Sept. 4, 1962 H. R. SCIVALLY 3,052,204

ELECTRIC MOTOR-PROPELLER UNIT MOUNTING AND CONTROL MEANS

Filed Nov. 7, 1960 2 Sheets-Sheet 1

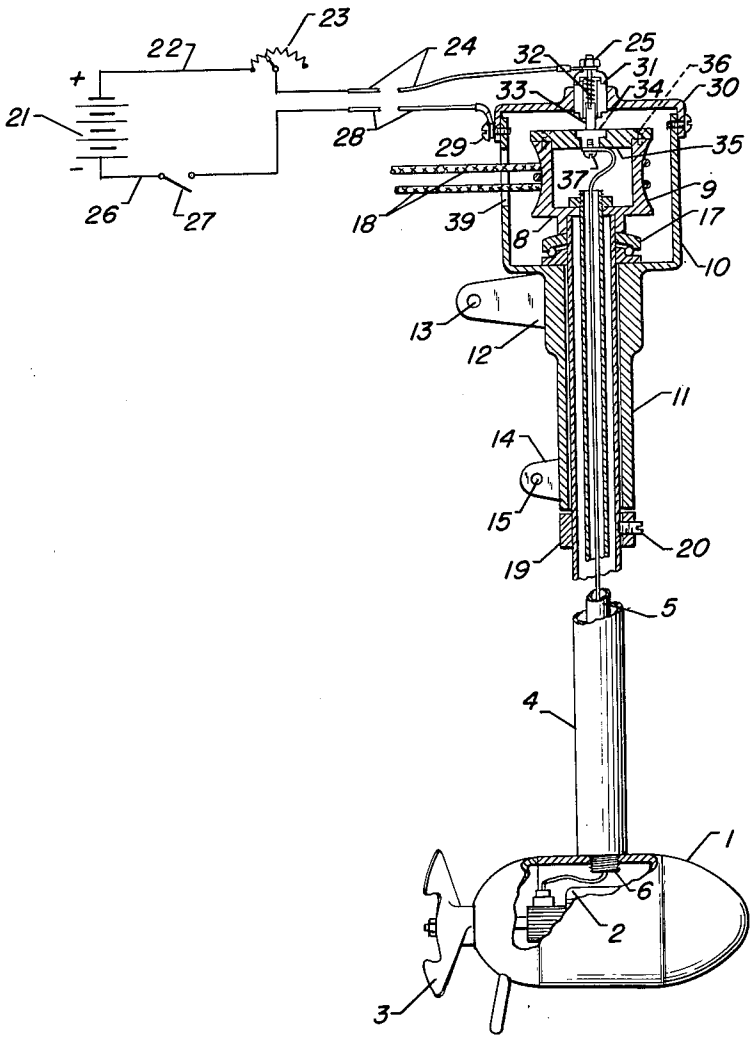



Figure 1

INVENTOR:
Herschell R Scivally

BY:
Philip T. Liggett
ATTORNEY

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Figure 2

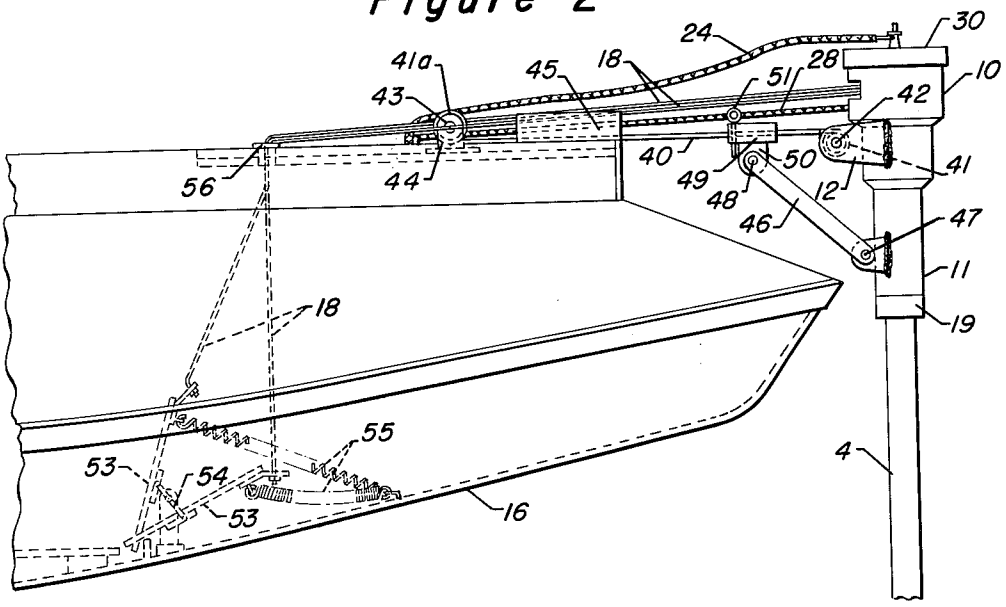
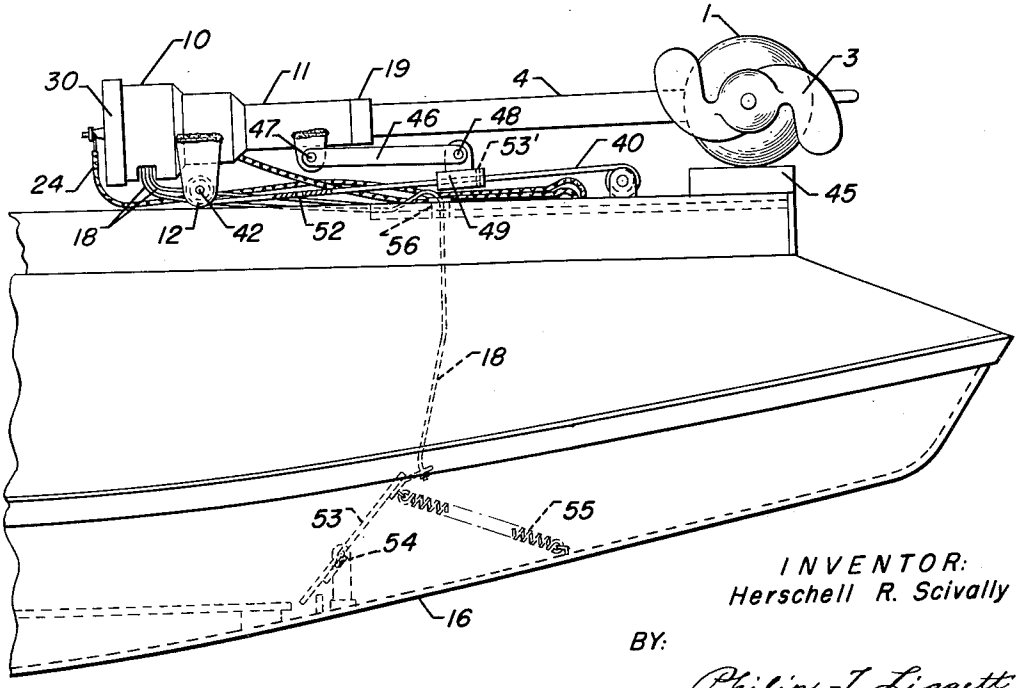



Figure 3




INVENTOR:
Herschell R. Scivally

BY:

Philip T. Liggett
ATTORNEY.

United States Patent Office

3,052,204

Patented Sept. 4, 1962



3,052,204

# ELECTRIC MOTOR-PROPELLER UNIT MOUNTING AND CONTROL MEANS

Herschell R. Scivally, 319 Airport Drive, Shreveport, La.

Filed Nov. 7, 1960, Ser. No. 67,807

3 Claims. (Cl. 115—18)

The present invention relates to improved means for mounting and controlling an electric motor-propeller unit in connection with a small boat. The improved attachment means and the control arrangement that is provided is particularly useful with small fishing boats in that it permits good landing and fishing maneuverability.

