M. B. MILLER.

PROPELLER.

APPLICATION FILED MAY 7, 1908.

914,857.

Patented Mar. 9, 1909.

FIG. 1

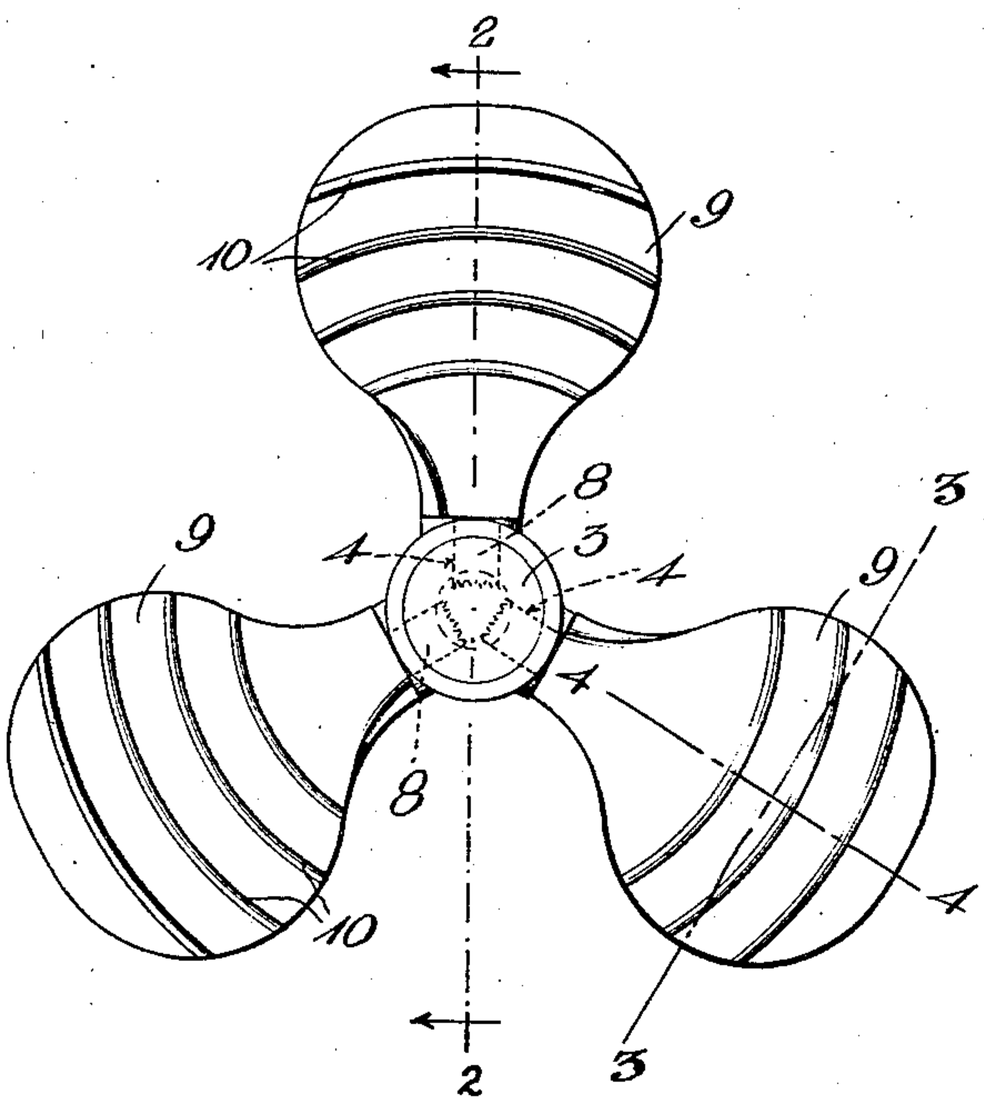


FIG. 2

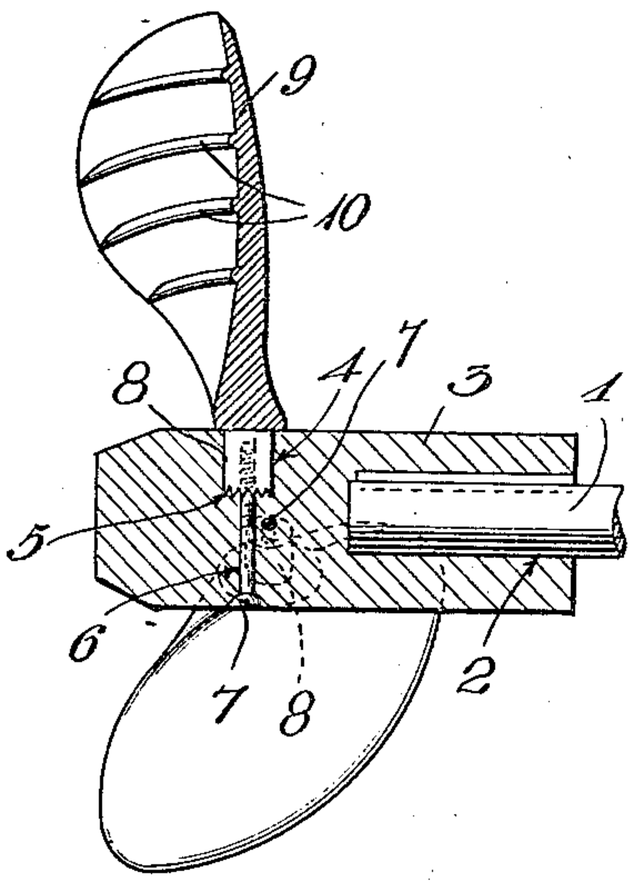


