R. B. OWEN.

MARINE PROPULSION MECHANISM.

APPLICATION FILED OCT. 22, 1915.

1,302,957.

Patented May 6, 1919.

2 SHEETS—SHEET 1.

Fig. 1.

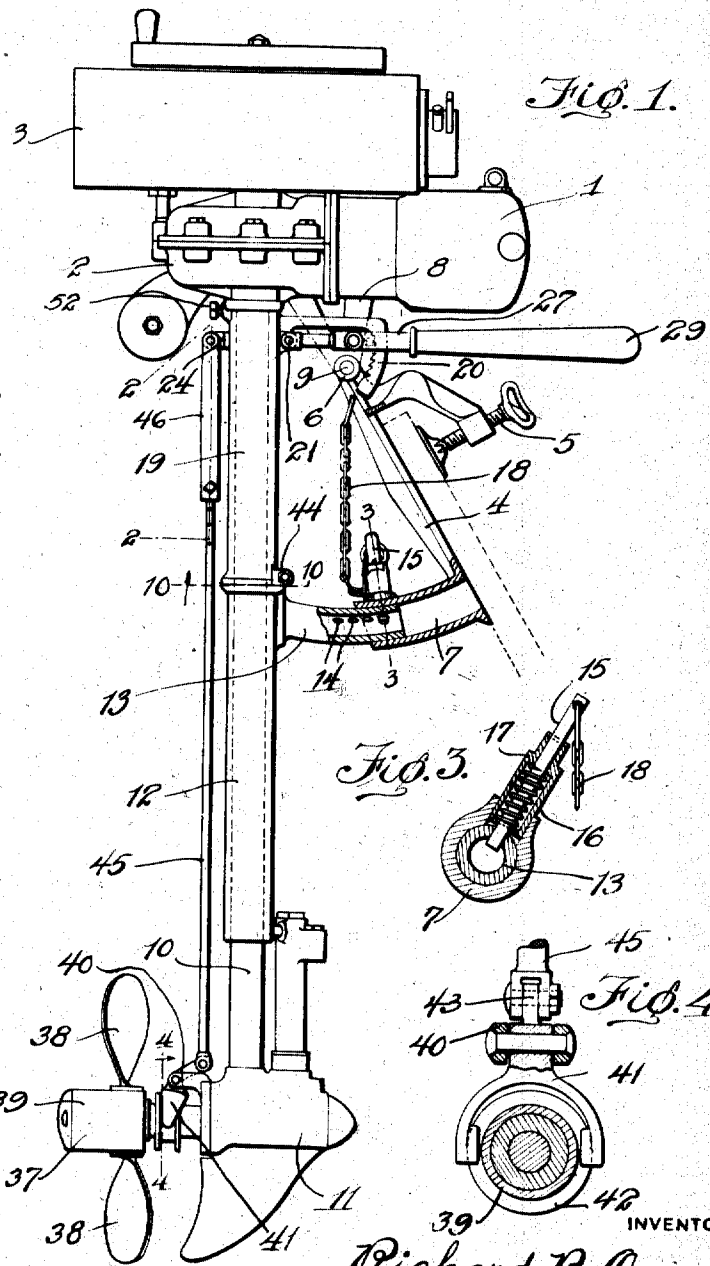


Fig. 2.

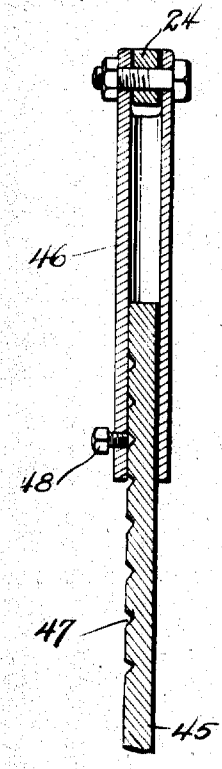


Fig. 3.

Fig. 4.

INVENTOR

Richard B. Owen

WITNESSES

W. B. Mulligan

Lloyd W. Patch

R. B. OWEN.

MARINE PROPULSION MECHANISM.

APPLICATION FILED OCT. 22, 1915.

1,302,957.

Patented May 6, 1919.

2 SHEETS—SHEET 2.

Fig. 5.

