

I. B. ROLKA.
PROPELLER OPERATING MEANS.
APPLICATION FILED APR. 6, 1910.

984,393.

Patented Feb. 14, 1911.

3 SHEETS-SHEET 1.

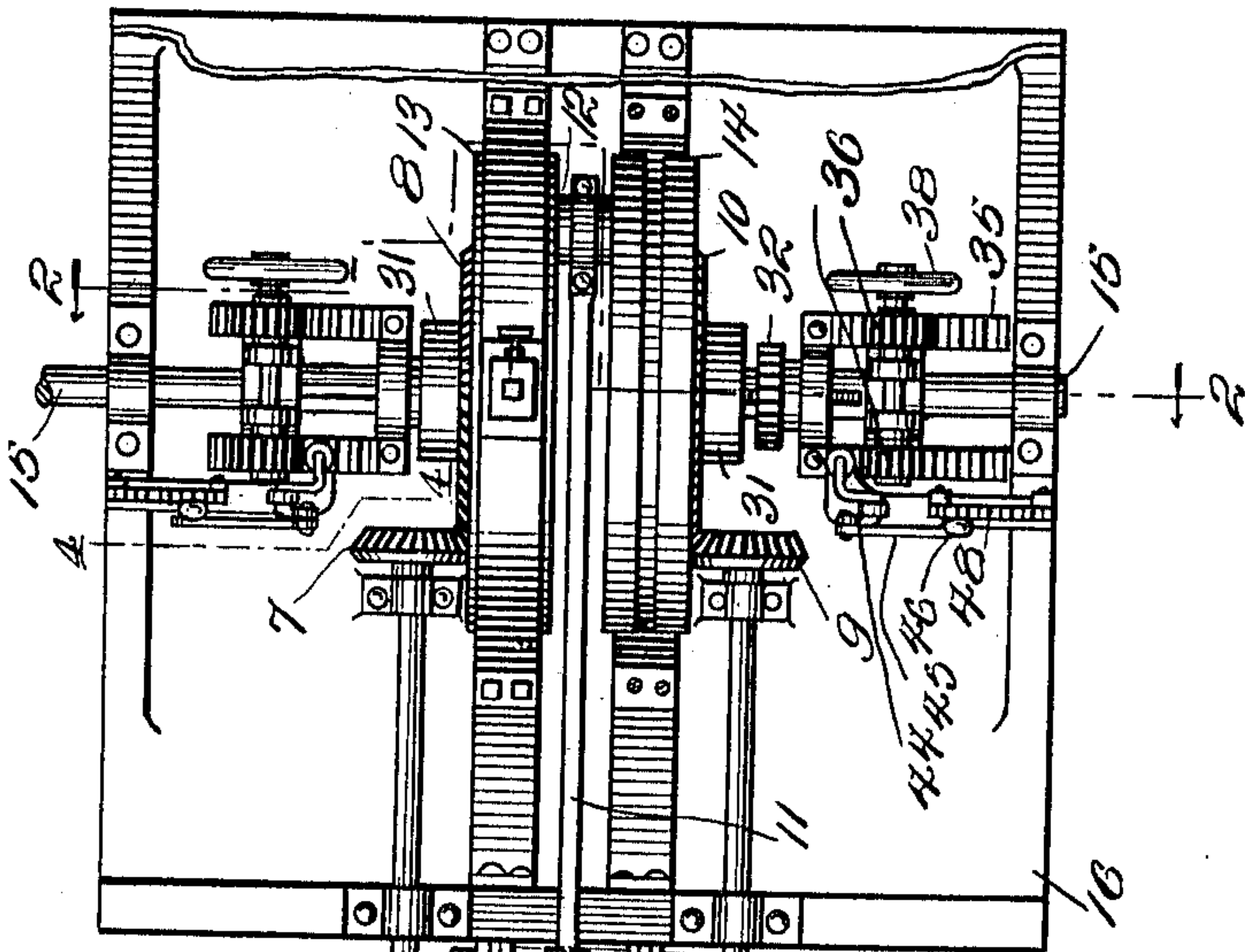


Fig. 1.

