M. D. NELON.

SCREW-PROPELLERS.

No. 193,989. Patented Aug. 7, 1877.

Fig. 1.

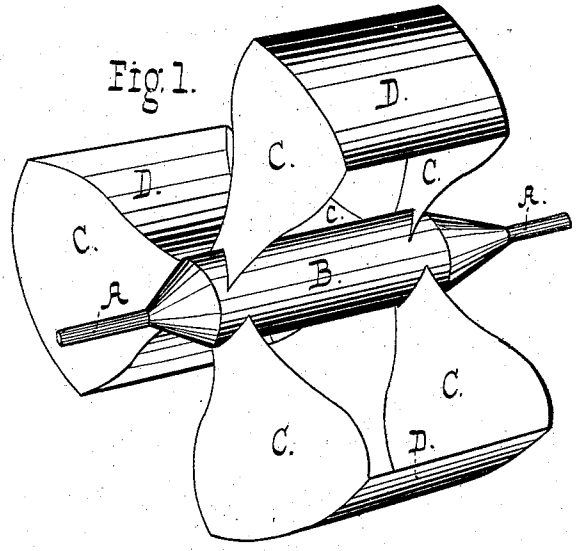
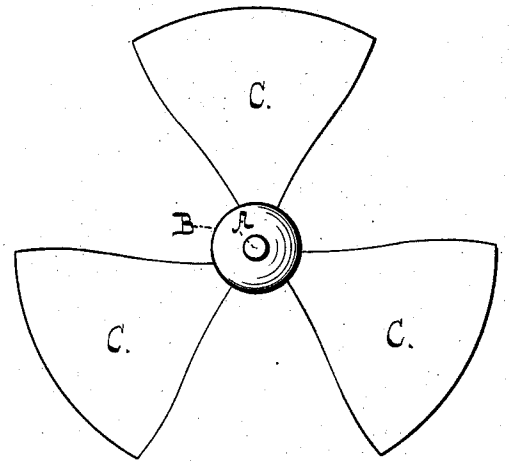


Fig. 2.



Witnesses.

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MICHAEL D. NELON, OF NEWPORT, KENTUCKY.

IMPROVEMENT IN SCREW-PROPELLERS.

Specification forming part of Letters Patent No. **193,989**, dated August 7, 1877; application filed July 26, 1877.

To all whom it may concern:

Be it known that I, MICHAEL D. NELON, of Newport, county of Campbell, and State of Kentucky, have invented certain new and useful Improvements in Propeller-Wheels; and I hereby declare the same to be fully, clearly, and exactly described as follows, reference being had to the accompanying drawings, in which—

Figure 1 represents a perspective, and Fig. 2 an end, view of my device.

In all machines for marine propulsion in which the power acts directly upon the water there is a discrepancy between the distance actually traveled over by the vessel and that which she should theoretically have traversed, which discrepancy or difference is known as "slip." Innumerable forms of both side and propeller wheels have been devised, designed to obviate or diminish the slip, but with indifferent success.

My invention has for its object the reduction of this loss to a minimum; and it relates to the class of wheels known as "screws," revolving at right angles to the vessel's axis.

Much time and thought have been expended in the study of the curves of the wings of birds and insects, and of the stroke of their wings through the air, in the expectation that a propeller-blade constructed and driven upon the same principle would be the perfect blade. It has been well settled, however, that no form of blade is more efficient than the true screw. Here slip is almost confined to the loss arising from the radial displacement of the water, a result which is unavoidable with the wheels in ordinary use. It is manifest that the power expended in driving the water at right angles to the axis of the screw is that much dead loss.

My wheel has been constructed upon the principle of preventing this lateral displacement of the water, and carrying it directly into the wake of the vessel. To this end I construct the wheel as follows, reference being had to the accompanying drawings.

A represents the main driving-shaft, to which is firmly fastened, by means of keys, set-screws, or other usual and suitable means, the hub B. This latter should, preferably, be constructed in conformity with the lines of least resistance, but the form shown in the drawings—that of a cylinder terminating in cones, the after cone being somewhat longer than the forward one—approximates sufficiently near thereto for all ordinary purposes. The blades C C are either cast in one piece with the hub, or are attached thereto by means of bolted lugs upon either the hub or blades, and are preferably in the form of true screws. Connecting the blades, and similarly attached to them, are the deflectors D, the free edges of which are accurately parallel with the shaft. The two sets of propeller-blades are, of course, similarly arranged in pairs, absolute parallelism of the pairs of blades being essential in order to obviate on the one hand back pressure, and on the other choking.

As the wheel revolves, the thread of water cut out by the blades and deflectors is compelled to traverse the channel between the same until it reaches its exit, when it is delivered directly in the wake of the craft.

It is clear that the slip being very nearly obviated by this means, there can be little or no radial displacement of the water from the rear side of the after set of blades, and the agitation of the water due to the wheel is only in the same ratio in excess of that caused by a skeleton-wheel. This fact renders my wheel of peculiar value in canal-navigation. The wash occasioned by a canal-boat equipped with my wheel would be simply that of the wake of the boat. The same fact makes my wheel equally applicable to torpedo-propulsion, whether on the surface or submarine. In the former case it gives the maximum of speed with the minimum of force expended in driving the wheel; in the latter the course of the torpedo, owing to the but slight agitation of the water, would be undiscoverable.

The wheel may be attached in the usual manner to vessels now in use, but a slight enlargement of the port being necessary—a change which is easily effected by a slight lengthening of the keel, and proportionate displacement of the rudder-post.

While I have shown the wheel as having three blades in each set, I do not limit myself thereto, the number of blades being no part of my invention.

It is evident that my wheel, being symmetrical fore and aft, is equally efficient in backing as in driving the vessel ahead.

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

1. In a propeller-wheel, a pair of blades connected by means of a plate, the unattached edges of which are parallel with the shaft, substantially as described.

2. In a propeller-wheel, two sets of blades, the same being connected in pairs by means of plates, the opposite edges of which are parallel, substantially as described.

3. In a propeller-wheel, a hub and a pair of blades, connected by means of a plate, forming together a water-channel having parallel opposite surfaces, as set forth.

4. In combination with the shaft A, the hub B, blades C, and plates D, all substantially as described, and for the purpose set forth.

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Witnesses:
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