(No Model.) 3 Sheets—Sheet 1.

A. ROSENHOLZ.

WAVE POWER MOTOR.

No. 472,398. Patented Apr. 5, 1892.

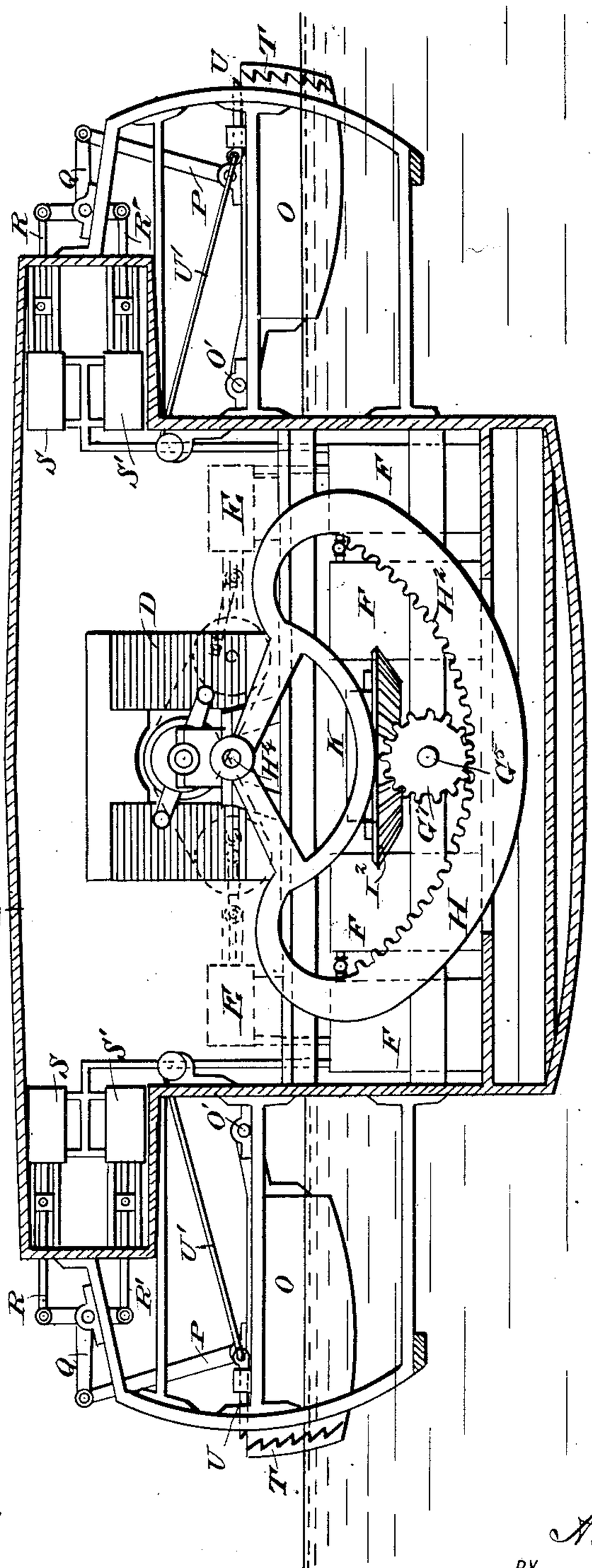

Fig. 1.

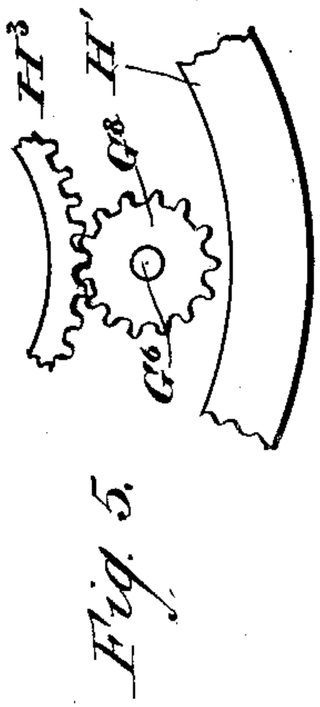

Fig. 5.

