(No Model.)

J. BELDUKE.

SCREW PROPELLER.

No. 329,528. Patented Nov. 3, 1885.

Fig. 1.

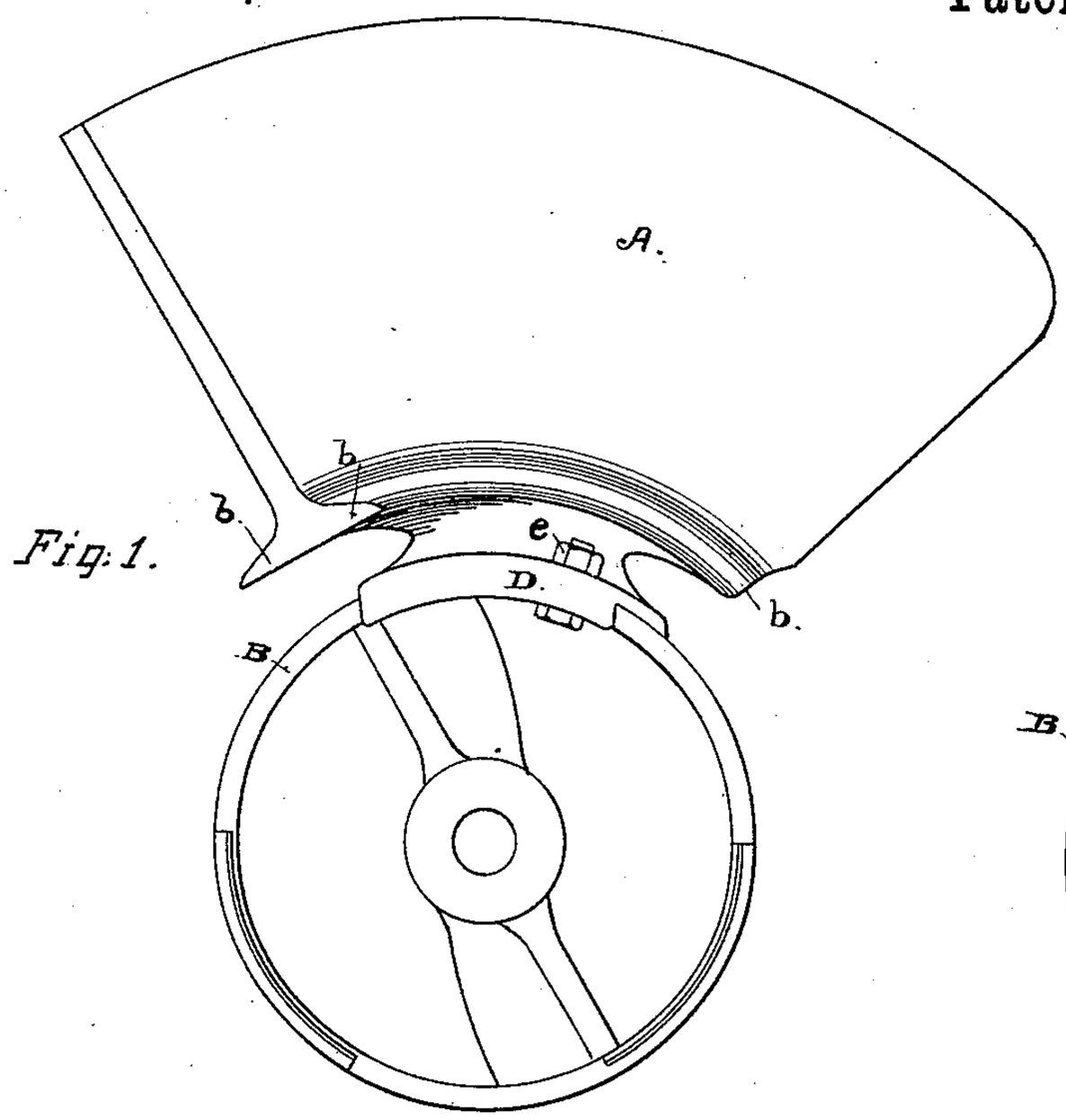


Fig. 2.

