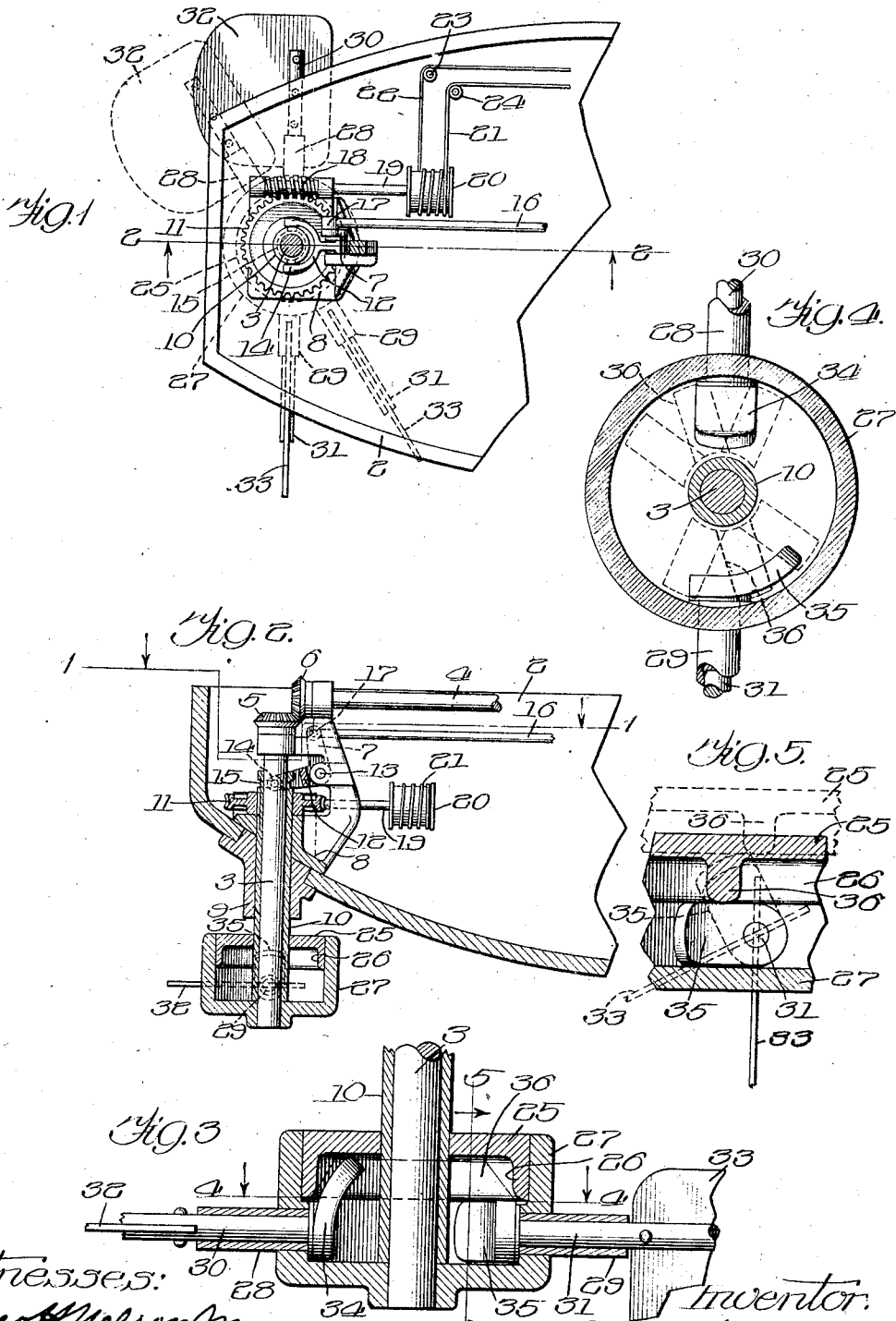


A. M. AKERMAN.
FEATHERING PROPELLER.
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Witnesses:
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UNITED STATES PATENT OFFICE.

AXEL M. AKERMAN, OF CHICAGO, ILLINOIS.

FEATHERING-PROPELLER.

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To all whom it may concern:

Be it known that I, AXEL M. AKERMAN, a subject of the Czar of Russia, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Feathering-Propellers, of which the following is a specification.

My invention relates to means for propelling marine vessels, and its object is to provide improvements in feathering paddle wheels or propeller blades as to simplicity of construction, operation, control and adjustment.

With these objects in view my invention consists in the novel construction, combination and arrangement of parts hereinafter described in detail, illustrated in the accompanying drawing and particularly pointed out in the appended claim.

In the drawing—Figure 1 is a top plan view of a section of the stern of a boat or vessel with my invention applied thereto, being also a section on line 1—1 of Fig. 1. Fig. 2 is a vertical section on line 2—2 of Fig. 1. Fig. 3 is an enlarged vertical section, partly broken away, of the mechanism for turning the blades of the propeller or paddle wheel. Fig. 4, is an enlarged top plan view of substantially the parts shown in Fig. 3, with the cover removed and the sleeve secured to said cover shown in section, or a section on line 4—4 of Fig. 3. Fig. 5 is a section taken substantially on line 5—5 of Fig. 3.

