

(No Model.)

E. D. BANGS.
PROPELLER WHEEL.

No. 486,062.

Patented Nov. 8, 1892.

Fig. 1.

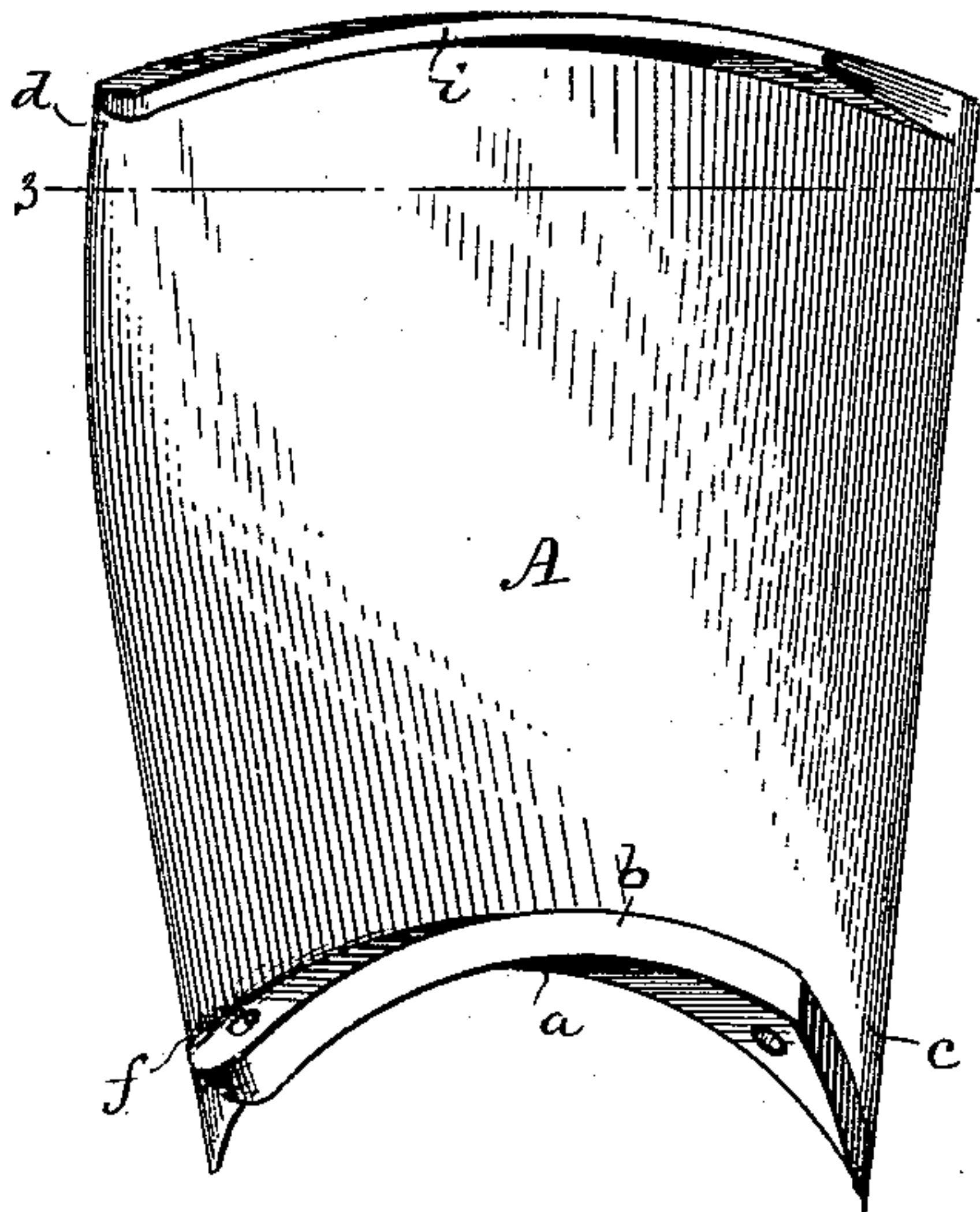


Fig. 2.

