(Model.)

2 Sheets—Sheet 1.

B. DICKINSON.

SCREW PROPELLER.

No. 344,898. Patented July 6, 1886.

Fig. 2.

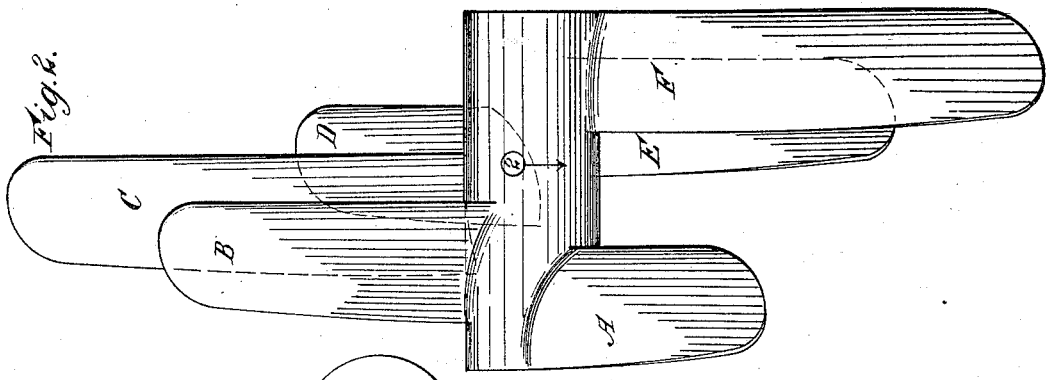
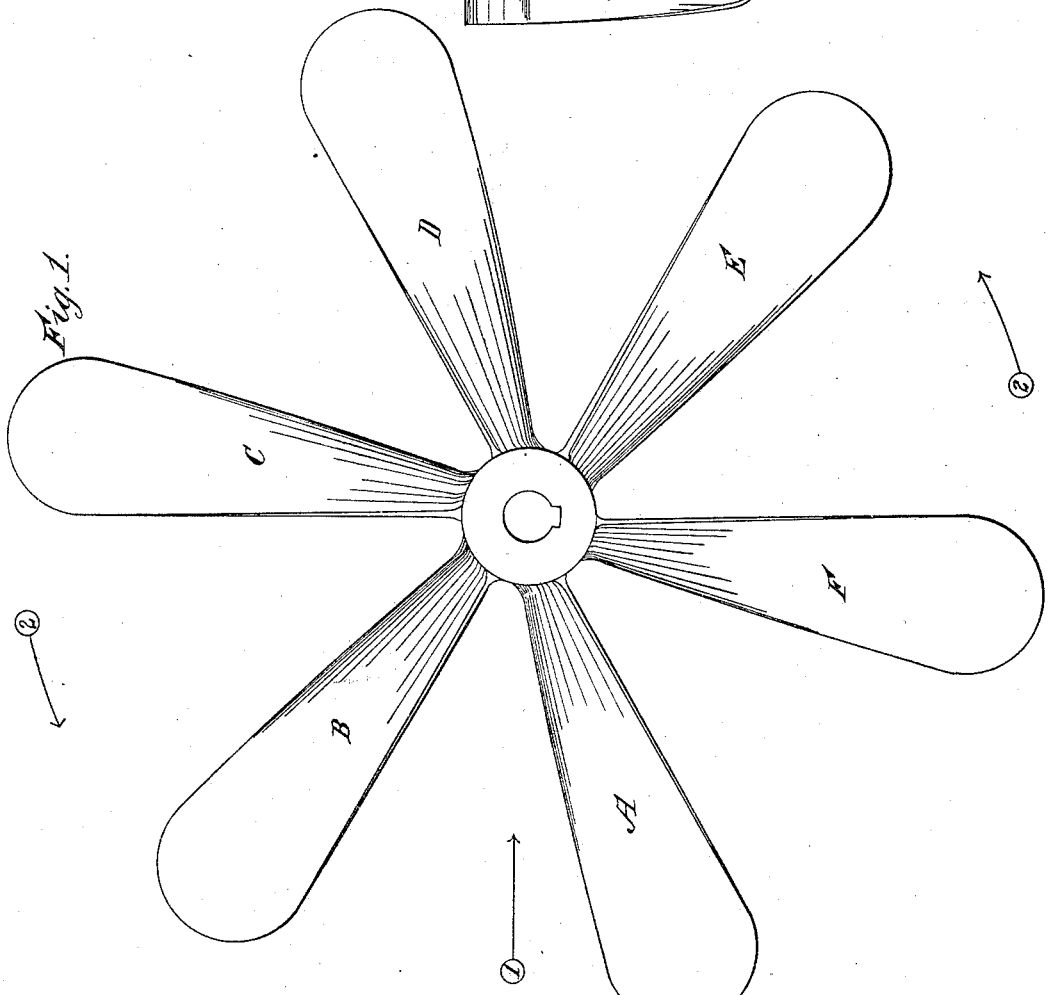


Fig. 1.



