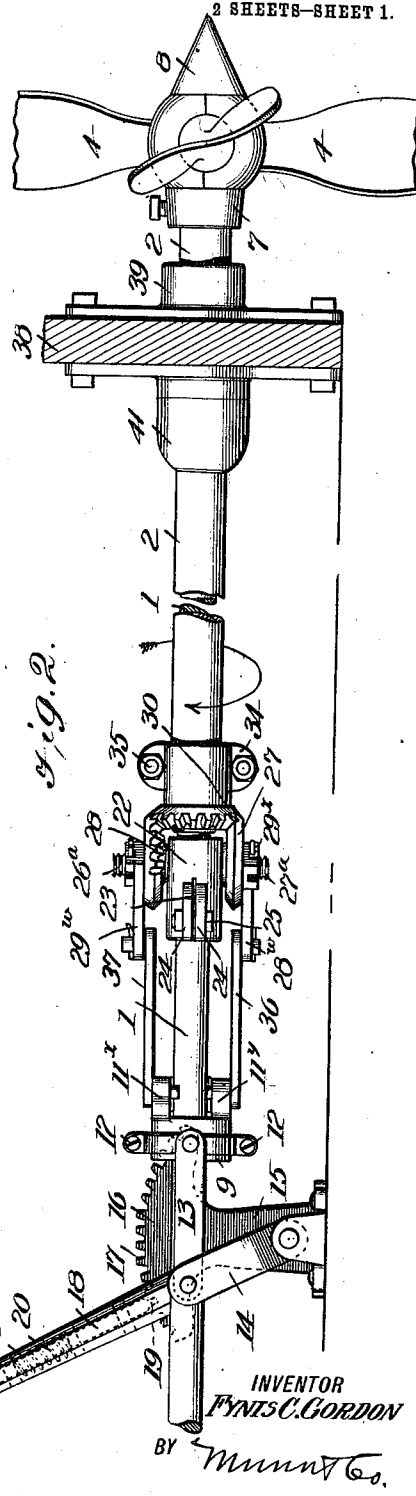
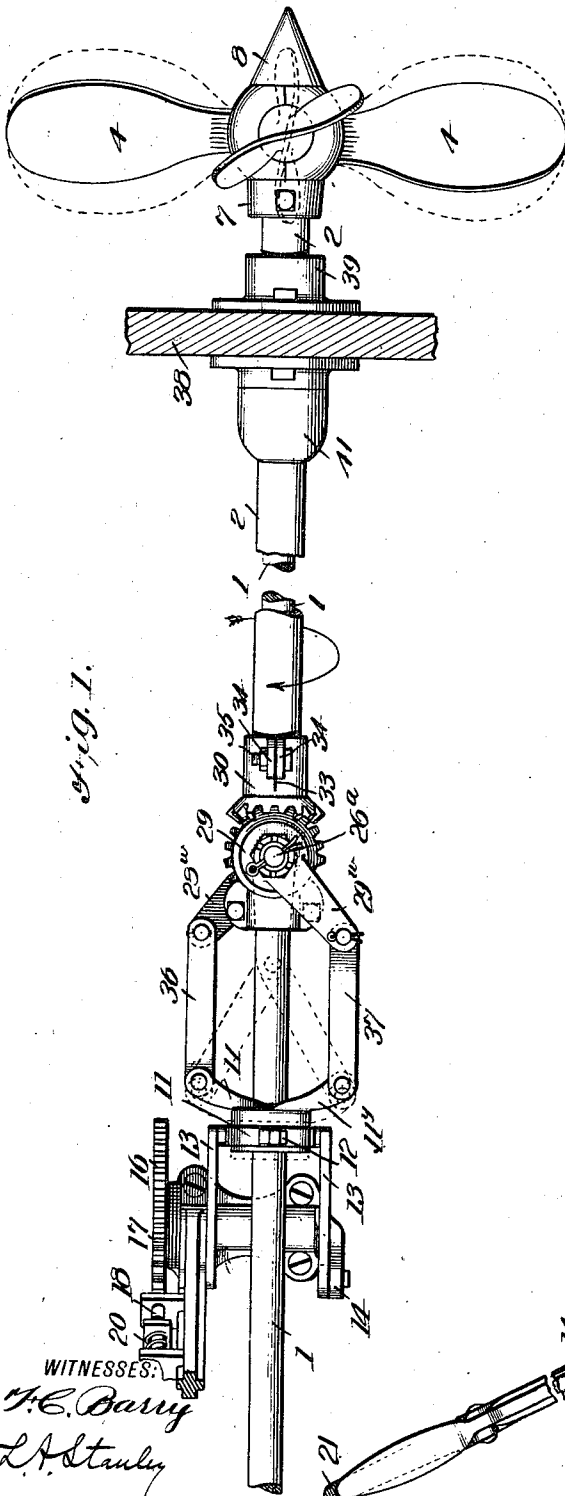


989,500.