At the present time, most small fishing boats are equipped with outboard motors which are gasoline powered, with such motors and their connecting propellers being mounted at the rear of a boat and thus regulated and operated therefrom. It is generally agreed that gasoline powered outboard motors are noisy and are difficult to operate and maneuver satisfactorily at all ranges of speeds, such that a lone fisherman in a boat finds it difficult to effectively operate the boat and to fish simultaneously.

It is a principal object of the present invention to provide an improved electric motor-propeller unit mounting and system which attains easy handling by a single person within a small boat.

It is also a specific object of the invention to provide a motor suspension and control means which is of a compact, simplified construction permitting easy steering and control.

It is still another object of the invention to provide a folding cantilevered bracket arrangement particularly adapted to permit the easy lifting of the motor propeller unit to a horizontal rest position on the boat, or alternatively, to permit the lowering of the unit into the water.

It should also be pointed out that the present construction and arrangement provides an advantageous feature in that it permits a mounting and suspension from the prow of the boat whereby a single person in the boat may always face forward while fishing and operating the unit. The present apparatus may be mounted from the rear or side portion of a boat, however, greater maneuverability is generally realized from the front mounting position.

In the present apparatus, the construction embodies a water-tight motor housing so that the motor-propeller unit is below the surface of the water when in operation and has an upper steering drum and control section which is connective to the lower motor housing by way of a rotatable hollow tube member. The steering drum at the top of the apparatus utilizes a cable wrapped therearound such that 180° of turn is accomplished in either direction. Preferably, the cable ends extend through suitable pulley means mounted on the boat and connect to spring-loaded foot pedal steering controls such that foot steering can be carried out and leave the boatman free to use both hands at all times. However, if desired, the steering cable ends may connect to a hand wheel or other leverage means which the operator desires to use in effecting the rotation of the steering drum of the apparatus and the maneuvering of the boat.

Briefly, the improved apparatus arrangement for attaching and controlling an electric motor-propeller unit in connection with a small boat, comprises in combination, a folding cantilevered support means attaching to and extending from an end of the boat to a control housing for the motor-propeller unit, the control housing having an upper chamber section and a lower sleeve section, the lower sleeve section encasing a rotatable tube extending



therethrough and connective between a depending motor housing for the motor-propeller unit and a steering drum positioned within the chamber section, a flexible cable passing through an aperture in the chamber section and passing around said steering drum therein, with said cable ends connecting to steering means mounted within the boat whereby the rotatable tube and motor unit can be turned in either direction to direct the course of the boat, a pair of wire leads from an electric power source to the control housing with one wire being grounded thereto and the other connecting to a terminal of an insulated brush holder in the top center portion of the chamber section, a brush in said brush holder, a brush contact plate in an insulated mounting in the top center portion of the steering drum, with said contact plate maintained in alignment with and in contact with said brush maintained within said brush holder providing thereby electric current flow thereto, a wire lead from the brush contact plate at the top of the steering drum extending through the interior of said rotatable tube to the inside of said motor housing and to the electric motor therein, adjustable switching means in said wiring from the power source for the adjustment of the speed of the motor and its connecting propeller blade.

A preferred embodiment of the apparatus arrangement utilizes a hollow steering drum portion within the upper chamber section in the control housing and has a removable top cover portion such that there is access to the interior of the steering drum. This permits the ready connection of the enclosed wiring extending from the brush contact plate to the motor at the bottom of the rotatable connecting tube. A preferred arrangement also utilizes a separate internal tubular member extending through the inside of the rotatable tube member to terminate at the interior of the motor housing and the interior of the steering drum. This inner tube is provided with threaded ends and suitable cap nuts which permit a clamping at one end to the motor housing and clamping at the other end to the inside of the steering drum in a manner having the outer rotatable tube member clamped in compression between the top of the motor housing and the lower portion of the steering drum, all of which provides an easy assembly for the control unit.

