June 26, 1956 H. W. OGILVIE 2,751,876

MANUAL PROPULSION AND STEERING MEANS FOR WATERCRAFT

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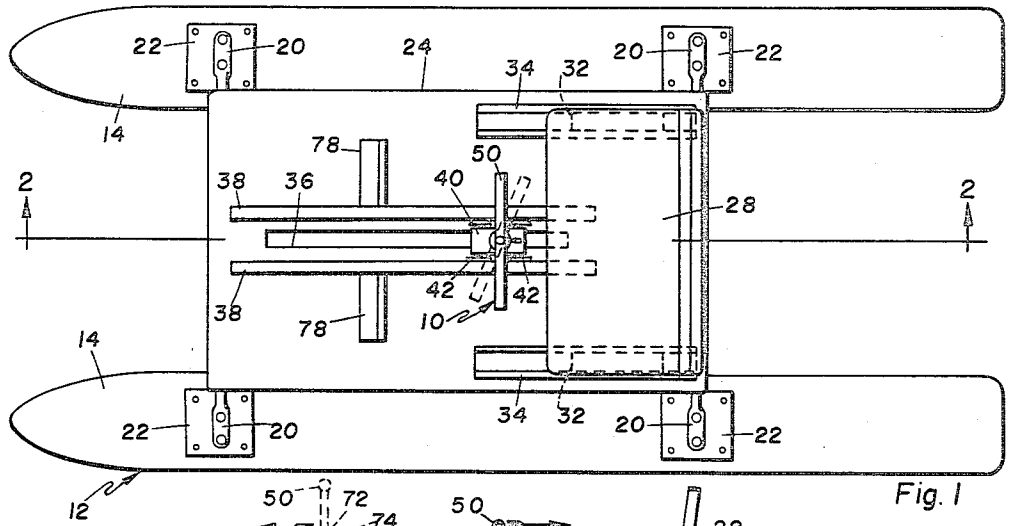


