Sept. 3, 1940. H. G. GENTRY 2,213,520

COMBINATION STEERING AND PROPULSION SYSTEM

Filed Oct. 26, 1938

Fig. 1.

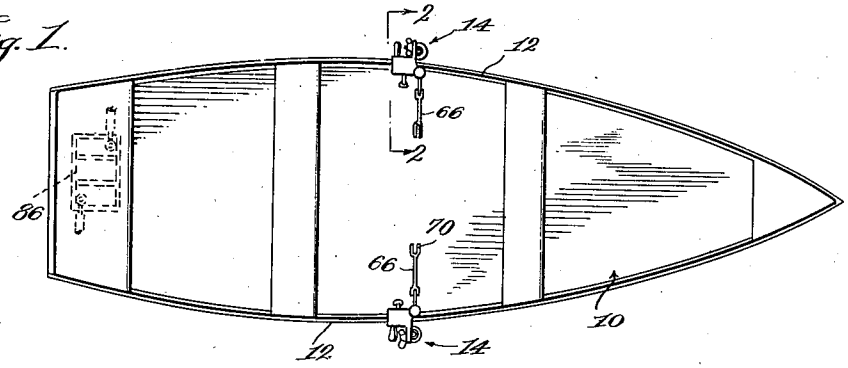


Fig. 2

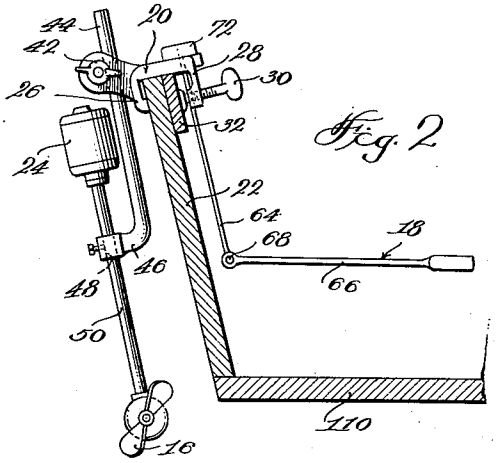


Fig. 3.

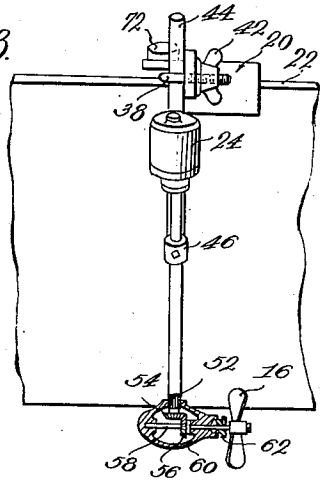
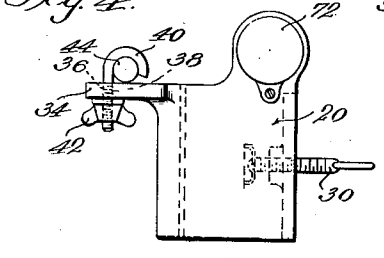


Fig. 4.



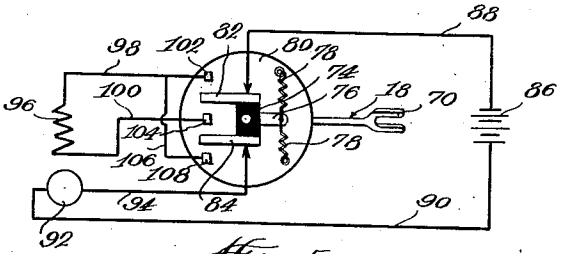


Fig. 5

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COMBINATION STEERING AND PROPULSION SYSTEM

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3 Claims. (Cl. 115—38)

My invention relates to boats, and has among its objects and advantages the provision of an improved combination motor operated steering and propulsion system.

An object of my invention is to provide a motor operated system of propulsion and steering facilities which may be mounted on a small boat of conventional design in which novel means are incorporated to facilitate control of the boat by the feet of the operator so as to render his hands free for other purposes, as when casting, fly fishing, and slow trawling.

