No. 649,248. Patented May 8, 1900.

C. D. KELLER.

PROPELLER.

(Application filed Oct. 5, 1899.)

(No Model.)

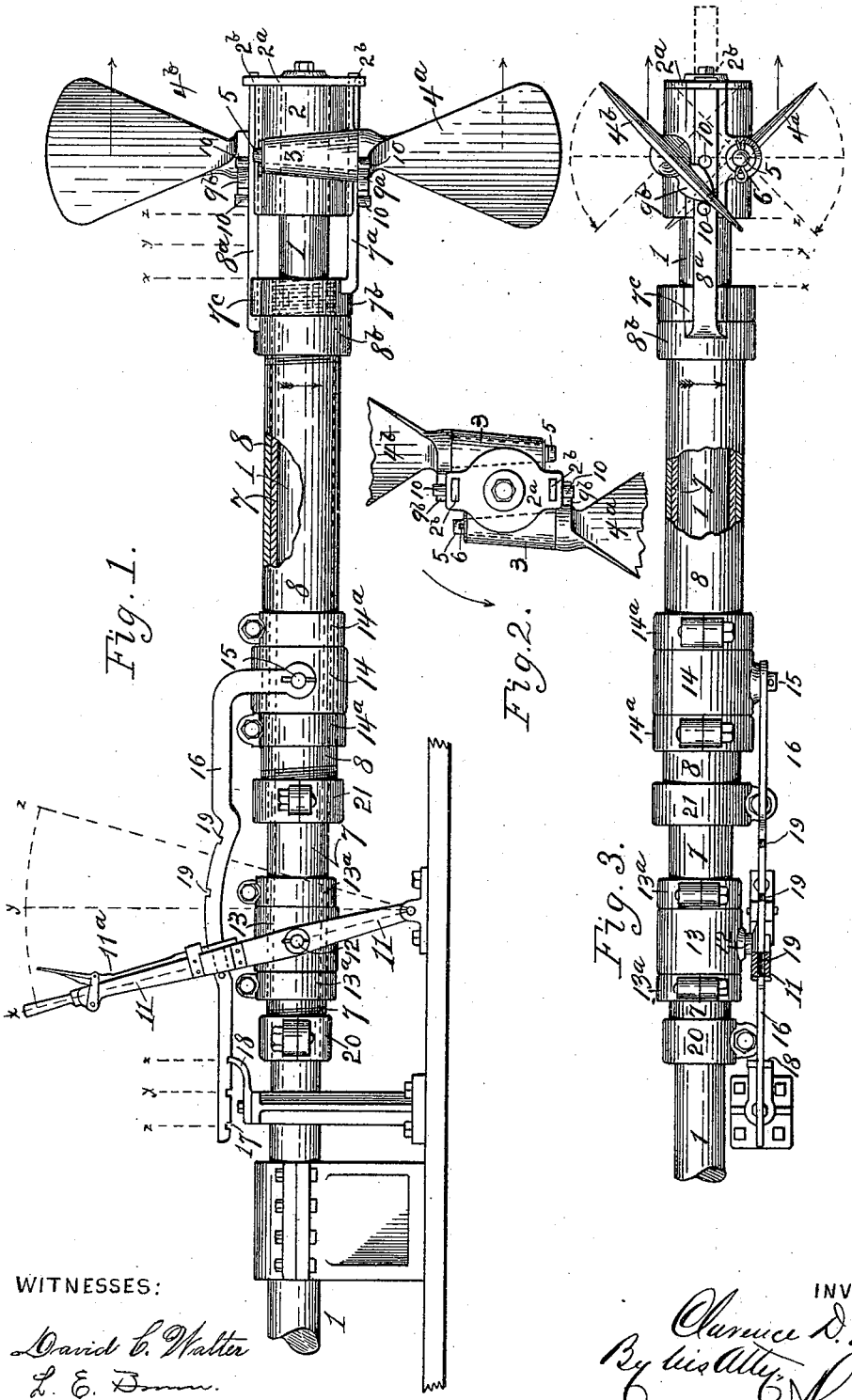

Fig. 1.

Fig. 2.

Fig. 3.

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PROPELLER.