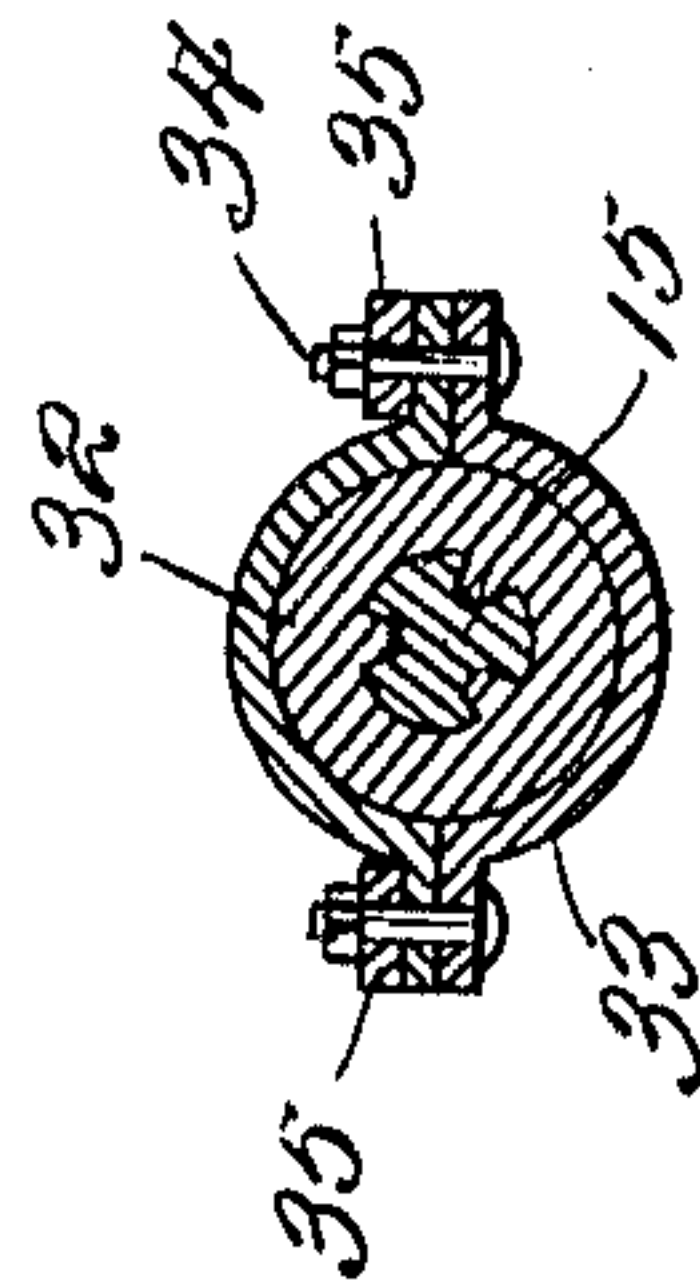


Fig. 8.

