F. GETTELMAN.

REVERSE MECHANISM FOR PROPELLER SHAFTS.

APPLICATION FILED JULY 6, 1914.

1,184,944. Patented May 30, 1916.

Fig. 1.

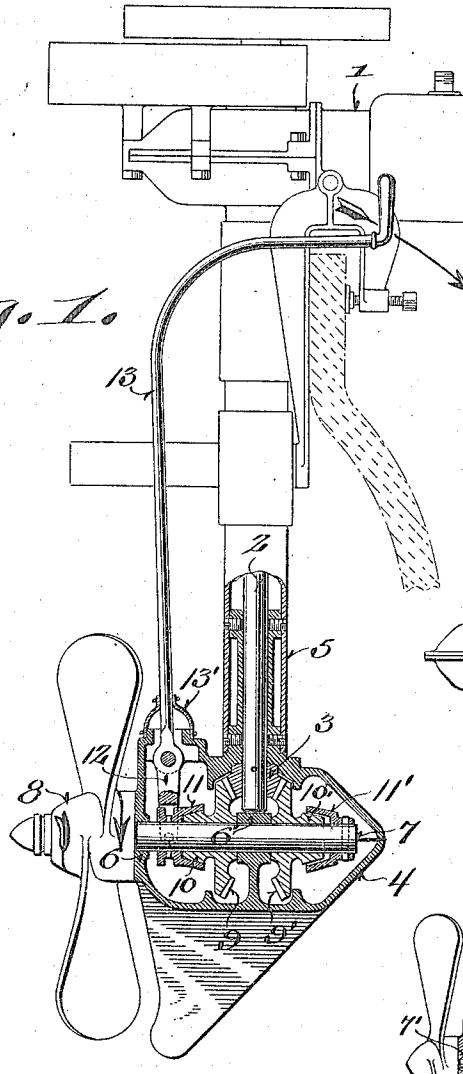
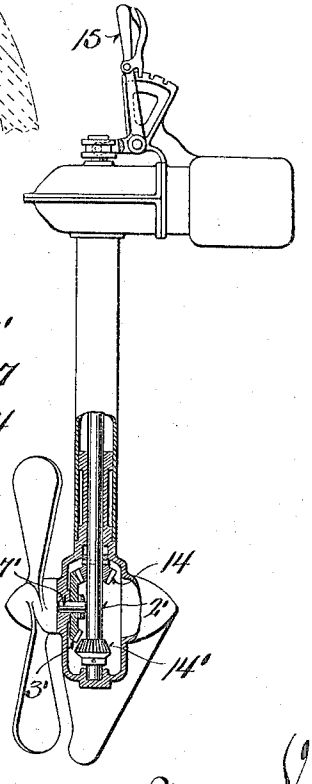


Fig. 2.



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REVERSE MECHANISM FOR PROPELLER-SHAFTS.

1,184,944. Specification of Letters Patent. Patented May 30, 1916.

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To all whom it may concern:

Be it known that I, FREDERICK GETTELMAN, a citizen of the United States, and resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Reverse Mechanism for Propeller-Shafts; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention has for its primary object to provide a simple, economical and effective reversing mechanism for motor driven propellers, the construction and arrangement being such that a reverse of the propeller is effected while the engine is running in one direction.

Specific objects of my invention are to provide a reversing clutch-gear connection between a propeller-shaft and a drive-shaft, the same being approximately at right angles to each other; to provide a back geared clutch connection between the drive and the driven propeller shaft, whereby the propeller will exert a maximum propelling force under load strain without causing the engine to stall or lag at high or its maximum speed, which would result in a material reduction in efficiency of the power; to provide a reversing clutch mechanism between a horizontally disposed propeller shaft and a vertically disposed engine driven shaft, whereby thrust of the propeller will force and maintain the clutch in its selected locked position to thus dispense with locking detents or like mechanisms.

With the above and other objects in view the invention consists in certain peculiarities of construction and combination of parts as set forth hereinafter with reference to the accompanying drawings and subsequently claimed.

In the drawings Figure 1 represents an elevation of a portable marine engine provided with a reverse mechanism embodying the features of my invention, with parts broken away and parts in section to more clearly illustrate the details of construction, and Fig. 2, a similar elevation of another form of my invention.

