No. 748,176. PATENTED DEC. 29, 1903.

T. H. EASTWOOD.

SCREW PROPELLER.

APPLICATION FILED OCT. 12, 1901.

NO MODEL.

Fig. 1.

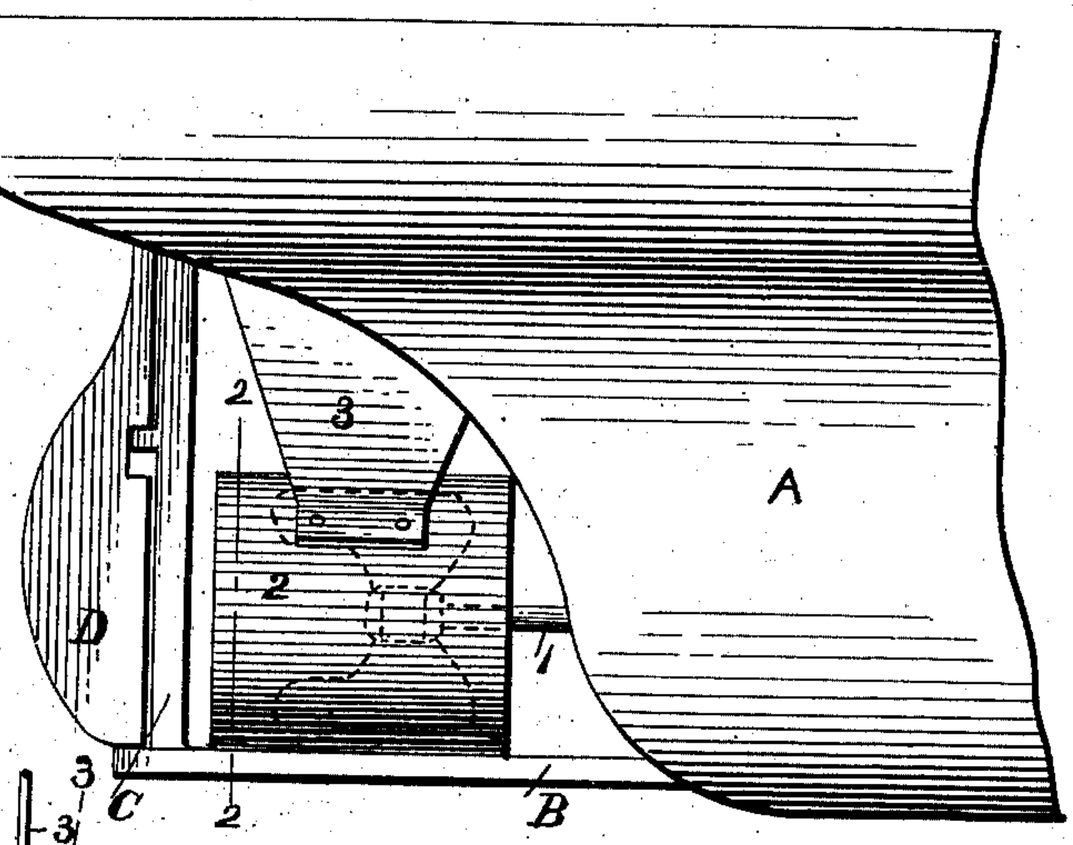


Fig. 2.

