

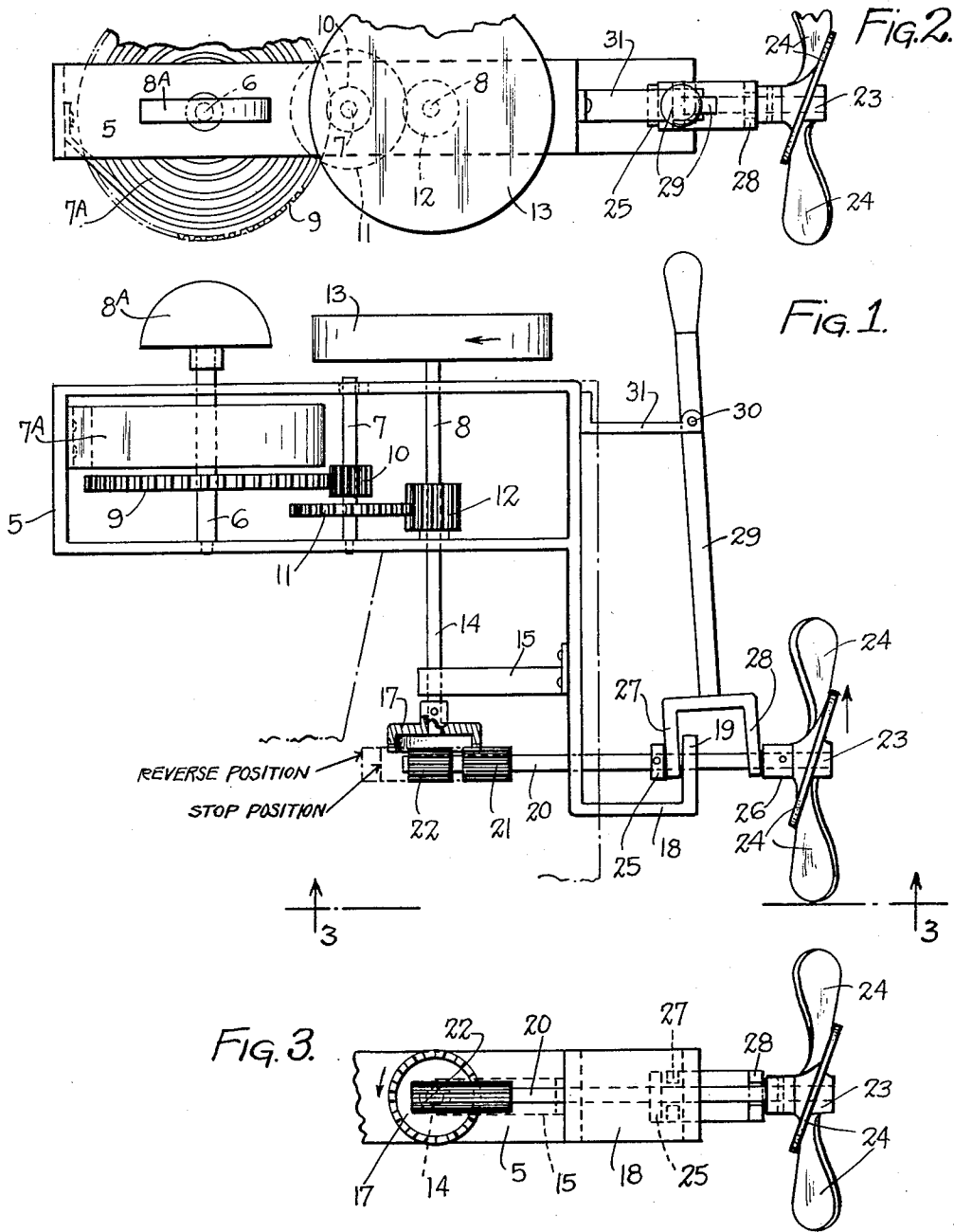
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REVERSING AND STOPPING PROPELLER MECHANISM

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REVERSING AND STOPPING PROPELLER
MECHANISM

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This invention relates to propelling means and in particular to a type adapted for use in connection with toy boats although the same may be employed in connection with larger vessels, if desired.

A particular object of my invention is to provide for use in connection with toy boats, a simplified propelling means which permits forward and reverse drive without changing the direction of rotation of the motor and at the same time eliminates the necessity of using a holding means for sustaining the adjusted position of the parts.

A still further object of my invention is to provide in combination, a propeller, the blades of which are so turned that, in connection with the adjustment mechanism, the position of adjustment will be maintained by the pressure of the water on the propeller, the mechanism also providing for a neutral position where neither forward nor reverse drive is permitted.

