

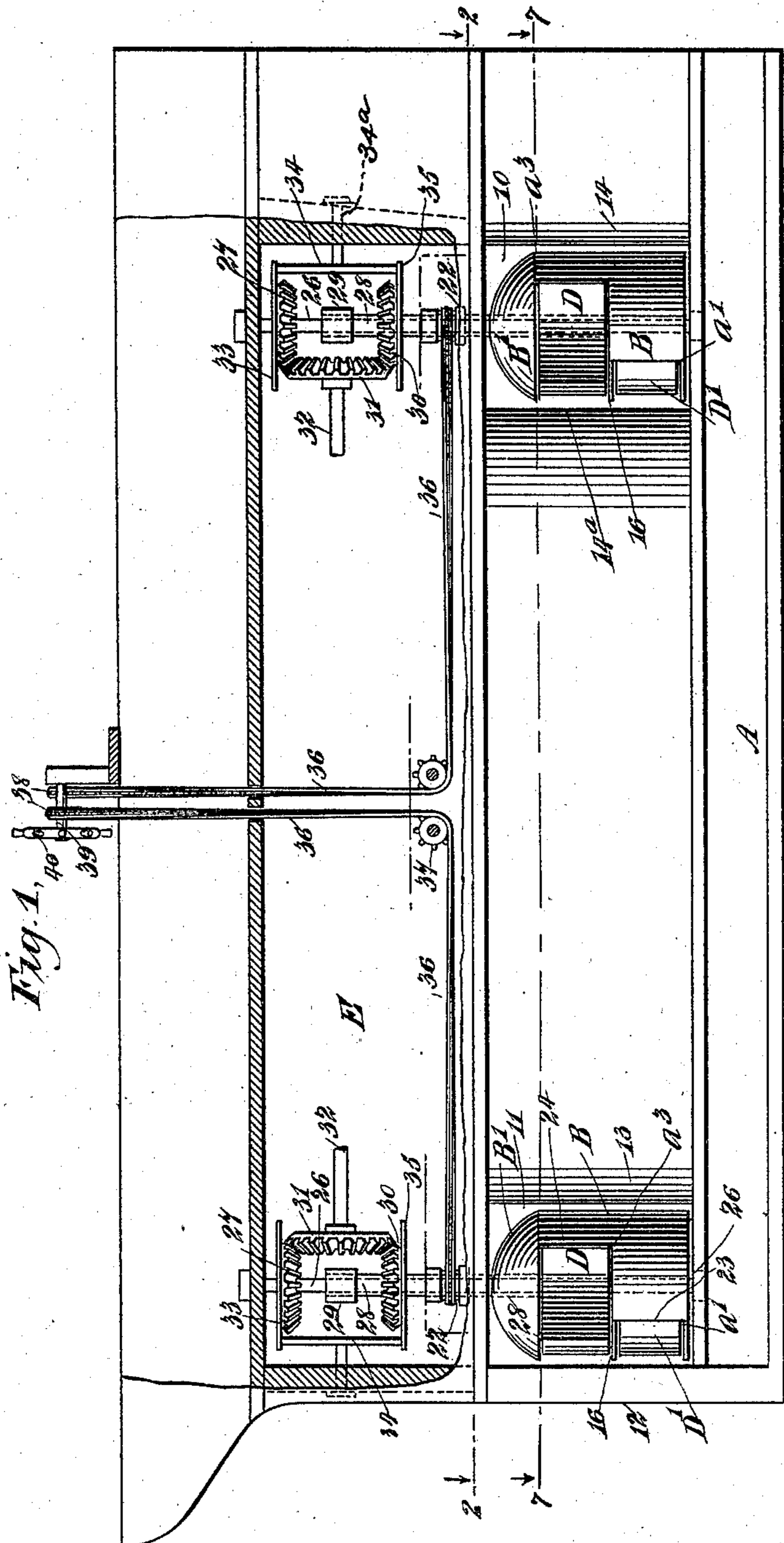
(No Model.)

3 Sheets—Sheet 1.

F. O. SLANKER.
PROPULSION OF VESSELS.

No. 575,178.

Patented Jan. 12, 1897.



