

No. 678,938.

Patented July 23, 1901.

F. BURGER & H. M. WILLIAMS.  
PROPULSION MECHANISM FOR BOATS.

(Application filed Nov. 4, 1899. Renewed Dec. 21, 1900.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.

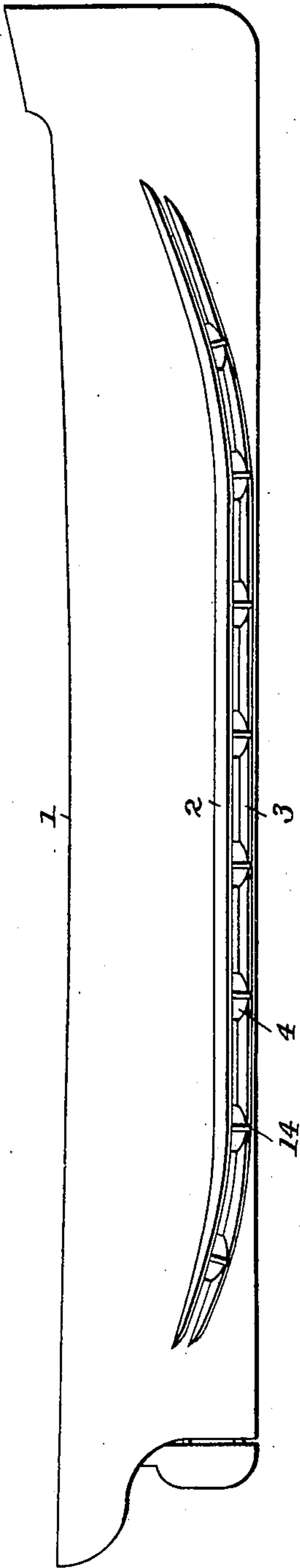
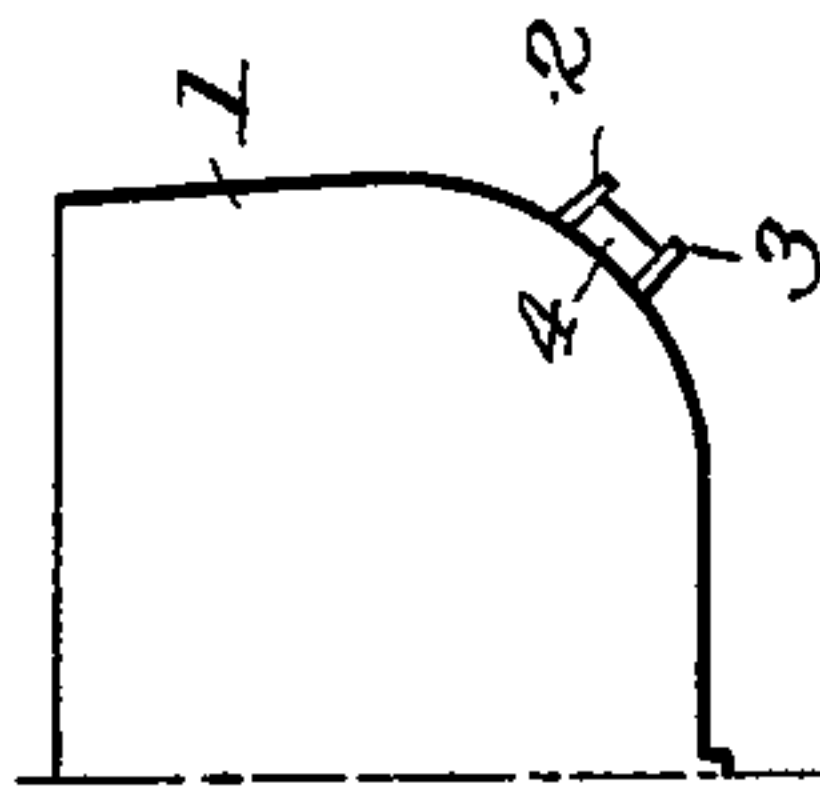


Fig. 4.



