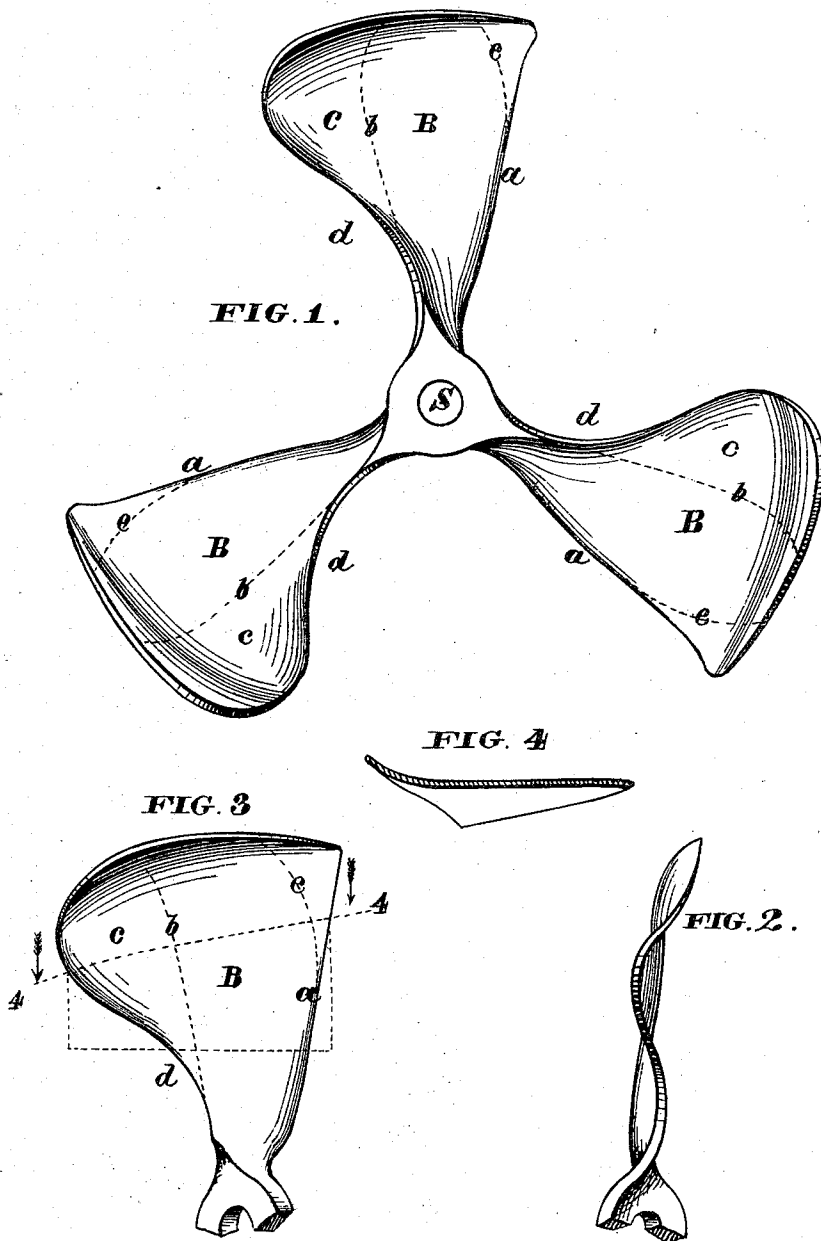


N. A. PATTERSON.
Screw-Propellers.

No. 156,375.

Patented Oct. 27, 1874.