WITNESSES:

Edward Thorpe
J. K. Acker

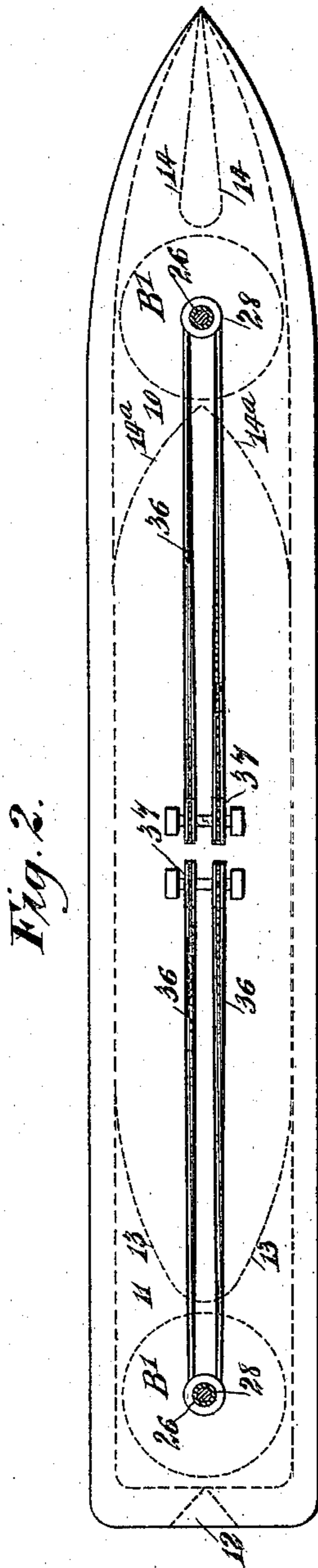


Fig. 2.

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Fig. 5.