Fig. 1

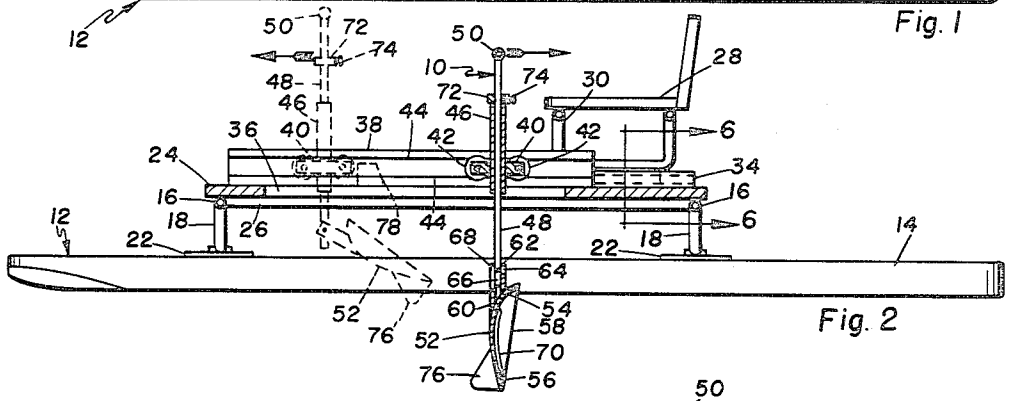


Fig. 2

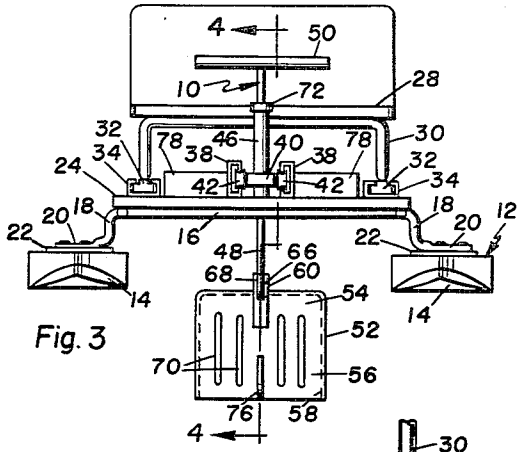


Fig. 3

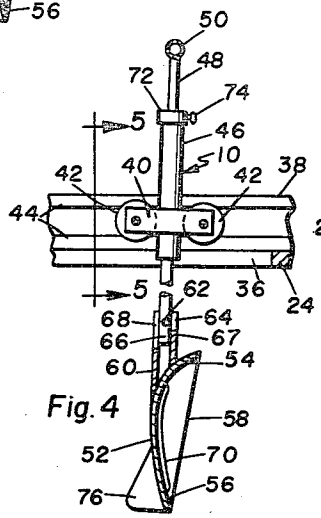


Fig. 4

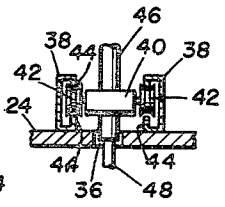


Fig. 5

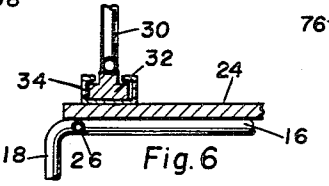


Fig. 6

INVENTOR.
HARRY W. OGILVIE
BY
Knox & Knox

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MANUAL PROPULSION AND STEERING MEANS FOR WATERCRAFT

Harry W. Ogilvie, San Diego, Calif.

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12 Claims. (Cl. 115—32)

The present invention relates generally to boats and more particularly to a manual propulsion and steering means for watercraft such as boats and catamarans.

The primary object of this invention is to provide a manually operated, steerable paddle device for mounting in small boats, especially catamarans, and which can be used for exercising as well as for propulsion.

Another object of this invention is to provide a paddle and paddle assembly of unique construction and high efficiency in performance.

Another object of the invention is provide a novel paddle which constitutes a steering means or rudder.

Another object of this invention is to provide a propulsion device in which the paddle is thrust into the water on the propulsion stroke and is lifted from the water on the return stroke, the paddle being pivotally mounted to offer a minimum of resistance on the return stroke.

Another object of this invention is to provide a propulsion device in which the paddle can be turned and even completely reversed while in operation to achieve offset thrust for directional control.

Another object of this invention is to provide a propulsion device which is designed to be actuated by natural and comfortable leg and arm movements of the operator.

Another object of this invention is to provide a propulsion device which is adapted for fabrication from many different materials, so that the choice of material can be according to the dictates of availability and price considerations, the exact sizes and proportions being matters easily determined to suit particular conditions and needs.

Finally, it is an object to provide a propulsion of the aforementioned character which is simple, safe and convenient to operate, and which will give generally efficient and durable service.

With these and other objects definitely in view, this invention consists in the novel construction, combination and arrangement of elements and portions, as will be hereinafter fully described in the specification, particularly pointed out in the claims, and illustrated in the drawing which forms a material part of this disclosure and wherein similar characters of reference indicate similar or identical elements and portions throughout the specification and throughout the views of the drawing, and in which:

Fig. 1 is a top plan view of a catamaran incorporating the propulsion device.

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1.

Fig. 3 is a front elevation view of the catamaran.

Fig. 4 is an enlarged fragmentary sectional view taken on the line 4—4 of Fig. 3.

Fig. 5 is a fragmentary sectional view taken on the line 5—5 of Fig. 4.

Fig. 6 is an enlarged fragmentary sectional view taken on the line 6—6 of Fig. 2.

Referring now to the structural details of the device, the propulsion unit 10 is shown installed in a small, simply

constructed catamaran 12, for which the unit is ideally suited. It should be understood, however, that the unit is applicable to other types of boats with a minimum of modification and without altering the operation and function of the unit.

The catamaran 12 comprises a pair of elongated floats 14 of suitable design which are held together in spaced, parallel relation by a pair of cross members 16 spaced longitudinally of the floats. The cross members 16 may be metal bars, rods or tubular stock and have downwardly turned end portions 18, the lower extremities of which are turned outwardly to constitute attachment lugs 20, said lugs being secured in a suitable manner to reinforcement plates 22 fixed on the upper surfaces of the floats 14. Fixed on top of the cross members 16 is a generally rectangular platform 24 which is braced by longitudinal side bars 26 secured between the cross members. Mounted on the rear end of the platform 24 is a seat 28 having a simple tubular support frame 30, the lower portions of which are fixed to shoes 32, said shoes being slidable in rails 34 secured longitudinally on said platform. The platform 24 has a longitudinal slot 36 generally on the center line thereof and extending from beneath the seat 28 to a point adjacent the forward end of the platform.

