

(No Model.)

2 Sheets—Sheet 1.

J. L. HELMOLT.
PROPULSION OF VESSELS.

No. 577,750.

Patented Feb. 23, 1897.

Fig. 1.

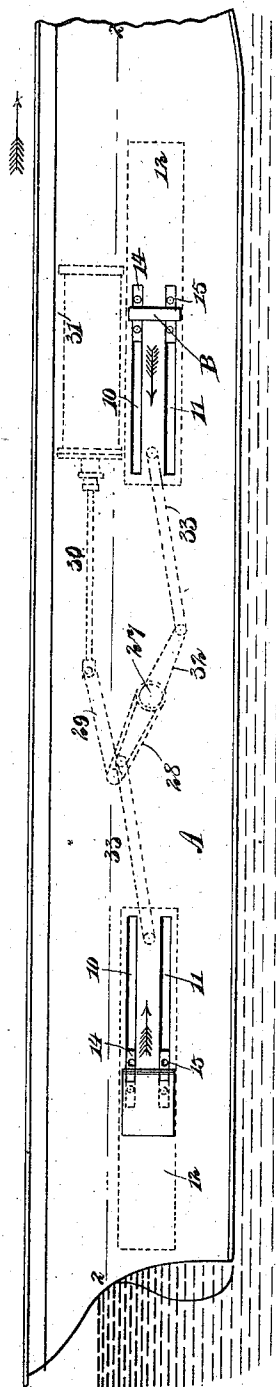
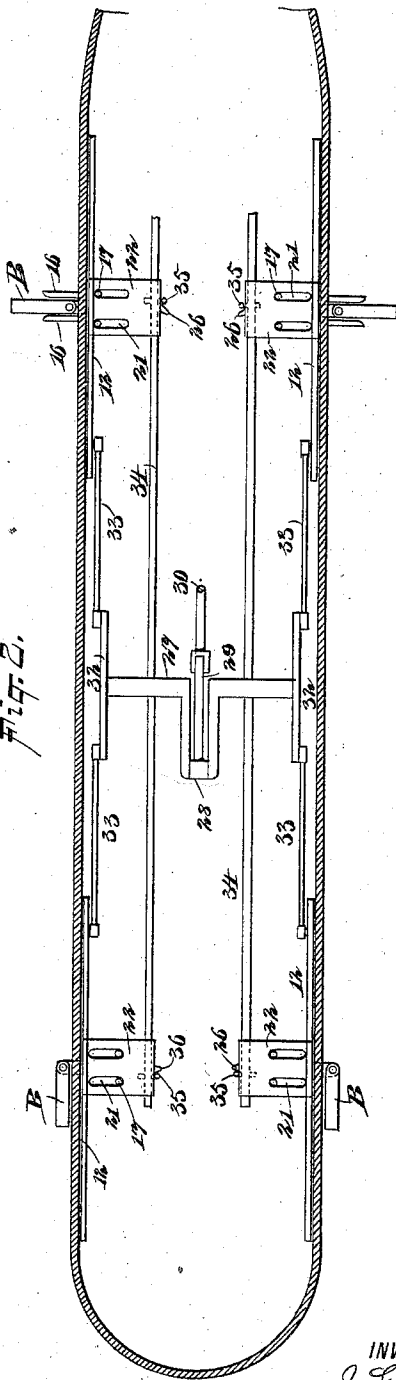


Fig. 2.



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PROPULSION OF VESSELS.

SPECIFICATION forming part of Letters Patent No. 577,750, dated February 23, 1897.

Application filed June 2, 1896. Serial No. 593,982. (No model.)

To all whom it may concern:

Be it known that I, JOHN L. HELMOLT, of New York city, in the county and State of New York, have invented a new and useful
5 Improvement in the Propulsion of Vessels, of which the following is a full, clear, and exact description.

The object of my invention is to provide an improved means of propelling vessels wherein
10 side paddles of a fin-like construction are located near the stern and near the stem of the vessel at each side, each set of paddles being adapted to move to and from the other set, the forward set of paddles having bearing
15 upon the water on their rearward stroke, and the rear set of paddles, which move simultaneously forward, fit at that time close against the sides of the vessel. Upon the return movement of the two sets of paddles the forward set will return folded and the rear set
20 in operative position, or at an angle to the sides of the vessel. Thus the forward and the rear sets of propelling-blades operate alternately to propel the vessel.

25 A further object of the invention is to provide a means for reversing the action of the paddles, so that the vessel may be carried stern foremost.

30 Another object of the invention is to construct propelling mechanisms equally balanced upon each side of the vessel's hull, so spaced that the vessel may be turned practically upon its center.