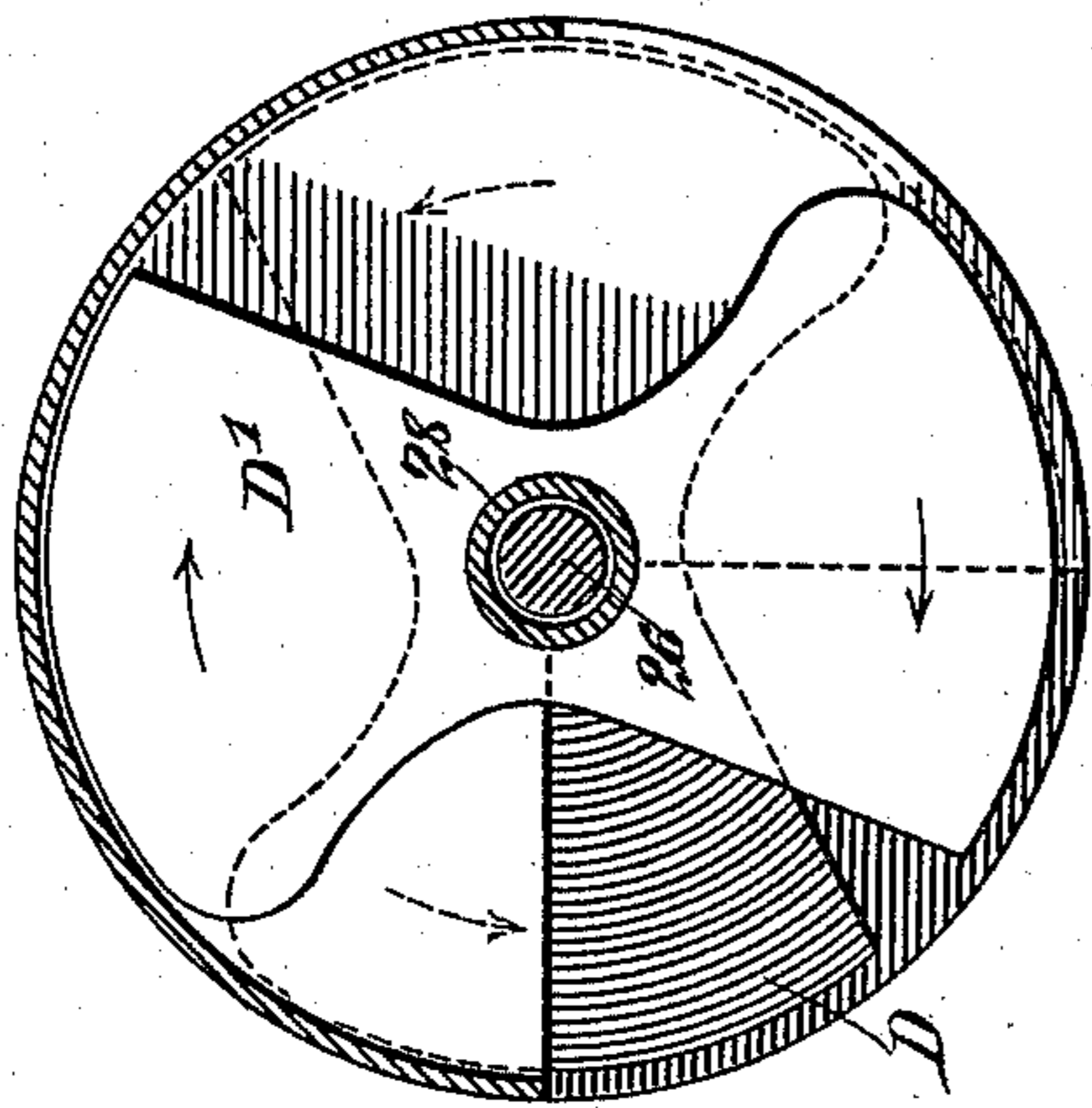


Fig. 6.

