

(No Model.)

F. TAFF.

PROPELLING MECHANISM FOR VESSELS.

No. 510,725.

Patented Dec. 12, 1893.

Fig 1

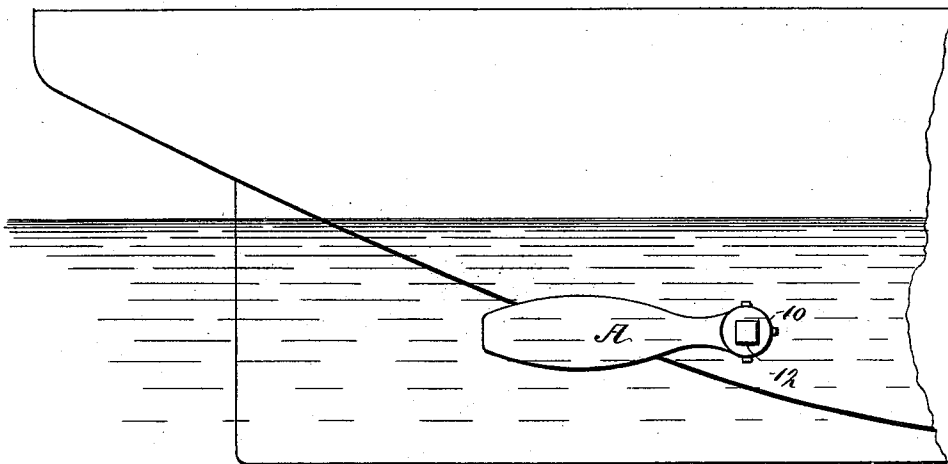


Fig 2

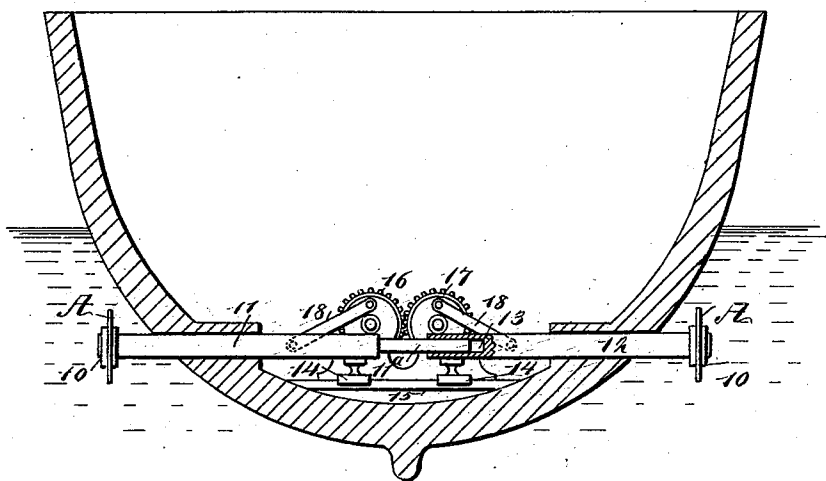
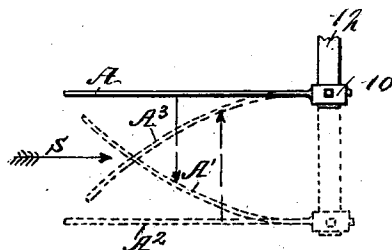


Fig 3



WITNESSES:

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UNITED STATES PATENT OFFICE.

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PROPELLING MECHANISM FOR VESSELS.

SPECIFICATION forming part of Letters Patent No. 510,725, dated December 12, 1893.

Application filed April 7, 1893. Serial No. 469,430. (No model.)

To all whom it may concern:

Be it known that I, FRANK TAFF, of Whitestone, in the county of Queens and State of New York, have invented a new and Improved Propelling Mechanism for Vessels, of which the following is a full, clear, and exact description.

My invention relates to that class of propellers for vessels which, following the analogy of a fish's tail, seeks to accomplish the same result by an oscillating blade or fin which is made flexible or elastic in its length, so as to bend laterally when oscillated about a center. The difficulty has been that any such blade or fin which is hung to oscillate about a vertical axis involves a backward drag on the vessel just in proportion to the radial swing of the blade which in departing from a straight longitudinal line must necessarily also move forward, involving a backward drag, and this backward drag so largely nullifies or neutralizes the sculling effect of the rear edge as to give this form of propeller but little practical value.

My invention avoids this backward drag by doing away altogether with the pivotal or oscillating movement of the flexible fin or blade, and arranging it to move bodily or integrally so that the front part of the fin or blade moves laterally just as far as the rear part does, and with a reciprocating motion at right angles to its plane. This avoids the backward drag incidental to the radial swing, and causes the reactionary effect to be resolved wholly into a forward movement as will be fully described hereinafter.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the stern of a vessel, illustrating the application of the improved propeller. Fig. 2 is a transverse section through the hull, illustrating the propellers in rear elevation and the mechanism for driving them; and Fig. 3 is a plan view of one of the propellers the said figure also illustrating the action thereof.

