

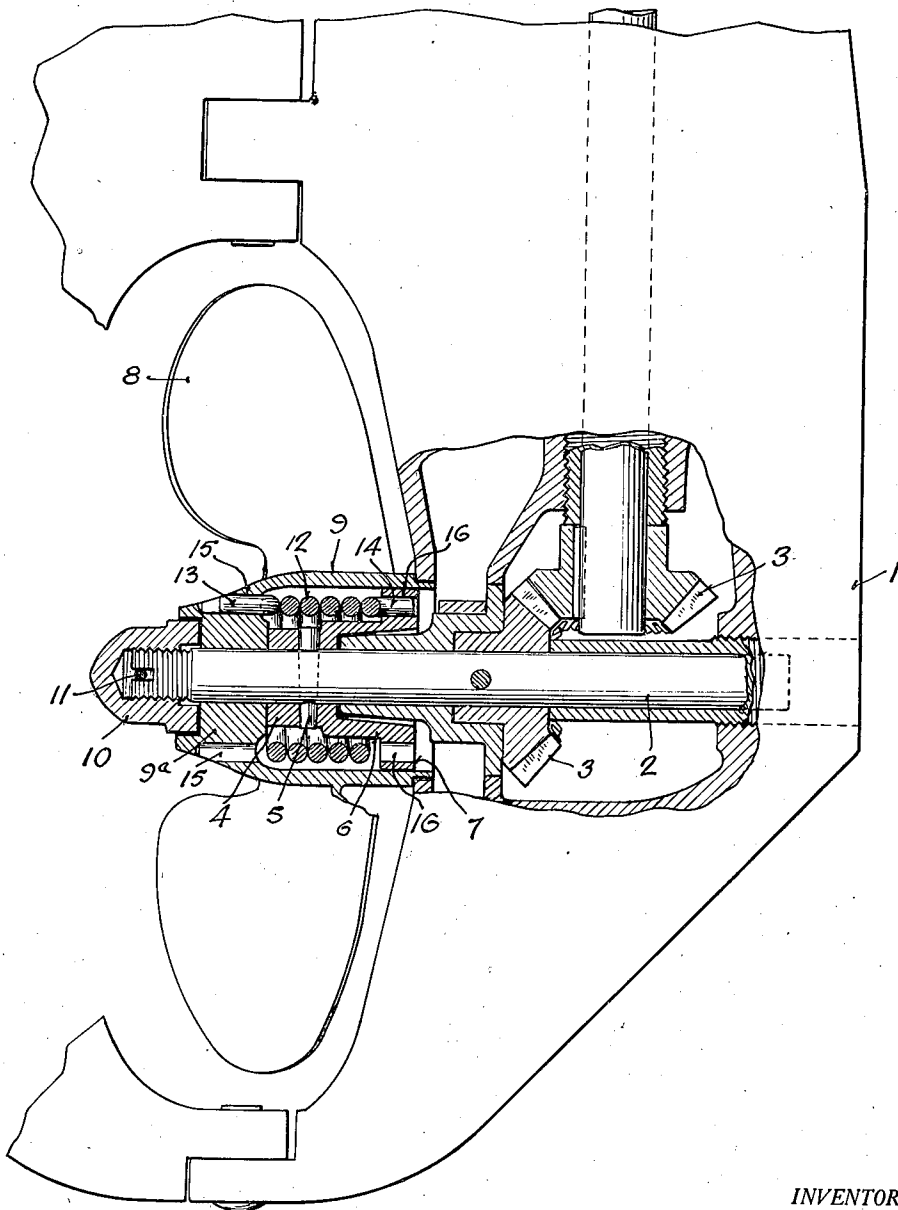
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SPRING CUSHIONED DRIVE FOR PROPELLERS

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SPRING-CUSHIONED DRIVE FOR PROPELLERS

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This invention relates in general to outboard motors and more particularly to a spring driving means for the propellers of outboard motor.

5 The boats on which outboard motors are employed frequently are utilized in shallow waters. More or less serious inconvenience, expense and annoyance has resulted from the propellers of outboard motors striking submerged objects, such as rocks, logs, or the like, as in such event, not only are the propellers liable to become bent or broken, but the gearing between the propeller and motor is liable to be injured. To avoid these disadvantages it has been proposed to utilize shear pins between the propeller and the propeller shaft, the shear pins being sheared off when the propeller strikes a submerged object. This tends to avoid damage, but it involves the inconvenience of replacing the shear pin. It has also been proposed to incorporate a spring engaged clutch between the propeller and the propeller shaft or somewhere in the propeller drive, but the disadvantage of this expedient resides in the fact that these clutches tend to and do become stuck, and moreover only partly take up the shock, as in order to provide for forward and reverse movement, the spring associated with such a clutch must be comparatively heavy, or else the clutch will slip and the operation of the motor will be impaired.

One of the principal objects of the present invention is to provide a spring drive for a propeller of an outboard motor wherein the propeller is positively turned from the propeller shaft through a spring member, which, when the propeller strikes an object, yields to take up the shock and prevent damage to the propeller, the gearing, or the like, the spring immediately resuming its normal position following its cushioning action, so as to preserve the drive between the motor and the propeller and yet to be always ready to exercise its cushioning and shock absorbing function.

