No. 789,999. PATENTED MAY 16, 1905.

W. E. PATRICK.

REVERSING PROPELLER GEAR.

APPLICATION FILED MAY 27, 1904.

Fig. 1.

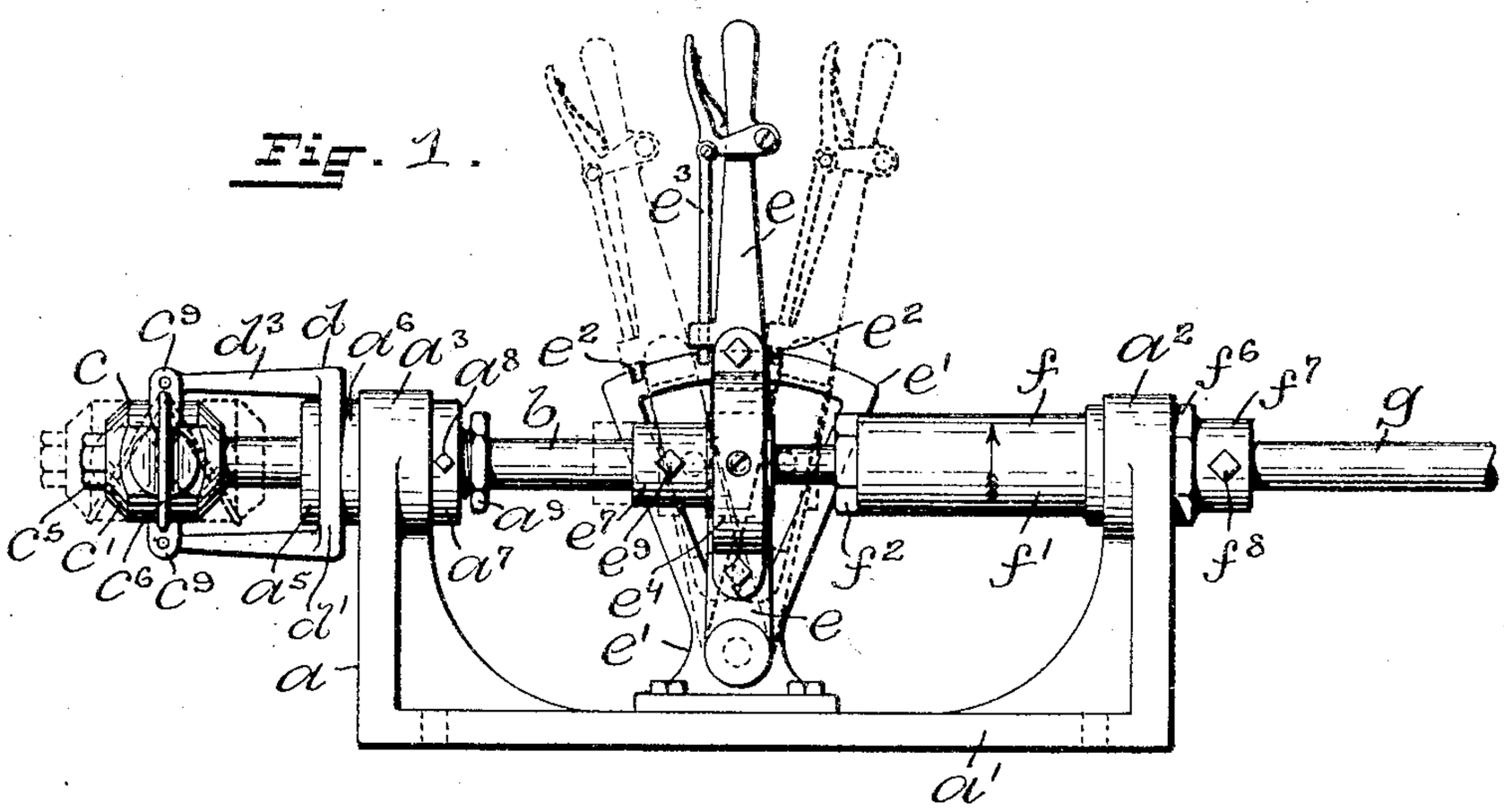


Fig. 2.

