

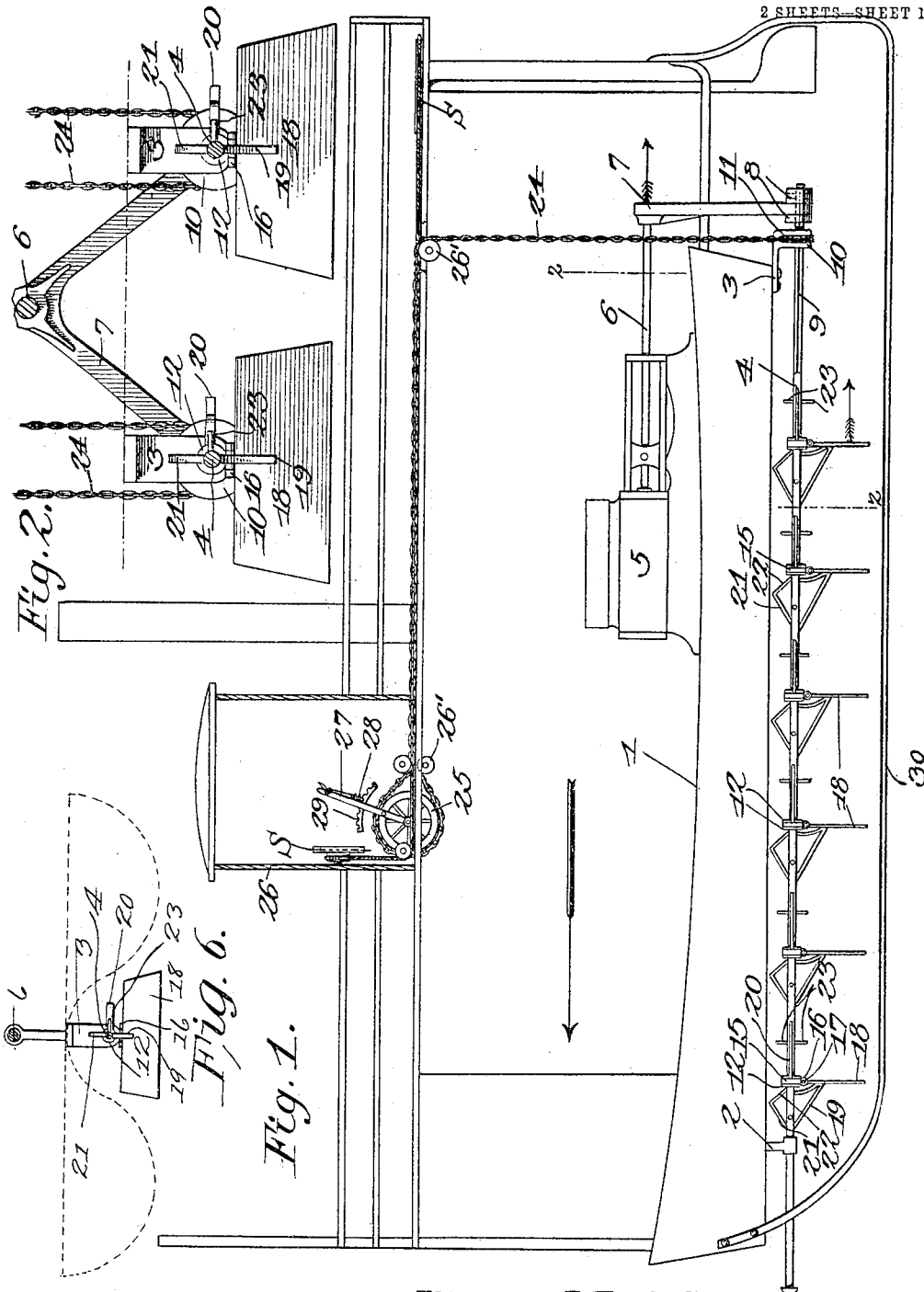
No. 801,560.

PATENTED OCT. 10, 1905.

H. W. THOMAS.  
BOAT PROPELLING MECHANISM.

APPLICATION FILED JAN. 4, 1905.