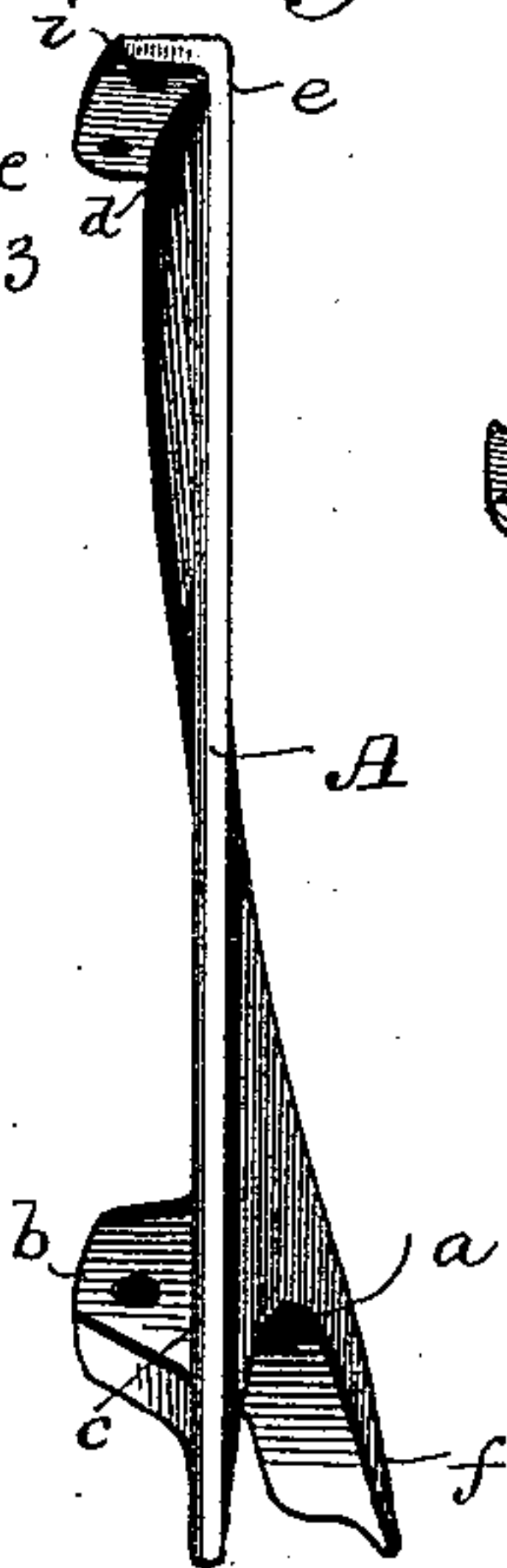


Fig. 3.

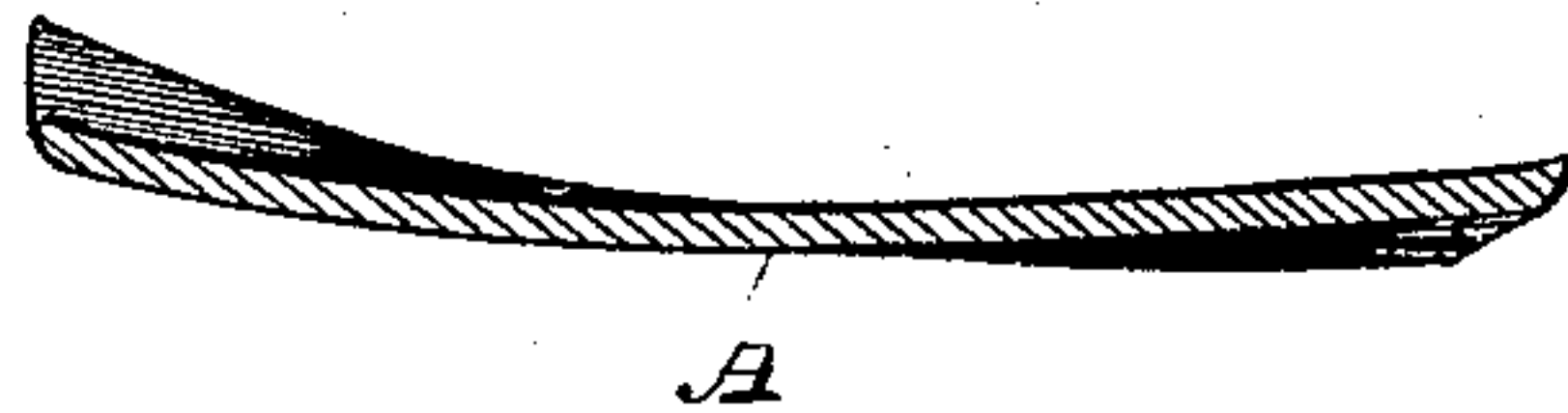


Fig. 4.

