April 5, 1927. 1,623,868

J. FISCHER

MARINE PROPELLER

Filed March 20, 1926 2 Sheets-Sheet 1

Fig. 1.

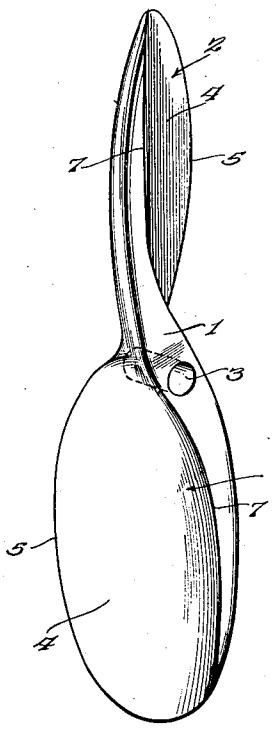


Fig. 2.

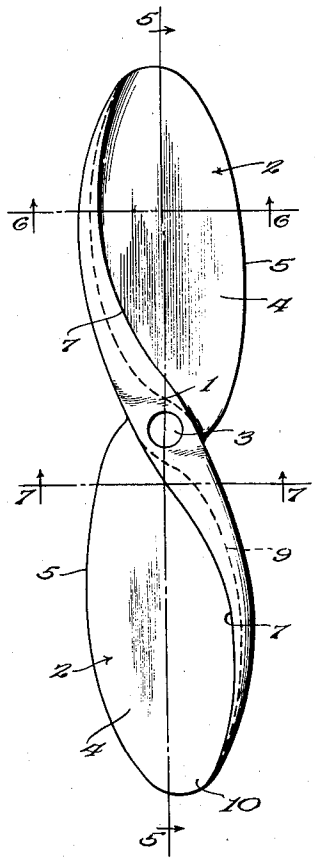
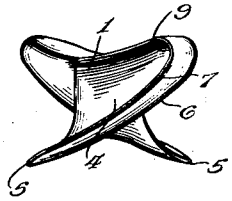


Fig. 3.



Inventor

J. Fischer

By Lacey & Lacey,

Attorneys

April 5, 1927. 1,623,868

J. FISCHER

MARINE PROPELLER

Filed March 20, 1926 2 Sheets-Sheet 2

Fig. 4.

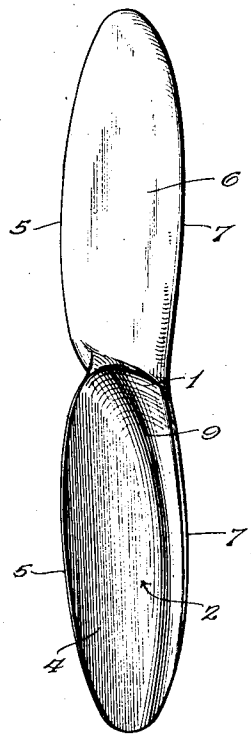


Fig. 5.

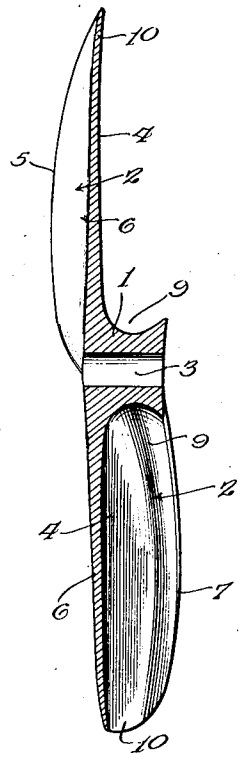


Fig. 6.

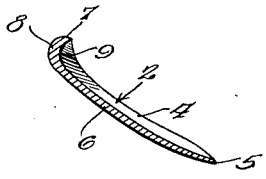
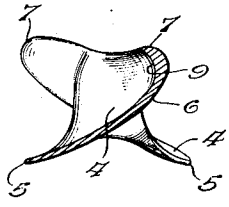


Fig. 7.



