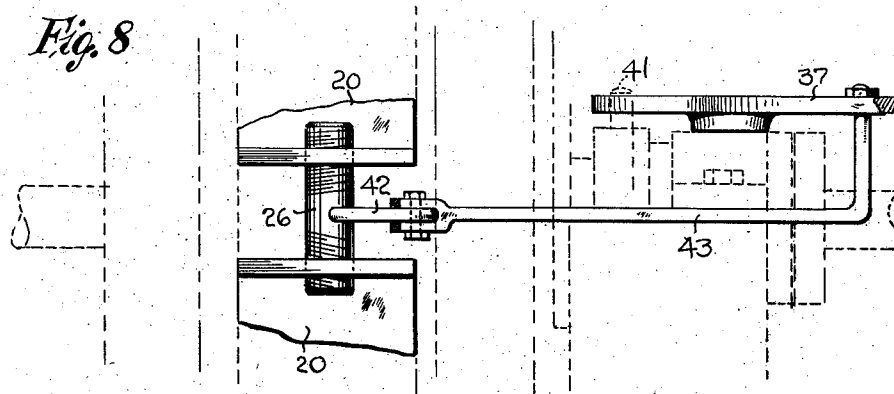
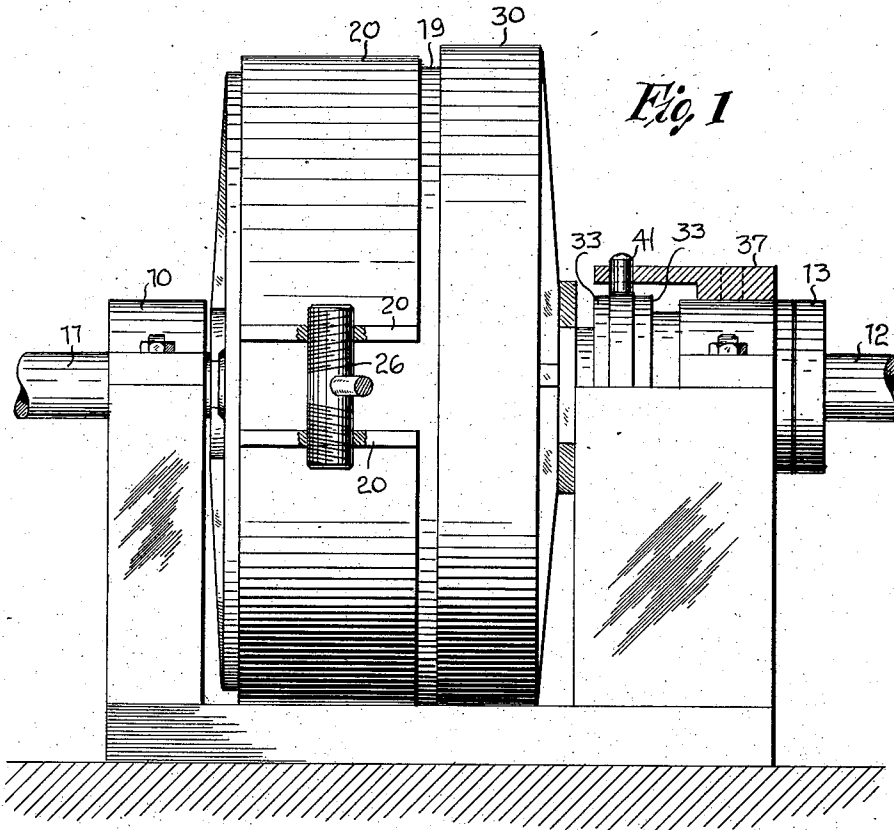


F. D. BOZARTH.
 REVERSING GEARING.
 APPLICATION FILED SEPT. 12, 1911.

1,027,313.

Patented May 21, 1912

4 SHEETS—SHEET 1.



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4 SHEETS—SHEET 2.