Witnesses:
H. A. Johnstone.
Charles R. Searle.

Inventor:
Benjamin Dickinson
by his attorney
Thomas Dyer Stetson

(Model.)

2 Sheets—Sheet 2.

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Fig. 3.

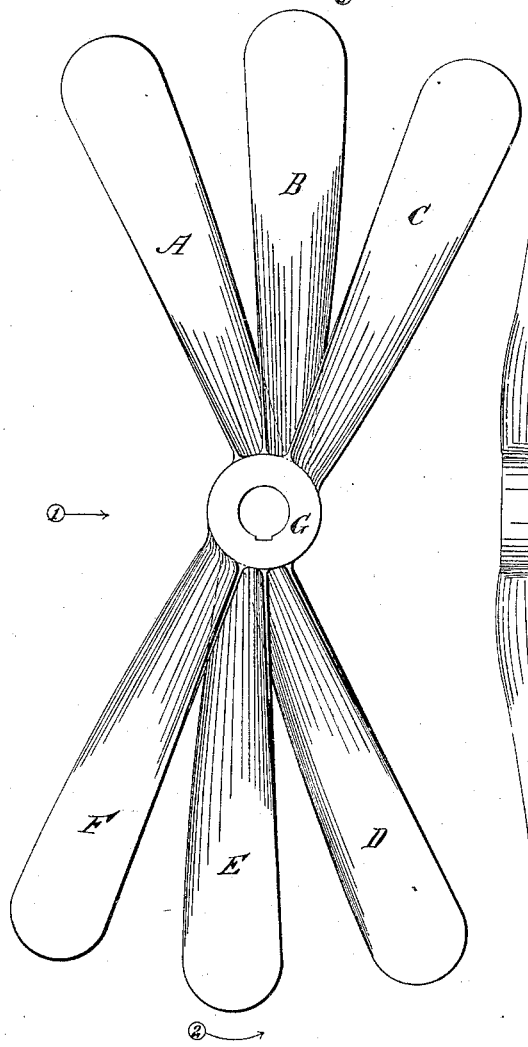
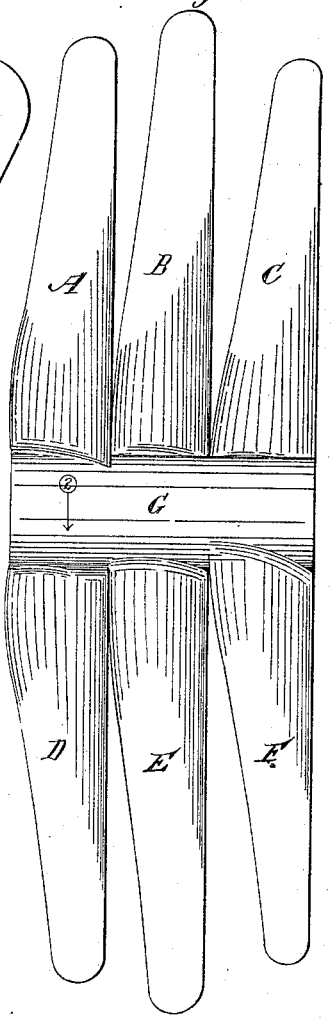


Fig. 4.



Witnesses:
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Inventor:
Benjamin Dickinson
by his attorney
Thomas Drew Stetson

UNITED STATES PATENT OFFICE.

BENJAMIN DICKINSON, OF BOURNE END, COUNTY OF BUCKS, ENGLAND.

SCREW-PROPELLER.

SPECIFICATION forming part of Letters Patent No. 344,898, dated July 6, 1886.

Application filed October 26, 1885. Serial No. 180,907. (Model.) Patented in England August 11, 1885, No. 9,540, and September 18, 1885, No. 11,122, and in France October 14, 1885, No. 171,670.

To all whom it may concern:

Be it known that I, BENJAMIN DICKINSON, a subject of the Queen of Great Britain and Ireland, residing at Bourne End, in the county of Bucks, Kingdom of Great Britain and Ireland, have invented new and useful Improvements in Screw-Propellers, (patented by me in England, August 11, 1885, No. 9,540, and September 18, 1885, No. 11,122, and in France October 14, 1885, No. 171,670,) of which the following is a specification.