More specifically, I mount an electric outboard motor driven propeller on each side of the boat and provide each motor with a foot operated switch mechanism so that each motor may be individually controlled by one foot for propelling and steering purposes. For forward or rearward propulsion, the two motors are operated simultaneously. Each motor is of the reversible type and is provided with a foot actuated switch, which includes a forward, reverse, and neutral position.

In steering, either motor may be individually operated, or one motor may be operated in a forward direction and the other motor reversed, as when making sharp turns. The motors are operated from an electric storage battery carried by the boat. I provide means to facilitate quick and easy attachment of the electric motors with the side of the boat, which means are so devised as to permit reversal thereof for positioning the motors inside the boat when not in use for any considerable period of time.

In the accompanying drawing:

Figure 1 is a top end view of a small boat illustrating my invention applied thereto;

Figure 2 is an enlarged sectional view along the line 2—2 of Figure 1;

Figure 3 is a side elevational view of a portion of one of the boat sides, illustrating one of the motor units;

Figure 4 is a plan view of one of the clamps employed for attaching the associated motor to the boat side; and

Figure 5 is a diagrammatic view of the electric circuit associated with one of the motors and the switch for controlling the operation of that electric motor.

In the embodiment selected to illustrate my invention, I make use of a small boat 10 to the sides 12 of which I mount motor driven propulsion units 14. Each unit includes a propeller 16 and a foot control 18. Units 14 are identical in construction so that the description of one will apply to both.

In Figures 2 and 3, a clamp 20 is secured to the boat side 22 for suporting the reversible outboard motor 24 which drives the associated propeller 16. Clamp 20 includes a flange 26 arranged to engage the outer face of the side 22 and a flange 28 which carries a clamp screw 30 arranged to be turned down against the inner face or reinforcing timber 32 of the side 22. Thus tightening of the screw 30 will effectively secure the clamp 20 to the boat side 22.

Clamp 20 includes a laterally projecting ear 34 having an opening 36 for loosely receiving the bolt 38 provided with a hook 40. Bolt 38 is provided with a wing nut 42 for drawing the hook 40 upon the shaft 44 which extends vertically of the boat side 22. Hook 40 draws the shaft 44 against the ear 34 so as to make the shaft secure. The lower end of the shaft 44 is provided with a right angular bend 46 which is bored at 48 to receive the tubular housing 50 which supports the motor 24, in addition to constituting a housing for a drive shaft 52, see Figure 3.

A bevel gear 54 is secured to the shaft 52 and is arranged in mesh with a bevel gear 56 secured to a shaft 58, to the external end of which the propeller 16 is secured. Gears 54 and 56, together with the greater run of the shaft 58, are enclosed in a housing 60 provided with a conventional stuffing box 62 to render the housing water tight. It will thus be seen that rotation of the shaft 52 through the medium of the motor 24 will impart rotation to the propeller 16.

Foot controls 18 each includes a rotatable shaft 64 connected at its lower end with a foot shaft 66 through the medium of a bolted joint 68. The outer end of the foot shaft 66 is bifurcated at 70 for the reception of the toe of the foot so that the shaft 64 may be rotated. The upper end of the shaft 64 extends into a switch housing 72 and is connected with an insulated block 74, see Figure 5. Block 74 is connected with an arm 76 to which I connect tension springs 78, which springs are connected at their outer ends with a stationary support 80. Springs 78 hold the arm 76 in the normal position of Figure 5. Contact arms 82 and 84 are connected with the block 74.

The storage battery 86 is connected with a wire 88 which leads to the contact arm 82. The wire 90 is connected with the source battery 86 and leads to the motor 92. The wire 94 leads from the motor 92 to the switch arm 84. The field 96 of the reversing motor includes wires 98 and 100, respectively, connected with terminals 102 and

104 arranged to be electrically connected with the switch arms 82 and 84, respectively. A wire 106 connects the wire 98 with a third terminal 108 arranged to be engaged by the contact arm 84. Contact arms 82 and 84 move as a unit to manipulation of the foot control 18 associated therewith.

Movement of the contact arms 82 and 84 into engagement with terminals 102 and 104, respectively, will close the circuit as follows: from battery 86 to wire 88, contact arm 82, terminal 102, wire 98, field 96, wire 100, terminal 104, contact arm 84, wire 94, motor 92, and wire 90 back to the battery 86. Thus the circuit to the motor will be closed for operating its armature in one direction.

