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MECHANISM FOR RAISING AND LOWERING OUTBOARD MOTORS

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3 Sheets-Sheet 1

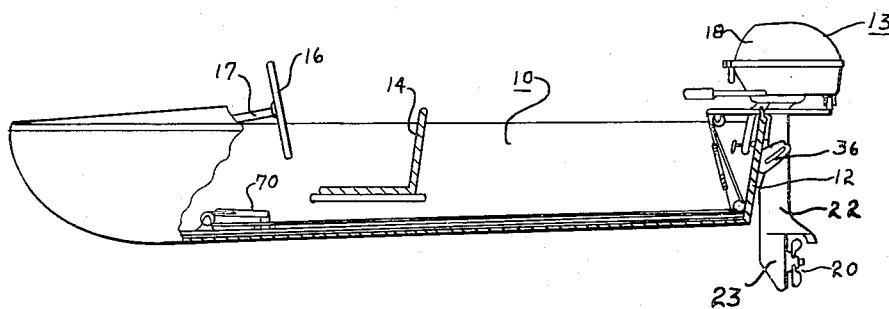


FIG. 1

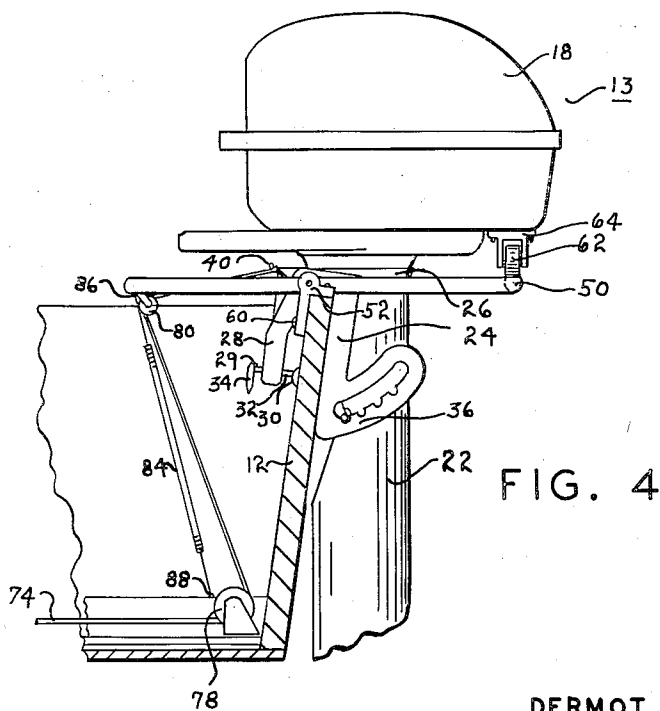


FIG. 4

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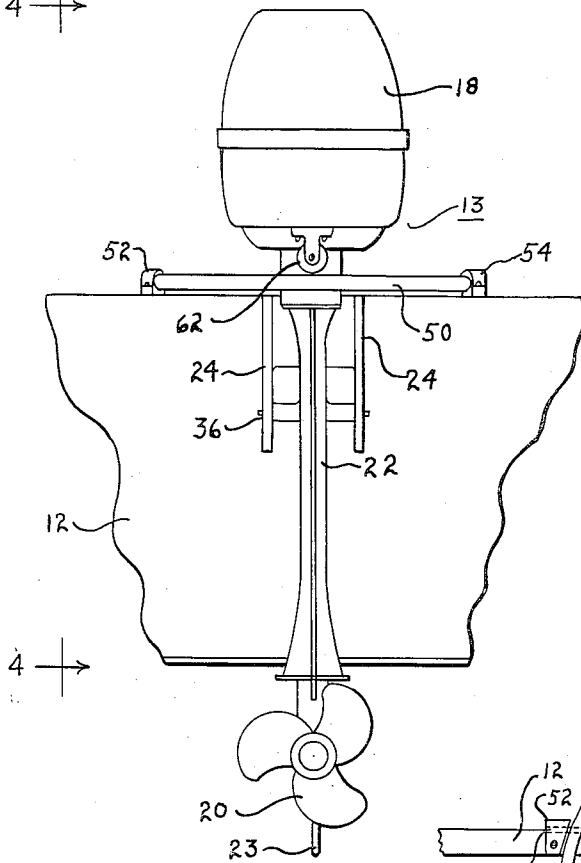


