No. 747,785. PATENTED DEC. 22, 1903.

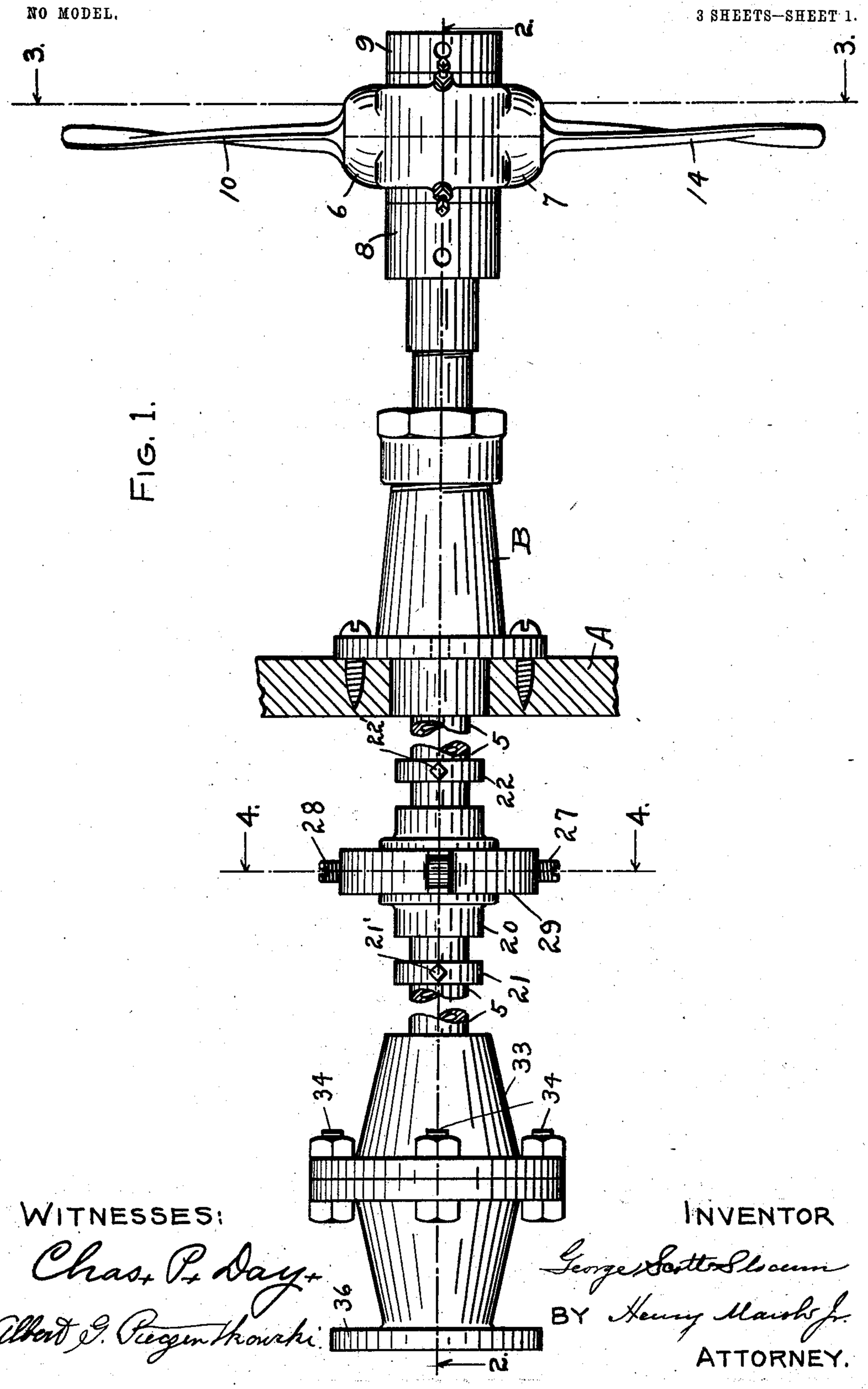
G. S. SLOCUM.

