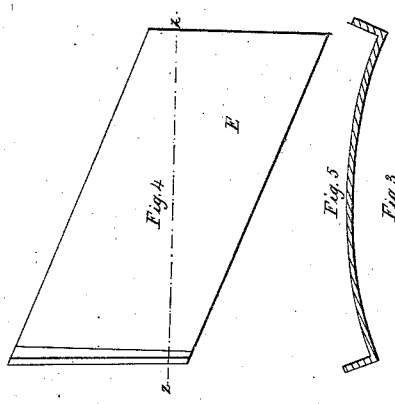
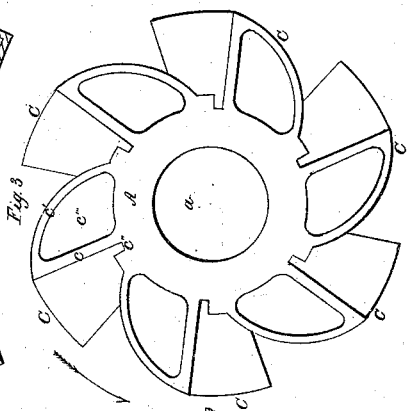
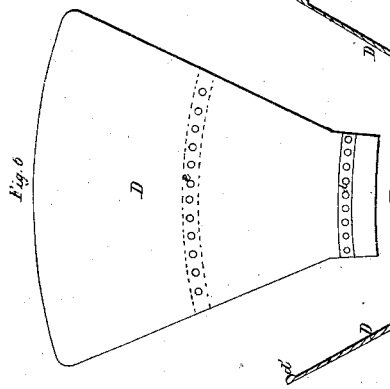
J. Ericsson.

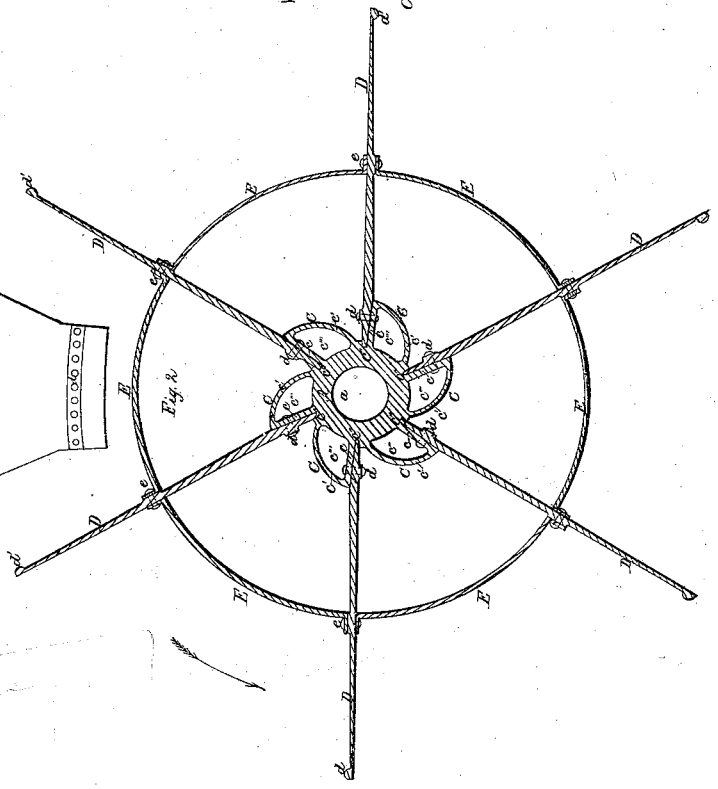
Ship Propeller.

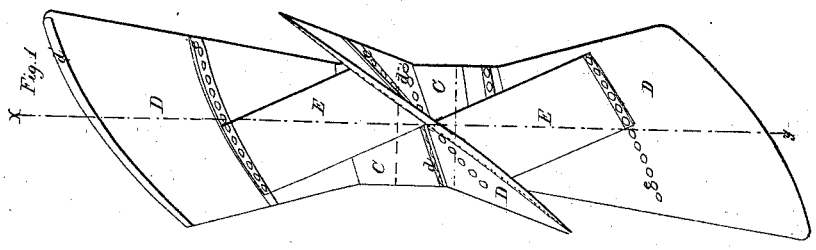
No. 4,181. Patented Sept. 9, 1845.











N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN ERICSSON, OF NEW YORK, N. Y.