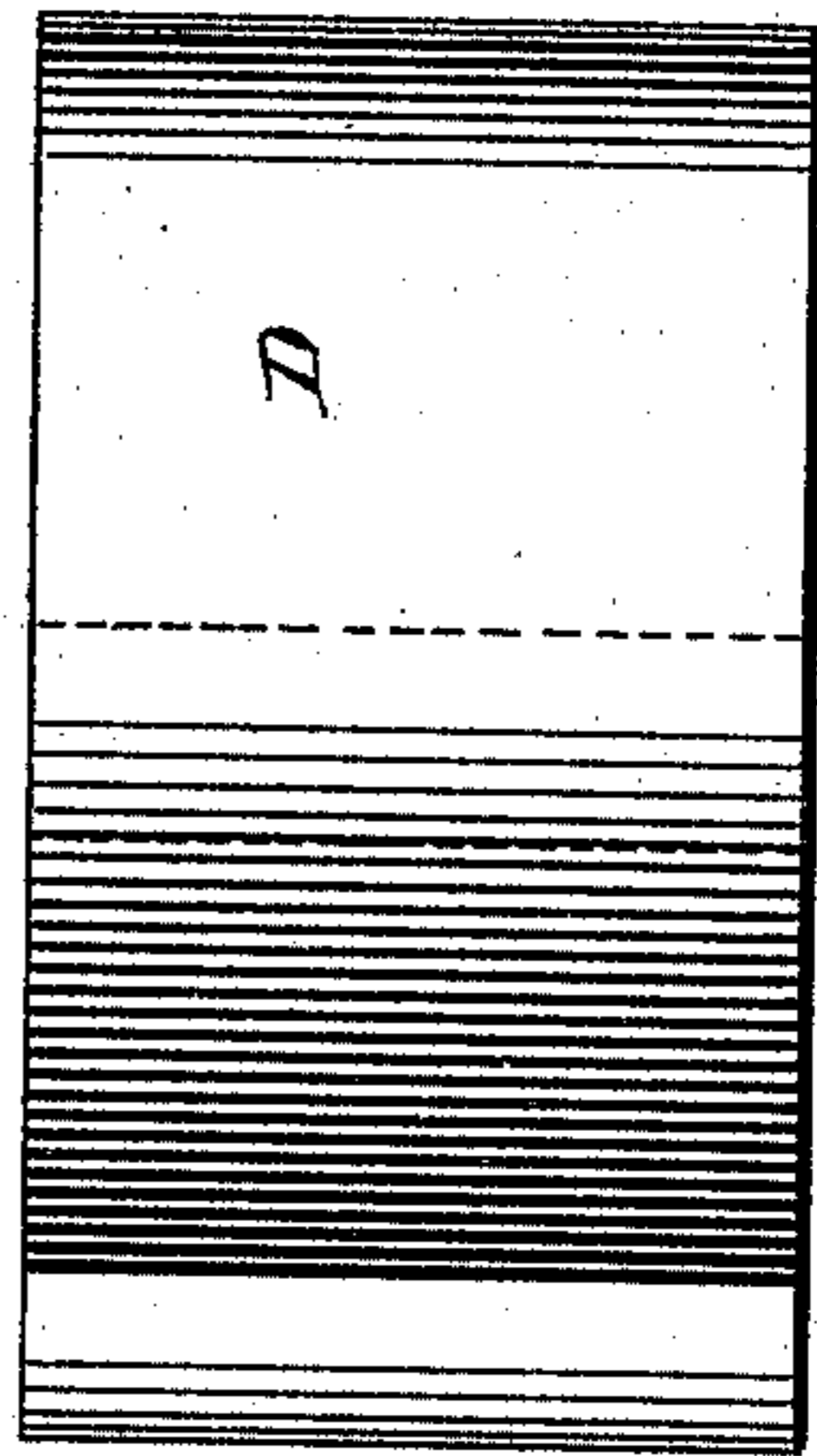


Fig. A.