2 SHEETS—SHEET 1.



Witnesses

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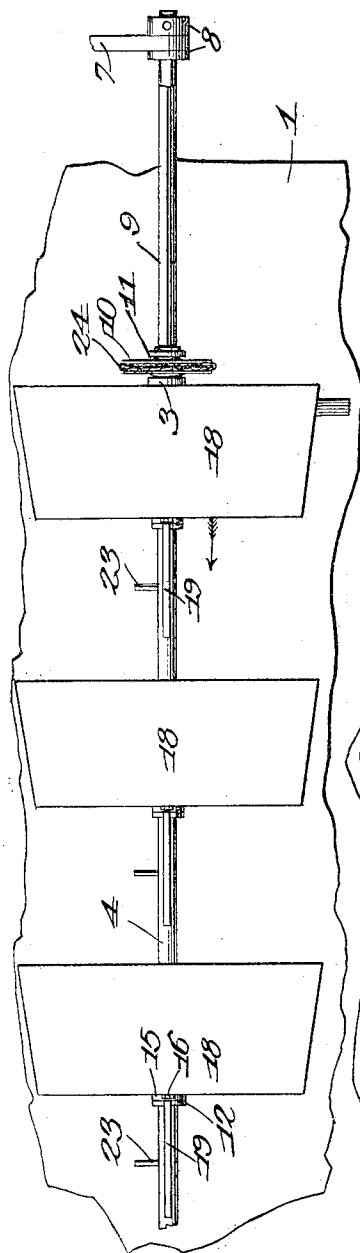


Fig. 3.

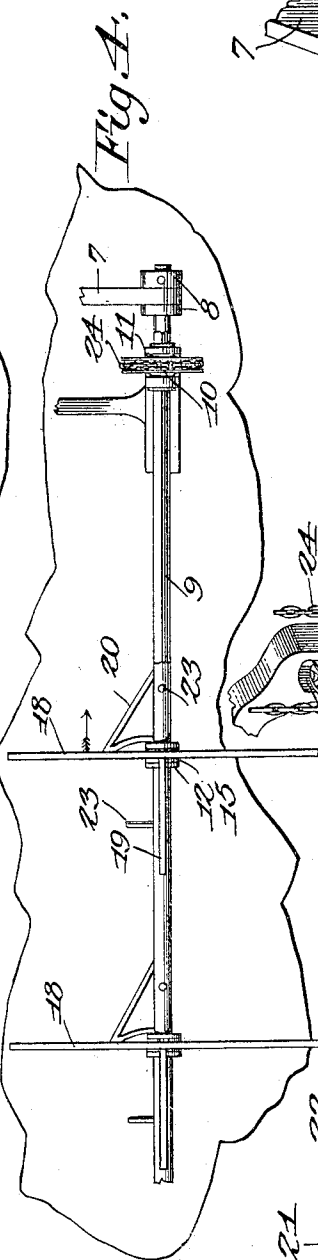


Fig. 4.

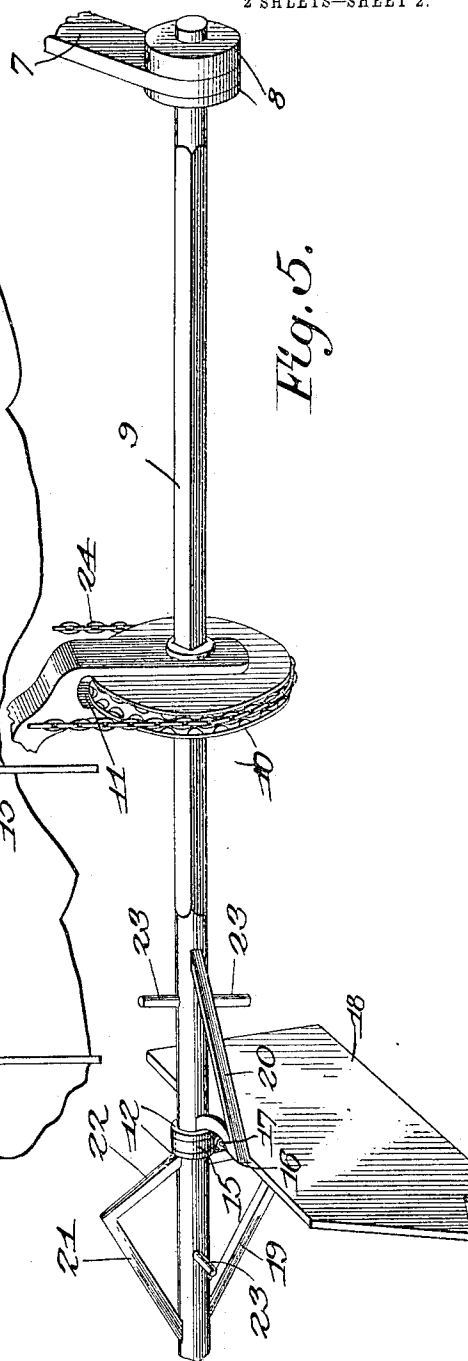


Fig. 5.

