Feb. 28, 1967 T. O. CHASE 3,306,249

PROPELLER, RUDDER AND WHEEL ASSEMBLY FOR BOATS

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FIG. 1

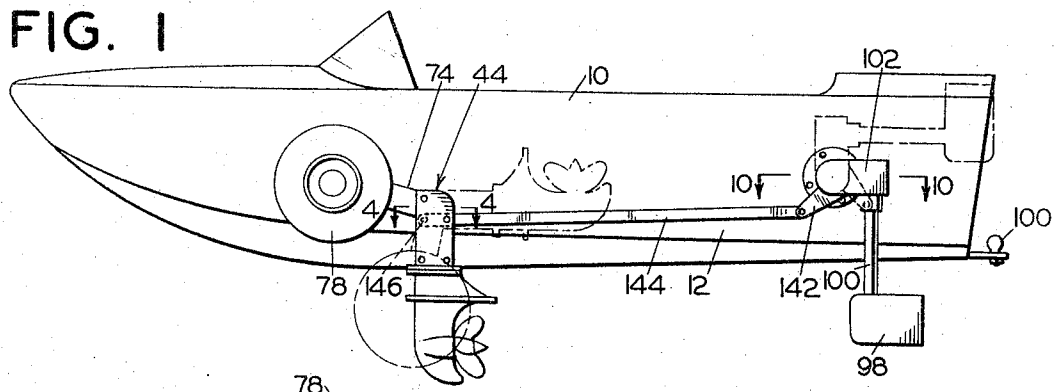


FIG. 2

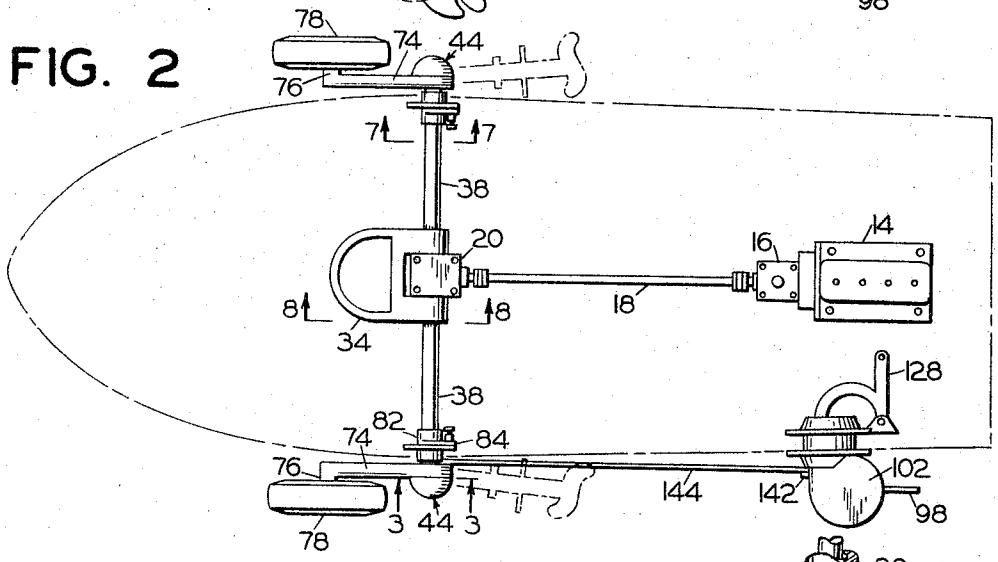
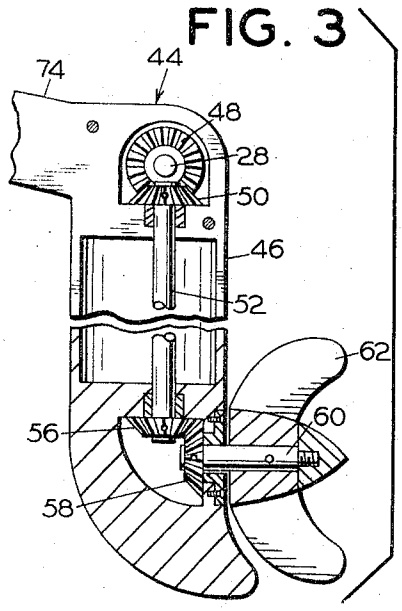


