Nov. 30, 1948. G. W. MARTIN 2,454,972

MOUNTING FOR OUTBOARD MOTORS

Filed Jan. 20, 1945

4 Sheets-Sheet 1

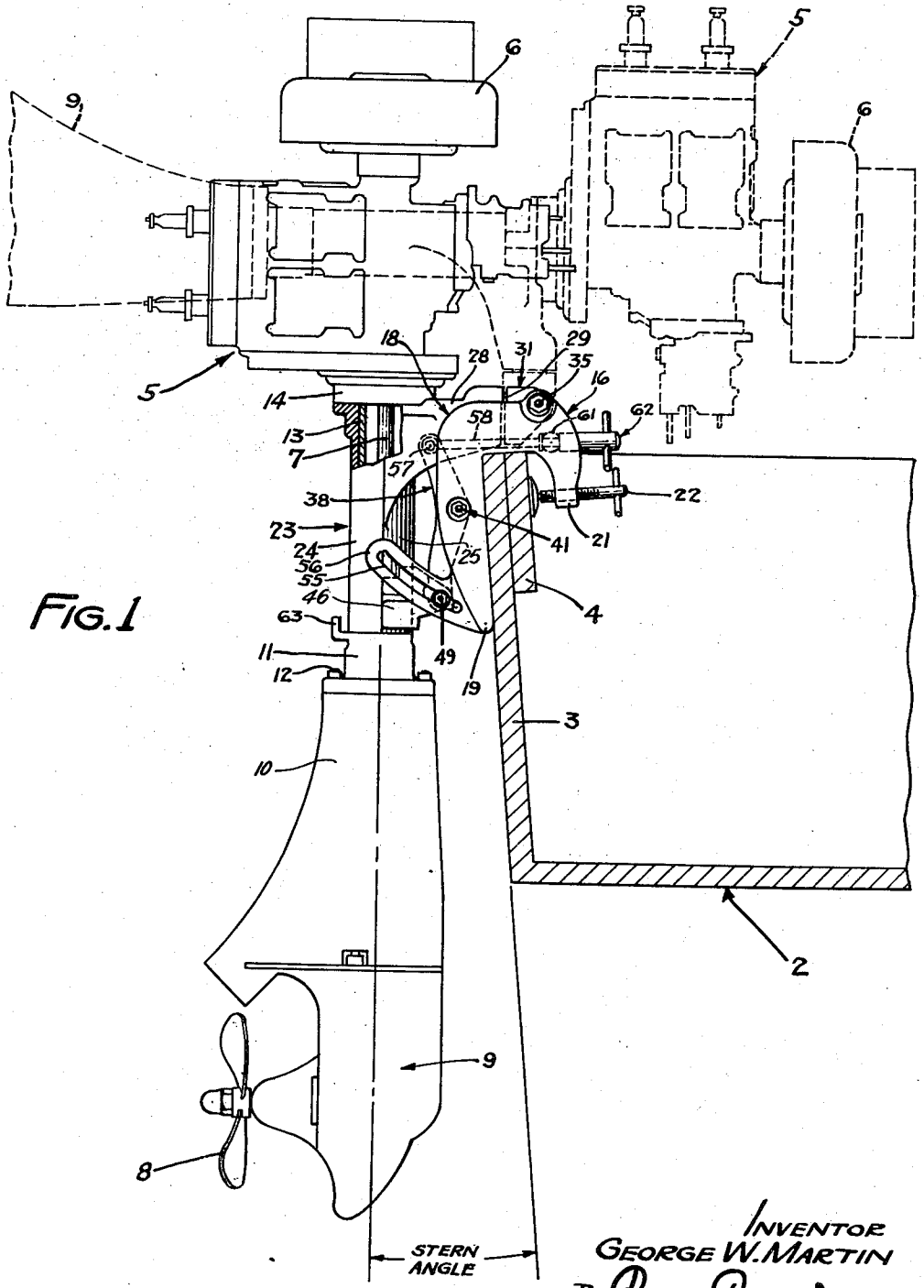


FIG. 1

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FIG. 2

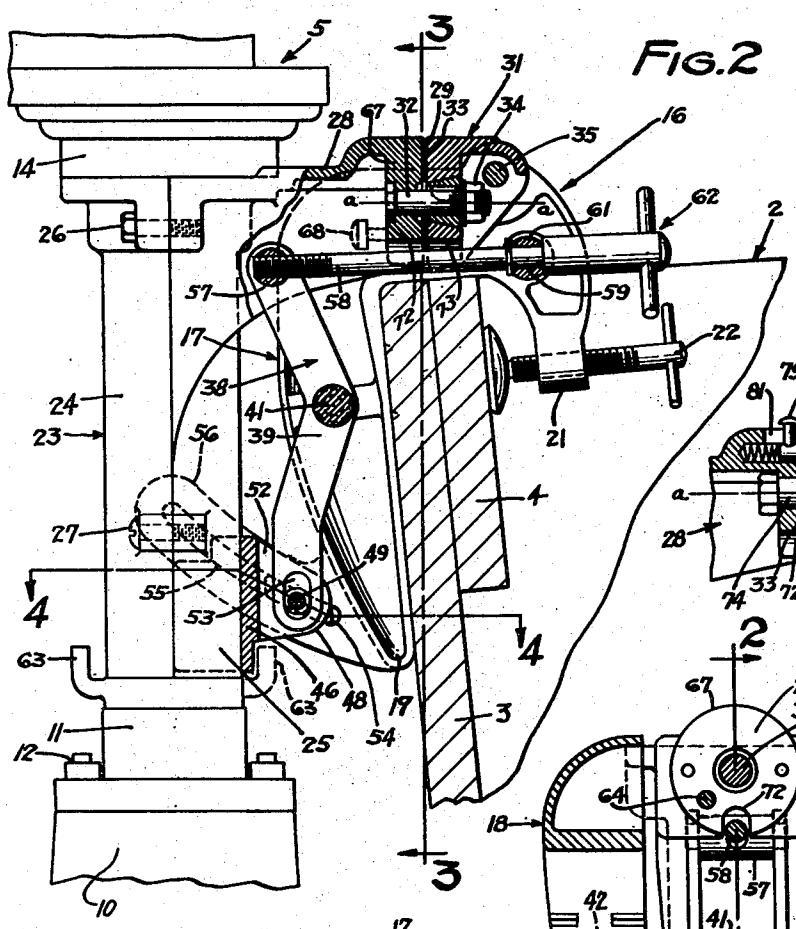
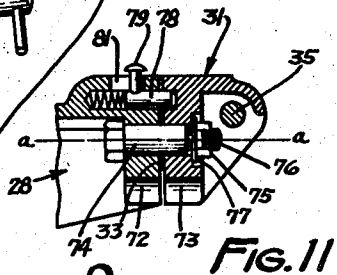