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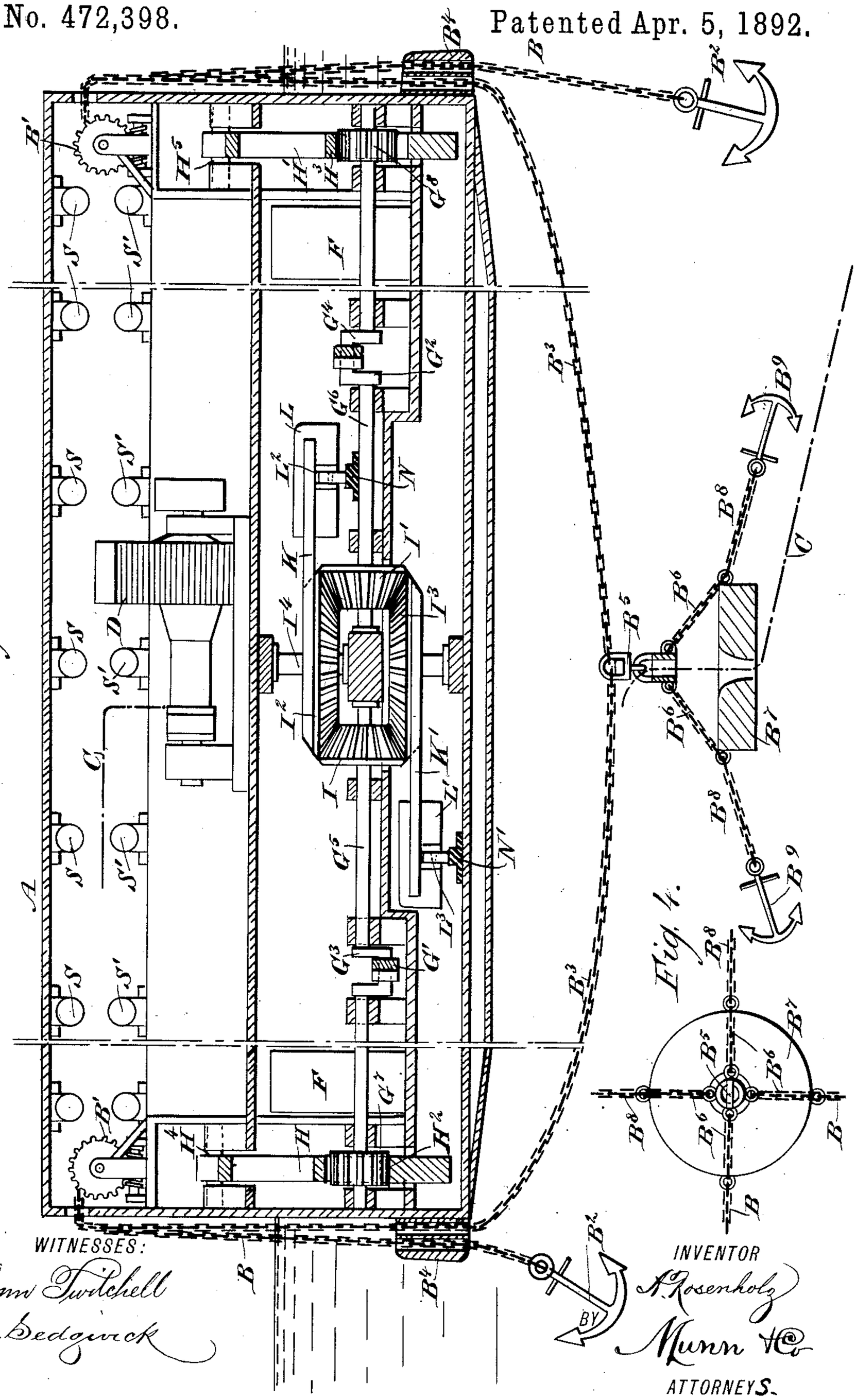

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(No Model.) 3 Sheets—Sheet 3.