F. C. GORDON.
PROPELLER.
APPLICATION FILED JUNE 18, 1910.

Patented Apr. 11, 1911.

2 SHEETS—SHEET 1.



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PROPELLER.

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2 SHEETS—SHEET 2.

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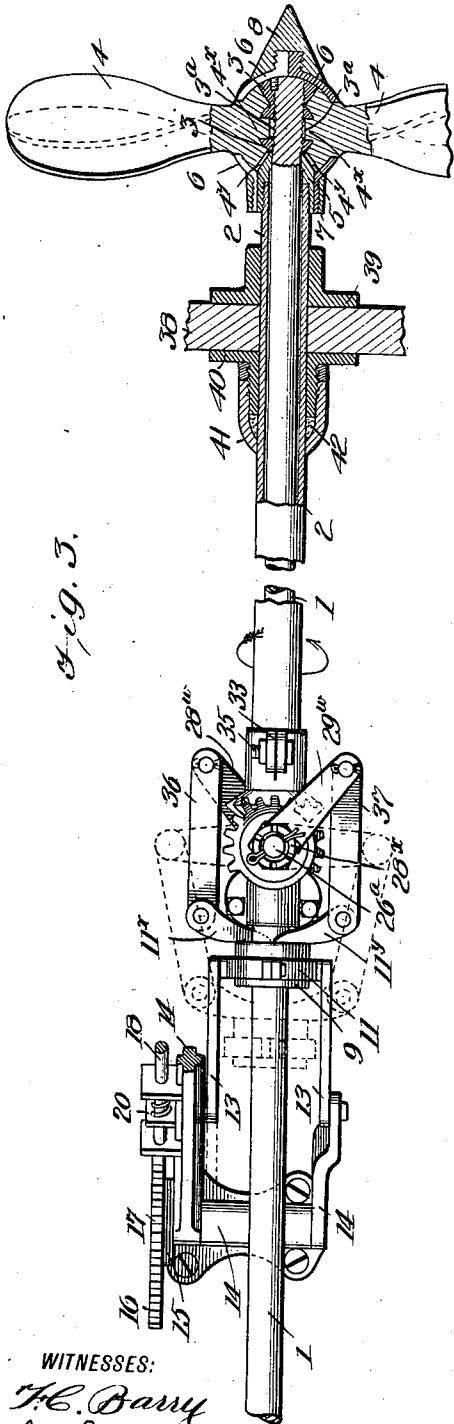


Fig. 3.

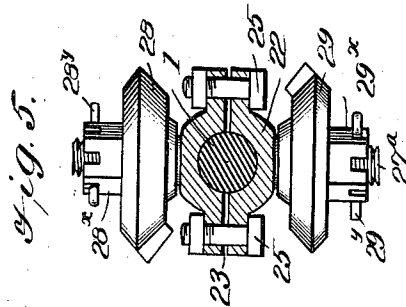


Fig. 5.

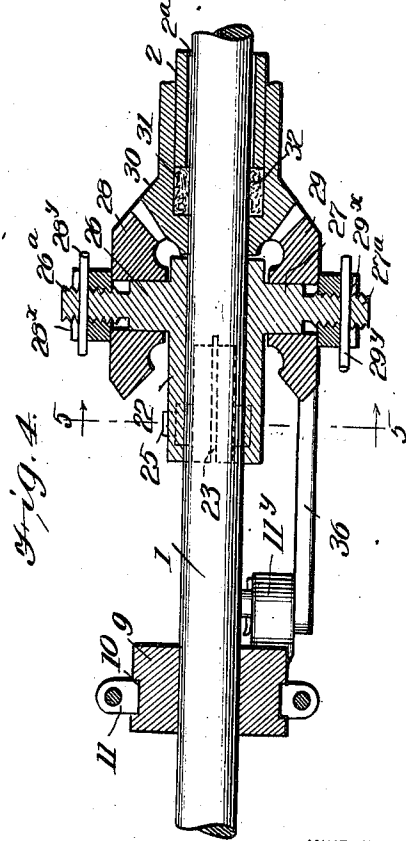


Fig. 4.

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PROPELLER.

989,500.

Specification of Letters Patent.

Patented Apr. 11, 1911.

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To all whom it may concern:

Be it known that I, FYNIS C. GORDON, a citizen of the United States, and a resident of Asotin, in the county of Asotin and State of Washington, have invented certain new and useful Improvements in Propellers, of which the following is a specification.

My invention relates to propellers having reversible blades so that the shaft, while turning continuously in one direction, may be made to drive the vessel ahead or astern as desired.

The invention herein described is an improvement over a similar device disclosed in my prior Patent Number 945,123, dated January 4, 1910, and the invention resides in certain novel features of construction and arrangement of parts, which will be set forth in the following specification, and particularly pointed out in the appended claims.