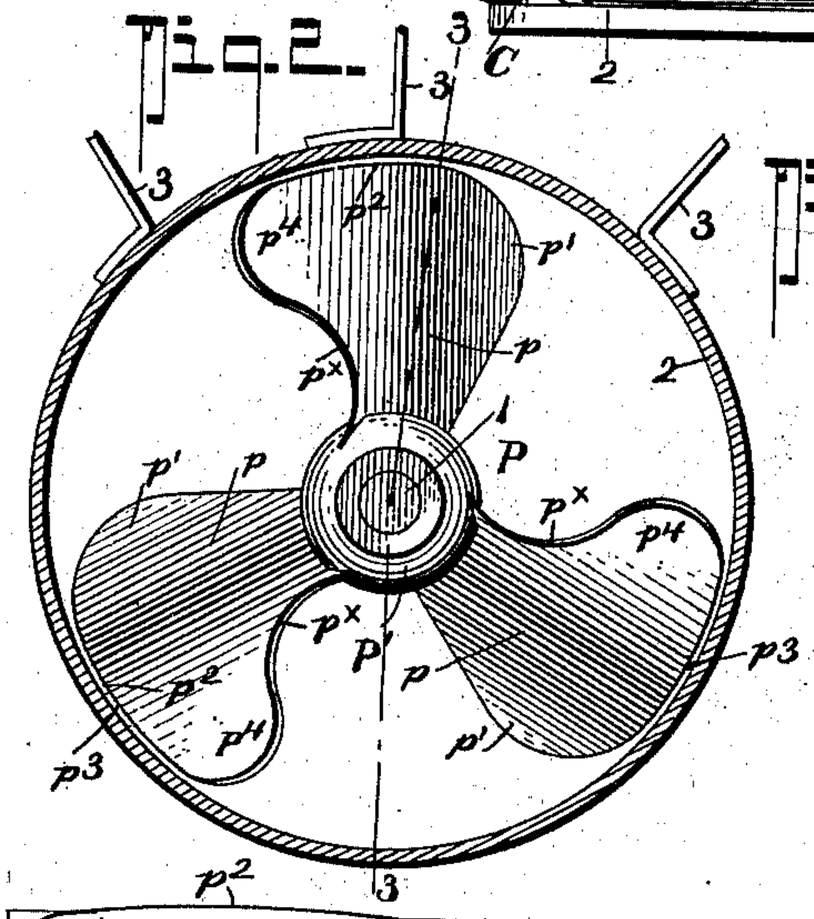


Fig. 3.

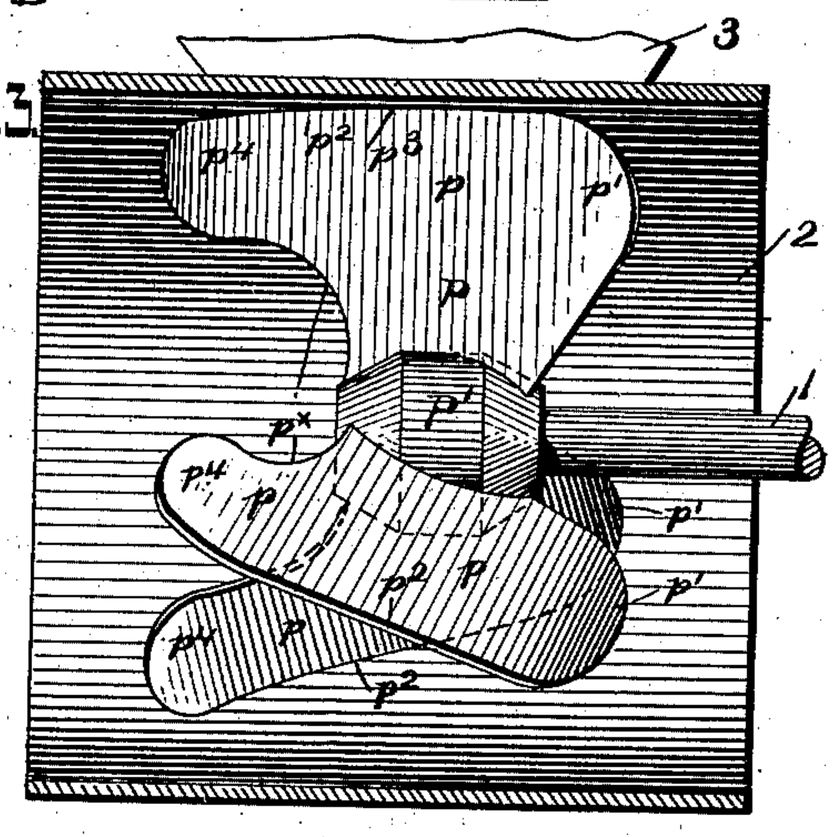


Fig. 5.

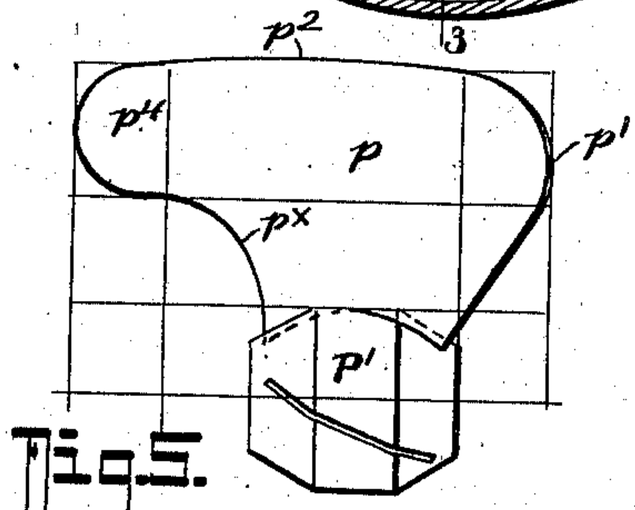


Fig. 4.