Shifting of the switch arms 82 and 84 into engagement with the terminals 104 and 108, respectively, will close the circuit as follows: battery 86 to wire 88, contact arm 82, terminal 104, wire 100, field 96, wire 98, wire 106, terminal 108, contact arm 84, wire 94, motor 92, and wire 90 back to the battery 86. Thus the motor will rotate in the opposite direction.

In operation, the operator may take a sitting position in the boat with the toes of his shoes positioned in the bifurcations 70. Forward pressure on the controls 18 will close the circuit through the motors 24 for simultaneously operating both propellers 16. Each motor is provided with a circuit such as that disclosed in Figure 5. Since both circuits are identical in construction, the description has been limited to one. A slight pull on the controls 18 in a rearward direction will reverse the motors 24 for propelling the boat backwards. When no pressure is applied to the controls 18, the springs 78 associated with the two foot controls 18 will hold the latter in their normal positions. One control 18 may be pushed forward, and the other control pulled rearward so that the propellers 16 will rotate in opposite directions. Reverse rotation of the propellers will impart a quick turning action to the boat for making sharp turns. In making slow turns, one propeller 16 is sufficient for turning the boat.

The tubular housing 50 may be adjusted to vary the elevation of the propeller 16, thus rendering the devices applicable to boats of different sizes. The tubes 50 may be elevated for bringing the propeller 16 above a line defined by the inner face of the boat bottom 110 and the brackets 20 reversed for positioning the motors 24 and the propellers inside the boat. Hooks 40 may be adjusted to secure the desired angularity of the shaft 44. Thus the propeller 16 may be accurately located with respect to boats of different construction. Bolt connections 68 permit the foot controls 18 to be adjusted to different positions vertically so as to satisfy the needs of the operator.

Without further elaboration, the foregoing will so fully illustrate my invention that others may, by applying current knowledge, readily adapt the same for use under various conditions of service.

I claim:

1. In a boat having sides, clamps adapted to be clamped to the sides of the boat at their upper margins, a motor carried by each clamp including a propeller operatively connected with each motor, an electric circuit including two switches each mounted on one of said clamps for controlling its respective motor, means for selectively actuating said switches, said means comprising vertical rotative shafts operatively connected with the respective switches, and foot actuated members pivotally connected with said vertical rotative shafts for adjustment about horizontal axes, said vertical rotative shafts being independently actuated by their respective foot actuated members for selectively actuating the switches, said vertical rotative shafts extending downwardly inside the boat and said foot actuated members being adjustable about said horizontal axes for locating said foot actuated members for height with respect to the bottom of the boat, said foot actuated members extending in the direction of each other.

2. In a boat having a side, a clamp adapted to be clamped to the side of the boat at its upper margin, a motor carried by said clamp including a propeller operatively connected with said motor, an electric circuit including a switch mounted on said clamp for controlling the motor, means for selectively actuating said switch, said means comprising a vertical rotative shaft operatively connected with said switch, and a foot actuated member pivotally connected with said vertical rotative shaft for adjustment about a horizontal axis, said vertical rotative shaft being actuated by said member for actuating the switch, said vertical rotative shaft extending downwardly inside the boat and said foot actuated member being adjustable about said axis for locating said foot actuated member for height with respect to the bottom of the boat.

3. In a boat having sides, clamps adapted to be clamped to the sides of the boat at their upper margins, a motor carried by each clamp including a propeller operatively connected with each motor, an electric circuit including two switches each mounted on one of said clamps for controlling its respective motor, means for selectively actuating said switches, said means comprising vertical rotative shafts operatively connected with the respective switches, and foot actuated members pivotally connected with said vertical rotative shafts for adjustment about horizontal axes, said vertical rotative shafts being independently actuated by their respective foot actuated members for selectively actuating the switches, said vertical rotative shafts extending downwardly inside the boat and said foot actuated members being adjustable about said horizontal axes for locating said foot actuated members for height with respect to the bottom of the boat, each of said foot actuated members having a bifurcated formation for the reception of the foot of the operator.

HERMOND G. GENTRY.