REVERSING PROPELLER GEAR.

APPLICATION FILED SEPT. 4, 1903.

NO MODEL. 3 SHEETS—SHEET 1.

FIG. 1.



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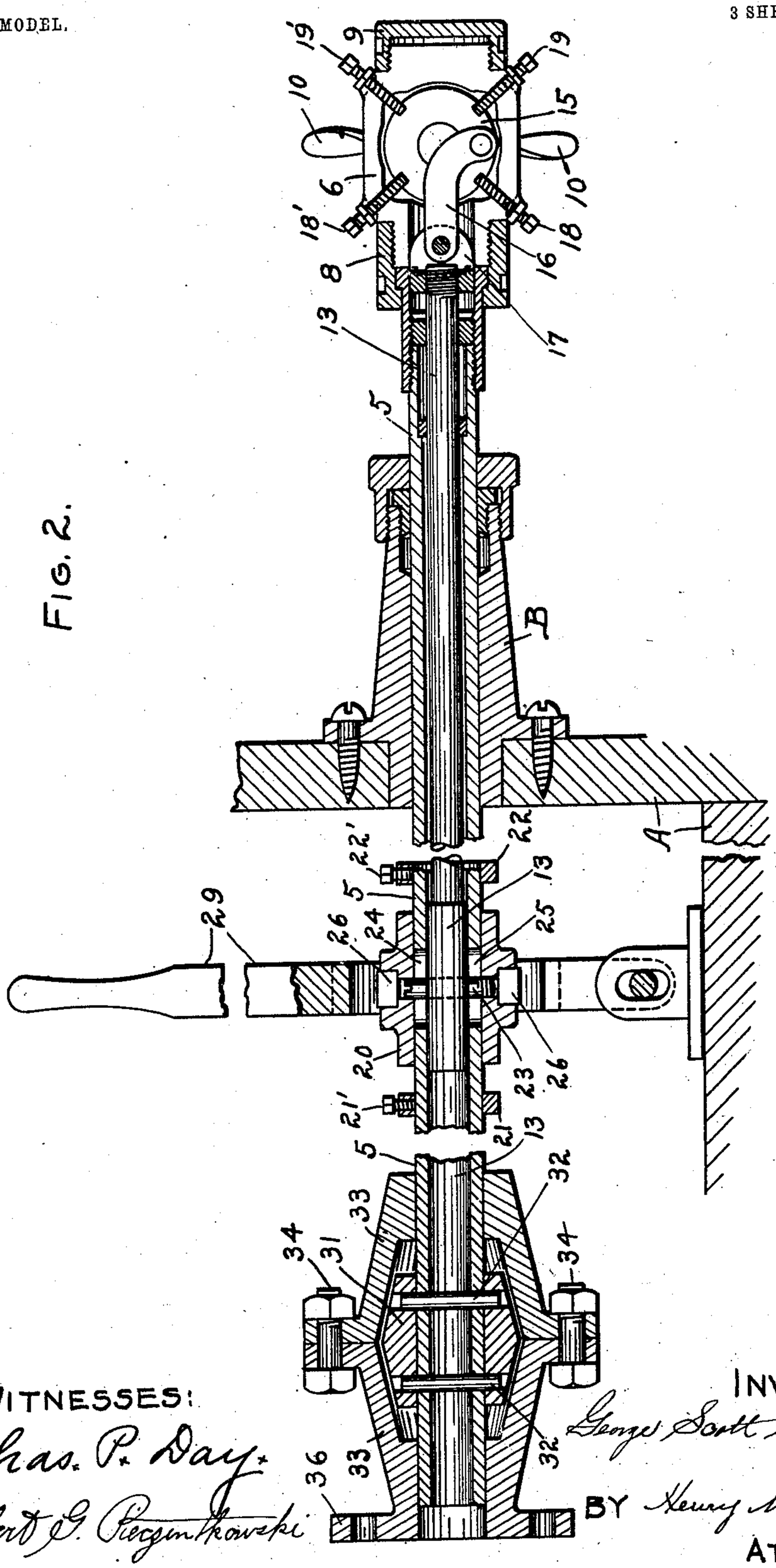
NO MODEL. 3 SHEETS—SHEET 2.

