

No. 648,460.

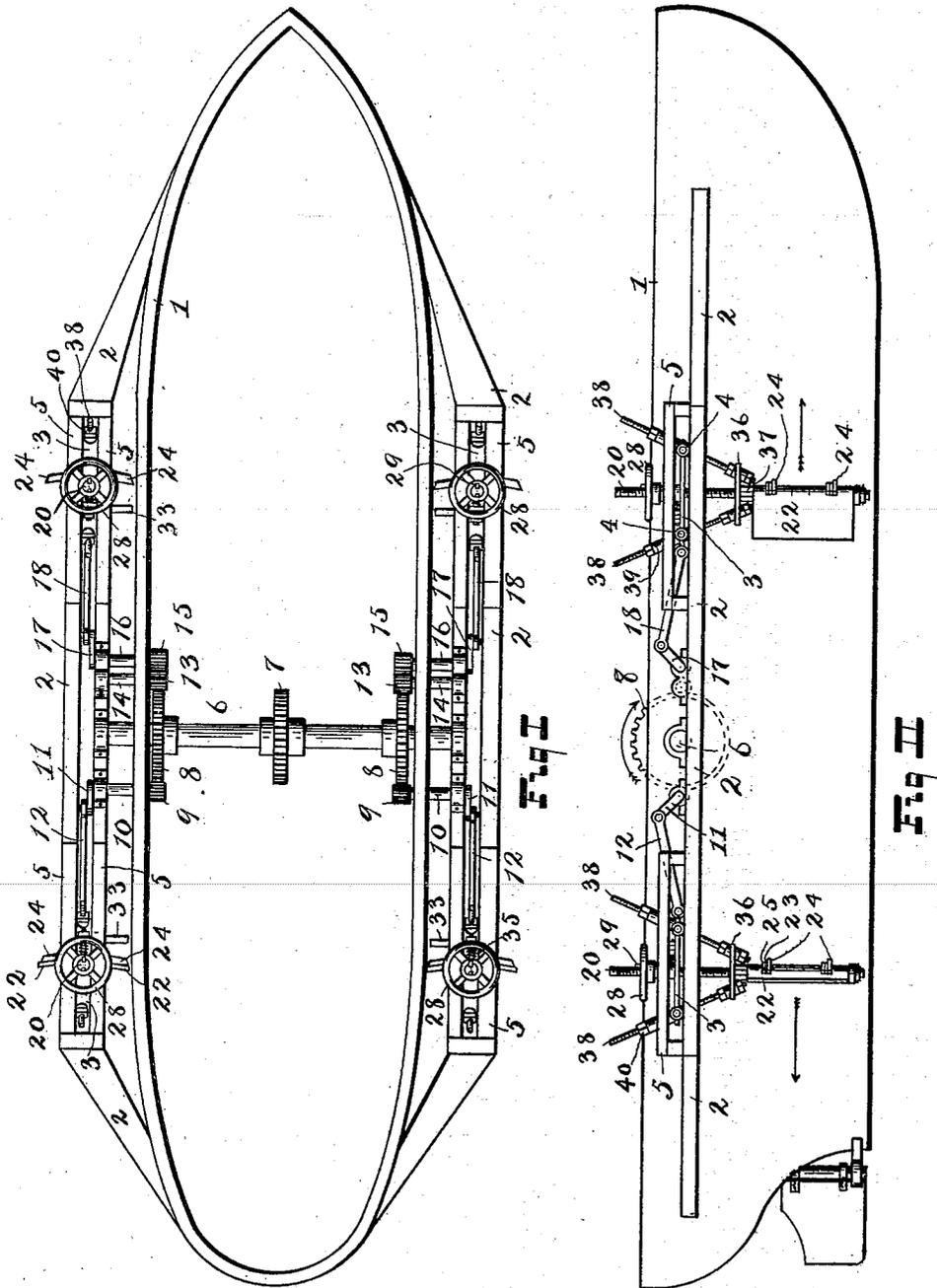
Patented May 1, 1900.

M. B. HUNTER.
VESSEL PROPELLING MECHANISM.

(Application filed Mar. 11, 1898.)

(No Model.)

