T. AMNELIUS.

PROPELLER.

APPLICATION FILED NOV. 27, 1914.

1,146,121.

Patented July 13, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

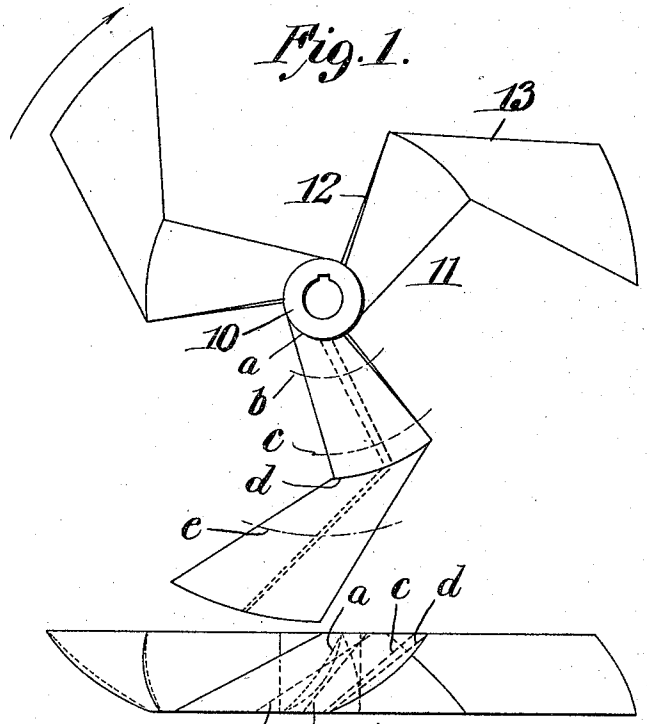


Fig. 2.

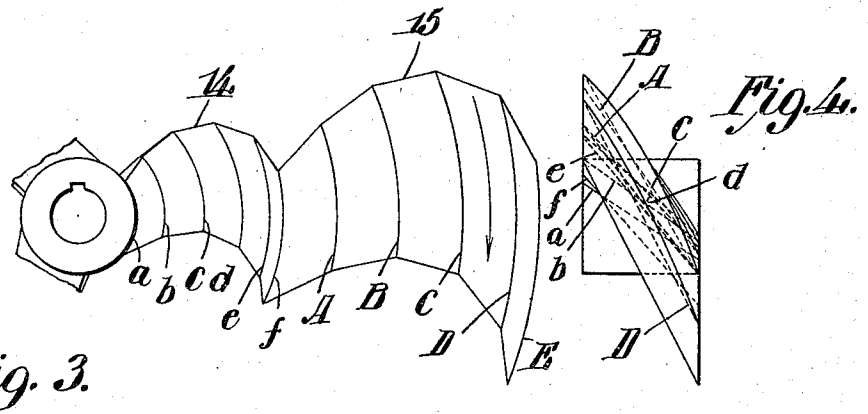


Fig. 3.

Fig. 4.

Witnesses

W. C. Galt.

H. S. Austin

Inventor

Theodore Amnelius.

By Joshua R. H. Potts.

Attorney

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

T. AMNELIUS.

PROPELLER.

APPLICATION FILED NOV. 27, 1914.

1,146,121.

Patented July 13, 1915.

2 SHEETS—SHEET 2.

Fig. 5.

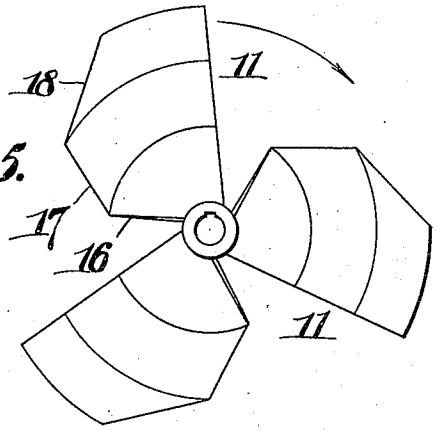


Fig. 6.