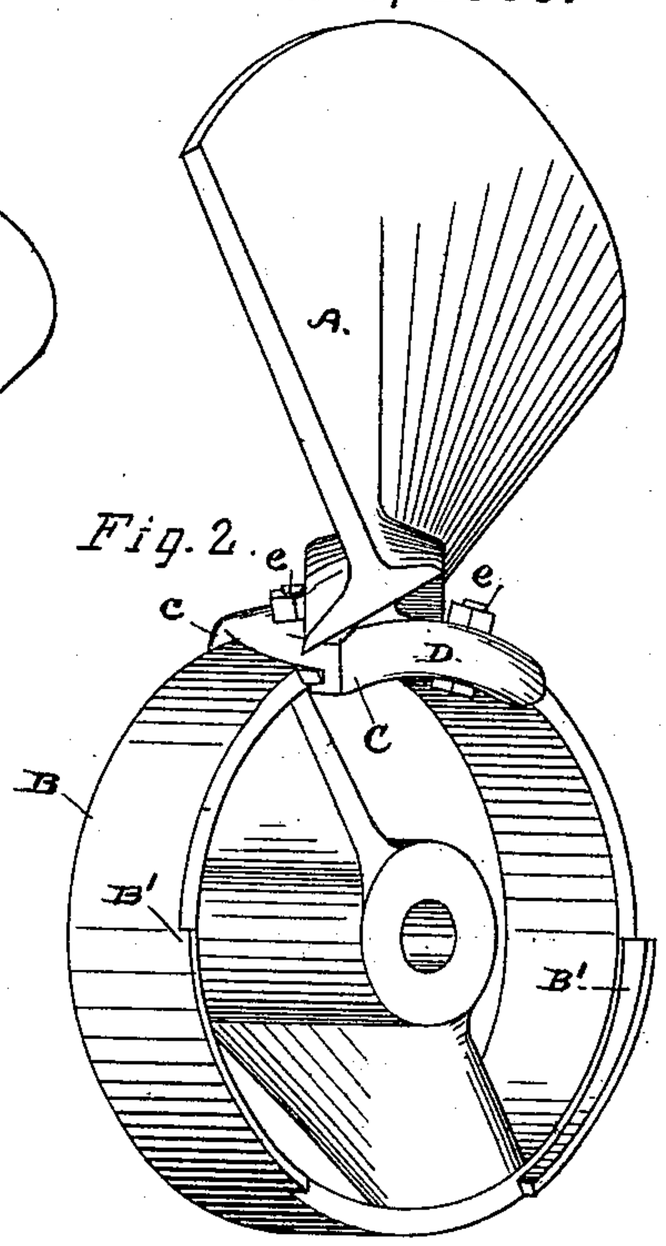


Fig. 3

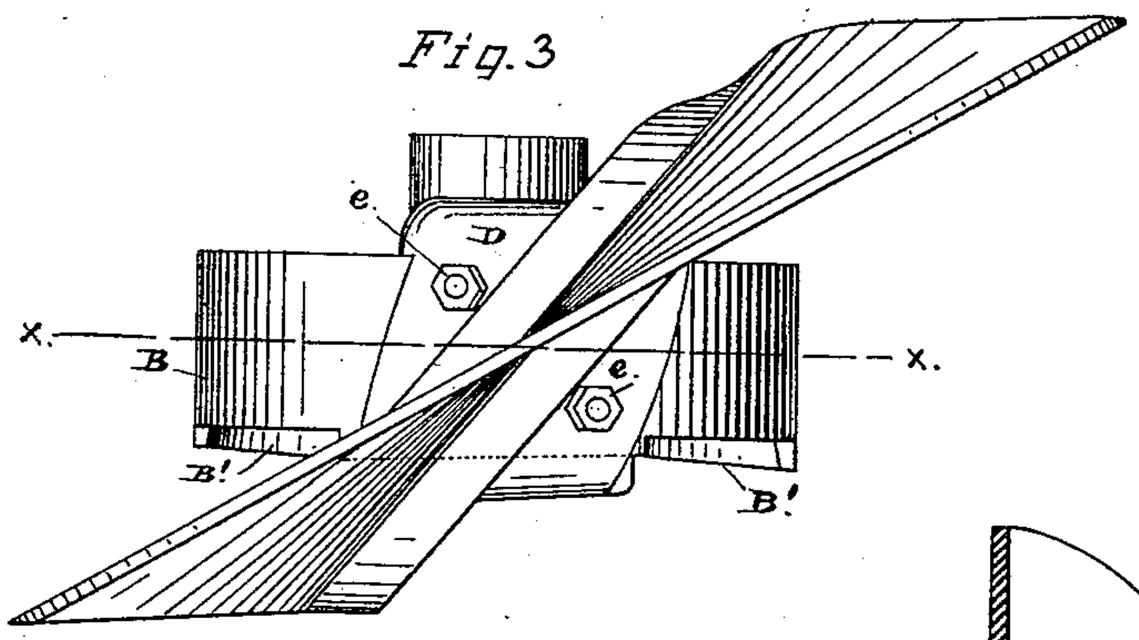


Fig. 4.

