March 20, 1951 A. C. TROESTER 2,545,502

STEERING PROPELLER AND RUDDER MOUNT FOR BOATS

Filed Feb. 2, 1948 2 Sheets-Sheet 1

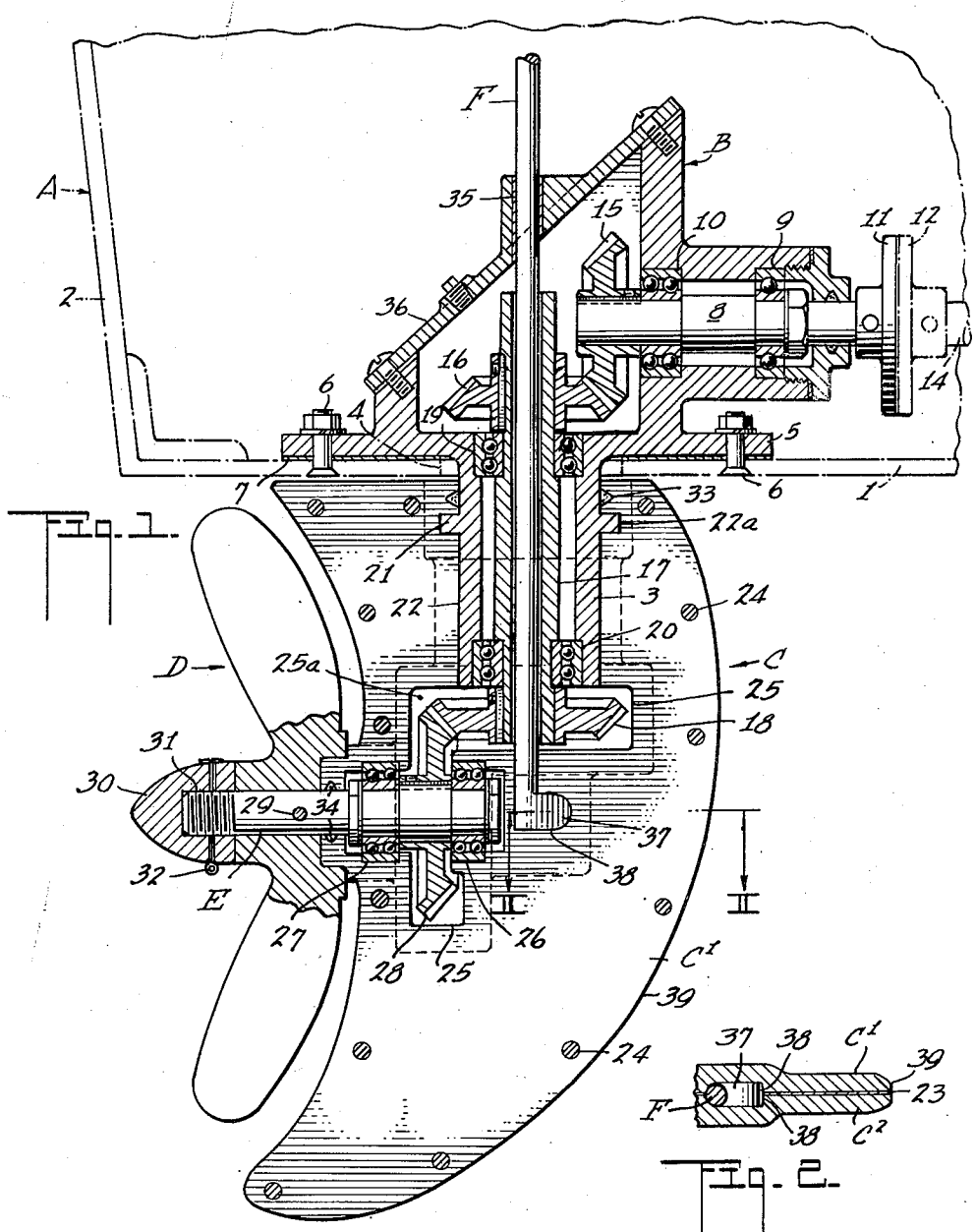


Fig. 1

Fig. 2

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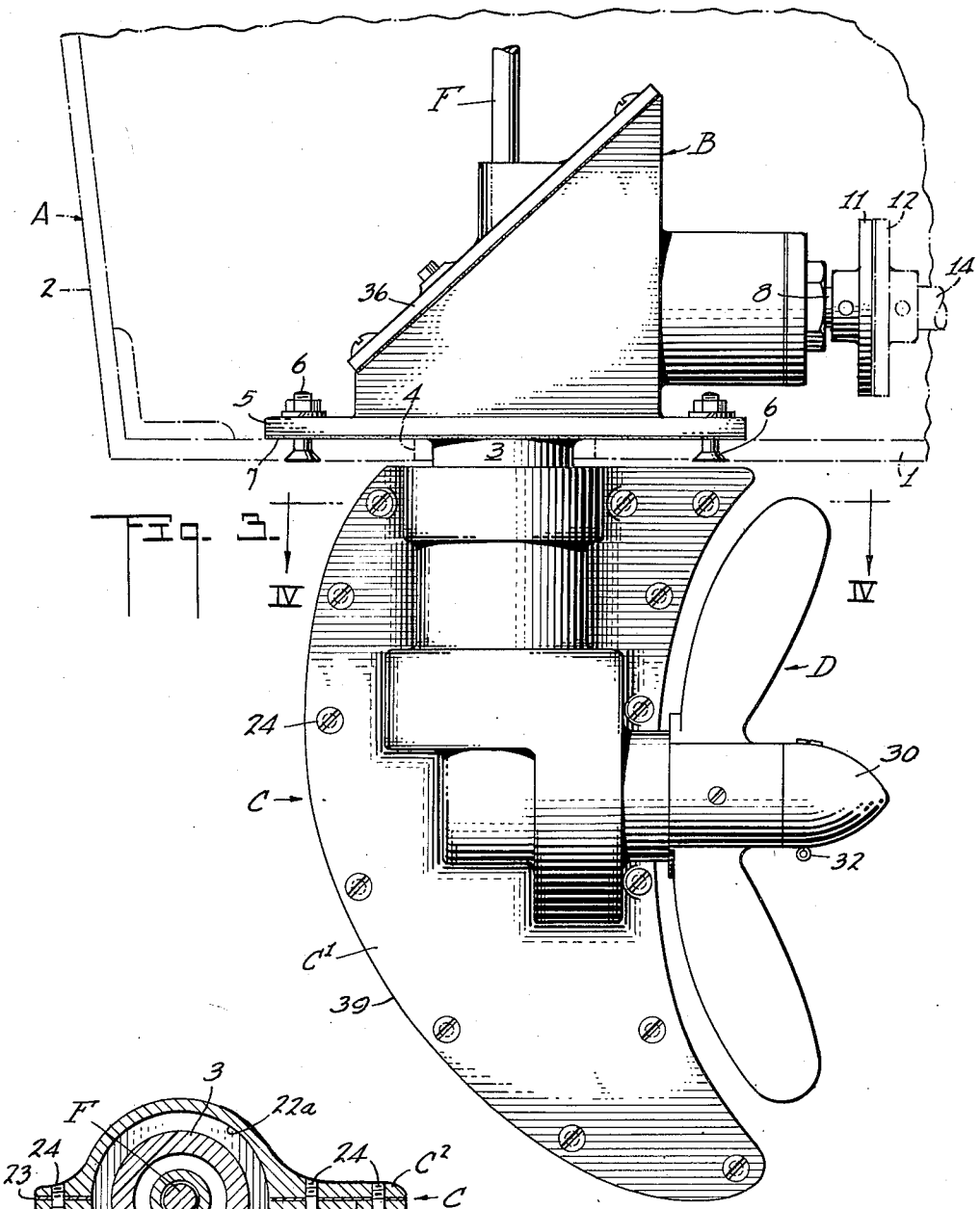


Fig. 3.

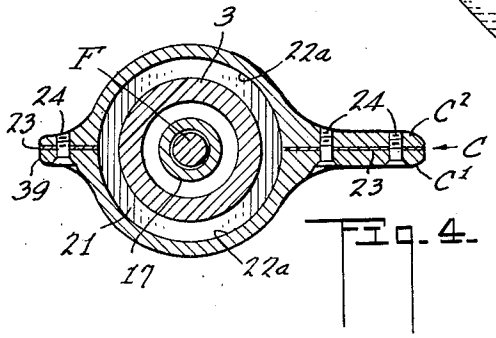


Fig. 4.

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STEERING PROPELLER AND RUDDER MOUNT FOR BOATS

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4 Claims. (Cl. 115—35)

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The present invention relates to improvements in propelling and steering apparatus for boats. It consists of the combinations, constructions and arrangement of parts hereinafter described and claimed.

An object of my invention is to provide a propelling and steering apparatus for boats, which may be swung as a unit into various angular positions for determining the course of the boat. The unit can be swung through a complete circle. Thus the boat can be propelled in any desired direction without reversing the engine.