In the prior patent, mentioned above, I disclosed a propeller having pivotal blades capable of being rotated so as to give the vessel a forward or a backward motion. The means for rotating the blades consist of a sleeve having a spiral slot and a pin adapted to work therein for imparting motion to a main sleeve connected with the propeller blades.

An object of the present invention is to provide a different form of means for shifting the main sleeve.

A further object of my invention is to provide a simple means, for shifting the blades in which a series of gears is used.

Further objects and advantages will appear in the following specification.

My invention is illustrated in the accompanying drawings forming part of this application, in which similar reference characters indicate like parts in the several views, and in which—

Figure 1 is a plan view of the device showing the blades in position for driving the vessel ahead at full speed, Fig. 2 is a side view of the device, shown in Fig. 1, Fig. 3 is a plan view of the device with the propeller blades set for driving the vessel astern at full speed, Fig. 4 is a detail section through the gearing which turns the sleeve, and Fig. 5 is a section along the line 5—5 of Fig. 4 looking in the direction of the arrows.

As stated before, the invention in this instance, lies not in the propeller blades or

their mountings, but in the means for turning the sleeve to which the blades are connected. I shall, therefore, briefly describe the reversible blades and their casings.

Referring now to the drawings, it will be seen that I have provided a shaft 1, this shaft being the main driving shaft which may be turned by any suitable means (not shown). On the outside of the shaft is a sleeve 2. Referring to Fig. 3, it will be seen that the main shaft is secured to a head 3, which is provided with recesses 3^a for the reception of the shaft spindles 4^x of the blades 4. These blades 4 are rotatable on their spindles 4^x and are provided with gear sections 4^y arranged to engage the teeth of a gear 5, which is secured to the end of the sleeve 2. Surrounding the head 3 and the gear sections 4^y, and concentric to the outer surfaces thereof, is a three part casing 6 having front and rear projections, the front projection being threaded to bear a nut 7 and the rear projection being threaded to bear a nut 8. As will be seen from the above description when the shaft 1 is revolved the propeller blades will be carried around. If, however, the sleeve 2 is rotated relatively to the shaft 1, then the propeller blades will be rotated on their axes, *i. e.*, on the short shafts 4^x by means of the gear 5, so that they may assume an inclination toward the rear, toward the front, or a neutral position between the two.

The above described construction, as has been stated before was fully set forth in my prior Patent Number 945,123. The means for moving the sleeve 2 relatively to the shaft 1 is new, however, in the present invention.

Referring now particularly to Fig. 4, it will be seen that upon the shaft 1, I mount loosely a collar 9 bearing a groove 10 for the reception of a yoke 11, this yoke being in two parts and being secured together by means of the screws 12 as shown in Figs. 1 and 2. The yoke 11 is pivotally connected by means of the links 13 to the arms of a U-shaped operating lever 14. This lever is pivoted at its central portion to a frame 15, having a segmental top 16 provided with teeth 17. Upon the lever is mounted a pull rod 18 whose lower end is fashioned into a tooth 19 (see Fig. 2) arranged to engage between the teeth 17. This rod is held by a spring 20 in normal engagement with the

segment 16, and may be lifted therefrom by means of a pivoted lever 21, which when pressed will draw the tooth out of the segment 16. The segment 16, therefore, constitutes, with the pull rod, a locking device for holding the collar in any desired position along the shaft.

Fig. 4 shows the gears for shifting the position of the sleeve. On the shaft 1, I arrange a collar 22, which is provided with the longitudinal slots 23. On each side of these slots are flanges 24. The bolts 25, extend through the flanges 24, and may be tightened so as to clamp the collar 22 firmly to the shaft 1. On each side of the collar 22 is a cylindrical lug or stub shaft such as those shown in Fig. 4 at 26 and 27. The shaft 26 has a reduced threaded portion 26^a and the shaft 27 has a similar reduced threaded portion 27^a. On the shaft 26 is mounted a bevel gear 28, and on the shaft 27 is a similar bevel gear 29. These gears are in mesh with the gear 30, which is cored out to receive the shaft 1. The base portion of the gear is provided with a cylindrical recess 31 in which packing material 32 is disposed. The recess 31 also provides means for attaching the gear 30 to the sleeve 2.

It will be seen that the base portion of the gear is provided with the slots 33 and with the adjacent flanges 34 which may be forced together by means of the bolts 35 to clamp the gear firmly to the sleeve in the same manner that the collar 22 is clamped to the shaft 1. It will be noted that the sleeve 2 does not fit closely upon the shaft 1, but that clearance 2^a is provided so that when the gear 30 is clamped to the sleeve, the latter does not bind on the shaft. The gears 28 and 29 are kept in place by means of nuts 28^x and 29^x, respectively. The latter are locked by means of the cotter pins 28^y and 29^y.