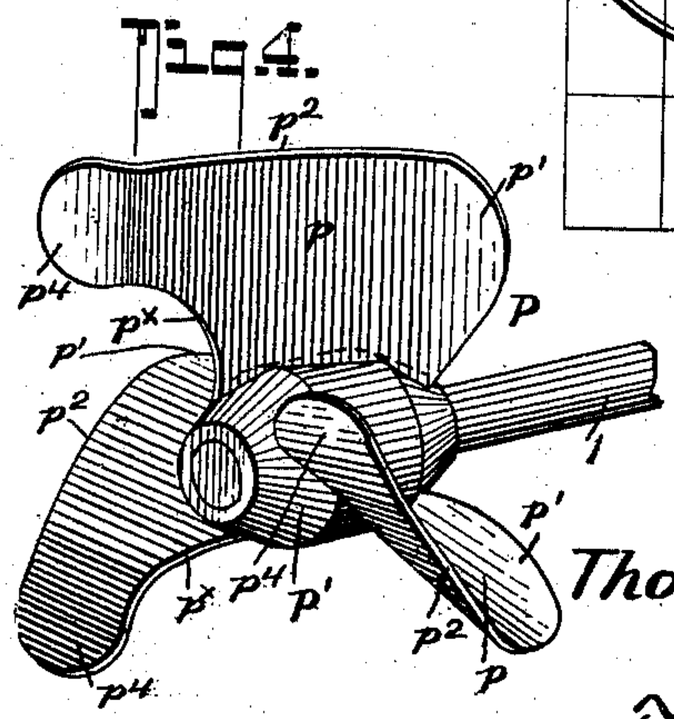
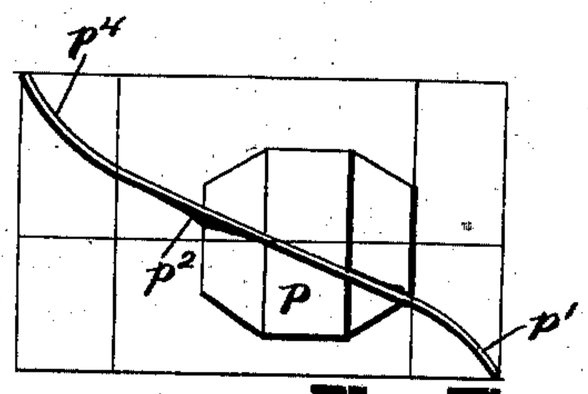


Fig. 6.



WITNESSES:

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No. 748,176. Patented December 29, 1903.

UNITED STATES PATENT OFFICE.

THOMAS H. EASTWOOD, OF McMINNVILLE, TENNESSEE.

SCREW-PROPELLER.

SPECIFICATION forming part of Letters Patent No. 748,176, dated December 29, 1903.

Application filed October 12, 1901. Serial No. 78,445. (No model.)

To all whom it may concern:

Be it known that I, THOMAS H. EASTWOOD, residing at McMinnville, in the county of Warren and State of Tennessee, have invented certain new and useful Improvements in Screw-Propellers, of which the following is a specification.

My invention has for its purpose to provide a propeller embodying a novel correlative arrangement and combination of parts of an economical and stable construction whereby to obtain greater propelling power in either direction than hitherto in the common construction of propeller of corresponding size, and my invention in its generic nature comprehends a propeller rotatable within a casing or hood extending entirely around the propeller and of such diameter that the blade peripheries travel close up to the hood, said hood being extended beyond both ends of the propeller equidistantly and with the front and rear edges disposed in a plane at right angles to the axis of the propeller-shaft whereby to form a jacket for the propeller open at both ends.

In its more complete nature my invention includes a propeller operating within a hood or casing whose ends extend beyond the propeller and a novel construction of propeller-blades, all of which will hereinafter be fully described, and particularly pointed out in the appended claim, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a portion of the stern of a vessel with my improvements applied. Fig. 2 is a cross-section of the same, taken on the line 2 2 of Fig. 1. Fig. 3 is a longitudinal section on the line 3 3 of Fig. 2. Fig. 4 is a perspective view of the propeller. Figs. 5 and 6 are diagrammatical views of the hub and one of the propeller-blades.

In the drawings, in which like numerals indicate like parts in all the figures, A designates the stern of a vessel, B the keel-bar or rudder-post support, C the rudder-post, and D the rudder, all of which may be of the ordinary construction, as they *per se* form no part of my invention.

1 designates the propeller-shaft, actuated by any suitable power, and this shaft projects beyond the stern to a predetermined point within the hood or casing 2, the reason for which will presently appear.

