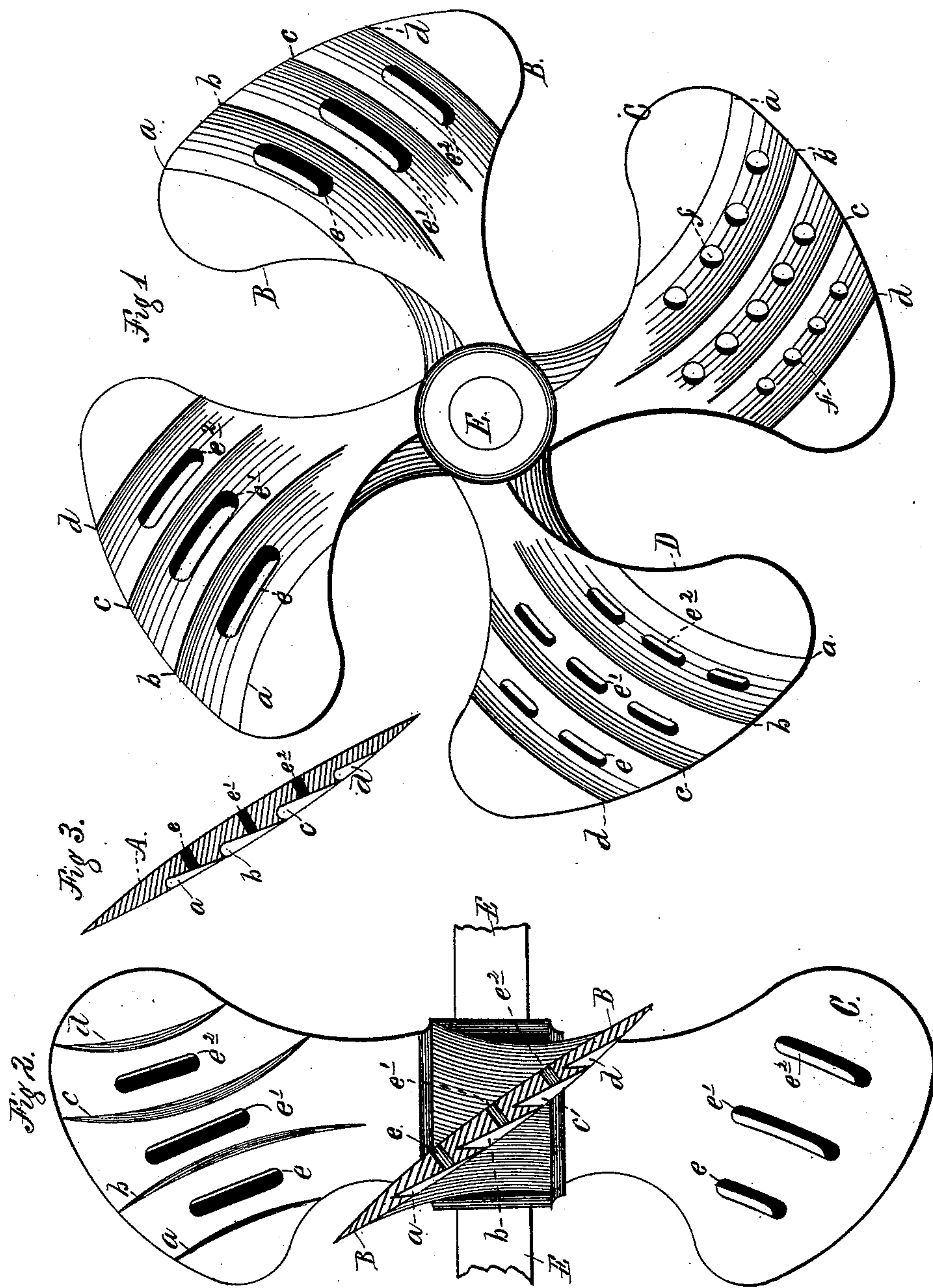


E. A. HEATH.  
Screw-Propeller.

No. 218,438.