It is still another advantageous feature of the improved construction and arrangement to utilize a folding cantilever type of support for holding the control section and the motor-propeller unit in a substantially vertical position from the end of the boat such that the depending motor-propeller unit is under the surface of the water when in operation, while alternatively, there is provided a means of folding the support bracket together with the control housing and motor-propeller unit back onto the boat in a horizontal rest position when the motor unit is not in use.

Other advantageous features and the construction and arrangement of one embodiment of the control and support assembly will be more apparent upon reference to the accompanying drawing and the following description thereof.

FIGURE 1 of the drawing is a sectional elevational view showing the attachment of a motor-propeller unit with the control apparatus.

FIGURE 2 of the drawing is a diagrammatic elevational view showing the cantilever support means and the attachment of the steering cable ends to foot controls in the boat.

FIGURE 3 of the drawing is a diagrammatic elevational view showing the motor-propeller unit and the cantilever support in a folded position, such that the unit rests horizontally on the top of the boat.

Referring now particularly to FIGURE 1 of the draw-

ing, there is shown a motor housing 1 which is adapted to encase in a water-tight manner a motor 2 and a connecting propeller blade 3. The housing 1 is connected to a rotatable tube 4 by means of an internal smaller diameter hollow tube 5 having a threaded lower end and a threaded upper end. The lower end of the internal tube 5 engages a tapped opening 6 in the housing 1, while at the upper end, an upper nut 8 is tightened against the inside bottom portion of a hollow steering drum 9 so as to press the latter against the upper end of the tube 4. Thus, the rotatable tube 4 is effectively clamped as a tight strut-like member between the housing 1 and steering drum 9 whereby rotation of the latter will effect a similar rotation of the housing 1 and of the motor-propeller unit, while at the same time the latter is actually suspended from the upper control apparatus by the inner tube 5.

Encompassing the upper portion of the tubular members 4 and 5 is a control housing having an upper enlarged chamber section 10 and a lower sleeve section 11. The latter has an upper pair of spaced lug members 12, with holes 13, and lower lug member 14 having a hole 15. As is subsequently described in connection with FIGURE 2 of the drawing, the lug members 12 and 14 provide means for connecting the control housing and motor-propeller unit to support means extending from a boat 16. Between the bottom portion of the steering drum 9 and the inside bottom portion of the chamber section 10 is a suitable thrust bearing 17, indicated diagrammatically as being of a roller bearing type, such that the drum member 9 and the attached rotatable tube member 4 will readily rotate within sleeve 11 by pulling of a cable member 18 wrapped around steering drum 9 and extending through an opening 39 in the side of the chamber section 10 to separate steering means. The cable 18 is of the type which is flexible and will provide frictional engagement with the outside periphery of the steering drum 9 whereby pulling one end or the other of the cable 18 will cause the rotation of the drum 9 and of the connecting tube 4. Although not shown, a preferred construction utilizes a clamping means to hold the cable in a non-slipping position around the drum 9, as for example, a small cable clamp in turn held by a small cap screw threaded into a tapped hole in the wall of the drum. Tubular member 4 and the drum 9 may rotate freely in either direction in accordance with the pulling of the cable 18, however, the diameter of the drum 9 is correlated with the extent of the movement of steering means within the boat 16 so as to provide movement of the cable effecting at least 180° of rotation of the drum 9 and tube 4 in either direction such that the motor-propeller unit is capable of in turn rotating at least 180° and effecting a backing-up of the boat where it is desired to do so in maneuvering it. A collar member 19 having a set screw 20 is positioned around the tube 4 just below the end of the sleeve section 11 such that the tube and the steering drum assembly within the upper chamber section 10 is maintained in proper vertical positioning after assembly of all of the parts.