The casing 2 is in the nature of a cylindrical body of a predetermined length relatively to the propeller, the front and rear edges of which, with their entire circumference, are in a plane at right angles to the axis of the propeller-shaft. This casing is fixedly held and made fast to the keel-piece B and braced by the stays 3, made fast to the casing and the boat-stern, as shown.

The propeller P, as best shown in Fig. 3, has the outer and inner edges of the blades disposed at points inside the outer and inner edges of the casing 2. This correlative arrangement of the blades and casing provides for a greater efficiency than is possible by extending the blades out to or beyond the edges of the casing, for the reason that when moving in either direction a full volume of water is permitted to enter the casing against the propeller in contradistinction to the water volume being split up or broken at the entrant end of the casing, such as is found where the blades run close to the outer edges of the casing or beyond it. Furthermore, my arrangement of parts while causing the water volume to come toward the blade in a dense condition and under great force also provides against breaking of the blades by reason of floating pieces of timber coming in between the edges of the casing and the blades, which would occur were the blades projected close up to or beyond the casing edges. Thus by making the casing of a cross-sectional area sufficient to permit of a free rotation of the propeller-blades of a length to project beyond the propeller at both ends also provides a complete protection for the blades as against striking obstructions with the blades or wings.

By extending the casing at each end, as stated, the water is confined in a compact space and is expelled with a much greater force than is possible with a naked propeller and in the line of direction of the travel, thus reducing the waste power caused by churning or agitating the water at the sides of the propeller-blades.

Again, by reason of locating the propeller within the casing and extending the casing at

ach end the propeller can be used with equal acility in backing as in going forward. Furhermore, the casing being open at both ends he same gives little or no resistance when urning the vessel in either direction.

To further increase the efficiency of my propeller mechanism and especially for providng increased speed forward, the propeller-blades have a special construction for coöperating with the casing. For this purpose the blades p are connected spirally to the hub P′ in the ordinary manner, and each blade has its intake side (assuming the vessel to be going forward) extending forward of the hub, as at p', and convexed from the hub to the perimeter p^2, which is so shaped whereby to provide for the blade running close against the casing nearly its entire length, as indicated by p^3. The portion p^2 extends rearwardly beyond the hub and merges with the rear extension or throw-off member p^4, which is, however, only half (more or less) the radial length of the blade-body, the rear edge of said extension merging with the rear edge $p^\times$ of the blade proper, which edge $p^\times$ terminates at the hub, the rear edges of the extension being shaped on a convex-concaved line, as clearly shown in Figs. 2 and 3. By thus forming the blades it will be noticed I get a larger blade-surface, the outer edge of which runs close up near the casing. This provides for directing the water back through the propeller in a dense body, and by constructing the rear edge of the propeller-blade in the manner shown and described a larger volume of water passing through the casing will be forced out in a more direct column than is possible by the ordinary construction of propeller-blade and casing, and thereby prevent the excessive churning of the water, which is so common in propeller-blades of the ordinary construction. As the water in passing through the propeller naturally gravitates toward the outer edge, the same in my construction will be caused to pass against and off the rear extension with greater force than would otherwise occur. By constructing the propeller-blade in the manner shown and described I get a greater forward speed than a rearward speed, a very advantageous feature of my invention.

I am aware that propeller-blades disposed wholly or partly within housings or protecting-hoods have heretofore been provided. I do not broadly claim such as my invention, which, so far as I know, differentiates from what has been provided in this art in the peculiar correlation of the casing and propeller, especially the extended front and rear ends of the casing and the peculiar shape of the propeller-blades combined with the inclosing jacket or hood.

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

In combination with the vessel-stern, the rudder-post and the keel-piece, said rudder-post being fixedly secured to the vessel-stern and to the keel-piece; of an open-ended cylindrical casing fixedly mounted on the keel-piece between the stern and rudder-post, a propeller-wheel located within the casing, said casing having its ends projected beyond the opposite ends of the wheel, said wheel comprising a hub, a series of diagonally-disposed blades radiating therefrom, each blade having its front edge curved inwardly from the hub and merging with the outer edge of the blade, said outer edge of the blade being shaped to run close to the inner surface of the casing, said blade having an extension, said extension being of a width less than the body of the blade, the outer edge of the extension merging with the outer edge of the body portion and with an inwardly-curved edge, said inwardly-curved edge merging with the hub, said outer edge of the rear extension being projected a greater distance beyond the hub than the front of the blade, as set forth.

THOMAS H. EASTWOOD.

Witnesses:
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