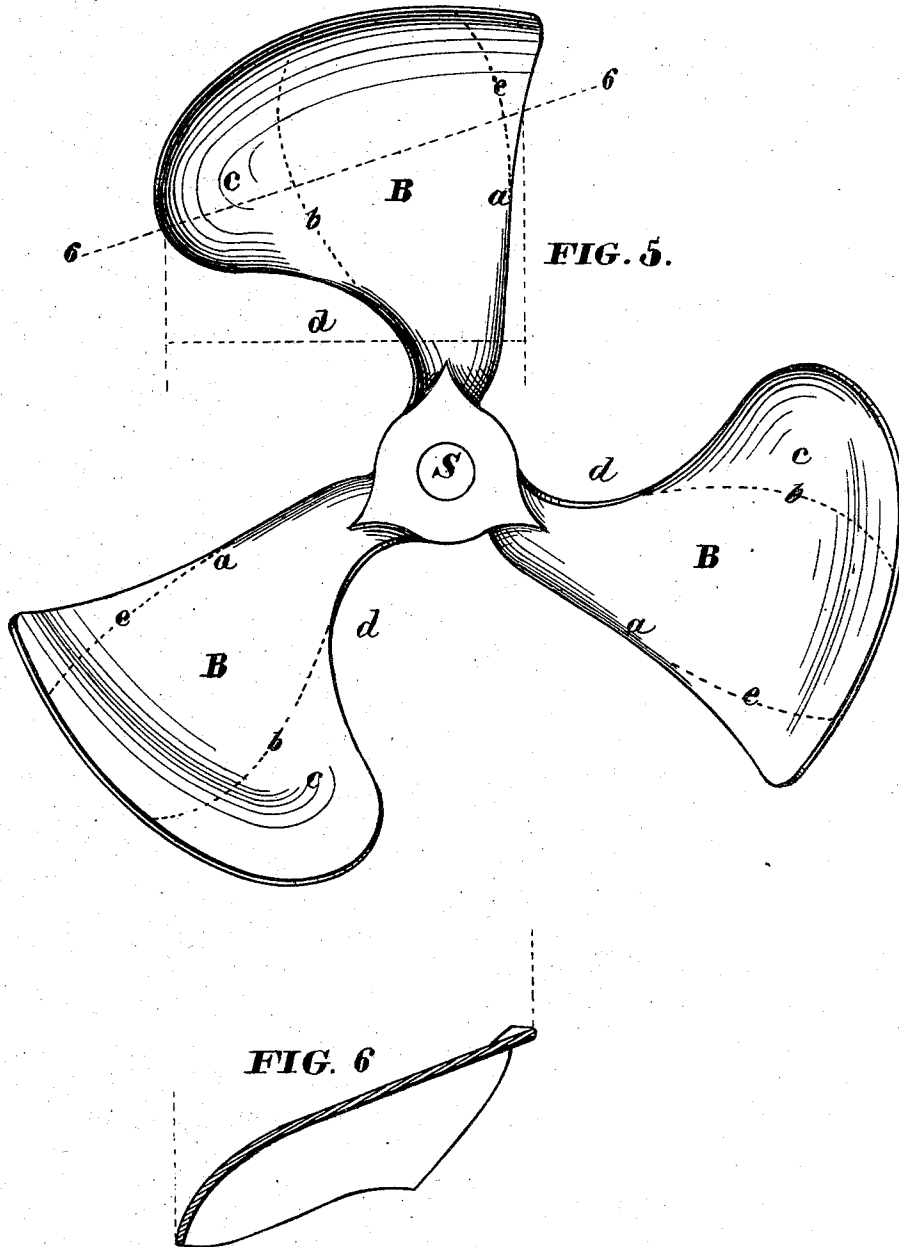
WITNESSES
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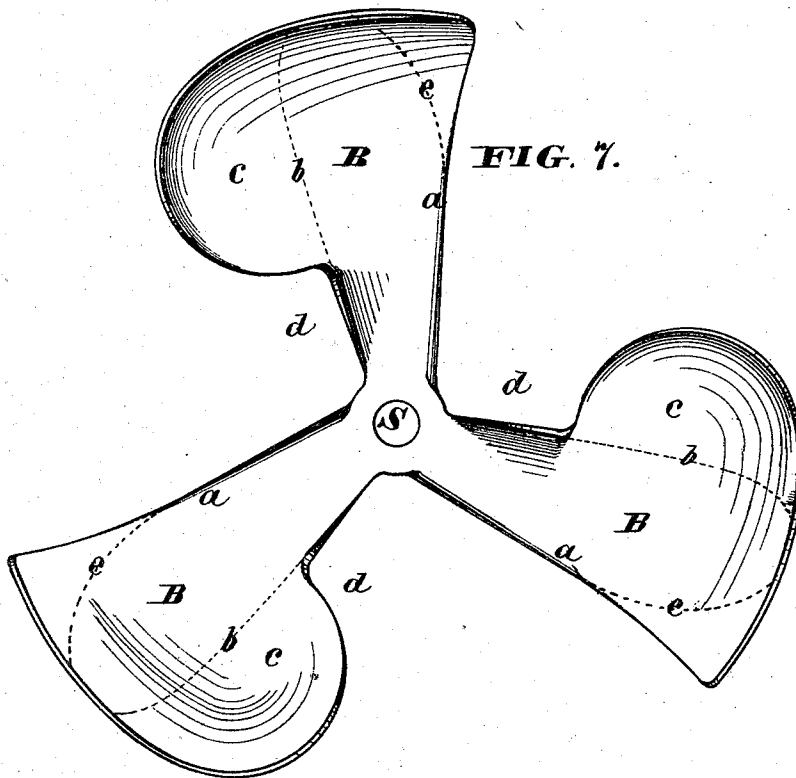
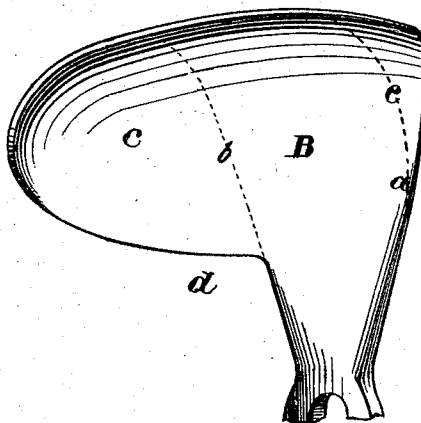