2 Sheets—Sheet 1.



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Fig III

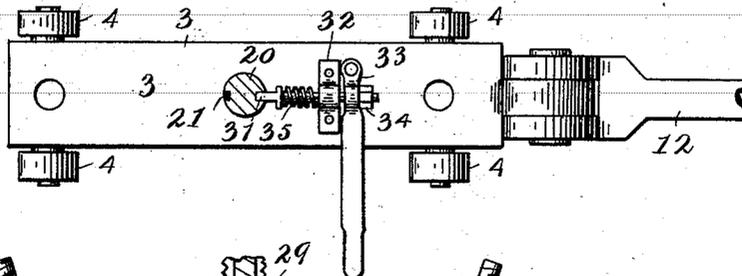


Fig IV

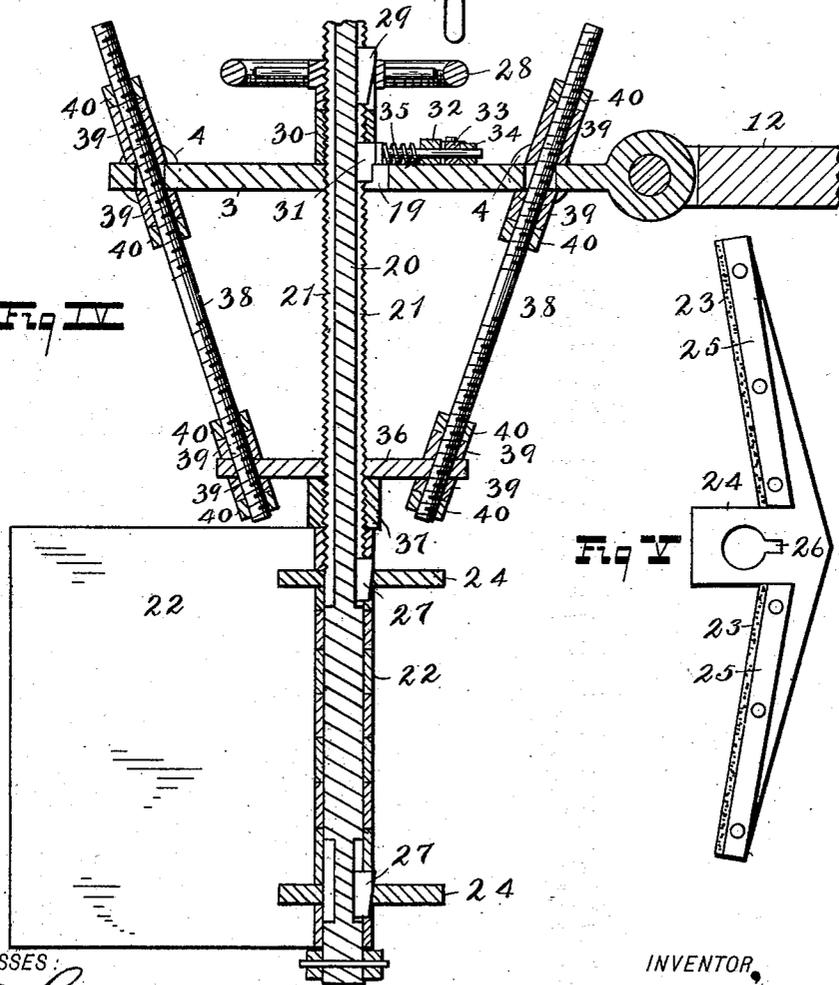
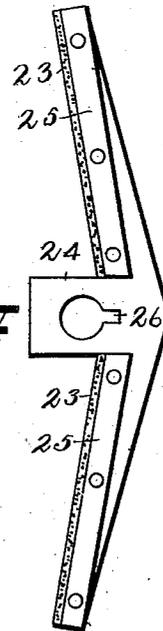


Fig V



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UNITED STATES PATENT OFFICE.

MARTIN B. HUNTER, OF EDWARDSVILLE, KANSAS, ASSIGNOR OF ONE-HALF
TO OLIVER M. SCHEE, OF KANSAS CITY, MISSOURI.

VESSEL-PROPELLING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 648,460, dated May 1, 1900.

Application filed March 11, 1898. Serial No. 673,473. (No model.)

To all whom it may concern:

Be it known that I, MARTIN B. HUNTER, a citizen of the United States, residing in Ed-
wardsville, in the county of Wyandotte and
5 State of Kansas, have invented a certain new
and useful Improvement in Vessel-Propelling
Mechanisms, of which the following is a speci-
fication, reference being had therein to the ac-
companying drawings.

