

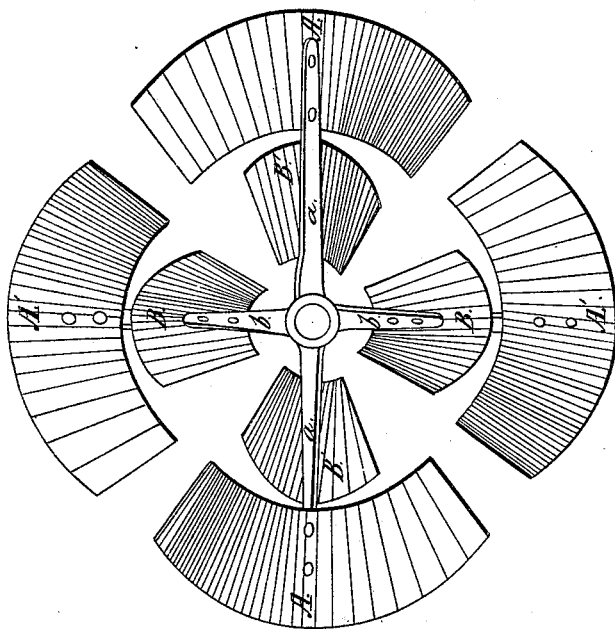
*Sheet 1. 2 Sheets.*

*J. Laing.*  
*Paddle Wheel.*

*N<sup>o</sup> 2,825.*

*Patented Oct 22, 1842.*

*Fig. 1.*

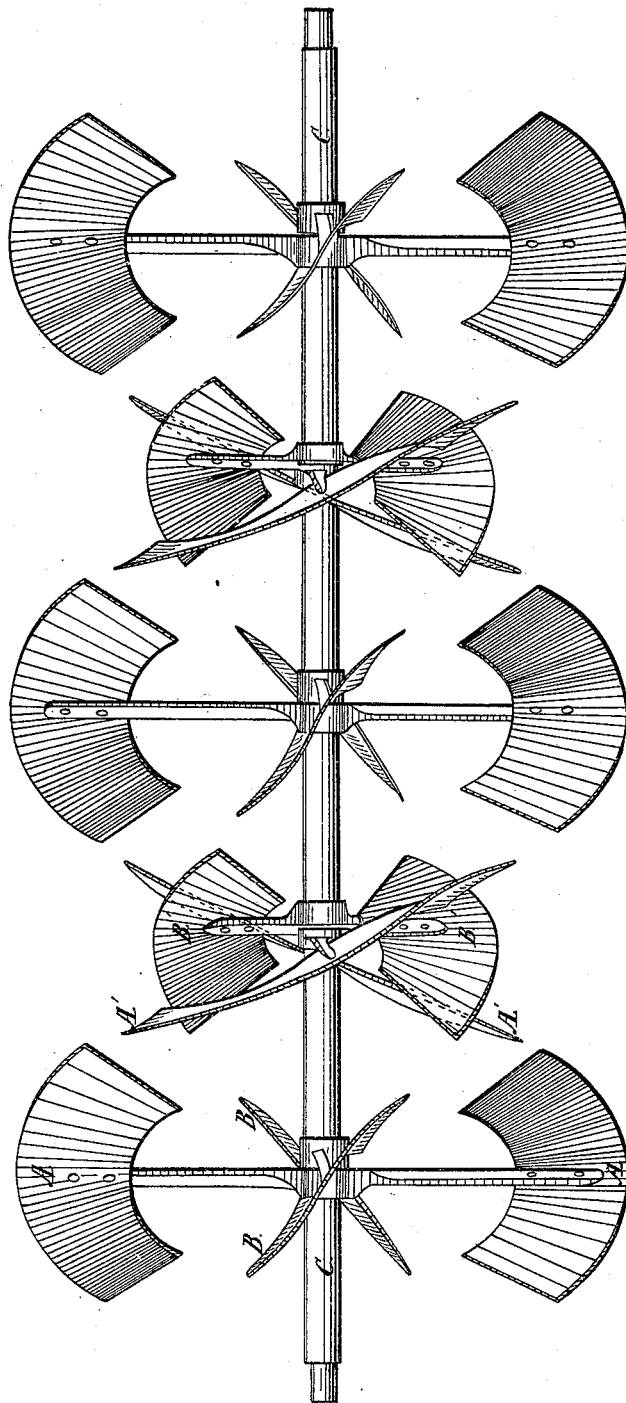


*J. Laing.*  
*Paddle Wheel.*

*N<sup>o</sup> 2,825.*

*Patented Oct. 22, 1842.*

*Fig. 2.*



# UNITED STATES PATENT OFFICE.

JOHN LAING, OF ELLICOTTS MILLS, MARYLAND.

