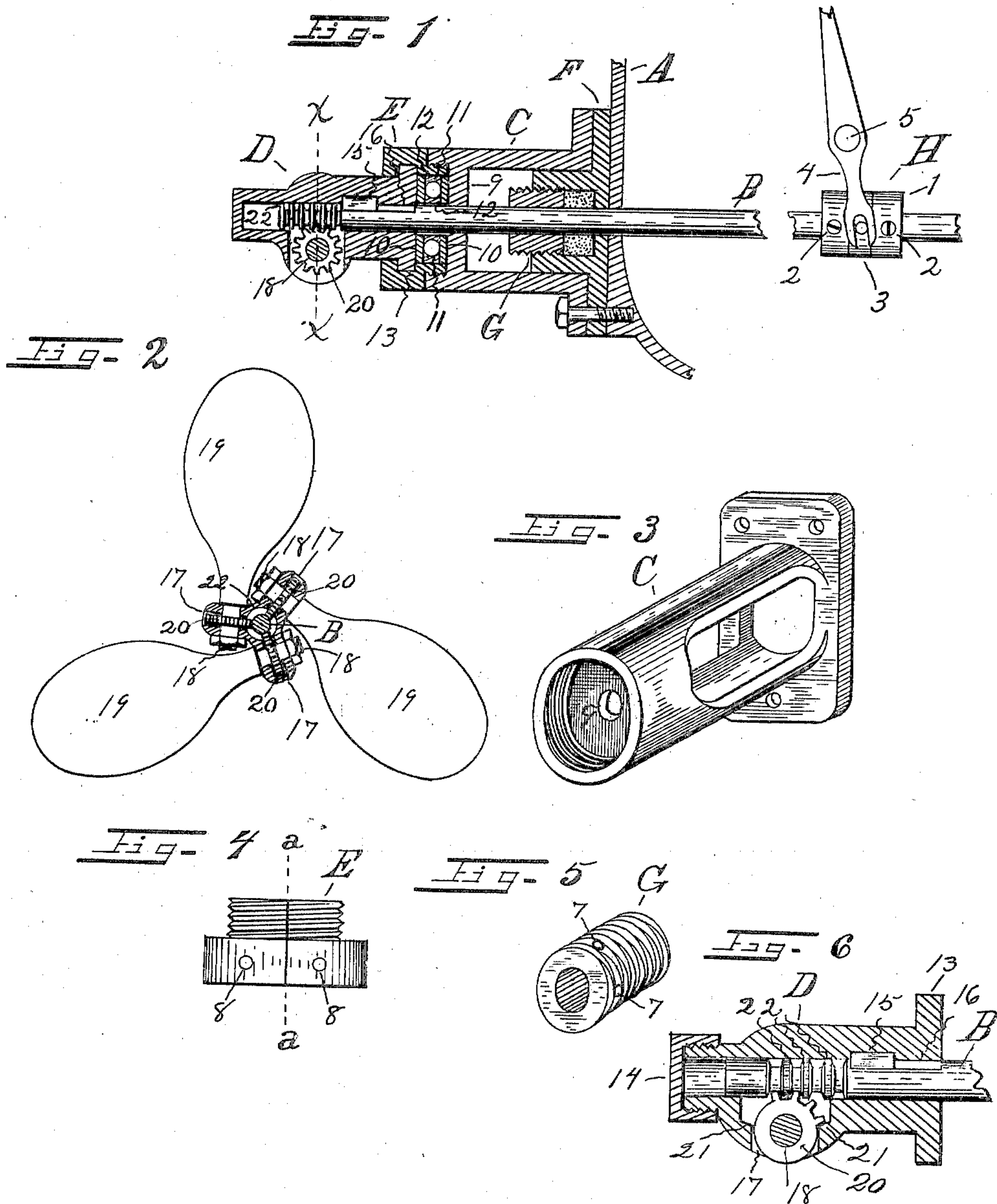


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PATENTED APR. 3, 1906.

