C. W. GRINDLE.

SCREW PROPELLER.

APPLICATION FILED AUG. 14, 1915.

1,247,263. Patented Nov. 20, 1917.

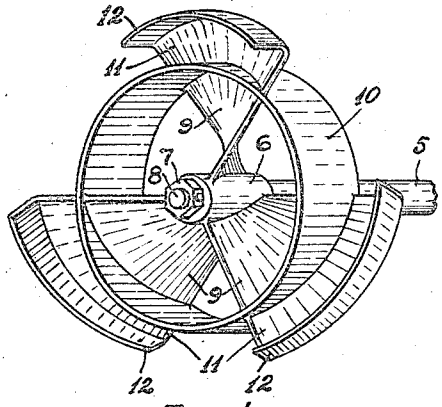


FIG. 1

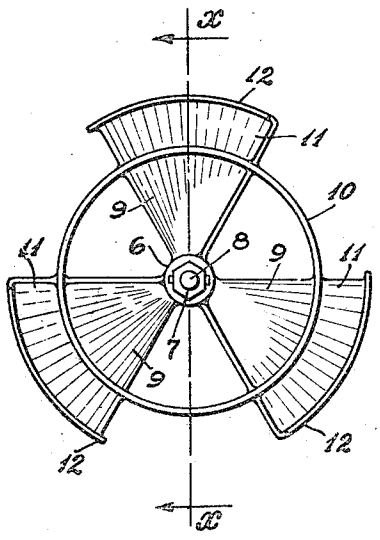


FIG. 2

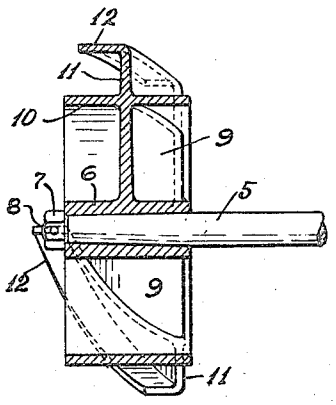


FIG. 3

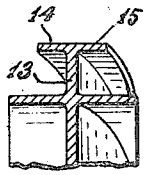


FIG. 4

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CHARLES W. GRINDLE, OF SEATTLE, WASHINGTON, ASSIGNOR OF FORTY-NINE ONE-HUNDREDTHS TO THEODORE FLAMMER, OF SEATTLE, WASHINGTON.

SCREW-PROPELLER.

1,247,263. Specification of Letters Patent. Patented Nov. 20, 1917.

Application filed August 14, 1915. Serial No. 45,470.

To all whom it may concern:

Be it known that I, CHARLES W. GRINDLE, citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented a certain new and useful Improvement in Screw-Propellers, of which the following is a specification.

My invention relates to improvements in screw-propellers for vessels and the object of my improvements is to provide a screw-propeller that shall be adapted to be securely mounted upon the outwardly projecting end portion of a vessel's propeller shaft and which shall be so formed that when submerged the energy transmitted to it through said shaft shall be almost wholly expended in forcing water to move rearwardly in lines directly parallel with the lengthwise direction of the keel of the vessel and in forcing the vessel to move forward in a desired course, while little of such energy shall be uselessly spent in forcing water in sidewise directions at right angles to the lengthwise direction of said keel.

I accomplish this object by devices illustrated in the accompanying drawings wherein Figure 1 is a perspective view of a propeller wheel embodying one form of my invention as it appears mounted on a propeller shaft; Fig. 2 is a view in end elevation of the same; Fig. 3 is a view of the same in vertical mid-section on broken line x, x of Fig. 2; and Fig. 4 is a fragmentary view in radial section of a modified form of a detail of the same.

Referring to the drawings, throughout which like reference numerals indicate like parts, 5 indicates the rear end portion of a vessel's rotatable propeller shaft upon which is fastened, in a well known manner, the hub 6 of a propeller by means of a nut 7 which is screwed on to the screw-threaded end 8 of the end portion of said shaft 5 to engage with the outer end surface of said hub 6 to force said hub on to the tapered portion of said shaft 5 as more clearly shown in Fig. 3.

Integral with the hub 6 are three symmetrical propeller blades 9 disposed each to radiate therefrom in the form of a spiral web of gradually increasing width, which blades 9 are equi-distant one from another and which extend to and are integrally united with a wide circular band 10 which is concentrically disposed with respect to the shaft 5 to encircle said blades 9 and the hub 6 as shown more clearly in Fig. 1.

Extending radially from the periphery of the band 10 are three auxiliary propeller blades 11 which are integral with said band 10 and which are disposed thereon in spiral lines that are equi-distant one from another.

The outer end portion of each of the auxiliary blades 11 is provided with a diagonally arranged flange, as flanges 12, which flanges 12 serve to prevent water (which is being acted upon by said auxiliary blades 11 as they revolve) from being forced sidewise in a direction at right angles to the lengthwise direction of the shaft 5; and in like manner the band 10 serves to force all the water which is acted upon by the blades 9 to move in a direct rearward direction, thus, no considerable portion of the energy exerted through the medium of the revolving blades 9 and 11 is wasted by uselessly moving water in sidewise directions, but all of such energy, less the portion that is lost by friction, is expended in driving the vessel forward and in forcing water to move directly rearward.

In Fig. 1 I have shown the blades 11 as being provided on their outer end portions with a flange 12 which projects from one side only, but in Fig. 4, I have shown a fragment of a propeller, by a view in radial section, wherein a blade 13, which corresponds to a blade 11 of Fig. 1, is provided with flanges 14 and 15 each of which project from a different side of the blade 13, thus to adapt the propeller to be revolved in either direction with like efficient results; but in general practice the propeller of Fig. 1 may be preferable since a vessel is seldom required to move in a backward direction, whereby there would be but little energy wasted.

What I claim is:

A screw propeller comprising in combination a hub, a plurality of spaced symmetrical blades radiating from said hub, said blades each being in the form of a spiral web of gradually increasing width, a wide circular band united to the wide outer edges of said blades, said band being of a single width throughout substantially equal to the length of said hub and arranged concentric therewith, an auxiliary blade coincident with each of the first-named blades

and united to the outer face of said band, each auxiliary blade being also in the form of a spiral web of gradually increasing width, and a flange united to the outer edge of each auxiliary blade, said flanges being concentric with said band and arranged diagonally thereof.

In witness whereof I hereunto subscribe my name this 28th day of July, A. D. 1915.

CHARLES W. GRINDLE.

Witnesses:
FRANK WARREN,
O. JOHNSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."