Electrical power for the motor-propeller unit is provided, as is shown diagrammatically, by a battery 21 having a lead wire 22 from one terminal connecting with a rheostat 23 and wire 24 which in turn connects with a brush terminal 25, while a lead wire 26 from the other terminal of the battery 21 connects with a switch 27 and the wire 28 which in turn connects with a terminal that is grounded to the control housing 29. At the top of the control housing, over the chamber section 10, is a removable cap member 30 which is provided with an insulated brush holder 31 that in turn encases a spring 32 and a brush 33. The latter engages a brass contact plate 34 which is within the center portion of an insulating member 35 at the top of the steering drum. In the present embodiment, the plate 35 provides the entire top cover section to the interior of the steering drum 9 and is removably attached thereto by suitable cap screws 36. The underside of the contact plate 34 is provided with a terminal 37 having attached thereto an electrical lead wire 38 extending through the inside of the tubular member 5 to the interior of the motor housing 1 and to the brush section of the motor 2. Thus, by virtue of the grounded wire 28 from the battery 21 there is a completed circuit to the electrical motor 2 and the motor speed is adjustable by means of operating the rheostat 23 to a desired position. The switch 27 in the circuit, of course, provides means for completely turning on or off the electrical power source to the motor.

Referring now more particularly to FIGURES 2 and 3, there is shown the construction and arrangement of a folding cantilever support means which permits holding the motor-propeller unit vertically within the water for operating the boat, or alternatively, for raising the motor onto the boat such that the assembly is in a substantially horizontal position when not in use. A relatively stiff cantilever member 40 has an end bushing or sleeve 41 adapted to hold a bolt or pin member 42 which can in turn extend through the holes 13 in the pair of lug members 12 such that there is a resulting hinged connection between the cantilever member 40 of the control housing sleeve 11. Similarly, the other end of the cantilever member 40 is provided with a sleeve or bushing 41*a* adapted to receive a bolt or pin member 43 which extends through a pair of spaced lug members 44 attached to the top of the boat 16, whereby there is also provided a hinged connection with the boat. The cantilever member 40 necessarily requires a substantially horizontal rest surface or rest member 45 mounted on the top of the boat 16 such that the member may extend from the pin member 43 outwardly over the end of the boat 16 in the manner of a true cantilever beam. One or more bracket members 46, having holes in their respective ends, connect by means of a pin 47 to the lug 14 on the sleeve 11, while the other ends connect by means of a pin 48 to a slide member 49. The latter has a lug 50 with a hole adapted to receive the pin 48 and connect the bracket 46 to the sleeve. The sleeve is shaped and adapted to encase the cantilever member 40 such that it is freely slidable along the length of the latter when the motor-propeller unit is being moved to or from the vertical position. A pin member 51 is utilized to pass through a hole 53′ in the sleeve member 49 and through a hole 52 in the cantilever member 40 such that there is at least one fixed position for the slide member 49 with respect to the cantilever member 40 to hold the rotatable tube 4 and the motor-propeller unit at the desired vertical position for use. When it is desired to raise the motor-propeller unit out of the water, the pin member 51 is pulled out of the slide member 41 and out of the hole 52 within the cantilever member 40, then by lifting of the control housing and the motor-propeller unit upwardly and inwardly, the hinged connections of the cantilever member 40, at its end pins 42 and 43, permit the 180° arcing of the cantilever member 40 to come to rest on the upper deck of the boat 16, as is best shown in FIGURE 3 of the drawing. The hinged connections of the bracket member 46 with the sleeve member 11 and with the slide member 49 also permit the bracket member 46 to fold over and to come to a rest at a substantially horizontal position paralleling the rotatable tube of the control section and the motor-propeller unit.

Reference to FIGURE 2 of the drawing also shows diagrammatically one embodiment of a steering means within the boat 16 by the provision of foot pedals 53 which connect with the ends of the cable 18. Preferably, a pair of spaced pedals 53 are connected to a crank-arm 54 in the bottom of the boat 16 to work against spring means 55 and provide an up and down movement to the ends of the cable 18. The springs 55 are attached to the pedals 53 such that when one pedal is pushed down the other pedal raises and extends its attached spring 55. Thus, when the pressure is released from the

pushed down pedal, the stretched spring **55** will pull back the raised pedal to a neutral position and at the same time return the motor unit to a straight forward position. As previously noted, a preferable steering arrangement provides movement for each of the cable ends such that the engagement of the cable **18** around the steering drum **9** will cause a rotation of the latter for at least 180°, whereby the motor-propeller unit can in turn be rotated through at least 180° of arc to permit the turning of the boat, or the backing up of the boat, where such is desired. The cable **18** is indicated diagrammatically as passing through suitable slide pulleys **56** on the boat deck, however, other suitable pulley arrangements may be utilized in connecting the ends of the cable **18** with the desired steering means inside of the boat **16**.

