

No. 698,582.

Patented Apr. 29, 1902.

E. E. STROTHMAN.
PROPELLER WHEEL.

(Application filed Dec. 13, 1901.)

(No Model.)

Fig. 1.

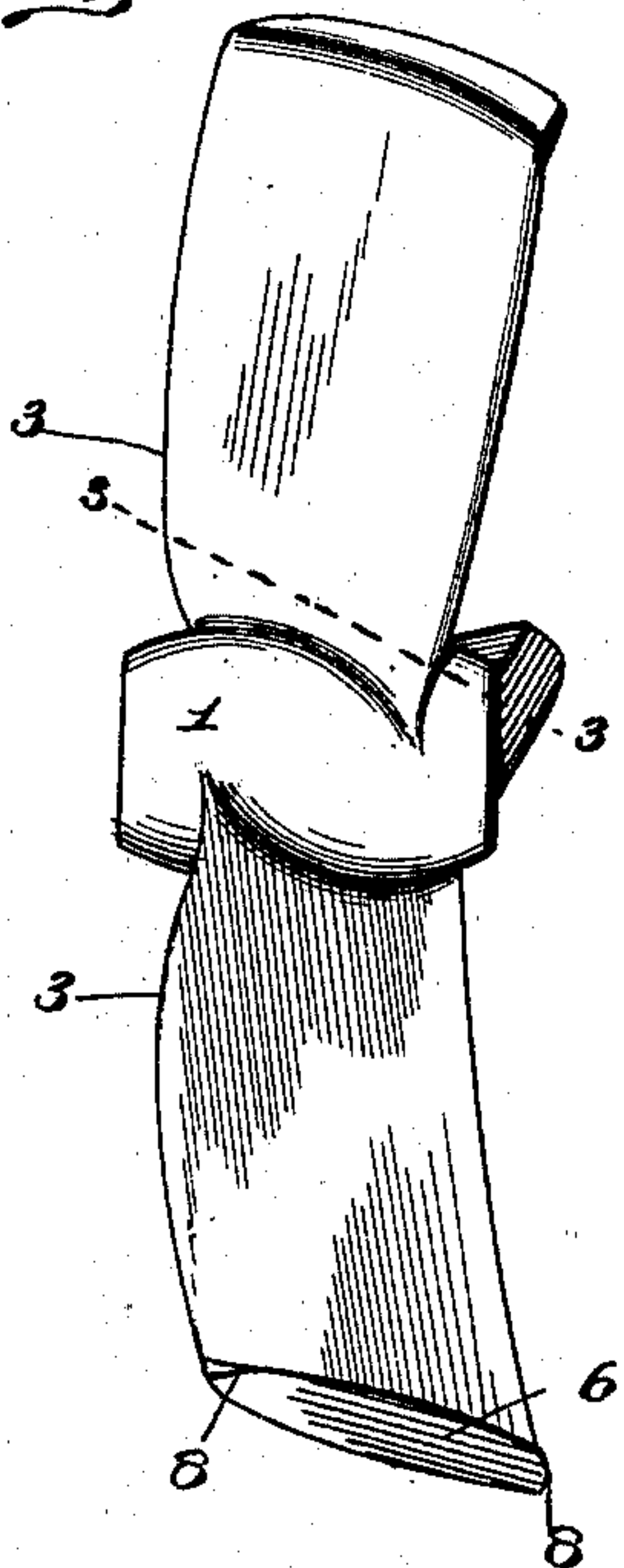


Fig. 4.

