W. ROWTHORNE.

SCREW PROPELLER.

APPLICATION FILED MAR. 15, 1915.

1,142,530.

Patented June 8, 1915.

3 SHEETS—SHEET 1.

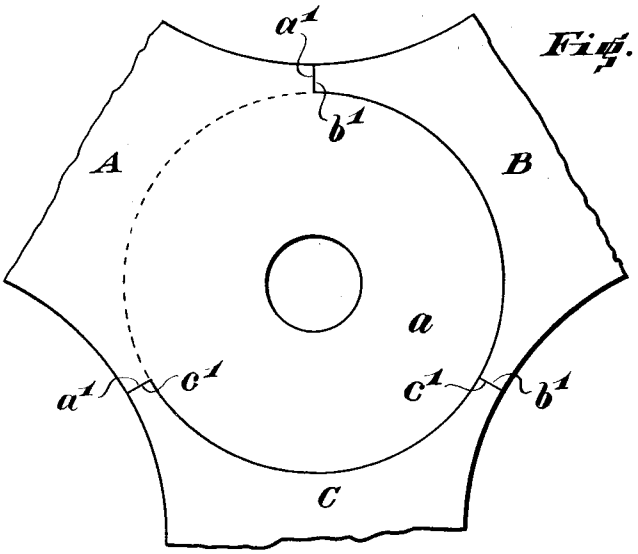


Fig. 1.

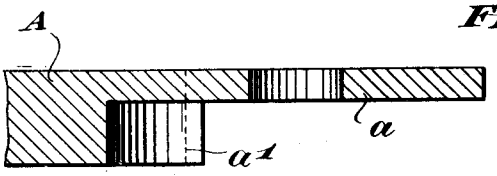


Fig. 2.

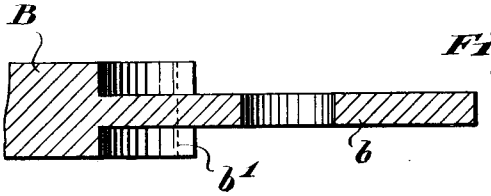


Fig. 3.

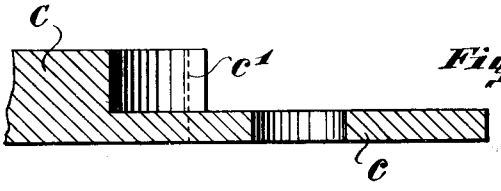


Fig. 4.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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3 SHEETS—SHEET 2.

Fig. 5.

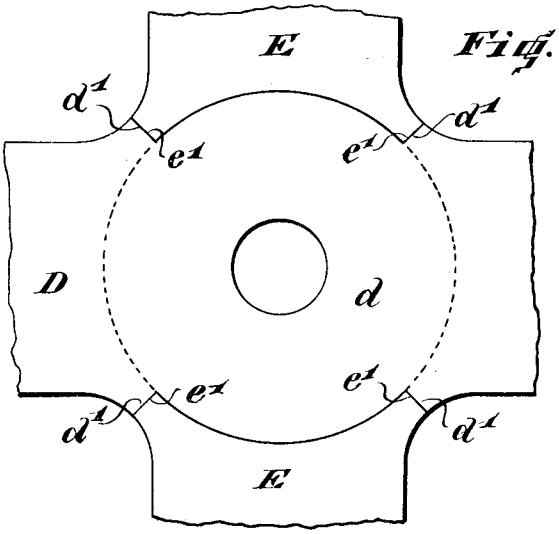
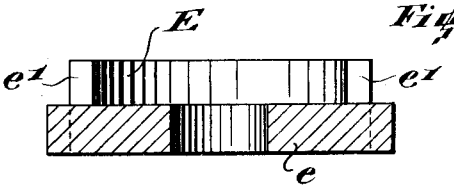


Fig. 6.



Fig. 7.



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3 SHEETS—SHEET 3.

Fig. 8.