FIG. 3



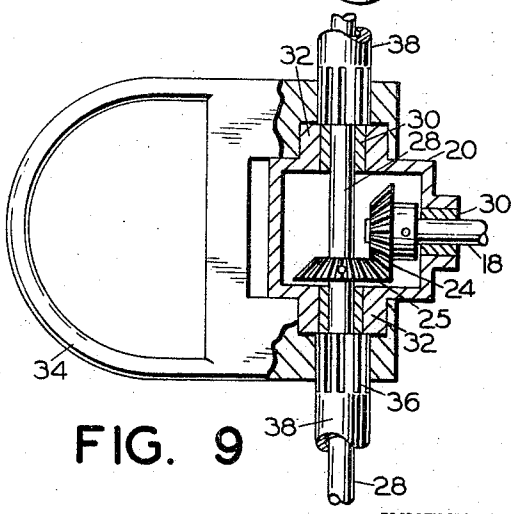


FIG. 9

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FIG. 4

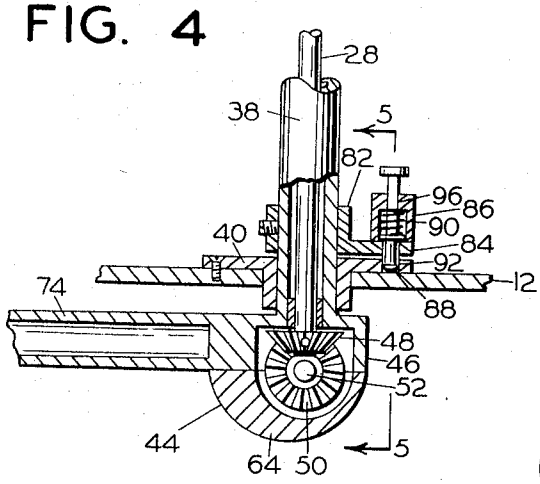


FIG. 8

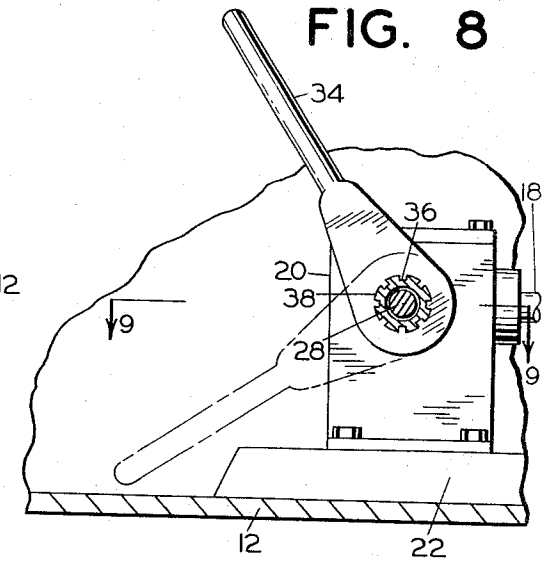


FIG. 5

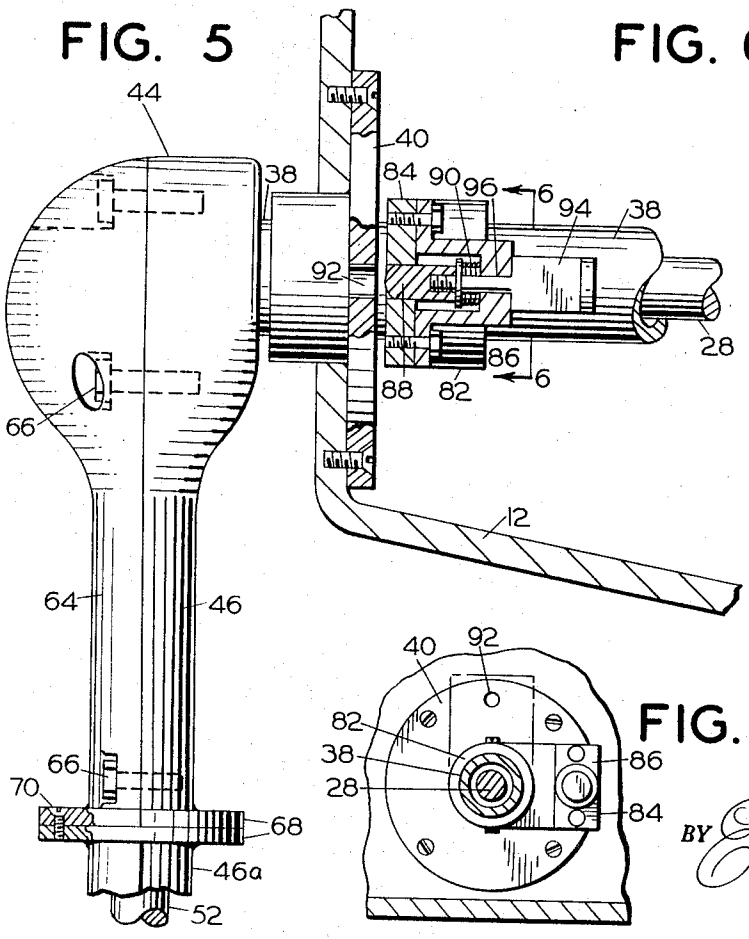


FIG. 6

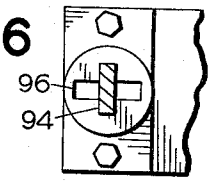


FIG. 7

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FIG. 11

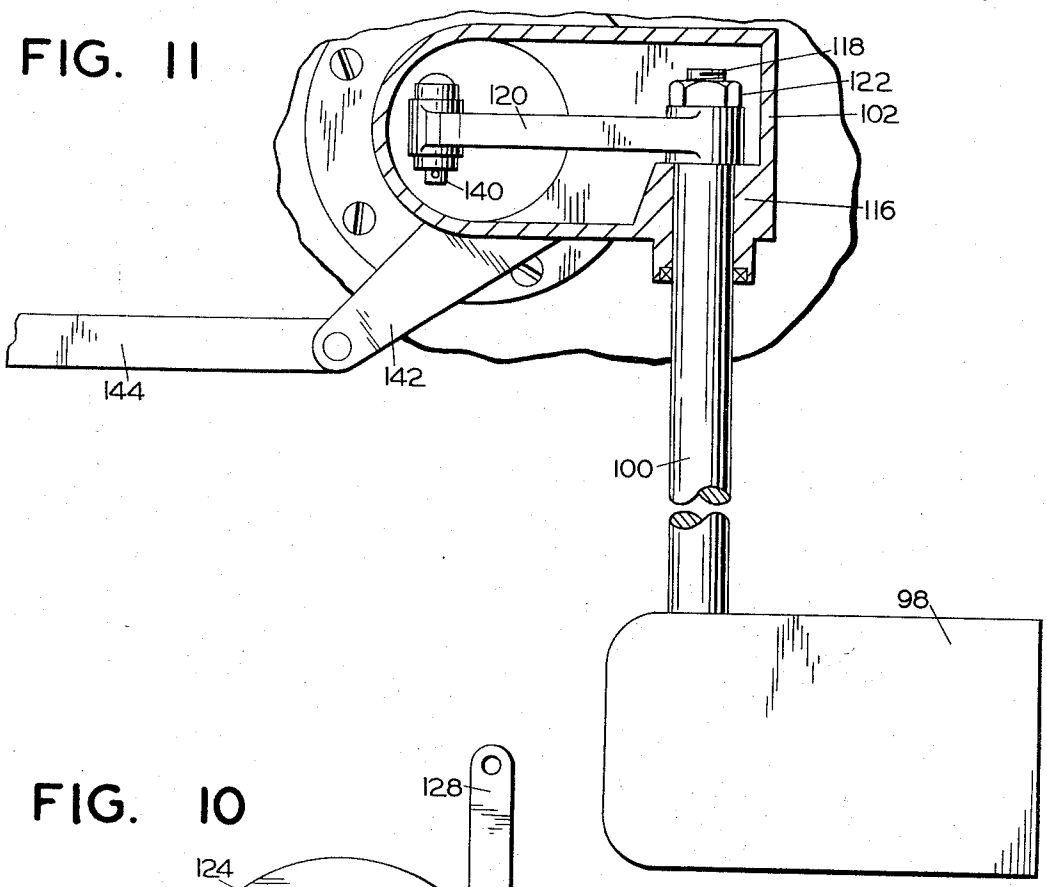
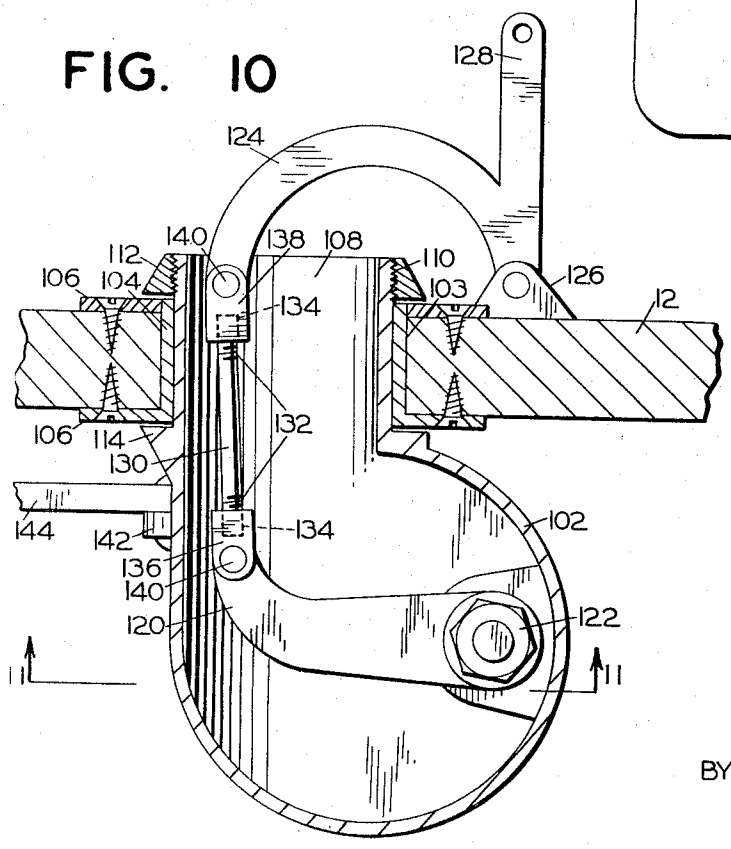


FIG. 10



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PROPELLER, RUDDER AND WHEEL ASSEMBLY FOR BOATS

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Filed Sept. 7, 1965, Ser. No. 485,230
7 Claims. (Cl. 115—1)

This invention relates to boat constructions and more particularly is concerned with a novel combination of propeller, rudder and wheel assembly therefor.