10 My invention relates to improvements in
boat-propelling mechanisms.

The object of my invention is to provide a
paddle propelling mechanism for vessels in
which the paddles are given a reciprocating
15 motion through the water through the inter-
mediacy of suitable mechanism, means being
provided by which the paddles are placed
during half a complete reciprocation at sub-
stantially right angles to the course of the
20 vessel and in a parallel plane therewith during
the other half-reciprocation.

In the accompanying drawings, illustrating
my invention, Figure I represents a plan
view of a vessel provided with my propelling
25 mechanism. Fig. II represents a side eleva-
tion showing the forward paddles moving for-
ward in the closed position and the rear
paddles moving rearward in the open or oper-
ative position. Fig. III represents a plan view
30 of one of the cross-heads and some connected
parts, the paddle-shaft being shown in trans-
verse section. Fig. IV represents a vertical
longitudinal sectional view of one of the cross-
heads, paddle-shaft, braces, &c., and the pad-
35 dle in the closed position. Fig. V represents
a plan view of one of the paddle-braces.

Similar numerals of reference indicate simi-
lar parts.

1 indicates the hull of the vessel.

40 2 indicates a horizontal framework on each
side of the vessel outside thereof and extend-
ing forward and rearwardly with respect
thereto and designed to support and serve as
guides for the cross-heads 3, of which there
45 are four, located two upon each side of the ves-
sel—two forward and two aft—and each pref-
erably provided with four carrying-wheels 4.

50 5 indicates the upper horizontal guide-
plates, between which and the framework 2
the cross-heads are located.

6 indicates the main driving-shaft, disposed

transversely across the vessel and provided
at each end with suitable supporting-bear-
ings. The driving-shaft may be rotated by
any desirable means, as by a gas-engine, 55
steam-engine, electric motor, or other motive
power, which, if desired, may be applied to a
spur-gear 7, secured upon the driving-shaft
at any desirable point thereon. Near each
end of the driving-shaft 6, and preferably 60
within the hull of the vessel and secured rig-
idly upon the shaft, is a spur gear-wheel 8.
To the rear of each gear 8 and meshing there-
with is a spur-gear 9, secured rigidly upon
the inner end of a horizontal crank-shaft 10, 65
mounted in suitable bearings upon the frame
2 and in the hull of the vessel. Each of the
crank-shafts 10 is provided with a crank-arm
11, to which is pivoted the forward end of a
pitman 12, the rear end of which is pivoted 70
to the forward end of the cross-head 3. In
front of the gears 8 and meshing therewith,
respectively, are two intermediate gears 13,
mounted each upon a horizontal shaft 14,
which in turn is mounted in bearings simi- 75
larly disposed to the crank-shafts 10. For-
ward of the intermediate gears 13 and mesh-
ing therewith, respectively, are the spur-gears
15, secured upon the inner ends of the hori-
zontal crank-shafts 16, having each the crank- 80
arm 17, to which are pivoted, respectively, the
rear ends of the forward pitmen, (indicated
by 18,) the forward ends of which are pivoted,
respectively, to the rear ends of the forward
cross-heads 3. The crank-arms 11 are dis- 85
posed with reference to the crank-arms 17 in
a diametrically-opposite position, so that dur-
ing rotation the pitmen 12 will be forced
rearward, while the pitmen 18 are forced
forward, thus reciprocating the rear cross- 90
heads in one direction and at the same time
reciprocating the forward cross-heads in the
opposite direction. Near the center of each
cross-head 3 is a vertical opening there-
through, provided, as indicated in Fig. IV, 95
with a key-seat 19 in one side. In each of
these openings is vertically and circumferen-
tially movably fitted a vertical paddle-shaft
20, externally screw-threaded from its upper
end two-thirds or so of its length and pro- 100
vided on diametrically-opposite sides with
two longitudinal key seats or grooves 21.