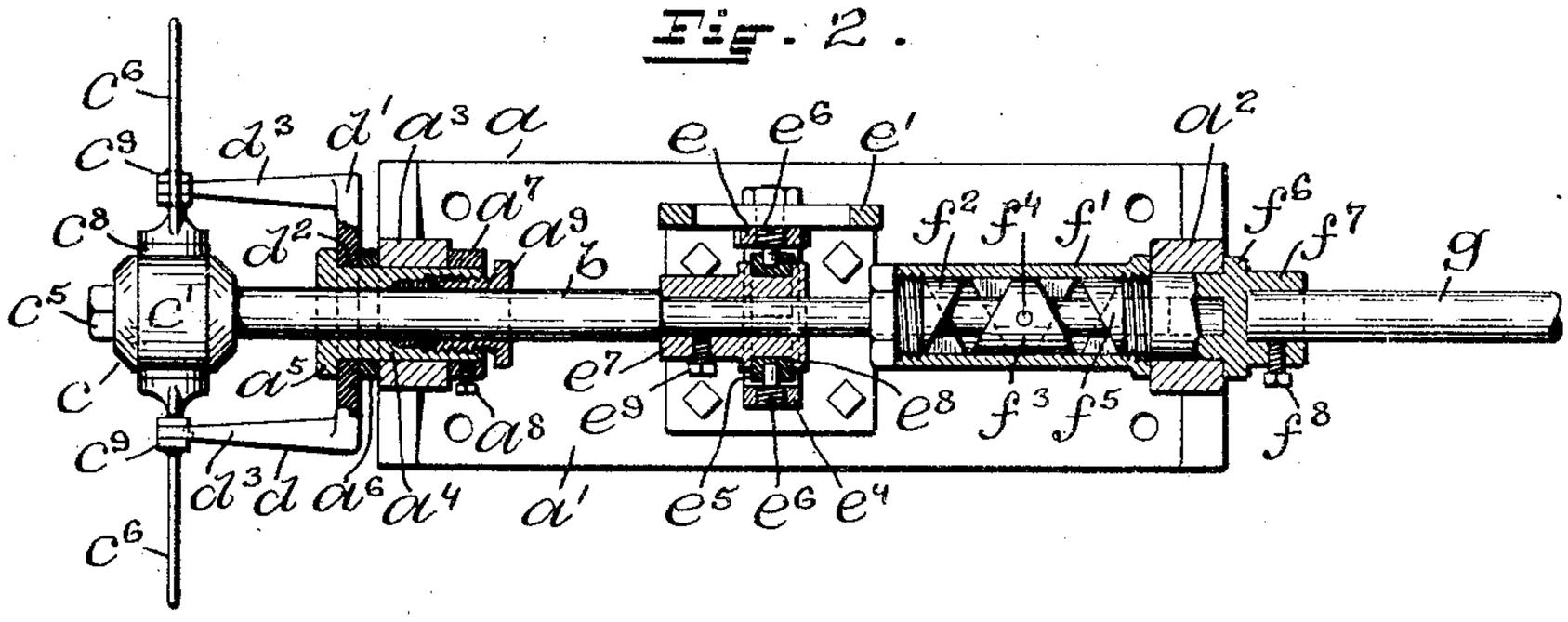


Fig. 3.