Fig. 2

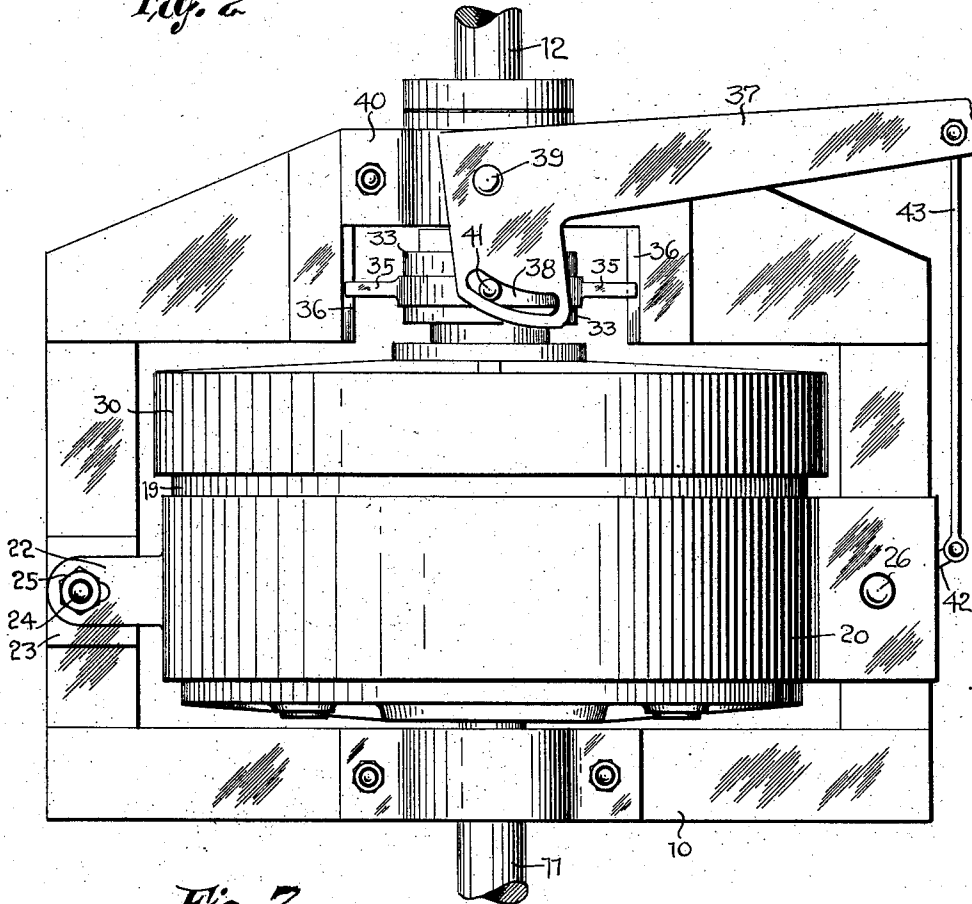
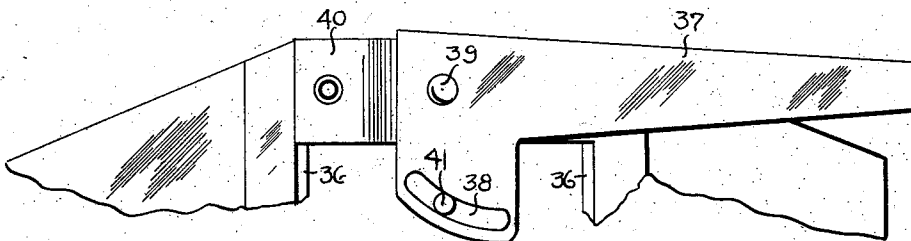