It is common to consider the action of the blades of a screw-propeller as if such blades were of no thickness. In practice they must be thick, particularly near the center of the propeller. Such thickness involves resistance to their movement through the water.

I have discovered and reduced to a practical form a means of reducing the resistance of any number of blades in being moved rapidly through the water. In practice each propeller-blade has considerable length fore and aft. I will refer to the center of such length as the "axis" of the blade. I make the hub or central boss of the propeller longer than usual in proportion to its diameter. I provide it with any desired number of blades, having their axes arranged in one or more series spirally. The arrangement is spiraled in the opposite direction to the helicoidal surface of the several blades. It will be understood that the blades are, as usual, sharpened at the front and rear edges, and thickened in the intermediate portion, so as to give proper strength. The arrangement allows one blade to make a passage for itself through the water, while another blade, similarly opening a passage for itself, is mounted so far to the rear of the first that before the second blade is required to open the water to its fullest extent the thickest portion of the first blade has passed, and the water is commencing to close in behind the first blade. It follows that the several blades, in passing any given point in the forward motion of the passage, by each acting at a time when the water alongside is not being acted on by the other blades, generate less resistance by the passage of their several thicknesses through the water than would be met by the arrangement of placing all the blades in one plane. On the other hand, an arrangement of the blades spirally in the same direction as the surface of the propeller would tend to make one traverse in the same path as another, and thus to diminish their efficiency. I avoid such arrangement and arrange them spirally in a direction opposite to that of the surface of each blade, and cause each to describe a separate path through undisturbed water. Each acts with its full efficiency.

My invention is illustrated in the annexed drawings, wherein Figures 1 and 2 show a propeller with one set or series of six blades, A B C D E F, and Figs. 3 and 4 show a modification with two sets or series of three blades each, A B C and D E F. These blades, as will be seen by the drawings, are arranged in such a manner that the blades of the set or series (or those of each set or series when more than one set or series are used) shall operate independently successively and continuously, so that no two blades of any one set shall act upon the same water. To this end the blades A B C D E F (there may be less or there may be more than six) constituting the one set or series, as in Figs. 1 and 2, or as in Figs. 3 and 4, the blades of each set or series (there may be more than two sets or series) are arranged upon the boss G or shaft in a spiral direction contrary to the direction of the inclination of the blades themselves. Thus, when the propeller is in operation to drive the vessel forward the rearmost blade, A, travels in advance of the succeeding or next blade, B, which in its turn (where more than two are used in the set or series) travels in advance of the next forward blade, C, and so on relatively, the arrangement being such that no two blades in one set or series shall operate upon the same water, and that the water acted upon may readily escape.

Of the propeller with only one set or series of blades, Fig. 1 is an elevation showing the forward end, and Fig. 2 is a view at right angles to Fig. 1, showing the propeller as seen when looking in the direction of the arrow ①⟶. Figs. 3 and 4 are corresponding views of the modified arrangement embodying two sets or series of blades. In each case the blade marked A occupies the aftermost position—that is, it is nearest (of the set to which it belongs) to the rearmost extremity of the

propeller-shaft. That marked B occupies a more forward position, while that marked C is the most forward of the three.

In the arrangement shown in Figs. 1 and 2, F is the most forward of the six blades.

For forward motion of the vessel the propeller revolves in the direction of the arrows ②⟶, the leading blades (considered with reference to the circle of rotation) being A in Figs. 1 and 2 and A and D in Figs. 3 and 4, respectively, and the others following in their order. By this arrangement each blade of a set or series is caused to operate on a distinct portion of the body of water through which the vessel passes, while a free channel is provided for the escape astern of the water operated upon.

The blades may be of any suitable pitch, breadth, or pattern, and may be made in one piece or in sections, as may be convenient.

What I claim is—

A screw-propeller with blades arranged spirally upon a shaft or boss in one or more sets or series, the spiral (or each spiral, if there be more than one) having a pitch or inclination of the opposite hand or denomination to that of the individual blades composing it, so that the rearmost blade of the set or series (or of each set or series, if their be more than one) travels in advance of the succeeding or next forward blade of the set or series, which in its turn (where there are more than two blades in the set or series) travels in advance of the next forward blade, and so on, the arrangement being such that no two blades in the set or series shall operate upon the same water, and that water acted upon may readily escape, substantially as hereinabove described.

BENJAMIN DICKINSON.

Witnesses:

EDWD. N. HOBBS,

WM. THOS. MARSHALL,

Both of 2 Popes Head Alley, Cornhill, London, Gentlemen.