The propulsion unit 10 includes a pair of guide rails 38 generally C-shaped in cross section and secured in spaced parallel relation to the platform 24 on opposite sides of the slot 36. Mounted on and between the guide rails 38 is a carriage 40 having at each end a pair of grooved rollers 42 which ride between the inwardly turned, opposed flanges 44 of said guide rails, as shown in Figs. 4 and 5. The rollers 42 are dimensioned to provide a limited amount of play, so that the carriage 40 can be tilted slightly as in Fig. 4. Fixed in the carriage 40 is an upright support tube 46 in which is slidably mounted a post 48 extending downwardly through the slot 36 and having at its upper end a cross bar type handle 50.

At the lower end of the post 48 is a paddle 52 comprising a scoop shaped blade, concave on the rearward side and having a generally arcuate upper portion 54 and a slightly curved lower portion 56, the sides of the paddle being enclosed by side plates 58. Fixed to the upper portion 54 is a short upright attachment tube 60 into which the lower end of the post 48 is inserted, said post being pivotally secured to the posts by a pin 62. The rearward side of the tube 60 has a notch 64 extending below the pin 62 and of sufficient width to clear the post 48 when the paddle is pivoted about the pin. The end of the post 48 extends below the notch 64 and this end 66 of the post and the adjacent portion 67 of the post constitute cooperating stop portions, as in Fig. 4. The forward side of the tube 60 has a deeper notch 68 which extends below the stop portion 66 and is also of sufficient width to clear the post 48. Other methods of attaching the paddle 52 may be used as long as the paddle is freely pivotal in one direction and is stopped in a vertical position in the opposite direction. The paddle 52 may be reinforced if necessary by swages or ribs 70. Fitted on the post 48 above the support tube 46 is a stop collar 72 having a thumb screw 74 or the like for locking the collar to the post. The lower forward portion of the paddle 52 has fixed thereto a small fin 76. This fin constitutes an important steering aid as hereinafter explained. Secured to the platform 24 of the guide rails 38 are foot stops 78 against which the operator's feet can be braced to obtain maximum thrust.

In operation, the post 48 is adjusted vertically so that the paddle 52 is totally immersed in the water when in the vertical position and the post is locked in this position by the collar 72. The operator is seated on the seat 28 with his feet against the foot stops 78 and hands grasping the handle 50. When the handle 50 is pulled rearwardly

toward the seat 28 as shown by the directional arrow in Fig. 2 the paddle 52 exerts considerable thrust against the water and the craft is propelled forward. The slidably mounted seat 28 and the foot stops 78 enable the operator to exert a maximum of effort as in a rowing boat having a slidable seat. Due to the small amount of play between the rollers 42 and the flanges 44, the trunnion block 40 tilts slightly on the thrust stroke so that the front rollers ride on the upper flange and the rear rollers ride on the lower flange, as shown in Fig. 4. This arrangement greatly reduces friction and enables all thrust to be applied to the paddle 52.

On the forward or return stroke, the handle 50 is lifted to raise the paddle 52 substantially clear of the water. At the same time the paddle 52 itself pivots about the pin 62 and rides along the surface of the water in the position shown in dash line in Fig. 2 the direction of stroke being indicated by a directional arrow. It should be noted that in this position, the fin 76 is still submerged and provides a useful steering component. On the subsequent power or rearward stroke, the handle 50 is pulled downwardly and rearwardly simultaneously so that the paddle 52 is thrust directly down into the water as the water resistance straightens the paddle to its vertical position against the stop portion 66. Thus the paddle 52 is immediately brought into full thrust position at the start of the power stroke and is just as quickly raised to the minimum resistance position at the beginning of the return stroke. Other types of reciprocating paddles are known to fold, collapse, or otherwise reduce their effective area on the inoperative stroke, but these normally remain submerged and often cause a deflection of the craft from its true course.