Witnesses

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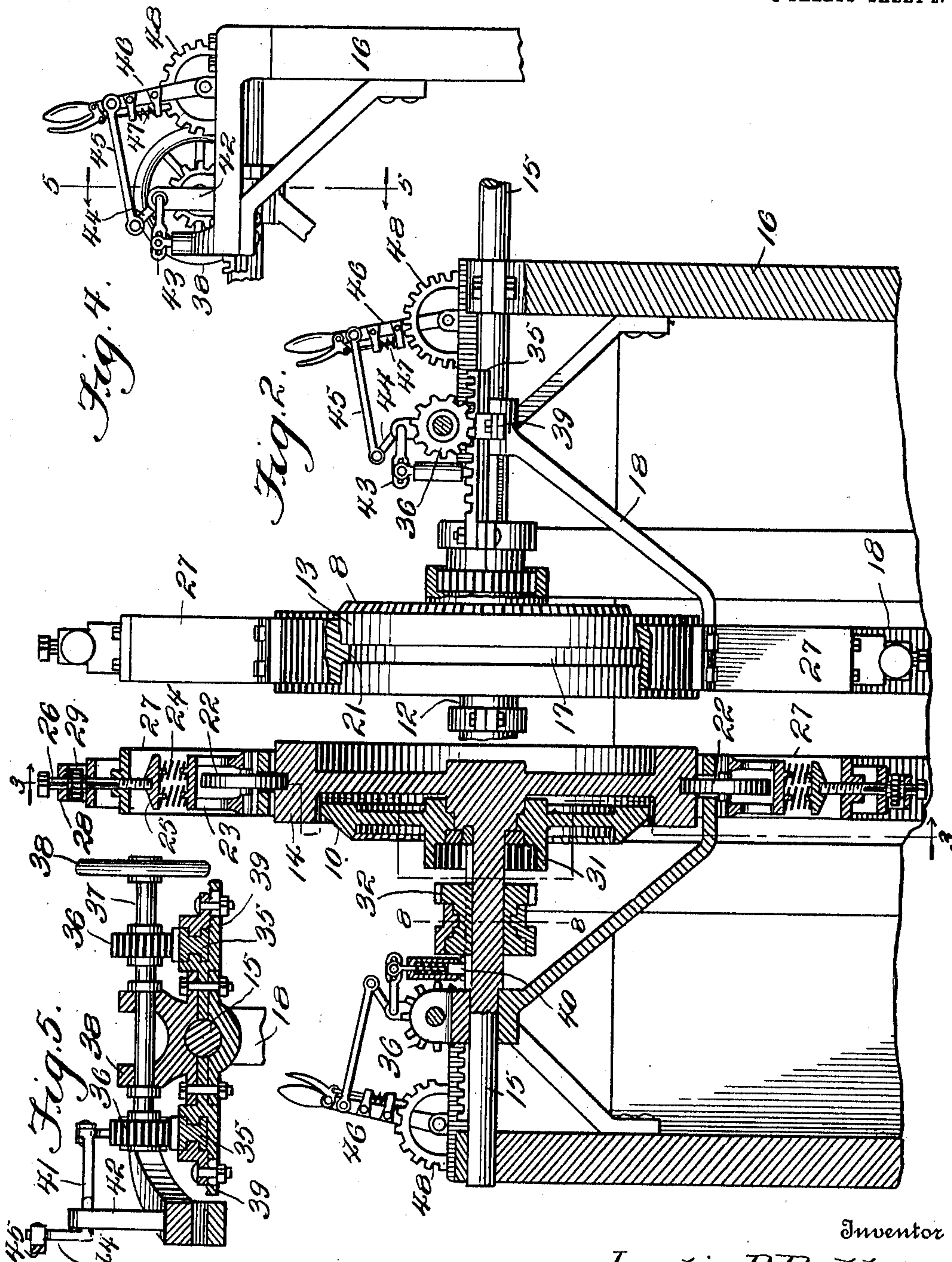
Attorney.

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Witnesses
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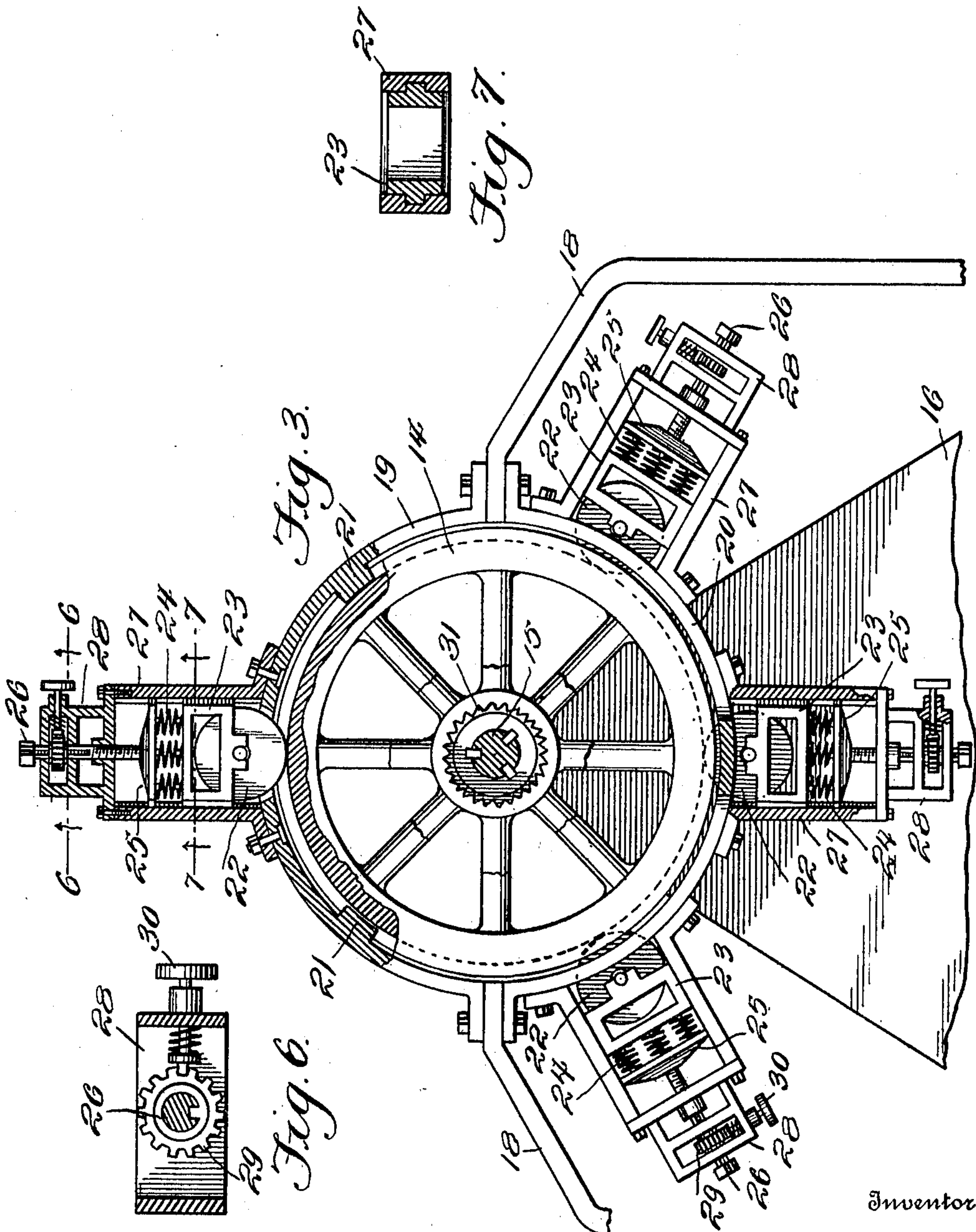
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UNITED STATES PATENT OFFICE.