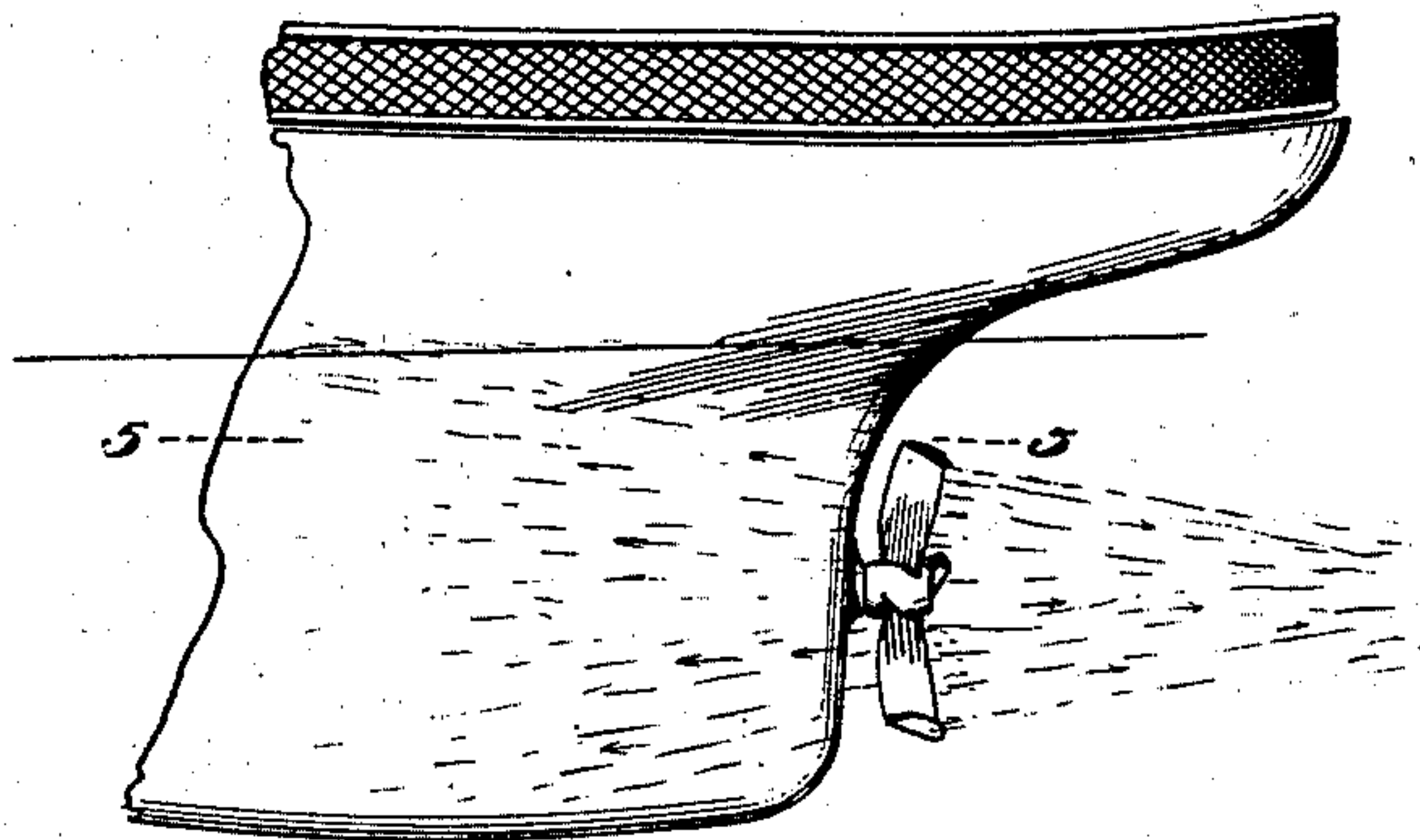


Fig. 3.

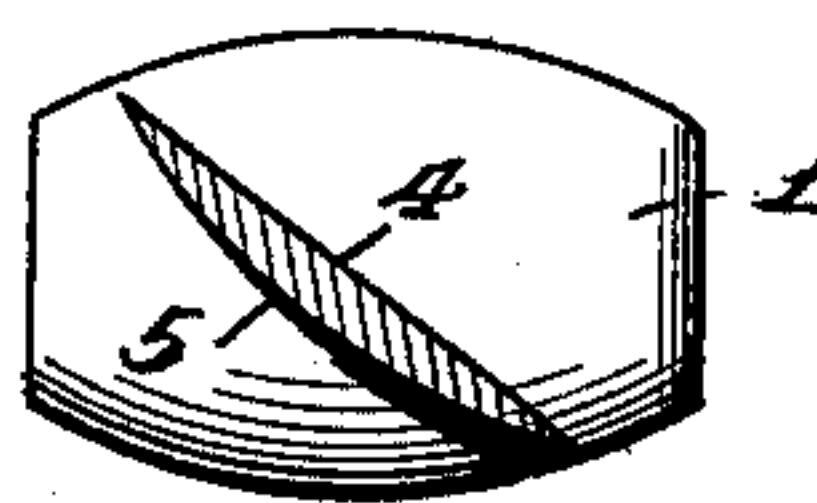


Fig. 2.