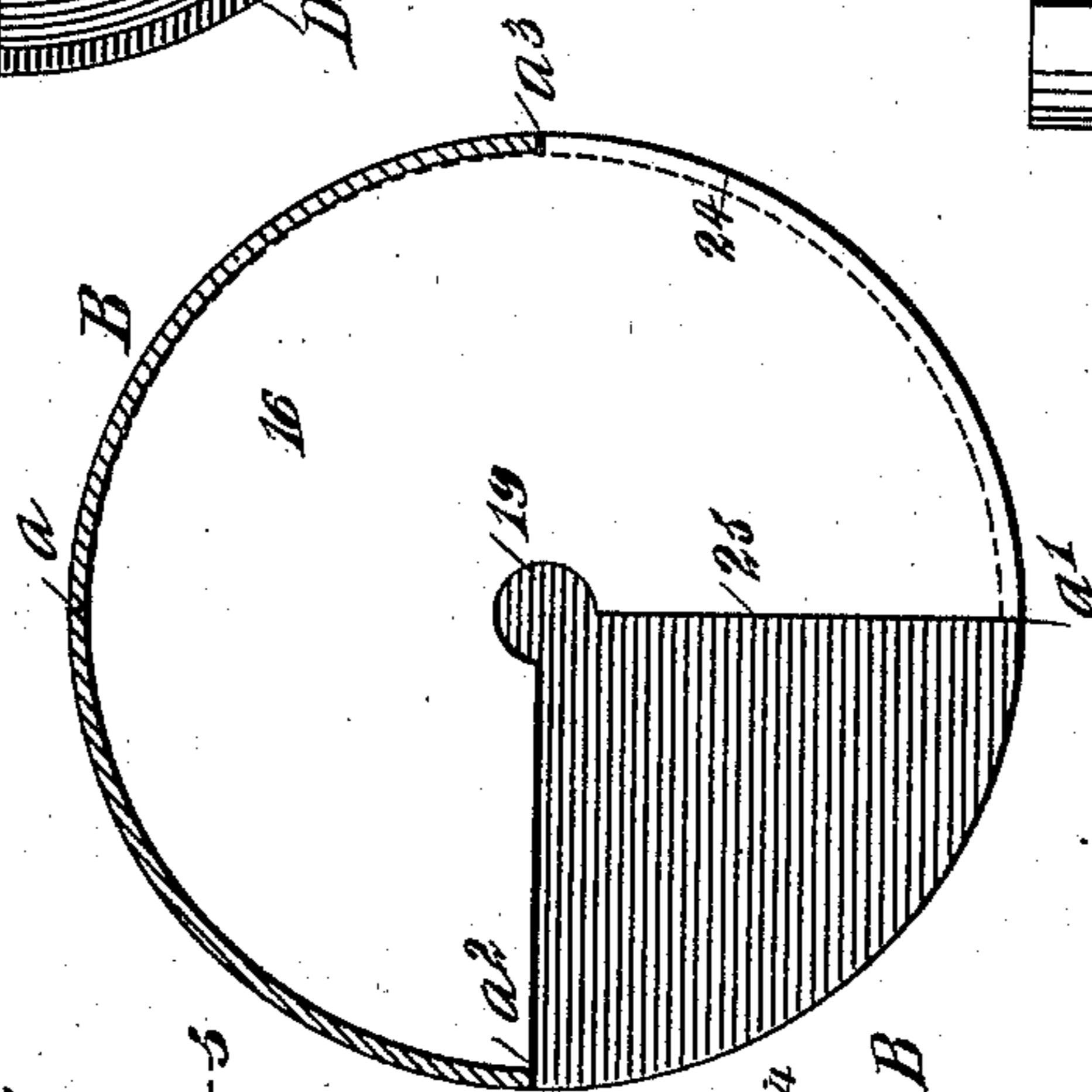
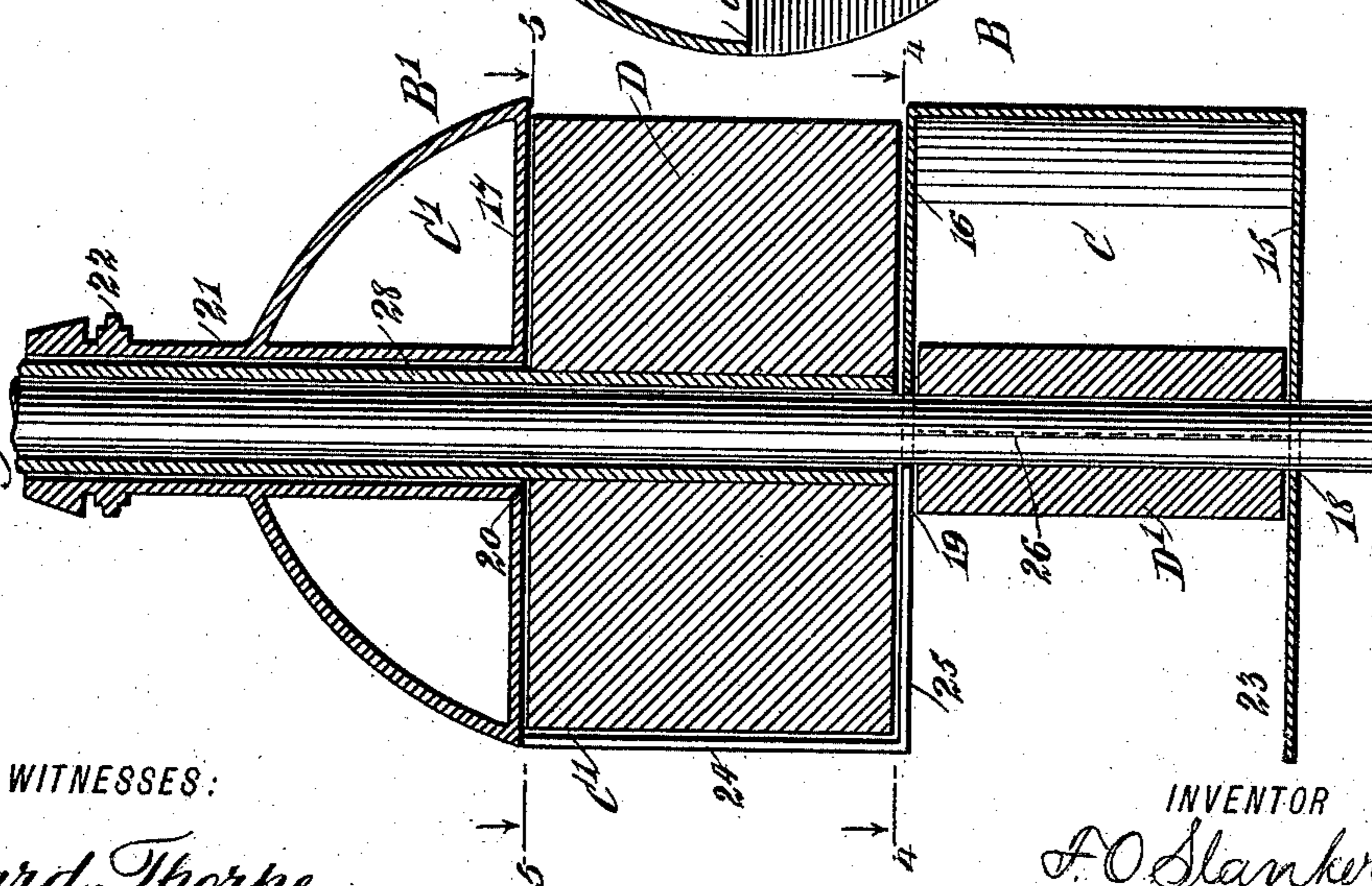


Fig. 3.