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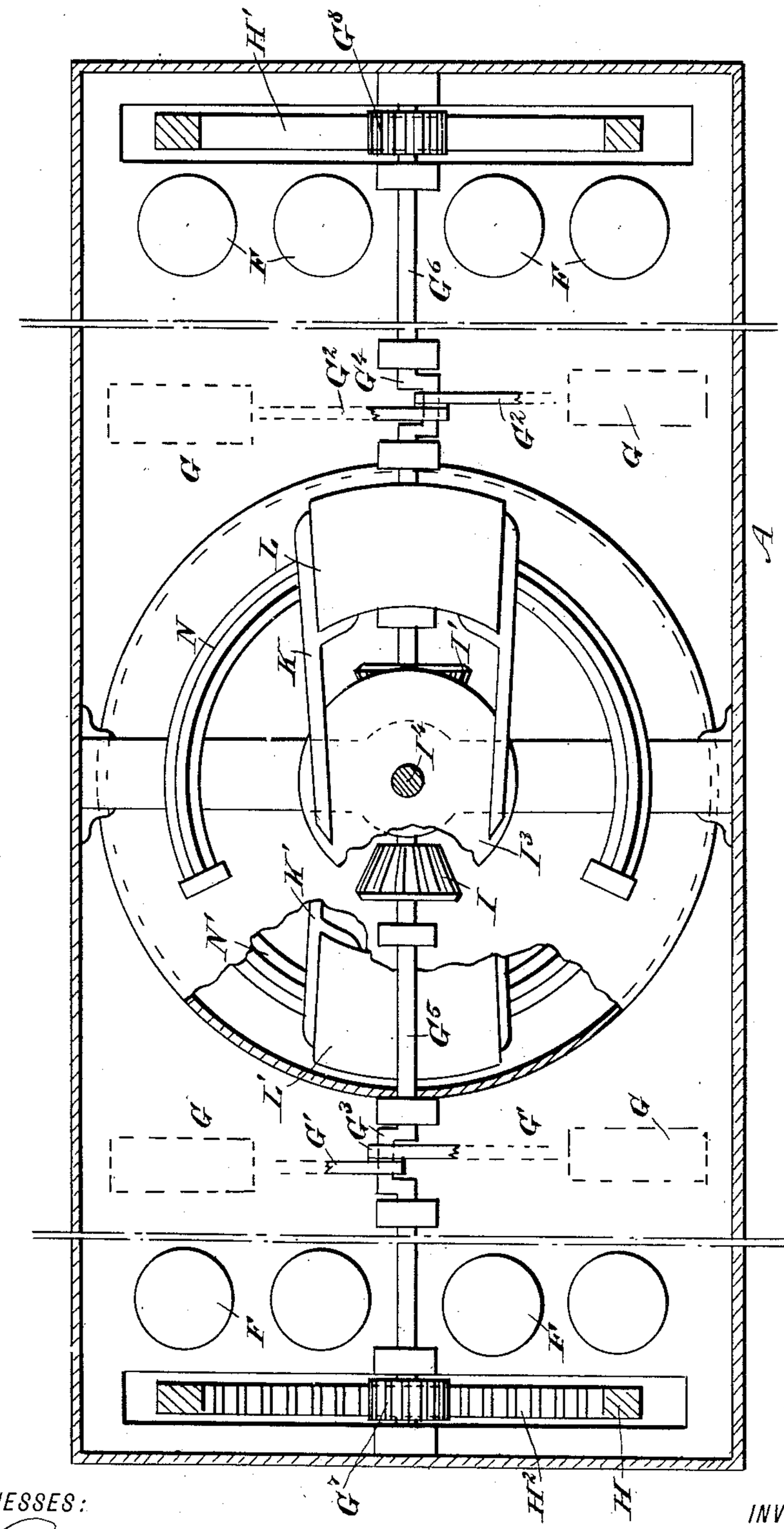

Fig. 3.

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UNITED STATES PATENT OFFICE.