More specifically described, I propose to provide a combined propelling and steering apparatus, which is mounted on a tubular housing projecting through the bottom of a boat. This housing has a pair of rudder plates swingable therearound. In turn, these plates revolvably support a propeller, and as the plates are swung into various angular positions, the propeller will swing therewith. The driving mechanism for the propeller extends through the tubular housing and rudder unit, and access thereto may be had readily by removing one of the rudder plates.

Another object of my invention is to provide a device of the character described, which is relatively simple in construction, yet durable and efficient for the purpose intended.

Other objects and advantages will appear as the specification continues, and the novel features will be set forth in the claims hereunto appended.

For a better understanding of my invention, reference should be had to the accompanying drawings, forming part of this application, in which:

Figure 1 is a longitudinal sectional view taken through my propelling and steering apparatus with the parts arranged to propel a boat ahead;

Figure 2 is a horizontal sectional view taken along the line II—II of Figure 1;

Figure 3 is a side elevation of my apparatus arranged to propel the boat astern; and

Figure 4 is a horizontal sectional view taken along the line IV—IV of Figure 3.

While I have shown only the preferred form of my invention, it should be understood that various changes, or modifications, may be made within the scope of the annexed claims without departing from the spirit thereof.

Referring to the drawings, it will be noted that I have shown a boat indicated generally at A and having a transmission box B mounted in the hull thereof. The boat includes a bottom 1 and a stern wall 2. This transmission box is formed with a tubular housing 3 projecting downwardly through an opening 4 fashioned in the bottom 1. A rudder unit C is rotatably supported on the portion of the tubular housing disposed below the boat for swinging through a complete circle

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around the tubular housing. The rudder unit revolvably carries a propeller D, which is swingable therewith.

Returning now to the transmission box B, Figures 1 and 3 illustrate this box as being provided with a base plate 5, which is anchored to the bottom 1 by bolts 6, or other suitable fastening means. A gasket 7 is interposed between the base plate and the bottom of the boat to preclude entry of water through the opening 4 into the interior of the hull.

The transmission B has a drive shaft 8 rotatably supported therein by bearings 9 and 10 (see Figure 1). The outer end of this shaft is provided with a flange coupling 11, which is operatively connected by a companion flange coupling 12 to a main drive shaft 14. The later is driven by an inboard engine (not shown) arranged in the hull. The inner end of the drive shaft 8 has a bevel gear 15 keyed thereto, which meshes with and turns a bevel gear 16 keyed to a transmission sleeve 17. The latter extends axially through the tubular housing 3 and has a bevel gear 18 keyed to the lower end thereof. Bearings 19 and 20 rotatably support the sleeve 17 in the housing 3, as clearly shown in Figure 1.

The exterior of the tubular housing 3 is fashioned with an annular flange 21 extending laterally therefrom. The rudder unit C, previously mentioned, includes a pair of rudder plates C1 and C2, which embrace the portion of the tubular housing 3 disposed below the bottom 1. These plates are positioned on opposing sides of the tubular housing and are made with recesses 22 for accommodating the latter. These recesses are enlarged, as at 22*a*, for the purpose of receiving the annular flange 21.

It will be apparent from Figure 1 that the plates C1 and C2 are retained from moving longitudinally of the tubular housing 3 by the annular flange 21 entering the enlarged recesses 22*a*. However, the rudder unit C can be swung through a complete circle about the tubular housing. These rudder plates are drawn toward one another against an interposed gasket 23 by a series of countersunk screws 24 or the like.

The confronting faces of the plates C1 and C2 are formed with pockets 25, which coact with one another to provide a gear-receiving compartment 25*a* on the interior of the rudder unit C. A propeller shaft E is revolvably mounted in bearings 26 and 27, which are supported by the rudder plates C1 and C2. A bevel gear 28 is keyed to the shaft E and meshes with and is driven by the gear 18. Accordingly, rotation of the transmission sleeve 17 will revolve the propeller shaft E. The bevel gears 18 and 28 are accommodated in the compartment 25*a*.

The propeller D is secured to the shaft E by a shear pin 29 and nut 30. The latter is threaded

onto the propeller shaft, as at 31, and retained in place by a cotter pin 32. In the event that the blades of the propeller should strike an obstruction, such as a submerged rock, the shear pin will give way to prevent material damage to the blades. However, the nut 30 will retain the propeller on its shaft.