Fig. 7



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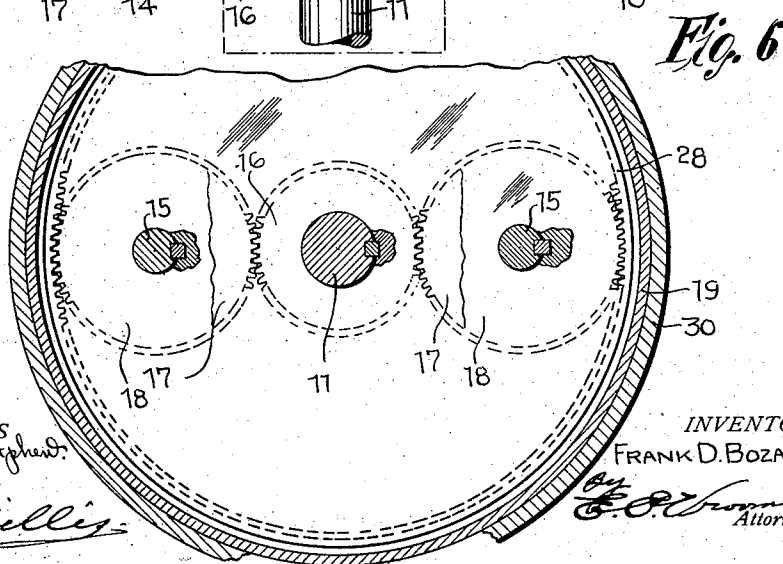
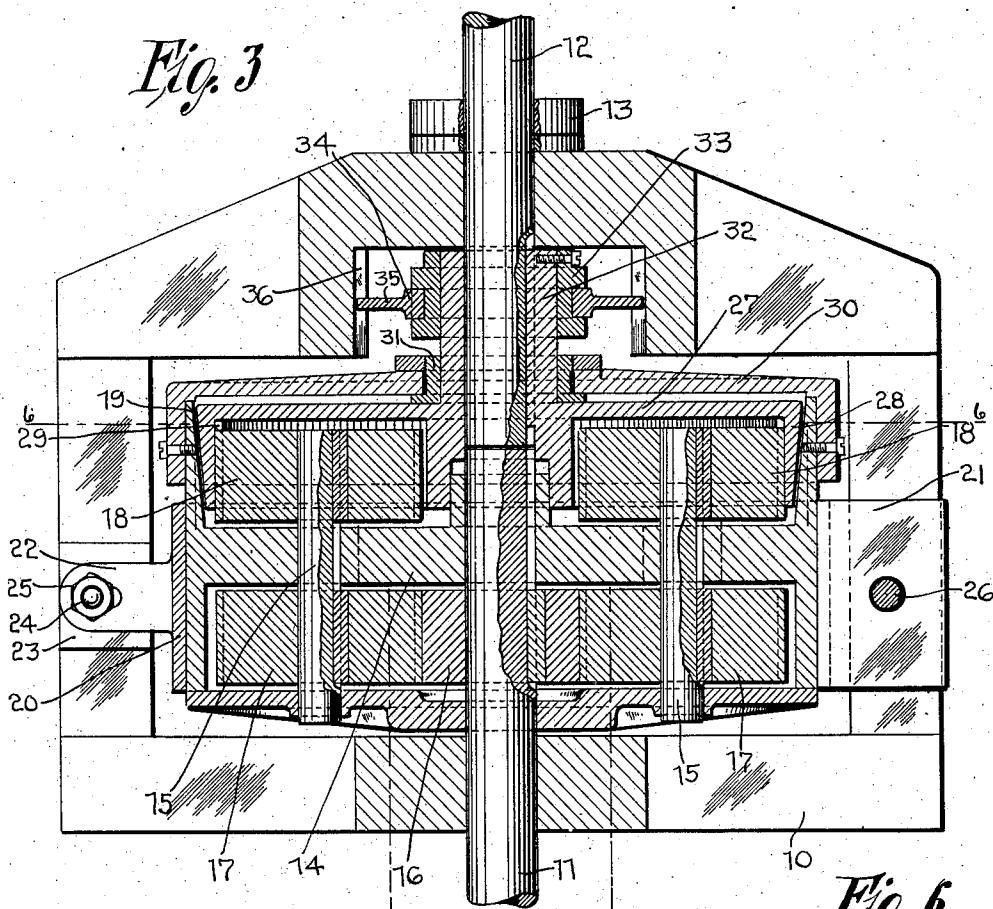
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4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