Upon the lower end of each shaft 20 are mounted two vertical paddles 22, one edge of each of which is hinged upon the shaft 20. These paddles are adapted, when the cross-head carrying the shaft 20 is moved forwardly, to swing upon their hinged supports, owing to the resistance of the water into the position shown in Fig. IV or in a plane parallel with the course of the vessel, and when the cross-head moves in the opposite direction the paddles will be forced by the water into a position substantially at right angles to the course of the vessel until they come in contact with the rubber buffer-strips 23, secured each by means of the plates 25, respectively, to the transverse arms of the paddle-brace 24, of which there are two mounted upon each shaft 20, one near the top of the paddles and one near the bottom of the paddles. Each horizontal paddle-brace 24 is provided with a central vertical hole through it, as shown in Fig. V, and a key-seat 26. The paddle-braces are mounted transversely upon the shafts 20 and are held securely thereon against rotation or vertical movement by means of keys 27, which are fitted in the key-seats provided in the periphery of each of the shafts 20 and the paddle-braces 24. Upon each of the paddle-shafts 20, above the cross-head upper guides, is mounted a hand-wheel 28, provided with an internally-screw-threaded hole in the hub fitted to the screw-threaded portion of the shaft 20. To prevent circumferential movement of the hand-wheels 28, keys 29 are provided, which are fitted into the keyways on the shafts 20, and keyways provided one in each hand-wheel. Between the hand-wheels and the upper sides of the cross-heads upon each shaft 20 is mounted a sleeve 30, the lower end of which is slotted to receive one end of a horizontal locking sliding-bolt 31, which rests upon the cross-head and has one end adapted to enter one of the longitudinal keyways in the shaft 20. This end of the sliding locking-bolt is provided with a downwardly-extending projection, which is forward and rearwardly movable in the key-seat 19 of the cross-head. The key 31 has its other end projecting through a guide-plate 32, secured upon the upper side of the cross-head, and also through a hand-lever 33, one end of which is pivoted to the upper side of the cross-head and the other end of which extends toward the side of the vessel. Upon the extreme outer end of the locking-key 31, which is externally screw-threaded, is mounted a nut 34. A compression coil-spring 35, encircling the key 31 and bearing at one end upon the guide-plate 32 and at the other end against the head of the key 31, normally holds the locking-key 31 in one of the longitudinal keyways in the vertical paddle-shaft 20. Below each cross-head 3 is located a horizontal brace-plate 36, provided with a central vertical opening therethrough, through which extends one of the shafts 20. Below each brace-plate 36, upon the threaded portion of

the shaft 20, is mounted a securing-nut 37, adapted to bear against the under side of the brace-plate. Upon each side of the shaft 20 are provided two upwardly and outwardly extending brace-rods 38, the ends of which are screw-threaded and extend through openings provided therefor, respectively, in the cross-head and brace-plate 36. Upon the upper and lower sides of the cross-head and the brace-plate 36, respectively, upon the brace-rods 38 are mounted sleeves 39, adapted to be held securely against the cross-head and brace-plate, respectively, by means of nuts 40, mounted upon the screw-threaded portions of the brace-rods 38.

My invention is operated as follows: The parts having been assembled as already described, the paddles are raised or lowered to the desired depth in the water by raising or lowering the vertical shafts 20. This is accomplished by first loosening the nuts 40 above and below the cross-heads, withdrawing key 29, and turning the hand-wheel 28 in a direction such as will raise or lower the shaft. When the shaft has been turned so as to place the paddles in the desired position vertically, the nuts 40 are turned, so as to tightly lock the sleeves 39 against the upper and lower sides of the cross-head. The key 29 is then replaced. If now the driving-shaft 6 be rotated—as, for instance, in the direction indicated by the arrow in Fig. II—the crank-shafts 10 and 16 will be rotated through the intermediacy of the gears 8, 9, 13, and 15, respectively, and will reciprocate the pitmen 12 and 18, which in turn will cause a reciprocation of the cross-heads, the forward cross-heads 3 moving in one direction and the rear cross-heads 3 moving in the opposite direction. The forward paddles upon each side of the vessel are thus moved in one direction and the rear paddles in the opposite direction. If, as shown in Fig. II, the forward paddles are moving forward, they will swing upon their supporting-shafts 20 into a plane parallel to the course of the vessel, in which position they will offer but little resistance to the forward movement of the vessel, while the rear paddles, moving rearwardly, will spread and offer their whole surface as a resisting medium. The rear-paddle braces 24 will prevent the too-far-forward movement of the rear paddles, which will have their forward sides rest against the buffers 23. The rear paddles being now forced through the water in the open position described will cause the vessel to move forward. As soon as the cross-heads begin to return in the opposite direction the forward paddles will open and the rear paddles will close. It will be seen from this description that two sets of paddles are continually at work impelling the vessel, and the power derived from the engine driving the main shaft is exerted without any intermission, except for an instant at each end of a stroke in forcing the vessel forward. If it is desired