FIG. 11



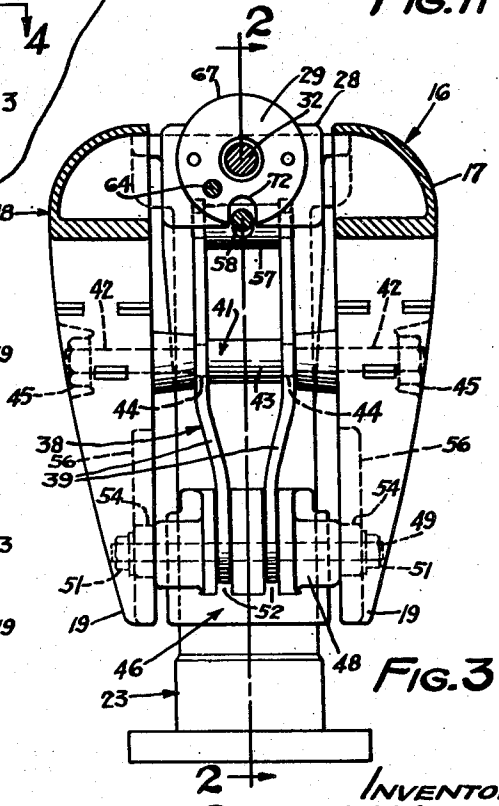


FIG. 3

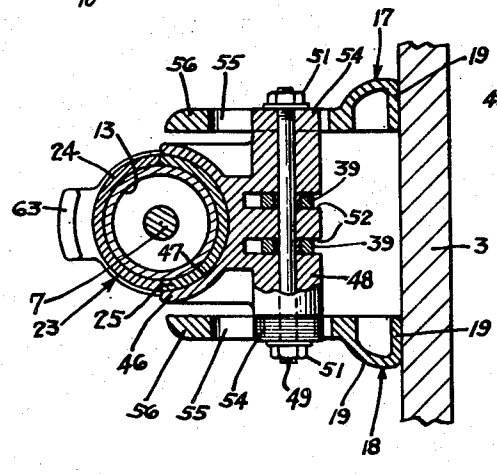


FIG. 4

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MOUNTING FOR OUTBOARD MOTORS

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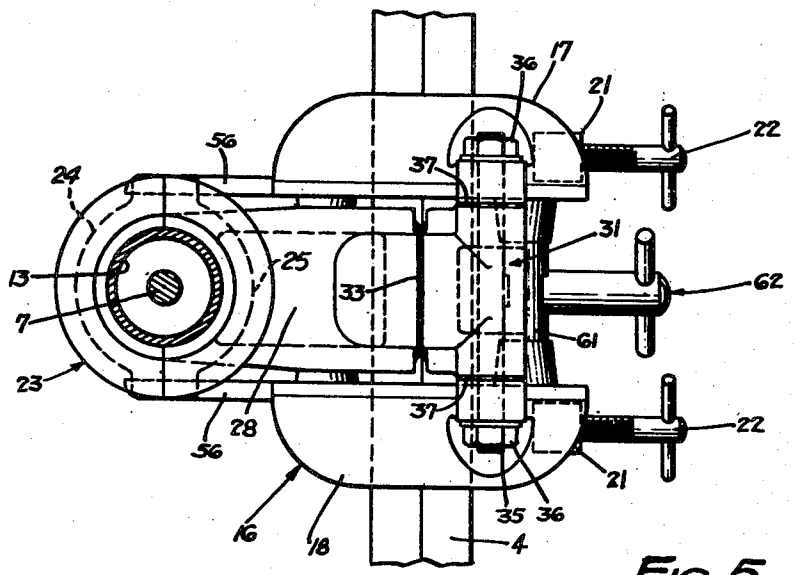


