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BOAT PROPULSION AND STEERING DEVICE

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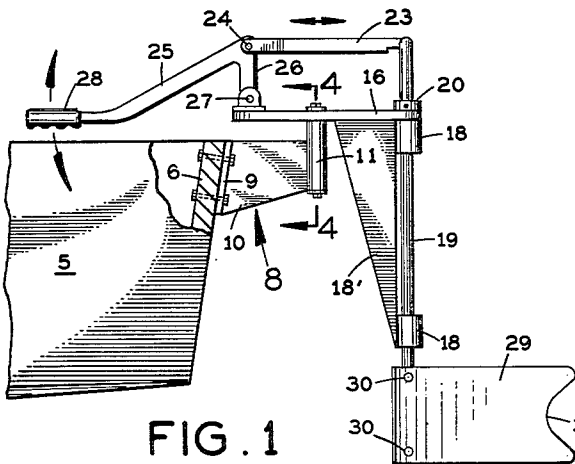


FIG. 1

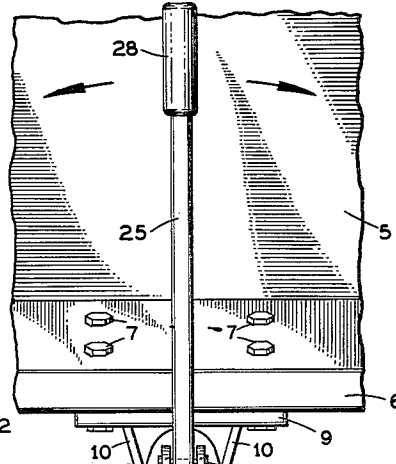


FIG. 2

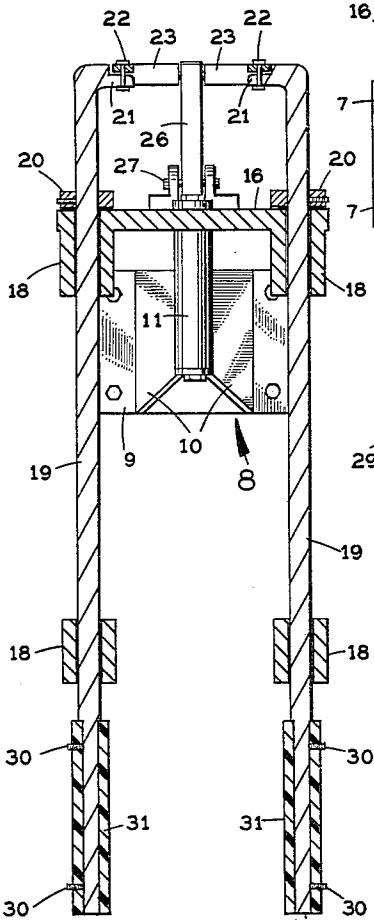


FIG. 3

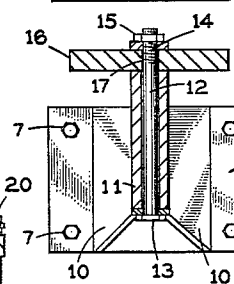


FIG. 4

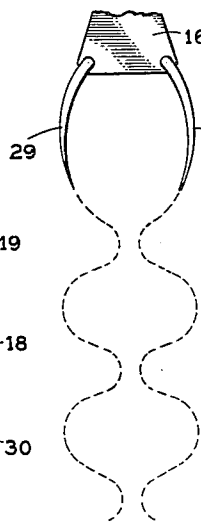


FIG. 5

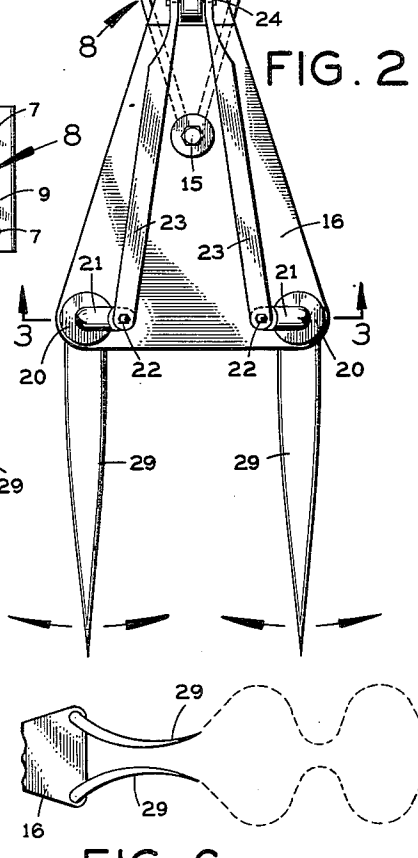


FIG. 6

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BOAT PROPULSION AND STEERING DEVICE

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1 Claim. (Cl. 115—29)

This invention relates to a propulsion device for attachment to a boat, either a surface craft or an underwater craft.