SCREW-PROPELLER.

Specification of Letters Patent No. 4,181, dated September 9, 1845.

To all whom it may concern:

Be it known that I, JOHN ERICSSON, of the city, county, and State of New York, have invented an Improved Propeller for Steam Navigation; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification and herein below more particularly referred to.

My invention consists: 1. In a cylindrical hub or center block to sustain the spiral propelling blades constructed with a series of projections, one side of which radiates while the other is curved, each of which projections is perforated with a hole corresponding to its exterior form, and at the base of each of which a notch is cut in the hub to receive the tapered extremity of the propelling blades, which are riveted severally to the radial side of the said projections. 2. In a series of elliptic braces, placed diagonally to the vertical plane of the propeller, corresponding to the number of propelling blades, and attached zig-zag to alternate and opposite sides of the same. They are made narrow, being less than half the width of the propelling blades at the point where they are attached, but by alternating they give a continuous support to the same for nearly the whole extent of their width, while the diagonal disposition of the braces prevents the ill effects that would otherwise result from the twisting action to which the spiral blades are subjected.

Description of drawings hereto annexed illustrating my invention.—Figure 1, is a side elevation of the propeller, representing a fore-shortened view of its blades with the elliptic braces. Fig. 2 cut section through the central vertical plane of the propeller, as marked by a red line *x y* in Fig. 1. Fig. 3, front view of the hub with its perforated projections—upon an enlarged scale. Fig. 4 top view of one of the elliptic braces and Fig. 5 a longitudinal section of said brace through a line drawn at right angles to its ends, as indicated by the red line *z z* in Fig. 4; both upon an enlarged scale. Fig. 6, top view of one of the propelling blades.

Similar parts in all the figures are indicated by the same letters of reference.

A the hub. *a*, hole through center of hub through which the propeller shaft passes, *c c c c c c* projections on the hub. *c* radial side of projection which extends across the whole width of the hub at an angle to its center line, and is made winding to coincide with the thread of a screw. *c'* curved side of the projection connecting the outer end of the said radial side to the circumference of the hub. *c''* a notch formed at the base of said radial side for receiving the end of the propelling blade. *c'''*, open space through which the water passes freely during the progress of the vessel and the rotation of the propeller. D propelling blades made to enter the notch *c''* and riveted to the radial side of the projection *c* at *d*. *d'*, bead or flange formed at the extreme circumference of the propelling blades to give strength and stiffness to the same. E elliptic braces, attached to the propelling blades by means of rivets at *e* at which place a bead or projection, is formed on the back of the blade to make good the strength lost by the requisite perforations for said rivets; the blade having also a similar projection for the same.

Having now described the various parts of the improved propeller, I will proceed to speak of their use, fitness and peculiar character. The motion of the propeller in driving the vessel ahead being indicated by the arrows marked on the plan, it will be seen that the pressure of the water against the propelling blades will force them against the radial sides of the projections on the hub without causing any strain on the rivets at *d*, since the narrow end of the blade is inserted in the notch at *c''*, where it is thus held firmly, while the extreme point of the projection *c* acts as a fulcrum or point of support; it will also be seen that the strain to which the blades or arms of all spiral propellers are necessarily subjected at the point where they leave the hub, is here entirely prevented by the introduction of the curved side of the projection without the use of any thick substance to cause resistance in passing through the water. With reference to the elliptic braces, it is to be particularly noticed that although they are made narrow, yet by being placed zig-zag a continuous support is given to the propelling blades for nearly the whole extent of their width; and it is also to be particularly noticed, that the twisting action to which the oblique plates are subjected is most thoroughly prevented by the

diagonal position of the said elliptic braces. The bead introduced at *e* and *d* add as much strength to the propelling blades as is taken away by the holes made for the rivets, while the bead *d'* gives great strength and stability without adding anything scarcely to the weight. It is also important to notice, that by cutting out the rivets at *c* and *d* any one blade may be removed and replaced without deranging the structure.

Now I do not claim as my invention the application to purposes of propulsion of spiral blades radiating from and fastened to a center block or hub, Letters Patent for the same having been issued in the United States to Benjamin M. Smith in 1827, but

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

The hub constructed with perforated projections and the combination of the same with the elliptic braces for the purpose of sustaining and strengthening the spiral propelling blades as herein-before described.

J. ERICSSON.

Witnesses:
JOHN O. SARGENT,
GEO. W. MORTON.