A primary objective of the invention is to provide a combination propeller, rudder and wheel assembly for boats employing a propeller and integrated wheel at each side of the boat, such combination of members being adapted for rotation between two positions wherein the wheels are lowered as the propellers and rudder are raised, and vice versa, facilitating operation of the boat on water or on land without a trailer.

Another object is to provide a propeller, rudder and wheel assembly for boats having a novel arrangement for rotating the assembly in positions of use of either the propeller and rudder or wheel means and for locking the assembly in each of the two positions.

Still another object is to provide a propeller, rudder and wheel assembly for boats which is rotatable for selective use of either of the propeller and rudder or the wheels and which employs operating means interiorly of the boat.

Another object of the present invention is to provide a propeller drive arrangement for boats wherein a propeller is disposed on each side of the boat at a point forwardly of the center of gravity of the boat.

Briefly stated, the invention resides in a boat construction having side mounted assemblies each including a propeller mechanism and a wheel mechanism. The side mounted propeller and wheel mechanisms are connected together and are operable between a pair of positions wherein either propellers or wheels may be utilized for the operation of the boat on water or on land, respectively. The propellers are suitably driven by a boat motor and are mounted forwardly of the center of gravity of the boat to provide a pulling action for the boat rather than the usual pushing action from the stern. Also forming a part of the invention is a pivoted rudder assembly which is connected to the propeller and wheel assemblies and movable therewith between upper and lower positions, the rudder assembly corresponding in its movable positions with that of the propeller mechanisms.