FIG. 2.



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NO MODEL. 3 SHEETS—SHEET 3.

FIG. 3.

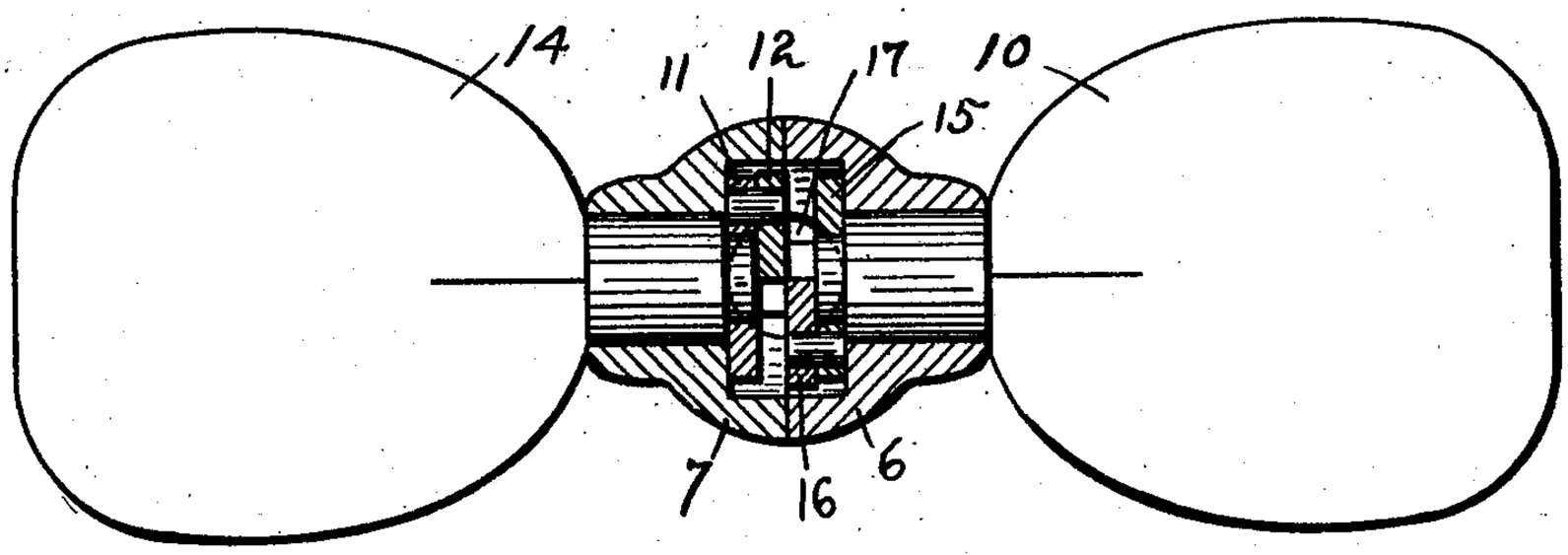


FIG. 4.