In the several views 2 represents the hull or body of a boat or vessel, 3 the propeller shaft and 4 the counter-shaft driven by any suitable means and operatively connected with the propeller shaft by bevel-gears 5 and 6 on a bearing 7. The propeller-shaft is mounted in a bearing 8 on the inner side of the vessel bottom, which may be a part of the bearing 7, and in a bearing 9 suitably secured to the under-side of said bottom. The shaft 3 is supported in its vertical position by the gear-wheel 5 keyed to its upper end and resting on the bearing 7. On the shaft 3 is mounted a sleeve 10 which is supported vertically by a worm-wheel 11 keyed to the upper end of said sleeve. This sleeve is movable vertically on said shaft 3 by means of a bell-crank lever 12 fulcrumed at 13 on the bearing 7, said lever having a fork 14 which engages an annular groove 15 in the sleeve 10. The bell-crank lever 12 is operated by a rod 16

pivoted to said lever at 17 and extending to any suitable operator's station. The sleeve 10 is revolubly adjusted about the axis of the shaft 3 by means of a worm 18 that engages the worm-wheel 11, said worm being keyed to a shaft 19 having keyed thereon a drum 20 on which is wound a steering rope or cable having runs 21 and 22 running over pulleys 23 and 24 to the operating station on the vessel (not shown).

On the sleeve 10, near its lower end, is secured a cover 25 having a downwardly extending annular flange 26 which fits into a cylindrical chamber or box 27 keyed to the lower end of the shaft 3. Thus the box 27 rotates with the shaft 3 while the sleeve 10 and the cover 25 thereon are normally stationary.

As shown best in Figs. 3 and 4 the box 27 is provided with a pair of radially opposed shaft-bearings 28 and 29 in which are mounted shafts 30 and 31, the outer ends of which carry blades 32 and 33, while the inner ends of these shafts, within the box, have secured thereto levers 34 and 35 which are, respectively, arranged at right angles to the planes of the blades 32 and 33. These levers are successively engaged and forced into horizontal position, as shown in Fig. 5, by a lug 36 projecting from the under-side of the cover 25, the timing of the engagement being such as to force the propeller-blade into a vertical and operative position during a part of its revolution away from the vessel when it is to be propelled forwardly, or during such portion of its revolution toward the vessel when the latter is to be moved backwardly. During the remainder of its cycle the propeller blade is free and is thus permitted to turn into horizontal position and feather the water which is facilitated by securing the propeller shaft above the median horizontal line of the propeller blade, as shown in Fig. 1, and in accordance with the usual mounting of feathering paddles. By turning the disk or cover 25 and its lug 36 the tipping of the propeller blade into vertical or operative position can be made to take place on any desired radius of its circular path. In Fig. 1 the dotted lines indicate such a change of adjustment by rotatively adjusting the sleeve 10 and its disk 25 and lug 36 through the medium of the worm 18 and worm-wheel 11 operated by the drum 20 and cables 21 and 22 thereon. Fig. 5 shows in dotted lines such change of rotary

adjustment. Said Fig. 5 also shows a change in vertical adjustment of the disk 25 to bring its lug 36 out of reach of the levers 34 and 35 in which event the blades or paddles will feather continuously when the shaft 3 rotates. This vertical adjustment of the lug 36 also makes provision for a partial engagement with each of the respective levers so as to incline the paddle more or less between its vertical and horizontal positions and thereby vary the effectiveness of its propelling power between its maximum capacity in vertical position to its feathering position. By this means the speed of the vessel may be controlled without varying the speed of the engine driving the shaft 3. The dotted lines in Fig. 4 indicate different positions of the lug 36. As shown in Fig. 5, the flange 26 is made wide enough to be engaged with the box 27 when the lug is raised sufficiently high to permit the upstanding levers 34 and 35 to pass underneath it without touching it. The number of paddles that may be employed is not limited to two, although for the purpose of illustrating the invention this number only is shown.

In operation the box 27 with the paddles or blades mounted thereon will be rotated by the shafts 3 and 4 and bevel-gears 5 and 6. When it is desired to swing the vessel from one side to the other or to turn it as on a pivot the sleeve 10 will be rotated by means of the cables 21 and 22 rotating the drum

20, shaft 19, worm 18 and worm-gear 11. When it is desired to vary the speed without varying the speed of the engine driving the shaft 16 the disk or cover 25 will be suitably elevated from normal position, or lowered toward said position, by manipulation of the rod 16, or connection therewith, the bell-crank 12 and its fork 15 engaging the groove 15 in the upper end of the sleeve 10.

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

The combination with a rotary shaft, of blades or paddles rotated or revolved by said shaft, said blades or paddles being mounted to face and move edgewise through their path of movement, means for temporarily locking the blades in the facing position, means for varying the locking means to cause same to lock the blades in an inclined position relative to their path of movement and for releasing said blades or paddles entirely from said locking means, and means for shifting the locking means to different positions radially from said shaft.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

AXEL M. AKERMAN.

Witnesses:

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