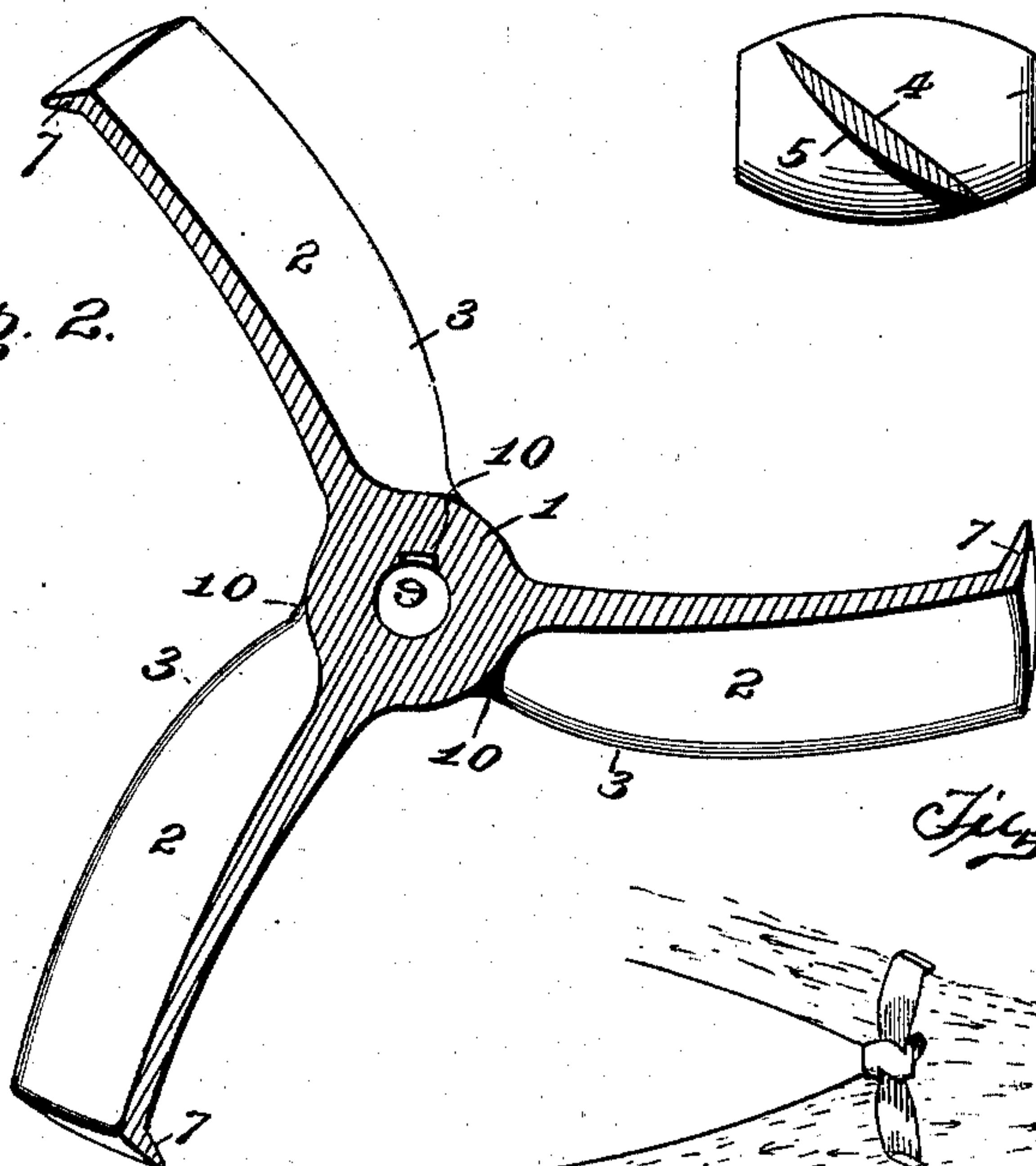
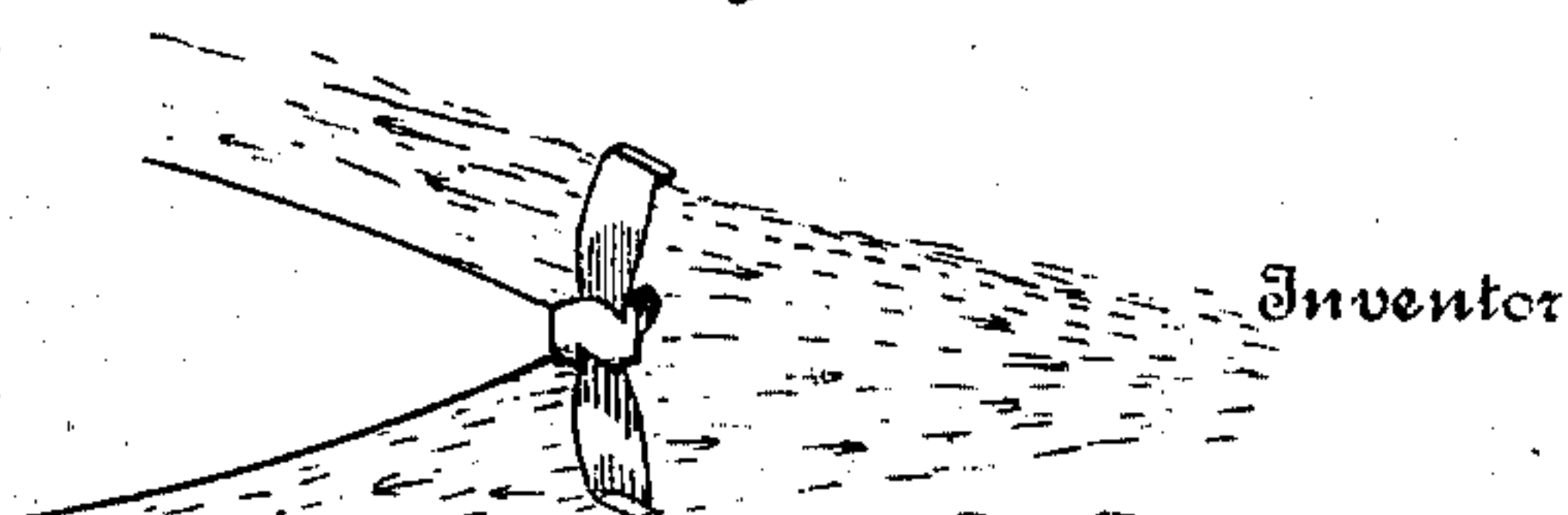