The invention will be better understood and additional objects will become apparent from the following specification and claims, considered together with the accompanying drawings, wherein the numerals of reference indicate like parts.

In the drawings:

FIGURE 1 is a side elevational view of a boat employing the present propeller, rudder and wheel assembly;

FIGURE 2 is a top plan view of the present assembly, the boat being shown in phantom lines;

FIGURE 3 is an enlarged, fragmentary sectional view taken on the line 3—3 of FIGURE 2;

FIGURE 4 is an enlarged, fragmentary sectional view taken on the line 4—4 of FIGURE 1;

FIGURE 5 is an enlarged, fragmentary sectional view taken on the line 5—5 of FIGURE 4;

FIGURE 6 is a fragmentary sectional view taken on the line 6—6 of FIGURE 5;

FIGURE 7 is an enlarged, fragmentary sectional view taken on the line 7—7 of FIGURE 2;

FIGURE 8 is an enlarged, sectional view taken on the line 8—8 of FIGURE 2;

FIGURE 9 is a fragmentary sectional view taken on the line 9—9 of FIGURE 8;

FIGURE 10 is an enlarged, fragmentary sectional view taken on the line 10—10 of FIGURE 1; and

FIGURE 11 is a sectional view taken on the line 11—11 of FIGURE 10.

FIGURE 1 exemplifies a boat 10 to which the present mechanism may be applied. Such boat is of usual construction, employing suitable side, bottom, and transom walls 12.

In accordance with the present invention, the engine 14 of the boat, FIGURE 2, preferably is located in the stern of the boat. This engine is associated with a conventional transmission 16 the output shaft 18 of which terminates at its forward end in a gear box 20 detailed in FIGURES 8 and 9. This gear box is secured to a base 22 in turn secured to the bottom of the boat. Incorporated in the gear box 20 are intermeshing bevel gears 24 and 25, the gear 24 being secured to the end of output shaft 18 and the gear 25 being secured on a cross shaft 28. Shafts 18 and 28 have journaled engagement in suitable bearing bushings 30 supported in the gear box.

Gear box 20 has laterally projecting hubs 32 on which is journaled a lever handle 34 in the form of a yoke and having a splined connection 36 with laterally projecting tubular shafts 38 which confine the shaft 28. Tubular shafts 38 have journaled support in bearing plates 40, FIGURES 4 and 5, secured to side walls 12 of the boat. Tubes 38 are integrated at their outer ends with wheel and propeller assemblies designated generally by the numeral 44. These assemblies are of identical construction and comprise a first housing portion 46 confining a pair of intermeshing bevel gears 48 and 50, FIGURES 3 and 4. The bevel gears 48 are secured to the outer ends of cross shaft 28 and bevel gears 50 are secured to the upper ends of shafts 52 journaled longitudinally in the housing portion 46. The ends of the shafts 52 opposite from the bevel gears 50 have bevel gears 56 secured thereto which mesh with bevel gears 58 secured to one end of propeller shafts 60 journaled in the housing 46 and projecting rearwardly of the latter. Propellers 62 are secured on projecting portions of shafts 60.

Referring to FIGURES 4 and 5, housing portions 46 have end plates or caps 64 which are removable for access to the interior of the housings, such plates being secured to the housings by means of studs 86. Furthermore the housings 46 have removable lower portions 46*a* secured thereto by flanges 68 and interconnecting screws 70.

With reference now to FIGURES 1–4, the wheel and propeller assemblies 44 have integral arms 74 which project substantially at right angles to the housings 46 and which have laterally directed end axles 76 for supporting wheels 78. These assemblies are rotatable relative to the boat between the full line and phantom line positions shown in FIGURE 1. That is, the propellers may be lowered to a downwardly extended position for operation of the boat in water or the wheels may be lowered when it is desired to transport the boat on land. In view of the angular disposition of the housings 46 and the wheel arms 74 the wheels are raised to an upper out of the way position when the propellers are lowered and the same is true of the propellers when the wheels are lowered. Since the lever handle 34 has a spline connection with the tubular shaft 38 and since the latter comprise an integral part of the wheel and propeller assemblies 44, operation of said wheel and propeller assemblies can be accomplished from inside the boat.

