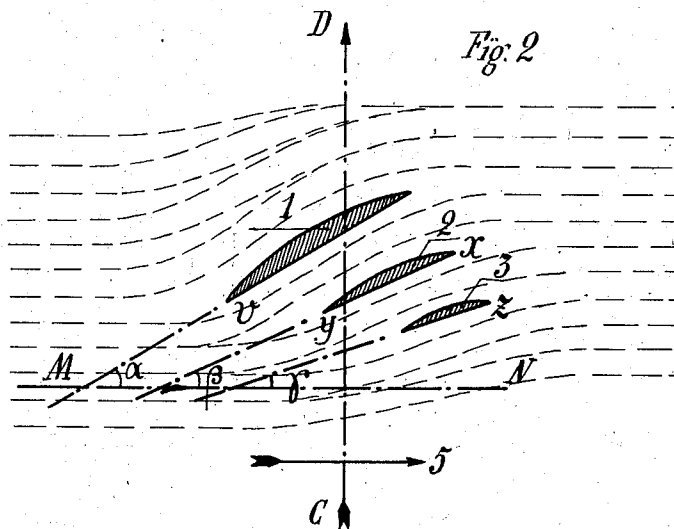


1,021,822.

Fig. 1

Diagram illustrating a flower-like structure with five petals, labeled 1, 2, 3, 4, and 5. A dashed line A-B passes through the center, and a dashed line 1-2 passes through the top petals. A curved arrow 5 indicates a direction of movement or rotation.



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UNITED STATES PATENT OFFICE.

FERNAND BROUSSEUSE, OF LIEGE, BELGIUM.

SCREW-PROPELLER.

1,021,822

Specification of Letters Patent.

Patented Apr. 2, 1912.

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To all whom it may concern:

Be it known that I, FERNAND BROUSSEUSE, a subject of the Kingdom of Belgium, residing at 13 Rue des Armuriers, in Liege, Belgium, have invented certain new and useful Improvements in Screw-Propellers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My present invention relates to an improvement in screw propellers.

In my present improved device I provide an arrangement of a plurality of auxiliary or directing blades in combination with the main blades of said screw propeller and which are subsidiary to the same, and being integrally mounted upon the hub of the main blades turn simultaneously with the same.

The main feature of this invention lies in the disposition of these auxiliary blades upon the boss and their respective pitches.

By my improved device and during the rotation of the propeller a progressive deflection of the fluid stream lines is secured, the eddies and dead water produced by the ordinary screw propeller being thus avoided. Owing to the improved structure in my device the propelling efficiency is increased and a better attacking action of the blades on the water takes place.

Figure 1 is a front view of the propeller. Fig. 2 is a section on the line A—B, Fig. 2.

In Fig. 1 is shown a propeller in its entirety, composed of the main blades 1 and the auxiliary or directing blades 2 and 3, integrally attached to the boss 4 of the main propellers and shows the respective advance of the attacking edges, the arrow 5 showing the direction of rotation.

Fig. 2 is a section of the blades on the radial line A—B, the arrow C indicating the direction of the force of propulsion. The directing blades 2 and 3 are so positioned and secured upon the boss 4 that their angles of attack, corresponding to the pitches or angles γ and β respectively, are smaller than the angle of attack α of the main blades 1,

while they decrease successively in such a manner that there are formed the various angles α , β , and γ . These blades are also characterized by their disposition on the boss 4 in conjunction with their initial attacking or entrance edges being placed *en echelon* in and with the direction of rotation, and their respective positions in relation to the main blades 1.

In Fig. 2 it will be noted that the fluid stream lines that are forced toward the rear during rotation are attacked gradually and in a successive fashion by the whole group of blades 3, 2, and 1. The dead water and all eddies which would be formed therein by the use of blades 1 alone are by this method avoided, with a consequent increase of the propelling efficiency.

It is not to be inferred that my new arrangement simply consists of a group of propeller blades of different pitches integrally arranged on one hub or boss, for the conditions of efficiency of the above described improvement lie in the progressive arrangement of the blade edges and the relative positions of the entering edges of the preceding blades and the location of the exit edges of the blades succeeding them.

I have found that to obtain the best arrangement the entrance edges of each blade should be in advance of and overlap the exit edges v and y of the succeeding blades as in Fig. 2, where the entrance portion of the blade 2 is shown positioned in advance of the exit portion v of blade 1 when considered in a plane parallel to line M—N.

Having thus described my invention, I claim:

A propeller having a plurality of helicoidal elements consisting of a main blade and a plurality of directing blades, said directing blades arranged with their entrance edges *en echelon* behind said main blade, the pitches of said directing blades being less than that of said main blade and decreasing progressively from one another rearward.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

FERNAND BROUSSEUSE.

Witnesses:

LEONARD LEVA,
ALEX LALLEMUND.