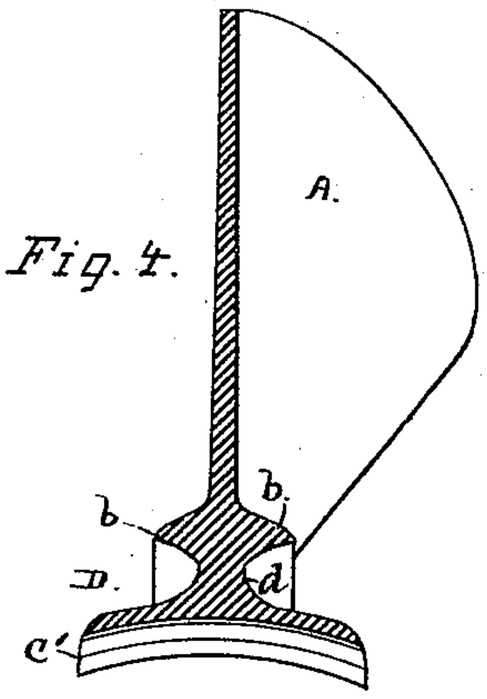


Fig. 5.

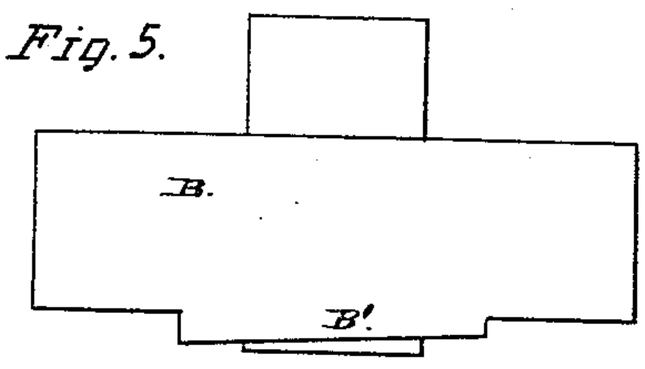


Fig. 6.

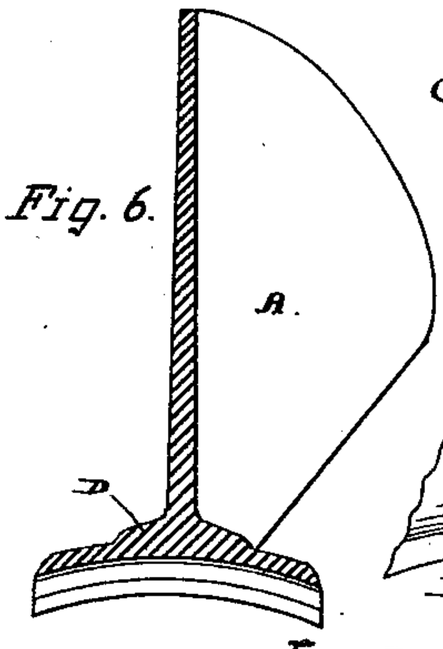
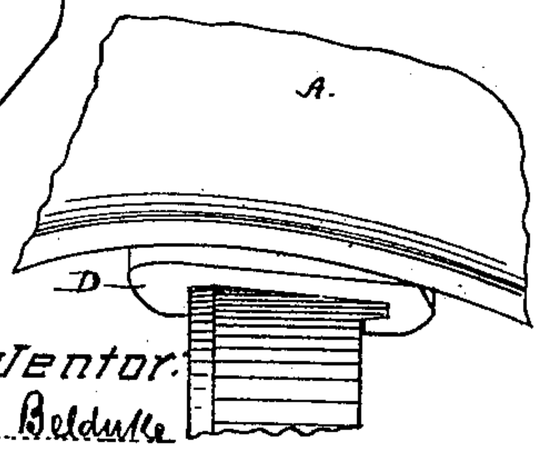


Fig. 7.



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L. R. Drabin

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By his Atty., Edward J. Babcock

UNITED STATES PATENT OFFICE.

JOSEPH BELDUKE, OF SAN FRANCISCO, CALIFORNIA.

SCREW-PROPELLER.

SPECIFICATION forming part of Letters Patent No. 329,528, dated November 3, 1885.

Application filed January 10, 1883. Renewed February 27, 1885. Serial No. 157,195. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH BELDUKE, (in French BOLDUC,) a citizen of the United States, residing in the city and county of San Francisco, State of California, have made and invented certain new and useful Improvements in Screw-Propellers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings.

My invention relates to a certain novel construction of screw-propellers, consisting of radial blades or flukes fixed to a hollow cylindrical hub or band that is secured to the propelling-shaft in such manner that the blades are brought out into solid water and are rendered much more effective in their action; and it is an improvement upon the propeller patented to me on the 7th day of February, 1882, by Letters Patent No. 253,258.

The present improvement consists, first, in an improved form of blade and in a manner of securely fixing it to the cylinder or hub; secondly, in proportioning the cylindrical hub and the blades so that a considerable part of the working-surface of the blade extends beyond the cylinder at front and rear, and the length of the cylinder bears small proportion to the length of the blades, yet acts to properly hold, support, and operate them, and, lastly, in an improved form or construction of helical blade and a means for securing it to the rim of the hub.