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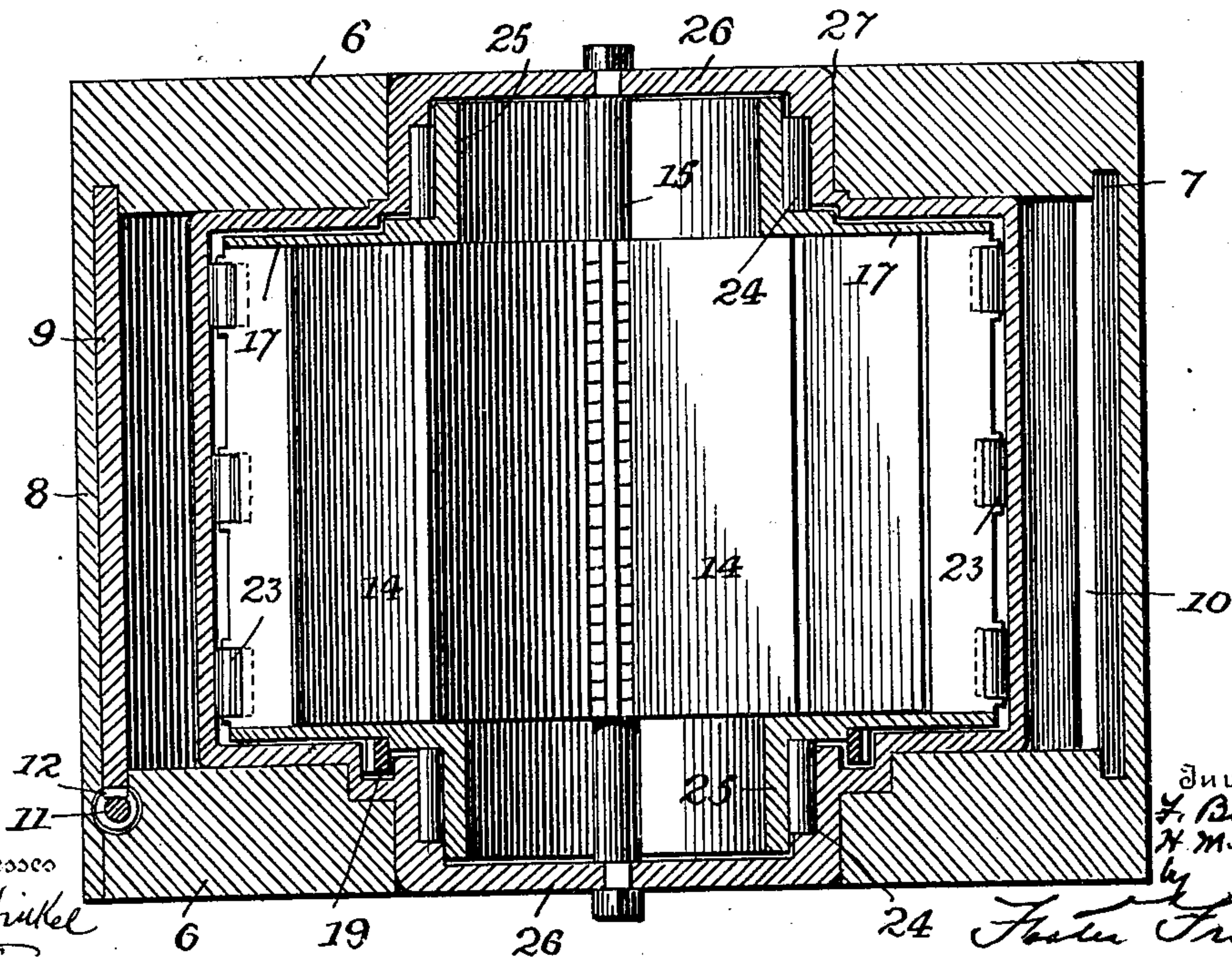