FIG. 3

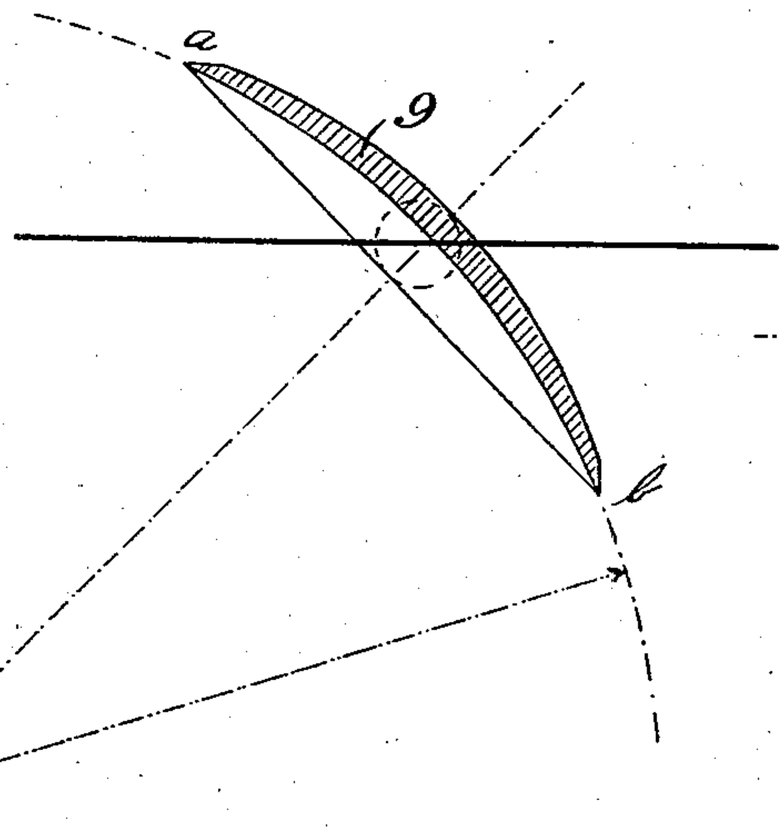
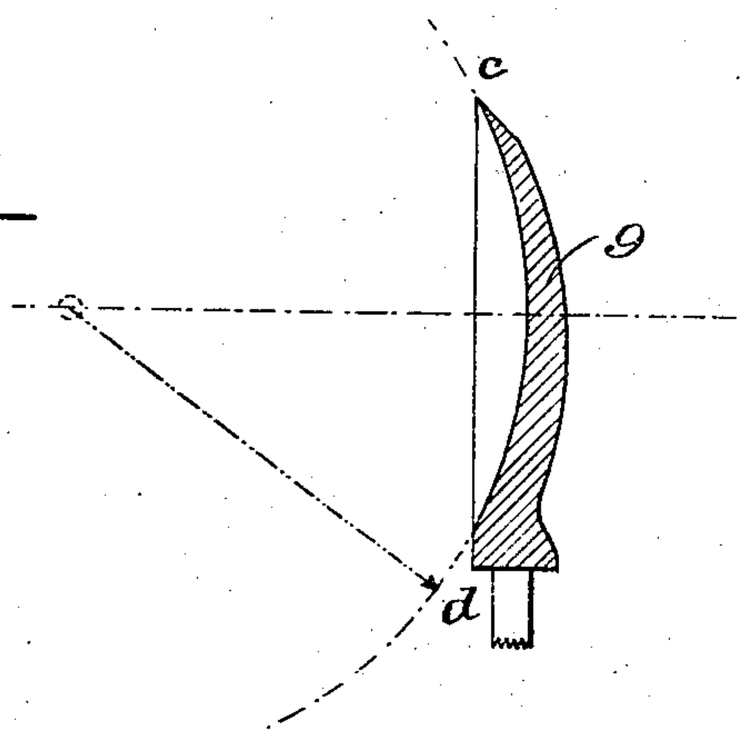


FIG. 4



Witnesses

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UNITED STATES PATENT OFFICE.

