No. 692,117. Patented Jan. 28, 1902.

I. McK. CHASE.

MARINE PROPULSION.

(Application filed Jan. 29, 1896.)

(Model.) 2 Sheets—Sheet 1.

Fig. 1.

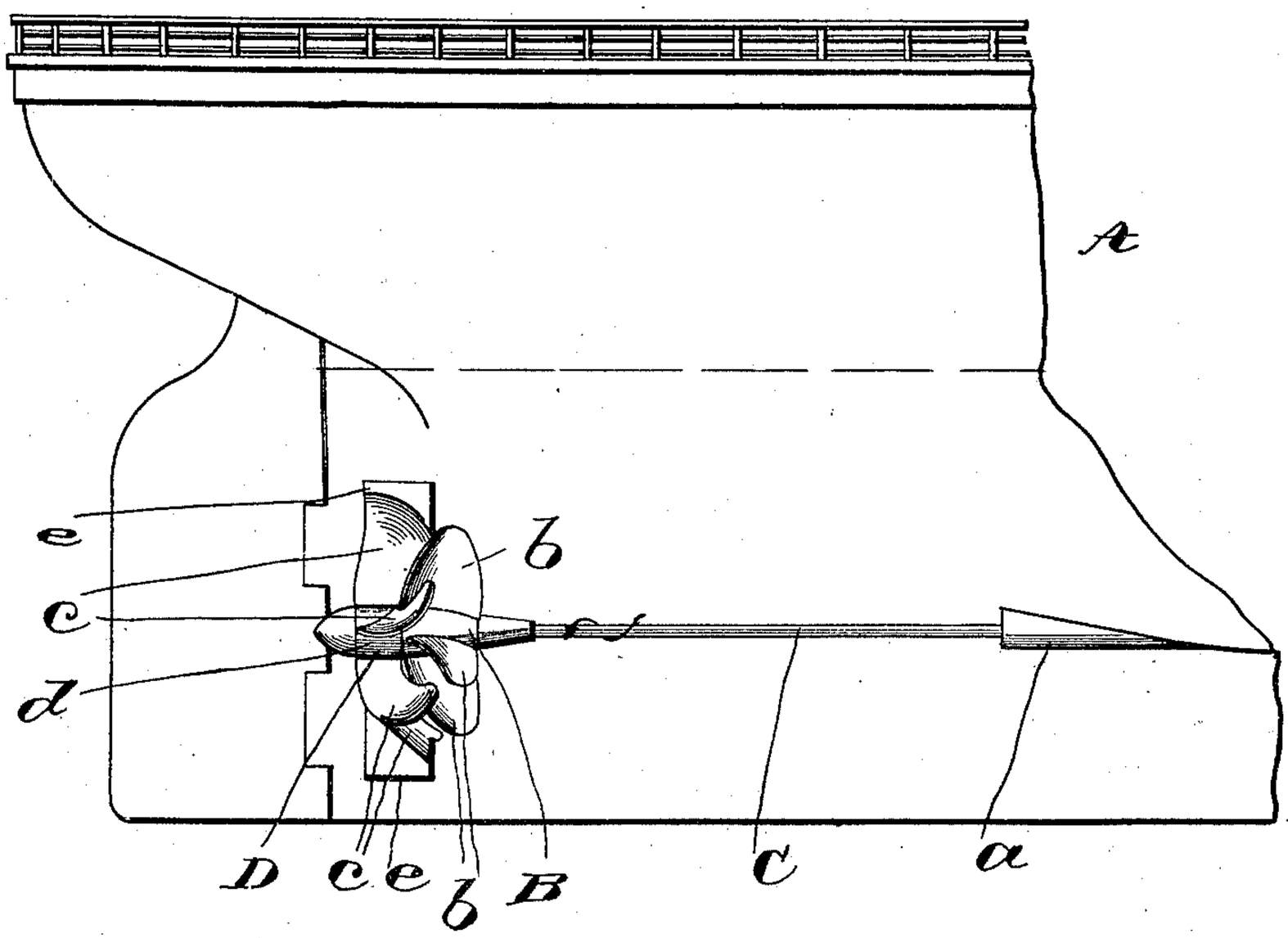
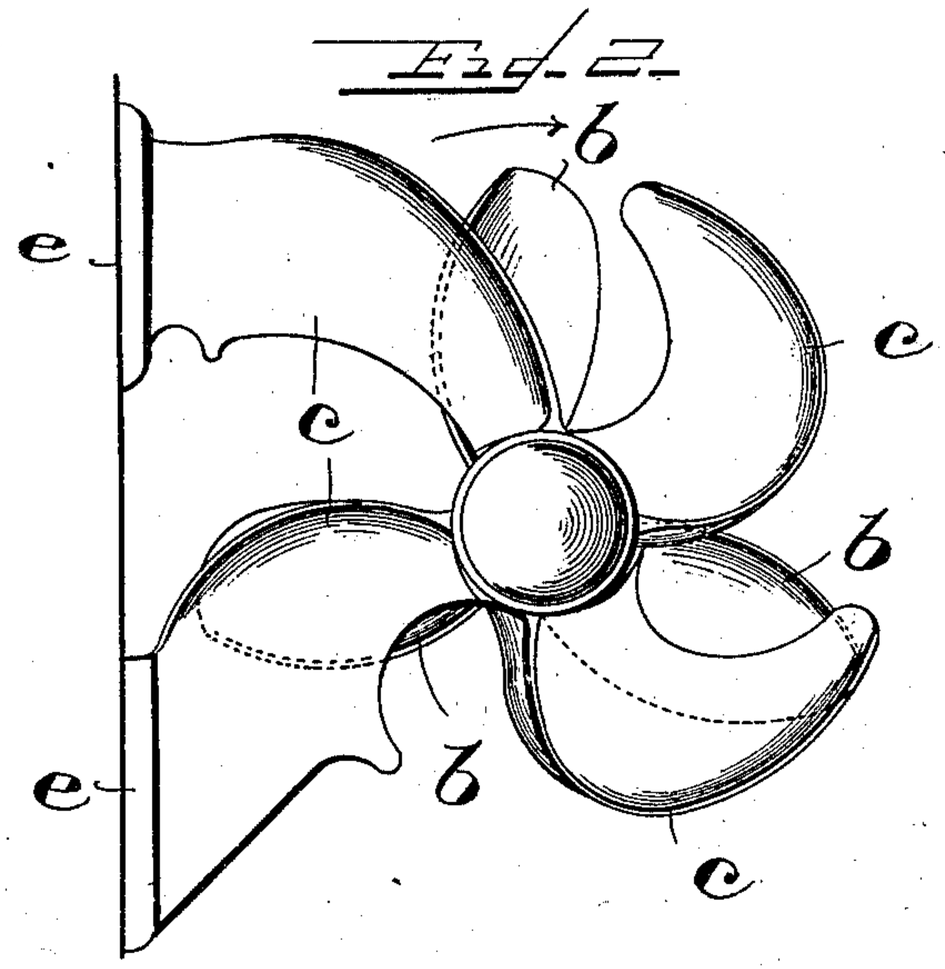