Fig. 5.



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UNITED STATES PATENT OFFICE.

EDWARD E. STROTHMAN, OF WEST SUPERIOR, WISCONSIN.

PROPELLER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 698,582, dated April 29, 1902.

Application filed December 13, 1901. Serial No. 85,770. (No model.)

To all whom it may concern:

Be it known that I, EDWARD E. STROTHMAN, a citizen of the United States, residing at West Superior, in the county of Douglas and State of Wisconsin, have invented certain new and useful Improvements in Propeller-Wheels; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in propeller-wheels, and has for its object the production of a simple and efficient form of wheel so constructed as to produce a maximum of power from a minimum of water contact.

With this and other objects in view it consists of a propeller-wheel comprising a hub, blades radiating therefrom and set upon angles preferably of substantially thirty-eight degrees with relation to the longitudinal axis of the hub, each of the blades gradually increasing in width from its line of jointure with said hub for a comparatively short distance and from thence to the outer end preferably being substantially of uniform width and curving laterally and having its front face convex as to its thickness and as to its width and length, the rear face being approximately flat as to its thickness and width and concave as to its length, and the blade being comparatively thick near its base and tapering to its outer end.

It also consists in certain other novel constructions, combinations, and arrangements of parts, as will be hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 represents a view in side elevation of a propeller-wheel embodying the features of the present invention. Fig. 2 represents a central vertical section through the same. Fig. 3 represents a top plan view of the hub with two of the blades omitted and the other shown in section on line 3 3 of Fig. 1. Fig. 4 represents a reduced view, in side elevation, of a portion of a ship having my improved propeller-wheel applied thereto, the lines of force being indicated by dotted lines; and Fig. 5 represents a horizontal section on line 5 5 of Fig. 4, illustrating the propeller-wheel in top plan

and indicating in dotted lines the direction of the flow of water caused by the rotation of the said wheel in both directions.

In the production of stern-wheel propellers it has been found desirable in backing a ship to obviate as far as possible the striking of the stream of water, caused by the rotation of the propeller-wheel, against the stern of the ship, for the obvious reason that the rearwardly-drawing force of the propeller-wheel will be neutralized in a comparative degree to the amount of force exerted by the said stream thrown by the propeller-wheel against the stern of the vessel, and in order to attain this and other results I provide, as seen in the drawings, a propeller-wheel made up of a suitable hub, as 1, carrying a plurality of radially-extending blades 2, preferably formed integral therewith and each set at an angle, preferably of approximately thirty-eight degrees, with respect to the longitudinal axis of the hub and extending slightly rearwardly throughout all or a portion of its length, the construction being such that if the line of the angle of the set of either of the blades at the hub were to be projected around the hub its two ends would meet rather than continue spirally around the same. Each of the blades gradually increases in width from its line of jointure with the hub for approximately one-fourth of the distance from the axial line of said hub to the outer end of said blade, the blade maintaining approximately the same width throughout the remainder of its length. As seen in Fig. 3, the rear face 4 is nearly or quite flat as to its width and thickness, and the front face 5 is convex to an extent giving the required thickness, whereby the pressure from the rear upon the wheel is resisted more effectually and the liability of overstrain upon the blades is obviated. Each of the blades also in addition to being convex on one face and tapering to comparatively sharp edges tapers outwardly with respect to its thickness from its jointure with the hub to its outer end, thereby lightening parts of the blade in a degree comparative to the distance they are from the hub. The outer end of each of the blades is preferably curved or bent backwardly, increasing the longitudinal convexity of the forward face and forming a longitudinal concavity in the rear face,