ALFRED ROSENHOLZ, OF WARDNER, IDAHO.

WAVE-POWER MOTOR.

SPECIFICATION forming part of Letters Patent No. 472,398, dated April 5, 1892.

Application filed July 8, 1891. Serial No. 398,839. (No model.)

To all whom it may concern:

Be it known that I, ALFRED ROSENHOLZ, of Wardner, in the county of Shoshone and State of Idaho, have invented a new and Improved Wave-Power Motor, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved wave-power motor which is simple and durable in construction, very effective in operation, and arranged to be located any desired distance from the shore to receive the full force of the waves.

The construction, arrangement, and combination of parts are as hereinafter described.

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

Figure 1 is a transverse section of the improvement. Fig. 2 is a longitudinal section of the same. Fig. 3 is a sectional plan view of part of the same. Fig. 4 is a plan view of one of the anchors, and Fig. 5 is an end elevation of part of the gearing.

The improved wave-power motor is provided with a suitably-constructed vessel A, adapted to float on the water and held in place by two cables or anchor-chains B, each carrying an anchor B^2 and arranged opposite each other on opposite sides of the vessel. Each chain is connected at its upper end with a windlass B′ for raising or lowering the anchor B^2, according to the depth of the water. The ends of a chain B^3 are also connected with the windlass B′ and pass through guide-blocks B^4, through which also pass the anchor-chains B. The blocks are secured on opposite sides of the vessel, near the bottom, and form a pivot for the vessel to rock on. The chain B^3 is connected at its middle with a swivel connection B^5, connected by chains B^6 with a heavy weight B^7, connected by short chains B^8 with anchors B^9 for holding the weight in place on the bottom of the sea. The weight B^7 is provided with a central opening for the passage of the cable or cables C, extending from the shore, passing through the weight and to the interior of the vessel A, to be connected with dynamo-machines D, located in the said vessel and driven by air-engines E, deriving their motive power from reservoirs F, filled with compressed air from air-reservoirs G, actuated by a special mechanism set in motion by the rocking of the vessel.

The air-compressors G are preferably arranged in two sets, and the sets are connected by pitmen G′ and G^2 with crank-arms G^3 and G^4, respectively, secured on the shafts G^5 and G^6, respectively, extending longitudinally and mounted to turn in suitable bearings located within the vessel A. The shafts G^5 and G^6 carry the gear-wheels G^7 and G^8, respectively, of which the former is in mesh at its bottom with segmental gear-teeth II^2, held on a segment II, secured on a shaft II^4 in the vessel A. The other gear-wheel G^8 engages at its top segmental teeth II^3, formed on a segment H′, similar in construction to the segment II, and pivoted on a short shaft II^5, arranged in line with the shaft II^4. (See Figs. 2 and 5.) The inner ends of the shafts G^5 and G^6 carry the bevel-pinions I and I′, respectively, both meshing into the bevel gear-wheels I^2 and I^3, arranged opposite each other on opposite sides of the said pinions I and I′, and both being secured on a vertically-arranged shaft I^4.

On the top of the gear-wheel I^2 is secured an outwardly-extending frame or arm K, and a like arm or frame K′ extends from the underside of the bevel gear-wheel I^3. The outer ends of the arms K and K′ carry the weights L and L′, respectively, provided at their under sides with friction-rollers L^2 and L^3, respectively, mounted to travel on semicircular tracks N and N′, respectively, arranged horizontally within the vessel A. As the latter is connected at its ends with the anchor-chains B it is free to rock from side to side, so that this rocking motion of the vessel causes the segments II and II′ to swing, whereby the gear-wheels G^7 and G^8 are rotated, thereby rotating the shafts G^5 and G^6, which actuate the air-compressors G. The motion of the shafts is also transmitted by the bevel-pinions I and I′ to the gear-wheels I^2 and I^3, so that the weights L and L′ are caused to swing forward and backward on the tracks N and N′, it being understood that the said weights travel in opposite directions. The weights L and

L′ thus serve as a governor for the shafts G^5 and G^6. The rotary motion of the latter is transmitted by the crank-arms G^3 and G^4 and pitmen G′ and G^2 to the air-compressors, which discharge the compressed air into the reservoirs F, from which the air-engines E derive their supply. The air-engines drive the dynamos, and the electricity generated by the latter is passed through the cables C to the shore to be utilized for various purposes.