FIG. 8



WITNESSES

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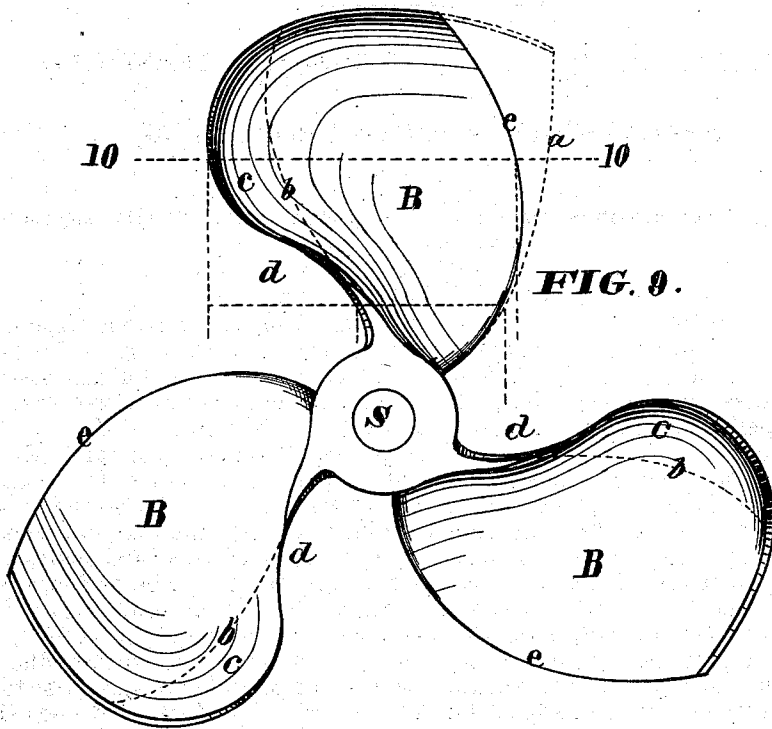


FIG. 9.