Inventor

J. Fischer

By Lacey & Lacey, Attorneys

Patented Apr. 5, 1927. 1,623,868

UNITED STATES PATENT OFFICE.

JOSEPH FISCHER, OF REDELM, SOUTH DAKOTA, ASSIGNOR TO FRED MEYER, OF REDELM, SOUTH DAKOTA.

MARINE PROPELLER.

Application filed March 20, 1926. Serial No. 96,226.

This invention relates to marine propellers of the type disclosed in my co-pending application Serial No. 53,155, filed Aug. 28, 1925, and has as its general object to provide a propeller which will possess greater efficiency than propellers of this type as ordinarily constructed.

Another object of the invention is to provide a marine propeller having the leading faces and trailing edges of its blades so formed as to so act against the body of water as to obtain a maximum propelling force in the rotation of the propeller without, however, offering such resistance to the propeller as to impose any undue strain thereon or any undue strain upon the propeller shaft.

Another object of the invention is to provide a marine propeller having its blades so constructed and formed that the blades will, in the rotation of the propeller, exert gradually increasing propelling force from their inner ends toward their outer ends, the blades being so formed as to pocket a volume of water near their inner ends, under pressure, and act upon the pocketed or trapped volume of water in a manner to produce maximum propelling force in the continued rotation of the propeller.

In the accompanying drawings:

Figure 1 is a perspective view of the propeller embodying the invention.

Figure 2 is a view in elevation of the propeller, looking at the leading sides of the blades.

Figure 3 is a lower end view of the propeller in the position shown in Figure 2.

Figure 4 is a side elevation of the propeller.

Figure 5 is a vertical sectional view through the propeller, taken substantially on the line 5—5 of Figure 2, looking in the direction indicated by the arrows.

Figure 6 is a transverse sectional view through one of the blades of the propeller, taken substantially on the line 6—6 of Figure 2, looking in the direction indicated by the arrows.

Figure 7 is a view similar to Figure 6, taken substantially on the line 7—7 of Figure 2, looking in the direction indicated by the arrows.

The propeller embodying the invention comprises a hub portion indicated by the numeral 1 and, in the embodiment illustrated in the drawings, a pair of blades 2 which radiate in opposite directions from the hub and which are of counterpart construction, although it will be understood that more than two blades may be employed. The hub portion 1 of the propeller is provided with the usual axially located opening 3 to accommodate the propeller shaft or a hub upon the shaft.

The leading faces of the blades are indicated by the numeral 4, the leading edges by the numeral 5, and the trailing faces and trailing edges respectively by the numerals 6 and 7. The leading faces 4 are transversely concave as will be observed by reference to Figures 3, 6 and 7 of the drawings, while the trailing faces 6 are transversely convex. It will likewise be observed by reference to Figures 6 and 7, that the curvature of the trailing face 6 of each blade is slightly greater than the curvature of the leading face of the blade from a point inwardly of the edge 5 to a point inwardly of the trailing edge 7, and that from this latter point the lines of curvature of the said faces of the blades are eccentric so that the blade is gradually thickened and formed with a relatively acutely curved fin 8 of greater thickness than the body of the blade and terminating in the relatively sharp trailing edge which, due to the said relatively acute curvature of the blade at this portion, is presented in the general direction of the leading edge 5 of the blade, thus providing a pocket 9 which is of greatest depth adjacent the hub portion 1 of the propeller and of gradually decreasing depth and width toward the tip portion of the respective blade, which portion is indicated by the numeral 10, the fin 8 being gradually diminished in width in order to effect the reduction in the depth and width of the said pocket, as stated, and merging at its outer end with the margin of the tip portion 10 of the respective blade. It will likewise be observed by reference to Figures 5, 6 and 7 of the drawings, that the leading faces 4 of the blades are nearly straight, in the direction of their length, on a line extending longitudinally medially of the blades and intersecting the axis of the opening 3 in the hub portion 1, as illustrated in the sectional view constituting Figure 5 of the

