

(No Model.)

J. E. SPANOGHE.
SCREW PROPELLER.

No. 435,330.

Patented Aug. 26, 1890.

FIG - 2 -



FIG - 1 -



FIG - 3 -

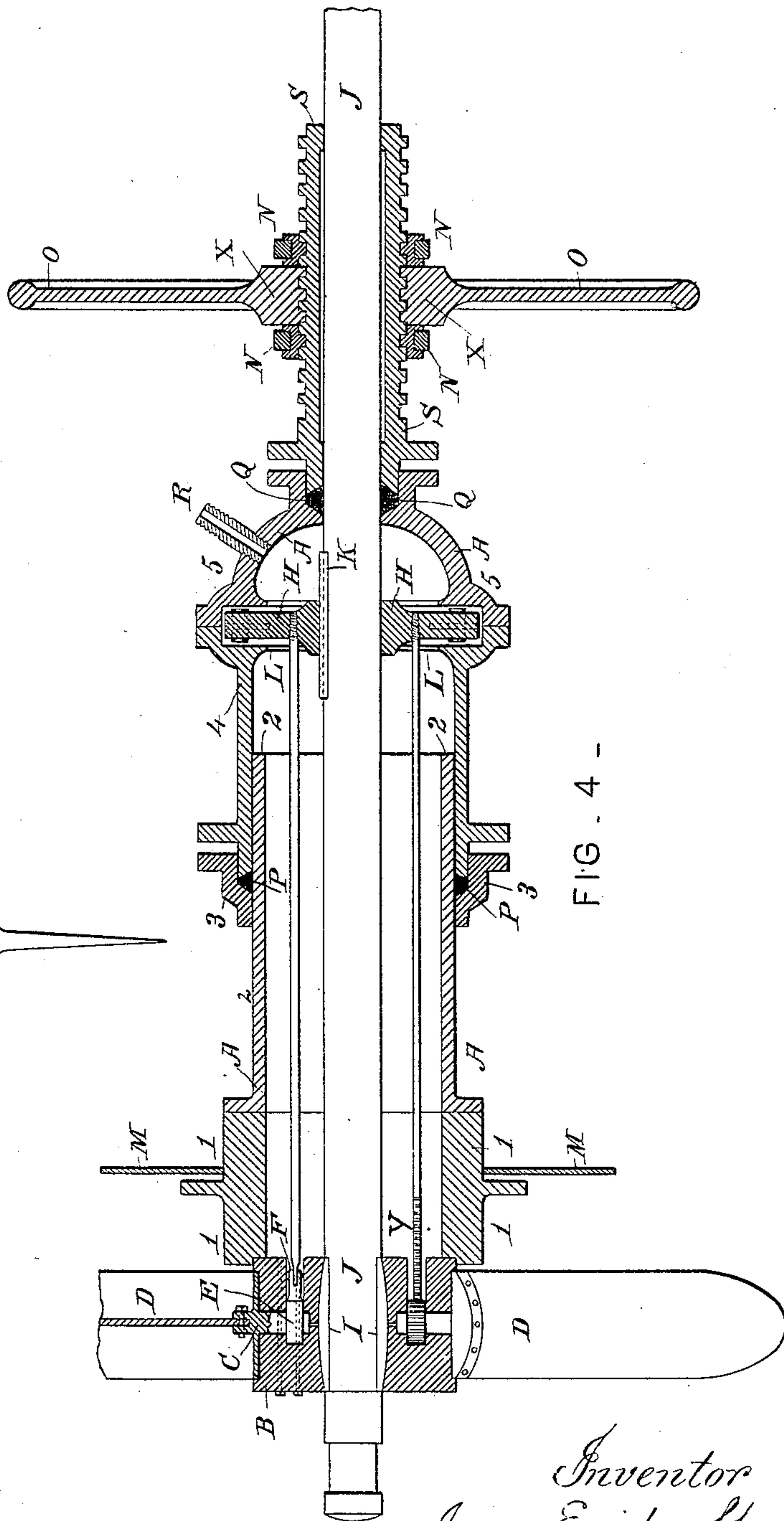
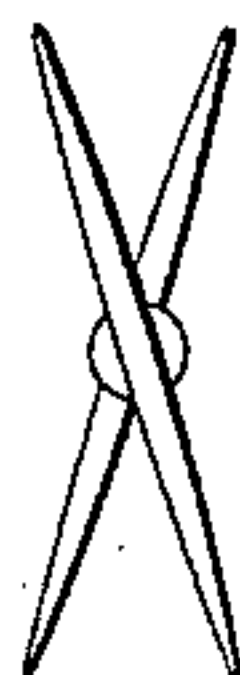


FIG - 4 -

Attest:

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UNITED STATES PATENT OFFICE.

JOSSE-EGIDE SPANOGHE, OF ANTWERP, ASSIGNOR TO AUGUSTUS MARQUE,
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SCREW-PROPELLER.

SPECIFICATION forming part of Letters Patent No. 435,330, dated August 26, 1890.

Application filed April 29, 1889. Serial No. 309,125. (No model.) Patented in Belgium March 3, 1888, No. 80,854; in France March 9, 1889, No. 196,599; in England March 12, 1889, No. 4,342; in Germany March 18, 1889, No. 49,541, and in Austria-Hungary March 28, 1889, No. 15,451 and No. 30,248.

To all whom it may concern:

Be it known that I, JOSSE-EGIDE SPANOGHE, a subject of the King of Belgium, residing at Antwerp, in the Kingdom of Belgium, have
5 invented certain new and useful Improvements in Screw-Propellers with Variable Pitch and Apparatus Therefor, (for which I have obtained Letters Patent in Belgium, No. 80,854, dated March 3, 1888; in France, No.
10 196,599, dated March 9, 1889; in Great Britain, No. 4,342, dated March 12, 1889; in Germany, No. 49,541, dated March 18, 1889, and in Austria-Hungary, No. 15,451 and No. 30,248, dated March 28, 1889,) of which the following is a
15 specification.