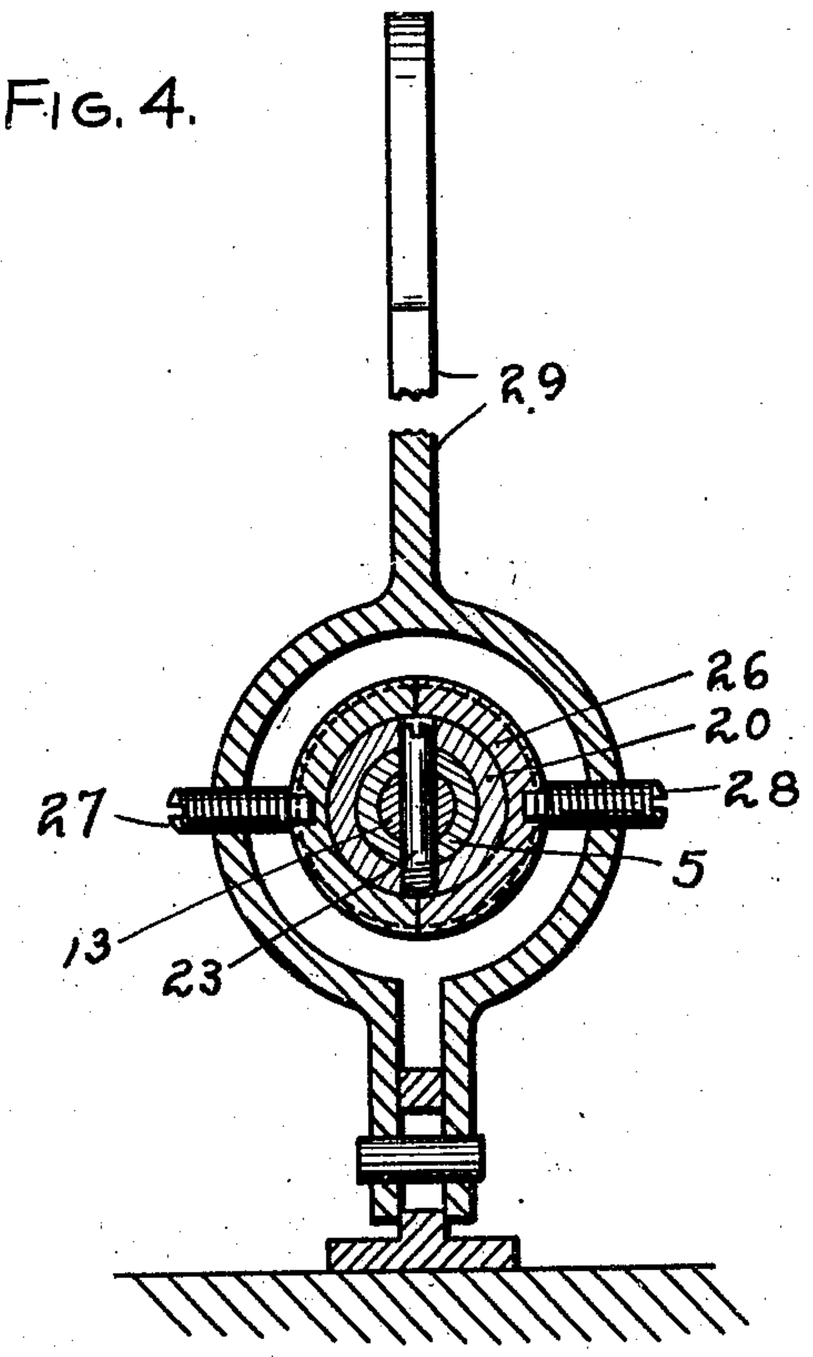


FIG. 5.

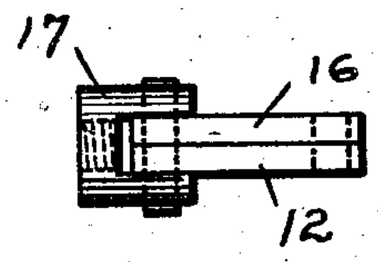
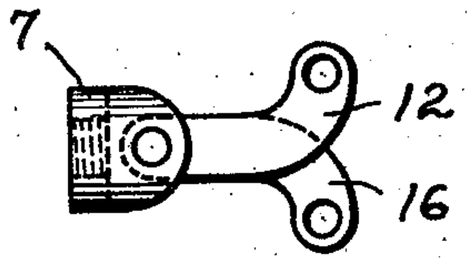


FIG. 6.