FIG. 5

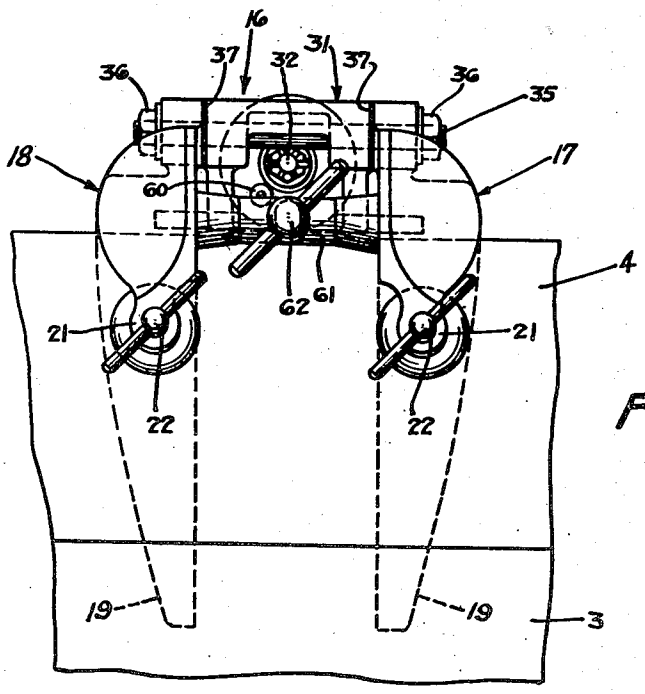


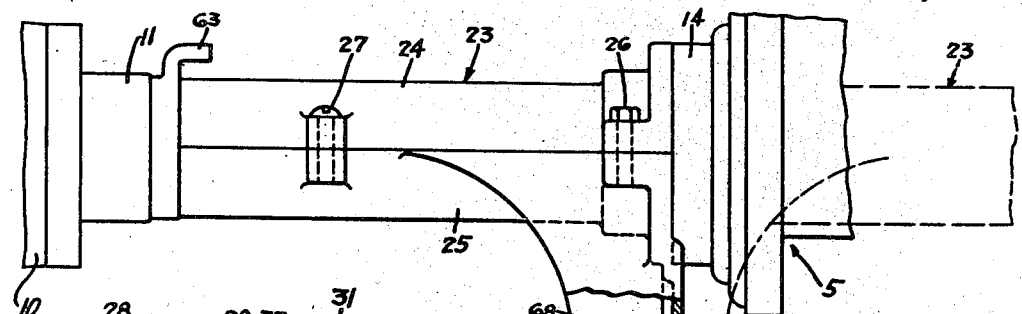
FIG. 6

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MOUNTING FOR OUTBOARD MOTORS

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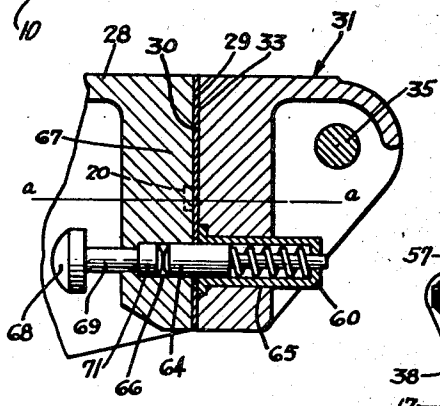


FIG. 8

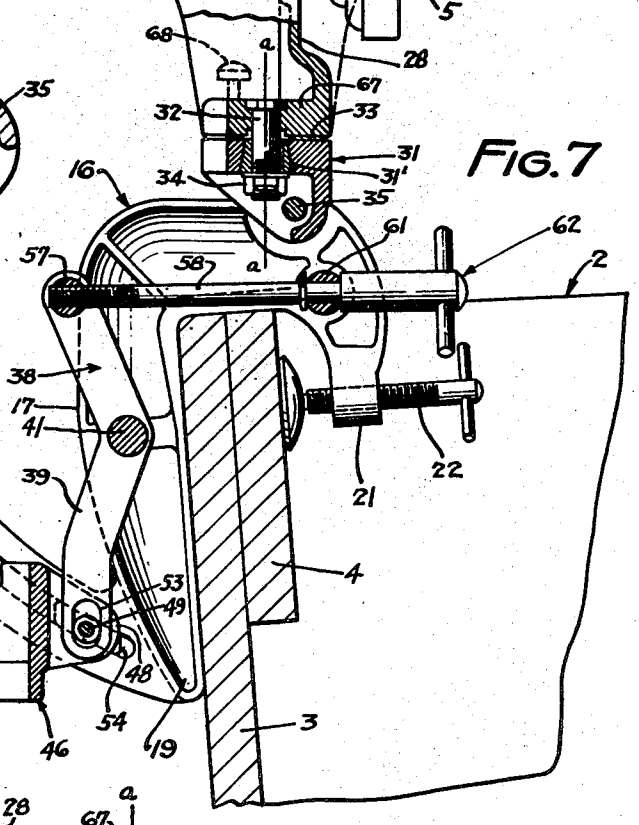


FIG. 7

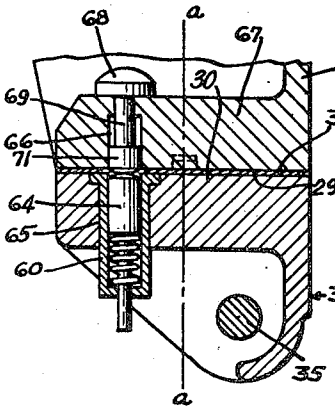


FIG. 9

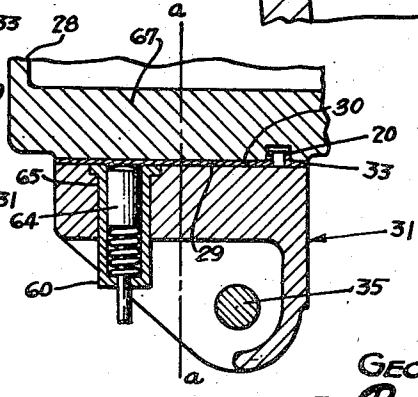


FIG. 10

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UNITED STATES PATENT OFFICE

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MOUNTING FOR OUTBOARD MOTORS

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Application January 20, 1945, Serial No. 573,768

9 Claims. (Cl. 248—4)

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This invention relates to new and useful improvements in outboard motor mountings and more particularly to a mechanism for varying the stern angle of outboard motors.

In the operation of nearly all outboard motors it is necessary in order to obtain maximum efficiency in the performance thereof that the axis of the usual drive shaft between the engine and the propeller shaft be maintained in substantially a vertical position to assure proper operation of the carburetor float, and also to obtain the maximum propelling effect of the propeller. In mountings now in common use, means are usually provided for varying the angle between the transom of the boat and the outboard drive shaft, commonly known to the trade as the stern angle. The means now provided for varying the stern angle of conventional outboard motors, is located exteriorly of the boat, usually at the point where the drive shaft housing bears against the stern bracket when the outboard motor is in operative position on the boat. Because of its location, such adjusting means cannot safely be manipulated when the boat is in operation, because to do so, the operator usually has to lean over the back end of the boat to manipulate the adjusting means. In such structures it is therefore customary for the operator to stop the engine and swing the propeller out of the water, after which, access, to a fashion, may be had to the stern angle adjusting means. Because it is so inconvenient to vary the stern angle of conventional outboard motors, such adjustments are not always made when they should be, and, as a result, the outboard motor may be operated in a position whereby its efficiency is greatly impaired.