and said outer end carries a rearwardly laterally extending flange, as 6, which flange is preferably of the thickness of the outer end of the blade and extends transversely thereof for its full width and is set at approximately a right angle to said blade. The flange 6 preferably tapers outwardly to a comparatively sharp edge, having its under face beveled, as at 7, and its corners rounded off, as at 8, whereby the edge of said flange is substantially continuous with the edges of its respective blade. Of course the hub is provided with any suitable shaft-receiving bore 9, formed with a key-retaining aperture 10 or any other suitable means common and well known for securing the said hub to its driving-shaft.

In operation, as seen in Figs. 4 and 5, the blades are disposed slightly rearwardly, whereby rotation of the wheel in one direction will cause the flanges 6 to engage and pass readily through the water, preventing slip, and thereby throwing a larger stream of water than would be directed by the blades 2 with the flanges omitted, the disposition of the blades tending to throw the column of water rearwardly to a common center, as is indicated in the drawings, whereby a maximum of forward pressure is produced. A reversal of the rotation of the wheel will of course produce a reverse action in the direction of the stream of water thrown, and in this particular I consider my invention specially advantageous, for the reason that the lateral bodily curve or bend in the blades, the set of blades with respect to the longitudinal axis of the hub, the convexity of the rear face of the blades, and their outward taper, which together produce the slightly-rearward disposition of the blades, as before mentioned and as clearly seen in Figs. 4 and 5, cause the water to flow in divergent lines, as shown in Fig. 5, whereby only a minimum will strike the stern of the vessel and the remainder will pass to either side thereof, not detracting from the rearwardly-drawing force of the propeller-wheel.

Although I have described very minutely one embodiment of my invention, yet I do not wish to be understood as limiting myself to the exact form specified, but shall feel at liberty to deviate therefrom with respect to all minor details within the spirit and scope of my invention.

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

1. A propeller-wheel, comprising a hub, blades radiating therefrom and each set upon an angle with relation to the longitudinal axis of the hub, each of the blades gradually increasing in width from its line of jointure with said hub for a comparatively short distance,

and from thence to the outer end being substantially of uniform width and curving laterally rearwardly and having its front face convex, the rear face of the blade being substantially flat, and the blade being comparatively thick near its base and tapering to its outer end, substantially as described.

2. A propeller-wheel, comprising a hub, blades radiating therefrom and set upon an angle with relation to the longitudinal axis of the hub, each of the blades gradually increasing in width from its line of jointure with said hub for a comparatively short distance, and from thence to the outer end being substantially of uniform width and curving laterally rearwardly and having its front face convex as to its thickness, width and length, the rear face of the blade being substantially flat as to its thickness and width, and the blade being comparatively thick near its base and tapering on its forward face to its sides and outer end, substantially as described.

3. A propeller-wheel, comprising a suitable hub, blades radiating therefrom and disposed at an angle to the radial axis of the hub, the edges of each blade curving outwardly from their jointure with the hub to a suitable distance, and thence extending in a substantially straight line to its outer end, all the blades being disposed slightly rearwardly, and a laterally-extending flange carried at the outer end of each of said blades, and extending transversely for the full width thereof, each of said flanges having its corners rounded and its under face beveled so as to produce a comparatively sharp edge approximately continuous with the edges of its respective blade, substantially as described.

4. A propeller-wheel comprising a hub and blades radiating therefrom, each of which blades is set at a non-spiral angle to the longitudinal axis of said hub, each of which blades has a broad and thick junction with said hub, diminishing in thickness from the center of the blade at the hub toward its edges, each of said blades being bent rearwardly and uniformly throughout its width at a transverse line drawn at any desired distance intermediate the hub and the end of the blade, each blade being provided with a terminal flange extending rearwardly at its outer end, each of said blades increasing in width from its junction with said hub to a transverse line at a suitable distance from said hub, thence maintaining a uniform width to the outer extremity of the blade, substantially as described.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

EDWARD E. STROTHMAN.

Witnesses:

JAMES T. WATSON,
CHARLES W. DANIELSON.