Referring by characters to the drawings, 1 represents an engine having a vertically disposed incased drive-shaft 2, the said engine being arranged to be attached to a small craft or rowboat and may be of any type, it being understood that, so far as my invention pertains, the details of construction of an engine form no part except as to provide a vertically disposed drive shaft. Secured to the lower end of the drive shaft is a gear-wheel 3 in the form of a beveled pinion, which pinion is revoluble in a housing 4 that is fixed to a tubing 5 constituting part of the engine casing, the said tubing forming a jacket for the drive shaft. The housing 4 is provided with bearing boxes 6, 6′, for a horizontally disposed propeller shaft 7, which shaft extends beyond the housing and has secured thereto the ordinary propeller 8. The journal-box 6′ of the housing is alined with the drive shaft 2 and loosely mounted upon the driven propeller shaft are oppositely disposed beveled gear-wheels 9, 9′, the hubs of which abut the journal-box 6′. The gear-wheels 9, 9′, in this exemplification of my invention are shown in constant mesh with the gear-wheel 3 and are of approximately twice the diameter of the drive-shaft gear-wheel or pinion, whereby motion imparted to the driven propeller shaft is reduced by the back-gear connection mentioned. Each gear-wheel 9, 9′, is formed with a beveled faced clutch-hub 10, 10′, which clutch-hubs are adapted to be engaged by contemporary clutch members 11, 11′, that are secured to the propeller-shaft. The clutch-member 11′, is annularly grooved for the reception of the spannered end 12 of a shift-lever 13, which shift-lever is pivotally mounted within the housing and extended therethrough. In order to form a water-tight joint and to at the same time permit oscillatory movement of the clutch lever 13, a flexible joint between the housing and lower end of the lever-adjacent to its fulcrum point is effected by a flexible jacket or sheathing 13′.

From the foregoing description it is manifest that should the propeller shaft be rotating in the direction indicated by the arrow, forward end thrust of the shaft will maintain clutching engagement between the clutch-member 11 and gear-wheel 9, whereby the drive-shaft 2, which is arranged to revolve in one direction only, will transmit power to the propeller shaft and the lever 13 will thus be free of any locking mechanism for the reverse clutch. Should it be desired to reverse the direction of rotation of the propeller shaft, a forward movement of the lever 13, in the direction indicated by the arrow, will cause a slight backward

movement of the propeller shaft, whereby the gear-wheel 9′ will be locked in engagement with said propeller shaft by the clutch member 11′ and simultaneously the clutch mechanism 11 will free the gear-wheel 9 from its locked engagement with said shaft. Hence power from the drive-shaft 2 will be imparted to the propeller shaft in a reverse direction through its gear connection 9′. Thus it will be seen that in an engine of the type mentioned which is designed to be run in one direction only, a quick reverse can be effected whereby perfect control of the craft to which the engine is attached will result.

Fig. 2 illustrates another form of my invention wherein the propeller shaft 7′ is journaled in the housing and has secured thereto and within said housing a large beveled gear-wheel 3′, which gear-wheel is arranged to be engaged selectively by one of a pair of beveled gear-wheels 14, 14′, which beveled gear-wheels are in the form of pinions and are fast upon the vertically disposed engine shaft 2′. By this arrangement in order to shift or reverse the direction of rotation of the propeller shaft, the engine shaft is raised or lowered by a lever mechanism 15 and locked in its adjusted position by said mechanism.

I claim;

1. A screw propeller reverse driving mechanism comprising a longitudinally movable propeller shaft, a drive shaft disposed at right angles thereto, a gear on the drive shaft, intermeshing gears loose on the propeller shaft, and clutch members carried by the propeller shaft for selective engagement with the gears thereof at relatively outward sides of said gears.

2. A reverse driving mechanism for out board motors comprising the combination with a depending drive shaft housing, and drive shaft, of a casing carried at the lower end of the housing and provided with a lever opening, a propeller shaft in the casing, a clutch mechanism associated with the propeller and drive shafts, a lever pivoted in the casing and connected with said mechanism and extending upwardly through the said opening and a flexible housing secured to the lever and to the casing adjacent the edge portions of the lever opening.

3. A reverse drive mechanism for out board motors comprising a motor, a drive shaft housing depending therefrom, a drive shaft longitudinally movable in the housing and extended above the motor, a casing at the lower end of the housing, a propeller shaft in the casing, a gear wheel on the propeller shaft, gear wheels on the drive shaft adapted to selectively mesh with the first gear wheel and means connected with the drive shaft above the motor for moving it longitudinally.

In testimony that I claim the foregoing I have hereunto set my hand at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

FREDERICK GETTELMAN.

Witnesses:
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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."