The gasket 23 will preclude entry of water into the interior of the rudder unit C. As a further precaution, I have provided seals 33 and 34 around the tubular housing 3 and propeller shaft E, respectively.

In order to swing the rudder C and the propeller D into various angular positions about the tubular housing 3, I provide a steering shaft F. The latter extends downwardly through a bearing 35 provided in a cover 36 of the transmission box B. Figure 1 illustrates this steering shaft as extending axially through the transmission sleeve 17 in slightly spaced relation therewith. This space permits a column of lubricant to be introduced between shaft F and sleeve 17.

The lower end of the steering shaft has an enlargement or lug 37 thereon, which is accommodated in registering pockets 38 formed in the confronting faces of the plates C1 and C2 (see Figure 2). The purpose of the enlargement 37 is to swing the rudder unit C and the propeller D when the steering shaft F is turned. Any suitable means, such as a stick or wheel, may be employed for turning the steering shaft.

Having thus described the various structural features of my propelling and steering apparatus, the operation thereof is summarized briefly as follows:

Assuming that the main drive shaft 14 is being turned by the inboard engine (not shown) of the boat A, this rotary motion will be imparted to the drive shaft 8. The bevel gears 15 and 16 will cause the transmission sleeve 17 to rotate which will drive the propeller shaft E through bevel gears 18 and 28. Thus the propeller D will revolve as long as the shaft 14 is turning.

When the rudder unit C occupies the position shown in Figure 1, the boat A will move ahead. The steering shaft F may be turned to swing the rudder unit C and its propeller through a complete circle. Therefore, the boat A may be moved in any desired direction. Figure 3 illustrates the rudder unit and propeller arranged for moving the boat astern. It is obvious, of course, that the boat could be moved to port or starboard by merely turning the steering shaft F until the leading edge 39 of the rudder unit points in the direction in which the operator desires to move the boat.

I claim:

1. In a propelling and steering apparatus for boats; a stationary tubular housing projecting through and below the bottom of a boat; the tubular housing having an annular flange extending laterally therefrom and positioned below the bottom of the boat; a pair of rudder plates removably secured together and embracing the portion of the tubular housing disposed below the boat from opposing sides of the housing to form a rudder unit; the plates having grooves snugly receiving the annular flange so that the latter will retain the rudder unit against longitudinal movement relative to the tubular housing; the rudder unit being swingable about the tubular housing; a propeller revolvably carried by the rudder unit and swingable therewith; means for swinging the rudder unit and propeller into various angular positions about the tubular housing for determining the course of the boat; and means for driving the propeller.

2. In a propelling and steering apparatus for boats; a stationary tubular housing projecting through and below the bottom of a boat; a pair of rudder plates removably secured together and embracing the portion of the tubular housing disposed below the boat from opposing sides of the housing to form a rudder unit; means for retaining the rudder unit against longitudinal movement relative to the tubular housing; the rudder unit being swingable about the outer surface of the tubular housing; the plates having confronting faces provided with registering pockets therein defining a gear-receiving compartment; a propeller shaft revolvably carried by the rudder plates and having a driven gear secured thereto disposed in said compartment; a driving gear meshing with the driven gear and also disposed in said compartment; a transmission sleeve journalled in the tubular housing and having the driving gear secured thereto; means for rotating the sleeve; and a steering shaft extending through the transmission sleeve and fixed to the plates so as to swing the rudder unit into various angular positions about the tubular housing for determining the course of the boat.

3. In a propelling and steering apparatus for boats; a tubular housing; a pair of rudder plates removably secured together and embracing the tubular housing from opposing sides of the latter and being swingable about the outer surface of the tubular housing; a driven propeller carried by the rudder plates; a steering shaft extending through the tubular housing and fixed between the rudder plates for swinging the latter about the tubular housing when the steering shaft is turned.

4. In a propelling and steering apparatus for boats; a transmission box mounted in a boat and having a tubular housing projecting therefrom through and below the bottom of the boat; a pair of rudder plates removably secured together and rotatably embracing the portion of the tubular housing disposed below the boat from opposing sides of the housing to form a stabilized rudder unit; a propeller revolvably carried by the rudder unit and swingable therewith; a hollow drive shaft rotatably mounted in the housing and operatively connected to the propeller; a drive shaft connected to the hollow drive shaft through the transmission box; and a steering shaft extending through the hollow shaft and having a lug at its lower end; the plates having registering recesses for snugly receiving the lug, whereby a turning of the steering shaft will swing the rudder unit and propeller about the axis of the hollow drive shaft into the desired angular position.

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