The following description fully explains the nature of my said improvements and the manner in which I proceed to construct, apply, and use them, the accompanying drawings being referred to by figures and letters.

In the said drawings, Figure 1 is an end elevation of my improved propeller removed from the shaft. Fig. 2 is an elevation in perspective of the same figure. Fig. 3 is a plan or top view of Fig. 1. Fig. 4 is a section through the center of one of the blades, taken on the line X X, Fig. 3. Fig. 5 is a top view of the cylinder, showing the wedge shape projections on the edge of the rim to hold the fastening-blocks. Figs. 6 and 7 are details showing the manner in which the blade and its fastening-block are formed together without any neck or clearance space.

The blades A A, three or more in number, are segments of a helix of which the axis coincides with the axis of the cylinder B that carries them. They are of such length, as compared with the cylinder, that a considerable portion of the surface at the front and rear projects beyond the cylinder.

The novel manner of fastening the blades to the cylinder, as well as the form of the blade itself, enables me to use a much longer blade than in my former propeller, so that I obtain a more effective and a greater amount of acting surface in a longitudinal direction, and I can also dispense with the outer supporting rim or band required by my former construction referred to.

The surface of my improved blade A, while being the segment of a helix, is formed on straight lines that are perpendicular to and radiate from the axis of the carrying-cylinder B. It is of equal thickness above the base or bottom line, but at and along its bottom line it is curved outwardly on both faces, and also downwardly, to form a web or flange, *b*, along its base from end to end. This flange *b* is then substantially at right angles to the surface of the blade, and gives required strength and stiffness along the bottom of the blade, where it springs from the cylinder. The front edge of the blade is made somewhat thinner than the principal portion or body, to give it a fin-like form, especially at the lower edge, and at this point also it is rounded off, as seen in the figures. The base of this blade is placed diagonally across and projects from a fastening-block D, which I prefer to form solidly with the blade and in one piece. The ends of this block take over and embrace the rim of the cylinder, and for this purpose it has dovetail grooves *c' c'* in the ledges *c c*, of which one receives the front edge and one the rear edge of the rim. At this point on the rear edge of the rim a projecting wedge shape portion, B', is formed of the substance of the cylinder, and when the block is pressed in place over it the tapering form of this projection serves to lock the blade firmly in place. Fastening-bolts *e e* are then passed through the blocks and through the cylinder-rim beneath to secure the blade.

In the accompanying drawings I show two modes of joining or of forming the blade and its fastening-block together, and one or the other is

intended to be employed according, as I may desire to increase the speed of the propeller or to add to its power at the expense of its speed. One of these forms consists in connecting the block and the bottom flange of the blade together by means of a contracted neck portion, *d*, which springs from the face of the block in a curve and meets and joins the edge of the web or flange, so as to give a clearance or space between the blade, flange, and the face of the block. This combination is seen in Figs. 1, 2, 4; but by leaving out this neck or clearance beneath the blade and bringing the flange directly down to the block, as seen in Figs. 6, 7, I make the block practically a widening and extension of the flange. This construction brings the blade closer to the cylinder, and thereby contributes to its stiffness, as it reduces the spring of the blade.

In applying such a propeller to a vessel where the well-room will not permit a full length of blade to be used at both ends of the propeller-hub, I reduce the length by removing a sufficent amount of blade from one end of the cylinder only, and that the rear end of the blade next to the hub.

These improvements enable me to increase the action of screw-propellers, and also reduce the weight and bulk of metal that has been required heretofore at and around the hub.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The propeller for ships or vessels, consisting of the hollow cylindrical hub B, having central bearing for the propeller-shaft, and the spiral blades A, having the bottom web or flange, and fastening-block D, placed over and securing them to the cylinder and extending beyond the ends of the cylinder, substantially as hereinbefore described.

2. In a propeller for ships or vessels, the combination, with a hollow cylindrical hub, B, of spiral blades A, the length of which is in excess of the width so that they extend over and beyond the ends of the cylinder, and fastening-blocks D, secured to both the blade and the cylinder, whereby the said parts are united, substantially as described.

3. The combination, with the propeller-blade A, of the fastening-block D, secured to said blade and having dovetail grooves *c c*, which are adapted to take over the rim of the cylinder-hub, substantially as described.

4. The combination, with the propeller-blade A, of the fastening-block D, having dovetail grooves *c c*, which take over and secure the block to the cylinder of the hub, and provided with the contracted neck or web *d*, whereby the block D is joined to the blade, substantially as described.

5. The combination, with the fastening-block D, having dovetail grooves *c c*, of the cylinder-hub and the wedge-shape projections on the rim of the said cylinder-hub, substantially as described.

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Witnesses:

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