No. 719,225. PATENTED JAN. 27, 1903.

J. V. JOHANSSON.

REVERSIBLE PROPELLER.

APPLICATION FILED APR. 22, 1902.

NO MODEL.

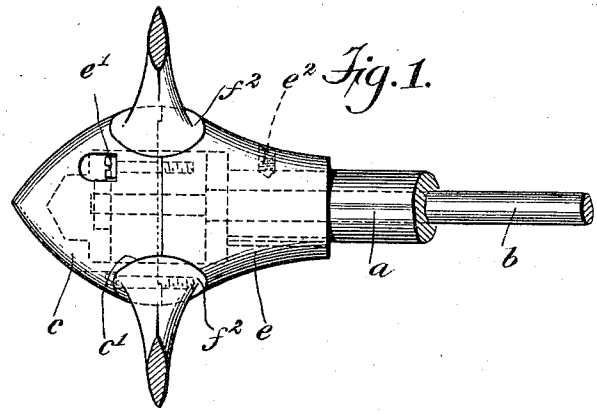


Fig. 1.

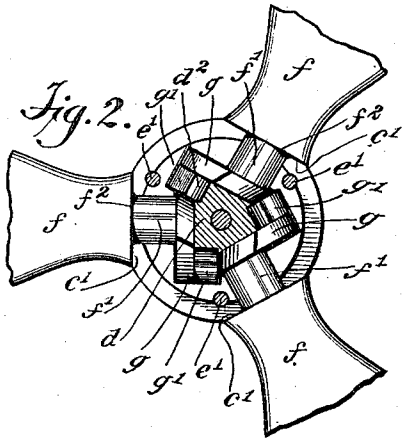


Fig. 2.

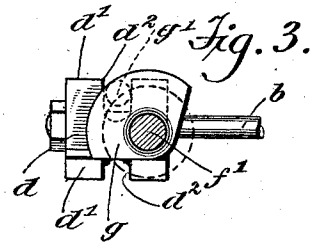


Fig. 3.

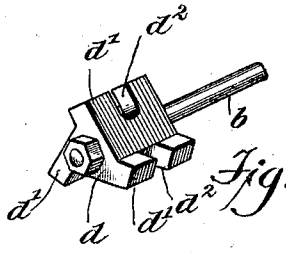


Fig. 4.

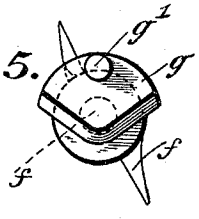


Fig. 5.

WITNESSES:

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REVERSIBLE PROPELLER.

SPECIFICATION forming part of Letters Patent No. 719,225, dated January 27, 1903.

Application filed April 22, 1902. Serial No. 104,113. (No model.)

To all whom it may concern:

Be it known that I, JOHAN VICTOR JOHANSSON, a subject of the King of Sweden and Norway, and a resident of Skyrsta, Hammar, Sweden, have invented a new and Improved Propeller, of which the following is a full, clear, and exact description.

This invention relates to a screw-propeller of that class in which the blades are arranged to be reversed, so that the vessel may be propelled either ahead or astern notwithstanding that the shaft may be turning continuously in one direction.

The object of this invention is to so construct and arrange the parts that the propeller-hub will not be enlarged to an extent materially to detract from the efficiency of the propeller and also to hold the blade perfectly rigid and free from idle movement when the propeller is set, thus preventing needless wear of the parts.

This specification is an exact description of one example of my invention, while the claims define the actual scope thereof.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side view of the invention with the blades broken away. Fig. 2 is a view showing the propeller-blades and illustrating the connection of the slide therewith. Fig. 3 is a plan view of one of the quadrants and the slide connected therewith. Fig. 4 is a perspective view of the slide, and Fig. 5 is a view looking outward from the base of one of the blades.

a indicates the tubular drive-shaft, and *b* the reversing-shaft, which is fitted to slide in the drive-shaft. The hub is constructed in two parts *c* and *e*, these parts being fastened rigidly together by bolts *e'* and being hollow or cupped to form a cavity within the hub. Between these sections *c* and *e* of the hub the trunnions *f'* of the blades *f* are mounted to turn. The blades have circular bases f^2, which turn loosely but snugly on correspondingly-formed parts on the hub, such parts being indicated at *c'*.

The shaft *b* carries at its outer end and within the said cavity the slide *d*. This slide, as best shown in Figs. 2, 3, and 4, is triangular in cross-section, thus adapting it to a three-bladed propeller, such as is here shown, and, indeed, my invention is especially designed with respect to this form of propeller, although of course it could be used with any number of blades, if desired. From each side of the slide *d* a flange *d'* projects in plane with the respective sides, and in these flanges are formed grooves d^2, disposed transversely of the shaft *b*. At the inner ends of the trunnions *f'* of the blades *f* quadrants *g* are arranged, these quadrants being fastened respectively to the trunnions and carrying pins *g'*, which project, respectively, into the slots d^2 of the flanges *d'* on the slide *d*. The quadrants lie, respectively, against the three sides of the slide, and the quadrants are therefore in triangular relation to each other, as Fig. 2 shows.

Now by referring to Fig. 3 it will be seen that if the shaft *b* is moved to the right the pin *g'* will play in the slot d^2 and the quadrant *g*, with the attached blade, will be thrown around its longitudinal axis, thus adjusting the blade to any position along the hub as may be desired. Fig. 3 shows one radial side of the quadrant *g* bearing snugly against the flange *d'* of the slide next adjacent to the flange, in the slot d^2 of which the pin *g'* of the quadrant in question is fitted. If pressure is exerted rightward on the shaft *b*, no further movement of the blade can take place, since all of the parts are thus bound firmly together. When the shaft *b* is moved to the limit of its forward movement, the same operation takes place with respect to the other side of the quadrant. Therefore when the shaft *b* is in either one of its utmost positions and the blades are correspondingly thrown all of the parts have firm bearing on each other and idle or rattling movement is avoided. The hub *c e* of the propeller is fastened on the hollow shaft *a*, as usual, and this may be effected in any desired manner—for example, by the set-screw e^3. (Indicated by dotted lines in Fig. 1.)

The propeller thus constructed is strong and sure in action, and the mechanism for reversing its blades does not increase the size of the hub to any material extent. Further, owing

to the arrangement shown, whereby a firm engagement of all of the parts is effected, the propeller is rendered durable and not liable to those destructive idle movements seen in other propellers of this class.

Various changes in the form and details of my invention may be resorted to at will without departing from the spirit of my invention. Hence I consider myself entitled to all forms of the invention as may lie within the intent of my claims.

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

1. In a propeller, the combination of a shaft, a slide fastened thereto, said slide having a plane surface with a flange projected from one side thereof, the slide also having a transverse slot therein, a propeller-blade, a quadrant on said blade and lying on the said plane surface of the slide, a pin attached to the quadrant and playing in the slot of the slide, the side edges of the quadrant being arranged to bear against the flange of the slide as the blade is thrown from one position to another, and a hub in which the blade is mounted to turn.

2. In a propeller, the combination of a shaft, a slide fastened thereto, said slide being angular in cross-section and having a flange projected from each face thereof, said flanges being transversely slotted, a hub, blades mounted to turn in the hub, a quadrant attached to each blade, said quadrants bearing respectively on the plane faces of the slide, and pins carried by the quadrants and fitting loosely in the respective slots of the slide, the side edges of the quadrants being arranged to bear against the respective flanges as the blades are thrown from one position to the other.

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

JOHAN VICTOR JOHANSSON.

Witnesses:
HJ. BORCLIUS,
A. F. GUSTAFSSON.