It is well known to those familiar with the operation of outboard motors that the stern angle may require frequent adjustments, as a result of variations between the longitudinal axis of the boat and the surface level of the water through which the boat is cruising. For example, if the boat is cruising very slowly, as when trolling, the axis of the boat may be disposed substantially parallel to the surface of the water, whereas, if the boat is crusing at high speed, the bow of the boat may be well out of the water and its stern may be traveling relatively deeper in the water than when moving slowly. Under such conditions, the longitudinal axis of the boat may be disposed at quite an angle to the surface of the water, which obviously will necessitate adjustment of the stern angle if the outboard motor is to be operated at maximum efficiency. Variations in load placements in the

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boat may also cause variations in the angle between the axis of the boat and the surface of the water, thereby requiring further adjustment of the stern angle to compensate for such variations.

It is therefore highly desirable that means be embodied in the mounting means of outboard motors whereby the stern angle may be conveniently varied at anytime by the operator of the boat without interrupting the operation thereof, thereby to assure maximum efficiency of the apparatus at all times and without interrupting the traveling movement of the boat, whenever it is deemed advisable so to vary the stern angle.

An object of the present invention therefore is to provide a mounting bracket for outboard motors having means conveniently positioned within the boat for tilting the motor to vary the stern angle without interrupting the operation of the motor and boat.

A further object of the invention is to provide an outboard motor comprising a mounting bracket on which the motor is pivotally mounted for swinging movement about a horizontal axis disposed transversely of the length of the boat, and an operating member being carried by said bracket and positioned within the boat whereby an operator seated in the boat may readily and conveniently vary the stern angle of the outboard motor while the boat is in operation.

A further object is to provide a mounting for outboard motors having means operable from within the boat to vary the angle between the motor drive shaft and the stern of the boat while in operation, and means also being provided whereby the propeller may be tilted to a position over the boat without detaching the mounting bracket from the stern of the boat.

A further object is to provide in combination with an outboard motor comprising a drive shaft having a tubular housing enclosing said shaft and connecting together the usual motor and propeller units, a sleeve member adapted to rotatably receive said shaft housing and having a forwardly extending arm pivotally connected to a mounting bracket secured to the stern of the boat, said sleeve member permitting rotary movement of the outboard motor about the axis of said drive shaft to provide for steering the boat, and the connection between the sleeve member and mounting bracket being such that when the motor is swung to a horizontal position above the water, the entire outboard motor may be swung about a vertical axis to bring the pro-

peller into a position over the boat to facilitate the removal of weeds and the like from the propeller and also to facilitate replacing the usual well known shear pin of the propeller, when necessary. The unique mounting of the motor also makes possible the positioning of the motor to allow maximum room for the operator when the motor is not in use.

A further object is to provide a mounting for an outboard motor comprising a stern bracket having means for detachably securing it to the transom of a boat, and a tubular supporting member being pivoted to the upper portion of the stern bracket adapted to rotatably receive the usual shaft housing of the outboard motor, and an arm being mounted on the stern bracket and adapted for rocking movement thereon, one end of said arm being pivoted to a thrust block against which the lower end of the tubular supporting member is normally seated, and an adjusting element being rotatably supported on the stern bracket and having one end engaged with the upper end of said arm, whereby when the operating member is rotated in one direction, the thrust block is swung rearwardly thereby to change the angle between the axis of the engine drive shaft and the stern of the boat, and whereby the motor may readily be maintained in substantially a vertical position while the boat is in operation thereby to obtain maximum efficiency of the engine, and propeller.

A further object is to provide a mounting for outboard motors comprising three different axes about which the outboard motor, including the engine drive shaft housing and propeller, may be independently oscillated, one pivot providing means for tilting the motor in a vertical plane to properly position the motor and propeller with respect to the surface of the water, and also whereby the outboard motor as a whole may be swung to a horizontal position out of the water; a second axis permitting rotary movement of the outboard motor about the axis of the drive shaft to provide for guiding the boat in its course; and the third axis providing means for swinging the outboard motor, as a whole, about a vertical axis when in a horizontal position with its propeller out of the water, and whereby the propeller may be quickly and conveniently swung to a position over the boat without detaching the stern bracket from the boat; in the construction and mounting of the rocker arm or arms carried by the tubular supporting bracket and which has a thrust block pivotally connected to the lower end thereof adapted normally to be engaged by the tubular supporting member; in the operating member provided within the boat and engaged with the upper end of the rocker arm whereby when said operating member is rotated, the position of the drive shaft and propeller of the outboard motor may be quickly adjusted to properly position the propeller with respect to the surface of the water; and in the mounting of the means provided for locking the outboard motor in a horizontal position with the propeller positioned over the boat, and whereby said lock is substantially concealed from view under normal operation of the apparatus.

Other objects of the invention will appear from the following description and the accompanying drawings and will be pointed out in the annexed claims.

In the accompanying drawings there has been disclosed a structure designed to carry out the various objects of the invention, but it is to be

understood that the invention is not confined to the exact features shown, as various changes may be made within the scope of the claims which follow.

In the drawings:

Figure 1 is a side elevational view showing an outboard motor mounted on the stern of a boat by the invention herein disclosed;

Figure 2 is an enlarged detail sectional view on the line 2—2 of Figure 3, showing the pivotal mounting of the tubular supporting member on the upper portion of the stern bracket;

Figure 3 is a cross sectional view on the line 3—3 of Figure 2;

Figure 4 is a detail sectional plan view on the line 4—4 of Figure 2;

Figure 5 is a plan view of the mounting means with the motor removed;

Figure 6 is a front view of Figure 5;

Figure 7 is a view similar to Figure 2, showing the motor tilted upwardly to substantially a horizontal position out of the water;

Figure 8 is a fragmentary view on an enlarged scale, showing the means for locking the motor against rotation on the swivel bracket;

Figure 9 is a view similar to Figure 8, showing the locking bolt depressed or positioned to permit swinging movement of the outboard motor about a vertical axis;

Figure 10 is a view similar to Figure 9 with the parts differently positioned with respect to one another; and

Figure 11 is a view showing a locking device of modified construction.

In the selected embodiment in the invention herein disclosed, there is illustrated in Figure 1, for purposes of disclosure, the stern end of a boat 2 comprising the usual end wall or transom 3 which in some instances is reinforced as indicated at 4 to provide an adequate support for the usual stern brackets provided on outboard motors.