E. E. ADAMS.
SCREW PROPELLER.
APPLICATION FILED APR. 13, 1905.



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EARL E. ADAMS, OF BATTLE CREEK, MICHIGAN.

SCREW-PROPELLER.

No. 816,836.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EARL E. ADAMS, a citizen of the United States, residing at Battle Creek, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Screw-Propellers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the marks of reference placed thereon, which form a part of this specification.

This invention relates to screw-propellers for vessels; and the objects of the invention are to provide a propeller that can be shifted to direct a vessel either backward or forward or bring the boat to a stop without reversing or stopping the engine, to lock the propeller-blades either to advance or recede at either side of their throw by a predetermined set-gage, to reduce the size of the blade-head and reduce back draft, to prevent obstructions from accumulating in the propeller-gear pockets, to provide an end-thrust bearing and reduce friction to a minimum, to construct a packing or stuffing box that can be easily and readily manipulated, and, finally, it consists in sundry novel and useful features of construction, as will be more fully set forth in the following specification, and particularly pointed out in the appended claims.

In the drawings, Figure 1 represents a longitudinal section through my improved stuffing-box and antifriction-bearing and shows a form of the propeller-head. Fig. 2 is a cross-section on the line $x x$ of Fig. 1. Fig. 3 is a perspective view of the main propeller-bracket. Fig. 4 is an elevation of the propeller-head clamp. Fig. 5 is a perspective view of the packing-box jam-nut; and Fig. 6 is a longitudinal section of the propeller-head, showing one of the propeller segmental shifting-gears turned to its limit toward the right.

A represents the stern of a boat; B, the propeller driving-shaft; C, the main bracket or tail block; D, the propeller-head; E, the propeller-head clamp; F, the stuffing-box gland; G, the jam-nut to the stuffing-box, and H the shifting mechanism for reversing the propeller-blades.

The propeller-shaft B has mounted thereon a shifting mechanism H, which comprises a

separable grooved collar 1, secured to the shaft by means of set-screws 2, a trunnioned ring 3, encompassing the groove between said collars, being engaged by the lower extremities of a U-shaped shifting yoke 4, pivoted by a stud 5 to a quadrant-bracket. (Not shown.)

To the stern of a boat the stuffing-box F is attached. This box has an outward flange over which the main bracket C fits, and the bore of the box is interiorly threaded and fitted with a corresponding jam-nut G, having holes 7 near the outer end thereof adapted to receive a spanner-wrench or other tool to adjust the same. The bracket C is secured by means of bolts passing through its flange, the flange of the packing-box, and into the stern of a boat, as shown. This bracket C has opened sides, through which openings the stuffing-box can be easily reached. The outer extremity of the bracket C is interiorly threaded and forms a cup within which the antifriction end-thrust-bearing mechanism and the propeller-retaining collar are adapted to be received.

The retaining-collar E has a threaded extremity and a large interiorly-grooved extremity, the latter of which is provided with spanner-wrench holes 8, the threaded end fitting within the outer end of the bracket C, as shown in Fig. 1. Within the collar and fitted against the web 9 of the bracket C and between the inner end of the hub D the antifriction-bearing mechanism is applied. This mechanism in the main comprises two hardened annular rings 10, between which balls 11 are adapted to play, the latter of which are caged between the concentric rings 12.

That the collar E may be attached so that the flange 13 of the propeller-hub D may fit within the annular groove within the outer extremity thereof the collar is separated longitudinally into two equal sections, as shown by the line $a a$ in Fig. 4. The two sections are fitted over the flange, and by screwing the threaded extremity within the bracket C the collar is prevented from separating or releasing the propeller-hub. This hub is provided with a bore sufficiently long to permit the shaft B to be longitudinally shifted to regulate the pitch of the propeller-blades, and it is covered with a cap 14. At a point within the hub where it is received by the collar a feather or key 15 is located. This key fits within a corresponding groove 16 within

the shaft B and provides a means to allow the longitudinal adjustment of the shaft within the hub and at the same time prevents the hub from turning on the shaft.