In carrying out the invention the propeller consists of a plate A, constructed of steel or other elastic material, the blade being made

of such thickness that it will flex sidewise. The shape of the blade is approximately that of a fish tail, or that of the blade of an oar, and at the end of the blade adapted for connection with the vessel a hub 10, is produced, in any suitable or approved manner. Each blade is adapted for connection with an independent shaft; therefore, two shafts are employed, designated respectively as 11 and 12. The shafts are located in the hull of the vessel, and extend outwardly through suitably packed openings in the sides of the hull. The two shafts are arranged end to end and have end movement. The shaft 12 is provided at its inner end with a socket or bore 13, into which the inner end of the shaft 11 enters and slides, the said inner end of the shaft 11 being reduced in diameter and made to conform to the cross sectional shape of the socket of the shaft 12. The reduced portion of the shaft 11, is designated in the drawings as 11^a. Thus one shaft serves in a measure to guide the other, and by thus coupling the shafts they are kept in proper alignment. As a further guide for the shafts each one is provided with a shoe 14, located near its inner end, and the said shoes travel upon a track or slide-way 15, or the equivalent thereof, located transversely in the bottom of the hull across the keel thereof. The propelling blades A, are secured at their hubs to the outer extremities of the shafts 11 and 12, the blades extending rearward in direction of the stern parallel with the keel. The shafts are adapted to move simultaneously outward and inward, and any approved form of driving mechanism may be employed for that purpose. In the drawings the mechanism used consists of two meshing gears 16 and 17, one of which is attached to a driving shaft, and each gear has connected with it a pitman 18, a pitman being connected likewise one with each shaft.

Referring now to Fig. 3, when the shaft is forced outwardly, as shown, in dotted lines, the flexible blade or fin A, curves during this stroke to the position A', and at the end of the stroke straightens out by its elasticity to the right angular position A² and during both the outward integral movement of the blade, and its reactionary spring movement in straightening, the resultant line of pressure is forward as shown by the arrow S. Then

when the shaft is drawn in, the blade from its normal straight position A^2 comes to the position A^3 and then straightens out to the position A again, and in both this inwardly integral movement and the reactionary spring movement in straightening, the resultant line of pressure is still in a forward direction as shown by the arrow S . In both strokes then it will be perceived that the curving and deflection of the blade, or its departure from the right angular position only takes place within the limits of the two positions A and A^2 which are parallel to the longitudinal axis of the vessel, so that the entire effect of the blade is expended in a forward direction without any such backward drag as a pivotal and oscillating swing would involve.

By causing the two blades on opposite sides of the vessel to move oppositely by reason of the gears 16 and 17 their lateral thrust on the vessel is neutralized and all jarring or trembling of the vessel is avoided.

It will be understood that the improved propelling mechanism may be used of itself to propel a vessel, or it may be employed as an auxiliary to the usual screw propeller or propellers, and the peculiar movement of the blades serves to force a vessel through the water steadily and speedily. As the side propellers are placed near the bottom of the hull, they will not disturb the surface of the water when they are in action.

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

1. A propeller for vessels consisting of a blade or fin made flexible and elastic in its length; combined with and rigidly attached to a shaft or support and guiding and actuat-

ing devices for moving the fin bodily at right angles to its plane substantially as and for the purposes described.

2. A propeller for vessels consisting of a blade or fin made flexible and elastic in its length; combined with and rigidly attached to a shaft or support at right angles and guiding and actuating devices for reciprocating the fin bodily in a plane at right angles to the blade substantially as and for the purposes described.

3. A propeller for vessels consisting of two elastic blades or fins arranged parallel to the longitudinal axis of the vessel on opposite sides of the same, two corresponding shafts rigidly attached to the blades and arranged transversely to the vessel to reciprocate through the sides of the same, and means for imparting an opposite or reverse movement to the shafts to cause the lateral thrust of one blade to neutralize the lateral thrust of the other to relieve the vessel of a tendency to tremble, substantially as and for the purposes described.

4. A propeller for vessels consisting of two elastic blades or fins arranged parallel to the longitudinal axis of the vessel on opposite sides of the same, two reciprocating shafts rigidly attached to the blades, arranged transversely in the sides of the vessel, and having a sliding connection with each other at their inner ends, and gear wheels and pitmen arranged to impart a reversed reciprocating motion to the two shafts and blades substantially as shown and described.

FRANK TAFF.

Witnesses:

OLIVER TAFF,
SETH HARPELL.