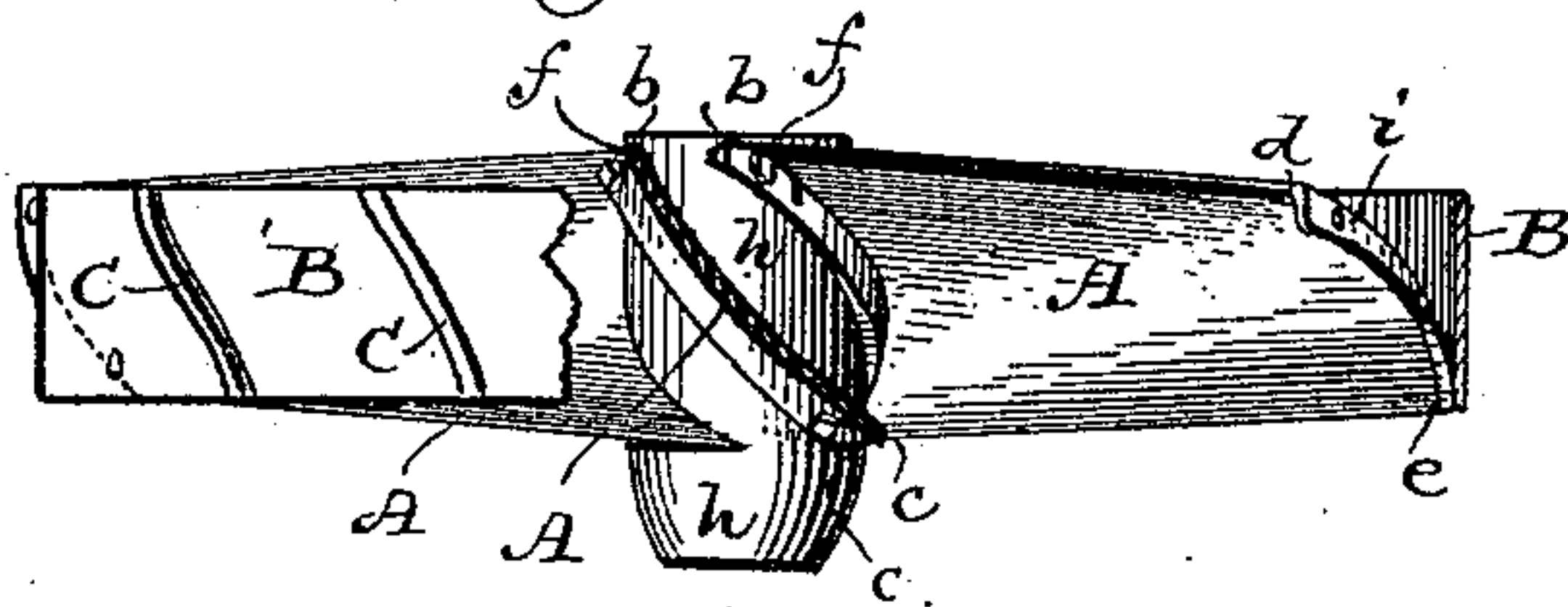
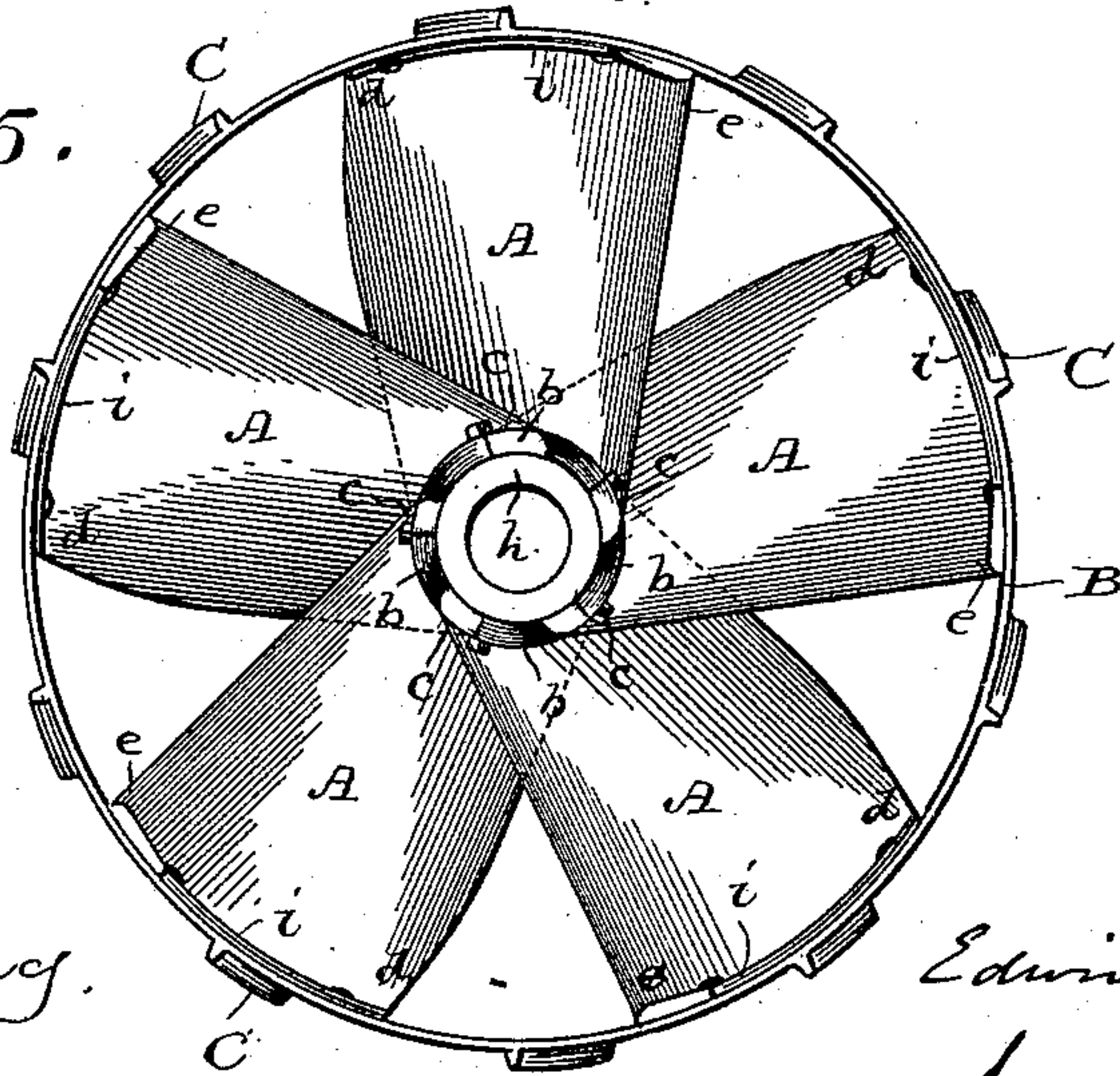