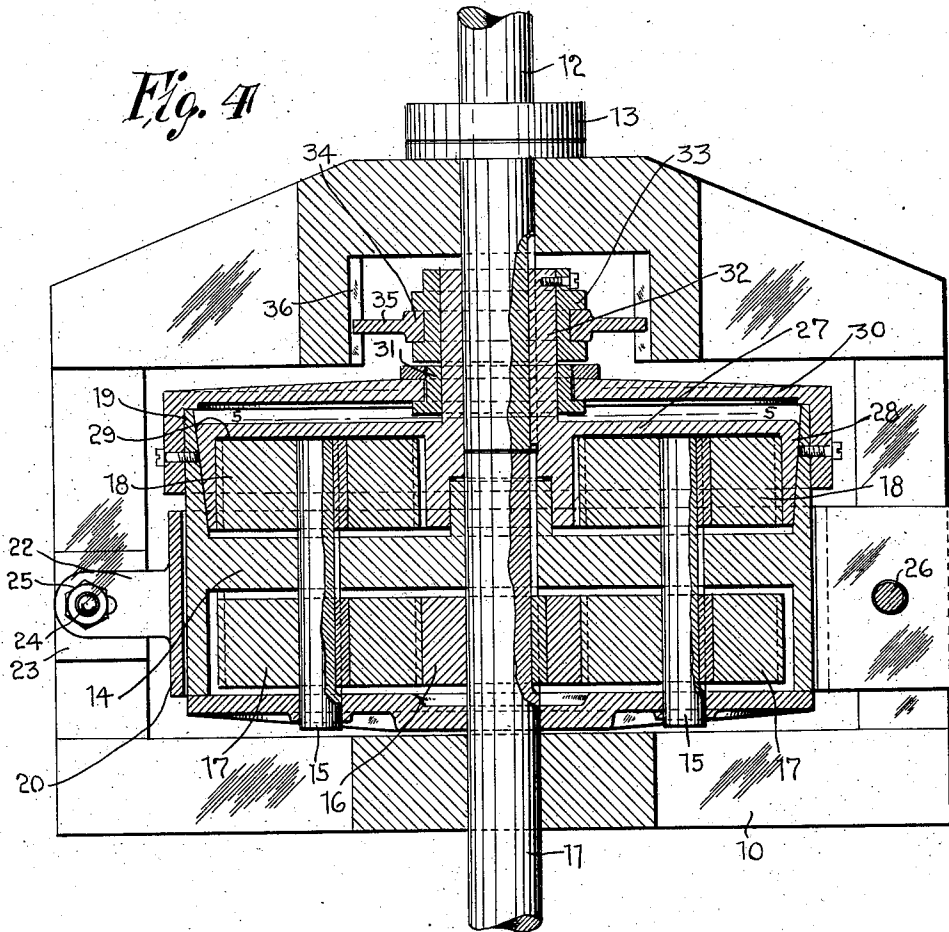
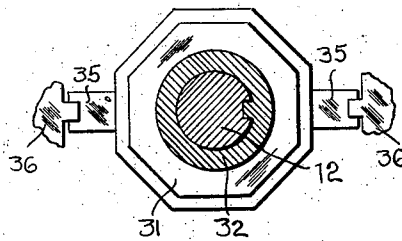


Fig. 5



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UNITED STATES PATENT OFFICE.

FRANK D. BOZARTH, OF WILLIAMSBURG, VIRGINIA.

REVERSING-GEARING.

1,027,313.

Specification of Letters Patent.

Patented May 21, 1912.

Application filed September 12, 1911. Serial No. 648,951.

To all whom it may concern:

Be it known that I, FRANK D. BOZARTH, a citizen of the United States, residing at Williamsburg, in the county of James City and State of Virginia, have invented certain new and useful Improvements in Reversing-Gearing, of which the following is a specification, reference being had therein to the accompanying drawing.