to back the vessel, it may be accomplished by drawing each lock bolt or key 31 out of the keyway in each shaft 20 through the intermediacy of the hand-levers 33, then turning the shafts 20 half a revolution by means of the hand-wheels 28, and finally releasing the hand-levers 33, when the springs 35 will force the lock-bolts 31 into the keyways upon the opposite side of the shafts 20 from the side in which they formerly engaged. It will be noted that the turning of the shafts 20 half-way around turns the paddles and the paddle-braces 24 into an opposite position to that formerly occupied by them, and a forward-and-backward reciprocation of the paddles will cause them to open on the forward reciprocation and to close on the rearward reciprocation, thus impelling the vessel rearward. If it is desired to turn the vessel in either direction, it may be done without the use of the rudder by placing the shafts 20 on one side of the vessel, so that the paddles will open upon their forward reciprocation, while the paddles on the opposite side are opened in the backward reciprocation. If desired, reciprocation of the cross-heads and their paddles may be entirely stopped by disconnecting the gearing from engagement with the driving-shaft in any of the well-known manners commonly employed to obtain such disconnection.

It is obvious that my invention is subjective to many modifications without departing from its spirit. The framework for supporting the cross-heads may be constructed of any suitable material and of any design that may be deemed most desirable for the particular construction of vessel on which it may be applied. The cross-heads may be mounted directly upon the guides, as in locomotive construction, without the employment of the carrying-wheels 4, and various other features of construction may be altered to suit the various requirements in different cases.

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

1. In a vessel-propelling mechanism, the combination with a reciprocable cross-head, of an upright shaft carried thereby, means for vertically adjusting the said shaft, means for reversing the position of the said shaft circumferentially, one or more paddles carried by the shaft the paddles being in operative position during reciprocation in one direction relative to the shaft, substantially as described.

2. In a vessel-propelling mechanism, the combination with a reciprocable cross-head of an upright shaft carried thereby, means for rotating the shaft, means for locking the shaft against rotation, one or more paddles hinged

to the said shaft and one or more abutments for limiting the swing of the said paddles, substantially as described.

3. In a vessel-propelling mechanism, the combination with a cross-head, of means for reciprocating the same, an upright paddle-shaft carried by the cross-head, means for vertically adjusting the shaft relative to the cross-head, means for rotating the shaft, and a releasable locking device for preventing rotation of the shaft, substantially as described.

4. In a vessel-propelling mechanism, the combination with a cross-head, of means for reciprocating the same, an upright paddle-shaft provided with screw-threads, a hand-wheel mounted upon the screw-threaded portion of the shaft and supported by the cross-head, means for preventing rotation of the hand-wheel upon the shaft, and a releasable locking device for preventing rotation of the shaft with respect to the cross-head, substantially as described.

5. In a vessel-propelling mechanism, the combination with the cross-head, of means for reciprocating the same, an upright paddle-shaft rotatably mounted in the cross-head and vertically adjustable thereon and provided with a longitudinal groove in its periphery, and a locking-bolt mounted on the cross-head and adapted to enter the said groove, substantially as described.

6. In a vessel-propelling mechanism, the combination with a cross-head, of a screw-threaded paddle-shaft rotatably mounted on the cross-head and provided with a longitudinal peripheral groove, a hand-wheel rotatably mounted on and having screw-thread connection with the shaft and supported by the cross-head, means for preventing rotation of the hand-wheel upon the shaft, and a locking mechanism carried by the cross-head and adapted to engage the groove in the shaft, substantially as described.

7. In a vessel-propelling mechanism, the combination with a cross-head, of a vertical paddle-shaft rotatably mounted on the cross-head and provided with two diametrically-opposite grooves, means for adjusting the shaft vertically on the cross-head, means for rotating the shaft, and a locking device carried by the cross-head and adapted to engage successively the two grooves so as to prevent rotation of the shaft, substantially as described.

Signed by me at Kansas City, Missouri, this 4th day of March, 1898, in presence of two witnesses.

MARTIN B. HUNTER.

Witnesses:

L. C. HUNTER,
O. M. SCHEE.