drawings, except that the outer portions or, in other words, the tip portions of the blades are curved slightly inwardly in the direction of their leading faces 4, as clearly shown in the said figure. At this point it will be evident, and particularly by a comparison of Figures 6 and 7 of the drawings, that the concavity of the leading faces 4 of the blades is more pronounced adjacent the hub portion 1 of the propeller and diminishes gradually in the direction of the tip portions 10 of the blades, and it will also be evident that the blades are somewhat thicker at their portions which define the pockets 9 than at their body portions, so that these pockets 9, which are designed to pocket a volume of water and so collect and deliver the same that this volume will be more effectually acted upon by the leading faces of the blades, is materially reenforced and not liable to become distorted.

It will be observed by reference to Figure 7 of the drawings, that lines touching the leading and trailing edges of each blade will intersect, the blades being diagonally oppositely positioned with respect to each other, and that the angular disposition of the blades is greater adjacent the hub portion of the propeller than adjacent the tips of the blades.

From the foregoing description of the invention it will be evident that, in the rotation of the propeller, a considerable volume of water is pocketed and compressed in the pockets 9 of the propeller blades and that the water is delivered by centrifugal force along the pockets toward their outer ends and, being under considerable pressure, will be acted upon by the leading faces of the blades in a manner to greatly enhance the propelling force exerted by the blades. At the same time, due to the gradual decrease in width and depth of the pockets in the direction of the tips of the blades, the water pocketed by the blades is not retained in such state for such period of time as to offer any considerable resistance to the rotation of the propeller, such resistance as is offered being greatly offset by the compressive force exerted by the leading faces of the blades against the volume of water which has been trapped by the pockets.

It will be observed, particularly by reference to Figures 1 and 2 of the drawings, that the leading and trailing edges of each blade are reversely curved so that each blade has approximately the marginal contour of an ellipse, the blades being of maximum breadth at a point substantially midway between their juncture with the hub portion 1 and their tip portions 10, the blades being further so formed that the trailing edge 7 of each blade merges with the outer transversely rounded trailing edge portion of the other blade, as clearly shown in Figure 2.

Having thus described the invention, what I claim is:

1. A marine propeller comprising a hub, and blades radiating therefrom, each blade having its leading and trailing faces respectively transversely concave and convex, the transverse curvature of the trailing face being greater than that of the leading face from a point inwardly of the leading edge of the blade to a point inwardly of the trailing edge thereof, the blade being provided along its trailing edge with a transversely curved fin of gradually decreasing width from its inner to its outer end and merging at its outer end with the margin of the leading face of the blade near the tip of the blade, the free margin of the fin overhanging the leading face for a major distance of its length.

2. A marine propeller comprising a hub, and blades radiating therefrom, each blade having its leading and trailing faces respectively transversely concave and convex, the transverse curvature of the trailing face being greater than that of the leading face from a point inwardly of the leading edge of the blade to a point inwardly of the trailing edge thereof, the blade being provided along its trailing edge with a transversely curved fin which has the major portion of its free margin overhanging the leading face, the inner and outer sides of which constitute continuations of the leading and trailing faces of the blade and are eccentrically curved whereby the fin is of greater thickness than the body of the blade, the curvature of the fin being such that the edge thereof is presented substantially in the general direction of the leading edge of the blade, the fin being of gradually decreasing width from its inner to its outer end and merging at its outer end with the margin of the leading face of the blade near the tip of the blade.

3. A marine propeller comprising a hub, and blades radiating therefrom in opposite directions, each blade having its leading and trailing faces respectively transversely concave and convex, the leading faces of the blades being nearly straight longitudinally and extending on a line intersecting the axis of the hub and having their outer portions deflected toward that side of the blades at which their leading faces are presented, each blade being provided along its trailing edge with a transversely curved overhanging fin, the fin being of gradually decreasing width from its inner to its outer end and merging at its outer end with the margin of the leading face of the blade near the tip of the blade and defining a pocket of gradually decreasing depth and width in the direction of the said tip of the blade.

In testimony whereof I affix my signature.

JOSEPH FISCHER. [L. S.]