10 This invention relates to reversing gearing of the single speed and reverse class.

The principal object of the invention is to improve the general construction of gears of this character.

15 Another object of the invention is to provide an improved form of gearing of this class wherein the clutch member used for locking the carrier to the secondary shaft will be provided with an internal gear.

20 With the above and other objects in view, the invention consists in general of certain novel details of construction, and combinations of parts, hereinafter fully described, illustrated in the accompanying drawings, and specifically set forth in the claims.

In the accompanying drawings, like characters of reference indicate like parts in the several views, and Figure 1 is a side elevation of the device. Fig. 2 is a plan view thereof. Fig. 3 is a horizontal median section showing the gear carrier held from movement and the sliding clutch member free from the member on the gear carrier. Fig. 4 is a horizontal median section showing the brake released and the clutch members engaged. Fig. 5 is a section on the line 5—5 Fig. 4. Fig. 6 is a section on the line 6—6, Fig. 3. Fig. 7 is a detail plan view of the clutch shipper lever in position to throw the clutch in. Fig. 8 is a detail side elevation of the clutch shipper lever and the co-acting parts.

In the application of the invention as illustrated in the present embodiment, the same has been shown as applied to driving arrangements for a propeller, and the numeral 10 indicates the frame or base which carries the various parts of the mechanism, and on this frame is journaled the engine shaft 11 and the propeller shaft 12. It is obvious that when an engine shaft and propeller shaft are employed the engine shaft is the driving shaft and the propeller shaft the driven shaft. However, it will also be obvious that for certain purposes it may be expedient to make the portion of the shaft

indicated at 12 the driving shaft while 11 becomes the driven shaft. In order to take up the end thrust of the shaft 12 a thrust bearing 13 is provided and this may be of any preferred type.

Rotatably mounted upon the shaft 10 is a gear carrier 14 and rotatably mounted in the gear carrier is one or more short stub shafts 15. Keyed upon the shaft 11 is a gear 16 which meshes with the gears 17, each of which is carried on a respective shaft 15. The form of the gear carrier is substantially I-shaped in cross section and the gears 15 and 16 lie to one side of the stem of the I. Keyed to each of the shafts 15 on the opposite side of the stem of the I is a gear 18. The flanges of the I extend around the gears 18 and are beveled as indicated at 19 to provide a clutch member on the gear carrier. The gear carrier is cylindrical in outline and surrounding it is a band brake 20 which has its ends separated and outturned to provide flanges 21 on one side of the gear carrier while opposite these flanges is a lug 22 which is held against a lug 23 extending upward from the frame 10. This lug 22 is kept in position by means of a bolt 24 and nuts 25 which are used respectively as main and jam nuts. The flanges 21 are provided with alined threaded openings and through these alined threaded openings pass a right and left hand screw 26 of relatively great pitch compared to its diameter so that upon the rotation of the screw the flanges 21 may be quickly brought together and as quickly forced apart. The brake is so dimensioned that when the screw is moved in one direction the flanges 21 are brought together and the brake will be tightly clamped upon the gear carrier and thus prevent movement of the same relative to said brake.

Upon the shaft 12 is mounted a clutch member 27 which has an annular portion 28 beveled exteriorly to coact with the clutch face or flange 19 of the gear carrier. This clutch member 27 is furthermore provided interiorly with an internal gear. With this internal gear 29 mesh the gears 18 which are carried by the gear carrier. The gear carrier is furthermore provided with a cover 30 which extends over the clutch member and incloses it and this gear is held by a sleeve 31 revolubly on the hub 32 of the clutch member 28. Fixed upon this hub 32 is a shipper ring 33 provided with the usual groove wherein moves the shipper yoke 34

provided with U-shaped extensions 35 which engage upon stop guides 36 formed upon the base 10 so that the yoke 34 will not revolve when the shipper ring 33 is revolved.