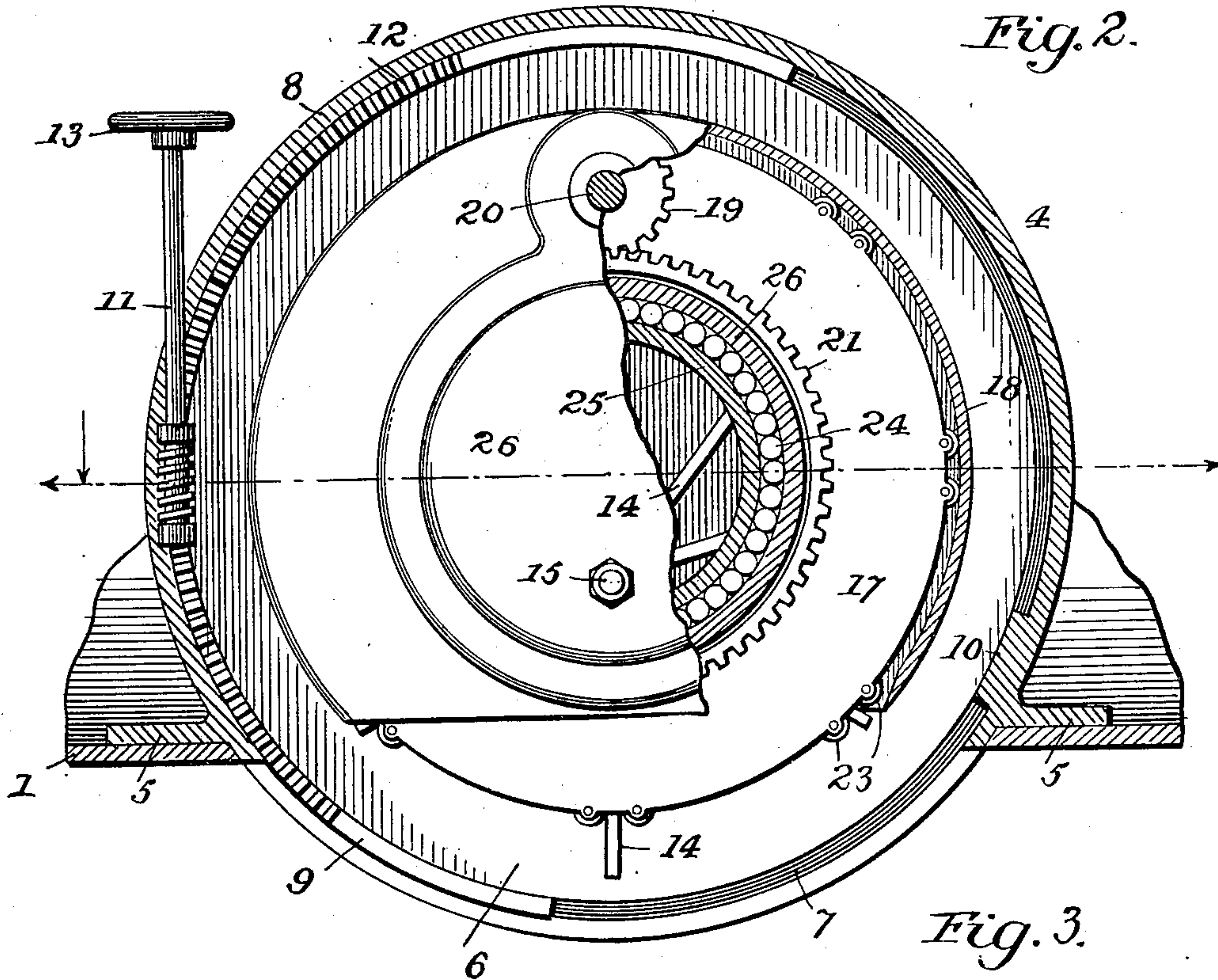
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3 Sheets—Sheet 2.