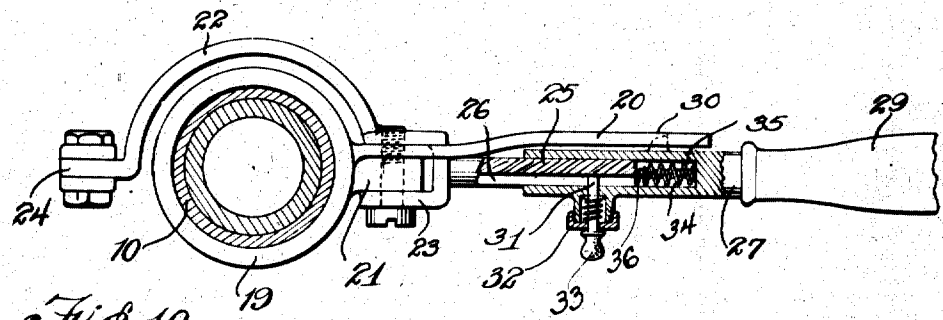


Fig. 10.

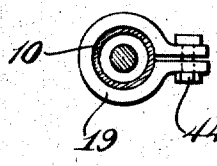


Fig. 6.

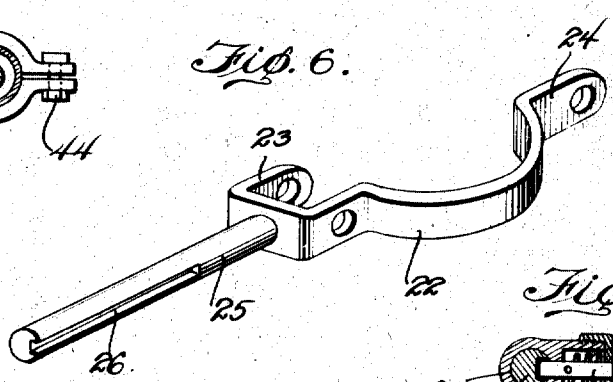


Fig. 8.

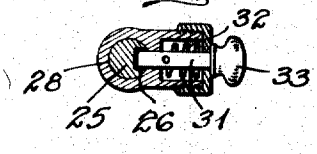


Fig. 7.

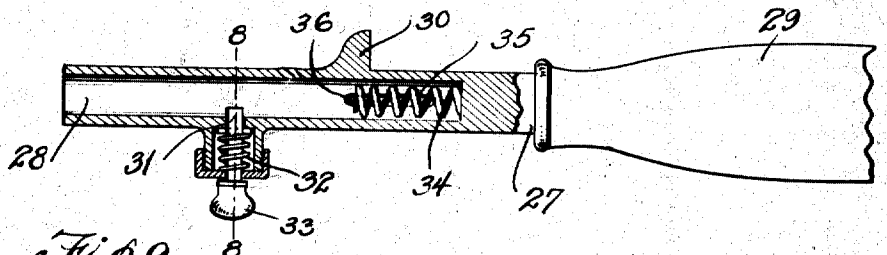
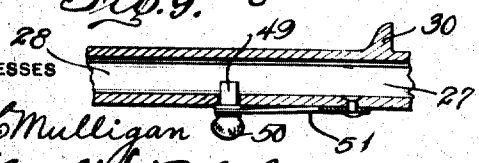


Fig. 9.



INVENTOR

Richard B. Owen

WITNESSES

W. H. Mulligan

Lloyd W. Patch

UNITED STATES PATENT OFFICE.

RICHARD B. OWEN, OF WASHINGTON, DISTRICT OF COLUMBIA.

MARINE PROPULSION MECHANISM.

1,302,957. Specification of Letters Patent. Patented May 6, 1919.

Application filed October 22, 1915. Serial No. 57,326.

To all whom it may concern:

Be it known that I, RICHARD B. OWEN, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Marine Propulsion Mechanisms, of which the following is a specification.

An object of my invention is to provide a marine motor, having a so-called reversing propeller arranged to have the angular disposition or pitch of the blades changed to reverse the direction of drive and to vary the speed and, in which the propeller is mounted to be capable of swinging movement, with means arranged to actuate the speed and reverse control from the steering handle or lever.

A further object is to adapt the parts to be used in connection with a motor mounted and supported on the boat to permit swinging movement to raise the propeller out of the water and to arrange the steering handle to be removed when the motor is tilted or swung to the raised position.

Yet another object is to construct the mechanism to be used with a propeller mounted to be adjustable vertically to vary the depth of the propeller, and to form the parts of the propeller blade shifting means to hold the blades at the desired setting when once adjustment has been made.

