O. K. NICOLAYSEN.

DETACHABLE PROPELLING DEVICE FOR ROWBOATS.

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1,234,929. Patented July 31, 1917.

Fig. 3

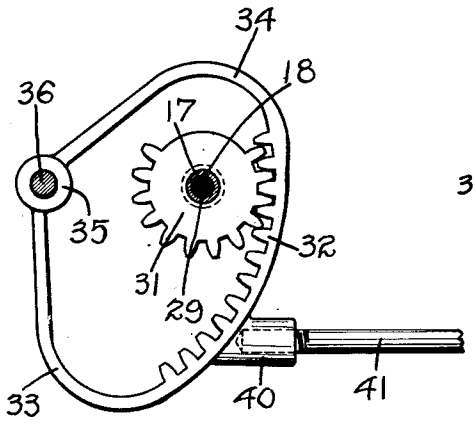


Fig. 4

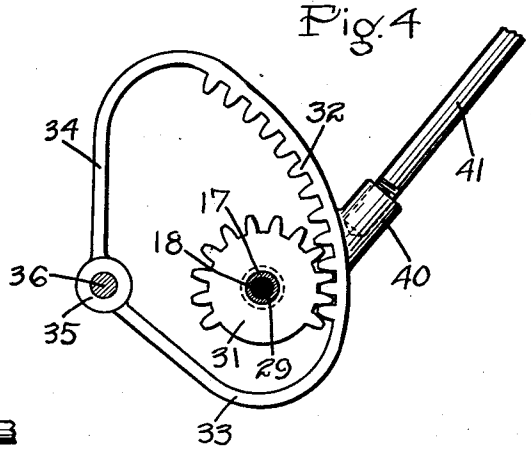


Fig. 1

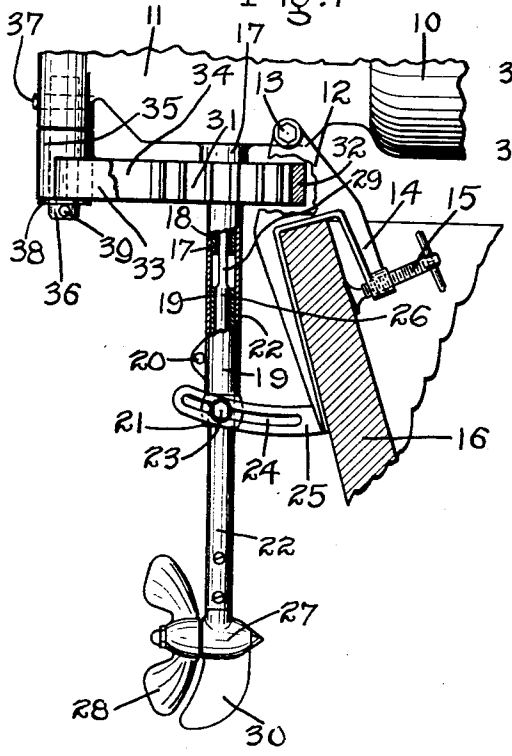
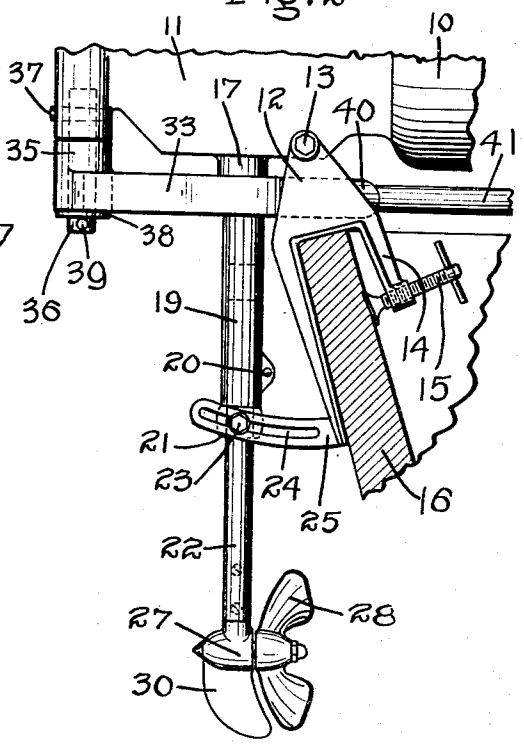


Fig. 2



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UNITED STATES PATENT OFFICE.

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DETACHABLE PROPELLING DEVICE FOR ROWBOATS.

1,234,929. Specification of Letters Patent. Patented July 31, 1917.

Application filed April 8, 1916. Serial No. 89,748.

To all whom it may concern:

Be it known that I, OLUF K. NICOLAYSEN, a subject of the King of Norway, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Detachable Propelling Devices for Rowboats, of which the following is a specification.

My invention relates to detachable propelling devices for rowboats and the like and has for its object to provide means for angularly adjusting and reversing the direction and operation of the propeller independently of the motor for operating said propeller. In carrying out my invention I provide a housing for a vertical drive shaft in which the propeller is journaled, which housing may be rotated to permit the propeller to face in any direction and so cause the boat to travel as desired. By means of a gear rigidly attached to the shaft housing and coöperating with a manually-controlled member having an internal segment gear cooperating with the first-named gear and a handle within easy reach of the operator, the shaft housing and the propeller may be rotated as desired.