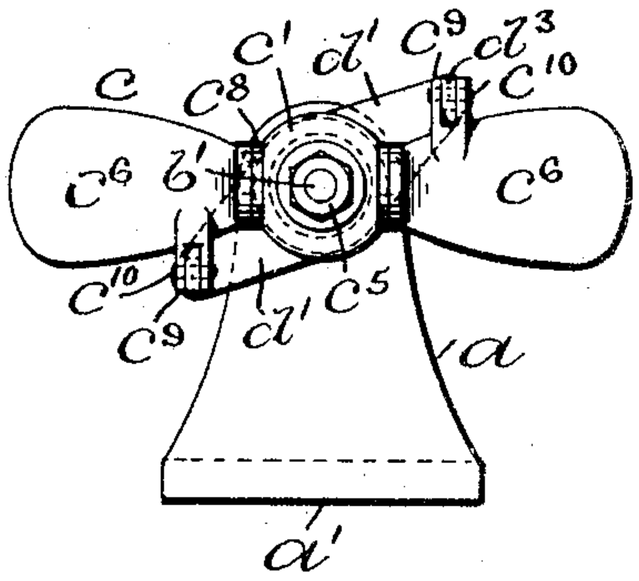


Fig. 5.

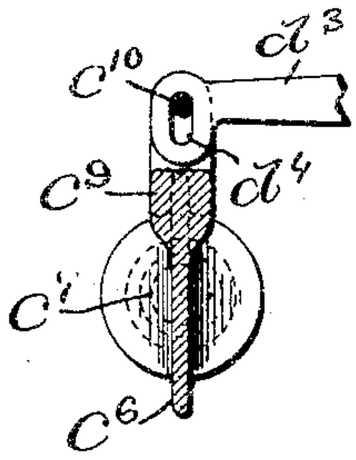
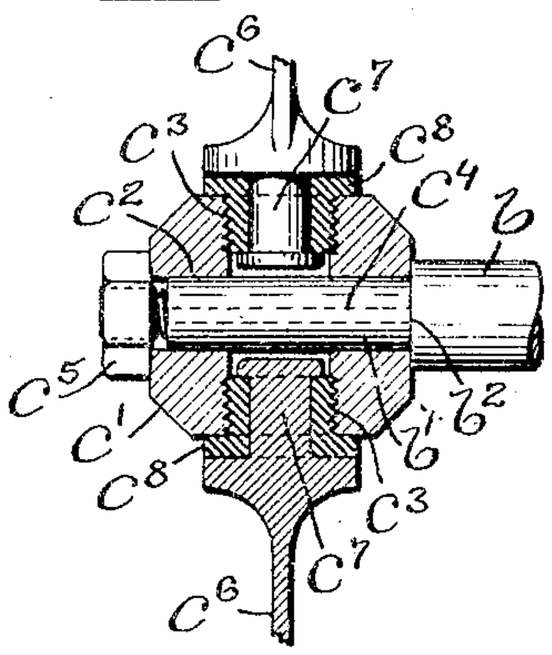


Fig. 4.



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No. 789,999. Patented May 16, 1905.

UNITED STATES PATENT OFFICE.

WILLIAM E. PATRICK, OF NEWPORT, RHODE ISLAND.

REVERSING PROPELLER-GEAR.

SPECIFICATION forming part of Letters Patent No. 789,999, dated May 16, 1905.

Application filed May 27, 1904. Serial No. 210,033.

To all whom it may concern:

Be it known that I, WILLIAM E. PATRICK, a citizen of the United States, residing at Newport, in the county of Newport and State of Rhode Island, have invented a new and useful Improvement in Reversing Propeller-Gears, of which the following is a specification.

This invention has reference to an improvement in reversing propeller-gears adapted for use in launches having gasolene-engines.

The object of my invention is to change the pitch of the propeller-blades by moving or reciprocating the propeller-shaft and propeller longitudinally, thus dispensing with hollow shafts or sleeves and simplifying the construction.

My invention consists in the peculiar and novel construction of a reversing propeller-gear having a frame in which are bearings for the propeller-shaft, a propeller-hub secured to the outboard end of the propeller-shaft, propeller-blades pivotally secured to the hub, a yoke pivotally connected to the propeller-blades and rotatably secured to the outboard-bearing of the frame, a clutch mechanism intermediate the propeller-shaft and the engine-shaft, a pivoted actuating-lever operatively connected with the propeller-shaft adapted to reciprocate the shaft, change the pitch of the propeller-blades, and operate the clutch mechanism, and other useful details of construction, as will be more fully set forth hereinafter.