With other objects in view, which will be referred to, my invention consists in the peculiar combination and novel arrangement of parts, such as will be hereinafter more fully described in connection with the accompanying drawings and more particularly pointed out in the appended claims.

In the drawings:

Figure 1 is a view in side elevation of a motor with my invention applied thereto and with parts broken away to more clearly illustrate the structure.

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

Fig. 3 is a fragmentary sectional view on the line 3—3 of Fig. 1.

Fig. 4 is an enlarged detail sectional view of the propeller operating yoke taken on the line 4—4 of Fig. 1.

Fig. 5 is an enlarged transverse sectional view of the steering and propeller shifting handle.

Fig. 6 is a perspective view of the rocking arm.

Fig. 7 is an enlarged sectional view of a portion of the structure shown in Fig. 5.

Fig. 8 is a transverse sectional view taken on the line 8—8 of Fig. 7.

Fig. 9 is a detail view showing a modification.

Fig. 10 is a transverse sectional view taken on the line 10—10 of Fig. 1.

The power means, which in the present instance is shown as an internal combustion engine comprises the cylinder 1 and crank case 2 which may be of any desired design and construction, and it will be understood that the engine might be of the single-cylinder or two-cylinder type and that the features thereof and the design and construction of the fuel tank 3 may be varied without restriction as these parts do not constitute a part of the invention and the structure to be hereinafter described may be applied with a number of various forms of power means.

Any form of supporting bracket which will permit the mounting of the engine to be capable of swinging or tilting movement to raise the propeller out of the water may be used. In the present illustration, the bracket 4 is secured in place on the stern of the boat by the clamp screws 5, and at its upper end has the pivot bearings 6, an arcuated or segmental sleeve 7 being provided on the lower portion of the bracket to extend rearwardly from the stern transom of the boat. An engine bracket 8 is secured to the cylinder or to the crank case, or both as the particular design of the engine may require, and this engine bracket is mounted on the pivot bearing 6 of the boat bracket 4 by a pin or bolt 9 to have free swinging movement. The usual drive shaft housing 10 depends from the motor and has the gear casing 11 carried by the lower end, and a bearing sleeve 12 is mounted around this housing 10 and is provided with an arcuated or segmental stud 13 which in its arcuated form is made on the same radius as the bore of the sleeve 7 of the boat bracket 4.

It is the intention that the motor struc-

ture shall be swung or tilted around the pivot pin 9 to throw the propeller to a position entirely out of the water to permit clearing of the propeller of weeds, in beaching the boat, or when for any other reason it is found desirable that the propeller should be moved from its submerged position, and in the tilted or raised position the weight of the engine or motor proper together with the gasolene or fuel tank will counterbalance the weight of the propeller and the motor will be held in the tilted position. However, when the parts are swung to the operative relation almost the entire weight of the propeller mechanism is outside of the boat and beyond a dead center and, further, the propeller is exerting a pushing or pulling strain tending to swing the parts in the one direction or the other around the pivot pin 9. When the parts are fitted in the operative relation, the stud 13 telescopes into the sleeve 7, and to hold the parts against the swinging or tilting movement as hereinbefore set forth and to allow adjustment of the mechanism to fit the angle of stern of various types of boats, the plurality of openings 14 are formed along the length of the stud 13, and a pin 15 is mounted on the sleeve 7 to fit into the various openings 14 and hold the stud 13 against movement within the sleeve 7.

It is preferable that this pin 15 have a spring 16 confined within the housing 17 by which the pin is guided to maintain the operative relation of the pin, and a chain 18 or other suitable means may be connected with the pin 15 to permit manual withdrawal of the same without leaning over the stern of the boat and grasping the pin. A sleeve 19 is mounted around the housing 10 between the bearing sleeve 12 and the crank case 2 of the engine and the housing 10 has free sliding and turning movement within this sleeve 19. At its outer end the sleeve 19 has a segmental rack 20 and a pivot bearing 21 is provided on the sleeve 19 at the center of the segmental rack.

The rocking lever 22 has a bifurcated bearing portion 23 and one of the arms of this bearing portion is extended and bowed to fit around this sleeve 19 and at a diametrically opposite point is formed in a bearing 24. A cylindrical extension 25 is provided to project from the bearing portion 23 of the rocking arm to lie substantially in line with the bearing 24, and this cylindrical extension has a groove or keyway 26 formed longitudinally preferably at one side thereof. A handle 27 has a central bore 28 of a diameter to receive the cylindrical extension 26 of the rocking arm and to permit endwise sliding movement thereof, and if desired a cushion handle 29 may be fitted on the member 27 to absorb shocks and vibration incident to the operation of the mechanism. A tooth 30 is provided to extend laterally from the handle portion 27 and is formed to engage the teeth of the segmental rack 20 which are preferably of the ratchet type with the biting faces disposed downwardly, and as has been hereinbefore set forth it is a purpose of my invention to provide a handle which can be fitted in an operative relation and which when it is desired to tilt the motor to the raised position can be removed.

