(No Model.)

J. D. MULLER.

SCREW PROPELLER.

No. 525,664. Patented Sept. 4, 1894.

Fig. 1.

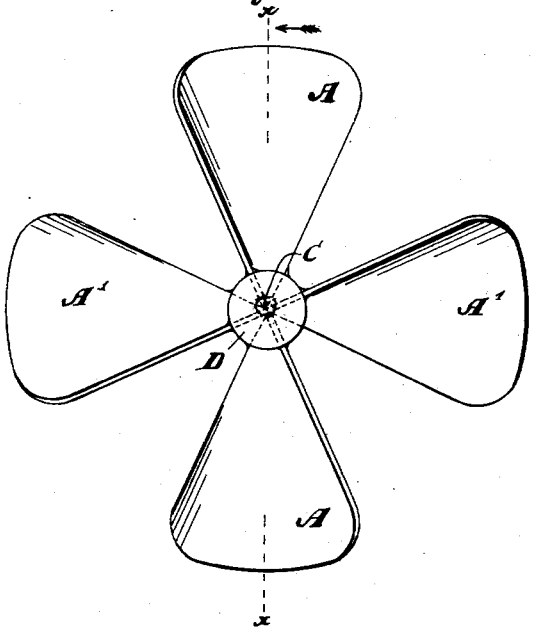


Fig. 2.

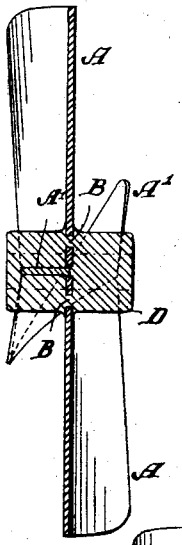


Fig. 3.

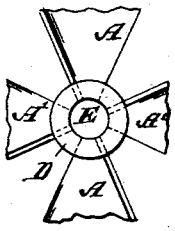


Fig. 4.

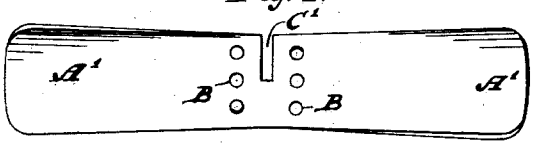


Fig. 5.

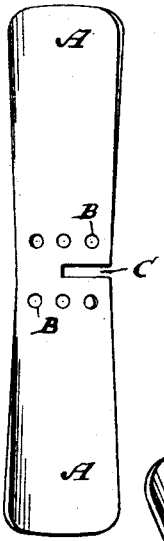


Fig. 10.

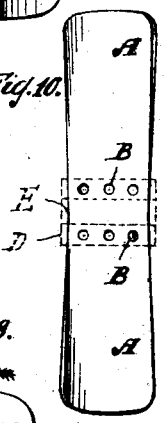


Fig. 6.

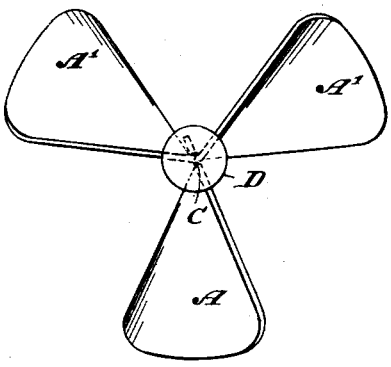


Fig. 8.

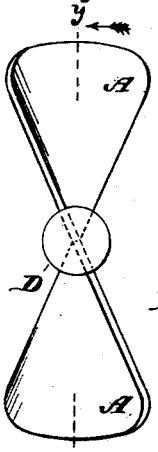


Fig. 7.

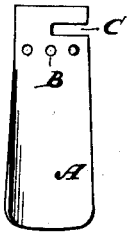
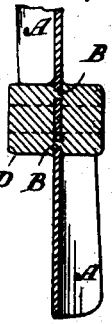


Fig. 9.



WITNESSES:

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INVENTOR:

John Diederich Muller.