FIG. 2

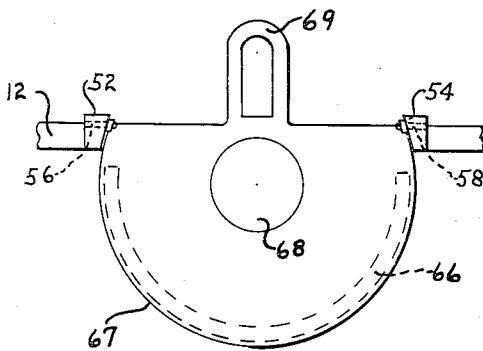


FIG. 8

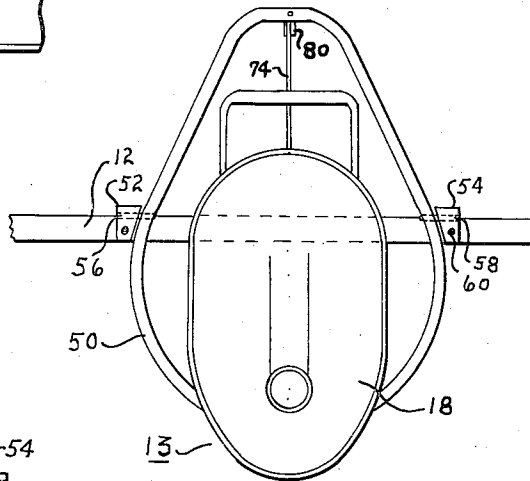


FIG. 3

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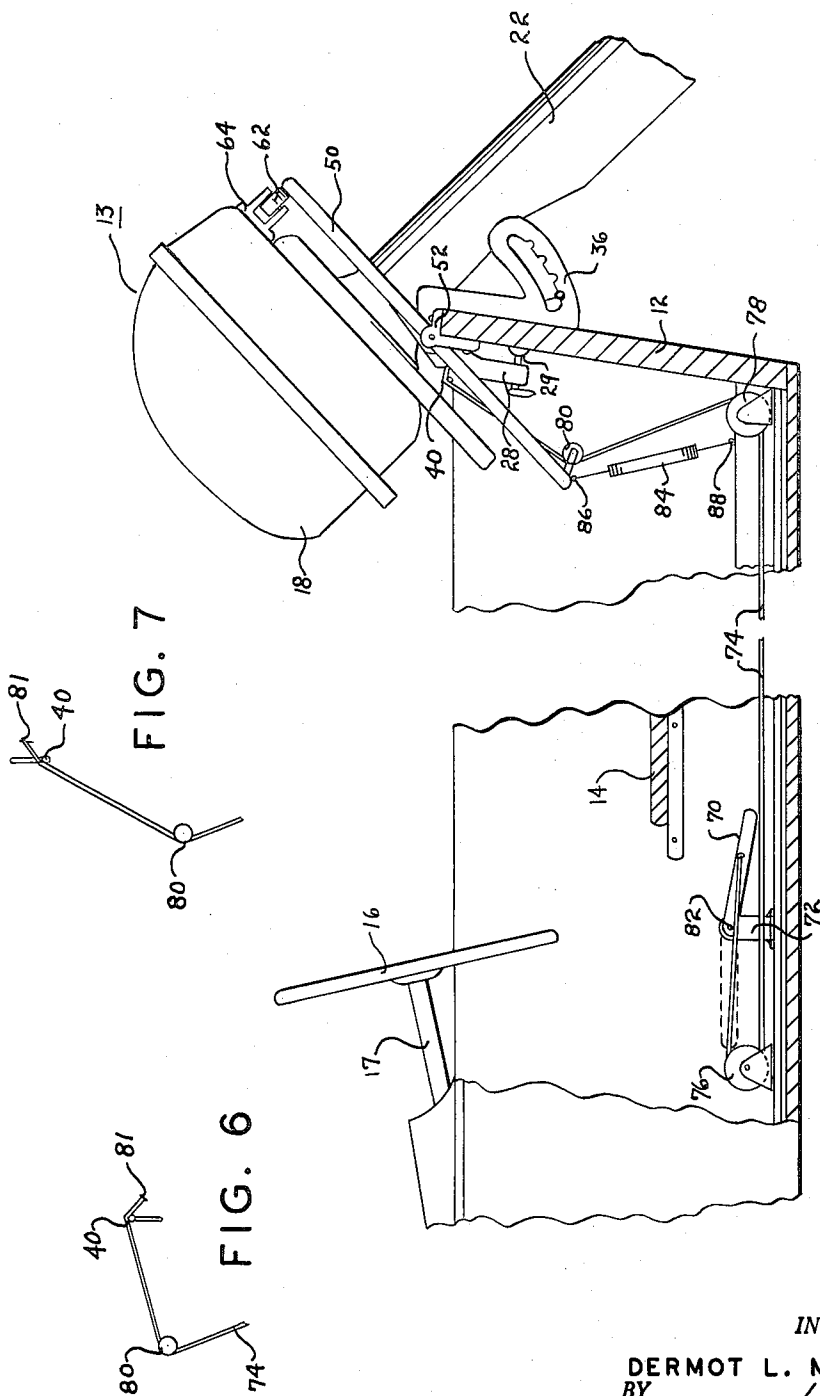
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MECHANISM FOR RAISING AND LOWERING OUTBOARD MOTORS