In Figs. 1 and 2, it will be seen that the collar 11 is provided on one side with a laterally extending arm 11^x, and on the other side with a similar laterally extending arm 11^y. The gear 28 has a laterally extending arm 28^w and the gear 29 has a similar arm 29^w. The arm 11^x is connected with the arm 28^w by means of the link 36, while the arm 11^y is connected to the arm 29^w by means of the link 37.

In Fig. 3, 38 denotes a section of the stern of the boat. A plate 39 is secured to the outside of the boat, and forms a bearing for the sleeve 2. On the inside is a plate 40, which is threaded to receive a cap 41, the latter being hollow for the reception of packing 42, as clearly shown in Fig. 3.

From the foregoing description of the various parts of the device the operation thereof may be readily understood. Referring now to Fig. 1, the arrow denotes

the direction of rotation of the driving shaft 1. With the blades in the position shown in this figure, and the direction of rotation as indicated by the arrow, it will be seen that the vessel will be propelled in a forward direction. Since Fig. 2 is a side view of Fig. 1, the handle 14 must be pushed over toward the left of the locking segment in order for the propeller to drive the boat ahead under full speed. Now when it is desired to reverse the motion of the vessel the operating lever 14 is first unlocked by pressing the lever 21, thereby withdrawing the tooth 19, when the lever may be shifted. The shifting of the collar 11 will cause a rearward movement of the arms 28^w and 29^w in opposite directions and to the same extent, and the movement of the gears 28 and 29 will cause the rotation of the gear 30, and, hence, the rotation of the sleeve 2, relative to the shaft 1. An examination of Fig. 3 will show, as already clearly explained, that when the sleeve 2 is rotated, it will cause the rotation of the propeller blades upon their stub shafts 4^x so that they will assume the position shown in Fig. 3. In this position the movement of the vessel will be astern. It is obvious that the operating lever may be set in such a position that there will be no movement. This is the neutral position, and is indicated in dotted lines in Fig. 3. The propellers now exert a dragging effect. It is also obvious that by setting the operating lever at intermediate points a greater or a less speed may be attained, with a constant speed of the engine.

I claim:

1. In a reversing propeller, a hollow sleeve, a main driving shaft extending through said sleeve, a main gear secured to said sleeve, auxiliary gears carried by said shaft and arranged to mesh with said main gear, and means for simultaneously rotating said auxiliary gears thereby causing a movement of said sleeve relative to said shaft.

2. In a reversing propeller, a hollow sleeve, a main driving shaft extending through said sleeve, a main gear secured to said sleeve at one end thereof, a collar secured to said shaft, auxiliary gears rotatably mounted on said collar and arranged to mesh with said main gear, and means for simultaneously rotating said auxiliary gears, thereby causing a movement of said sleeve relative to said shaft.

3. In a reversing propeller, a hollow sleeve, a main driving shaft extending through said sleeve, a main gear having a longitudinal cylindrical bore adapted to receive one end of said sleeve, packing in said cylindrical bore at the end of said sleeve, a collar secured to said shaft, means for adjusting said collar longitudinally of the shaft, auxiliary gears rotatably mounted on

said collar and adapted to mesh with said main gear, a slidable collar mounted on said shaft, means for moving said slidable collar toward or away from said auxiliary gears, 5 and link connections between said gears and said movable collar for simultaneously rotating said gears in opposite directions.

4. In a reversing propeller, a hollow sleeve, a main driving shaft extending 10 through said sleeve, a main gear having a longitudinal bore adapted to receive said shaft, said gear being provided with a larger cylindrical bore extending part way through the gear, said larger bore having a 15 common axis with said first-named bore, the end of said main sleeve extending part way into said enlarged bore, packing between the end of said main sleeve and the end of said enlarged bore, said gear being provided 20 with means for adjusting it longitudinally of said sleeve and said shaft, an adjustable collar secured to said shaft, a pair of auxiliary gears rotatably mounted on said collar, said gears being of the same diameter 25 and being in mesh with said main gear, an arm carried by each of said auxiliary gears,

a slidable collar carried by said shaft, a lever, connections between said lever and said collar for moving the latter along the shaft, a pair of arms carried by said collar, 30 and link connections between the arms of the collar and the respective arms of the auxiliary gears for moving the latter simultaneously in opposite directions, to the same extent.

5. In a reversing propeller the combination with a main shaft, a head secured thereto, rotatable propeller blades mounted on said head, a sleeve upon said shaft, means actuated by said sleeve for causing 40 the rotation of said blades on their axes, a gear secured to said sleeve at one end thereof, an auxiliary gear on each side of said collar arranged to mesh with said first-named gear, and means for causing the simultaneous 45 rotation of said auxiliary gears in opposite directions and to the same extent.

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Witnesses:

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 SOLON C. KEMON.