The raising of the handle 50 on the forward stroke and lowering of the handle on the rearward stroke have been found to be natural and easily accomplished movements, so that a rhythmic cycle of operation can be maintained to provide a steady propulsive thrust.

Directional control is easily accomplished by merely turning the handle 50, as shown in dash line in Fig. 1, thus turning the paddle 52 and offsetting the thrust. Reverse thrust is also easily applied by reversing the paddle 52. While coasting with the paddle 52 raised and trailing on the surface of the water, the fin 76 may be used as a rudder for steering by turning the handle 50.

The device may be operated by a single person or by two persons seated on opposite sides of the post 48. Other arrangements in which multiple operators and even multiple paddles may be used will be obvious. The catamaran illustrated in the drawings provides a lightweight, easily constructed vehicle for leisurely travel or for strenuous exercise and considerable speed if necessary. The spacing of the platform 24 above water level enables the paddle 52 to be lifted from the water into the space beneath the platform. The device may be applied to a more conventional boat by constructing a trough in the underside of the hull into which the paddle may be raised. The upper portion of the trough would then be equivalent to the platform 24 and this would place the slot through which the post 48 projects well above the water line, so that sealing against leakage would be unnecessary.

The operation of this invention will be clearly comprehended from a consideration of the foregoing description of the mechanical details thereof, taken in connection with the drawing and the above recited objects. It will be obvious that all said objects are amply achieved by this invention.

Further description would appear to be unnecessary.

It is understood that minor variation from the forms of the invention disclosed herein may be made without departure from the spirit and scope of the invention, and that the specification and drawing are to be considered as merely illustrative rather than limiting.

I claim:

1. A manual propulsion and steering means for watercraft comprising: a carriage; means for mounting said carriage for longitudinal sliding motion in a watercraft; a generally upright post mounted for axially slidable and rotatable motion in said carriage; a handle on the upper end of said post; a paddle mounted on the lower end of said post for pivotal movement to a generally horizontal position on the idle return stroke of the paddle; said post and paddle having cooperating stop means for retaining said paddle in a generally vertical position during the power stroke of the paddle.

2. A manual propulsion and steering means for watercraft comprising: a carriage; means for mounting said carriage for longitudinal sliding motion in a watercraft; a generally upright support tube fixed in said carriage; a post mounted for axially slidable and rotatable motion in said support tube; stop means for limiting the downward travel of said post; a handle on the upper end of said post; a paddle mounted on the lower end of said post for pivotal movement to a generally horizontal position on the idle return stroke of the paddle; said post and paddle having cooperating stop means for retaining said paddle in a generally vertical position during the power stroke of the paddle.

3. A manual propulsion and steering means for watercraft comprising: a carriage; means for mounting said carriage for longitudinal sliding motion in a watercraft; a generally upright post mounted for axially slidable and rotatable motion in said carriage; a handle on the upper end of said post; a paddle mounted on the lower end of said post for pivotal movement to a generally horizontal position on the idle return stroke of the paddle; said post and paddle having cooperating stop means for retaining said paddle in a generally vertical position during the power stroke of the paddle, said paddle having a fin secured to the face of the paddle disposed downwardly when the paddle is in said generally horizontal position, said fin constituting a rudder when the paddle is in said horizontal position.

4. In a watercraft: a platform element spaced above the normal waterline of the craft and having a longitudinal slot therein; and a manual propulsion and steering means comprising a pair of longitudinal guide rails fixed in spaced parallel relation on said platform element on opposite sides of said slot; a carriage mounted for longitudinal sliding movement between said guide rails; a generally upright support tube fixed in said carriage; a post mounted for axially slidable and rotatable movement in said support tube; a handle on the upper end of said post; said post having a lower end depending through said slot; a paddle on said lower end; said paddle being pivotally mounted for movement to a generally horizontal position when the paddle is moved in one direction during the idle return stroke; and stop means for retaining said paddle in a generally vertical position in an opposite direction during the power stroke of the paddle.

