No. 766,953. PATENTED AUG. 9, 1904.

A. KREBS.

SCREW PROPELLER.

APPLICATION FILED SEPT. 26, 1903.

NO MODEL.

Fig. 1.

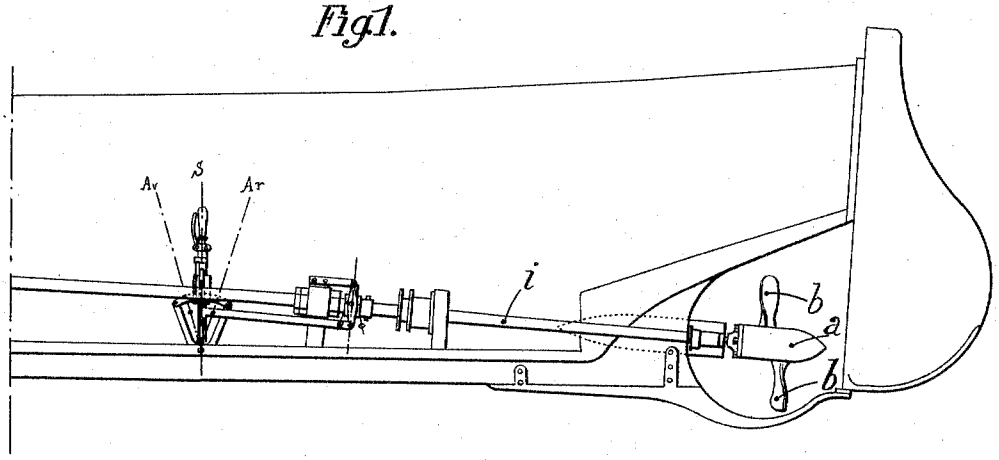


Fig. 2.

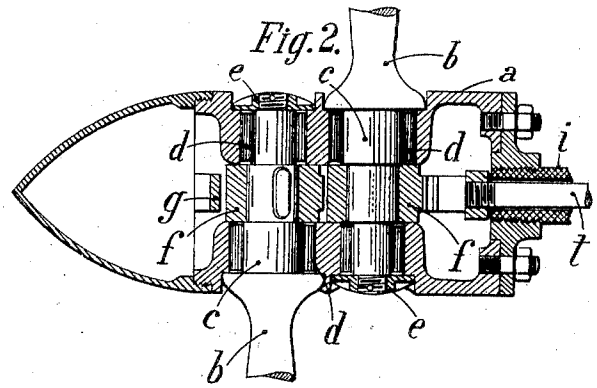


Fig. 4.

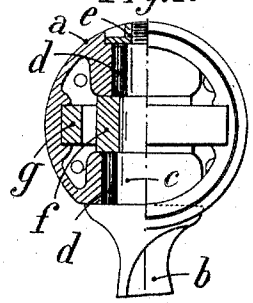
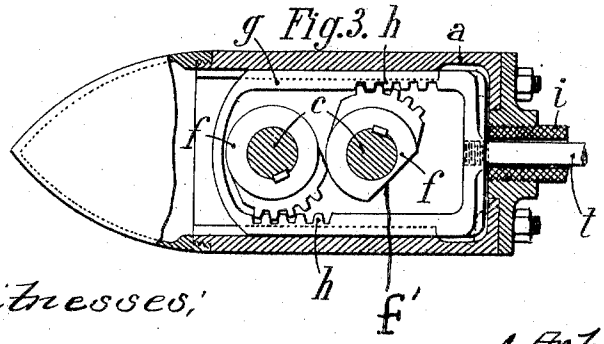


Fig. 3.



Witnesses,

C. D. Kesler.

Inventor

Arthur Krebs

By

James L. Norris.

Atty.

No. 766,953. Patented August 9, 1904.

UNITED STATES PATENT OFFICE.

ARTHUR KREBS, OF PARIS, FRANCE, ASSIGNOR TO SOCIÉTÉ ANONYME DES ANCIENS ETABLISSEMENTS PANHARD ET LEVASSOR, OF PARIS, FRANCE.

SCREW-PROPELLER.

SPECIFICATION forming part of Letters Patent No. 766,953, dated August 9, 1904.

Application filed September 26, 1903. Serial No. 174,826. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR KREBS, engineer, a citizen of the French Republic, residing at 19 Avenue d'Ivry, Paris, (Department of Seine,) France, have invented certain new and useful Improvements in Screw-Propellers, of which the following is a specification.

My invention relates to screw-propellers and to apparatus for changing the direction of the blades during the working thereof, and is designed to provide a propeller which will give varying speeds to the boat either in a forward or backward direction merely by changing the direction of the blades.