In carrying out my invention I provide a pivoted operating member comprising a yoke member having an internal gear segment meshing with a spur gear or pinion, the pivot of the yoke member being at the rear of and in line with the pivot of the spur gear. The detachable marine engine is primarily devised for use for small boats such as rowboats having a rear wall and a rear seat adjacent thereto. The yoke member is provided with a handle, preferably at one side thereof, which extends forward conveniently adjacent the rowboat seat. It will be apparent that this construction not only gives a relatively long leverage for a comparatively short tiller arm, but also, because of the rearward pivoting of the yoke member, gives for forward steering a true tiller action in oscillating the propeller or rudder connected with the spur gear. That is, when the tiller arm is moved in one direction the rudder or propeller is oscillated in the opposite direction, just as is true of the common tiller and rudder of a rowboat or sailboat. Furthermore, the yoke member is so proportioned to the spur gear and the tiller arm so connected with the yoke member, that when the tiller arm extends directly ahead the propeller and rudder are positioned for steering straight ahead. This will be, as shown in the drawings, when one end of the segment is in coöperative relation with the spur gear. The extent of the segment is such that a movement in one direction from this position will produce the maximum effective forward turning action, and then engagement of the yoke member with the spur gear or pinion will block further movement in that direction. For reversing, the segment will be swung until the other end thereof comes into coöperation with the spur gear, at which end the same range of reverse control is provided and is limited in the opposite direction of movement of the yoke member by corresponding engagement of the other side of the yoke member with the spur gear.

The full objects and advantages of my invention will appear in connection with the detailed description thereof and are particularly pointed out in the claims.

In the drawings, illustrating the application of my invention in one form,—

Figure 1 is a part sectional side elevational view of a portion of a marine engine embodying my invention and attached to a rowboat with the parts positioned to cause the boat to travel in a forward direction. Fig. 2 is a view similar to Fig. 1 with the parts positioned to cause the boat to travel in the opposite direction. Fig. 3 is a plan view of the reversing and steering mechanism set as indicated in Fig. 1. Fig. 4 is a view similar to Fig. 3 with the parts set as indicated in Fig. 2. Figs. 1 and 2 show one form of a detachable marine engine applied to the rear of a rowboat. An engine comprising a cylinder 10 and a crank case 11, as well as other customary parts not shown in the drawings, is pivotally secured to a casting 12 by bolts 13 screwed into said crank case. Casting 12 is provided with a U-shaped member 14 in which is screwed a clamping screw 15 by means of which the device may be secured to the back of a rowboat 16. As will be noted, the engine is horizontally positioned and is provided at the lower portion of the crank case 11 with a downwardly-projecting bearing 17 through which a crank shaft 18 extends. A partly split tubular sleeve 19 is journaled about the end of the crank-case bearing 17 and is adapted to surround and be secured to a similar tube 22 by means of a bolt 20 screwable through the divided parts of the sleeve

19. A collar 21 is loosely positioned upon the sleeve 22 and abuts against the end of the sleeve 19. A bolt 23 passes through a slot 24 in a segmental arm 25 formed integral with the casting 12 and is screwed into the collar 21. By this means the collar may be clamped to the segment at any desired position on the segment and the angularity of the crank shaft 18 with respect to the boat may be varied at will. The slot 24 is in an arc of a circle having the center of bolt 13 as a center and hence causes said collar 21 to remain at a definite depth below the motor proper, holding the tube or sleeve 19 correctly positioned.

The driving means from the engine to the propeller are best shown in Fig. 1. A drive shaft 26 is journaled within the tube 22 and extends throughout the length of the same into a propeller housing 27 where, by means of a pair of miter gears not shown in the drawings a drive between a propeller 28 and said shaft is effected in the usual manner. The upper end 29 of shaft 26 is preferably made square and is adapted to slide into the shaft 18 to form a splined connection therewith. By shifting the position of the sleeve 19 upon the tube 22 the propeller 28 can be made to descend into the water at various depths to conform to different sizes of boats and for other similar purposes to correctly position the propeller in respect to the same. A rudder 30 may be formed integral with the housing 27 or may be situated and operated in any other suitable manner.