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# UNITED STATES PATENT OFFICE.

HOWARD W. THOMAS, OF CHARLEROI, PENNSYLVANIA.

## BOAT-PROPELLING MECHANISM.

No. 801,560.

Specification of Letters Patent.

Patented Oct. 10, 1905.

Application filed January 4, 1905. Serial No. 239,626.

*To all whom it may concern:*

Be it known that I, HOWARD W. THOMAS, a citizen of the United States, residing at Charleroi, in the county of Washington and State of Pennsylvania, have invented a new and useful Boat-Propelling Mechanism, of which the following is a specification.

This invention relates to mechanism for propelling boats and vessels of various kinds; and it has for its object to simplify and improve the construction and operation of this class of devices.

With these and other ends in view, which will readily appear as the nature of the invention is better understood, the same consists in the improved construction and novel arrangement and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the accompanying drawings has been illustrated a simple and preferred form of embodiment of the invention, it being, however, understood that no limitation is necessarily made to the precise structural details therein exhibited, but that the right is reserved to any changes, alterations, and modifications to which recourse may be had within the scope of the invention and without departing from the spirit or sacrificing the efficiency of the same.

In said drawings, Figure 1 is a side view, partly in section, illustrative of the invention. Fig. 2 is a sectional detail view taken on the line 2 2 in Fig. 1 and on an enlarged scale, but omitting the hull of the vessel. Fig. 3 is a bottom plan view of a portion of one of the paddle-carrying shafts, showing the paddles thereon in the position occupied when the shaft is well started in a forward direction. Fig. 4 is a bottom plan view of a portion of one of the paddle-carrying shafts, showing the paddles thereon in the position occupied when the shaft is well started in a rearward direction. Fig. 5 is a perspective detail view of a portion of one of the paddle-carrying shafts and the adjusting means for the same. Fig. 6 is a transverse sectional detail view illustrating a modification of the invention.

Corresponding parts in the several figures are indicated by like characters of reference throughout.

Upon the under side of the bottom of the hull 1 of a vessel are supported brackets 2 3, affording bearings for longitudinally-reciprocating shafts 4 4. It is to be understood that any desired number of shafts 4 from one up-

ward may be employed. In Fig. 2 of the drawings two such shafts have been shown, which ordinarily is the preferred number.

The shafts 4 4 are operated synchronously by an engine, including a cylinder 5, the piston-rod of which 6 carries a cross-head 7, which in the present instance has been shown as being of inverted-V shape, the ends of the arms of said cross-head, being provided with apertures in which the shafts 4 are mounted for rotation, said shafts being provided with collars 8, secured thereupon adjacent to the sides of the cross-head, with which the said shafts are thus operatively connected. Each of the shafts has a non-circular portion 9, upon which is mounted a chain-wheel 10, the latter being supported in a cleft or bifurcation 11 of one of the brackets 3, whereby the shaft is permitted to reciprocate longitudinally, while the chain-wheel is free to rotate with the shaft, but is prevented from longitudinal movement with the latter. Each of the shafts is provided with suitably-spaced collars 12 12, arranged in pairs at suitable distances apart, said collars constituting flanges which may be integral with the shafts 4, but which in any event are rigidly connected with the said shafts. Between each pair of collars 12 12 is revolubly mounted a ring or clip 15, terminating at the ends thereof in eyes 16, affording bearings for a pin 17, upon which a blade or paddle 18 is hingedly mounted, said paddles being preferably constructed of metal or other material sufficiently heavy to prevent accidental displacement of said paddles.