The invention contemplates a propulsion device that is manually actuated and requires no driving motor or other external power although, the device may conceivably be actuated by an engine to be substituted for the hand operation. The device basically is intended for manual or hand operation.

The invention has for its object to provide a propulsion device that includes multiple, flexible, contra-movable rudder shaped propellers which are attached to and moved by vertical shafts which project into the water. The proximity of the propellers to one another directs and takes advantage of the water between them so as to more effectively produce a forward motion to the craft in comparison to a single sculling device which pushes much of the water aside and thus wastes much of the potential power available.

The invention also contemplates a device of the above noted characteristics that is also capable of steering the craft due to its rudder shaped propellers and with minor modifications, can be made to perform a reverse action.

The device is also unique in that the propelling medium is immersed in the water without extra appurtenances such as normal rudders and housing which would otherwise add to the drag.

A further object of the invention is to provide a propulsion device for water craft that is simple in construction and its use and is economical to manufacture and easy to install. It can be used in very shallow water and gives added safety in proximity to water skiers or bathers.

Further objects and advantages of the invention will be more clearly apparent during the course of the following description, reference being had to the accompanying drawings wherein has been illustrated a preferred form of the device and wherein like characters of reference are employed to denote like parts throughout the several figures.

Referring to the drawings:

FIGURE 1 is a view partly in side elevation and partly in section showing the invention supported upon a stern portion of a water craft,

FIGURE 2 is an enlarged top plan view of the device as illustrated in FIGURE 1,

FIGURE 3 is a transverse vertical section taken substantially on line 3—3 of FIGURE 2,

FIGURE 4 is a fragmentary section taken substantially on line 4—4 of FIGURE 1,

FIGURE 5 is a diagrammatic illustration showing the motion and water displacement as performed by one outward motion of the propelling blades, and

FIGURE 6 is a similar view showing the blades when swung in an opposite direction toward each other, creating a venturi effect.

Referring specifically to the drawings, the numeral 5 designates the stern portion of a water craft, such as the row boat or the like. The boat 5 is provided with the usual transom 6.

Bolted or otherwise connected to the transom 6, as by bolts 7 is a bracket, indicated as a whole by the numeral 8. The bracket 8 is provided with a base plate 9, that is apertured to receive the bolts 7. The plate 9 is provided with a pair of converging ribs 10, welded or otherwise connected to a cylindrical bearing sleeve 11. The bearing sleeve 11 rotatably supported a shaft or pin 12, having a

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lower head 13 and with the upper end of the shaft 12 being threaded at 14 to receive a securing nut 15. The bearing 11 projects a suitable distance above the ribs 10 for a purpose to be presently described.

Also engaging the upper end of the shaft 12 is a flat and preferably triangular mounting plate 16. The plate 16 is apertured at 17 for mounting upon the shaft 12 and whereby the plate may be rocked in a horizontal plane. The plate 16 at its rear corners is provided with journal bearings 18, receiving vertical rock-shafts 19. The rock shafts 19 are provided with fixed collars 20, supporting the shafts upon the plate 16 and preventing the shaft from dropping downwardly. Each of the shafts 19 are provided with a right angularly disposed crank arm 21 at their upper ends. The crank arms 21 have pivotal connection at 22, with forwardly extending links 23. The links 23 are pivotally connected at 24 upon opposite sides of a hand crank 25, having a vertical arm 26, that is pivotally supported at 27 to the forward end of the plate 16. The handle 25 is provided with a friction grip 28 whereby the handle 25 may be pumped up and down for movement of the links 23 and to cause the cranks 21 to rotate the shafts 19 in opposed relation. The journal bearings 18 are also duplicated at the lower end of a gusset plate 18' formed integral with the plate 16.