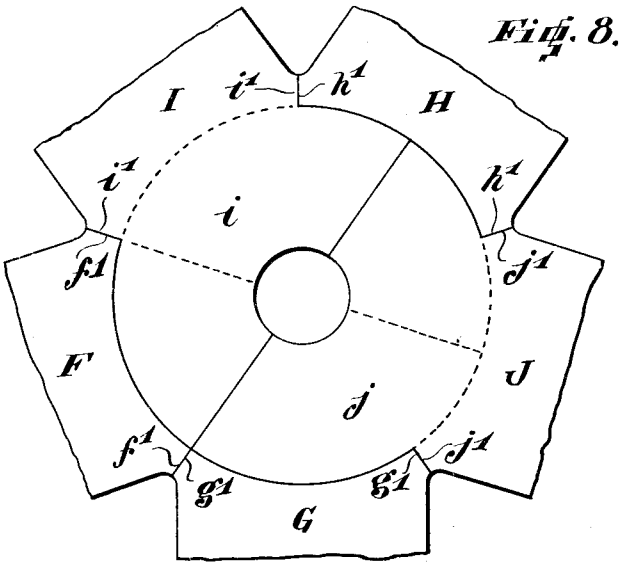


Fig. 9.

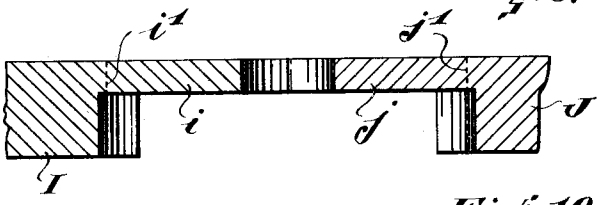


Fig. 10.

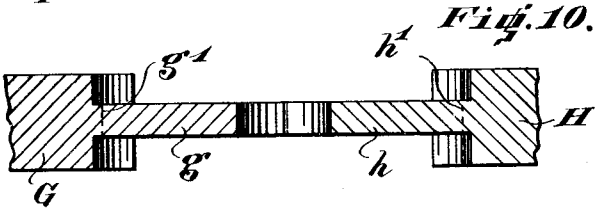
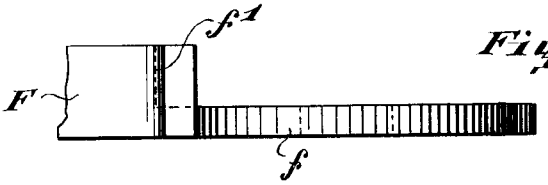


Fig. 11.



Witnesses:-
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UNITED STATES PATENT OFFICE.

WILLIAM ROWTHORNE, OF SOUTHAMPTON, ENGLAND.

SCREW-PROPELLER.

1,142,530. Specification of Letters Patent. Patented June 8, 1915.

Application filed March 15, 1915. Serial No. 14,583.

To all whom it may concern:

Be it known that I, WILLIAM ROWTHORNE, subject of the King of Great Britain and Ireland, residing at 126 Avenue road, Itchen, Southampton, in the county of Hampshire, England, engineer, have invented new and useful Improvements in Screw-Propellers, of which the following is a specification.

This invention relates to the construction of screw and like propellers, enabling the propellers to be made of great strength without increasing the weight.

The type of propeller to which my improvement relates is that built up of a number of parallel sections of wood or like material, each of which is suitably shaped, so that, when laid one on top of the other, the complete propeller is given any form required. I propose to sew the layers forming the propeller together by copper or like wire passing through holes crossing the joints and drawn tight in shallow grooves, the propeller being afterward finished to give a smooth surface in any suitable manner. I also provide a simple method by which the propeller may be readily secured to the end of the shaft.

According to this invention each of the elements which go to make up one complete layer of a propeller having 3, 4, 5 or more blades is provided with a boss or centerpiece of reduced thickness and of circular form which fits into a similarly shaped recess in the other elements. By this means the boss or center portion of each layer is laminated and consists of the center pieces of reduced thickness of each element whose curved sides fit snugly into similar circular recesses in the other sections while the radial shoulders provided at the base of each blade shut and maintain the elements in their proper relative positions.

