(Model.)

L. N. TONNS.

SCREW PROPELLER.

No. 413,268. Patented Oct. 22, 1889.

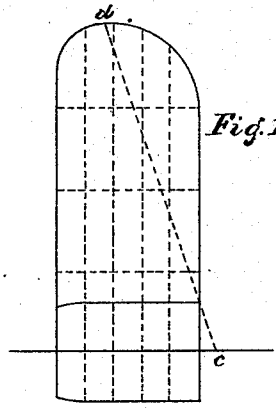
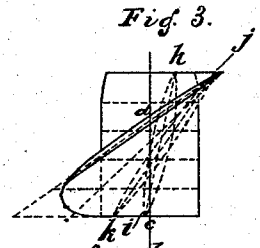


Fig. 1.

Fig. 3.



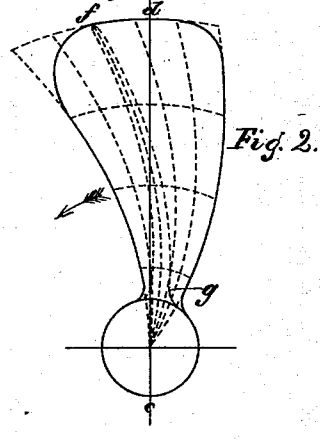


Fig. 2.

WITNESSES:

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LEWIS N. TONNS, OF NEW BRIGHTON, NEW YORK.

SCREW-PROPELLER.

SPECIFICATION forming part of Letters Patent No. 413,268, dated October 22, 1889.

Application filed May 21, 1884. Serial No. 132,336. (Model.)

To all whom it may concern:

Be it known that I, LEWIS NICHOLAS TONNS, of New Brighton, in the county of Richmond and State of New York, have invented a certain new and useful Improvement in Propeller-Wheels, of which the following is a specification.

The object of my improvement is to produce a propeller-wheel which will be more effective than the propeller-wheels now in use.

The improvement consists in a propeller-wheel having the blades leaned or extended back in line with the central axis.

In the accompanying drawings, Figure 1 is a side view of my wheel. Fig. 2 is an end view of it, and Fig. 3 is a top view of it.

I have only shown one blade, but any desirable number may be employed.

In order to explain the wheel I shall refer to its construction-lines and to the sections or portions between construction-lines. I mean the construction-lines and sections which are ordinarily laid out for a pattern-maker to work by in making patterns for use in constructing the screws.

In my propeller-wheel the blade is so constructed and arranged that it leans or extends back in line or plane parallel with the central axis, as indicated by the line *c d*. If the sections of the blade are laid out perpendicular to the axis, the sections will form parabolic curves, as illustrated by the longitudinal cut or section *f g*, delineated by dotted lines in Fig. 2. The only straight lines are in line with the central axis parallel with the angle to which the blade is leaned back. The result of my improvement is that all the water circumscribed by the wheel is thrown directly and centrally astern, lessening and nearly entirely avoiding loss or slip. The wheel runs without shake and without causing any material commotion in the water outside the line described by the outer edges of its blade or blades.

A further advantage resulting from my improvement is the equal division of the thickness on each side of the pitch-lines. This feature is illustrated by the cross cuts or sections *h i* and *j k*, delineated by dotted lines in Fig. 3.

I am also enabled by my improvement to make the blade as wide on the hub as the length of the hub will permit; hence my wheel will have a longer hub than wheels now in common use. This results in a steadier travel or motion of the screw. Little or no vibration occurs, even with a wheel having two blades.

The leaning of the blade of the wheel back in line with the axis of the wheel must not be confounded with the old custom of pitching the blade back on its pitch-line. The distinction will be comprehended fully when it is seen that the wheel of an ordinary blade, when laid out or divided into sections for the pattern-maker, has each section presenting a straight line perpendicular to the axis, which is the only straight line obtainable in the present screw, no matter how much the blade may be pitched back. In my improvement the vertical sections present a curved form, and the only straight line or lines are those axial lines on which the blade is leaned back. The blade itself, to the eye, stands perfectly upright and is not pitched back on its pitch-line.

What I claim as my invention, and desire to secure by Letters Patent, is—

A propeller-wheel having a blade or blades transversely leaned or extended back in a plane parallel with the axis of the hub, the said blade or blades being of such width that the fore and aft edges will extend at all parts between two parallel planes at right angles to the axis of the hub, substantially as specified.

L. N. TONNS.

Witnesses:
T. J. KEANE,
WM. G. LIPSEY.