IGNATIUS B. ROLKA, OF PATTON, PENNSYLVANIA.

PROPELLER-OPERATING MEANS.

984,393.

Specification of Letters Patent.

Patented Feb. 14, 1911.

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To all whom it may concern:

Be it known that I, IGNATIUS B. ROLKA, a citizen of the United States, residing at Patton, in the county of Cambria and State of Pennsylvania, have invented new and useful Improvements in Propeller-Operating Means, of which the following is a specification.

The present invention provides novel actuating means for propellers of the screw type, whereby the same have imparted thereto a combined reciprocatory and rotative movement, the primary purpose being to devise power transmitting means whereby the propeller may be reversed without requiring the reversal of the engine or motor, hence enabling a motor of the type constructed to rotate continuously in one direction to be successfully employed.

The invention contemplates a screw propeller mounted to receive both a reciprocating and a rotary movement and duplicate power transmitting means each embodying a clutch, said power transmitting means being so related that when one is in action the propeller is driven in one direction and when the other is in operation the propeller is caused to rotate in an opposite direction, the clutch devices being adapted to be independently operated so that one power transmitting mechanism is in operation at a time.

The invention consists of the novel features, details of construction and combination of parts, which hereinafter will be more particularly set forth, illustrated in the accompanying drawings, and pointed out in the appended claims.

Referring to the drawings, forming a part of the specification, Figure 1 is a top plan view, partly in section, of a propeller and power transmitting mechanism embodying the invention. Fig. 2 is a section on the line 2—2 of Fig. 1, looking to the left, showing the parts on a larger scale. Fig. 3 is a section on the line 3—3 of Fig. 2, looking to the right. Fig. 4 is a detail view on the line 4—4 of Fig. 1, looking to the right, showing more clearly the means for holding the movable clutch member in the desired position. Fig. 5 is a section on the line 5—5 of Fig. 4, looking to the left. Fig. 6 is a detail section on the line 6—6 of Fig. 3, looking in the direction of the arrows. Fig. 7 is a section on the line 7—7 of Fig. 3. Fig. 8 is a detail section of the movable clutch member and shaft on the line 8—8 of Fig. 2.

Corresponding and like parts are referred to in the following description, and indicated in all the views of the drawings, by the same reference characters.