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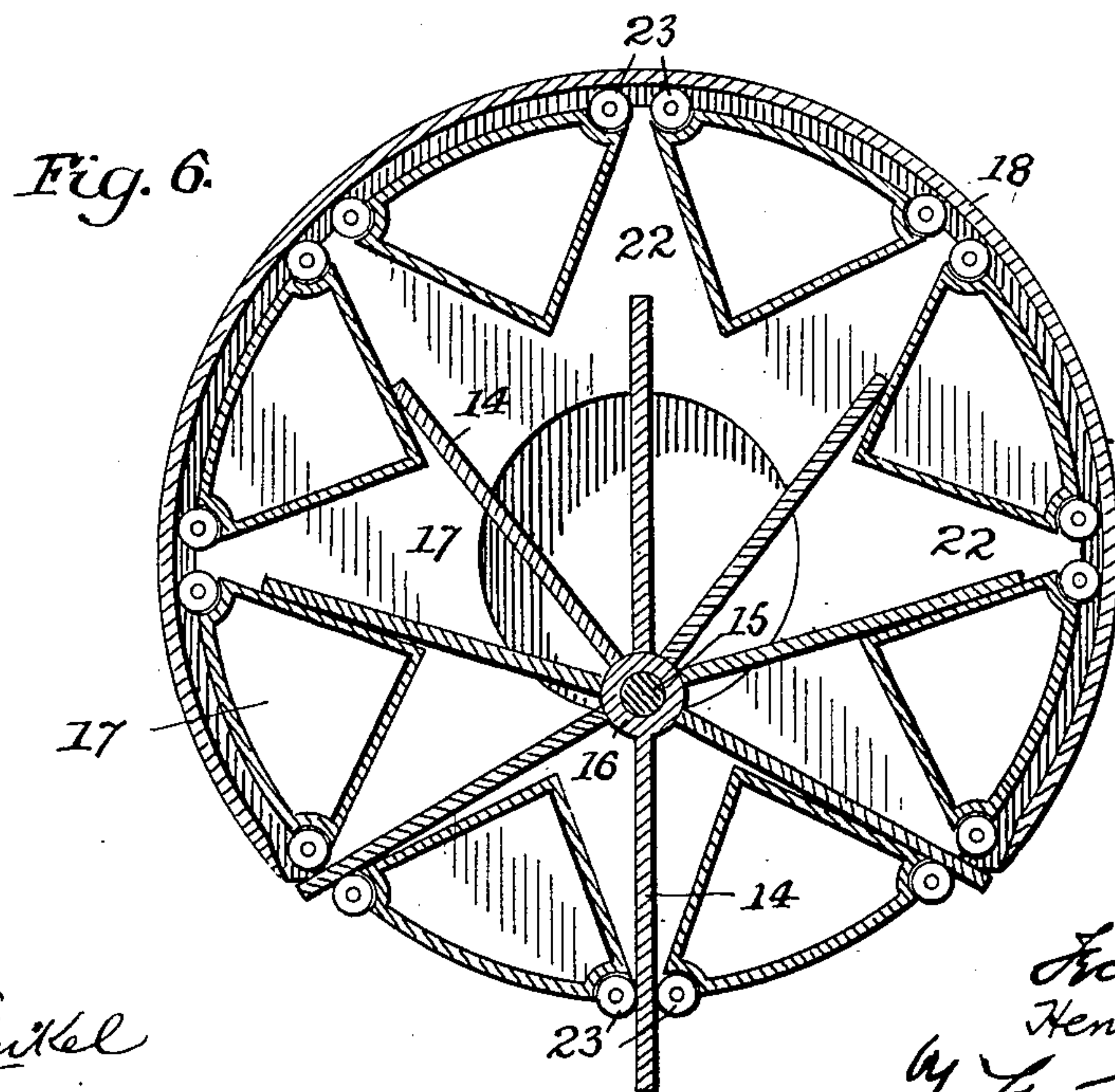