35 The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

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

45 Figure 1 is a side elevation of a portion of a vessel's hull, illustrating the application of the invention to the same. Fig. 2 is a horizontal section through the hull on the line 2 2 in Fig. 1, showing the propelling mechanism in plan view. Fig. 3 is a diagrammatic view
50 illustrating the paddles at their outward stroke and a means for controlling the movement of the said paddles. Fig. 4 is a view similar to Fig. 3, illustrating the paddles at the inner limit of their stroke. Fig. 5 is a

section taken practically on the line 5 5 of Fig. 3, the top plate of the frame of the locking mechanism for the paddles being removed 55 and the paddles being shown in two positions. Fig. 6 is an enlarged plan view of the locking device for one of the paddles. Fig. 7 is a section taken substantially on the line 7 7 of Fig. 6. Figs. 8 and 9 are plan views of the 60 shifting shaft, illustrating the locking mechanism as acted upon, first, to lock a paddle, and, secondly, as withdrawn from locking engagement therewith; and Fig. 10 is a sectional view through the shifting shaft, illustrating its construction, whereby the operation 65 of the paddles may be reversed when desired.

In carrying out the invention the vessel's hull A is provided, well below the water-line 70 at each side near the bow and near the stern, with two horizontal and parallel openings 10 and 11, corresponding openings on opposite sides of the vessel's hull being in transverse alinement.

75 Within the hull of the vessel, back of each set of openings 10 and 11, a plate 12 is held to slide in suitable ways 13, the plates being so packed in their ways or the ways being so constructed as to effectually prevent any water 80 entering the hull through the aforesaid openings 10 and 11. Each plate is provided with ribs 14 upon its outer face, and the ribs are fitted to slide in the openings 10 and 11 in the hull, as shown in Figs. 1, 3, 4, and 7. 85 Each rib of each plate is provided with openings extending through from the inside of the plate, and the openings are at each side of the center of the ribs; and between the openings 15 in the rib of each sliding plate 90 12 a blade or a paddle is hinged to the outer faces of the said ribs, the said paddles or blades being of a fin-like construction. Fingers 16 are held to slide in the openings 15 in the sliding plates 12, and therefore these fin- 95 gers, when projected outward, will be at each side of a fin or blade B, as shown in Figs. 6 and 7, and will hold the fin or blade at a right angle to the side of the vessel's hull.

Each vertically-alining set of fingers 16 is 100 secured to an upright post 17, and the posts belonging to the fingers of each plate are connected near the top and near the bottom by a cross-bar 18, and each cross-bar is provided

with an inwardly-extending horizontal arm 19, as particularly shown in Figs. 5 and 7, the arms 19 being connected by a vertical post 20. The posts 17 connect directly with the locking arms or fingers 16, extending through slots 21, made vertically in upper and lower plates 22, secured to the upper and lower portions of the sliding plates 12, and the upper and lower plates 22 are connected at the rear by a preferably centrally-located post 23. These upper and lower plates 22 form housings for two sets of links 24 and 25. These links are pivotally connected, and the innermost link is attached to the post 23, which rotates in the plates 22, while the outermost link 25 of each set is pivotally connected with the post 20, connecting the extensions 19 from the links or cross-bars uniting the finger-posts 17; and at the lower end of the rear rotary post-shaft 23 of each housing a button 26 is firmly secured, which extends preferably beyond opposite ends of the aforesaid shaft 23.

The sliding plates 12, carrying the blades or fins B, may be operated from any suitable source of power. In the drawings a rock-shaft 27 is shown as journaled amidships, being provided with a central crank-arm 28, connected by a link 29 and a pitman with the piston-rod 30, the head whereof has movement in a cylinder 31, supplied with steam, compressed air, or water. A crank-arm 32 is secured to each end of the rock-shaft 27, and the extremities of the crank-arms 32 are attached by means of connecting-bars 33 to the inner end portions of the paddle slides or plates 12, as shown in Fig. 2.

Beneath the housings containing the locking links and fingers for the paddles a shifting shaft 34 is journaled longitudinally in suitable bearings within the hull, one of the said shafts being near each side; and each shaft near the end of each set of openings 10 and 11 in the hull is provided with two preferably angular arms 35 (shown best in Fig. 10) and located so that one arm will extend below and the other arm above the shaft; and the uppermost arm at each end of a set of openings is adapted to engage an end portion of a button 26, carried by one of the plates 12 and operating the links connected with its locking-fingers.