Each of the shafts 4 is provided adjacent to the collars or flanges 12 12 and adjacent to opposite sides of the paddles 18 with angular lugs 19 and 20, the former of which are disposed in front and the latter in rear of the paddles, said lugs radiating from the shafts at an angle of approximately ninety degrees to one another. These lugs are for the purpose of supporting the paddles when the device is in operation, and the paddle-supporting faces of said lugs are preferably at an angle of approximately ninety degrees to the axes of the shafts 4, so that the paddles will be supported for operation at approximately right angles to said shafts, this being deemed the most suitable and effective position. The shafts 4 are provided with auxiliary paddle-engaging lugs, which have been shown as being disposed diametrically opposite to the lugs 19. Said lugs, which are designated 21, are provided with obliquely-dis-

posed paddle-engaging faces 22, which lean in a forward direction and which will thus be adapted to support the paddles for operation in an inclined position, which may approximate forty-five degrees to the axes of the shafts.

Suitably spaced from the paddle-engaging faces of each of the lugs 19, 20, and 21 are pins or stops 23, which are for the purpose of preventing the paddles from folding too closely against the respective shafts.

Over the chain-wheels 10 upon the respective shafts 4 are guided endless chains 24, which are likewise guided over chain-wheels 25, which may be located in the pilot-house 26, and one of which has been shown in Fig. 1 of the drawings. Intermediate pulleys or guiding means 26' for the chains 24 are provided at various points. The chain-wheels 25 are provided with lever-handles 27 whereby they may be manipulated, said levers being provided with catches 28, of well-known construction, adapted to engage segment-racks 29, whereby the hand-levers and the parts operated thereby may be securely retained in various positions to which they may be adjusted.

It will be seen that by the means herein described the shafts 4 may be partially rotated in their bearings and adjusted and secured in various positions with either of the paddle-engaging lugs 19, 20, or 21 in downward, paddle-engaging position. When it is desired to propel the vessel in a forward direction, the paddle-engaging lugs 19 in front of the paddles will be turned downward into operative position, as shown in Fig. 1. Then on the forward stroke of the shafts the paddles will swing in a rearward direction until interrupted by the stops 23, whereby they will be supported in an approximately horizontal and non-effective position. On the rearward stroke the paddles will swing downwardly into engagement with the lugs 19, and will thus be sustained in approximately vertical position, which is effective to propel the vessel in a forward direction.

When it is desired to back the vessel, the shafts 4 are each turned approximately one-quarter of a revolution or until the lugs 20 in rear of the paddles will be in operative or paddle-engaging position. The operation of the paddles will thus be instantaneously reversed, and the vessel will be propelled in a rearward direction.

For the purpose of steering the vessel the shafts 4 may be so adjusted that the lugs 19 of one of said shafts and the lugs 20 of the other shaft shall be in paddle-engaging position. By proper and attentive adjustment of the shafts the vessel may thus be steered successfully in the absence of a rudder, or it may be turned completely around in a very limited space.

By turning the lugs 21 downward into paddle-

engaging position the paddles will be effective not only to propel the vessel but will also have a tendency to move it upwardly, thus increasing its buoyancy and preventing sinking in case of a leak.

If difficulty should be at any time experienced in stopping the engine, the sides of the shafts 4, which are unprovided with lugs or projections of any kind, may be turned downward, and the paddles will then be permitted to swing non-effectively in both directions.

As will be seen from the foregoing, a vessel provided with this improved propelling mechanism may be operated by the simplest type of an engine and no reversing-gear of any kind is required, the various movements of the boat being performed entirely through the proper adjustment of the shafts 4, which may be effected by the pilot who is stationed in the house 26. A steering-gear of ordinary construction has been shown in Fig. 1 of the drawings, (designated S;) but this is no part of the present invention. Guards 30 have been shown in Fig. 1 of the drawings to protect the paddles from injury by snags and other obstructions.

Under some circumstances, and especially when more than two propeller-shafts 4 are used, it may be found advantageous to operate said shafts alternately or successively, so that the paddles upon one or more of the shafts shall at all times be in position for active operation. Such a construction, however, is considered to be within the skill of the ordinary mechanic, and it has not been deemed necessary to specially illustrate the same.

Under the modification illustrated in Fig. 6 of the drawings only a single paddle-bearing shaft is used, and when this construction, which is applicable to the smaller sizes of vessels, is resorted to the bottom of the vessel may be bulged upwardly along the longitudinal center, as shown at 32, so as to accommodate the paddle-bearing shaft.