Fixed upon the lower extremities of the rock shafts 19 are rearwardly tapered propeller blades 29. The blades 29 are fixed to the lower terminal ends of the rock shafts 19 by set screws 30. The lower extremities of the rock shafts may be non-cylindrical or possibly serrated to prevent any tendency of the hub portions 31 of the blades 29 from turning with respect to the shaft 19 or, any suitable bushing may be installed within the hubs 31 and bonded thereto but of course numerous means may be employed to connect the blades to the lower ends of the rock shafts. The blades 29 may be formed of rubber, plastic or any other suitable material that may be capable of flexing as the rock shafts are oscillated. The forward end of the blades may be notched as indicated at 32.

Operation

The bracket 8 having been mounted upon the transom of the boat 5 in any desirable manner, the plate 16 is pivotally connected to the pin 12 and secured against displacement by the nut 15. The plate 16 is now free to rotate in a horizontal plane under the influence of crank arm 25 and whereby the propelling action of the blades 29 may be continuous during any lateral movement of the crank arm 25. Thus, during the pumping action of the crank arm 25 to oscillate the rock-shafts 19 and a simultaneous lateral movement of the crank arm 25, the propelling action of the blades 29 will continue to impart a driving movement to the boat and in the direction of the lateral movement of the crank arm 25. The plate 16 constitutes the main actuating frame, since it supports the crank arm 25, the rock shafts 19 and the links 23, all being so mounted upon the pin 12 that they are moveable in a horizontal plane by the crank arm 25 and causing the shafts 19 to be contra-rotating with respect to each other.

As the crank arm 25 is lifted upward, the links 23 rotate the rock shafts 19 in a direction to swing the blades 29 outwardly, such as indicated in FIGURE 5. The movement of the blades 29 functions in a manner somewhat similar to the tail of a fish, creating a combined motion between the blades 29, first trapping water between the blades and then as the crank 25 is moved downward, the blades 29 are moveable toward each other as indicated in FIGURE 6, squeezing the water from between the blades much in the nature of a venturi tube and creating a forward thrust to the craft. The stabilizer propellers or blades 29 as previously described are formed of relatively strong but flexible material, such as rubber or plas-

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tics and permits the blades to be moveable toward and from each other according to the pumping action of the crank 25. Simultaneous with the propulsion of the craft, the crank 25 may be swung laterally, while at the same time maintaining the pumping action or propulsion of the blades 29 and such action varies the line of force imparted by the blades in accordance with the angularity of the crank 25, functioning to steer the boat in any direction without interfering with the forward propulsion thereof. Various alterations and rearrangement of the stabilizer propellers may if desired, be constructed to move forward or back on the shaft to gain a possible advantage in power or speed.

It will be apparent from the foregoing that a very novel form of combined propulsion and steering mechanism has been provided for relatively light draft boats. The structure is simple, has few parts that may be economically manufactured and assembled with a minimum of effort. It will of course be obvious that the elements of the invention will be manufactured of a material having a high degree of resistance to corrosion.

It is to be understood that the invention is not limited to the precise construction shown, but that changes are contemplated as readily fall within the spirit of the invention as shall be determined by the scope of the subjoined claim.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

A combined propulsion and steering device for water craft that comprises a rigid bracket for fixed attachment to a stern portion of the craft and substantially central with respect to the center line of the craft, the bracket being provided with a vertical cylindrical bearing, a plate pivotally supported upon the bearing and rotatable

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through the medium of a pin extending through the bearing and the plate, the plate being flat and generally triangular in shape, a rear portion of the plate being provided with vertically aligned and spaced apart journal bearings, rock shafts rotatable in the bearings and with the rock shafts being vertically disposed and having their lower extremities submerged in the water, the upper ends of the rock shafts being provided with cranks, a hand crank that is pivotally supported upon the forward end of the plate to swing in a vertical plane, links pivotally connected through the last named crank and also to the cranks of the rock shafts and whereby vertical swinging movement of the last named crank will impart an oscillatory movement to the rock shafts through the medium of the links, the lower ends of the rock shafts being provided with propulsion blades, the blades being flexible and streamlined longitudinally, the blades having fixed connection to the rock shafts whereby to prevent relative rotation of the blades with respect to the rock shafts, the movement of the hand crank causing the blades to swing toward and from each other for impinging on the water in a progressive series of venturi movements and whereby to propel the boat in a forward direction or in a lateral direction in accordance with the lateral positioning of the hand crank.

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