5. In a watercraft: a platform element spaced above the normal waterline of the craft and having a longitudinal slot therein; and a manual propulsion and steering means comprising a pair of longitudinal guide rails fixed in spaced parallel relation on said platform element on opposite sides of said slot; a carriage mounted for longitudinal sliding movement between said guide rails; a generally upright support tube fixed in said carriage; a post mounted for axially slidable and rotatable movement in said support tube; an adjustable stop on said post for limiting the downward travel of the post; a handle on the upper end of said post; said post having a lower end depending through said slot; a paddle on said lower end; said paddle being pivotally mounted for movement to a generally horizontal position when the paddle is moved in one direction during the idle return stroke; and stop means for retaining said paddle in a generally vertical position in an opposite direction during the power stroke of the paddle.

6. In a watercraft: a platform element spaced above the

normal waterline of the craft and having a longitudinal slot therein; and a manual propulsion and steering means comprising a pair of longitudinal guide rails fixed in spaced parallel relation on said platform element on opposite sides of said slot; a carriage mounted for longitudinal sliding movement between said guide rails; a generally upright support tube fixed in said carriage; a post mounted for axially slidable and rotatable movement in said support tube; an adjustable stop on said post for limiting the downward travel of the post; a handle on the upper end of said post; said post having a lower end depending through said slot; a paddle on said lower end; said paddle being pivotally mounted for movement to a generally horizontal position when the paddle is moved in one direction during the idle return stroke; and stop means for retaining said paddle in a generally vertical position in an opposite direction during the power stroke of the paddle; a seat mounted on said platform element; and foot engaging stops fixed to said platform element forwardly of said seat.

7. In a watercraft: a platform element spaced above the normal waterline of the craft and having a longitudinal slot therein; and a manual propulsion and steering means comprising a pair of longitudinal guide rails fixed in spaced parallel relation on said platform element on opposite sides of said slot; a carriage mounted for longitudinal sliding movement between said guide rails; a generally upright support tube fixed in said carriage; a post mounted for axially slidable and rotatable movement in said support tube; an adjustable stop on said post for limiting the downward travel of the post; a handle on the upper end of said post; said post having a lower end depending through said slot; a paddle on said lower end; said paddle being pivotally mounted for movement to a generally horizontal position when the paddle is moved in one direction during the idle return stroke; and stop means for retaining said paddle in a generally vertical position in an opposite direction during the power stroke of the paddle; a seat mounted on said platform element for sliding movement generally parallel to said guide rails; and foot engaging stops fixed to said platform element on opposite sides of said guide rails forwardly of said seat.

8. In a watercraft: a platform element spaced above the normal waterline of the craft and having a longitudinal slot therein; and a manual propulsion and steering means comprising a pair of longitudinal guide rails fixed in spaced parallel relation on said platform element on opposite sides of said slot; a carriage mounted for longitudinal sliding movement between said guide rails; a generally upright support tube fixed in said carriage; a post mounted for axially slidable and rotatable movement in said support tube; an adjustable stop on said post for limiting the downward travel of the post; a handle on the upper end of said post; said post having a lower end depending through said slot; a paddle on said lower end; said paddle having a concave rear face; an upwardly extending attachment tube fixed to the upper forward face of said paddle; said lower end fitting within said attachment tube; and a pin pivotally interconnecting said lower end and said tube; the rear portion of said attachment tube having a first notch extending slightly below said pin, said lower end projecting below said first notch; the forward portion of said attachment tube having a second notch extending below said lower end; both of said notches being of sufficient width to straddle said post.

9. In a watercraft: a platform element spaced above the normal waterline of the craft and having a longitudinal slot therein; and a manual propulsion and steering means comprising a pair of longitudinal guide rails fixed in spaced parallel relation on said platform element on opposite sides of said slot; a carriage mounted between said guide rails; said carriage having opposed rollers at each end thereof; said guide rails having inwardly turned opposed flanges between which said rollers are retained; said rollers being dimensioned to provide for limited tilting of said carriage; a generally upright support tube fixed in said carriage; a post mounted for axially slidable and rotatable movement in said support tube; an adjustable stop on said post for limiting the downward travel of the post; a handle on the upper end of said post; said post having a lower end depending through said slot; a paddle on said lower end; said paddle being pivotally mounted for movement to a generally horizontal position when the paddle is moved in one direction during the idle return stroke; and stop means for retaining said paddle in a generally vertical position in an opposite direction during the power stroke of the paddle.