Figure 1 is a vertical side view of my improved reversing propeller-gear, showing the actuating-lever and the propeller in its inoperative or stopped position in full lines, in the position for going ahead in light broken lines, and in the position for going astern in heavy dottod lines. Fig. 2 is a top plan view of Fig. 1, partly in section, showing the means for rotatably securing the propeller connecting-yoke to the outboard-bearing, the means for operatively connecting the actuating-lever with the propeller-shaft, and the clutch mechanism connecting the propeller-shaft with the engine-shaft. Fig. 3 is an end view of the propeller, connecting-yoke, and outboard end of the frame. Fig. 4 is an enlarged detail sectional view of the propeller-hub, showing the means for pivotally securing the propeller-blades to the hub; and Fig. 5 is an enlarged detail transverse sectional view of one of the propeller-blades, showing the means for pivotally connecting the blades to the connecting-yoke arms.

In the drawings, a indicates the frame of my improved reversing propeller-gear; b, the propeller-shaft; c, the reversible propeller; d, the propeller connecting-yoke; e, the actuating-lever; f, the clutch mechanism, and g the engine-shaft broken away from the engine.

The frame a is constructed to form the base a', the inboard-bearing a^2, and the outboard-bearing a^3, in which is the bearing-sleeve a^4, having the enlarged outer head a^5, the washer a^6, the ring a^7, secured to the inner end of the sleeve by the set-bolt a^8, and the stuffing-box a^9, as shown in Fig. 2.

The propeller-shaft b extends from the clutch mechanism f through the bearing-sleeve a^4 and the stuffing-box a^9 and has the reduced outboard end b', forming the shoulder b^2, as shown in Fig. 4.

The reversible propeller c is constructed to have the hub c', in which is the central hole c^2, adapted to fit over the reduced end b' of the propeller-shaft b and the oppositely-disposed screw-threaded holes c^3 c^3. The hub c' is secured on the end of the propeller-shaft by the spline c^4, as shown in broken lines in Fig. 4, and the nut c^5, forcing the hub against the shoulder b^2 on the propeller-shaft. The propeller-blades c^6 c^6 are pivotally secured to the hub by extending the cylindrical studs c^7 c^7 on the inner ends of the blades through the bearing-collars c^8 c^8, upsetting the ends of the studs over the inner ends of the bearing-collars and then screwing the collars into the screw-threaded holes c^3 c^3 in the hub. On the edge of each propeller-blade adjacent the inner end is formed the forked lugs c^9 c^9 with the pins c^{10} c^{10}. With the propeller in the position as shown in Fig. 3 a lug is formed on the upper edge of the right-hand blade and on the lower edge of the left-hand blade.

The connecting-yoke d consists of the cross-bar d', in which is the central hole d^2, and the outwardly-extending arms d^3 d^3, in the ends of which are the slots d^4 d^4, as shown in Figs. 2 and 5. This yoke is rotatably secured

through the hole d^2 to the bearing-sleeve a^4 between the head a^5 and the washer a^6 and pivotally connected to the lugs c^9 c^9 on the propeller-blades by the pins c^{10} c^{10} passing through the lugs and the slots d^4 d^4 in the ends of the arms d^3 d^3 of the yoke, said slots d^4 d^4 allowing for the movement of the propeller-blades in changing the pitch of the blades.

The actuating-lever e is pivotally secured at its lower end to the bracket e', which in turn is secured to the base a' of the frame a, as shown in Fig. 1. The upper end of the bracket e' is semicircular in shape and has the notches e^2 e^2 for the spring-pressed latch e^3 on the actuating-lever, which, engaging with a notch e^2, holds the lever in the position desired. The strap e^4 is secured to the side of the lever e around the propeller-shaft b and, with the lever, supports the two-part ring e^5 by the screw-pins e^6 e^6 in the strap and the lever, as shown in Fig. 2. The collar e^7, having the external annular groove e^8, is secured to the propeller-shaft b by the set-bolt e^9 in a position for the two-part ring e^5 on the actuating-lever to engage with the groove e^8 in the collar, operatively connecting the actuating-lever with the propeller-shaft.