In order to hold the wheel and propeller assemblies securely in their two positions, locking means are provided for each of said assemblies, FIGURES 1, 2 and

4–7. Each of said locking means comprises a collar **82**, FIGURES 4, 5 and 7, secured non-rotatably to the respective tubular shaft **38** in a position adjacent the bearing plate **40**. Collar **82** has an arm extension **84** supporting a latch housing **86** in which is slidably incorporated a plunger type latch pin **88** urged outwardly toward the bearing plate **40** by a compression spring **90**. Bearing palte **40** has a pair of recesses or apertures **92** selectively positioned such as to receive the latch pin **88** and hold the propellers or wheels in one or the other of their two operative positions.

With particular reference to FIGURES 5 and 6, the latch pin **88** is constructed and arranged such that it projects outwardly in a locking position or is held retracted in a non-locking position. For this purpose, the pin **88** has a rectangular stem **94** which projects through a similarly shaped slot **96** in the housing **86**. When the rectangular portion **94** of the latch pin is aligned with the slot **96**, the latch pin is capable of moving outwardly a sufficient amount to engage the recesses **92** in the bearing plate **40**. However, when the latch pin is pulled outwardly and rotated such that the rectangular portion **94** thereof is crosswise to the slot **96**, said pin is locked in an outwardly held position.

The operator in changing the position of the wheel and propeller assemblies, first grasps the lever handle **34** and then releases one of the latch pins **88** by pulling it out and turning it crosswise to its slot. This is accomplished by working the lever handle **34** slightly to permit easy withdrawal of the latch pin from aperture **92** in its respective bearing plate **40**. The other latch pin **88** is similarly removed except that it need not be locked in position but merely withdrawn sufficiently to clear the aperture **92** in its bearing plate until such time that rotation of the wheel and propeller assemblies has commenced. Thereupon the latch may be released and it will ride on the bearing plate **40** until a recess **92** comes into registry therewith whereupon the pin will drop into said recess. The other latch pin is then unlocked by rotating its rectangular stem portion **94** into alignment with slot **96**, and since the propeller and wheel assemblies are held in one of their two positions by the first operated latch pin, the last operated latch pin will drop freely into its recesses.

The boat **10** is provided with a steering rudder **98** connected to the propeller and wheel assemblies and arranged to be swung between upper and lower positions corresponding to the positions of the propellers. More particularly, the rudder **98** is disposed at one side of the boat and is integrated with a post **100** which projects upwardly into a housing **102**, FIGURES 1, 10 and 11. The housing **102** is rotatably supported in a side wall **12** of the boat adjacent the stern, and to accomplish such rotatable support the wall **12** is provided with an aperture **103**, FIGURE 10, in which is mounted a bushing **104** having end flanges **106** for securement thereof to the side wall **12** of the boat. Housing **102** has a circular, tubular, lateral extension **108** which projects through the bushing **104** in a water-tight but rotatable joint. Extension **108** projects interiorly of the boat and has exterior screw threads **110** for receiving a securing nut **112**, the housing **102** having a flange or suitable projections **114** spaced from threads **110** for rotatably engaging the outer flanged portions of the bushing **104**.

The upper end of the rudder post **100** is journaled in the housing **102** by suitable bearing means **116**, FIGURE 11, in said housing and the upper terminal end of this post has a shank **118** to which is secured in a non-rotatable connection a horizontal arm **120**. For the purpose of connecting the post **100** and the arm **120** in a non-rotatable connection, the shank **118** may be threaded for receiving a securing nut **122**.

Arm **120** is rotatably operated by a horizontally disposed lever **124** pivotally connected at one of its ends to a lug **126** secured to the inner side of the boat wall **12**.