On each side of the vessel A are arranged a number of weighted floats O, each pivoted at O′ to the side of the vessel, as is plainly shown in Fig. 1. Each weighted float O is pivotally connected by a link P with a three-armed lever Q, connected with the piston-rods R and R′ of the air-compressors S and S′, respectively, discharging the compressed air into the air-reservoirs F, located within the vessel A. The compressed air in the reservoirs F is utilized for various purposes, principally, however, as above stated, for the air-engines E, located within the vessel.

Each of the weighted floats O is provided with an upwardly-extending toothed arm T, adapted to be engaged by a bolt U, fitted to slide in suitable bearings on the frame-work extending from the sides of the vessel and forming part of the support for the compressors S and S′. Each bolt is connected with a rod U′, extending into the casing and under the control of the operator. By engaging the bolt U with the toothed arm T the respective weighted float can be locked in place to prevent it from actuating its air-compressors. By these means any set of air-compressors can be stopped whenever desired. The weighted floats O are sufficiently heavy to sink about half-way down into the water, so that when the waves exert their power on the float it will rise, and thus give the same pressure to the working parts as when the float is going down on the receding of the waves.

The dynamo-machines D, air-compressors G, S, and S′, reservoirs F, and air-engines E are not shown in detail, as they may be of any approved construction, and therefore further description of them is not deemed necessary.

It is understood that when the vessel A leans to one side, this being caused by the action of the waves, then the two weights L and L′ travel in opposite directions on their tracks until they meet at the lower side of the vessel, and when the vessel keels over to the opposite side the weights run back, but in opposite directions to their former positions. By raising either anchor-chain B the vessel will swing around with its head to the wind, so that the waves have no effect on the vessel, and consequently the rocking motion of the latter ceases and the entire interior machinery is stopped.

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

1. In a wave-motor, the combination, with a vessel adapted to rock and air-compressors arranged as shown, of the horizontal shafts H^4 H^5, the vertical rocking segments H and H′, mounted thereon and having teeth projecting upward and downward, respectively, as shown, the horizontal rock-shafts G^5 and G^6, gears G^7 and G^8, and pinions I and I′, mounted thereon, the bevel-gears I^2 and I^3, meshing with said pinions, and weighted arms adapted to swing with said vessel, as shown and described.

2. In a wave-power motor, the combination, with a vessel floating in the water and anchor-chains connected with the ends of the said vessel, of driving-shafts mounted to turn within the said vessel and adapted to be actuated by swinging weights receiving their motion when the vessel rocks, substantially as shown and described.

3. In a wave-power motor, the combination, with a vessel adapted to float in the water and anchored at its ends to be free to rock sidewise, of weighted arms mounted to swing within the said vessel and main shafts adapted to be turned by the rocking motion of the said weights, the said shafts being connected with air-compressors located in the vessel, substantially as shown and described.

4. In a wave-power motor, the combination, with a vessel adapted to float in the water and anchored at its ends to be free to rock sidewise, of weighted arms mounted to swing within the said vessel, main shafts adapted to be turned by the rocking motion of the said weights, the said shafts being connected with air-compressors located in the vessel, and cables leading from the dynamos in the said vessel through the anchors and then to the shore, substantially as shown and described.

5. In a wave-power motor, the combination, with a vessel containing the motor adapted to drive dynamo-machines located in the said vessel, of chains connected with the ends of the said vessel, weights hung on said chains and anchored at the bottom of the sea, and cables leading from the dynamo-machines in the said vessel through the said weights to extend to the shore along the bottom of the sea, substantially as shown and described.

ALFRED ROSENHOLZ.

Witnesses:
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CLEMENS WEYER.