In operation, the rock-shaft 27 being set in motion the slides will be simultaneously forced apart at each side of the vessel and then simultaneously drawn together. When the slides are forced outward, as shown in Fig. 3 and in positive lines in Fig. 5, the stern paddles will have been held at an angle to the vessel's sides and the bow paddles will have been folded parallel therewith, thereby forcing the vessel ahead from the stern, and when the bow paddles in their folded position reach the forward ends of the openings 10 and 11 the button 26 on the carriage attached to the slides of these paddles will have so contacted with one of the upwardly-projecting trip-arms

35 of the shifting shaft 34 as to give the button a diagonal position, (shown in positive lines in Fig. 5 at the right-hand side of the said figure,) thereby straightening the links 24 and 25 and forcing the fingers 16 outward at each side of the bow paddles, holding them at right angles to the sides of the vessel, while the stern paddles when their carriages reach the rear ends of the stern openings 10 and 11 will be closed or folded parallel with and against the outer face of the vessel, as shown also in positive lines in Fig. 5, the folding action taking place by reason of the buttons 26 on these stern carriages being brought at an angle to a center line drawn through the carriages by an engagement with the projecting trip-arms 35 on the shifting shaft 34, located opposite the rear ends of the aforesaid stern openings, and this shifted position of the buttons will cause the links to be drawn inward and at an angle to one another, carrying the locking-fingers 16 of the stern paddles inward with them, and the pressure of the water will then force the paddles against the sides of the vessel. Upon the inward stroke of the bow and stern sliding plates the bow blades or paddles will perform the work, returning inward at an angle to the vessel's hull, while the stern blades or paddles will return inward in their folded condition, and when the inner ends of the slides are reached the forward paddles will be folded in the same manner as just described with reference to the rear paddles, while the rear paddles will be opened to return in that position and perform the work of propulsion, as shown in dotted lines in Fig. 5.

When it is desired to back the vessel, it is simply necessary to give the shifting shaft 34 a quarter-turn, bringing the lower shifting arms 35 (shown in Fig. 10) upward and carrying those normally employed downward, so that the withdrawal of the locking devices for the blades will take place in the reverse order to that heretofore described.

By means of a propelling mechanism of this description the vessel may be quickly turned almost as upon a pivot and considerable power is obtained, acting constantly to force the vessel in any desired direction.

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

1. In the propulsion of vessels, a hull and paddles located at the sides of the hull, capable of lateral movement, the said paddles having a hinged connection with a sliding support, locking devices adapted to engage the sides of the paddles to hold the same at an angle to the vessel's side, and a shifting mechanism connected with the locking devices, as and for the purpose set forth.

2. The combination, with the hull of a vessel, hinged stern and bow paddles having sliding movement in the hull at each side, a driving mechanism for the paddles, moving the paddles on opposite sides alternately in

direction of and away from one another, and automatic locking devices engaging alternately the sides of the stern and the bow paddles to hold the same at an angle to the vessel's sides, as and for the purpose specified.

3. In the propulsion of vessels, the combination, with a hull having longitudinal openings made in its sides near the bow and near the stern, plates having sliding movement in the said openings, paddles having hinged connection with the said plates and located at the outside portion of the vessel's hull, a motor, and a driving connection between the motor and all of the said slides, operating each set of slides at each side simultaneously, opposite slides on the same side of the vessel's hull moving alternately toward and away from each other, a carriage connected with each slide, locking devices located in the carriage and adapted to hold the paddles at an angle to the sides of the vessel, and a mechanism, substantially as described, for releasing the paddles from the aforesaid locking devices, as and for the purpose set forth.

4. In the propulsion of vessels, the combination, with a hull having longitudinal openings made in its sides near the bow and near the stern, plates having sliding movement in the said openings, paddles having hinged connection with the said plates and located at the outside portion of the vessel's hull, a motor, and a driving connection between the motor and all of the said slides, operating each set of slides at each side simultaneously, opposite slides on the same side of the vessel's hull moving alternately toward and away from each other, of a carriage connected with each slide, locking devices located in the carriage and adapted to hold the paddles at an angle to the sides of the vessel, a shifting shaft, trip-arms carried by the said shifting shaft, links connected with the locking devices of a carriage, a shaft adapted to oper-

ate the said links, and a trip connection between the shaft and the aforesaid trip-arms, as and for the purpose set forth.

5. The combination, with a vessel's hull, of paddles having a hinged connection with supports held to slide upon the said hull, means for simultaneously moving the said sliding supports toward and away from each other at each side of the vessel, locking devices arranged to hold the paddles at an angle to the vessel, and means for withdrawing the said locking devices from engagement with the said paddles, and releasing devices operating simultaneously to lock sundry of the paddles and release others, as and for the purpose set forth.

6. The combination, with a vessel's hull having openings therein, plates held to slide in the said openings within the hull, the openings being located near the bow and near the stern at each side, and means, substantially as described, for simultaneously imparting movement to all of the sliding plates, of a carriage connected with each plate, locking-fingers located in each carriage and arranged to extend outward therefrom, a blade or paddle having a hinged connection with the outer portion of each sliding plate and located between the locking-fingers of the plate, a withdrawing device located in each carriage and connected with the said locking-fingers, a shifting shaft operating the releasing devices, and trips located at the forward and rear portions of the slots in the hull, and arranged to operate the releasing mechanism in a manner to force the fingers to a locking engagement with the paddles, or to withdraw the said fingers from such locking engagement, as and for the purpose set forth.

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