Fig. 2.



Witnesses.

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Fig. 3.

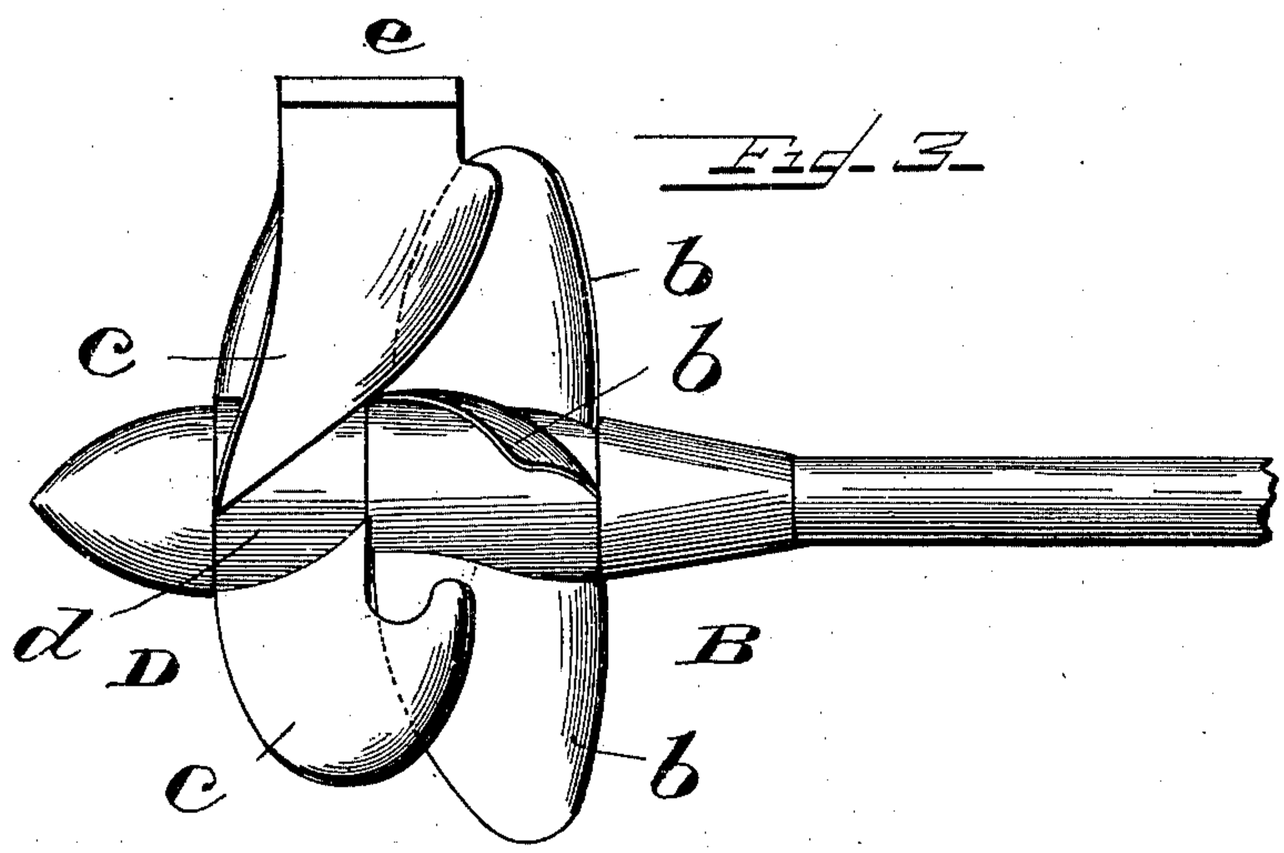


Fig. 4.