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3 Sheets-Sheet 3



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## MECHANISM FOR RAISING AND LOWERING OUTBOARD MOTORS

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7 Claims. (Cl. 115—41)

The present invention relates to outboard motors and more particularly to a mechanism for raising and lowering outboard motors mounted in operating position on the boat.

One of the principal objects of the present invention is to provide a relatively simple, easily installed and operated mechanism for raising and lowering outboard motors at a point remote from the motor.

Another object of the present invention is to provide a mechanism for raising and lowering outboard motors from a remote place in the boat which can be installed on any conventional outboard motor boat without interfering with normal operation and control of either the motor or the boat.

Still another object of the invention is to provide a mechanism of the aforesaid type for raising and lowering outboard motors which permits the pilot of the boat to raise and lower the motor from a forward driver's seat and assists the pilot in raising and lowering the motor at the motor.

A further object is to provide a mechanism for raising and lowering an outboard motor from and into the water at a point remote from the motor, which can be located at various places in the boat and which occupies very little otherwise usable space in the boat.

Additional objects and advantages will become apparent from the following description and accompanying drawings, wherein:

Figure 1 is a partial vertical cross sectional view of an outboard motor boat showing an outboard motor mounted in operative position on the boat transom;

Figure 2 is an elevational view of the outboard motor shown in Figure 1 mounted on the boat in operative position;

Figure 3 is a top plan view of the outboard motor shown in Figures 1 and 2 mounted on the boat;

Figure 4 is an enlarged partial elevational view, taken on line 4—4 of Figure 2, of the outboard motor mounted on the boat which is shown in part and in vertical cross section, the motor being shown in its lowered position with the propeller submerged in the water for driving the boat;

Figure 5 is an enlarged partial elevational view of the outboard motor mounted on the boat shown in fragmentary vertical cross sections, the motor being shown in its raised position, lifted to and locked into said position by my mechanism;

Figures 6 and 7 illustrate steps in the operation of my mechanism; and

Figure 8 is a modified form of one of the parts of my outboard motor raising and lowering mechanism.

Referring more specifically to the embodiment of my invention illustrated in the drawings, numeral 10 designates an outboard motor boat having a transom 12 on which an outboard motor 13 is shown mounted in its lowered position for propelling the boat. The boat is adapted to be piloted from a seat 14 located forward in the boat by a steering wheel 16 mounted on a steering