Fig. 5.



Witnesses
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UNITED STATES PATENT OFFICE.

EDWIN D. BANGS, OF MILWAUKEE, WISCONSIN.

PROPELLER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 486,062, dated November 8, 1892.

Application filed June 21, 1888. Serial No. 277,787. (No model.)

To all whom it may concern:

Be it known that I, EDWIN D. BANGS, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Propeller-Wheels; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to propeller-wheels, and will be fully described hereinafter.

In the drawings, Figure 1 is a rear elevation of one of the blades. Fig. 2 is an edge elevation of the same. Fig. 3 is a section on line 3 3, Fig. 1. Fig. 4 is a broken plan. Fig. 5 is an elevation of the wheel as seen from the boat.

A are the blades of my wheel, the driving-faces of which are each formed by the intersection of two curved or dished surfaces of different degrees of curvature—that is, the surface between the corners *f* and *c* forms the arc of a smaller circle than does the surface between *e* and *d*, making a channel from the points *c* to *d* between *f* and *e*, which channel increases in depth from the concave *a*, that fits on the hub, out to the rim of the wheel. The blades are provided with flanges *b*, by which they are attached to the hub, and the concaves *a* are fitted spirally on the hub, inclosing half of its circumference obliquely, each edge of each blade standing at a tangent to the circumference of the hub. As the inner end of each blade stands at a less angle to the axis of the hub than the outer end, the action of the blade upon the water at the hub is more direct than at the outer end, and as the angle increases from the hub outward the directness of impingement is gradually lessened. This is to compensate for the difference in speed and leverage at different points on the blade from the hub out, so that the water may be taken evenly by each blade throughout its entire length and a maximum

amount of impingement may be obtained without bunching the water and thus choking the wheel.

The outer ends of the blades are preferably inclosed by a strengthening-rim B, which is suitably secured thereto by bolts that pass through said rim and flanges *i* of the blades, and on this rim is secured a series of ribs C, which have the same general conformation of surface that the blades have, and serve as extensions thereof.

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

1. In a propeller-wheel, the combination, with the hub, of blades fitted spirally thereto, said blades formed with driving-faces that are the result of the intersection of two curved surfaces that have different degrees of curvature, the inner portion of the blade standing at a less angle to the axis of the hub than the outer portion and having a channel formed from one inner corner to the opposite outer corner of said blade, said channel increasing in depth from the inner edge of the blade outward, substantially as described.

2. The combination, with the hub, of the blades having inner flanges that are obliquely secured to the hub, said blades straddling the hub and the edges thereof each forming a tangent to the hub, together with flanges projecting from the outer ends of said blades, and a strengthening-rim secured directly to the said blade-flanges, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

EDWIN D. BANGS.

Witnesses:

S. S. STOUT,
A. J. WILLIAMS.