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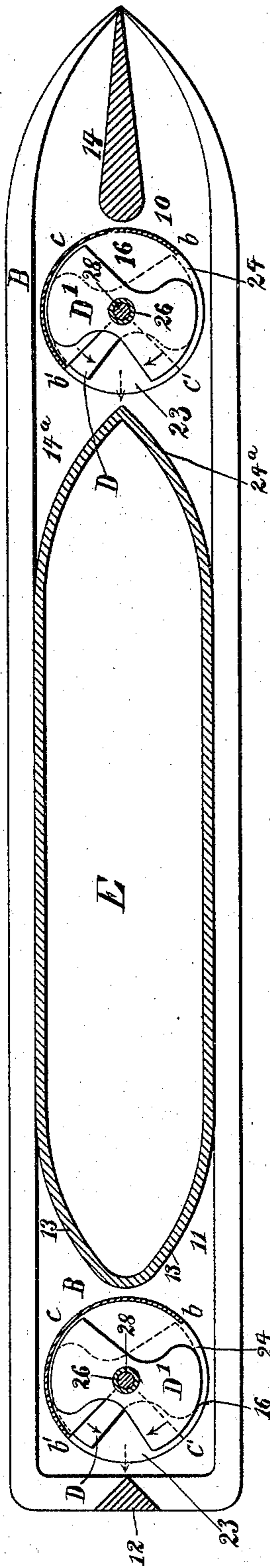


Fig. 7.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRANK OSCAR SLANKER, OF POMONA, CALIFORNIA.

PROPULSION OF VESSELS.

SPECIFICATION forming part of Letters Patent No. 575,178, dated January 12, 1897.

Application filed November 26, 1895. Serial No. 570,169. (No model.)

To all whom it may concern:

Be it known that I, FRANK OSCAR SLANKER, of Pomona, in the county of Los Angeles and State of California, have invented a new and useful Improvement in the Propulsion of Vessels, of which the following is a full, clear, and exact description.

My invention relates especially to an improvement in propellers and steering devices for vessels; and it has for its object to provide a means whereby the propeller and steering device may be combined, and whereby the combined propeller and steering device may be located at the bow and at the stern of a vessel's hull and manipulated so as to obtain a maximum of speed and expeditiousness in maneuvering.

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.

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.

Figure 1 is a partial side elevation and partial sectional view of a vessel's hull having the improvement applied thereto. Fig. 2 is a longitudinal section taken substantially on the line 2 2 of Fig. 1. Fig. 3 is an enlarged vertical section taken through the combined steering device and propeller. Fig. 4 is a horizontal section taken substantially on the line 4 4 of Fig. 3. Fig. 5 is a horizontal section taken practically on the line 5 5 of Fig. 3. Fig. 6 is a side elevation of one of the paddles of the propeller, and Fig. 7 is a horizontal section taken substantially on the line 7 7 of Fig. 1.

In carrying out the invention the hull of the vessel is provided with the usual keel A, but near the bow an opening 10 is made in the hull, extending through from side to side, and a corresponding opening 11 is made in the said hull at the stern and near the stern-post 12, the inner face of which stern-post constitutes one wall of the said stern opening 11, and is preferably somewhat triangular in cross-section, as shown in dotted lines in Fig. 2, its contracted surface facing the aforesaid stern opening. The body of the hull is made tapering upon each side in di-

rection of the said stern opening, presenting substantially a feather-edge, as shown at 13 in Fig. 1, and the front portion of the forward wall 14 of the bow opening 10 is made triangular, as is likewise the front portion of the rear wall 14^a, the hull being inclined upon both sides inwardly in direction of this opening. The rear wall 14^a is made quite sharp, as shown in dotted lines in Fig. 2, while the forward wall 14 is made of somewhat cylindrical form at its rear portion, and the same is true of the front portion of the rear or stern opening 11 in the hull, as shown in the same figure. Within each of the said openings 10 and 11 a combined steering device and propeller is located.