The outboard motor to be supported on the boat is shown comprising an engine, generally designated by the numeral 5, comprising a fly-wheel 6 secured to one end of the usual crank shaft, not shown, in the drawings. A drive shaft 7, partially shown in Figures 1 and 4, has its upper end secured to the crank shaft in the usual manner and its lower end operatively connected to the propeller 8 through the usual gear mechanism provided in the gear housing 9 of the propeller, as is well known.

A collar or cap 11 is shown secured to the upper end of the intermediate housing 10 by suitable bolts or studs 12, said housing constituting the upper portion of the usual propeller gear housing 9. The tubular housing 13 of the drive shaft, shown in Figures 1 and 4, has its lower end secured to the collar 11 and its upper end to the lower portion 14 of the engine crank case, whereby the engine 5, tubular shaft housing 13, intermediate housing 10 and gear housing 9, become, in effect, an integral structure.

An important feature of the present invention resides in the novel means provided for pivotally supporting the outboard motor upon the boat 2. As shown in Figures 1, 2, 3, and 7, a mounting or stern bracket, generally designated by the number 16 is shown comprising two opposed members 17 and 18 each having one leg 19 adapted to clampingly engage the outer surface of the transom 3 of the boat, as best shown in Figures 2 and 7. Each member 17 and 18 has a relatively shorter depending leg 21 spaced forwardly from its outer leg 19 and carrying a clamping screw 22

adapted to engage the inner surface of the transom, thereby to securely and detachably clamp the stern bracket 16 to the transom of the boat. The bracket members 17 and 18 are secured together in spaced relation, as will subsequently be described.

A tubular supporting member, generally designated by the numeral 23, rotatably receives the tubular shaft housing 13 of the outboard motor drive shaft 7, as shown in Figures 1 and 4. The supporting member 23 is split, and comprises a rear section 24 and a front section 25 secured together by suitable screws or bolts 26 and 27, whereby the housing 13 is supported within the supporting member 23 under a slight friction, such friction, however, permitting free turning movement of the housing within the supporting member, to provide for steering the boat.

The front section 25 of the supporting member 23 is shown provided with a forwardly extending arm 28, terminating at its foremost end in a flat bearing face 29 adapted to seat against a thin bearing plate 33, preferably of brass, which is interposed between the faces 29 and 30 of the arm 28 and swivel bracket 31, respectively, to prevent direct contact between said faces, it being understood that the parts 28 and 31 are preferably made of cast aluminum to reduce weight. The plate 33 is shown having lateral projections 20 receivable in sockets provided in the face 29 to retain it in place. See Figure 10. The forward end of the arm 28 is pivotally connected to the swivel bracket 31 by a pivot pin 32 having its axis *a—a* normally disposed lengthwise of the boat, (as best shown in Figure 2). The pivot pin 32 is preferably permanently secured in the arm 28, as by casting it therein when the section 67 of the supporting member 25 is cast. The swivel bracket 31 is bored to receive a tapered bushing 31' which, in turn is bored to receive the pivot pin 32, as shown in Figures 2 and 7.

The pivot pin 32 is provided with a locknut 34 having slots therein for receiving a cotter pin to secure the nut to the pin whereby it cannot work loose or become tightened when the arm 28 is rotated about the axis of the pivot pin 32. The bushing 31' is preferably keyed to the pivot pin 32, as indicated in Figures 2 and 7, whereby the bushing will rotate in the tapered bore provided in the swivel bracket 31, when the arm 28 is relatively rotated about the axis of the pivot pin 32. The tapered bushing 31' and locknut 34 cooperate to provide means whereby the swivel or pivotal connection between the arm 28 and swivel bracket 31 may be maintained with the necessary friction to eliminate play or looseness between the parts.

The swivel bracket 31 is mounted on a pivot 35 between the upper forward portions of the spaced members 17 and 18 of the stern bracket 16, the pivot 35 being in the form of a rod having both ends threaded and received in aligned apertures provided in the members 17 and 18 of the stern bracket, as clearly illustrated in Figures 5 and 6. Suitable nuts 36 are received in threaded engagement with the ends of the rod 35. Friction disks or washers 37 are shown interposed between the side members 17 and 18 of the stern bracket and the adjacent sides of the swivel bracket 31, and the nuts 36 are so tightened that the swivel bracket is clamped between the side members 17 and 18 of the stern bracket, whereby the outboard motor may be swung upwardly, as indicated in Figure 7, the friction between said parts being such as to retain the motor in any desired position between the full and dotted lines shown in

Figure 1, when the engine is not in operation. The axis of the pivot pin 35, it will be noted by reference to Figure 2, is disposed at right angles to the axis of the pivot pin 32 whereby the pivot pin 35 will permit free swinging movement of the outboard motor in a vertical plane disposed lengthwise of the boat.

Another important feature of the present invention resides in the means provided for varying the stern angle of the outboard motor with respect to the transom 4 of the boat, and whereby said angle may readily and conveniently be varied at anytime by a person seated in the boat while the boat is in operation.

As hereinbefore stated, to operate an outboard motor at maximum efficiency, it is highly essential that the outboard motor be operated in substantially a vertical position, as shown in full lines in Figure 1. The means heretofore provided in outboard motors for varying the stern angle thereof, has, to the best of my knowledge, always required that the operation of the outboard motor had to be interrupted in order that any such adjustment could be made. In most such structures it was also found more convenient to make such adjustments when the propeller was swung out of the water.

The novel mounting herein disclosed is provided with means whereby the stern angle may be varied at any time while the boat is in operation by a person sitting within the boat. Thus, if the boat is lightly loaded whereby its front end is likely to ride rather high in the water, the operator may quickly adjust the stern angle to properly adjust the outboard motor with respect to the surface of the water regardless of the angle of the boat in the water. In like manner should the boat be evenly loaded so that it will ride with its bottom substantially parallel to the surface of the water, then the stern angle may be quickly decreased to again properly position the outboard motor with respect to the surface of the water.