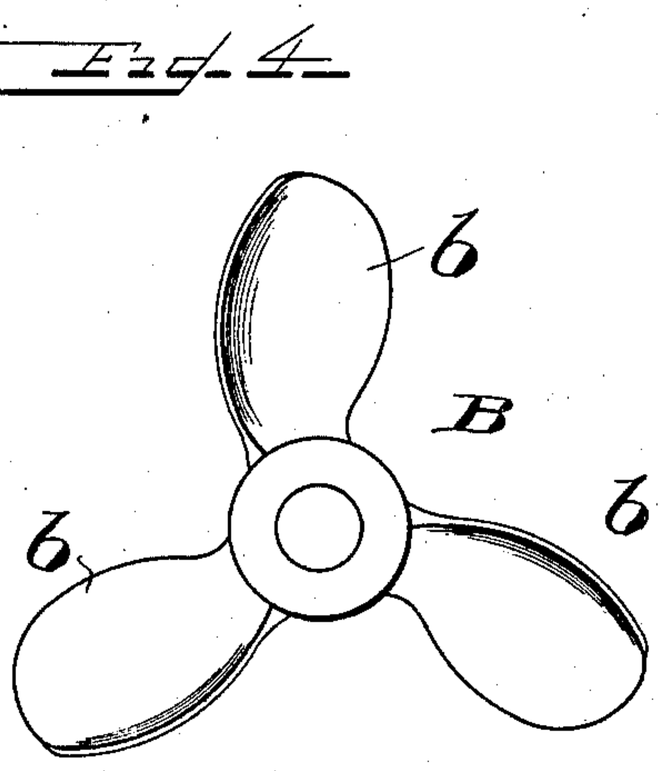
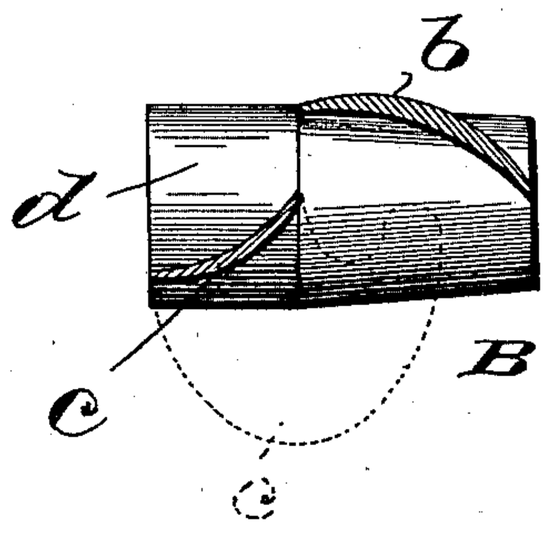


Fig. 5.



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UNITED STATES PATENT OFFICE.

ISAAC McKIM CHASE, OF WASHINGTON, DISTRICT OF COLUMBIA.

MARINE PROPULSION.

SPECIFICATION forming part of Letters Patent No. 692,117, dated January 28, 1902.

Application filed January 29, 1896. Serial No. 577,227. (Model.)

To all whom it may concern:

Be it known that I, ISAAC MCKIM CHASE, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Marine Propulsion; and I do hereby 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 present invention relates to the propulsion of marine vessels, has especial reference to screw-propellers, with the object of utilizing the energy of the water displaced by the screw, and consists in certain improvements in construction, which will be fully disclosed in the following specification and claims.

In the accompanying drawings, which form part of this specification, Figure 1 represents a side elevation of my invention applied to a vessel; Fig. 2, a rear end view of the invention detached from the vessel and on an enlarged scale; Fig. 3, a top plan view of the same; Fig. 4, a rear end view of the propeller detached, and Fig. 5 a transverse longitudinal section through one blade of the propeller and one of the guide-blades of the bracket.

A submerged screw-propeller when revolving always discharges the water upon which it operates with a more or less rotary motion and frequently with considerable velocity. This motion represents a percentage of the energy which the engine has developed in giving the propeller motion, and in the prevailing practice this energy is allowed to go to waste in the course of the water regaining its normal condition. Several expedients have been proposed to recover the energy contained in the water discharged by a screw-propeller and to utilize it to augment the thrust. The most promising of these are guide-blades placed aft or behind a screw and upon which the water impinges when leaving the screw. It has been proposed to apply a number of radiating blades set some distance aft of the screw and so formed as to receive the obliquely-moving streams of water flowing from the screw and turn them directly astern. It has also been proposed to use a guide-blade in the form of a twisted rudder, the part above the screw curved in one direction and the part below in the opposite direction. One of the most successful applications of the guide-blade principle is in a device which consists of a cylinder secured to the vessel. Within the cylinder is a body or boss of such shape that the channel is gradually contracted from the forward to the after end. Within the forward part of the cylinder there are revolving screw-blades attached to the forward part of the boss and is separate from the after part. Aft of the revolving blades are numerous guide-blades of contrary or opposite curvature, which are fixed to the rearward portion of the boss and to the cylinder. The screw is made unusually long, which produces considerable rotary motion in the discharged water; but in neither of these constructions has the water displaced by the screw been directed immediately against the guide-blades in such manner as to obtain the energy of the water in imparting thrust to the vessel. While guide-blades are of undoubted utility when properly applied, they have not been extensively used, owing to difficulties encountered in their practical application.