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No. 747,785. Patented December 22, 1903.

UNITED STATES PATENT OFFICE.

GEORGE SCOTT SLOCUM, OF NEWPORT, RHODE ISLAND.

REVERSING-PROPELLER GEAR.

SPECIFICATION forming part of Letters Patent No. 747,785, dated December 22, 1903.

Application filed September 4, 1903. Serial No. 172,025. (No model.)

To all whom it may concern:

Be it known that I, GEORGE SCOTT SLOCUM, a citizen of the United States, residing in the city and county of Newport, in the State of Rhode Island, have invented certain new and useful Improvements in Reversing-Propeller Gear, of which the following is a specification.

My invention is applicable to that class of propellers known as "reversing" propellers.

The purposes of my invention are to provide means for determining the degree of pitch of the propeller-blades and for varying and adjusting such pitch at will within the predetermined limits, and also making or breaking at will the connection of the propeller-shaft with the engine or motor. These purposes I accomplish by the novel constructions, combinations, and arrangements of parts hereinafter more fully described, and shown in the accompanying drawings, in which—

Figure 1 is a plan view. Fig. 2 is a longitudinal section taken on line 2 2 of Fig. 1. Fig. 3 is a cross-section taken on line 3 3 of Fig. 1. Fig. 4 is a cross-section on line 4 4 of Fig. 1. Fig. 5 is an edge view of the blade-actuating links and of the cap by which they are attached to their actuating means. Fig. 6 is a plan view of the same.

Similar reference letters and numerals indicate like parts in the drawings.

A represents the stern and a portion of the hull of a vessel, and B the stuffing-box and shaft-support, all of the ordinary well-known type.

The hollow shaft 5, mounted, connected, and driven in the usual manner, carries at its outboard end a hollow hub formed, as shown, of two half-sections, as 6 and 7, clamped together by a threaded sleeve 8 and cap 9. The half-section 6 of the hub is adapted and arranged to serve both as a support for the spindle of a propeller-blade 10, journaled therein, and also as a seat for a disk crank 11, secured upon the inner end of said spindle and arranged by its connection with the end of the rod 13, through the link 12, to rotate the blade 10. The half-section 7 of the hub similarly serves as a support for the spindle of the blade 14 and as a seat for the disk crank 15, likewise connected through a link 16 with the end of the rod 13, and thereby adapted to rotate the blade 14. The links 12 and 16 are preferably connected, as shown, with a cap 17, screwed or otherwise secured to the end of said rod 13. An adjusting-screw 18 serves to limit the movement of the link 16, and consequently the movement of the blade 10, in one direction, while the adjusting-screw 19 serves to similarly limit the movement of said link and blade in the opposite direction. The adjusting-screws 18′ and 19′ similarly serve to limit the movements of the link 12 and blade 14. The rod 13 is, as will be later described, arranged and adapted for rotative movement in unison with the hollow shaft 5 and also for independent longitudinal reciprocating or sliding movement in the bore of said shaft, whereby, through the link connections 12 and 16, the propeller-blades 10 and 14 are rotated upon their spindles to thereby change or adjust their pitch.

Upon the shaft 5 at a suitable point intermediate of its length is adjustably fitted a sleeve 20, arranged for movement longitudinally on said shaft within limits determined by adjustable collars 21 22, in turn adjustably secured upon said shaft by set-screws 21′ 22′. The shaft 5 and rod 13 are bound together for rotative movement by a pin 23, secured in the sleeve 20 and rod 13, and, passing through the opposite coinciding slots 24 25 in the shaft 5, thereby admits of reciprocating longitudinal movement of the rod within the shaft, Figs. 2 and 4. Such reciprocating movement of the rod 13 is effected by the pivoted actuating-lever 29, which, embracing an annular two-part ring 26, loosely recessed in the exterior of the sleeve 20, is secured thereto by set-screws 27 28. Said ring 26 being, as described, loosely fitted on the sleeve 20 allows the latter to revolve with the shaft 5, while the pin 23 binds the shaft 5, rod 13, and sleeve 20 together at all times for rotative movement and by its engagement with the slots 24 25 in the shaft allows the rod independent longitudinal sliding movement in the bore of the hollow shaft.