MORGAN B. MILLER, OF SAN JOSE, CALIFORNIA, ASSIGNOR OF ONE-HALF TO GEORGE W. HARVEY, OF SAN JOSE, CALIFORNIA.

PROPELLER.

No. 914,857. Specification of Letters Patent. Patented March 9, 1909.

Application filed May 7, 1908. Serial No. 431,393.

To all whom it may concern:

Be it known that I, MORGAN B. MILLER, a citizen of the United States, residing at San Jose, in the county of Santa Clara and State of California, have invented certain new and useful Improvements in Propellers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to propellers.

The object of the invention is the provision of a propeller blade which will cause the water displaced thereby to be projected in a solid stream in parallelism with the axis of the propeller.

Heretofore with many of the screw propellers in use twenty-five per cent. of the power was lost by the water passing off of the propeller blades at the top instead of at the rear edge. My invention is designed to obviate these difficulties, and broadly speaking consists in a blade whose curvature is sufficient to prevent the water from passing off the upper edge and insuring its course of travel to be from the leading to the trailing edges of the blade.

With these and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts, as will be more fully described and particularly pointed out in the appended claims.

In the drawings, Figure 1 is an elevation of a propeller, Fig. 2 is a section on the line 2—2 of Fig. 1, Fig. 3 is a diagrammatic section on the line 3—3 of Fig. 1, and Fig. 4 is a diagrammatic section of one of the blades taken on the line 4—4 of Fig. 1.

Referring more especially to the drawings, 1 represents the power shaft which enters a socket 2, formed in the propeller hub 3, and is keyed therein in any suitable or approved manner. The outer end of the hub is provided with a plurality of apertures 4, which are arranged at equal distances around the hub and each provided with a serrated bottom 5. A suitable bolt aperture 6 communicates with the aperture 4, and is adapted to receive the attaching bolt 7, which threads into the socket pin 8, of the propeller blade 9. This pin is serrated on its bottom to mesh with the serrations 5 of the socket 4.

The blades 9 which are shown here are preferably platter-shaped, that is having a major and a minor axis through their body. The major axis *a*—*b* is dished upon the arc of a circle whose radius is considerably greater than the arc of the circle upon which the body of the minor axis *c*—*d* is dished, and consequently we have a greater curvature in the blade in the direction of its minor axis than we have in the blade in the direction of its major axis. This effectually holds the water so that slipping is absolutely prevented, and the course of the water after striking the blades is directly in line with its major axis and substantially in line with the driving shaft.

In order to strengthen the propeller blade and at the same time to secure a much more positive action ribs 10, are provided which curve upon the blade in the arc of a circle concentric with the hub.

It will be noticed that by loosening the bolt 7 and raising the blades 9 slightly from their engagement with the serrated faces 5 of the sockets 4 any pitch desired may be given to them.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention as defined in the appended claims.

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

1. A propeller blade having a dished engaging face the curvature thereof being on arcs of circles and having a greater radius in a direction transverse from the propeller shaft than radially thereto.

2. In combination with a propeller shaft, of a hub secured thereto, and blades secured to said hub and having a dished engaging face the curvature thereof being on arcs of circles and having a greater radius in a direction transverse to the hub than radially thereto.

3. A propeller comprising a hub, and a plurality of blades secured thereto each having a major axis in a line transverse to the hub and a minor axis extending radially

therefrom and a dished face, the curvature of which is greater along the minor axis than along the major axis, and means for adjustably mounting the blades.

4. A propeller comprising a hub having a plurality of sockets formed therein whose bases are serrated, propeller blades having studs formed thereon for engagement with the sockets, said studs having a serrated end to engage the serrations in the base of the sockets, and means passing through the hub to engage the studs on the blades to hold the same in adjusted position.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

MORGAN B. MILLER.

Witnesses:

WESLEY PIEPER,

FRANK L. MAYHEW.