5 For the purpose of simultaneously operating the shipper, and the screw which controls the brake, there is provided a lever 37 of the bell crank type and having a cam slot 38 formed therein. This lever is pivoted as at 39 to a fixed portion of the machinery, as for instance, to the cap 40 of the bearing of the shaft 12 and through the slot 38 passes a pin 41 which engages the shipper yoke so that as the lever is moved, 10 the shipper yoke is also moved and the clutch members thrown into and out of engagement. Projecting from the screw 26 is an arm 42 which is connected by means of a link 43 with a suitable part of the lever 37. These parts are so proportioned that 20 when the lever is in a central position both the brake band and the clutch will be free from the gear carrier while in either extreme positions one or the other of these parts will be engaged.

In the operation of the device let it be supposed that the shaft 11 is rotating in the direction of the arrow in Fig. 6. Let it also be supposed that the parts are in the position 30 shown in Fig. 3, that is to say, with the brake band applied and the clutch uncoupled. For the sake of convenience, the direction shown by the arrow will be termed clock-wise and the opposite direction counterclock-wise. Now, since the gear 16 35 is revolving clock-wise and the shafts 15 are held stationary the gears 17 will revolve counterclock-wise, and consequently the gears 18 will be revolved in the same direction, and thus will cause the gear 27 to revolve also in a counterclock-wise direction since this is an internal gear. The shaft 12 will thus revolve in a direction opposite to that of the shaft 11 under these conditions. Now let it be supposed that the parts 45 are in the position shown in Fig. 4, that is to say, with the brake off and the clutch applied. Now, the gear 16 will revolve as before but since the clutch is thrown into engagement with the gear carrier the internal gear will prevent the rotation of the gears 18 so that the gears 17 will likewise be prevented from rotating with the consequence that they will be locked to rotate around the gear 16. By disengaging the clutch without 55 applying the band brake the resistance to movement of the shaft 12 will hold the clutch member 27 stationary so that when the shaft 11 revolves in a clock-wise direction the gears 17 and 18 will revolve in an anti-clock wise direction and the gears 18 60 will run around the periphery of the in-

ternal gear 29, thus causing the wheel carrier to rotate in a clock-wise direction. There has thus been provided a simple and 65 efficient device of the kind described and for the purpose specified.

It is obvious that many minor changes may be made in the form and construction of this invention without departing from the 70 material principles thereof. It is not, therefore, desired to confine the invention to the exact form herein shown and described, but it is wished to include all such as properly come within the scope of the appended 75 claims.

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

1. In a reversing mechanism, a shaft, a gear carrier rotatable on said shaft and provided with a clutch member, a stub shaft 80 rotatably mounted on said carrier, a gear fixed to said stub shaft, a gear fixed on the first mentioned shaft and meshing with the other gear, a second gear fixed on said stub shaft, 85 a shaft alined with the first mentioned shaft, a clutch member splined on the last mentioned shaft and cooperating with the clutch member on the carrier, said last mentioned member being provided with an internal 90 gear meshing with the second gear on the stub shaft, a brake for said carrier, and means to operate said brake and second clutch member.

2. In a reversing mechanism, a shaft, a 95 gear carrier rotatable on said shaft, and provided with a clutch member, a stub shaft rotatably mounted on said carrier, a gear fixed to said stub shaft, a gear fixed to the first mentioned shaft, and meshing with the 100 other gear, a second gear fixed on said stub shaft, a shaft alined with the first mentioned shaft, a clutch member splined to the last mentioned shaft and cooperating with the clutch member on the carrier, said last mentioned 105 member being provided with an internal gear meshing with the second gear on the stub shaft, a band extending around said carrier and provided with outturned parallel extremities, a right and left hand screw 110 passing through said extremities and provided with a lateral arm, a shipper ring fixedly mounted on the second clutch member, a shipper fork rotatable upon said ring, a cam lever pivoted adjacent said fork and 115 provided with a cam slot, a pin passing through said slot and secured to said fork, and a link connecting said lever and arm.

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

FRANK D. BOZARTH.

Witnesses:

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W. J. FINCH.