While the present arrangement and construction indicates the supporting means and the control arrangement at the front end of the boat **16**, it should be noted that the same apparatus may well be utilized at the rear of the boat or alongside thereof, inasmuch as the proper positioning of the rotatable tube **4** and the depending motor-propeller unit can be directed through the steering apparatus to effect the desired maneuverability of the boat from any position therearound. A preferred arrangement, of course, has the assembly at the prow of the boat such that a single boatman may face forward and can maneuver with a minimum of difficulty.

I claim as my invention:

1. In apparatus for the attachment and control of an electric motor-propeller unit with a small boat and having such unit constructed and arranged to connect with an elongated control housing having an upper chamber section with steering control means therein and a lower sleeve section encasing a rotatable tube and electrical wire means, the improvement which comprises, providing a folding cantilevered support means to hold said unit in both vertical and horizontal positions with respect to said boat, with said support means having a single cantilever member hingedly connecting to a substantially horizontal portion of said boat at one end thereof, whereby such member cantilevers over the edge of said horizontal portion of said boat, a hinged connection at the other end of said cantilever member attached to the said upper chamber section of said housing, a bracket member having one end hingedly connecting to said lower sleeve section of said housing at a spaced point below the connection of said cantilever member and the other end of said bracket member hingedly connecting to a slide member on said cantilever member, with said slide member slideably engaging the latter and permitting said cantilever member to fold over in a 180° arc, said slide member and said connecting bracket member being movable along said cantilever member as said unit is moved with respect to said boat, and locking means between said slide member and said cantilever member holding the slide member and bracket member in at least one fixed knee-brace-like position.



2. The apparatus of claim 1 further characterized in that said locking means comprises a removable pin member adapted to fit in a hole provided through said slide member and an opposing hole provided through said cantilever member, whereby said slide member holds said bracket member in a fixed diagonal bracing position under said cantilever member when the latter is supporting the motor-propeller unit over the edge of the boat.

3. Apparatus for the attachment and control of an electric motor and propeller unit with a small boat, which comprises in combination, a folding cantilever support means including a cantilever member with hinged connecting means at each end attaching to and extending from the end of said boat to a control housing for said motor-propeller unit and a bracket member hingedly connecting between said cantilever member and the control housing, said housing having an upper chamber section and a lower sleeve section, said lower sleeve section encasing a rotatable tube extending therethrough and connecting a depending motor housing with a hollow steering drum positioned within said chamber section, said motor housing being water tight and holding said motor-propeller unit, bearing means within the lower portion of said chamber section around said tube and below said steering drum permitting easy rotation of said tube connecting to the said motor housing, a steering cable passing through an aperture in said chamber section and engaged with said steering drum therein, the ends of said cable connecting to movable steering means within said boat whereby said rotatable tube and motor housing can be turned in either direction responsive to the pulling of one of the cable ends to direct the course of said boat, a pair of wire leads from an electric power source to said control housing with one wire being grounded thereto and the other connecting to a terminal of an insulated brush holder in the top center portion of a removable cap to said chamber section, a brush contact plate in an insulated mounting in the center portion of a removable top on said steering drum, said contact plate in alignment with and in contact with a brush maintained in said brush holder providing thereby an electric current flow thereto, a wire lead from said brush contact plate in the top of said steering drum extending through the hollow portion of said drum and through said rotatable tube to the inside of said motor housing and to the electric motor therein, and adjustable switching means in said wiring leads from said power source for adjustment of the speed of said motor.

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