Lever **124** has an arm **128** extending inwardly and arranged for connection with steering mechanism of the boat, such as steering cables. Connection between the arm **120** and the lever **124** is accomplished by a rod **130** having threaded ends **132** engageable in threaded bores **134** in yoke-type adapters **136** and **138** pivotally attached, respectively, to the arm **120** and lever **124**. The pivotal attachment between the adapters **136**, **138** and the arm **120** and lever **124**, respectively, is accomplished by pivot pins **140**. By the arrangement thus described, pivotal movement of the lever **124** on the lug **126** causes a similar pivotal movement of the rudder post **10** and rudder **98** for maneuvering the boat in the water. The housing **102**, together with the rudder **98**, post **100**, and arm **120**, may rotate on a horizontal axis, the threaded engagement of the ends of rod **130** in the adapters **136** and **138** allowing the rotation of the housing relative to the lever **124**.

With particular reference to FIGURES 1, 2, 10 and 11, housing **102** has an integral forwardly projecting lever arm **142** pivotally connected to a forwardly extending link **144**. The forward end of link **144** is pivotally connected to the housing portion **46** of one of the wheel and propeller assemblies. The pivotal connection between the link **144** and the housing portion **46** is accomplished by a pin **146** suitably secured to the housing portion **46**.

The stern of the boat is provided with a permanent trailer hitch connection **148** for attachment to a towing vehicle.

In accordance with the present invention the propeller, rudder and wheel assembly of the present invention facilitates operation of the boat on land without the use of a trailer. That is, by the arrangement shown and described, the propellers may be rotated to their down or operative position by suitable manipulation of the latch pins **88** and the lever handle **34**, the rudder also being moved simultaneously with the propeller to its down or operative position. When the wheels are lowered, also by suitable manipulation of the latch pins **88** and the lever handle **34**, the propellers and rudder are raised, the latter position of the parts being shown in phantom lines in FIGURE 1. Furthermore, by the arrangement shown the propellers are disposed forward of the center of the boat to provide a pulling action of the boat rather than a pushing action. Such arrangement improves the maneuverability of the boat.

It is to be understood that the form of my invention herein shown and described is to be taken as a preferred example of the same and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of my invention or the scope of the subjoined claims. For example, although an inboard motor drive system is shown in the drawings, the motor assemblies at the sides may comprise simply a pair of outboard motor units.

Having thus described my invention, I claim:

1. A boat construction comprising a pair of drive propeller supporting means disposed on opposite sides of the boat, power drive means for said propellers, wheel supporting means secured integrally to said propeller supporting means in longitudinally disposed, angular position, and horizontal axis pivot means mounting said propeller and wheel supporting means on said boat for rotation between two positions, one of which positions comprises a downwardly extended operative position of the propeller supporting means and an inoperative position of the wheel supporting means for operation of the boat in water and the other of which positions comprises a downwardly extended position of the wheel supporting means and an inoperative position of the propeller supporting means for movement of the boat over land.

2. The boat construction of claim **1** wherein the propeller and wheel supporting means are disposed forwardly of the center of gravity of the boat.

3. The boat construction of claim 1 including means interconnecting the oppositely disposed propeller and wheel supporting means together for rotation as a unit between the two positions.

4. The boat construction of claim 1 including means interconnecting the oppositely disposed propeller and wheel supporting means together for rotation as a unit between the two positions, and including lever means integrated with said interconnecting means for rotating the said propeller and wheel supporting means.

5. The boat construction of claim 1 including means interconnecting the oppositely disposed propeller and wheel supporting means together for rotation as a unit between the two positions, and including lever means integrated with said interconnecting means and disposed interiorly of the boat for rotating the said propeller and wheel supporting means from a point inside the boat.

6. The boat construction of claim 1 including latch means engageable with said propeller and wheel supporting means for holding the latter in one or the other of said two positions.

7. The boat construction of claim 1 including a rudder assembly pivotally attached to the boat on a horizontal axis and arranged for pivotal movement between a lowered operative position and an upper inoperative position, and means connected between said rudder assembly and one of said drive propeller supporting means and wheel supporting means whereby said rudder assembly has movement to its operative and inoperative positions in corresponding relation to said propeller supporting means.

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