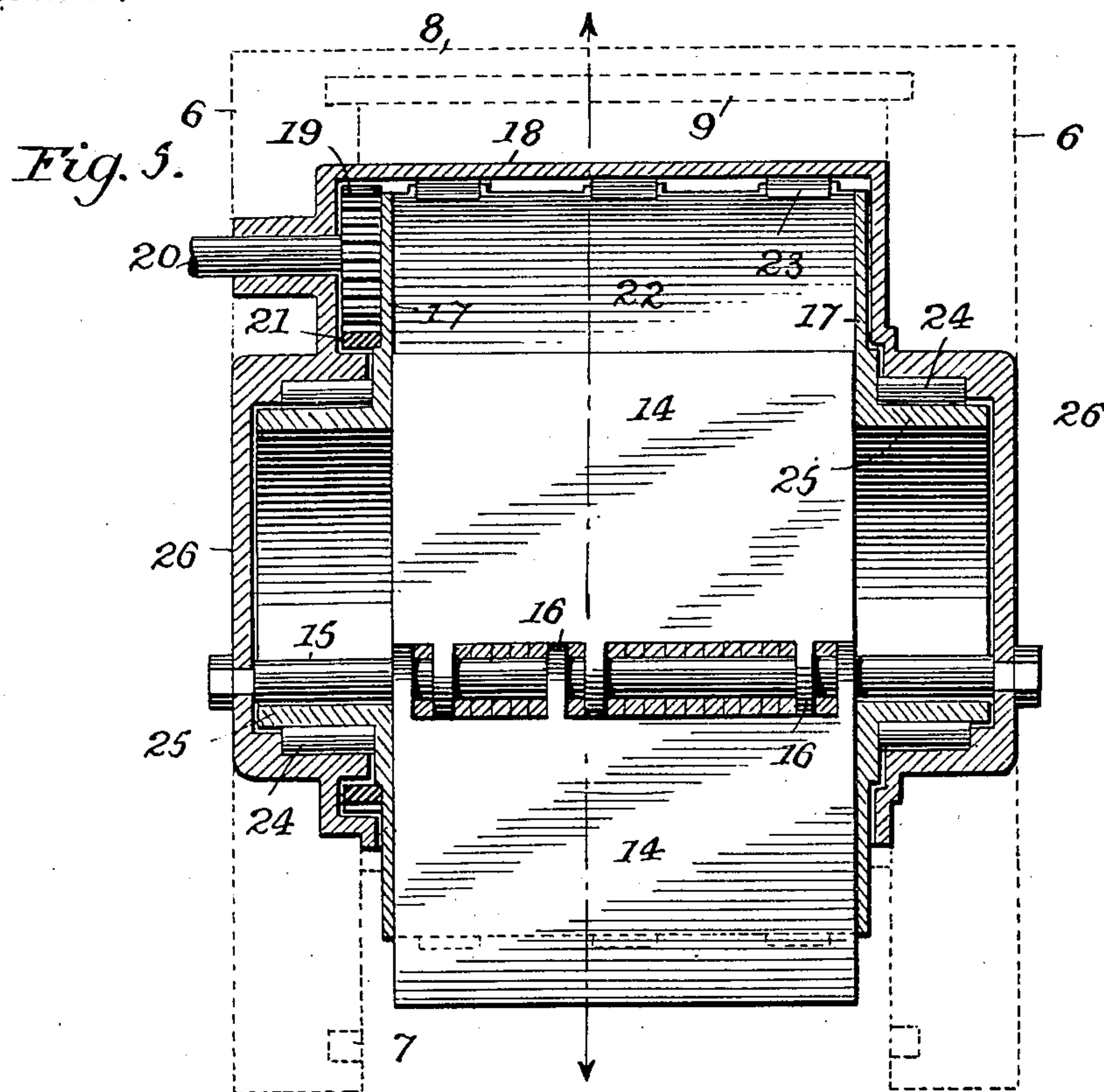
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(No Model.)

