S. T. SWASEY.
Screw-Propeller.

No. 208,211. Patented Sept. 17, 1878.

Fig. 1.

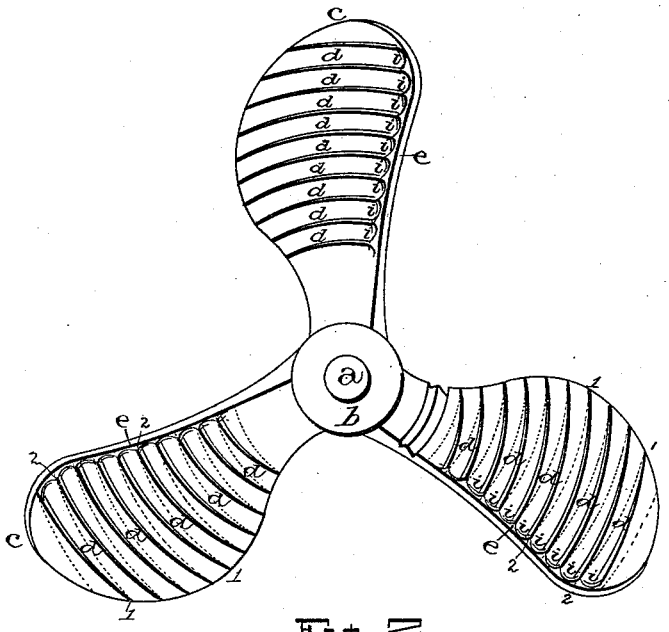
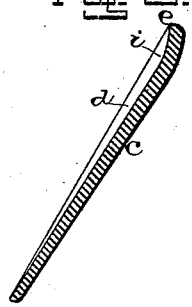



Fig. 2.


Fig. 3.




Witnesses:

J. W. Garner

H. S. D. Haines

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per
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# UNITED STATES PATENT OFFICE.

SAMUEL T. SWASEY, OF NEW YORK, N. Y.

## IMPROVEMENT IN SCREW-PROPELLERS.

Specification forming part of Letters Patent No. **208,211**, dated September 17, 1878; application filed April 22, 1878.

*To all whom it may concern:*

Be it known that I, SAMUEL T. SWASEY, of New York city, in the county of New York and State of New York, 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in propeller-wheels; and it consists in the peculiar construction of the faces of the blades, whereby the water is forced inward toward the hub of the wheel, and is prevented from slipping off too readily, thereby obtaining a greater propelling force from the same amount of steam, as will be more fully described hereinafter.

Figure 1 is a plan view of my wheel. Figs. 2 and 3 are detail views of the same.

*a* represents the shaft, *b* the hub of the wheel, and *c* the blades. There may be any number desired of these blades, and each one will be given any desired shape, curvature, or inclination that may be preferred. Upon the force side of each one of these blades there is made a series of circular grooves, *d*, which are equidistant, and extend from any suitable distance from the hub out to the extreme point of the blade. These grooves may be so formed that the shoulders shall face outward toward the outer end of the blades or toward the hub, as shown, and are made shallowest upon the front sharp edges of the blades, and gradually increase in depth rearwardly until just before the rear edge of the blade is reached.

Upon the extreme rear edges of the blades are formed the flanges *e*, which serve to close up the rear ends of the grooves, and thus prevent the water from escaping too readily from the face of the blade. Just inside of the flanges, in the rear end of each one of the grooves, is formed a recess, *i*, which serves to take an additional hold on the water, and by preventing the water from slipping off the face gives so much additional propelling-power to the wheel. The shoulders *o* of these grooves form an angle of about thirty degrees, while the bottoms form a gentle curve, as shown. This form of groove is preferred; but I do not limit myself to this form alone. By giving the shoulder an angle of about thirty degrees as the blades revolve through the water, the water is constantly forced from the shoulder, instead of running idly in the groove, and, being thus forced against the curved bottom of the grooves, the wheel is thus enabled to exert a greater pressure upon the water, and hence will force the boat more rapidly along.

By laying out the curve of the grooves across the face of the blade, I first draw a number of concentric equidistant circles from the center of the shaft or hub, and then from the corner 1 of one of the spaces thus laid off I draw a circle across the blade to the opposite corner, 2, and thus give the grooves an inclination toward or from the hub, instead of having them run across the face of the blade at about the angle they would enter the water. By thus inclining the grooves toward the hub the water is forced inward in a solid body, thereby preventing any tendency to form a vacuum at or near the hub, and enabling the wheel to take a firmer hold upon the water. When the grooves are made to run outward from the hub, they throw the water outward instead of inward, each groove serving as a wedge to operate upon the water.

I am aware that wheels have been made having flanges and grooves across the face of the blades inclined so as to throw the water outward from the hub, and this I disclaim.

Having thus described my invention, I claim—

1. In a propeller-wheel, the blades *c*, having grooves *d* across their faces, the said grooves being shallowest at the ends where they enter the water when the wheel is moving forward, and increasing gradually in depth toward their rear ends, so that the deepest parts shall be at or near the rear edges of the blades, substantially as shown.

2. In a propeller-wheel, the grooves *d*, having a recess or depression, *i*, formed in their rear ends, at or near the rear edges of the blades, so as to give the blades an increased hold upon the water, substantially as described.

3. The blades *c*, having the grooves *d* made across their faces, and having the flanges *e* on

their rear edges, so as to close the rear ends of the grooves, and thus prevent the water from escaping too readily from the blades, substantially as set forth.

4. In a propeller-wheel, the blades *c*, having the grooves *d*, gradually increasing in depth from their front to their rear ends, and inclined inward, so as to force the water toward the hub of the wheel, substantially as specified.

In testimony that I claim the foregoing I have hereunto set my hand this 20th day of April, 1878.

S. T. SWASEY.

Witnesses:
F. A. LEHMANN,
WILL. H. KERN.