A spring-held pin 31 is mounted to project through the wall of the bored portion of the handle 27 and the spring 32 acts to normally hold this pin at a position of projection into the bore 28. When it is desired to fit the handle in an operative position, the knob 33 on the outer end of the pin 31 is grasped and the pin is withdrawn from its projection within the bore 28, against the tension of the spring 32, after which the handle may be fitted over the cylindrical extension 25 with the tooth 30 in a position of vertical extension and after the tooth 30 has been moved past the segmental rack, a torsional movement transmitted to the handle will swing the tooth 30 to a position within the segmental rack 20 and the pin 31 will come into registry with the keyway 27 to hold the handle against further torsional movement in either direction.

It is preferable that some means be provided to hold the tooth 30 of the handle 27 in an engaged position with the teeth of the segmental rack 20, and to accomplish this object a coil spring 34 is mounted at the inner end of the bore 28 to engage with the outer end of the tubular extension 25 thus exerting a force to bring the tooth 30 into engagement with the teeth of the rack 20. When the handle is removed from the extension 25 of the rocking arm, it is desirable that some means be provided to prevent displacement of the spring 34, and to accomplish this purpose the handle member 27 has the elongated slots 35 formed through the side walls of the bored portion and a pin 36 is received through these elongated slots to extend transversely across the bore 27 at a point to hold the spring within the orifice. When the extension 25 is inserted within the bore 28, the outer end of the extension comes to a bearing against the pin 36 and this pin in turn acts against the spring 34.

The propeller 37 which may be of standard type is mounted to be driven from the propeller shaft, which motion is transmitted from a drive shaft, this shaft in turn receiving its impetus from the operation of the motor, and as these various features are of standard construction they are not here shown in detail. With the form of propeller illustrated, the blades 38 are maintained at a fixed point and are capable of radial or turning adjustment on a substan-

tially central axis, this adjustment being effected through movement of the hub 39 in the direction of the longitudinal extent of the propeller shaft. The bearing arms 40 are provided on the gear casing 11 and a propeller shifting yoke 41 is pivotally mounted in these bearing arms, a collar 42 being provided on the propeller hub to receive the bearing lugs of the yoke and transmit a shifting movement through the hub to the propeller blades as the yoke is rocked about its pivotal mounting in the bearing arms 40. The rocking arm 43 is a part of the yoke 41 and motion is transmitted thereto from the extension arm 22 of the rocking arm carried by the sleeve 19.

The sleeve 19 has a clamp portion at the lower end thereof, as is better illustrated in Fig. 10, and by loosening the clamp bolt 44 the housing 10 may be moved longitudinally within the sleeve 19, and then by again tightening this clamp bolt the housing will be held in the adjusted position and it is thus possible to procure various adjustments of the depth at which the propeller will be disposed from the boat bracket to accommodate the mechanism to boats having various types of stern transoms. To take care of the adjustments thus afforded for the propeller, it is necessary that an adjustable connection be provided between the bearing 24 and the rocking arm 43 of the yoke 41, and to accomplish this purpose an operating rod 45 is pivotally connected with the rocking arm 43 and is extended downwardly substantially parallel with the housing 10, and an operating sleeve 46 is connected with the bearing 24 and is telescoped over the upper end of the operating rod 45. A plurality of recesses 47 are formed in alinement on one side of the operating rod 45 for a considerable length at the upper end and set screw 48 is mounted through the sleeve 46 in line with these recesses 47 so that as the proper adjustment of the propeller is obtained this set screw may be turned to an inoperative relation and then when the propeller has been set, the set screw can be turned into the proper recess 47 and the operating rod 45 and the operating sleeve 46 will be substantially continuous and rigid between the bearing 24 and the rocking arm 43.

In Fig. 9 I have disclosed a slightly modified form of pin which might be used to hold the handle member 27 in position on the cylindrical extension 25 of the rocking arm, and in this modified form a pin 49 passes through an orifice formed through the side wall of the bored portion of the handle member in line with the keyway 26 and at its outer end has the knob 50 to permit withdrawal of the pin from extension into the bore 28, a flat leaf-spring 51 being connected with the pin and secured to the handle extension to normally hold the pin in a position of projection into the bore 28.