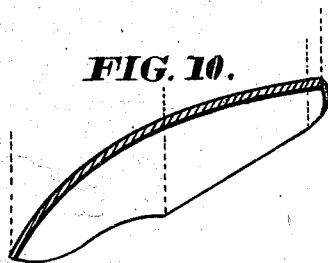


FIG. 10.

WITNESSES

Geo L. Ewin
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INVENTOR

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UNITED STATES PATENT OFFICE.

NEWTON A. PATTERSON, OF CLEVELAND, TENNESSEE.

IMPROVEMENT IN SCREW-PROPELLERS.

Specification forming part of Letters Patent No. **156,375**, dated October 27, 1874; application filed May 15, 1874.

To all whom it may concern:

Be it known that I, NEWTON A. PATTERSON, of Cleveland, in the county of Bradley and State of Tennessee, have invented an Improvement in Propellers, of which the following is a specification:

In this invention each blade of the screw is made straight, or nearly so, at its forward or cutting edge, and has a gradually-increasing radial curvature, imparting to the forward section form and proportions similar or analogous to those of a helicoidal blade of most approved form. From the outer portion of this forward section a flange or lobe projects backward, having a spiral or increasing curvature to prevent centrifugal movement or slip of the water leaving an open space within the rear lobes around the shaft.

My invention combines all the advantages of a helicoidal blade with the centrifugal properties of my propeller patented August 26, 1873.

In the accompanying drawings, Figure 1 is a rear view of a three-bladed screw illustrating my invention. Fig. 2 is a rear-edge view of one of the blades. Fig. 3 is an elevation of a blade looking in a direction perpendicular to the surface. Fig. 4 is a section on the line 4 4, Fig. 3. Fig. 5 is a rear view of a blade of modified form. Fig. 6 is a transverse section on the line 6 6, Fig. 5. Fig. 7 is a rear view of a modification. Fig. 8 is a view of the working surface of the blade shown in Fig. 7, but looking in a direction parallel to its surface. Figs. 9 and 10 are, respectively, a rear view and a section on the line 10 10, illustrating another modification.

The blades B may be two, three, or more in number, and are attached to the shaft in any usual or suitable manner. The forward or cut-

ting edge *a* of each blade is straight, or nearly so, viewed edgewise or in the direction in which it cuts the water, but may have a curved outline, as indicated by dotted lines *c* in Figs. 1 and 5, or full lines in Fig. 9. From this edge the blade takes a spiral form with gradually-increasing curvature from center to circumference, so that the section bounded by the lines *a b* may approximate closely to the form of improved helicoidal blades now in use. From the line *b* a lobe or flange, *c*, extends backward, continuing the spiral or increasing curvature of the outer portion of the blade in such a manner as to still confine the water against tangential slip, and cause the blade to act on it with full effect. Between this lobe or flange and the shaft S is a space, *d*, permitting the passage of water at the center of the wheel.

The length of the lobes *c* may be varied according to the number of blades and the size of the wheel.

In wheels of small size having a rapid rotation the curvature of the blades toward the periphery is more abrupt or rapid than in larger wheels having a slower movement.

The following is claimed as new:

A screw-propeller with blades having helicoidal front parts *a b*, backwardly-projecting lobes *c*, of greater concavity or curvature, and throats *d*, to permit the passage of water at the center, all substantially as herein shown and described.

In testimony of which invention I hereunto set my hand this 15th day of April, 1874.

N. A. PATTERSON.

Witnesses:

OCTAVIUS KNIGHT,
WALTER ALLEN.