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mechanism 17 connected to the motor by suitable cables and pulleys (not shown) attached to the boat structure. One or more additional seats may be provided in the boat to the rear of seat 14, including one at the rear of the boat adjacent transom 12, without interfering with the installation of my mechanism. For the purpose of the present description both the boat and outboard motor may be considered as conventional and the present invention is not limited in its application to any particular kind or make of outboard motor, the one shown consisting of a motor enclosed in a housing 18 and connected to a propeller 20 by a drive shaft disposed in a leg 22 rigidly connected at its upper end to the motor and terminating at its lower end in a rudder 23. The outboard motor, which term hereinafter refers to the entire unit unless otherwise specified, is mounted on the boat transom 12 by a mounting device 24 including a swivel bracket 26 secured to the motor and a stern bracket 28 pivotally connected to bracket 26. The swivel bracket 26 holds the motor so that it can be oscillated on an upright axis for steering. The stern bracket 28 is adapted to seat over the top of transom 12 and to be secured thereto by a plurality of clamping units 29 consisting of a shoe 30, a screw threaded shaft 32 secured to the shoe and threadedly received in a portion of bracket 28 and a handle 34 for rotating the clamp. The pivoting of the swivel bracket relative to the stern bracket permits the motor to be tilted downwardly into operating position as shown in Figure 5. In conventional mountings of this general type, a thrust receiving member 36 adjustable to various positions receives the forward thrust from the swivel bracket and transmits the propelling force of the motor to the boat.

Most of the more expensive models of outboard motors are equipped with a latching mechanism for locking the motor in its upright operating position so that the operation of the motor can be reversed without the motor tilting upwardly from the water. While the mechanism for locking the motor in its operating position may be considered conventional and is therefore not disclosed in detail herein, a lever for manually operating the latching mechanism is shown at numeral 40, said lever being moved downwardly to release the latch mechanism to permit the motor to be tilted from the water.

The embodiment of my outboard motor raising and lowering mechanism shown in the drawings includes track 50 of round bar or tubular stock pivoted on substantially the same axis as the pivot means connecting the swivel bracket 26 and stern bracket 28 and rotatably supported on the upper edge of transom 12 by a pair of fixtures 52 and 54 and respective pivot pins 56 and 58 seated in said fixtures. The fixtures are secured to the transom by a plurality of screws 60, and the pivot pins 56 and 58 are positioned near the inside edge of the transom to permit the annular track to tilt downwardly into the boat at an acute angle as will be more fully explained hereinafter. The pivot pins must also be so positioned that the track can tilt downwardly at the rear of the boat below the horizontal position to give the motor wide latitude in adjustment for various operating conditions.

A roller 62 supported by a bracket 64 mounted on the underside of housing 18 or on the motor frame engages and rolls freely on track 50 as the motor is rotated from left to right on its vertical axis as the boat is steered in the conventional manner. Roller 62 with bracket 64 forms a contact element between the motor and track 50. The center of the circular part of track 50 is on the axis of the motor swivel so that roller 62 always follows the track throughout its full movement from one side to the other and is therefore offset rearwardly from the axis of pins 56 and 58. Although the track is shown as being substantially ring shaped, for some other types

of outboard motors other shapes may be required. A reversible type motor which turns completely around requires a complete annular track while the motor which is reversed by shifting gears may only require a track commensurate with the distance traveled by roller 62 as the motor is oscillated in steering the boat. Further, the track may take the form of a disc or plate or segment thereof for the roller to engage, such as that shown in Figure 8, the primary requirement for member 50 being that it provide an arcuate track on which roller 62 can roll freely and a means functioning as a lever for lifting and lowering the roller track. In Figure 8 the track is an arcuate surface area shown in broken lines at numeral 66 on a disc 67 having a central hole 68 for leg 22 of the motor and a lever 69 for tilting the disc to lift and lower the motor. While track 50 in Figures 2 to 5 is shown and described as being constructed of round bar or tubular metal stock, other cross sectional shapes of the material can be satisfactorily used if desired. Roller 62 may be of any suitable material such as metal, hard rubber, plastic, wood or rubber coated metal, and in some embodiments a shoe contacting the track may be used in place of the roller.