## MANNER OF CONSTRUCTING SEGMENTAL SPIRAL PROPELLERS FOR PROPELLING BOATS AND OTHER VESSELS.

Specification of Letters Patent No. 2,825, dated October 22, 1842.

*To all whom it may concern:*

Be it known that I, JOHN LAING, of Ellicotts Mills, in the county of Anne Arundel and State of Maryland, have invented a new and useful Improvement in the Manner of Constructing a Segmental Spiral Propelling Wheel or Apparatus for Propelling Boats and other Vessels; and I do hereby declare that the following is a full and exact description thereof.

My propeller is of that kind which is known under the name of the spiral propeller, and consists of a shaft which is to be placed in the direction of the vessel's length, and has on it a number of flights, or buckets, each of which approaches in form a segment of a spiral, but which are so arranged as not to act upon the water in the manner of those propellers the spirals of which are continuous.

The distinguishing feature of my propeller is the employment of a double set of spiral segments, flights, or buckets, the inner edges of one set of which are within a short distance of the shaft, and the outer edges of which terminate at a distance therefrom which is on a line, or nearly so, with the inner edges of the larger set.

The two sets of buckets may be equal in width, and supposing each set to form a continuous spiral around the shaft, the width of the larger, would, in such case, be double that of the smaller spiral. The buckets of the larger series are supported on arms which extend out at right angles from the shaft. Each of these larger buckets may be a quarter of a circle in length, or nearly so, and they are to stand in pairs, one opposite to the other, their supporting arms being in the same right line. In the intervals between these, stands a pair of smaller buckets, which may also constitute a quadrant of a circle, or nearly so; these are sustained by short arms proceeding from the shaft. The second pair of larger buckets have their supporting arms at right angles to the first pair, and are placed at a suitable distance from them, which is such that their outer ends shall be at the same distance from the shaft; and the same may be said of the successive pairs of smaller buckets.

In the accompanying drawing, Figure 1, is an end view of the propeller, showing two

pair of the larger, and two pair of the smaller flights, or buckets. Fig. 2, is a side view of the propeller, showing a succession of such buckets, which may be more or less in number.

The faces of each of the larger buckets may be so made as to constitute planes, or nearly so; but I generally give to them a twist, or convolution, so as to make some approach to the form of a continuous spiral; the smaller flights, also, are somewhat twisted, so as to assume a similar form; this continued spiral direction actually exists at their outer edges only, as the arms by which they are sustained rise at right angles from the shaft, and their inner edges, therefore, would not coincide, unless the plates of which the buckets consist were considerably convoluted, instead of being nearly planes. The buckets are so placed as that their planes shall form an angle of about forty five degrees with the shaft; and they are, as above indicated, placed at such distance from each other as that their outer edges, if continuous, would form a continuous, spiral line.

A, A, Fig. 1, are two of the larger end buckets; and B, B, two of the smaller.

*a, a*, are the arms which support the larger, and *b, b*, are arms that support the smaller buckets; the arms of these two pair, as well as of the successive double pairs rise from the same, or from nearly the same, point of the shaft, and the middles of these four buckets are, therefore, in the same plane with each other; the two pairs A', A', and B', B', stand at the proper distance in the rear of the first pairs, as shown in Fig. 2, and so of all the successive pairs.

C, C, is the shaft upon which the buckets are placed.

By this manner of arranging the sectional, or segmental, buckets, in alternate large and small pairs, it has been found that they act upon the water with greater effect than do any of the continuous, or of the segmental, spiral buckets which have been hitherto essayed.

What I claim, therefore, as constituting my improvement in the propelling of boats, and other vessels, is—

The forming and arranging of the buckets, or flights, of a spiral, propelling wheel in the manner herein set forth; that is to

say, with alternate, pairs of large and small  
buckets, so proportioned to each other as  
that the outer edge of a small pair, shall be  
in a line, or nearly so, with the inner edges  
5 of the larger buckets; and that the outer  
edges of each set shall stand in the direction  
of continuous spirals; the whole being other-

wise combined together substantially in the  
manner herein set forth.

JOHN LAING.

Witnesses:

HUGH BONE, Sr.,  
CHAS. MAREAN.