BY

Hauff & Hauff

ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN DIEDERICH MULLER, OF NEW YORK, N. Y.

SCREW-PROPELLER.

SPECIFICATION forming part of Letters Patent No. 525,664, dated September 4, 1894.

Application filed December 1, 1893. Serial No. 492,495. (No model.)

To all whom it may concern:

Be it known that I, JOHN DIEDERICH MULLER, a citizen of the United States, residing at New York, in the county and State of New York, have invented new and useful Improvements in Screw-Propellers, of which the following is a specification.

The object of this invention is to form a screw propeller with the blades of rolled metal so that the blades being of uniform character throughout without the air bubbles or defects at times found in cast propellers can be made of considerable thinness and lightness and still possess the required strength and to this end the invention consists in the novel features of construction set forth in the following specification and claims and illustrated in the annexed drawings, in which—

Figure 1 is an end elevation of a screw propeller before the shaft opening is formed. Fig. 2 is a section along *x x* Fig. 1. Fig. 3 is a view similar to Fig. 1 the shaft opening having been formed. Figs. 4 and 5 indicate two sets of propeller blades in position to be put together. Fig. 6 is an end elevation of a modification. Fig. 7 is a detail view of a blade applicable in the structure shown in Fig. 6. Fig. 8 is an end elevation of another modification. Fig. 9 is a section along *y y* Fig. 8. Fig. 10 is a side elevation of Fig. 8.

In making for example a four bladed propeller as seen in Figs. 1 to 5, I roll the blades A A as seen in Fig. 5 and the blades A′ A′ as seen in Fig. 4, the rolling operation as known making the metal homogeneous or free from flaws or defects. The blades are not only rolled but also given the requisite twist or curvature required for the propelling or screw action. Each series of blades A A and A′ A′ is provided with holes or perforations B and with cuts C C′ extending partly through each set of blades. The blade set A A is then placed onto the blade set A′ A′ the lips of cut C extending across or corresponding to the uncut portion of blades A′ and the lips of cut C′ extending across the uncut portion of blades A, so that the blades are evenly or properly interlocked as seen in Figs. 1 and 2. The blades are then placed in a mold or suitable receptacle and the hub D is cast about the junction or meeting portion of the blades, so that the metal forming the hub will be cast into or bind through the holes B B as seen in Fig. 2 so as to make a firm structure. When the hub D has properly hardened or become set the hole E for the propeller shaft is bored or formed in or through the hub as seen in Fig. 3.

In making a three bladed propeller the method is the same, the blade series A′ A′ in addition to being rolled and twisted being also set or bent to such an angle as to be in proper relative position to one another and to blade A as seen in Fig. 6. The blade series A in Fig. 6 consists of but one blade formed as seen in Fig. 7, the junction of the several blade series A′ and A and the formation of the hub D being the same as in Fig. 1.

In making a two bladed propeller (Figs. 8 to 10), I take a blade series as A A (Fig. 5) the cut C being in this case unnecessary and cast the hub D at the perforations B as before.

A screw propeller is thus obtained the blades of which cannot become detached, and as the blades are strengthened by rolling said blades can be reduced to an extreme thinness, no allowance being required for flaws.

What I claim as new, and desire to secure by Letters Patent, is—

1. The method herein described of manufacturing a propeller, which consists in rolling the propeller-blades and twisting them to the proper form, providing the blades with cuts extending from edges of the blades toward their median lines, and with perforations extending transversely in proximity to the cuts, interlocking the propeller blades at their cut portions, casting a hub about the interlocked portions and through the said perforations, and then forming a shaft opening in the cast hub, substantially as set forth.

2. A screw-propeller, consisting of rolled metal blades provided with cuts extending from edges of the blades toward their median lines and with perforations extending transversely in proximity to the cuts, and a hub cast in a single piece to the blades and through said perforations, substantially as shown and described.

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

JOHN DIEDERICH MULLER.

Witnesses:
WM. C. HAUFF,
E. F. KASTENHUBER.