The mechanism for tilting track 50 from the motor operating position to the raised position as shown in Figures 4 and 5, respectively, consists of a pivoted lever 70 mounted on a bracket 72 secured to the floor of the driver's compartment and a cable 74 attached to the lever and threaded around a pulley 76 secured to the floor forward of the lever, under a second pulley 78 secured to the floor at the rear of the boat and over a third pulley 80 attached to the boat side of track 50, over the free end of lever 40 of the motor latching mechanism and then anchored preferably on the motor mount at numeral 81. The relationship of the anchor to lever 40 is illustrated in Figures 6 and 7, the former showing the relationship when the motor is in operative position shown in Figure 4, and the latter when the motor is in the inoperative position shown in Figure 5. When lever 70 is in its forward position as shown in Figure 1, the weight of the motor tending to move it to its vertical position is sufficient to tilt track 50 to its horizontal position as seen in Figure 4. Movement of lever 70 from its forward position as shown in Figure 1 to its rearward position as shown in Figure 5 first pulls lever 40 of the motor latching mechanism to unlock the latch and then applies sufficient downward force on pulley 80 secured to track 50 to tilt the track from the horizontal position of Figure 4 to the inwardly tilting position of Figure 5. As the track is tilted it bears against roller 62 urging the motor from its operating position in the water to its nonoperating position with the propeller entirely removed from the water. When lever 70 is in its rearward position, the line of force on cable 74 between pulley 76 and the point at which it is attached to the lever is below pivot point 82 of the lever so that this force pulls the free end of the lever against the floor where it is prevented from further movement. In order to lower the motor into the water the driver merely raises the free end of the lever and moves the lever to its forward position shown in broken lines in Figure 5.

To assist the driver in raising the motor, particularly during the first part of the lifting movement, a spring 84 is provided to apply a downward force to the boat side of annular track 50. This spring is an extension coil spring attached at one end to the track by an eye 86 secured to the underside of the track and anchored at the other end to the boat floor by an eye 88 secured thereto. In addition to assisting the driver in lifting the motor, spring 84 also assists the driver in lowering the motor easily and gradually into the water. While a certain amount of force is constantly applied by spring 84 to track 50, this force has no adverse effect on the normal operation of the motor in that the forward propelling force of the motor holds it in its operating position

for forward motion and the motor is locked in place by the latching mechanism for reverse motion. Further, when the boat with the motor is being hauled on a trailer or the like, the force applied by spring 84 and cable 74 tends to shift the weight of the motor forward so that the center of gravity is directly over the transom. The motor rides better with its weight shifted to that position. If desired, the coil spring can be replaced by a compression spring placed on the rearward side of transom 12 or a coil spring mounted coaxially with pins 56 and 58.

In the operation of the present motor raising and lowering mechanism, the motor operates in the same manner as if the mechanism had not been installed when the motor is in its vertical operating position, i.e. the driver can freely steer the boat by oscillating the motor back and forth laterally, reverse the operation of the motor, and make adjustments between vertical and off vertical positions of leg 22. When the driver wishes to raise the motor, he first shuts the motor off and then shifts lever 70 from its forward position to its rearward position, first unlocking the latching mechanism and then tilting the track toward the boat to the position shown in Figure 5, locking it in this position as previously described until the motor is to be used again.

Although only one embodiment of the present invention has been described in detail herein, various changes can be made without departing from the scope of the present invention.

I claim:

1. A mechanism for raising and lowering an outboard motor having a housing, a leg depending from said housing for supporting a propeller, a means for mounting said motor on the transom of a boat, including a pivot forming a vertical axis on which said motor swivels in steering the boat and a second pivot forming a horizontal axis on which said motor tilts between operating and nonoperating positions, and a latching means having an operating lever for locking said motor in its operating position, comprising: a roller mounted on the underside of the motor housing to the rear of said leg member and having an axis positioned on a line intersecting said axis on which the motor swivels in steering the boat, a curved member forming a track for said roller and having as its center the swivel axis of said motor, fixtures adapted to be mounted on said transom and forming an axis parallel with and in the proximity of the axis on which the motor tilts between operating and nonoperating positions for supporting said curved member, a spring connected to said member for urging said member against said roller in the direction to tilt said motor from its operating position to its nonoperating position, a pivoted lever remote from said motor, a pulley adapted to be mounted in the boat below said member, a cable engaging said pivoted lever, threaded under said pulley and attached to the latch lever, and a pulley attached to said curved member on the boat side of said fixtures for engaging said cable between said first mentioned pulley and the latch lever.

2. A mechanism for raising and lowering an outboard motor having a housing, a leg depending from said housing for supporting a propeller, a means for mounting said motor on a support at the rear of a boat including a pivot forming an axis on which said motor swivels in steering the boat and a second pivot forming a horizontal axis on which said motor tilts between operating and nonoperating positions, and a latching means having an operating lever for locking said motor in its operating position, comprising: a roller mounted on the underside of the motor housing to the rear of said leg, a member forming a track for said roller and having as its center the swivel axis of said motor, fixtures adapted to be mounted on said support and forming an axis parallel with and in the proximity of the axis on which the motor tilts between operating and nonoperating positions for

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supporting said member, a spring connected to said member for urging said member against said roller, a movable means remote from said motor, a pulley adapted to be mounted in the boat below said member, a cable attached to said movable means threaded under said pulley and engaging the lever for operating said latch, and a means attached to said member on the boat side of said fixtures for receiving said cable between said pulley and the lever for said latch.