The propeller A is mounted upon the outer end of a shaft B, which latter is arranged to receive a combined reciprocatory and rotative movement. A spur gear 1 is mounted upon the frame 2 and is connected with the shaft B in any manner to rotate therewith and admit of the shaft having a longitudinal movement therethrough. Longitudinal shafts 3 and 4 are located upon opposite sides of the frame 2 and shaft B and are provided with spur gears 5 and 6 respectively, which are in mesh with the spur gear 1. The shaft 3 is provided at one end with a bevel pinion 7, which is in mesh with a bevel gear 8. The shaft 4 is provided at one end with a bevel pinion 9, which is in mesh with a bevel gear 10. The shafts 3 and 4 are adapted to be driven in opposite directions but not at the same time, hence the propeller shaft B may be rotated either to the right or to the left to drive the vessel ahead or to back the same. A cross head C is slidably mounted in the frame 2 and has the propeller shaft B connected therewith. The cross head C is adapted to have a reciprocating movement imparted thereto, whereby a corresponding reciprocatory movement is imparted to the propeller and its shaft. A pitman 11 transmits motion to the cross head C and in the present instance is connected with a wrist pin 12 joining a pair of wheels 13 and 14, which are mounted axially and spaced apart to provide clearance for the pitman 11. The wheels 13 and 14 are secured to a shaft 15, which is mounted in bearings applied to a frame-work 16. The shaft 15 comprises sections, each of which is secured to the respective wheels 13 and 14.

Inasmuch as the wheels 13 and 14 are similarly constructed and mounted and the power transmitting means coöperating therewith are alike, a detailed description of the one will suffice for a clear understanding of both. The wheels 13 and 14 constitute balance or fly wheels and each is provided in its periphery with a groove 17 to receive a series of devices for preventing lateral movement of the fly wheels and supporting the same with a minimum amount of friction. In addition to the main frame 16 a frame 18 is provided for each fly wheel, the frames

18 comprising portions which encircle the fly wheels and other portions forming stays or braces. The encircling portion of each of the frames 18 comprises an upper section 19 and a lower section 20, the two sections having outwardly extending ears at their ends which are pierced to receive fastenings, by means of which said sections are connected together and to the braces or stays. The upper section 19 is provided upon opposite sides of a vertical line with inwardly extending lugs 21, which are adapted to enter the grooves 17 of the fly wheels, so as to prevent lateral movement thereof. A series of small wheels 22 are provided and located about the encircling portion of the frame 18 so as to distribute the support presented thereby. Each of the wheels 22 is mounted in a frame 23, which is pressed inward by means of a series of helical springs 24 confined between the frame 23 and a follower 25. A set screw 26 exerts a pressure upon the follower 25 to compress the springs 24 more or less to offer a greater or less resistance to the movement of the wheels 22. The frame 23 is slidably mounted in a guide frame 27 secured to the encircling portion of the frame 18 and the set screw 26 is threaded into the outer end of the guide frame 27. A second frame 28 is secured to the cross piece closing the outer end of the frame 27 and supports a toothed wheel 29, which is keyed to the set screw 26, as shown most clearly in Fig. 6. A spring actuated latch 30 is mounted in a side of the frame 28 and is adapted to engage the teeth of the toothed wheel 29 to hold the latter and the set screw 26 in an adjusted position, thereby preventing displacement of the set screw after the same has once been adjusted.

Each of the bevel gears 8 and 10 is provided with a central toothed portion 31 forming a clutch member, which is adapted to cooperate with a movable clutch member 32 slidably mounted upon the shaft 15 and keyed thereto in any manner so as to rotate therewith. The bevel gears 8 and 10 are mounted upon the parts of the shaft 15 so as to turn freely thereon, but are held against any movement longitudinally thereon. The movable clutch member 32 is toothed to match the teeth of the clutch member 31 so that when the clutch members 32 and 31 are in engagement the fly wheel, bevel gear and shaft rotate together. The movable clutch member 32 consists of a collar or sleeve having an annular groove in its periphery in which is fitted a sectional band 33, the ends of the sections of the band being outturned and pierced to receive fastenings 34, by means of which the sections are connected. Rack bars 35 are secured to the outwardly extending ends of the sections of the bands 15 by means of the fastenings 34. The rack bars 35 extend in parallel relation upon opposite sides of the shaft 15

and are in mesh with pinions 36 secured to a shaft 37, which is mounted in a bearing 38 forming a part of the frame 18. Each of the shafts 37 is provided with a hand wheel 38 for operation thereof. The rack bars 35 are mounted in guides 39, which are secured to parts of the frame 18. The rack bars 35 are grooved in opposite sides and the guides 39 are formed of separable parts having ribs upon their inner sides to enter the grooves of the rack bars to retain the same in place and direct them in their reciprocating movements. In order that the clutch members 32 may be held in the adjusted position latches 40 are provided to cooperate therewith, said latches being arranged to engage the teeth of one of the rack bars. A shaft 41 mounted in a standard 42 is provided at one end with an arm 43 engaging the latch 40 and at its opposite end with an arm 44, which is connected by means of a rod 45 with an operating lever 46, the latter being provided with a hand latch 47 to cooperate with a toothed segment 48, whereby the latch 40 may be manipulated.