Changes and variations may be made in the construction shown and described without departing from the principles of the invention or sacrificing its chief advantages; hence such invention is not to be confined to the structures shown in the accompanying drawing, in which:

Figure 1 is a view in side elevation of a propelling motor and mechanism constructed in accordance with my invention and arranged to be employed with either an inboard or outboard boat.

Figure 2 is a top plan view of the mechanism illustrated in Figure 1.

Figure 3 is a view taken on the line 3—3 of Figure 1 illustrating the relation of the drive gear and drive pinion.

Referring to the drawings in detail, 5 indicates a frame in which is journaled the shafts 6, 7 and 8. The shaft 6 in the motor mechanism illustrated, which is of the spring type, is arranged to have secured thereto, one end of a coil spring 7—A, whose outer end is secured to the frame 5 so that when the shaft 6 is revolved through the medium of the finger piece 8—A to wind up the spring, release of the winding handle will permit the mechanism to operate and the spring to cause drive of the shaft 6 in the usual manner. The shaft 6 also carries the main drive gear 9 which meshes with the pinion 10 on the shaft 7 whose upper end is positioned in a slot in the frame so that the pinion 10 will be free of the gear 9 to permit winding of the spring by the key 8.

The shaft 7 also carries a gear 11 which meshes with a pinion 12 carried on the shaft 8. The

shaft 8 carries at its upper end beyond the frame, the fly wheel 13 and in its depending portion 14, passes through a suitable bracket 15 secured to the depending portion 16 of the frame 5 and has secured at its lower end, the flanged annular gear 17. The depending portion 16 of the frame 5 is U-shaped as at 18 and in its upstanding portion 19 forms a journal for the slide propeller shaft 20 which also passes through the depending portion 16 of the frame 5 and at one end carries the reverse pinion 21 and the forward drive pinion 22, each of which are arranged to engage the diametrically opposite sides of the annular gear 17 depending upon the slide movement of the shaft 20. The shaft 20 at its outer end carries the propeller 23, the blades 24 of which are left-handed, that is, the propeller is the reverse of the usual propeller and if revolved in clock-wise direction, would cause reverse movement of the craft. The shaft 20 carries the collars 25 and 26 which are arranged to be engaged by the bifurcated ends 27 and 28 respectively of the shift lever 29 which is pivoted as at 30 in a suitable bracket 31 adjacent the upper portion of the frame 5, it being understood that any bracket may be employed but preferably in toy boats, my device is made up as a single unit and in order to reduce the cost of the mechanism, the same must be made as simple as possible, hence, one of the important features of my invention is the reverse mechanism as indicated by the gears 17, 21 and 22 and the elimination of any means for holding the shift lever 29 in the position at which it is placed.

This retention of the shift lever 29 in its adjusted position, is caused by the pitch of the blade 24 of the propeller and it will be noted in Figure 1 that the mechanism is in position for reverse drive, assuming the fly wheel to be moving in the direction indicated by the arrow. This will cause drive of the gear 17 in the same direction and drive of the gear 21 in counter-clockwise direction with the result that the propeller 23 will be driven in counter-clockwise direction and the pitch of the blades will cause reverse movement of the craft.

It will be noted, however, that the reverse movement of the propeller to cause reverse movement of the craft will have a tendency to keep the shaft 20 in its adjusted position and also the lever 29 because the propeller will be pulling itself rearwardly in the water and will tend to sustain or rather, maintain, its reverse driving position. When the shaft 20 is shifted to the position so that gear 22 is engaging the opposite

side of the gear 17 as indicated in outline in Figure 1, the drive of the propeller will be counter-clockwise and the drive of the vessel forward, this change having taken place by the throw of the lever 29 which causes the end 27 thereof to engage the collar 25 on the shaft 20 to move the shaft 20 longitudinally to bring the gear 22 into engagement or mesh with the opposite side of the gear 17 and at the same time bring gear 21 out of engagement with the gear 17, the gears being so designed that neither gear 22 nor 21 will engage the gear 17 when the lever 29 is thrown from one extreme position to the other but when the lever 29 is midway in its extreme position, the gears 21 and 22 will be positioned both in engagement with the gear 17 and no drive of the motor can take place through the gears 17, 22 or 21.

In the forward drive of the vessel, the resultant pressure on the shaft tending to keep it in its forward drive position will of course, eliminate any necessity for the employment of springs or other devices to maintain the throw lever 29 in its adjusted position.