To thus quickly vary the stern angle, a rocker 38, preferably in the form of a pair of spaced links 39, is shown mounted upon a shouldered stud 41 having reduced end portions 42 received in apertures provided in the side members 17 and 18 of the stern bracket 16, as best shown in Figure 3. In the drawings I have shown the stud 41 provided with an enlarged central portion 43 between the ends of which and the reduced end portions 42, bearing portions 44 are provided for receiving the links 39 of the rocker 38. By this arrangement, it will be understood by reference to Figure 3, that when the nuts 45 received in threaded engagement with the end portions 42 of the stud 41, are drawn tightly against the adjacent faces of the members 17 and 18 of the stern bracket 16, said members and stud or tie rod 41 will be firmly tied together as a unit. It is to be understood that the bearing portions 44 of the tie rod 41 are a fraction of an inch longer than the thickness of the links 39, whereby they are free to pivot thereon. It is further to be understood that in lieu of the shouldered stud 41, a straight, or unshouldered stud or rod, not shown, having threaded terminals may be utilized by placing thereon a suitable spacing sleeve for retaining the links 39 in spaced relation and which may also provide bearing portions for said links.

The lower ends of the links 39 are operatively connected to a thrust block 43 having a concaved or semi-cylindrical seat 47 adapted to receive the lower end of supporting member 23, as

shown in Figures 2 and 4. The thrust block 46 has a forwardly extending portion 48 bored to receive a rod or bolt 49 provided at each end with a nut 51, as best shown in Figure 4. The lower ends of the links 39 are received in slots 52 provided in the forwardly extending portion 48 of the thrust block 46 and are provided with slots 53, as shown in Figure 2. A small anti-friction roller may, if desired, be provided in each slot 53, and these rollers are bored to receive the rod 49 which provides a pivotal connection between the links 35 and thrust block 46.

Means is provided for constantly retaining the thrust block 46 in position to receive the supporting member 23, regardless of the pivotal movement of the rocker 38. To thus constantly retain the thrust block 46 in proper position, the forwardly extending portion 48 of the thrust block is provided with opposed elongated end portions 54 which are received in arcuately formed slots 55 provided in rearwardly extending portions 56 provided on the lower portions of the members 18 and 19 of the stern bracket 16, as will be understood by reference to Figure 2. The slots 55 cooperate to always retain the thrust member 46 in operative relation to the supporting member 23, and the relatively shorter slots 53 in the lower ends of the links 39 of the rocker 38 permit relative up-and-down movement of the pivot pin 49 therein.

The upper ends of the links 39 of the rocker 38 are connected together by a cross member 57 having its end portions rotatably received in the upper ends of the links 39. An adjusting rod 58 has one end received in threaded engagement with the cross member 57 and its opposite end is rotatably received in a guide or bearing 59, provided in a cross member 61 having its reduced end portions supported in the forwardly and downwardly extending legs 21 of the stern bracket. The rod 58 has an operating handle 62 whereby it may be conveniently rotated to oscillate the rocker 38 about the axis of the tie rod 41, thereby to rearwardly swing the supporting member 23 in a direction to increase the stern angle, indicated in Figure 1. When the rod 58 is rotated in a direction to cause the thrust block 46 to move in a direction toward the boat, the propelling action of the propeller in the water will swing the lower end of the supporting member 23 into firm engagement with the seat provided in the thrust block 46.

In Figures 2 and 7 it will be noted that the spacing between the pivot pin 41 of the rocker 38 and the pivot pin 49 connecting the lower ends of the links 39 to the thrust block 46 is relatively greater than the spacing between the pivot 41 and the pivot member 57, connecting the upper ends of the links to the adjusting rod 58. In some motors it may be found desirable to vary the spacing between the pivots 57, 41 and 49 from that shown in the drawings, but for general use, the spacing shown has been found very satisfactory. The spacing between said pivots may, however, be varied to suit conditions.

In the operation of the novel mounting herein disclosed, the tubular supporting member 23 is attached to the outboard motor by removing the rear cap or section 24 of the supporting member from the front half or section 25 thereof, whereby the tubular shaft housing 13 of the outboard motor may be received between the sections 24 and 25. When the tubular shaft housing 13 is thus received in the supporting member 23, the propeller may readily be swung upwardly out of the water by simply grasping the motor or upper end of the outboard motor and pulling it forwardly, as indicated by the full and dotted lines in Figure 1. The friction disks or elements 37 provided in connection with the pivot pin 35 provide sufficient friction to hold the motor at any particular angle, when manually tilted forwardly, as indicated in Figure 1.

When the outboard motor is thus manually tilted forwardly without manipulation of the operator 62, the thrust block 46 will remain in fixed position with respect to the rearwardly extending end portions 56 of the side members 17 and 18 of the stern bracket, it being understood that when the outboard motor is operating, the thrust of the propeller against the water will hold the lower end of the tubular supporting member 23 in close contact with the thrust block 46, as is customary in devices of this type.

The mounting is so constructed that the outboard motor may be freely rotated about the axis of the drive shaft 7. To propel the boat in a rearward direction, an upstanding lug 63 is provided on the rear side of the collar or cap 11 provided at the upper end of the intermediate housing 10 of the propeller gear housing 9, as best shown in Figures 1 and 2. When the outboard motor is rotated half a revolution from the position shown in Figure 1, about the axis of the drive shaft 7, the upstanding lug 63 will assume a position forwardly of the thrust block 46, as indicated in dotted lines in Figure 2. When so positioned and the propeller is operated, the lug 63 will engage the front side of the thrust member 46 whereby the propeller is retained in operative position in the water to thereby reverse the traveling movement of the boat.

In the operation of an outboard motor it sometimes becomes necessary to tilt the propeller out of the water to remove weeds and other foreign matter which may have become entangled therewith, and also to replace the shear pin in the event that it should become sheared as a result of the propeller striking an obstruction in the water.

In the mounting herein disclosed the propeller may be quickly swung to a position over the boat by first swinging it upwardly about the axis of the pivot pin 35 to substantially a horizontal position, as indicated in dotted lines in Figure 1. When the motor is thus positioned the pivot pin 32 will be vertically disposed and the motor may then be swung about the axis of the pivot pin 32 to bring the propeller into a position over the boat.

