(No Model.)

G. TOLIVER.

PROPELLER FOR VESSELS.

No. 451,086. Patented Apr. 28, 1891.

Fig. 1.

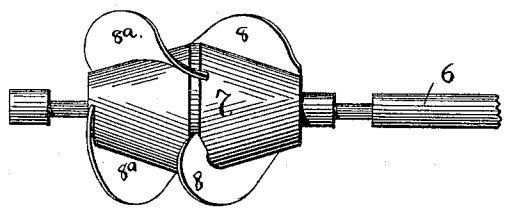


Fig. 2.

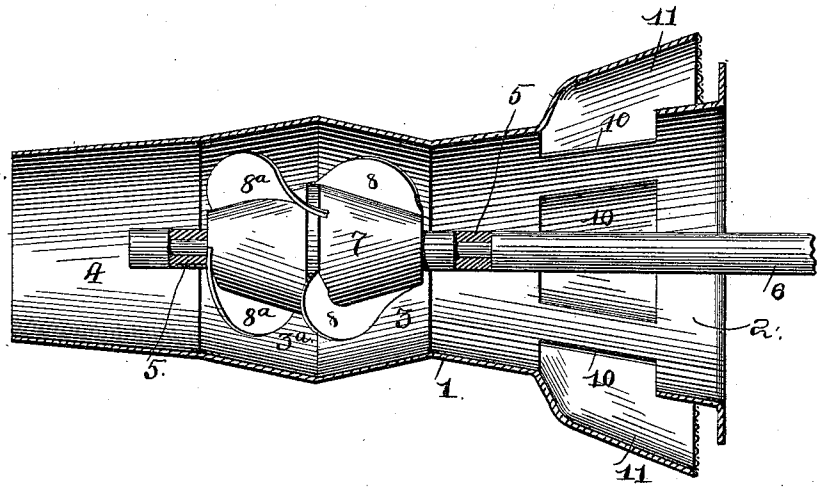
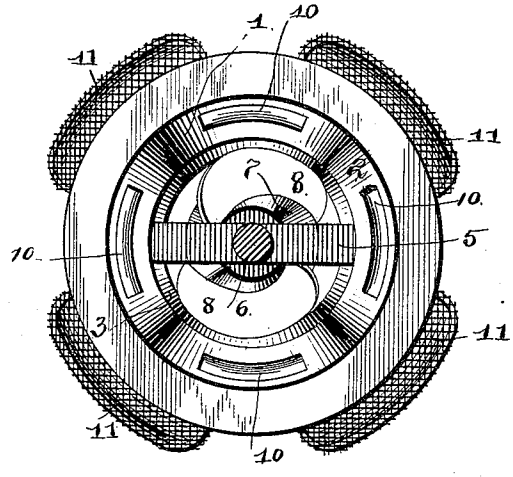


Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

GEORGE TOLIVER, OF PHILADELPHIA, PENNSYLVANIA.

PROPELLER FOR VESSELS.

SPECIFICATION forming part of Letters Patent No. 451,086, dated April 28, 1891.

Application filed August 25, 1890. Serial No. 362,977. (No model.)

To all whom it may concern:

Be it known that I, GEORGE TOLIVER, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Propeller for Vessels, of which the following is a specification.

This invention relates to propellers for vessels; and it has for its object to construct a device of this class which shall be simple, durable, and efficient, and by means of which the motive power shall be fully utilized in forcing the vessel to which the invention is applied through the water, thereby gaining speed and economizing power.

The invention consists in the improved construction, arrangement, and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings hereto annexed, Figure 1 is a side view of a screw-propeller constructed in accordance with my invention. Fig. 2 is a longitudinal sectional view showing the propeller mounted in the casing, which forms a part of the invention. Fig. 3 is a front view of the casing with the propeller in position therein.

Like numerals of reference indicate like parts in all the figures.

The casing, which is designated by 1, is composed of the flaring or funnel-shaped front portion or compartment 2, the double conical central compartment 3 3^a, and the approximately cylindrical or slightly rearwardly-tapering rear compartment 4.

The casing 1 is provided with interior cross-braces 5, affording bearings for the longitudinal shaft 6, carrying a double-frustum-shaped hub or core 7, which may be either solid or hollow, and upon the outer side of which the spiral flanges or propeller-blades 8 and 8^a are mounted. The front propeller-blades extend from the front end of the hub in an upward and rearward direction and are extended slightly beyond the central line of the hub, so as to throw the water in an upward and rearward direction beyond said central line. The rear spiral flanges are likewise extended beyond the central line of the hub, and from thence downward and rearward to the rear end of the hub. The rear flanges, owing to the described construction, are necessarily arranged intermediately between or breaking joints with the front spirals. The said rear spirals will consequently intercept the volume of water forced upwardly and rearwardly by the front spirals and propel it forcibly in a downward and rearward direction within the casing. The two sets of spirals will thus act against the water two separate and distinct times, and the water, in being forced out of the casing, gives to the latter an impetus in the forward direction which further assists in the propulsion of the vessel to which the device is attached.

The front compartment 2 of the casing is provided with side openings 10, which are covered by the chutes 11, having open front ends over which guards of wire-netting or other suitable material are secured for the purpose of preventing obstructions—such as wreckage and the like—from entering the casing.

The operation of my invention will be readily understood from the foregoing description, taken in connection with the drawings hereto annexed. The casing containing my improved propeller may be secured in any desirable position with relation to the vessel which is to be propelled, provided only that the casing is entirely submerged.

Power may be transmitted in any suitable manner from the driving machinery to the shaft 6, carrying the propeller, which is rotated in the proper direction, thus causing a heavy volume of water to be constantly forced through the casing and the vessel to be driven in a forward direction.

My improved propeller practically has three distinct actions against the water, as above set forth, and it will be found to be exceedingly powerful as a propeller and economical in the expenditure of motive power.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a screw-propeller, the combination, with a double-frustum-shaped hub, of the spiral flanges arranged upon the front and rear ends, respectively, of said hub and overlapping the central line of the latter, substantially as set forth.

2. In a screw-propeller, the combination, with a double-frustum-shaped hub, of two

sets of spiral flanges arranged, respectively, upon the front and rear ends of said hub and breaking joints with each other, substantially as set forth.

3. The combination of the casing having the flaring or funnel-shaped front compartment, the double conical central compartment, and the approximately cylindrical or rearward-tapering rear compartment, the transverse braces arranged within said casing, the shaft journaled in said braces, and the double-frustum-shaped hub mounted on said shaft and having two sets of spiral flanges arranged, respectively, upon its front and rear ends and overlapping the central line, substantially as set forth.

4. The herein-described casing having the flaring or funnel-shaped front compartment provided with side openings, the chutes arranged over said side openings, and the wire guards, in combination with the shaft journaled in said casing, and the double-frustum-shaped hub mounted upon said shaft and having two sets of spiral flanges arranged, respectively, upon its front and rear ends and overlapping the central line of said hub, substantially as set forth.

5. As an improvement in screw-propellers, the combination, with a casing having a funnel-shaped front end and a double conical middle compartment, said front compartment being provided with side openings having diverging chutes, of a shaft arranged longitudinally in said casing, a double-frustum-shaped hub mounted on said shaft, and spiral blades or flanges arranged upon the front and rear ends, respectively, of said hub, extending beyond the central line of the latter, and breaking joints with each other, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

GEORGE TOLIVER.

Witnesses:
ABEL P. CALDWELL,
JAMES STANFORD.