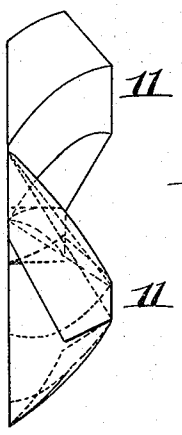
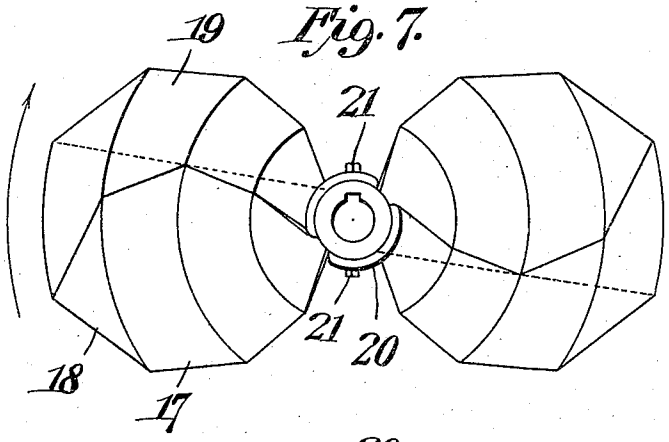
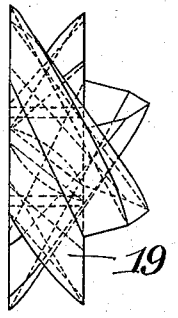


Fig. 8.

Fig. 7.





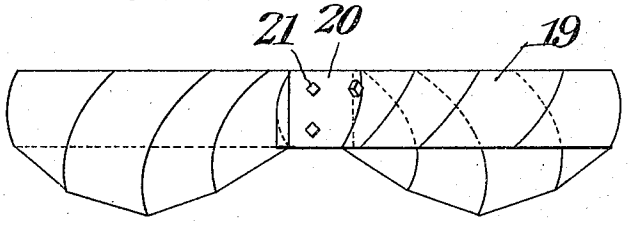


Fig. 9.

Witnesses

D. D. Galt.

H. S. Austin

Inventor

Theodore Amnelius.

By Joshua R. H. Potts.

Attorney

UNITED STATES PATENT OFFICE.

THEODORE AMNELIUS, OF SOUTH FRAMINGHAM, MASSACHUSETTS.

PROPELLER.

1,146,121. Specification of Letters Patent. Patented July 13, 1915.

Application filed November 27, 1914. Serial No. 874,199.

To all whom it may concern:

Be it known that I, THEODORE AMNELIUS, a citizen of the United States, residing at South Framingham, county of Middlesex, and State of Massachusetts, have invented certain new and useful Improvements in Propellers, of which the following is a specification.

My invention relates to propellers, and more particularly to that class thereof commonly known as screw propellers.

The primary object of my invention is to provide a propeller of improved type which shall be more effective in operation than those types now in general use of the same size and when rotating at the same rate.

A further object of my invention is to provide a propeller which, when rotating, shall have but little centrifugal action upon the water or other element within which it is rotating.

Other objects will appear hereinafter.

With these objects in view my invention consists generally in a propeller having a blade so shaped as to transform its centrifugal movement or action of water or air in which the propeller is rotating at or near the hub into a rearward and preferably inward direction as it approaches the periphery or outer end of the blade.

My invention further consists in certain novel details and forms of construction whereby the normal centrifugal force is overcome and caused to condense the medium behind the propeller and rarefy or decrease its density in front of the propeller.

My invention still further consists in the novel combination and arrangements of parts all as will be more fully described hereinafter, and particularly pointed out in the claims.

My invention will be more readily understood by reference to the accompanying drawing forming a part of this specification, and in which—

Figure 1 is a rear elevation of a propeller embodying my invention in its simplest form, Fig. 2 is an edge view of the propeller illustrated in Fig. 1, Fig. 3 is a fragmentary view of a propeller illustrating a modified form of propeller blade, Fig. 4 is an edge view of the blade shown in Fig. 3, Fig. 5 is a rear elevation of a propeller embodying my invention and illustrating a further modified form, Fig. 6 is an edge view of the propeller shown in Fig. 5, Fig. 7 is a rear elevation of a propeller showing a still further modification, Fig. 8 is an end view looking at the ends of the blades shown in Fig. 7, and Fig. 9 is an edge view looking at the sides of the blades.

Referring now to the drawings, and more particularly to Figs. 1 and 2 thereof, 10 indicates the hub of the propeller and 11 the blades thereof. Each of the blades in this form of the invention has its operative face formed of two faces 12 and 13 arranged at an angle to each other longitudinally of the blade. It will be observed that transverse sections of the blade of this form of the invention taken successively from the hub outwardly are at increasing angles to the axis of rotation as indicated by the dotted lines *a*, *b*, *c*, *d* and *e*, the same being shown more clearly in Fig. 2 of the drawings. As is shown in this figure, as well as other figures of the drawings, I prefer to construct the operative faces of the propeller blade straight from front to back edge, thereby reducing the friction with the element in which it is rotating common to propellers of this type to a minimum. It is obvious that as the propeller rotates, the blades, which are disposed upon the hub at an angle to the direction of travel of the propeller, as is clearly shown in the drawings, will be enabled to get sufficient purchase upon the medium or element surrounding the same to secure the maximum efficiency for the size of the propeller employed, and by the arrangement of the various faces of each blade at an angle to its next adjacent face the centrifugal force which is present in all rotary mechanism will be transformed into a rearward condensing force. Obviously, by arranging the outer face of each blade at an angle to the inner face of the blade, as shown in Figs. 1 and 2, the centrifugal force created by the inner face 12 of the blade will be broken, and the water or air through which the propeller is rotating will be directed inwardly and rearwardly without in the least impairing the speed of the propeller.