Another object is to provide cushioning means in the propeller drive of an outboard motor which is not liable to become stuck, frozen or jammed, and which operates with equal effectiveness irrespective of whether the

propeller is operating in forward or reverse.

Other objects and advantages reside in certain novel features of the construction, arrangement and combination of parts which will be hereinafter more fully described and particularly pointed out in the appended claims, reference being had to the accompanying drawing forming a part of this specification, and in which:

The figure is a view partly in section and partly in elevation showing portions of an outboard motor and illustrating the spring incorporated in the propeller drive.

Referring to the drawing, the numeral 1 designates generally the gear housing of an outboard motor, in the lower portion of which the propeller shaft 2 is rotatably mounted and driven in the usual manner, gears 3 being employed in the gearing for driving the propeller shaft.

The rearward end of the shaft 2 projects beyond the gear housing, and on this projecting portion a collar 4 is fixed, a shear pin 5 preferably being employed for fixing the collar 4 to the rearward portion of the shaft 2. In the embodiment of the invention illustrated, the collar 4 has a tubular extension 6 formed with an outwardly projecting annular flange 7. A propeller designated generally at 8 is provided and has a hub 9 formed with a bearing portion 9^a loosely mounted on the shaft 2 immediately rearwardly of the collar 4. A nut 10 threaded on the rearward end of the shaft and held in position by the pin 11 prevents endwise displacement of the propeller 8 off of the shaft 2. A coil spring 12 is provided and has suitably spaced convolutions terminating in out-turned ends 13 and 14, the end 13 being snugly fitted in an opening 15 provided in the hub 9 of the propeller 8, and the end 14 being snugly fitted in an opening 16 provided in the flange 7 of the extension 6 of the collar 4. If desired, the bearing portion 9^a of the hub 9 may have more than opening 15, and similarly the flange 7 may have more than one opening, 16, to permit adjustment. As shown, the hub 9 is hollow and houses the spring 12 and collar 4.

With the arrangement shown, when the propeller shaft 2 is being rotated the drive is

transmitted from the propeller shaft 2 to the propeller 8 through the pin 5, collar 4 and the spring 12. Should the propeller 8 strike a submerged object, the motion of the propeller is arrested and the shock is taken up by the spring 12. If the shock should be so unusual and extremely severe as to be beyond the capacity of the spring 12 to absorb, then the shear pin 5 breaks, the structure and strength of the shear pin 5 being such in relation to the capacity of the spring 12 as to accomplish this operation.

The spring 12 is of such size, shape and strength that its convolutions will remain slightly spaced even when the propeller is being rotated to drive the boat forward, at which time the propeller tends to wind up the spring. The point is that the clearance between the convolutions is preserved to enable the spring to twist or flex and take up the shock when the propeller strikes an obstacle.

The invention claimed is:

1. In an outboard motor a gear housing, a propeller shaft extending therefrom, a collar fixed to the portion of the propeller shaft located outside of the housing, a propeller having its hub loosely mounted on the propeller shaft, means for preventing endwise displacement of the hub of the propeller, and a coil spring located within the propeller hub and interposed between the collar and the propeller hub and connected thereto.

2. In an outboard motor a propeller shaft, a collar fixed to the propeller shaft, a propeller having its hub loosely mounted on the propeller shaft, means for preventing endwise displacement of the hub of the propeller, and a coil spring interposed between the collar and the propeller hub, said spring having outturned ends, said propeller and said collar having openings in which the outturned ends are snugly fitted.

3. In an outboard motor a propeller shaft, a collar, a shear pin fixing the collar to the propeller shaft, a propeller having its hub loosely mounted on the propeller shaft, means for preventing endwise displacement of the hub of the propeller, and a coil spring interposed between the collar and the propeller hub and connected thereto.

4. An outboard motor including a propeller shaft, a propeller loosely mounted thereon and a spring interposed between and positively connected to the propeller shaft and to the propeller.

5. An outboard motor including a propeller shaft, a propeller having a hub loosely mounted on the shaft, said hub having an opening, a torsional coil spring contained within the opening of the hub and positively connected to the propeller and to the propeller shaft, whereby the propeller may be positively driven from the propeller shaft in both forward and reverse directions of rotation of the propeller shaft and yet the torsional coil

spring is always adapted to yield to prevent injury to the propeller.

6. An outboard motor including a propeller shaft, a propeller loosely mounted thereon and means affording a positive driving connection between the propeller shaft and the propeller at all times and yet adapted to yield to prevent injury to the propeller.

7. With an outboard motor structure having a rotating propeller shaft, a propeller fitted to turn upon said shaft, and a spiral spring fitted on said shaft having one end secured to the propeller and the remaining end secured to the shaft, said spring having a normal tension to substantially resist the usual water pressure upon the propeller and flexing to expand under greater pressure.

In witness whereof, I hereto affix my signature.

OLE EVINRUDE.