**3 Sheets—Sheet 3.**



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# UNITED STATES PATENT OFFICE.

FRANZ BURGER AND HENRY M. WILLIAMS, OF FORT WAYNE, INDIANA; SAID  
BURGER ASSIGNOR OF ONE-HALF OF HIS RIGHT TO SAID WILLIAMS.

## PROPULSION MECHANISM FOR BOATS.

SPECIFICATION forming part of Letters Patent No. 678,938, dated July 23, 1901.

Application filed November 4, 1899. Renewed December 21, 1900. Serial No. 40,687. (No model.)

*To all whom it may concern:*

Be it known that we, FRANZ BURGER and HENRY M. WILLIAMS, citizens of the United States, residing at Fort Wayne, in the county of Allen and State of Indiana, have invented a certain new and useful Improvement in Propulsion of Boats, of which the following is a specification.

Our invention relates to vessels and means for propelling the same whereby great speed may be obtained with slight rolling motion of the vessel, thereby contributing to the comfort and pleasure of passengers. We secure these ends by means of the combination and improved construction of the parts of a vessel and its propelling mechanism, as will be hereinafter more fully set forth.

In the accompanying drawings, in which the same reference-numeral indicates a corresponding part in each of the views in which it occurs, Figure 1 is a side elevation of a vessel embodying our invention. Fig. 2 is an end view, partly in section, of one of the propelling-wheels and its casing. Fig. 3 is an axial sectional view of one of the compartments, the propeller being shown in elevation. Fig. 4 is an end view of one side of the vessel, showing the bilge-keels to decrease the rolling motion of the vessel. Fig. 5 is an axial sectional view of one of the propellers, and Fig. 6 is a transverse sectional view of the same.

Referring more particularly to the drawings, 1 indicates a vessel, which may be of any size and construction. Projecting laterally from the sides of the vessel below the water-line are two bilge-keels 2 and 3, which preferably follow the lines of the vessel nearly the entire length thereof. These keels are substantially parallel with each other and are preferably continuous from end to end. The distance to which they may project from the sides of the vessel can be varied to suit conditions and circumstances.

By the use of two parallel keels upon each side of the vessel it is rendered more stable than it would be with only a single keel, as the two keels and the water between them virtually form one broad keel. In its passage from one side of one of the keels to the opposite side of the other keel as the vessel rolls

the water would form eddies or swirls between the keels, which would generate more friction than it would in passing around the thin edge of a single keel, and thereby have a greater tendency to counteract the rolling of the vessel.

At suitable points along the sides of the vessel between the keels openings are made for the reception of water-tight compartments 4, each of which is preferably provided with flanges 5, by means of which it is secured to the side of the vessel. These compartments are substantially segmental and may be formed integral, as shown in the drawings, or they may be formed from separate pieces joined together in the usual manner for making close joints. The top and bottom plates 6 of each of the compartments project beyond the side of the vessel a suitable distance, and when used in connection with the bilge-keels they form a portion thereof. They are made of sufficient thickness to fully protect the propeller within the compartment and also to permit of a groove 7 being formed adjacent to the vertical wall 8, within which is located a sliding gate 9. The gate is of the same curvature as the wall of the compartment and is of such length that it will completely close the outer portion of the compartment or the portion extending between the side walls of the opening in the vessel within which the compartment is located. At one end of the wall of the compartment a vertical stop or shoulder 10 projects inward a short distance, against which the end of the gate abuts when it is closed, thereby making a close joint to exclude the water from the compartment. The gate may be moved around in the grooves 7 by any suitable means; but we prefer to use a screw-threaded shaft 11, which is journaled at the top of the casing and engages with suitable teeth 12, formed in the upper edge of the gate. The inner end of the shaft, which is convenient of access upon the interior of the vessel, is provided with a hand-wheel 13, by means of which a very powerful leverage is secured for operating the gate. The teeth in the upper edge of the gate are of a less length than the depth of the groove in the top plate, so that when the gate is closed the water cannot pass through the



spaces between them. Located within each compartment is a suitable propeller of any kind, which is provided with an independent motor, preferably electrical, but not shown in the drawings. By providing each propeller with a separate motor and providing each compartment with a gate the propeller can be stopped and repaired without stopping any one of the other propellers, thus decreasing the danger of delay on the passage and avoiding the necessity of putting the vessel in the dock at the end of the journey, access being had to the interior of the compartment in any suitable manner. By providing each propeller with an independent motor, as an electrical motor, the speed of the motors can be increased toward the stern to compensate for the rearward movement of the water caused by the action of the forward propellers.

The form of propeller we prefer using consists of a series of blades or paddles 14, pivotally secured to a rigid shaft 15 by means of eyes 16 and caused to move around the shaft by means of a rotary drum 17, which is rotated within a semicylindrical casing 18. The drum is rotated by a gear-wheel 19 on the motor-shaft 20, which engages with a gear wheel or rim 21, secured to one end of the drum. As the drum and paddles must move in different circles to cause the paddles to project beyond the wall of the drum when in engagement with the water, the drum is located concentrically within the casing 18, which is suitably secured in the compartment 4, and the shaft 15, on which the paddles rotate, is located eccentrically to both of them and between their common center and the side of the vessel. The drum 17 is formed or provided with triangular compartments 22, the outer wall of each of which corresponds with the curvature of the casing 18 and their inner walls are at such an angle to each other and terminate at such a distance from the center that the blades or paddles 14 will not interfere therewith, but will be forced outward between the adjacent compartments as the casing is rotated. To reduce the friction between the parts, antifric-tion-rollers 23 are journaled at the adjacent edges of the compartments to engage with the paddles, and similar rollers 24 are placed between the journals 25 of the drum 17 and the bearing therefor in the casing 18. As the ends of the shaft 15 are rigidly secured in the top and bottom plates of the casing 18, eccentrically to the axis or center of motion of the drum 17, it is necessary to make the journals of the drum hollow, so as to extend beyond the shaft and not interfere therewith as the drum is rotated. The bearings for these large hollow journals is preferably formed by cupping the ends of the casing, as shown at 26, and within which the antifric-tion-rollers 24 are located.

