion element 73 is provided at one end with an extension 79 of reduced diameter which extension is provided near its outer end with a transverse aperture. A crank or handle 80 is slidably received in the transverse aperture in the extension 79 and is provided with enlarged ends 81 and 82 which retain it in operative assembly with the extension 80. This handle is used to manually rotate the pinion element 73 to move the cylindrical elements or plungers 70 and 71 longitudinally of the guide tubes 36 and 37 and thereby raise and lower the motor 20.

Near one end the pinion element 73 is provided with an annular series of ratchet teeth 83 and a pawl 84 is slidably received in an aperture provided in the housing 76 and has one end engaging the ratchet teeth 83 on the pinion element. A flat spring 85 mounted on the arm 34 has one end in engagement with the pawl 84 and resiliently urges the pawl into engagement with the ratchet teeth 83, the arrangement being such that the pawl will hold the pinion element against reverse rotation when the pinion element is manually rotated in a direction to raise the motor. A head or hand knob 86 is provided on the end of the pawl 84 remote from the pinion element and when it is desired to lower the motor, this knob is manually grasped and the pawl pulled away from the ratchet teeth to free the pinion element to rotate in a reverse direction, so that the motor will descend relative to the mounting bracket.

The invention may be provided in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are, therefore, intended to be embraced therein.

What is claimed is:

1. In combination with an outboard motor and a motor supporting bracket, a longitudinally adjustable motor mount interposed between said bracket and said motor for raising and lowering the motor when the bracket is operatively mounted on a boat comprising an auxiliary bracket structure pivotally connected at one end to said bracket for movement about an axis extending transversely of said bracket and overlapping the latter, a pair of guide tubes secured to said auxiliary bracket structure and extending from the other end of the latter longitudinally thereof in spaced apart and substantially parallel relationship to each other, cylindrical plungers slidably mounted one in each of said guide tubes and projecting from the ends of the latter remote from said other end of the auxiliary bracket structure, a yoke mounted on said cylindrical plungers at the ends of the latter projecting out of said guide tubes, a tongue depending from said yoke, means guiding said tongue relative to said auxiliary bracket structure for longitudinal movement of the former relative to the latter, means carried by said tongue and pivotally connecting said motor to said tongue for movement about an axis extending longitudinally of the latter, and manually operated means connected between said auxiliary bracket structure and said plungers for imparting substantially vertical movements to said yoke and said tongue relative to said auxiliary bracket structure.

2. In combination with an outboard motor and a motor supporting bracket, a longitudinally adjustable motor mount interposed between said bracket and said motor for raising and lowering the motor when the bracket is operatively mounted on a boat comprising an auxiliary bracket structure pivotally connected at one end to said bracket for movement about an axis extending transversely of said bracket and overlapping said bracket, a pair of guide tubes secured to said auxiliary bracket structure and extending from the other end toward said one end of the latter in spaced apart and substantially parallel relationship to each other, cylindrical plungers slidably mounted one in each of said guide tubes and projecting from the ends of the latter remote from said other end of the auxiliary bracket structure, a yoke mounted on said cylindrical plungers at the ends of the latter projecting out of said guide tubes, a tongue depending from said yoke, means guiding said tongue relative to said auxiliary bracket structure for longitudinal movement of the former relative to the latter, means carried by said tongue and pivotally connected to said motor for movement of said motor relative to said tongue about an axis extending longitudinally of said auxiliary bracket structure, each of said cylindrical plungers constituting a hollow cylinder, pistons slidably mounted one in each cylinder, means in said guide tubes supporting said pistons from the ends of said guide tubes remote from said yoke, a hand pump mounted on said yoke, said yoke having fluid passages therein connecting said pump with the spaces within said cylinders between said pistons and said yoke and said tongue having a fluid passage therein connecting the fluid passages in said yoke with the end of said tongue remote from said yoke, check valves in said fluid passages constraining the flow of fluid from the end of said tongue remote from said yoke to said pump and from said pump into said cylinders, and a manually operated relief valve connected to one of said fluid passages for venting fluid from said cylinders.

3. In combination with an outboard motor and a motor supporting bracket, a longitudinally adjustable motor mount interposed between said

bracket and said motor for raising and lowering the motor when the bracket is operatively mounted on a boat comprising an auxiliary bracket structure pivotally connected at one end to said bracket for movement about an axis extending transversely of said bracket and overlapping the bracket, a pair of guide tubes secured to said auxiliary bracket structure and extending from the other end toward said one end of the latter in spaced apart and substantially parallel relationship to each other, cylindrical plungers slidably mounted one in each of said guide tubes and projecting from the ends of the latter remote from said other end of the auxiliary bracket structure, a yoke mounted on said cylindrical plungers at the ends of the latter projecting out of said guide tubes, a tongue extending from said yoke between said guide tubes, means guiding said tongue relative to said auxiliary bracket structure for longitudinal movement of the former relative to the latter, means carried by said tongue and pivotally connected to said motor for movement of said motor relative to said tongue about an axis extending longitudinally of said auxiliary bracket structure, each of said cylindrical plungers constituting a hollow cylinder, pistons slidably mounted one in each cylinder, means in said guide tubes supporting said pistons from the ends of said guide tubes remote from said yoke, and manually controlled hydraulic means connected with the spaces in said cylinders between said pistons and said yoke for imparting movement to said tongue longitudinally of said auxiliary bracket structure.

4. In combination with an outboard motor and a motor supporting bracket, a longitudinally adjustable motor mount interposed between said bracket and said motor for raising and lowering the motor when the bracket is operatively mounted on a boat comprising an auxiliary bracket structure pivotally connected at one end to said bracket for movement about an axis extending transversely of said bracket and overlapping said bracket, a pair of guide tubes secured to said auxiliary bracket structure and extending from the other end of the latter toward said one end

thereof in spaced apart and substantially parallel relationship to each other, cylindrical plungers slidably mounted one in each of said guide tubes and projecting from the ends of the latter remote from said other end of the auxiliary bracket structure, a yoke mounted on said cylindrical plungers at the ends of the latter projecting out of said guide tubes, a tongue extending from said yoke between said guide tubes, means guiding said tongue relative to said auxiliary bracket structure for longitudinal movement of the former relative to the latter, means carried by said tongue and pivotally connected to said motor for movement of said motor relative to said tongue about an axis extending longitudinally of said auxiliary bracket structure, each of said cylindrical plungers having rack teeth along one side thereof, a pinion element mounted in said auxiliary bracket structure for rotation about an axis extending transversely of the latter and meshing with the rack teeth on said plungers, means connected to said pinion element for manually imparting rotational movement to the latter to move said tongue longitudinally of said auxiliary bracket structure, and means carried by said auxiliary bracket structure and releasably engaging said pinion element to hold said tongue in selected positions of longitudinal adjustment relative to said auxiliary bracket structure.

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