In Figs. 3 and 4 I have illustrated a slightly modified form of the propeller blade, in which the inner and outer blade sections 14 and 15 are provided with a plurality of faces arranged at angles to each other longitudinally of the blade and with the angles becoming more acute outwardly or toward the outer ends of the blades. It is also to be observed that each of these various smaller faces of the inner and outer

blade sections is at increasing angles to the axis of rotation of the blade, and consequently during the rotation of the propeller the element surrounding the blades will be acted upon not only by the inner and outer sections of the propeller blades, but also by the variously inclined faces provided upon the operative faces of said sections, and centrifugal force of the medium will be converted into an inwardly and rearwardly directed force. In Figs. 3 and 4 the lines *a*, *b*, *c*, *d*, *e*, and *f*, and A, B, C, D, and E are lines indicating the juncture of the various smaller faces formed upon the inner and outer sections of the propeller blade. The width of the successive faces increases slightly from the center toward the outer end of each propeller blade.

My invention also contemplates the employment of sub-blades in connection with the blades of the above described forms of propeller. These sub-blades are constructed or shaped substantially similar to the main blades with which their use is intended, and when properly assembled upon the propeller the configurations of the same are reversed, not in pitch, but so that the substantially concave or operative faces of each blade proper and sub-blade are adjacent. By arranging the propeller and sub-blades in this manner it is to be observed that an open ended, angularly disposed pocket like construction is provided upon each of the blades proper of the propeller, whereby the element in which the same rotates will be driven inwardly and forced rearwardly, and thus condensed to a great degree to reduce agitation of the same. To this end, I have, in Figs. 7, 8 and 9, shown the arrangement of sub-blades indicated generally at 19, in connection with a propeller similar to that shown in Figs. 5 and 6, and wherein each sub-blade is illustrated as being of substantially the same contour and construction as the propeller blade proper, having a base plate 20 conforming to the shape of a section of and for application to the hub of the propeller, through which bolts 21 may be inserted to hold the sub-blade in proper position. It is to be observed that each sub-blade is arranged upon the propeller so that the extreme ends thereof and the end of its respective blade proper meet, and the lateral edges of the blade proper and sub-blade are in overlapping relation. By providing the blades of the propeller with sub-blades such as have been above described the propelling surface of the propeller is increased.

I claim:

1. A propeller blade having an operative face, the successive portions of which lie at increasing angles to the axis of rotation from the inner to the outer end, and successive sections of the same being at angles more acute from the inner to the outer end, substantially as described.

2. A propeller blade having an operative face, the successive portions of which lie at increasing angles to the axis of rotation from the inner to the outer end, and successive sections of the same being at angles more acute to each other from the root to the outer end, and all lines described on said face by cylinders of revolution being straight, substantially as described.

3. A propeller blade having an operative face, the successive portions of which are straight from front to back edge and lie at increasing angles to the axis of rotation from the inner to the outer end, and the successive sections of the same being at angles more acute from the inner to the outer end, substantially as described.

4. A propeller blade formed with an operative face consisting of a plurality of faces arranged at angles to each other longitudinally of the blade, the said faces being arranged at angles more acute toward the outer end of said blade, and a like number of sub-blades of opposite configuration coacting with said propeller blades, substantially as described.

5. A propeller blade having an operative face, said face consisting of a plurality of flat faces arranged at angles to each other from the inner to the outer end of said blade and the angles of said faces becoming more acute toward the said outer end, the successive portions of said blade lying at increasing angles to the axis of rotation from the inner to the outer end, and a sub-blade having its operative face constructed similar to said propeller blade arranged thereon with its operative face adjacent that of said propeller blade, substantially as described.

6. A propeller blade formed of a plurality of sections each having an operative face consisting of a plurality of faces arranged at angles to each other longitudinally of the blade, and the faces in each succeeding section being of greater dimension longitudinally of the blade than the corresponding faces of the next preceding section, substantially as described.

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

THEODORE AMNELIUS.

Witnesses:
WILLIAM RICHTMAN,
W. T. O'CONNOR.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."