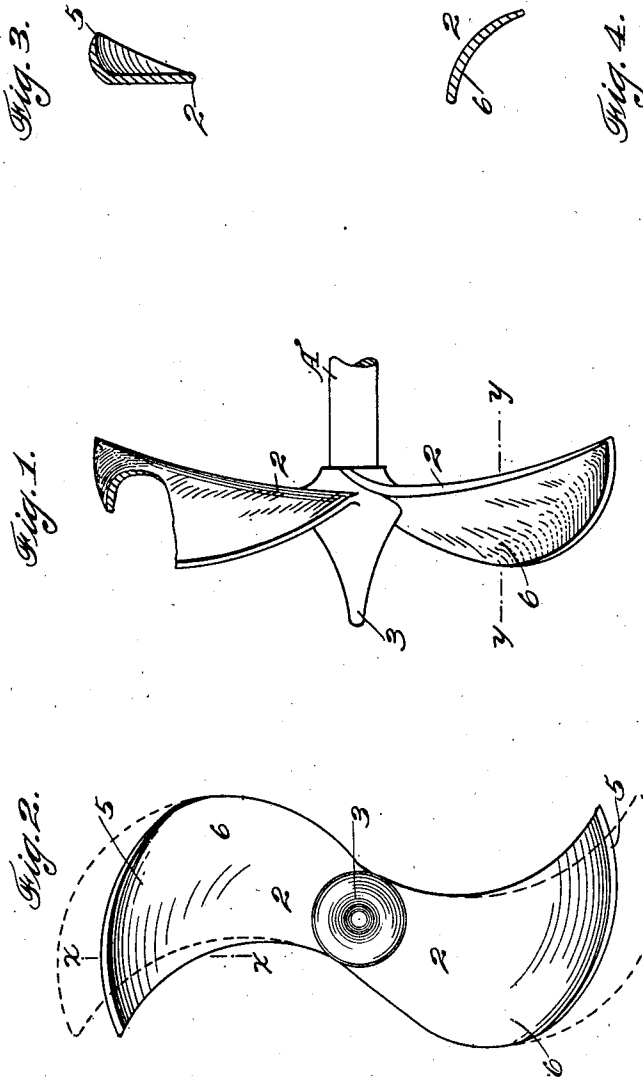


J. F. BALL.
PROPELLER.
APPLICATION FILED APR. 27, 1909.

933,013.

Patented Aug. 31, 1909.



Witnesses:

F. J. Maynard.
J. H. H. H.

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By Geo. H. Strong
his atty.

UNITED STATES PATENT OFFICE.

JOSEPH F. BALL, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-FOURTH TO CHARLES C. BILLS, ONE-FOURTH TO P. D. CUTLER, AND ONE-FOURTH TO FREDERICK W. BALL, OF SAN FRANCISCO, CALIFORNIA.

PROPELLER.

933,013.

Specification of Letters Patent.

Patented Aug. 31, 1909.

Application filed April 27, 1909. Serial No. 492,440.

To all whom it may concern:

Be it known that I, JOSEPH F. BALL, a citizen of the United States, residing in the city and county of San Francisco and State of California, have invented new and useful Improvements in Propellers, of which the following is a specification.

My invention relates to propellers.

Heretofore it has been considered a desideratum that the propeller blades should throw the water off centrifugally. I have devised a propeller with blades of peculiar design curved on geometrical lines so that the water is directed backward, more on lines parallel with the axis of the shaft, so as to get a greater push against the body of water and give additional speed to the boat.

The invention consists of the parts and the construction and combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a side elevation of the invention. Fig. 2 is a rear view. Fig. 3 is a section on X—X, Fig. 2. Fig. 4 is a section on Y—Y, Fig. 1.

In the embodiment of the invention, A represents a propeller shaft provided with two or more blades 2, and with the outer end of the shaft continued beyond the blades and tapered and concaved to form a concaved conical projection 3. These blades are set in such position to the shaft and are so fashioned as to cause a congestion of the water toward the center of the wheel, thereby creating a greater pressure on the surface of the blades, and at the same time sending or forcing the water straight back in the line of the axis of the propeller. The outer or extreme points of the blades are curved, as shown at 5, so that these curved ends lie substantially parallel to the shaft. The rear edges 6 of the blades are each curved before bending the flanges 5, in an arc of a semi-circle (see dotted lines, Fig. 2) and these rear edges are higher than the front cutting edges of the blades, since the latter are trans-

versely dished, so that this transverse dish, taken with the longitudinal dish formed by the curved ends 5, gives the appearance of a cup when the propeller is spun rapidly; and it is this cup which acts on the water and forces it backward in the form of a column substantially in the line of the shaft. By forming the conical projection 3 with the concaved sides, the void usually formed by propellers around the base of the blades is in part filled, and also the concaved sides of the part 3 form deflecting surfaces for the reactance of the water forced inwardly by these dish-shaped blades.

I claim that curved blades at the extreme points, as shown, give a better hold on the water for the blades, insuring less slip and greater speed.

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

1. A propeller having a plurality of blades with their operating surfaces transversely dished, and also with the ends of the blades curved backwardly to form flanges which are substantially parallel with the axis of the propeller, and a conical extension on the hub of the propeller beyond the blades, said conical projection having concaved sides.

2. A propeller having a plurality of blades with their operating surfaces transversely dished, and also with the ends of the blades curved backwardly to form flanges which are substantially parallel with the axis of the propeller, the blades being of such shape that if the flanges and body were opened out into the same plane the back edges of the blades would be approximately an arc of a semi-circle.

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

JOSEPH F. BALL.

Witnesses:

CHARLES A. PENFIELD,
CHARLES EDELMAN.