The steering device consists of a substantially cylindrical casing B, terminating in a conical cap or upper end B', and the propelling device is contained within the said casing and consists of two blades D and D', which are mounted to revolve in a manner to be hereinafter set forth. The bottom of the casing B is closed, as is likewise its top 17, and the said casing is provided with a preferably centrally-located and horizontal partition 16, as shown in Figs. 3 and 4, whereby the casing is divided into a lower compartment C and an upper compartment C'. The bottom of the casing is provided with an opening 18 at its center, the partition having a corresponding opening 19 made therein, and the top is provided with a registering opening 20, while a sleeve 21 is projected upward from the top 17 proper of the casing, being connected with the upper portion of the cap B' thereof, and this sleeve at its upper end has secured thereon a sprocket-wheel 22 or a gear of other shape.

The lower compartment C of the casing is open at the back and at one side, the said opening being designated as 23, while the upper compartment C' is likewise open at the back and at the opposite side, (designated as 24,) whereby the two openings 23 and 24 in the two compartments are practically at right angles to one another, and an opening or recess 25 is made in the central partition 16 of the casing at the back of the same, connecting, preferably, with the opening 19 at the center, and the opening or recess 25 is about one-fourth the circumference of the casing.

The opening 23 in the lower compartment of the casing extends from a point a (shown in Fig. 4) to a point a' , which latter point is in vertical alinement with one wall of the partition or recess opening 25, while the opening 24 in the upper compartment extends from a point a^2 at the opposite side of the partition-opening 25, as is also shown in Fig. 4. The two openings 23 and 24 extend a corresponding distance beyond opposite sides of the said rear opening 25.

The paddles D and D' are semicylindrical at their ends and are of such length and of such shape as to fit within the cylindrical steering-casing B, extending from side to side, and preferably these paddles are contracted at their central portions. The paddle D', which is located in the lower compartment C, extends from the bottom of the casing to the partition 16, being secured to a shaft which at its lower end extends below the casing and is journaled in the bottom of the opening in which the casing is placed, the journal-bearing being a water-tight one and located immediately over the keel. The said shaft 26 at its upper end is carried through the hull of the vessel, preferably to one of the decks, where it is suitably journaled, and at the upper portion of the hull is provided with a beveled gear 27, securely fastened to it. The upper end of the sleeve 21, connected with the casing, is carried up through a water-tight bearing located over the upper portion of the opening in which the casing is mounted to revolve and extends within the upper or carrying chamber of the hull a predetermined distance.

The second paddle D of the propeller is located in the upper compartment C' and is placed at a right angle to the lower paddle D'. The upper paddle is secured to a propeller-shaft 28, and this shaft is carried upward around the solid shaft 26, to which the lower paddle is attached, to a point within the main chamber E of the hull, and its upper end is journaled in a suitable bearing 29. This tubular shaft within the chamber E of the hull is provided with a beveled gear 30, secured thereto, facing the gear of the solid shaft 26, and the two gears are made to mesh with a vertically-disposed beveled gear 31, and the beveled gears 31 at both the stem and the bow of the vessel are secured to a driving-shaft 32 driven from the engine or other motor that may be employed.

In order that the gears 27, 30, and 31 shall not bind to too great an extent, a friction-disk is secured upon the upper gear 27 on the shaft 26, which engages with a spacing and likewise frictional disk 34, secured upon a separate or idler shaft 34^a, this latter friction-disk being also in engagement with a disk 35, secured to the tubular shaft 28 below its gear 30, as is best shown in Fig. 1.

An endless chain 36 is passed around each of the sprocket-wheels 22 of each of the rudder-casings B, and these chains are carried

horizontally within the hull-chamber E to about the center of the same and are then passed upward over sprocket-guides 37 to an engagement with sprocket-wheels 38, located, preferably, each upon the steering-shaft 39, and each shaft is provided with the usual steering-wheel 40 or its equivalent, as shown in Fig. 1. Thus it will be observed that by manipulating the aforesaid steering mechanism either of the rudder-cylinders may be turned independently. I do not limit myself to any particular connection between the said rudder-cylinders and the helms or the location of the latter.

When the vessel is running straight ahead, the paddles act upon the water commencing at the sides of the casing, the upper paddle striking the water at the point b and ceasing to act at a point b' , the lower paddle turning in a reverse direction, striking the water at a point c and ceasing to act on the water at the opposite point c' , as shown in Fig. 7, in which the rudder-casings are in position to direct the vessel straight ahead.