Patented Aug. 12, 1879.



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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN SCREW-PROPELLERS.

Specification forming part of Letters Patent No. **218,438**, dated August 12, 1879; application filed May 9, 1878.

*To all whom it may concern*

Be it known that I, EUGENE A. HEATH, of the city, county, and State of New York, have invented certain new and useful Improvements in Screw-Propellers, of which the following is a specification.

This invention relates to that class of devices for propelling vessels known as "screw-propellers," which, as commonly used, consist of a series or set of four blades of peculiar shape and form, these blades, in their rapid revolutions and action, possessing two powers, technically termed the "inclined plane" and the "lever," which blades, acting upon the body of the water in a similar manner as a threaded screw in a nut, give the propelling power.

The present invention consists in the novel application to the well-known and conventional form of screw-propeller blades of a series of channels or flutes, such channels being cut on acute angles into and retiring from the face of the blades. They are preferably cut on curved lines, and they may be more or less in number, and be convoluted and overlie each other. The location of these channels upon the impinging face of the blades and their wedge shape are such as to give an increased gripe upon the body of water, thereby increasing the propelling power of the blades.

As an adjunct to such channels or flutes, a series of perforations or openings is made through the blades, in the base of the channels or between several of them, this for the purpose of permitting some of the water to pass through to the rear of the blades, which action will result in destroying any vacuum or partial vacuum that may form behind the rapidly-revolving blades, thereby causing the blades to operate in a solid body of water instead of a mass of foam—all of which improvements, together with the application and operation thereof, will be hereinafter fully set forth and pointed out in detail.

In the drawings, which form an essential part of this specification, Figure 1 is a front elevation of a screw-propeller in which my invention is fully embodied. Fig. 2 is a side elevation of the same, one of the blades being

shown in section; and Fig. 3 is a modification thereof.

The same reference-letters marked on the various figures of the drawings will locate and point out corresponding parts.

A B C D represent the several blades of the propeller, which are mounted upon the shaft E. These blades may be cast separately and afterward attached to the hub, or the hub and blades may be cast as a unit, as mechanical skill may deem best.

*a b c d* designate a series of channels or flutes formed in the body of the blades. They are retired from the face of the blades to the rear on acute angles, as plainly shown in blade B in Fig. 2, this formation giving them a wedge shape. They are also preferably formed on the line of a circle, as shown in Fig. 1, each circle being drawn from the same center, this for the purpose of securing a gradual and easy action on the water, both in the action of gripping and releasing it.

*e, e<sup>1</sup>, and e<sup>2</sup>* in blades A B D represent a series of elongated slots cut through the blades, and located in between the various channels, or a portion of them, or from the base thereof, such openings being of the same size on the front and rear of the blades, as will be seen in the drawings. In some cases a series of straight holes, *f*, may be drilled through the blades, as shown on blade C.

The modifications shown in Fig. 3 are necessarily but variations from the form of the channels shown in Fig. 1; and it is obvious that the number of the channels, flutes, or grooves, and the number of slots or holes, and their size, formed in the blades, may be varied to suit circumstances.

In some cases angle-iron may be successfully riveted upon the face of the blades, giving an increased gripe upon the water; in other cases corresponding channels may be formed upon the rear face of the blades; but I prefer the formation first described.

The object aimed at in this invention is twofold—first, to increase the gripe of the blades upon the water, and, second, in connection therewith, to effectually prevent the formation of the vacuum or partial vacuum that now

exists in the use of the common form of screw-propellers.

I claim as my invention—

A screw-propeller wheel the several blades of which are provided with a series of wedge-shaped recesses, radiating from the hub and retired at an angle from and below the faces of the blades, such recesses being provided

with perforations or elongated holes opening from the bases thereof to the rear faces of the blades, substantially as and for the purposes as shown and set forth.

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