In practice the shaft 15 is adapted to be rotated continuously in the same direction by means of a motor of any type, thereby imparting a like movement to the fly wheels 13 and 14. By reason of the arrangement of the miter gears 7, 8 and 9, 10, the shafts 3 and 4 are adapted to be driven in opposite directions when the bevel gears 8 or 10 are clutched to the shaft 15. When the bevel gear 8 is clutched to the shaft 15 the shaft 3 and propeller are driven in one direction, but when the bevel gear 10 is clutched to the shaft 15 the shaft 4 and the propeller are driven in an opposite direction. It will thus be understood that a motor or engine of the type adapted to be driven in one direction only may be advantageously used for operating the propeller to drive the same either forwardly or backwardly as required.

From the foregoing description, taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the device which I now consider to be the embodiment thereof, I desire to have it understood that the device shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims appended hereto.

Having thus described the invention what is claimed as new, is:—

1. In combination a propeller, a shaft adapted to be driven continuously in the same direction, gear elements loosely mounted upon said shaft and adapted to be driven thereby, connecting means between said gear

elements and the propeller for driving the latter in opposite directions, and clutches mounted upon said shaft and adapted to secure one or the other of said gear elements thereto.

2. In combination a propeller, a shaft, a fly wheel secured to said shaft for rotation therewith and having a groove in its periphery, wheels arranged about the fly wheel and entering the groove thereof, relatively fixed mountings for said wheels, connecting means between the fly wheel and propeller for imparting a reciprocating movement thereto, a gear wheel loose upon the shaft, connecting means between the gear wheel and propeller for imparting a rotary movement to the latter simultaneously with its reciprocating movement, and a clutch for throwing the said gear wheel into clutched engagement with the shaft.

3. In combination a propeller, a power driven shaft, gear wheels loose upon said shaft, parallel shafts geared to the propeller shaft and to said loosely mounted gear wheels to be driven in opposite directions thereby when rotating with the power driven shaft, and clutches keyed to the shaft and adapted to secure one or the other of the loose gear wheels thereto for driving the propeller forwardly or backwardly.

4. In combination a propeller, a power driven shaft, a gear wheel loose upon said power driven shaft, connecting means between the propeller and said gear wheel, a clutch having one member provided upon the said gear wheel and the other member keyed to the power driven shaft, a rack bar connected with the movable clutch member, a shaft having a pinion in mesh with said rack bar for moving the same and the clutch

member connected therewith, and a latch for engaging the rack bar to hold the movable clutch member in the adjusted position.

5. In combination a propeller, a power driven shaft, a gear wheel loose upon said power driven shaft, connecting means between the propeller and the gear wheel, a clutch comprising a member provided upon said gear wheel, and a member keyed to the power driven shaft, rack bars secured to opposite sides of the movable clutch member, a shaft, pinions fast to said shaft and in mesh with the rack bars, and a latch adapted to engage the rack bar to hold the movable clutch member in the adjusted position.

6. In combination a propeller mounted to receive both a reciprocating and a rotary movement, a power driven shaft, fly wheels secured to said shaft, a pitman connection between the fly wheels and propeller to impart a reciprocating movement to the latter, gear wheels loose upon the shaft and arranged upon opposite sides of the fly wheels, connecting means between the gear wheels and propeller for rotating the latter forwardly or backwardly, each of said gear wheels having a clutch member, movable clutch members keyed upon the shaft, and means for operating the movable clutch members to throw one or the other of the gear wheels into clutched engagement with the power driven shaft to drive the propeller in the desired direction.

In testimony whereof I affix my signature in presence of two witnesses.

IGNATIUS B. ROLKA.

Witnesses:

JAMES MELLON,
STARALLY ROLKA.