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W. I. MILLER

1,814,175

PROPELLER

Filed Nov. 28, 1928

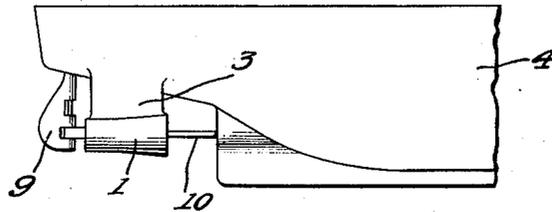


FIG. 1

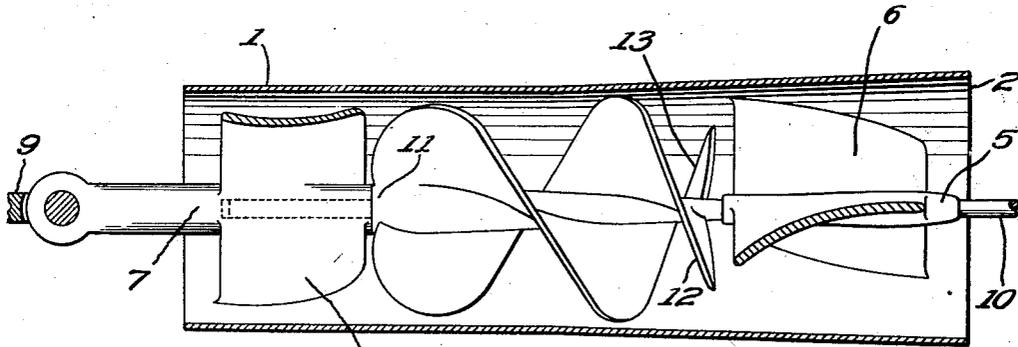


FIG. 2

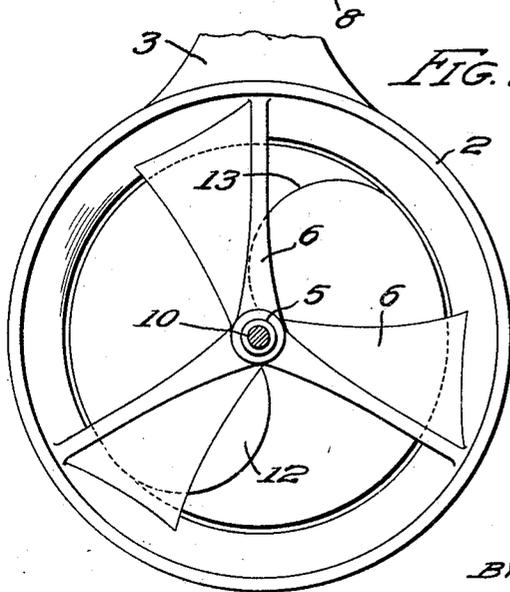


FIG. 3

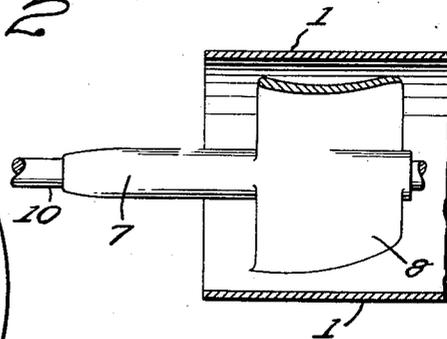


FIG. 4

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PROPELLER

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This invention relates to improvements in propellers and more particularly to propellers for boats and marine vessels. One object is to provide a propeller that will provide greater thrust and speed for the volume of water delivered per revolution. A further object is to provide a propeller wherein the centrifugal force is broken or converted into a longitudinal thrust thus materially increasing the speed of the vehicle propelled.

A further object is to provide a propeller wherein the normal impact of the head waters against the propeller is broken or diminished and the discharge water coming therefrom is "straightened out" or deprived of its whirl or lateral thrust before it is released.

With the foregoing and other objects in view the invention consists in the combination and arrangement of parts to be hereinafter fully described, pointed out in the claims and illustrated in the accompanying drawings which form a part of this application for patent and in which—

Fig. 1 is a view of the propeller applied to the stern of a boat or vessel.

Fig. 2 is an enlarged longitudinal sectional view through the propeller.

Fig. 3 is a front end view of the propeller including a portion of the support therefor.

Fig. 4 is a fragmentary view of a slightly modified form of support and guide used when the propeller is driven from the rear.

Like reference characters denote corresponding parts throughout the several views.