It is evident, for example, that if the stern-casing be turned half around it will stop the vessel, as the power will be applied in the reverse direction and the discharge of water will be just the same, as the hull of the vessel has no influence with receiving or discharging the water from the casing, no matter in what direction it is turned. This applies to both the bow and stern, rudder, and propeller. If the casing be turned only a quarter of a revolution, the vessel will be turned short in the direction reversed to that in which the casing is turned. The paddles move independent in opposite directions, but both paddles commence and cease action on the water at the same time.

The function of the openings 25 in the two partitions 16 is to make possible the existence of a continuous column of water at this point from the lower edge of the paddle D' to the upper edge of the paddle D, so that the paddles moving oppositely and having outwardly-extending sides will engage the opposite sides of an approximately triangularly-shaped column of water, this having a wedge-like action by which to give impetus to the vessel, as will be best seen by reference to Fig. 7. The paddles always rotate in the same relative direction, since they are neither reversed, no matter whether the vessel is going ahead, backing, or moving to port or starboard, since the direction in which the vessel moves is entirely controlled by the casings.

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

1. A combined rudder and propeller, comprising a casing mounted to revolve and having openings at angles to one another in one of its faces, shafts within the casing and paddles located within the said casing and respectively fixed to the shafts one paddle being opposite each of the aforesaid openings,

and the paddles being at angles to one another, the said casing and each of the said paddles being capable of independent movement, as and for the purpose specified.

5 2. A combined rudder and propeller, the rudder consisting of a revoluble cylindrical casing closed at the top and at the bottom, and provided with side openings at angles to one another, and a partition having openings
10 therein communicating with the aforesaid side openings, the propeller consisting of paddles located one in each compartment of the said casing, the paddles having the same arrangement relative to the side openings in the
15 casing, and each of the paddles being capable of independent movement, as and for the purpose set forth.

3. In a driving mechanism for vessels, the combination, with a steering apparatus consisting of a cylindrical casing closed at the top and bottom and provided with openings in the sides located one above the other and at right angles to each other, and a partition dividing the said casing into compartments,
25 in each of which one of the aforesaid openings occurs, the partition being provided with a recess communicating with both of the aforesaid openings, of a propelling device consisting of blades located one in each of the aforesaid compartments of the casing, capable of revolving therein and placed at a right angle to each other, a tubular shaft attached to one of the aforesaid blades, a shaft contained within the tubular shaft and secured to the
35 other of the said blades, a driving-shaft, independent gearing connecting the inner and outer paddle-shafts with the said driving-shaft, and a steering-shaft connected with the casing, all operated in substantially the manner herein set forth.

4. The combination, with a rudder consisting of a cylindrical casing closed at the top and bottom and provided with a partition dividing it into two compartments, each compartment being provided with a horizontal opening, the said openings being at right angles to each other, the said partition having an opening therein affording communication
45 between the two compartments and leading

into the aforesaid side openings, of a propeller consisting of paddles having semicylindrical ends and contracted centers, being adapted to revolve one within each of the said compartments of the cylinder, the said paddles being at right angles to each other, a solid
55 shaft secured to one of the paddles, a tubular shaft surrounding the solid shaft and attached to the other paddle, a driving-shaft, independent gearing connecting the said driving-shaft with each of the paddle-shafts, and
60 a steering apparatus having connection with the aforesaid cylinder, whereby the cylinder and each of the paddles are capable of independent movement, substantially as described.

5. In the construction of a vessel, a hull provided with an opening near the bow and near the stern, a combined propeller and rudder located within each of the said openings, a driving mechanism connected with the propellers, and a steering device connected with the rudders, the rudders being in the form of a casing provided with apertures, in which casings the rudders revolve, as and for the purpose specified.

6. In the construction of a vessel, a hull having a bow and a stern opening, a cylindrical casing constituting a rudder mounted to revolve in the said bow and in the said stern openings, each cylindrical casing having openings in its side at right angles to each other and located one above the other, propeller-paddles located within each casing opposite each of its side openings, the propeller-paddles having the same relation to each other
85 as the openings in the casings, a driving mechanism arranged to simultaneously operate all of the propeller-paddles and impart to corresponding paddles of each casing an independent and reverse movement, and a steering
90 device connected with the aforesaid casings, whereby the casings are turned independently of the movement of the said paddles, as and for the purpose set forth.

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Witnesses:

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W. T. SCOTT.