Means is provided for holding the outboard motor in a relatively fixed position with respect to the swivel bracket 31, and is shown comprising a spring-actuated plunger 64, preferably mounted in a sleeve 60 fitted into an aperture 65 provided in the swivel bracket 31. A socket 66 is provided in the wall 67 of the arm 28 of the supporting member 23 adapted to receive the plunger 64, when the outboard motor is in its operating position, shown in Figures 1 and 2. A push button 68 has a stem 69 slidably mounted in a guide aperture axially aligned with the socket 66, which socket is axially aligned with the plunger 64, when the outboard motor is in operating position. A head 71 is provided on the inner end of the stem 69 and is axially movable in the bottom of the socket 66, as will be understood by reference to Figure 8. When the plunger 64 is in locking engagement with the socket 66, it holds the push

button 68 in extended position, as shown in Figure 8.

When the outboard motor is swung upwardly to the position shown in Figure 7, and the propeller is to be swung inwardly over the boat, the plunger 64 is disengaged from the socket 66 by depressing the push button 68 to the position shown in Figure 9, wherein it will be noted that the plunger is completely out of the socket 66 whereby the supporting member 23 which carries the outboard motor may readily be rotated about the axis *a—a* of the pivot pin 32, which then is vertically disposed as shown in Figure 7. If desired, a second socket, not shown, may be provided in the face of the wall portion 67 adapted to receive the plunger 64 and thereby lock the supporting member 23 against rotation about the pivot pin 32, when the propeller is positioned inwardly over the boat as above stated, and as indicated in dotted lines in Figure 7. In actual practice, however, I have found it unnecessary to provide a second socket for thus locking the outboard motor with the propeller positioned over the boat.

Another feature of the invention resides in the location of the push button 68 which, it will be noted by reference to Figures 2 and 8, is back of the swivel bracket 31 whereby it cannot accidently be actuated to permit relative rotation of the supporting member 23 about the axis of the pivot pin 32, should the propeller housing strike an obstruction and rearwardly swing the tubular bearing portion of the supporting member 23 out of engagement with the thrust block 46.

Aligned notches 72 and 73 are provided in the lower edges of the adjacent wall portions of the arm 28 and swivel bracket 31 adapted to receive the adjusting rod 58, when the outboard motor is positioned as shown in Figures 1 and 2.

In Figure 11 there is shown a modified construction wherein a shouldered stud 74 provides the pivot between the arm 28 of the supporting member 23 and the swivel bracket 31. A nut 75 is received in threaded engagement with the threaded end portion of the stud 74 and may be locked against relative rotation on the stud by a suitable cotter pin 76. A friction washer 77 is provided between the nut 75 and the adjacent face of the swivel bracket 31 whereby the nut 75 may be adjusted to provide the desired friction between the arm 28 and swivel bracket 31 to permit relative turning movement of the arm 28, when it is desired to swing the propeller inwardly over the boat.

A spring-actuated plunger 78 is shown mounted in the arm 28 and has a finger button 79 projecting outwardly through a slot 81 in the upper portion of the arm 28 whereby an operator within the boat may readily actuate the plunger 78 to release the arm 28 for turning movement about the axis *a—a* of the pivot 74. Other means, not shown, may be provided for locking the arm 28 against relative rotation about the stud 74, without departing from the scope of the invention.

In the operation of an outboard motor supported on a boat by the novel mounting means herein disclosed, it will be noted by reference to Figures 1 and 2, that the stern angle may readily and conveniently be varied by the operator from within the boat at any time, when such adjustment becomes necessary, and without interrupting the operation of the outboard motor. To thus adjust the stern angle, the operator

simply rotates the operating member 62 which, when rotated in one direction, will increase the stern angle, and when rotated in the opposite direction, will decrease the stern angle.

The outboard motor it will be noted is free to swing rearwardly from the full to the dotted line position shown in Figure 1, whereby should the propeller housing 9 encounter an obstruction in the water, said housing may readily pass over the obstruction without being damaged thereby.

Should the propeller, however, strike the obstruction and break or shear the shear pin, the outboard motor may be swung upwardly to the dotted line position shown in Figure 1, after which the operator depresses the push button 68 and frees the arm 28 for swinging movement about the axis of the pivot pin 32, which then is vertically disposed as shown in Figure 7. When the propeller is positioned over the boat, weeds and other foreign matter which may have become entangled therewith may readily and conveniently be removed therefrom, and the shear pin may also be replaced, if necessary.

From the foregoing it will be noted that maximum efficiency of the outboard motor may be had at all times by maintaining the outboard motor in substantially the vertical position shown in Figure 1, which, in most outboard motors, is necessary to obtain maximum efficiency and economy of operation of the carburetor or fuel supply means, and also to obtain the greatest propelling effect of the propeller.

For example, when the boat is used for trolling, the outboard motor is usually operated at minimum speed whereby the longitudinal axis of the boat may be substantially parallel to the surface of the water. In such cases, the stern angle may be at its minimum as shown, for example, in Figure 1. When the speed of the boat is increased, the front end of the boat may ride considerably higher in the water than when used for trolling whereby the stern angle of the boat must be increased to maintain the outboard motor at its most efficient operating angle with respect to the surface of the water. This, as hereinbefore stated, may be quickly accomplished while the boat is in operation by simply manipulating the control member 62. In like manner, if the load is not uniformly distributed in the boat, it may be necessary to vary the stern angle to compensate for variations in the angular relation between the longitudinal axis of the boat and the surface of the water.

It will be apparent to those skilled in the art that I have accomplished at least the principal objects of my invention, and it will also be apparent to those skilled in the art that the embodiments herein described may be variously changed and modified without departing from the spirit of the invention, and that the invention is capable of uses and has advantages not herein specifically described; hence it will be appreciated that the herein disclosed embodiments are illustrative only, and that my invention is not limited thereto.

I claim as my invention:

1. A mounting for outboard motors comprising a stern bracket, a supporting member pivoted on said bracket and adapted to receive and support an outboard motor, a rocker pivoted on the stern bracket at a point below said first mentioned pivot and located rearwardly of the boat transom, one end of said rocker being operatively connected to said supporting member, and a horizontal and forwardly extending control ele-

ment carried by the stern bracket and connected to the opposite end of the rocker whereby when the control element is manipulated to impart pivotal movement to the rocker, pivotal movement is also imparted to the supporting member, whereby the stern angle of the outboard motor may be quickly varied without interrupting the operation of the outboard motor.