The object of this invention is an arrangement of screw-propeller, the pitch of which can be varied at will by altering the inclination of the blades, which for this purpose are
20 pivoted in a special boss, so as to be turned in the one direction or the other by suitable mechanism worked within the vessel, thus varying the pitch of the propeller from zero to the maximum practicable for going either
25 ahead or astern. From this arrangement of the blades capable of being more or less inclined relatively to their plane of rotation it results that the speed of the vessel can be varied from the maximum forward through
30 the phase corresponding to actual stoppage up to the maximum astern, according as the blades are turned in the one direction or the other in the plane of rotation from zero to one hundred and eighty degrees, while the
35 engines continue to work in the same direction with constant speed. This therefore gives means of controlling the vessel's movements by the propeller quite independently of the engines while they remain working.

40 Figure 1 is an elevation of a propeller having the blades placed in the plane of rotation. Fig. 2 is a view showing the blades perpendicular to the plane of rotation, and Fig. 3 is a view showing the blades at a slight inclination. Fig. 4 is a sectional view showing
45 the arrangement of the several parts for adjusting the pitch of the propeller-blades.

From what precedes it is easy to deduce that if the blades are placed actually in the plane

of rotation, forming part of it, as indicated 50 diagrammatically by Fig. 1 of the annexed drawings, the propeller may revolve at any speed whatever without propelling the vessel—in other words, may stop the vessel while the engines are going. If, on the other hand, 55 the blades stand perpendicular to the plane of rotation, as in Fig. 2, the engines being stopped, the vessel can sail without being retarded by the propeller-blades.

A slight inclination of the blades to the 60 plane of rotation, as in Fig. 3, will permit of slowly getting under way without shock to the engines, and this inclination can be gradually increased, so as to increase the pitch of the propeller to suit the maximum speed de- 65 termined by the conditions and the waters in which the vessel floats. For going astern the inclination of the blades has merely to be reversed, all the other actions remaining the same. It will therefore not require the long 70 or difficult operations attending reversal of the engines. Hence result many practical advantages, which greatly facilitate the navigation of screw-steamers.

Fig. 4 of the annexed drawings represents, 75 as an example, a construction for practically altering the inclination of the blades pivoting on the boss.

The boss B consists of two halves bolted together by cross-bolts after having mounted 80 the blades by their inner ends in hollows formed to receive them in the halves of the boss. The boss is fixed on the shaft J by keys I, thickened toward the middle to prevent shifting. The ends of the blades are in 85 the form of pivots or journals C, each having a collar E, which prevents the blade from being detached from the boss, on which it bears firmly by its circular flange c, turning on a corresponding seating on the boss. 90

To the collar E is fixed a crank-arm F, to which is jointed a rod for turning the blade in the one direction or the other. Instead of the crank-arm, the collar may be toothed, as a pinion, gearing with a rack Y, this arrange- 95 ment being preferable practically. The working, whether of the crank F or the toothed pinion, is effected in the same way—that is

to say, the rods G or rack-rods Y are attached to a disk H, which can slide axially on a key K of the shaft J, so that the disk and its connections revolve along with the shaft J and the propeller. The position of each blade being properly set in the first place, it results from the arrangement described that if the disk H is moved to or fro the blades are correspondingly turned, and the pitch of the screw is altered in the one direction or the other. In order that the disk H may be moved to or fro, as required, its edge is fitted to turn within an internal groove formed in a cast-metal casing inclosing the whole and consisting of several parts, 1 2 3 4 5. The parts 1 and 2 are fixed to the vertical bulk-head M at the stern of the vessel, and the boss B bears against the face of the part 1. The parts 3 and 4 can be moved longitudinally, sliding along the part 2, and for this purpose they are attached to a gun-metal tube S, which is externally threaded, and has two longitudinal keyways fitting feathers in two stationary bridles N N, between which a wheel-nut X can be turned to make the tube S move to or fro and along with it the casing 3 4 5 and the disk H, according as the wheel X is turned in the one direction or the other.

Into the casing 5 opens a nozzle R, to which is connected by a pipe a lubricator situated several feet above the level of the water in which the vessel floats. By this is supplied oil for lubricating all the sliding and revolving parts of the propeller and its mechanism. To prevent leakage of water or oil into the vessel, the casing inclosing the mechanism is provided with suitable stuffing-boxes P and Q.

It is obvious that instead of working the nut-wheel X by hand it may be arranged to be worked by suitable engines or gear provided for this purpose, in case the angular shifting of the blades should require too much power for being applied by hand with the desired rapidity.

Having thus described my said invention and in what manner the same is to be performed, what I claim is—

1. The combination, with a screw-propeller having an alterable pitch, of the blades D, mounted by pivots C in the boss B, the rods G, engaging with projections on collar E of pivot C, and disk H, attached to said rods G, with suitable mechanism for imparting longitudinal motion to disk H, whereby the inclination of the blades of the propeller is varied, as set forth.

2. In a screw-propeller having an alterable pitch, the combination of the pivoted blades, the boss B, rods G, gearing mechanism between said rods and blades, disk H, sliding on shaft J and having connection with rods G, casing 4 5, engaging with disk H and sliding on casing 2, and screw-threaded tube S, sliding on shaft J and connected with casing 5, with nut-wheel X engaging said screw-threaded tube S and held from longitudinal movement by stationary pieces N, whereby the inclination of the blades may be varied at will, as set forth.

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Witnesses:

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