SPECIFICATION forming part of Letters Patent No. 649,248, dated May 8, 1900.

Application filed October 5, 1899. Serial No. 732,610. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE D. KELLER, a citizen of the United States, residing at Toledo, Lucas county, Ohio, have invented certain new and useful Improvements in Propellers, of which the following is a specification.

In the propulsion of small craft gas and gasolene engines have been found to be a most desirable form of motor. The difficulties encountered in the use of such engines are the time, labor, and skill required in stopping and starting them. Another difficulty is that this class of engines is not reversible.

My invention relates to and its object is to provide a propeller to be used, preferably, in connection with an engine of the type referred to, which propeller shall obviate the objections herein indicated.

It should be understood that in a boat driven, for instance, by a propeller having two propeller-blades if one of the blades be reversed and the propeller revolved on its shaft the boat will stand motionless, that if both of the propellers be reversed the boat will move backwardly, and that if both the blades be set in normal position the boat will be driven ahead. It will also be understood that these movements of the blades may be effected without stopping or reversing the engine. I attain these objects by means of the device hereinafter described, and shown and illustrated in the accompanying drawings, made part hereof, in which—

Figure 1 is a side elevation of my device, partly in section; Fig. 2, a rear end view of the shaft, showing the propeller-blade attachments; and Fig. 3, a top plan view of the device shown in Fig. 1, partly in section.

Like numerals of reference indicate like parts throughout the drawings.

In the drawings, 1 is the propeller-shaft, designed to be driven by any suitable power, projecting through the stern of the boat and supported in relation to the boat in the usual manner. The outer end of the shaft carries a collar or housing 2, rigidly secured to the shaft. At opposite sides of this collar are formed integral with the collar socket portions 3, having tapered sockets therethrough, the axes of which sockets are in a plane at a right angle to the axis of the collar.

4^a and 4^b are the propeller-blades, each of which at its inner end is provided with a tapered spindle 5, adapted to fit the sockets of the parts 3. When the tapered spindles are in place within their sockets, the small end of the spindle projects through the socket-piece and may be secured against longitudinal movement by means of pins 6 or equivalent devices. The spindles and sockets here described now form journals upon which the blades, respectively, may be rotated upon their longitudinal axes.

7 is an elongated sleeve loosely embracing the shaft 1 and movable longitudinally thereon. 8 is another and shorter sleeve which loosely embraces the sleeve 7 and is movable longitudinally thereon. The inner sleeve 7 at its outer end is provided with a rearwardly-projecting arm 7^a, parallel with the shaft. This arm is made part of or is rigidly secured to a collar 7^b, which is fast upon the outer end of the inner sleeve 7. In like manner the outer sleeve 8 is provided with a rearwardly-projecting arm 8^a, leading from the collar 8^b, formed with or rigidly secured to the outer end of the sleeve 8. It will be seen that the two concentric sleeves, with their rearwardly-projecting arms or extensions, may now be reciprocated or moved to and fro longitudinally and independently of each other. To the rear end of the collar or housing 2 is secured a plate 2^a, the margin of which projects beyond the collar as a flange. Through this plate are openings 2^b, through which project the arms 7^a and 8^a. These openings form guides and supports for the arms. The collar 7^b at its side opposite the arm 7^a is thickened, as at 7^c, and through this thickened portion is a channel, parallel with the shaft, in which rests the arm 8^a, the channel serving as a guide and brace for the arm 8^a.

9^a is a lug or arm formed integral with and projecting radially from the spindle of the blade 4^a. 9^b is a like arm or lug for the blade 4^b. Upon each of the two arms 7^a and 8^a and projecting at a right angle thereto is a pair of pins 10. The lug or arm 9^a projects between the pins of one pair and the lug or arm

9^b projects between the pins of the other pair. When the arms 7^a and 8^a are reciprocated, the pins 10 swing the lugs or arms 9^a 9^b, causing the propeller-blades to swing upon their pivot-pins 5.