The clutch mechanism f consists of the cylindrical sleeve f', to the outboard end of which is secured the clutch member f^2, having a central hole through which the propeller-shaft b extends, the central clutch member f^3 in the sleeve, secured to the propeller-shaft b by the pin f^4, and the clutch member f^5, which is secured to the inboard end of the sleeve f', extends through the bearing a^2, and has the flange f^6 and the collar f^7 secured to the end of the engine-shaft g by the set-bolt f^8, as shown in Fig. 2. The inboard end of the sleeve f' and the flange f^6 holds the clutch mechanism in its operative position in the bearing a^2.

In the operation of my improved reversing propeller-gear the engine-shaft g and the clutch-sleeve f' revolve in the direction of the arrow, as shown in Fig. 1. The operator stops the action of the propeller c by moving the actuating-lever e into a vertical position, as shown in full lines in Fig. 1. This operation moves the propeller-shaft b and propeller c longitudinally, places the propeller-blades c^6 c^6 in a vertical or inoperative position, and disengages the clutch member f^3, secured to the propeller-shaft, from the clutch members secured to the sleeve f', as shown in Fig. 2. The actuating-lever e may now be moved into the position, as shown in light broken lines in Fig. 1, to go ahead. This moves the propeller-shaft b and propeller c outwardly. The propeller-blades, pivotally attached to the arms of the yoke d, (which revolves with the propeller,) assume the required pitch, and the clutch member f^3 on the propeller-shaft b, engaging with the clutch member f^2, secured to the sleeve f', revolves the propeller-shaft and propeller. The actuating-lever may be moved into the position as shown in heavy dotted lines in Fig. 1. This moves the propeller-shaft and propeller inwardly, gives the required pitch to the propeller-blades to go astern, and engages the clutch member f^3 on the propeller-shaft with the clutch member f^5, secured to the sleeve f', and the engine-shaft g, to revolve the propeller-shaft and propeller through the clutch mechanism.

It is evident that the construction of my improved reversing propeller-gear could be varied so as to use three propeller-blades on the propeller, and a friction or other well-known form of clutch could be used in the clutch mechanism without materially affecting the spirit of my invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a reversing propeller-gear, the combination with a power-shaft, a cylindrical sleeve secured to the power-shaft, and clutch members secured at either end of the sleeve, of the propeller-shaft, a clutch member on the inboard end of the propeller-shaft and within the cylindrical sleeve, a hub on the outboard end of the propeller-shaft, a plurality of blades pivotally secured to the hub, a yoke rotatably secured against longitudinal movement and pivotally connected to the propeller-blades, and means for reciprocating the propeller-shaft to change the pitch of the propeller-blades, as described.

2. In a reversing propeller-gear, the combination of a frame having bearings, a propeller-shaft in the bearings, a propeller-hub rigidly secured to the outboard end of the propeller-shaft, propeller-blades pivotally secured to the hub, oppositely-disposed lugs on the edge of the blades, a yoke rotatably secured to the outboard-bearing of the frame and pivotally connected to the lugs on the propeller-blades, a clutch mechanism intermediate the propeller-shaft and an engine-shaft, consisting of a sleeve, a clutch member having a hole through which the propeller-shaft extends secured to the outboard end of the sleeve, a central clutch member in the sleeve secured to the propeller-shaft, a clutch member secured to the inboard end of the sleeve and to the engine-shaft, and an actuating-lever pivotally secured to the frame and operatively connected with the propeller-shaft, as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM E. PATRICK.

Witnesses:

ADA E. HAGERTY,

J. A. MILLER, JR.