The propeller comprises a tubular housing provided in its interior and at the ends thereof with support guides between which the rotary blade, or blades, is supported upon a shaft received for rotation in the said guides which serve as bearings therefor, the forward support guide having blades so curved as to break the impact of the head waters against the blade and the rear support guide having blades reversely curved with relation thereto to break the whirl and lateral thrust of the water as it is discharged from the blade.

Two or more blades of graduated helicoid

type that completely encircle a tapered shaft are provided. These blades, which may be either right or left hand, are both of identical diameter at any point. The reference numeral 1 denotes the tubular housing which tapers gradually from its relatively large forward end 2 and is supported by the web 3 at the rear end of the vessel 4. Spaced inwardly from the forward end of the housing is a stationary forward guide support comprising the boss 5 for the wings 6 which may be three, more or less, in number, said wings being secured to the wall of the housing. Spaced inwardly from the rear or contracted end of the housing in like manner is the rear guide support comprising the sleeve 7 for the wings 8 which are similar in number to the wings 6 but are reversely curved with respect thereto, said wings 8 being likewise secured to the wall of the housing. The sleeve 7 extends beyond the rear end of the housing and serves as a support for the rudder 9, except in the case of side propellers and in this case the sleeve 7 has the propeller shaft 10 extending entirely therethrough, this shaft being driven either from the front or rear depending upon the location of the propeller relative to the bow or stern of the vessel.

The propeller shaft 10 extends through the boss 5 and into the sleeve 7 in the form shown in Fig. 2 and is operatively supported in said members, said shaft having fast thereto the tapered hub 11 of the blades 12, 13, said hub 11 being of smaller diameter at its forward than at its rearward end, the ends of said blades being spaced from the boss and sleeve 5, 7. The blades are disposed substantially at right angles to their hub and shaft at their ends and therefrom they are coiled or curved, the curvature depending upon the speed desired, the load, etc. The diameter of the blades is less at their ends than at points in their intermediate portions. The several wings 6 of the forward guide support are, at their forward ends parallel to the boss and shaft 5, 10 and as they recede are curved gently in the direction of rotation of the blades 12, 13 while the wings 8 are curved in the opposite direction.

The water received in the forward end of the housing is guided or directed by the wings 6 against the forward end of the blades 12, 13. The same amount of water received at the forward end of the housing is, of course, delivered from the rear or contracted end thereof but due to the relatively smaller size of the rear end the water is delivered at a materially greater speed than it is received. The taper of the hub 11 and the slant of the propeller blades relative thereto tends to speed up the flow of water through the housing. The blades 12, 13 at the forward end of the hub are disposed at an angle something less than a right angle but as they recede their slant increases and their angle with the hub diminishes. The water thrown by centrifugal force against the wall of the housing is thrust rearwardly substantially parallel to the shaft 10 and its whirl is further arrested and straightened out by the action of the guide support wings 8 which are curved in a direction opposite to the rotation of the blades 12, 13. The relative speed with which the water is thrust outwardly from the contracted end of the housing materially increases the speed at which the vehicle is driven.

What is claimed is:—

1. In a propeller, a rotary shaft, blades fast thereupon, a tubular tapered housing receiving said blades, a stationary support guide arranged in said housing in advance of said blades and receiving said shaft, and a stationary support guide at the rear of said blades arranged in said housing and receiving said shaft.
2. In a propeller, a rotary shaft, blades fast thereupon, a tubular tapered housing receiving said blades, a stationary support guide arranged in said housing in advance of said blades and receiving said shaft, said support guide comprising wings curved in a common direction, and a stationary support guide at the rear of said blades arranged in said housing and receiving said shaft, said support guide comprising wings curved in a direction opposite to that of the first named wings.
3. In a propeller, a rotary shaft, blades fast thereupon, a tubular tapered housing enclosing said blades, a stationary support guide in said housing in advance of said blades and comprising portions curved in the direction of rotation of said blades, said support guide receiving said rotary shaft, and a second support guide in said housing at the rear of said blades and comprising portions curved in a direction opposite to the rotation of said blades.
4. In a propeller, a rotary shaft, blades fast thereupon, a tubular tapered housing enclosing said blades, a tapered hub common to said blades, the taper thereof being reverse to that of said housing, a stationary support guide at one end of said blades comprising

portions curved in the direction of rotation of said blades, and a second support guide at the rear of said blades comprising portions curved reversely to the first support guide.

5. In a propeller, a rotary shaft, graduated helicoid blades fast thereupon, a tapered tubular housing enclosing said blades, means within said housing immediately in advance of said blades for breaking the impact there against of the incoming water, and means at the rear of said blades within said housing for straightening out the discharge water from said blades.

In testimony that I claim the foregoing as my own I have hereto affixed my signature.

WILLMAN I. MILLER.