Various devices will suggest themselves to those skilled in the art for manually actuating the inner and outer sleeves 7 and 8 either simultaneously or independently of each other. In this part of my device I have shown in the drawings by way of illustration a lever 11 engaged with a trunnion or lug 12 upon a collar 13, loose upon the inner sleeve 7. The collar 13 is held in place between two rings 13^a, fixed upon the sleeve 7. When the lever 11 is thrown to and fro, the sleeve 7 is reciprocated with its arm 7^a, which swings the blade 4^a, as above described. 14 is a collar loose upon the outer sleeve 8, held in place between two fixed rings 14^a and having a lug or trunnion 15. Upon this lug or trunnion is pivoted one end of an arm or latch 16, provided at its opposite extremity with notches 17, each of which is adapted to engage a stop 18. When the arm 16 through its notches 17 is engaged with the stop 18, the sleeve 8 is held rigidly against longitudinal movement. The lever 11 is provided with a lift-latch 11^a, through the lower end of which loosely passes the arm 16. The arm 16 is provided with a series of notches 19 in its top. When by means of the lift-latch 11^a arm 16 is raised out of engagement with the stop 18, one of the notches 19 in the top of the arm or latch 16 at the same time becomes engaged with the lever through a stop or lug on the lever. (Not shown in the drawings.) Now when the arm 16 is raised and engaged with the lever the motion of the lever will cause both the inner and the outer sleeves 7 8 to reciprocate together.

20 is a stuffing-box for the shaft at the inner end of sleeve 7 to prevent access of water into the boat between the shaft and the sleeve.

21 is a stuffing-box at the inner end of sleeve 8 to prevent access of water between the inner and the outer sleeves.

The operation of my device is as follows: Assuming that the shaft and its two sleeves 7 8 are in motion and that the propeller-blades are set to drive the boat forward, now if it is desired that the boat shall stand still without stopping the engine the lever 11 is thrown, causing the inner sleeve to move, carrying with it the arm 7^a, whose pins 10 through the arm or lug 9^a swing the blade 4^a upon its pivot-pin 5 a half-turn. The two propeller-blades will now be set at opposite angles, and the two blades will each exert an equal power in opposite directions, causing the boat to remain motionless. If instead of causing the boat to stand still it is desired to back the boat, the operator in grasping the lever also grasps the lift-latch 11^a, disengaging the arm 16 from stop 18 and engaging it with the lever. Now both the inner and the outer sleeves 7 8 are connected with the lever, and when the lever is thrown both sleeves 7 8 move in concert, causing both of the propeller-blades to swing upon their axes and to operate at a changed angle.

It is obvious that for the device here shown, having but a single lever adapted to operate one or both of the propeller-blades, two independent levers may be provided, one for actuating the inner sleeve, the other for actuating the outer one.

One of the advantages of my device is that it avoids the "racing" of the propeller due to shifting all of the blades simultaneously edgewise to the water or in position of least resistance to the engine.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a propeller, a plurality of blades, means for changing the angle of said blades to the plane of their rotation either independently of each other or in mechanical connection and unison with each other.

2. A propeller, comprising a plurality of propeller-blades, a shaft, a plurality of concentric sleeves loose upon said shaft, and connections intermediate said sleeves and said blades whereby, by the motion of said sleeves, the angle of said blades may be controlled.

3. In a propeller, a shaft, a housing upon the outer end of the shaft, a series of blades pivotally secured to said housing, a series of sleeves concentric with the shaft, connections between each of the sleeves and its appropriate blade, and means for actuating the sleeves.

4. In a propeller, a shaft, a housing on the outer end of the shaft, propeller-blades pivotally mounted upon said housing, sleeves concentrically mounted upon said shaft, connections for the sleeves each with its appropriate blade, a lever engaged with one of said sleeves, and means for detachably connecting said lever with the other of said sleeves.

5. In a propeller, a shaft, a housing thereon, propeller-blades pivotally mounted in said housing, radial arms or lugs on said blades, horizontally-reciprocating arms having lugs or pins engaging said radial arms at their opposite sides, and means for actuating said arms independently of each other comprising concentric sleeves movable upon said shaft and connections between each of the sleeves and its corresponding blade.

6. In a propeller, a shaft, blades thereon adapted to swing on their longitudinal axes, concentric sleeves movable upon said shaft, connections between said sleeves and said blades, means for actuating said sleeves independently of each other, and a stuffing-box for each of said sleeves.

CLARENCE D. KELLER.

In presence of—
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