5 Triangularly about the hub D and longitudinally therewith radial pockets 17 are provided, which intersect the central bore thereof. The projections of the hub within which these pockets are formed are bored crosswise
10 for the reception of the shanks 18 of the propeller-blades 19. Within these pockets the blade-adjusting gear 20 are introduced. These gear are formed with teeth sufficient only to permit of their rotating forty-five de-
15 grees in either direction, the end cogs abutting against the shoulders 21, formed at either side of the pockets, and that grass and other debris may not accumulate and tend to obstruct the gear within their bearings these
20 pockets from the exterior are made only large enough to allow the gear to fit freely therethrough. These gear mesh with the annular cogs 22 on the drive-shaft and are caused to oscillate and tilt the pitch of the
25 propeller-blades by the longitudinal thrust of the shaft, as hereinbefore set forth. The vessel may be stopped or reversed according to the lead and rotation of the propeller-blades.

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

1. In a propeller, the combination of a stuffing-box, a bracket having openings in the side thereof mounted over said stuffing-
35 box, a collar carried by said bracket, an anti-friction-bearing fitted within said collar, a shaft passing through said stuffing-box and anti-friction-bearings and a screw-propeller mounted upon the end of said shaft and
40 adapted to bear against said anti-friction-bearing, for the purposes set forth.

2. In a propeller, the combination of a stuffing-box, a bracket having openings in the side thereof mounted over said stuffing-
45 box, and an opposite cupped extremity interiorly threaded, a collar comprising two longitudinal sections having a threaded end adapted to fit within the threaded end of said bracket and an enlarged opposite ex-
50 tremity having an interiorly annular groove, a propeller-hub having a flange on one end thereof adapted to be received by said groove, anti-friction-bearings interposed within said collar between said hub and the cup-bottom
55 of said bracket, a shaft passing through said stuffing-box, bracket and anti-friction-bear-

ing, and secured to said propeller-hub, substantially as and for the purpose set forth.

3. In a propeller, the combination of a bracket, a collar carried by said bracket, anti- 60 friction-bearings fitted within said collar, a hub having a longitudinal bore and pockets triangularly intersecting said bore from the exterior, gear located within said pockets, pro-
65 peller-blades pivotally secured to said gear passing through said pockets, a shaft passing through said collar, anti-friction-bearings in said bracket, said shaft being longitudinally adjustable, means to rotate said hub with
70 said shaft, means to longitudinally adjust said shaft, means to operate said blades with said shaft, and means to limit the throw of said blades within said pockets, substantially
as and for the purposes set forth.

4. In an adjustable propeller, the combi- 75 nation with a shaft longitudinally adjustable and provided with annular cogs at its outer extremity, of a hub retained from longitudinal movement but rotatable therewith, se-
80 cured upon the outer extremity of said shaft, longitudinal pockets triangularly arranged in the circumference of said hub intersecting the bore of said hub, a shoulder formed at
85 either end of said pockets, gear-segments operative within said pockets meshing with the annular cogs of said shaft, propeller-blades axially operative from said segments, the
90 shoulders at either side of said pockets adapted to engage and prevent said segments from rotating farther than a predetermined pitch of said blades, all arranged to coact substan-
tially as and for the purpose set forth.

5. In a propeller, the combination with a shaft, a propeller secured at the outer ex- 95 tremity of said shaft, and a bracket encompassing said shaft, of a collar comprising two longitudinally-separable sections, said collar having an interiorly-grooved outer extremity adapted to fit over an outwardly-turned
100 flange on said propeller-hub, and an opposite extremity exteriorly threaded and adapted to fit within a corresponding threaded outer extremity of said bracket, anti-friction end-
105 thrust bearings interposed between said propeller and said bracket within the threaded extremity of said collar, and means to tighten said collar, substantially as and for the purpose set forth.

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