In practicing our invention we provide the vessel with as many propellers and compartments as desirable, and where we use the

bilge-keels they are connected with the projecting portions of the plates 6 to form a continuation thereof. The gates 9 are opened as far as desirable and power is applied to the motor-shafts 20. As the drums 17 are rotated the paddles 14 are successively projected through the slots or openings between the compartments 22 and by their engagement with the water propel the vessel forward. If desired, the bilge-keels may be made continuous and the top and bottom plates 6 of the compartments may only extend out to the side of the vessel and abut against the inner edges of the upper and lower keels, respectively.

When the form of propeller is used as above described, the plates 6 are preferably recessed or perforated, as shown at 27, for the reception of the bearings 26.

Having described our invention, we claim—

1. The combination with a vessel, of a plurality of parallel bilge-keels projecting laterally from the sides thereof, and a series of propellers between said keels.
2. The combination with a vessel, of two parallel bilge-keels extending nearly the entire length of each side of the vessel and projecting laterally therefrom, the sides of the vessel being provided with a series of openings between the keels, a water-tight compartment in each opening, and a propeller in each compartment.
3. The combination with a vessel, each side of which is provided with a series of openings, of a water-tight compartment in each opening, the top and bottom plates of which project beyond the sides of the vessel and are each provided with a groove, a gate in said grooves, means for sliding the gate therein and a propeller in the compartment.
4. The combination with a vessel, each side of which is provided with a series of openings, of a water-tight compartment in each opening, the top and bottom plates of which project beyond the side of the vessel and are each provided with a groove, a gate in said grooves, the upper edge of which is provided with teeth, a screw-threaded shaft journaled in the compartment in engagement with said teeth, and a propeller in the compartment.
5. The combination with a vessel, each side of which is provided with a series of openings, of a compartment in each opening, a casing in each compartment, a slotted drum in the casing, a portion of which projects beyond the side of the vessel, a series of blades within the drum, and means for projecting said blades through the slots as they pass beyond the sides of the vessel.
6. The combination with a vessel, each side of which is provided with a series of openings, of an open-sided compartment in each opening, a casing in the compartment, a slotted drum in the casing, a portion of which projects beyond the side of the vessel, and the top and bottom plates each provided with a hollow journal, a shaft through the drum



and the hollow journals and having its ends secured to the casing, a series of blades pivotally secured upon the shaft, the outer ends of which project through the slots as they pass beyond the sides of the vessel, and means for rotating said drum.

7. The combination with a vessel, each side of which is provided with a series of openings, of an open-sided compartment in each opening, a semicylindrical casing in each compartment, a drum in each casing, the wall of which is provided with a series of triangular compartments adjacent to each other, the outer walls of which are curved and the inner walls terminate at a point distant from the center, a portion of said drum projecting beyond the sides of the vessel and each end being provided with a hollow journal, a shaft through the drum and the journals and secured at its ends in the casing, a series of blades pivotally secured upon said shaft, the outer ends of which project between the compartments of the drum as they pass beyond the sides of the vessel, a gear-rim secured to

the top of the drum, and a motor gear-wheel in engagement with said rim. 25

8. The combination with a vessel, each side of which is provided with a series of openings, of an open-sided compartment in each opening, a semicylindrical casing in the compartment, a slotted drum journaled concentrically within the casing, a portion of which projects beyond the sides of the vessel, a shaft through the drum eccentrically thereto and between the side of the vessel and the common center of the drum and the casing, a series of blades upon the shaft, the ends of which project through said slots as they pass beyond the side of the vessel, and means for rotating the drum. 30 35 40

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

FRANZ BURGER.

HENRY M. WILLIAMS.

Witnesses:

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C. B. WATERS.