Any suitable number of layers prepared as above are built up in the manner described to form the complete propeller.

In order that my invention may be more readily understood, reference is had to the accompanying drawings in which:—

Figure 1 is a plan of the junction or boss portion of one layer of a three bladed propeller according to my invention. Figs. 2, 3, and 4 are longitudinal sections of each unit of the layer taken along the center line of the blade. Fig. 5 is a similar view to Fig. 1 but showing a four bladed propeller. Figs. 6 and 7 are longitudinal and cross sections of the two elements employed to build up Fig. 5. Fig. 8 is a plan view of one layer of a five bladed propeller according to my invention, and Figs. 9, 10 and 11 are respectively sections and elevation of the elements thereof.

Referring to Figs. 1 to 4 the three bladed layer is built up of three elements A, B, C one for each blade and each of the elements A, B, C has a boss portion a, b, c of reduced thickness arranged, a at the top, b at the center and c at the bottom of the thickness of their respective blades A, B, C as shown in Figs. 2, 3 and 4. When the elements are built up to form one layer of the propeller as shown in Fig. 1 they form a common laminated boss, comprising the portions a, b, c, which together equal in thickness the blades A, B, C. Each blade A, B, C is provided with radial shoulders or abutments a^1, b^1, and c^1 which abut against one another to maintain the blades A, B, C in the relative position.

In Figs. 5, 6 and 7 each of the blades D and E are double ended and have central bosses d and e of half their thickness as shown in Figs. 6 and 7. These blades D and E cross each other at right angles, their radial shoulders d^1 and e^1 abutting each other and acting to retain the blades in the required position, radially as in Fig. 1.

Figs. 8, 9, 10 and 11 show parts for a five bladed propeller, each of the five blades F, G, H, I, and J having a portion f, g, h, i and j respectively, which together form the laminated central boss. The blade F has a complete circular boss piece f of one third of the thickness of the blades, while each of the blades G, H, I, J, have only semicircular boss pieces g, h, i, j, of which g and h fit together to form one complete boss while i and j form another, both equal in thickness to one third of the blades. These two compound bosses g, h and i, j will together with the complete boss f, form a compound laminated boss equal in thickness to the thickness of the blades F, G, H, I, J. As in the previous cases, the blades are provided with radial shoulders f^1, g^1, h^1, i^1, j^1 respectively, which abut, to keep the blades F, G, H, I, J, in the required relative positions, radially.

A six bladed propeller may be built of

layers formed similarly to a three bladed propeller, as shown in Figs. 1 to 4 but with double ended blades as shown in connection with a four bladed propeller in Figs. 5 to 7. Layers for propellers having a greater or less number of blades may be formed by suitable modifications of the same methods.

The layers formed according to this invention are built up into propellers by placing a number of layers having the required number of blades, one above the other. These layers are each arranged in a progressively different position radially, from the next, so as to form a rough screw having the required number of blades. The layers are glued or otherwise secured together and finished or worked to the true screw form by suitable tools or machinery. The blades are then reinforced or strengthened by stitching or binding together the various layers with fine copper wire or other suitable material. The final smooth surface is imparted to the blades by alternately rubbing down their surface with abrasive material such as glass-paper and coating with paint, varnish, polish or the like preservative material.

It will be seen that a feature of the present construction is that the disks forming the bosses are completely circular and shoulders are formed on the blades themselves which serve to keep them in correct angular relation.

What I claim as my invention and desire to secure by Letters Patent is:—

A screw-propeller comprising blades, each having an annular, apertured hub-portion, of reduced thickness, and each blade having lateral shoulders at the hub-end thereof, but not contained in the reduced portion; said hub-portions being superposed to make a laminated hub for the propeller; and said shoulders of one blade abutting shoulders of adjacent blades.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

WILLIAM ROWTHORNE.

Witnesses:

GEORGE COMYORS MARROCK,
FREDERICK JOHN RICHARDS.

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