2. A mounting for outboard motors comprising a stern bracket, means mounting the outboard motor on said bracket for swinging movement about a horizontal axis disposed transversely of the boat, a rocker pivoted on the stern bracket and having one end operatively connected to said mounting means below said horizontal axis and being located rearwardly of the boat transom, and a horizontal and forwardly extending control element carried by the stern bracket and connected to the opposite end of the rocker whereby when the control element is manipulated, the rocker is actuated to vary the stern angle of the outboard motor the operative connection between the rocker and said mounting means permitting the outboard motor to be swung to a horizontal position out of the water.

3. A mounting for outboard motors comprising a stern bracket, means mounting the outboard motor on said bracket for swinging movement about an axis disposed transversely of the boat, a rocker pivoted on the stern bracket and having one end operatively connected to said mounting means below said pivot and located rearwardly of the boat transom, and a horizontal and forwardly extending control element carried by the stern bracket and connected to the opposite end of the rocker whereby when the control element is manipulated, the rocker is actuated to vary the stern angle of the outboard motor, said control element being mounted forwardly of the boat transom for convenient manipulation from within the boat.

4. A mounting for outboard motors comprising a stern bracket, a supporting member having its upper portion connected to the stern bracket by a horizontally disposed pivot arranged transversely of the boat, said member having an upright tubular portion rotatably supporting an outboard motor, a rocker pivoted on the stern bracket and having one end operatively connected to the lower portion of the supporting member, and a horizontally disposed control element carried by the stern bracket and having one end connected to the upper end of the rocker and its opposite end extending forwardly into the boat whereby it may be conveniently operated by an individual seated within the boat, and whereby the stern angle of the outboard motor may be varied without interrupting the operation of the outboard motor.

5. A mounting for outboard motors comprising a stern bracket having means for securing it to the transom of a boat, a supporting member having its upper end pivotally connected to the upper portion of the stern bracket by a horizontally disposed pivot arranged transversely of the boat, said member having an upright tubular portion rotatably supporting and outboard motor, guide means in the lower portion of the stern bracket, a thrust block guidingly supported in said guide means and adapted to be engaged by the lower portion of said supporting member to maintain the stern angle between the outboard motor and the boat, a rocker pivoted on the stern bracket and having its lower end pivotally connected to the thrust block, and a control element mounted for rotary movement in the upper portion of the stern bracket and having a connection with the upper end of the rocker, whereby manipulation of the control element will vary the stern angle.

6. In a mounting for outboard motors, a stern bracket having means for securing it in fixed position on a boat transom, a supporting member pivotally mounted on the stern bracket and adapted to receive the usual shaft housing of an outboard motor and permitting complete rotation of the outboard motor relative thereto, an operating mechanism carried by the stern bracket and comprising a thrust member adapted to be engaged by the supporting member to limit relative forward swinging movement of the outboard motor, when the outboard motor is in operative position to propel the boat forwardly, means carried by the outboard motor for locking the supporting member to the thrust member whereby the outboard motor may be positioned to propel the boat in a rearward direction, and means whereby manipulation of said operating mechanism will relatively move the thrust member to vary the stern angle of the outboard motor, when the supporting member is engaged with the thrust member.

7. In a mounting for outboard motors, a stern bracket having means for securing it in fixed position on a boat transom, a supporting member pivotally mounted on the stern bracket and having a tubular depending portion adapted to receive the usual shaft housing of an outboard motor and permitting complete rotation of the outboard motor relative thereto, an operating mechanism carried by the stern bracket and comprising a thrust member adapted to be engaged by the tubular lower portion of the supporting member, thereby to limit relative forward swinging movement of the outboard motor, when the outboard motor is in operative position to propel the boat forwardly, a hook-like element carried by the outboard motor for locking the supporting member to the thrust member whereby the outboard motor may be positioned to propel the boat in a rearward direction, said locking means permitting free turning movement of the outboard motor to guide the boat on its course, and means whereby manipulation of said operating mechanism will relatively move the thrust member to vary the stern angle of the outboard motor, when the supporting member is engaged with the thrust member.

8. In a mounting for outboard motors, a stern bracket having means for securing it in fixed position to a boat transom, a swivel bracket mounted for swinging about a pivot carried by the stern bracket, said pivot having its axis disposed transversely of the boat, a supporting member, a pivot mounting said supporting member on the swivel bracket and having its axis disposed at right angles to said first mentioned pivot, said supporting member being adapted to receive the usual shaft housing of an outboard motor and permitting complete rotation thereof, said pivots cooperating to permit the outboard motor to be swung to a position over the boat transom with its propeller end swung forwardly, an operating mechanism carried by the stern bracket and comprising a thrust member adapted to be engaged by said supporting member when the outboard motor is in an operative position to propel the boat either forwardly or rearwardly, means carried by the outboard motor adapted to interlock with said thrust member to retain the outboard

motor in position to propel the boat in a rearwardly direction, and means whereby said operating mechanism may be manipulated to vary the stern angle of the outboard motor regardless of its position when engaged with the thrust member.

9. In a mounting for outboard motors, a stern bracket having means for securing it in fixed position to a boat transom, a swivel bracket mounted on a pivot secured in the stern bracket and disposed transversely of the boat, a supporting member mounted on a pivot carried by the swivel bracket and disposed lengthwise of the boat, said supporting member having a tubular bearing portion adapted to receive the usual shaft housing of an outboard motor and permitting complete rotation of the shaft housing therein to guide the boat in its course, said transversely disposed pivot permitting the outboard motor to be swung to a horizontal position over the boat transom, after which the outboard motor may be rotated about the vertical axis of the other of said pivots, thereby to position the

propeller over the boat, and a mechanism for adjusting the stern angle of the outboard motor while the latter is in operation, said mechanism also including means for locking the outboard motor against relative rearward swinging movement when the outboard motor is positioned to propel the boat rearwardly.

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