The device hereinafter described is designed to overcome the difficulties heretofore found to exist in the application of guide-blades to a screw-propeller and augment the efficiency of the propelling apparatus, especially in its application to twin-screw vessels.

To accomplish the object of this invention, the bracket-bearing for the propeller-shaft is placed aft of the screw and is provided with guide-blades, which constitute a part of the bracket and which are so arranged with relation to the screw that they overhang or overlap and envelop or surround the blades of the screw to about the longitudinal median line of the propeller and aft of said line. The guide-blades may, however, be continued to any desired extent beyond said median line if found expedient to do so, and the guide-blades are so curved as to receive the water displaced by the blades of the screw directly upon their concave surfaces, arrest the motion of the water discharged, restore the water to its normal condition, and utilize the energy contained in the water to increase the speed of the vessel. Several advantages are secured by this construction and arrangement of the bracket—the weight is reduced

to a minimum, the supply of water to the screw is unobstructed, and the screw is thereby able to operate upon a greater quantity of water than it could with the bracket forward of the screw, as in the prevailing practice of applying the bracket to twin screws. The effectiveness of a marine propeller depends in a great measure upon the quantity or solidity of water it receives. Therefore any object that will be an obstruction to the free flow of water to a propeller will cause a diminution in its efficiency.

Reference being had to the drawings and the letters thereon, A indicates a marine vessel, and B a screw-propeller of any approved form; C, the propeller-shaft, which is supported at its forward end in a suitable bearing *a* and at its after end in a bracket D. The pitch and curvature of the blades *b* of the screw may be varied to suit circumstances.

The bracket D is provided with guide-blades *c* of a diameter substantially equal to the diameter of the screw and which project forward beyond the face of the hub *d* of the bracket, overhang or overlap, and envelop or surround the propeller to the longitudinal median line thereof, as shown in Figs. 1 and 3, and the guide-blades are preferably of a pitch and curvature approximating those of the blades of the screw, but set in a direction opposite thereto, so that the water displaced by the blades *b* of the screw (and to which a more or less rotary motion has been imparted) impinges directly upon the blades *c* of the bracket D, imparting the energy contained in the water to the blades of the bracket and thrust to the vessel and also arresting the rotary motion of the water and restoring it to its normal condition. In the construction shown two of the guide-blades *c* are free and two of them are provided with a flange or foot *e*, by which to secure the bracket to the vessel by suitable bolts, this number being adopted to prevent vibration of the guide-blades and to arrest the rotary motion of the water speedily. Fig. 1 of the drawings shows one side of the stern of a twin-screw vessel with the bracket D in its relative position to the screw B; but the guide-blades may be applied to a single screw by supporting a bracket on the end of the keel of the vessel or upon the stern.

Having thus fully described my invention, what I claim is—

1. A screw-propeller, in combination with fixed guide-blades aft of, overhanging, and extending forward to a point within the length of the screw.

2. A screw-propeller, in combination with fixed guide-blades aft of, surrounding, extending forward and terminating at approximately the longitudinal center of the screw.

3. A screw-propeller, in combination with fixed guide-blades aft of the screw and having a pitch and a curve from the root to the tip of the blade approximating the pitch and curve of the screw.

4. A screw-propeller, in combination with fixed guide-blades aft of, overhanging the screw and approximating the diameter of the screw.

5. A screw-propeller, in combination with a bracket provided with guide-blades, aft of the screw and supporting one end of its shaft.

6. A screw-propeller, in combination with a bracket provided with guide-blades having a pitch approximating the pitch of the screw, aft of and supporting the screw.

7. A screw-propeller, in combination with a bracket provided with guide-blades having transversely-curved or oblique outer surfaces, aft of and adjacent to the screw.

8. A screw-propeller in combination with a bracket provided with guide-blades which surround the screw aft of its longitudinal center.

In testimony whereof I affix my signature in presence of two witnesses.

ISAAC MCKIM CHASE.

Witnesses:
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D. WEIMER REINOHL.