In some connections it may be desired to hold the housing 10 rigidly against turning movement and to accomplish steering by the use of a rudder fitted to be operated independently of any turning or swinging movement of the propeller, and for this purpose a set screw 52 is fitted through a boss on the sleeve 19 to be set against the bearing or some other stationary part of the crank case of the motor.

In the use of the structure, the motor is fitted to the stern transom of a boat and is secured in place thereon by the bracket 4 after which the proper adjustment to obtain the best working position of the propeller is made through the adjustment of the pin 15 to the proper opening 14, the pin 31 is then withdrawn from the orifice 28 of the handle against the tension of the spring and the handle may be fitted in place as has been hereinbefore described after which the spring 35 tends to hold the tooth 30 of the handle in operative engagement with the teeth of the segmental rack 20. When the set screw 52 is in a disengaged relation turning of the handle 27 to the one side or the other will cause the propeller to be correspondingly swung laterally and steering will be accomplished in this way, then when pressure is exerted to move the handle inwardly against the tension of the spring 34 the tooth 30 will be disengaged from the teeth of the segmental rack 20 and the handle may be swung up or down in a substantially vertical path to impart movement to the propeller yoke 41 which will, in turn, cause the hub 39 to be moved forwardly or rearwardly to change the angle of setting of the blades of the propeller. As the teeth of the segmental rack 20 are made of ratchet form, it will be seen that the handle may be moved downwardly in the swinging path without necessity of the inward pressure to overcome the tension of the spring 34 as the tooth 30 will in this downward movement ride over the back faces of the teeth.

When the set screw 52 is turned to set against the immovable structure of the engine, the sleeve 19 will be held in a relation to maintain the uniform setting of the gear casing 11 through the connection of the housing 10 and the propeller will drive in a straightforward direction and in this adaptation any form of rudder or other steering means may be used, it being understood that the handle would in this connection be used only to procure the various adjusted settings of the propeller.

While I have herein shown and described only specific forms of my invention, it will be understood that various changes might be made in the form and arrangement of the parts without departing from the spirit

and scope of my invention, and hence I do not wish to be limited thereto except for such limitations as the claims may import.

I claim:—

1. The combination with an outboard motor mounted for tilting movement, of a reversing propeller, a reversing mechanism for said propeller, and a detachable endwise movable handle engaging said reversing mechanism for locking said propeller in an adjusted position and to be removed to permit tilting movement of said propeller.

2. The combination with an outboard motor, of a reversing propeller, swinging means arranged to actuate said propeller to secure the desired adjustment, a segmental rack, and a slidably mounted handle removably fitted on said actuating means, and coöperating with said segmental rack for locking said propeller in an adjusted position.

3. In combination with an outboard motor, a reversing propeller, a rocking arm connected to actuate said propeller, a segmental rack mounted adjacent said rocking arm, and a handle detachably mounted on said rocking arm and normally engaging said rack and mounted for endwise movement for disengaging said segmental rack.

4. The combination with an outboard motor, of a reversing propeller, a rocking arm connected to actuate said propeller, a slidably mounted detachable handle carried by said rocking arm, a segmental rack associated adjacent said rocking arm, yieldable means for normally forcing said detachable handle in engagement with said segmental rack for locking said rocking arm in an adjusted position, and means for holding said handle against rotation upon said rocking arm.

5. The combination with an outboard motor, a reversible propeller, a rocking arm connected to actuate said propeller, said arm provided with a longitudinally extending groove, a detachable handle slidably mounted upon said arm, a spring pressed plunger engaging said groove and holding said handle against rotating movement upon said arm, a segmental rack mounted adjacent said arm, a tooth carried by said handle and adapted to engage said segmental rack, and yieldable means carried by said handle and normally urging said tooth in detachable engagement with said segmental rack.

6. In combination with a power means, a reversing propeller, a rocking arm coöperating with said propeller, a handle mounted upon said rocking arm, a spring carried by said handle and engaging one end of said rocking arm for normally urging said handle outwardly, a segmental rack, a tooth carried by said handle and engaging said segmental rack, and means for holding said handle against accidental detachment from said rocking arm.

In testimony whereof I affix my signature in presence of two witnesses.

RICHARD B. OWEN.

Witnesses:

IDALENE T. COOK,

LELIA A. PRICE.