The adjusting-screws 18 19 18′ 19′ afford, as hereinbefore described, novel and efficient means for determining and adjusting the degree of pitch of the propeller-blades in their forward and backward movements. As they are located outside of the vessel, it may prove

inconvenient at times to get access to them without removing the vessel from the water. Furthermore, in case the blades are not adjusted to exactly the same pitch the water is liable to act unequally upon them at times when the motive power is at rest, and thereby cause movement of the vessel and possible strain upon the mechanism. I have therefore provided novel and useful means for adjusting the pitch of the blades at will from the interior of the vessel and also for disconnecting the propeller-shaft from the engine or motor when the latter is at rest. To these ends I secure upon the shaft 5, preferably forward of the reversing-lever 29, a reversible friction-clutch, consisting of sleeve 31, preferably in the form of a double frustum of a cone and rigidly secured to said shaft by bolts, as 32 32, and a surrounding correspondingly-chambered sleeve 33, preferably constructed in two flanged parts adapted to be clamped together by bolts, as 34 34, and also, as to one of said parts, provided with a flange 36, by which it is connected to the engine or motor in the well-known manner. It will be noted that the shaft 5 and sleeve 31 are free to move longitudinally in the outer sleeve 33 and that such movement in either direction is effected by means of the reversing-lever 29, the movement of which in one direction or the other is limited and determined by the respective collars 21 22, Fig. 2. For example, movement of the lever 29 forward will bring the sleeve 20 into contact with the collar 21, and continued movement of said lever will force the shaft forward until the friction-sleeve 31 is brought into frictional contact with the forward inner surface of the sleeve 33, against which the forward thrust of the propeller will serve to hold it in firm and operative frictional contact. Reverse movement of the lever 29 will bring the sleeve 20 into contact with the collar 22, and continued will carry the shaft and cone 31 backward until the cone is in like frictional contact with the rear interior surface of the sleeve 33, against which the back pull of the propeller will serve to hold it in firm frictional and operative contact. When the lever 29 is stopped at its intermediate position, as shown in Fig. 2, neither side of the cone 31 will be in contact with the sleeve 33, and the shaft will be disconnected from the engine or motor and free to revolve without strain. In any position of the cone 31 movement of the lever 29 in either direction will cause a corresponding longitudinal movement of the rod 13 and through the link connections 12 and 16 a consequent change in the pitch of the blades within the limits determined by the adjusting-screws 18 19 18′ 19′.

I claim as my invention and desire to secure by Letters Patent—

1. The combination with the hollow shaft, and the reversible propeller-blades arranged at the end of said shaft, of the sliding rod in the bore of said shaft, the link connections between the sliding rod and the propeller-blades, the adjustable set-screws for limiting the movements of said links, the sliding sleeve, the adjustable stops for limiting the sliding movement of said sleeve, and the lever actuating the sliding rod to effect the required adjustment of the pitch of the propeller-blades.

2. The combination with the propeller-shaft, the reversible propeller-blades and means for causing the reversal, of the same, of the external conical surfaces arranged base to base upon the propeller-shaft, the corresponding internal conical surfaces by means of which the shaft is driven, and means for causing the engagement and disengagement of the conical surfaces.

3. The combination with the hollow shaft, the reversible propeller-blades arranged at the end of said shaft, the sliding rod in the bore of said shaft, operative connections between the end of the sliding rod and the propeller-blades, and means for actuating said sliding rod, of the adjustable screws which serve as stops to limit the reversing movements of the propeller-blades.

GEORGE SCOTT SLOCUM.

Witnesses:
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