10. In a watercraft: a platform element spaced above the normal waterline of the craft and having a longitudinal slot therein; and a manual propulsion and steering means comprising a pair of longitudinal guide rails fixed in spaced parallel relation on said platform element on opposite sides of said slot; a carriage mounted for longitudinal sliding movement between said guide rails; a generally upright support tube fixed in said carriage; a post mounted for axially slidable and rotatable movement in said support tube; an adjustable stop on said post for limiting the downward travel of the post; a handle on the upper end of said post; said post having a lower end depending through said slot; a paddle on said lower end; said paddle having a concave rear face; an upwardly extending attachment tube fixed to the upper forward face of said paddle; said lower end fitting within said attachment tube; and a pin pivotally interconnecting said lower end and said tube; the rear portion of said attachment tube having a first notch extending slightly below said pin, said lower end projecting below said first notch; the forward portion of said attachment tube having a second notch extending below said lower end; both of said notches being of sufficient width to straddle said post; a seat mounted on said platform element for sliding movement generally parallel to said guide rails; and foot engaging stops fixed to said platform on opposite sides of said guide rails forwardly of said seat.

11. In a watercraft: a platform element spaced above the normal waterline of the craft and having a longitudinal slot therein; and a manual propulsion and steering means comprising a pair of longitudinal guide rails fixed in spaced parallel relation on said platform element on opposite sides of said slot; a carriage mounted between said guide rails; said carriage having opposed rollers at each end thereof; said guide rails having inwardly turned opposed flanges between which said rollers are retained; said rollers being dimensioned to provide for limited tilting of said carriage; a generally upright support tube fixed in said carriage; a post mounted for axially slidable and rotatable movement in said support tube; an adjustable stop on said post for limiting the downward travel of the post; a handle on the upper end of said post; said post having a lower end depending through said slot; a paddle on said lower end; said paddle being pivotally mounted for movement to a generally horizontal position when the paddle is moved in one direction during the idle return stroke; said paddle having a concave rear face; an upwardly extending attachment tube fixed to the upper forward face of said paddle; said lower end fitting within said attachment tube; and a pin pivotally interconnecting said lower end fitting within said attachment tube; and a pin pivotally interconnecting said lower end and said tube; the rear portion of said attachment tube having a first notch extending slightly below said pin, said lower end projecting below said first notch; the forward portion of said attachment tube having a second notch extending below said lower end; both of said notches being of sufficient width to straddle said post.

12. In a watercraft: a platform element spaced above the normal waterline of the craft and having a longitudinal slot therein; and a manual propulsion and steering

means comprising a pair of longitudinal guide rails fixed in spaced parallel relation on said platform element on opposite sides of said slot; a carriage mounted between said guide rails; said carriage having opposed rollers at each end thereof; said guide rails having inwardly turned opposed flanges between which said rollers are retained; said rollers being dimensioned to provide for limited tilting of said carriage; a generally upright support tube fixed in said carriage; a post mounted for axially slidable and rotatable movement in said support tube; an adjustable stop on said post for limiting the downward travel of the post; a handle on the upper end of said post; said post having a lower end depending through said slot; a paddle on said lower end, said paddle being pivotally mounted for movement to a generally horizontal position when the paddle is moved in one direction during the idle re-

turn stroke; said paddle having a concave rear face; an upwardly extending attachment tube fixed to the upper forward face of said paddle; said lower end fitting within said attachment tube; and a pin pivotally interconnecting said lower end fitting within said attachment tube; and a pin pivotally interconnecting said lower end and said tube; the rear portion of said attachment tube having a first notch extending slightly below said pin, said lower end projecting below said first notch; the forward portion of said attachment tube having a second notch extending below said lower end; both of said notches being of sufficient width to straddle said post; and a fin fixed to the lower face of said paddle when the paddle is in said generally horizontal position.

No references cited.