(No Model.)

R. UREN.

SCREW PROPELLER.

No. 257,416. Patented May 2, 1882.

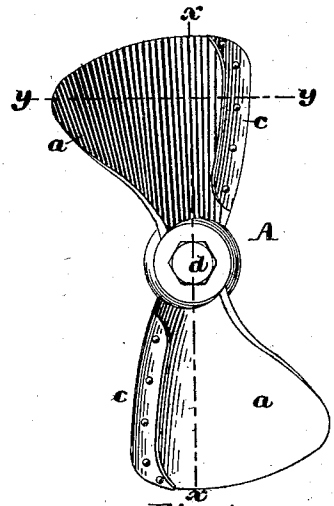


Fig. 1.

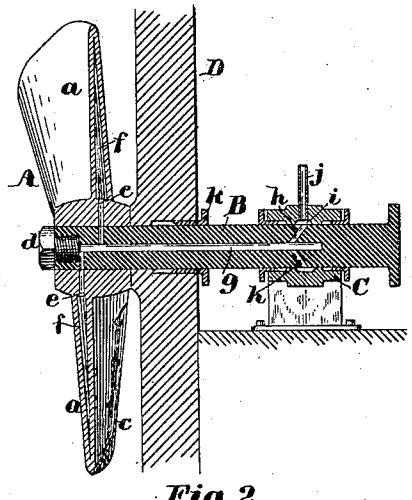


Fig. 2.

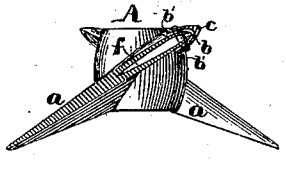


Fig. 3.

Witnesses:

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UNITED STATES PATENT OFFICE.

RICHARD UREN, OF HOUGHTON, MICHIGAN.

SCREW-PROPELLER.

SPECIFICATION forming part of Letters Patent No. 257,416, dated May 2, 1882.

Application filed July 21, 1881. (No model.)

To all whom it may concern:

Be it known that I, RICHARD UREN, of Houghton, in the county of Houghton and State of Michigan, have invented a new and useful Improvement in Screw-Propellers, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to the construction of screw-propellers for steam-vessels and their supporting-shafts, and has for its object a reduction of the resistance to the revolutions of the propeller due to the friction of the water upon the surface of the propeller-blades; and it consists in forming the blades of the propeller hollow, with one or more openings at or near their forward edges, so formed and arranged that the exterior mouth of said opening or openings shall be in close proximity to the exterior surface of the blade along its front radial edge and face toward the rear radial edge of said blade.

It further consists in the combination of a propeller constructed as above set forth and a hollow supporting and operating shaft, through which air may be forced to the interior of the propeller-blades, as will be further described.

Figure 1 of the accompanying drawings is an end elevation of a screw-propeller embodying my invention. Fig. 2 is a sectional elevation, the cutting-plane being on line *x x* on Fig. 1; and Fig. 3 is a section through one of the blades on line *y y* on Fig. 1.

A is the propeller, provided with blades *a a*, made hollow, as shown, with openings *b* in their front edges, which openings are covered by the overlapping shields or hoods *c c*, but not closed thereby, said shields or hoods *c c* serving to form an extension and a division of the passage from the interior of the blade, and to turn the two divisions backward, so that the mouths of the openings *b'* are toward the back edge of the blade. The shield or hood *c* is riveted to the propeller-blade through and through, thimbles or washers being placed between said hood and the blade and between the two parts of the blade, as shown in Fig. 3.

B is the rear section of the propeller-shaft, the rear portion of which is bored out hollow and has inserted in its rear end the screw-plug *d*. Near its rear end are drilled the two radial holes *e e*, in positions to connect with the chambers *f f* in the arms *a a* of the propeller A with the central or longitudinal passage, *g*, of the shaft B, the inner end of which communicates through the radial holes *h* with the annular chamber *i* in the stationary bearing C, which is connected by the pipe *j* with an air-pump. (Not shown.) The bearing C is provided with two stuffing-boxes, one upon each side of the chamber *i*, to prevent leakage of air around the shaft B.

D is the stern-post of the vessel, provided with a suitable bearing for the shaft B and a suitable stuffing-box, *k*, to prevent water entering the vessel.

The operation of my invention is as follows: Any well-known air force-pump being connected to the pipe *j* and set in operation, air will be forced into the chamber *i* through the holes *h*, passage *g*, holes *e*, and the chambers *f f* in the arms *a a* of the propeller A, and escaping through the openings *b* in the front edges of the blades *a a* is deflected by the hoods *c c* and turned in two divisions around the edges of the blades, and is discharged toward the rear edges of said blades, between the surface of said blades and the surrounding water, thus causing a film of air to be interposed between the blade and water and materially reducing the friction of the water upon the blades of the propeller and causing a great saving in the power required to revolve the propeller.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A screw-propeller having hollow blades, each provided with one or more orifices in close proximity to its front radial edge and opening toward the rear radial edge of said blade, substantially as described.

2. A screw-propeller having hollow blades, each provided with two or more orifices in close proximity to its front radial edge and opening toward the rear radial edge of said blade, one or more upon each side of said blade, substantially as described.

3. The combination of the propeller A, having hollow arms *a a*, each provided with one or more openings, *b b*, the hoods *c c*, and mechanism for forcing air through the hollow arms *a a* and the orifices *b b*, substantially as and for the purposes described.

Executed at Boston, Massachusetts, this 11th day of July, A. D. 1881.

RICHARD UREN.

Witnesses:

E. A. HEMMENWAY,

WALTER E. LOMBARD.