3. A mechanism for raising and lowering an outboard motor having a frame, a means for mounting said motor on a support at the rear of a boat including a pivot forming an axis on which said motor swivels in steering the boat and a second pivot forming a horizontal axis on which said motor tilts between operating and non-operating positions, and a latching means having an operating lever for locking said motor in its operating position, comprising: a roller mounted on the frame, a member forming a track for said roller with its center the swivel axis of said motor, a fixture adapted to be mounted on said support and forming an axis parallel with and in the proximity of the axis on which the motor tilts between operating and nonoperating positions for supporting said member, a spring connected to said member for urging said member against said roller in the direction to tilt said motor from its operating position to its nonoperating position, a movable means remote from said motor, a pulley adapted to be mounted in the boat below said member, a cable attached to said movable means threaded under said pulley and engaging the lever for operating said latch, and a means attached to said member on the boat side of said fixture for slidably receiving said cable between said pulley and the lever for said latch.

4. A mechanism for raising and lowering an outboard motor having a frame, a means for mounting said motor on a support at the rear of a boat including a pivot forming an axis on which said motor swivels in steering the boat and a second pivot forming a horizontal axis on which said motor tilts between operating and non-operating positions, and a latching means having an operating lever for locking said motor in its operating position, comprising: a roller mounted on the frame, a member forming a track for said roller and with its center the swivel axis of said motor, a fixture adapted to be mounted on said support and forming an axis parallel with and in the proximity of the axis on which the motor tilts between operating and nonoperating positions for supporting said member, a movable means remote from said motor, a cable attached to said movable means and connected to said member on the boat side of said fixture and to the lever for operating said latch, and a means on said member on the boat side of said fixture for slidably receiving said cable.

5. A mechanism for raising and lowering an outboard motor having a frame, a means for mounting said motor on a support at the rear of a boat including a pivot forming an axis on which said motor swivels in steering the boat and a second pivot forming a horizontal axis on

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which said motor tilts between operating and nonoperating positions, and a latching means having an operating lever for locking said motor in its operating position, comprising: a contact element mounted on the frame, a member forming a track for said element and with its center the swivel axis of said motor, a fixture adapted to be mounted on said support and forming an axis parallel with and in the proximity of the axis on which the motor tilts between operating and non-operating positions for supporting said member, a movable means remote from said motor, and a cable attached to said movable means and connected to said member on the boat side of said fixture and to the lever for operating said latch.

6. A mechanism for raising and lowering an outboard motor having a housing, a leg depending from said housing for supporting a propeller, a means for mounting said motor on a support at the rear of a boat including a pivot forming an axis on which said motor swivels in steering the boat and a second pivot forming a horizontal axis on which said motor tilts between operating and nonoperating positions, comprising: a roller mounted on the underside of the motor housing to the rear of said leg, a member forming a track for said roller, fixtures adapted to be mounted on said support and forming an axis parallel with and in the proximity of the axis on which the motor tilts between operating and nonoperating positions for supporting said member, a spring connected to said member for urging said member against said roller in the direction to tilt said motor from its operating position to its nonoperating position, a pivoted lever remote from said motor, a pulley adapted to be mounted in the boat below said member, and a cable attached to said pivoted lever threaded under said pulley and connected to said member on the boat side of said fixtures.

7. A mechanism for raising and lowering an outboard motor having a frame, a means for mounting said motor on a support at the rear of a boat including a pivot forming an axis on which said motor swivels in steering the boat and a second pivot forming a horizontal axis on which said motor tilts between operating and nonoperating positions, comprising: a contact element mounted on the frame, a member forming a track for said element with its center the swivel axis of said motor, a fixture adapted to be mounted on said support and forming an axis parallel with and in the proximity of the axis on which the motor tilts between operating and nonoperating positions for supporting said member, a movable means remote from said motor, and a cable attached to said movable means and connected to said member on the boat side of said fixture.

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