Having thus described the invention, what is claimed is—

1. A propeller-shaft mounted for reciprocation and oscillation, and paddles hingedly supported by said shaft.

2. A propeller-shaft mounted for reciprocation and oscillation, members mounted for rotation upon said shaft, and paddles hingedly connected with said members.

3. A propeller-shaft mounted for reciprocation and oscillation, paddles hingedly connected with said shaft, and paddle-engaging lugs radiating from said shaft.

4. A propeller-shaft mounted for reciprocation and oscillation, paddles hingedly connected with said shaft, and paddle-engaging lugs radiating in various directions from said shaft.

5. A propeller-shaft mounted for reciprocation, paddles hingedly connected with said

shaft, paddle-engaging lugs radiating from said shaft, and paddle-engaging stops connected with said shaft.

6. A propeller-shaft mounted for reciprocation and oscillation, paddle-carrying members mounted for rotation upon said shaft, means for confining said members against longitudinal displacement, and paddle-engaging lugs radiating from the shaft in various directions.

7. A propeller-shaft mounted for reciprocation and oscillation, paddle-carrying members mounted for rotation upon said shaft, paddles hingedly connected with said members, paddle-engaging lugs radiating from the shaft, disposed respectively in front and in rear of the paddles at approximately right angles to one another and having paddle-engaging faces at approximately right angles to the axis of the shaft, and means for rotating the shaft in its bearings and for securing it at various adjustments.

8. A propeller-shaft mounted for reciprocation and oscillation, paddle-carrying members mounted for rotation upon said shaft, paddles hingedly connected with said members, paddle-engaging lugs radiating from the shaft, disposed respectively in front and in rear of the paddles at approximately right angles to one another and having paddle-engaging faces at approximately right angles to the axis of the shaft, paddle-engaging stops disposed in alinement with said lugs, and means for rotating the shaft in its bearings and for securing it at various adjustments.

9. A propeller-shaft mounted for reciprocation and oscillation, paddle-carrying members mounted for rotation upon said shaft, paddles hingedly connected with said members, paddle-engaging lugs radiating from the shaft, disposed respectively in front and in rear of the paddles at approximately right angles to one another and having paddle-engaging faces at approximately right angles to the axis of the shaft, auxiliary paddle-engaging lugs disposed in front of the paddles diametrically opposite to the above-mentioned lugs in front of the paddles, and having obliquely-disposed paddle-engaging faces, and means for rotating the shaft in its bearings and for securing it at various adjustments.

10. A plurality of propeller-shafts mounted for reciprocation and oscillation, paddles supported hingedly with relation to the said shafts, paddle-engaging lugs and stops upon

said shafts, means for operating said shafts, and means for independently rotating said shafts and for securing them against rotation at various adjustments.

11. A plurality of propeller-shafts mounted for reciprocation and oscillation said shafts having non-circular portions, chain-wheels slidably engaging the non-circular portions of the shafts, means for preventing longitudinal displacement of said chain-wheels, paddles supported hingedly with relation to said shafts, paddle-engaging lugs and stops upon said shafts, means for imparting reciprocatory movement to said shafts, endless chains guided over the chain-wheels upon the shafts, chain-wheels supporting said chains and having adjusting-levers, means for retaining the latter in adjusted position, and intermediate chain-guides.

12. The combination with a vessel, of longitudinal propeller-shafts connected therewith for reciprocation and oscillation, paddles hingedly supported by and with relation to said shafts, paddle-engaging stops and lugs upon said shafts, a reciprocatory driving member, a cross-head connected with the latter and having bearings for the propeller-shafts, and means for preventing longitudinal displacement of said shafts from said bearings.

13. The combination with a vessel, of a longitudinal propeller-shaft connected therewith for reciprocation and oscillation, paddle-carrying members supported for rotation upon said shaft, paddle-engaging lugs and stops radiating from said shaft in various directions, and paddle-guards extending longitudinally under the vessel below the paddles.

14. The combination with a vessel having a longitudinally and centrally upwardly curved bottom, a shaft supported for oscillation and reciprocation, paddle-carrying members supported for rotation upon said shaft, the paddles being hingedly connected with said members, paddle-engaging lugs and stops radiating in various directions from the shaft, and means for adjusting the latter.

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

HOWARD W. THOMAS.

Witnesses:

MINNIE B. RICHARDSON,  
DANIEL F. FERGUSON.