In steering and reversing the direction of travel of the boat I employ the following mechanism: Attached to the upper end of the sleeve 19 is a spur gear 31 which may have teeth on only a portion of the periphery thereof as shown in Figs. 3 and 4, or which may have teeth completely encompassing the same. This gear meshes with an internal gear segment 32 having members 33 and 34 inclosing the gear 31 and connecting the segment 32 with a hub 35, and comprising in effect a yoke member surrounding the gear 31 and having the internal gear segment 32 coöperating therewith. Segment 32 is pivoted to the extreme rear portion of the crank case 11 by means of a stub shaft 36 which passes through hub 35 and is secured to said crank case by a pin 37 and has on the end thereof a washer 38 and a pin 39 for holding said gear segment in place. A lug 40 is formed integral with segment 32 and has screwed into it a long rod 41 which serves as a handle for oscillating said segment. By this means the gear 31 can be rotated as shown in Fig. 3 to cause the propeller to face as shown in Fig. 1 in driving the boat forward, or it may be rotated as shown in Fig. 4 to position the propeller as shown in Fig. 2 to drive the boat backward. Any oscillations of this gear from the position shown in Figs. 3 and 4 will hence tend to steer the boat in the usual manner, the rudder 30 assisting in said operation. It will be noted in Fig. 3 that the rod 41 in that position of the segment 32 extends out substantially parallel to the keel of the boat. This greatly facilitates steering in a forward course as the direction of the handle is substantially straight and the operator is able to tell when he is traveling in a direct course. In order to have the lug 40 oscillate more nearly the same distance on both sides of the center line of the engine, said lug is offset to one side thereof, as clearly shown in Fig. 3.

The parts in the position shown in Fig. 3 are so related that the rudder and propeller are positioned for driving and steering directly ahead, as indicated in Fig. 1. Correspondingly, the parts as shown in Fig. 4 are related and positioned so as to drive and steer directly in reverse position, as indicated in Fig. 2. The yoke portion 34 is so positioned relative to gear 31 that it will engage said gear and limit movement thereof by opposite movement of the yoke member to the maximum effective forward turning action in one direction. Correspondingly, the part 33 by engagement with gear 31 will limit reverse steering action in one direction. The intervening portion of the segment will care for the maximum forward steering action and reverse steering action in the opposite directions. In this manner, with a yoke member of relatively small range of movement a complete range of steering action in both direct and reverse directions is provided, and in no position can the parts become disassociated or other than effectively related. The pivot 36 of the yoke member being at the rear of and in line with shaft 18 gives a relatively large leverage and also causes the propeller and rudder to operate in reference to movement of tiller 41 as in a common rudder and tiller construction. The provision of the tiller arm 41 at one side of the yoke member gives ample room for the pilot to sit in the rear seat of the rowboat and move the arm from one extreme position to the other as steering and driving requirements may necessitate.

The advantages of my invention are manifest. The engine remains stationary after being once attached and adjusted to the boat, which is especially advantageous in cranking the engine as it is only necessary to use one hand in performing this operation. The operating handle projects in toward the boat from below the engine and hence does not require that the operator geat near the exposed fly-wheel and starting crank usually positioned on the upper side of such engines. By giving the steering handle a quick jerk to the side the direction of travel

of the propeller can be instantly reversed and the power of the engine used as a brake. To perform this function it becomes evident that no clutch is required and it does not become necessary to change the speed of the propeller shaft or sever driving connections with the engine shaft, which it is well-known affects the operation of the engine.

I claim:

1. In a detachable marine engine a propeller and means for oscillating the same, comprising a pinion, a yoke member surrounding said pinion and pivoted to the rear thereof and having an internal gear segment coöperating with said pinion, said segment engaging said pinion in relation to the propeller and rudder so as to give a maximum range of forward driving oscillations at one side of the center of said segment, and a maximum range of reverse driving oscillations at the other side of the center of said segment.

2. In a detachable marine engine a propeller and means for oscillating the same comprising a pinion, a yoke member surrounding said pinion and pivoted to the rear thereof and having an internal gear segment coöperating with said pinion, said segment engaging said pinion in relation to the propeller and rudder so as to give a maximum range of forward driving oscillations at one side of the center of said segment and a maximum range of reverse driving oscillations at the other side of the center of said segment, and the sides of said yoke member being so positioned as to limit the oscillations at either end by engagement with said spur gear.

3. In a detachable marine engine a propeller and means for oscillating the same comprising a pinion, a yoke member surrounding said pinion and pivoted at the rear thereof and having an internal gear segment coöperating with said pinion so that movement of said yoke member will oscillate the pinion and the propeller through maximum ranges of direct and reverse driving action, and a tiller handle secured to said yoke member spaced from the line of centers of oscillation of said yoke member and pinion and positioned so that the parts are held for direct forward driving action when the tiller handle is parallel with the line of said pivots.

4. In combination with the supporting frame of a marine engine, a vertical supporting member rotatably suspended from the frame, a propeller journaled upon said supporting member with its axis of rotation at right angles thereto, means to drive the propeller, a gear on said supporting member, and a yoke member having an internal gear segment meshing with said gear for rotating the supporting member, said yoke member being pivotally connected to the frame at the rear of the supporting member.

5. In combination with the supporting frame of a marine engine, a vertical supporting member rotatably suspended from the frame, a propeller journaled upon said supporting member with its axis of rotation at right angles thereto, means to drive the propeller, a gear on said supporting member, and a yoke member having an internal gear segment meshing with said gear for rotating the supporting member, said yoke member being pivotally connected to the frame at the rear of the supporting member and in line with the axis of rotation of the supporting member.

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

OLUF K. NICOLAYSEN.

Witnesses:
F. A. WHITELEY,
H. A. BOWMAN.