The principle of this arrangement is known. It consists in having blades movable around an axle and in moving these blades by means of a stem passing through the shaft of the screw longitudinally. Whatever the means employed may be for obtaining by the rectilineal movement of the stem the circular movement of the blades—*i. e.*, gearing and rack or crank-pin and slide-bar—the turning of the blades during the working of the screw is very difficult and sometimes impossible on account of the resistances owing to the friction. The strains act on the blades, of course, out of the perpendicular and on surfaces which cannot be lubricated because they are in water.

This invention has for its object to substitute the friction of rolling for the friction of sliding in the parts where the strains act out of the perpendicular owing to the working of the screw.

The invention hereinafter described is illustrated in the accompanying drawings, wherein like letters refer to like parts.

Figure 1 represents the arrangement mounted upon a boat. Fig. 2 is a sectional elevation of the screw. Fig. 3 is a sectional plan, and Fig. 4 an end view with a part in section.

a is the hub of the screw, suitably connected to a rotary shaft *i* and which carries two or more blades *b b*, provided with spindles *c c*, which pass through the hub transversely. The ends of these spindles are provided with rollers *d d d d*, on which the spindle rolls when it is necessary to give a variation to the direction of the blades. A screw-nut *e* keeps the spindle fastened when the blade is moved.

The movement of the blades is obtained as follows: A sprocket or sleeve *f*, provided with a suitable number of teeth, is mounted in the middle of each of the spindles *c*. A frame *g* is also provided with toothed bars *h*, gearing with the teeth in the aforesaid sprockets, one of the said sprockets or sleeves having a mutilated portion to allow the full and complete movement of the frame *g* along the axle of the hub *a*, thereby operating simultaneously and in the suitable direction the rotation of the two blades. In Fig. 3 the sprocket or sleeve shown on the right is mutilated, as hereinbefore set forth, and such mutilated portion being denoted by *f'*. The pinions are keyed on the spindles of the blades, so as to have always the same direction with respect to the axle of the hub.

The frame *g* is connected by a suitable rod *t* with a hand-lever S, having a range of movement between dotted lines indicated at A^v and A^r, by the movement of which a forward or backward movement is communicated to the frame, and thus the toothed bars are caused to rotate the spindles and vary the direction of the propeller-blades and the pitch of the screw, by which means the speed of the boat is varied.

The turning of the blades is possible during the working of the motor, because the friction of the spindles of these blades in the hub is a friction of rolling and not of sliding.

Having thus described and ascertained the nature of my invention and in what manner the same may be performed, I declare that what I claim is—

1. A screw-propeller comprising a pair of spindles, a sleeve having a toothed segment carried by each of said spindles, roller-bearings coacting with the terminal portions of the spindles and held spaced by the sleeves, one of said sleeves being mutilated, a blade carried by one end of each of the spindles and means engaging with each of said segments for operating the blades.

2. A screw-propeller comprising a hub, a spindle arranged transversely therein, a blade carried by said spindle, a sleeve having a toothed segment mounted on said spindle, roller-bearings coacting with the terminal portions of the spindle and held spaced by the sleeve, said sleeve having a mutilated portion to permit of the complete movement of the blade, and means for actuating the same.

3. A screw-propeller comprising a hub, a pair of spindles in parallelism and arranged transversely of said hub, a blade carried by each of the spindles, a toothed member secured to each of said spindles and centrally located within the hub, roller-bearings coacting with the terminal portions of the spindles and held spaced by the members, means engaging the teeth of said members for rotating the spindles, a portion of one of said members being mutilated to allow a complete movement of the said means.

4. A screw-propeller comprising a hub having laterally-extending blades provided with spindles, said spindles being in parallelism and arranged transversely of said hub, a toothed member centrally located on each of said spindles, roller-bearings coacting with the terminal portions of the spindles and held spaced by the toothed member, means engaging the teeth of said members for imparting a rotary motion thereto, a portion of one of said members being mutilated to allow a complete movement of the said means.

5. A screw-propeller comprising a hub, blades oppositely disposed thereto, said blades having spindles in parallelism and extending transversely of the said hub, a sleeve mounted on each of said spindles, roller-bearings coacting with the terminal portions of the spindles and held spaced by the sleeve, a toothed segment carried by the sleeve, a longitudinally-movable rack-bar engaging said segment, and means for actuating the bar.

6. A screw-propeller comprising a hub having laterally-extending blades provided with spindles, said spindles being in parallelism and arranged transversely of said hub, a toothed member secured to each of said spindles, roller-bearings coacting with the terminal portions of the spindles and held spaced by the said members, means engaging the teeth of said members for imparting a rotary motion thereto, a portion of one of said members being mutilated to allow a complete movement of the said means.

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

ARTHUR KREBS.

Witnesses:
H. SEINE,
PAUL F. PAQUET.