While I have illustrated a spring driven motor and set forth that my device is particularly adapted to toy boats, it is to be understood that the same principle may be employed in connection with the larger vessels such as canoes, row-boats and the like employing inboard or outboard motors and the motor drive may be of the usual gasoline engine type or electric driven mechanism, may be used in connection with my device, if desired.

It is to be particularly understood that my device is essentially a reversing and stopping propelling mechanism as applied to outboard motors used on any type of vessel and to inboard motors used in toys. The use of a left hand propeller in combination with a drive shaft operating in a clockwise direction eliminates the use of auxiliaries in connection with a reverse drive mechanism and the reversing lever is in fact used as a reversing and stop lever.

If desired, the gears 22 and 21 may be made as a single gear a sufficient length to carry out the purpose of my invention. The upstanding portion 19 of the frame 5 acts as a stop to limit the swinging movement of the lever 29 when shifting the propeller shaft longitudinally.

My invention is not to be restricted to the precise details of construction shown since various changes and modifications may be made therein without departing from the scope of the invention or sacrificing the advantages derived from its use.

What I claim is:—

1. In a propelling mechanism a motor, a drive shaft, a rotary propeller shaft, gear connections between said shafts, means for moving said propeller shaft longitudinally to affect a change in said gear connection to reverse the direction of rotation of said propeller shaft, and an intermediate position of said shaft preventing actuation of said motor.

2. In a propelling mechanism a motor, a drive shaft, a rotary propeller shaft, a gear on the drive shaft, a gear on the propeller shaft meshing with said drive shaft gear, means for adjusting the propeller shaft longitudinally to move the gear thereon across the face of the drive gear to reverse the direction of rotation of said propeller shaft, and said propeller shaft gear being ar-

ranged, when in neutral position, to prevent actuation of the motor.

3. In a propelling mechanism, a drive shaft, a rotary propeller shaft, a gear on the drive shaft, a gear on the propeller shaft meshing with said drive shaft gear, and means for adjusting the propeller shaft longitudinally to move the gear thereon across the face of the drive shaft to prevent operation of the propeller and drive shaft.

4. In a propelling mechanism a motor, a drive shaft, a rotary propeller shaft, a gear on the drive shaft, a gear on the propeller shaft meshing with said drive shaft gear, means for adjusting the propeller shaft longitudinally to move the gear thereon across the face of the drive gear to reverse the direction of rotation of said propeller shaft, a bladed propeller on the shaft, the blades of the propeller being positioned so that the pressure thereon during a propelling movement will maintain the propeller shaft in its adjusted position, and said propeller shaft gear, when in neutral position, being arranged to prevent actuation of the motor.

5. In a propelling mechanism a motor, a drive shaft, a rotary propeller shaft, a gear on the drive shaft, a gear on the propeller shaft meshing with said drive shaft gear means including a rock shaft for adjusting the propeller shaft longitudinally to move the gear thereon across the face of the drive gear to reverse the direction of rotation of said propeller shaft, and said propeller shaft gear, when in neutral position, being arranged to prevent actuation of the motor.

6. In a propelling mechanism a motor, a frame, a drive shaft, a rotary propeller shaft, a gear on the drive shaft, a gear on the propeller shaft meshing with said drive shaft gear, means including a rock lever pivoted to the frame and having a bifurcated end for adjusting the propeller shaft longitudinally to move the gear thereon across the face of the drive gear to reverse the direction of rotation of said propeller shaft, means on said frame for limiting the movement of said shaft adjusting means, and said propeller shaft gear, when in neutral position, being arranged to prevent actuation of the motor.

7. In a propelling mechanism, a motor, a frame, a plurality of shaft including a drive shaft, means for operating said shaft, a rotary propeller shaft, a gear on the drive shaft, a gear on the propeller shaft meshing with said drive shaft gear, means pivoted to the frame for adjusting the propeller shaft longitudinally to move the gear thereon across the face of the drive gear to reverse the direction of rotation of said propeller shaft, means on said frame for limiting the movement of said shaft adjusting means and a bladed propeller on the shaft, the blades of the propeller being positioned so that the pressure thereon during a propelling movement will maintain the propeller shaft in its adjusted position, and said propeller shaft gear, when in neutral position, being arranged to prevent actuation of the motor.

8. In a propelling mechanism, a drive shaft, a rotary propeller shaft, a gear on the drive shaft, gears on the propeller shaft, meshing with said drive shaft gear alternately, and means for adjusting the propeller shaft longitudinally to move the gears thereon across the face of the drive shaft to prevent operation of the propeller and drive shafts.

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