

April 21, 1931.

S. H. H. PARSONS

1,801,781

OUTBOARD PROPELLER DRIVE

Filed Dec. 31, 1929

2 Sheets-Sheet 1

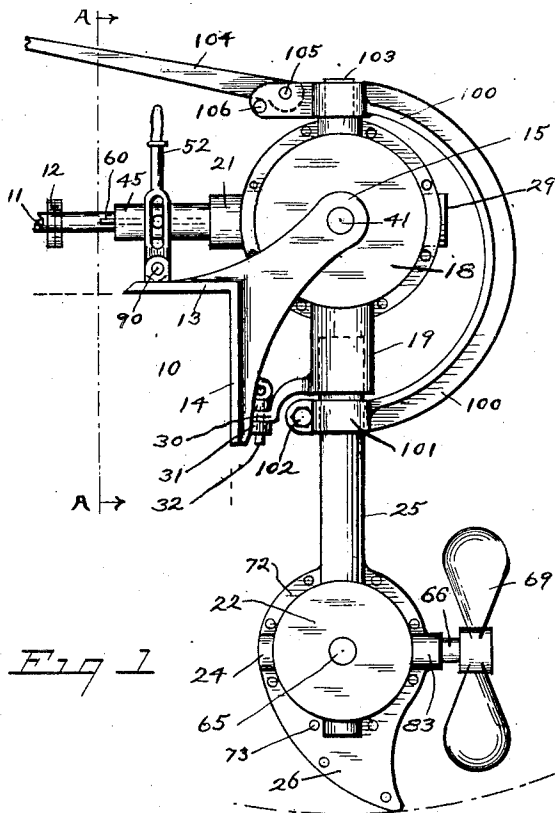


Fig 1

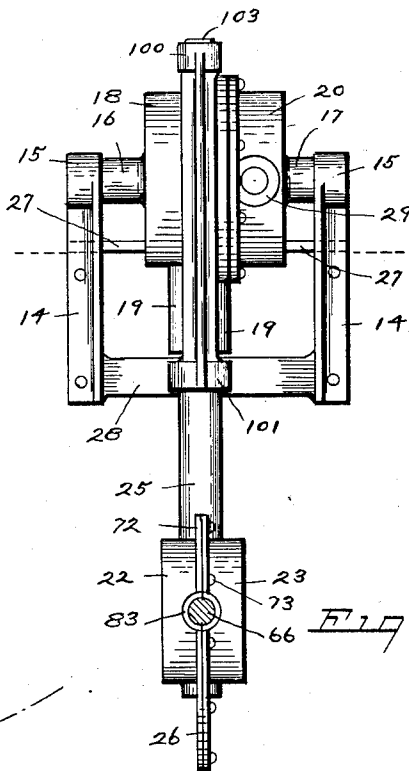


Fig 2

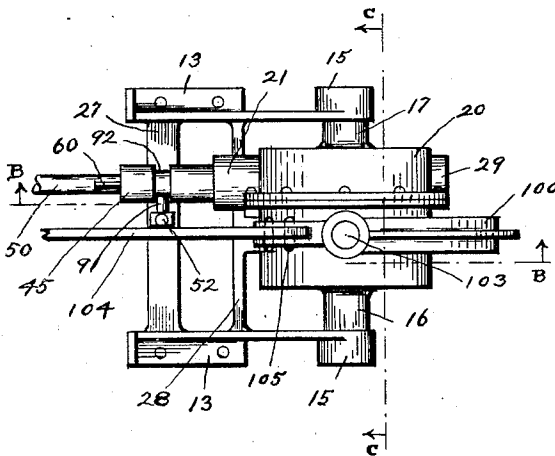


Fig 3

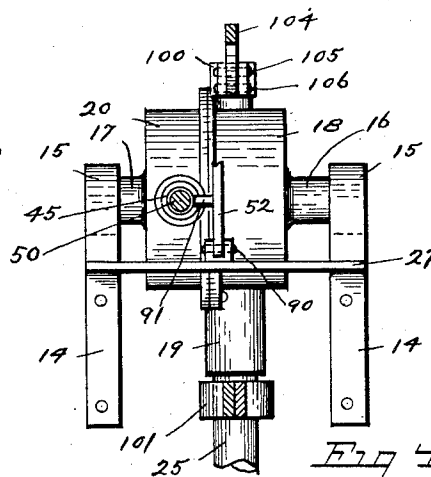


Fig 4

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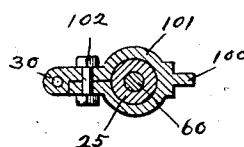
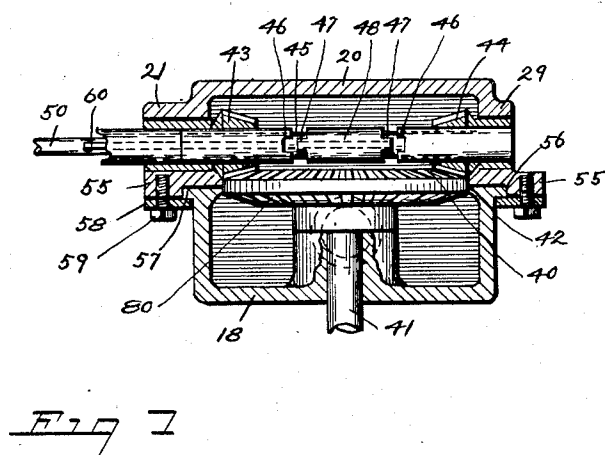
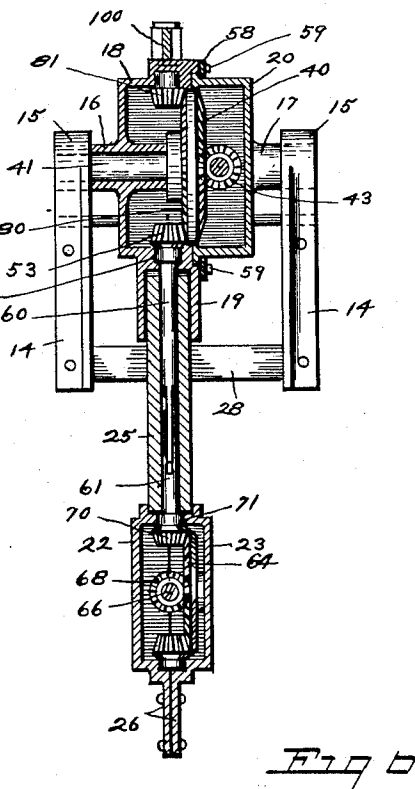
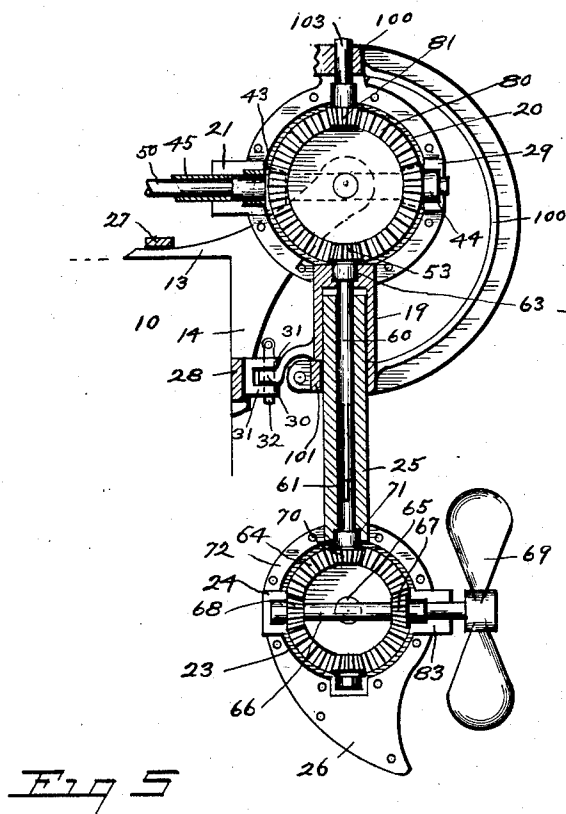
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UNITED STATES PATENT OFFICE

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OUTBOARD PROPELLER DRIVE

Application filed December 31, 1929. Serial No. 417,807.

This invention relates to an outboard propeller drive of that class employed to propel vessels of any draft, especially of shallow draft and where the engine is mounted within the vessel and the propeller shaft is placed over the stern in place of being passed through a bearing in the hull, and the propeller mounting means is secured to the stern, and in this case the mounting is intended to be of a truly substantial nature.

This type of drive is intended primarily for the operation of that class of vessels known as scows, lighters, towboats, etc., and which are used in shallow water, and this drive permits the easy removal of the propeller together with its bearings and housings without necessitating the dry docking or hauling out upon a marine railway of the vessel.

And this drive also permits of the easy replacement of a propeller damaged by the grounding of the vessel, and with this drive those operating the vessel may quickly raise the propeller from the water when the possibility of striking an obstruction occurs, and further the invention greatly increases the number of possible locations for the engine aboard the vessel.

One of the objects of the invention is to provide means whereby an easy and powerful drive is effected without lost motion and with a minimum amount of friction and loss of power.

Another object of the invention is to provide means in an outboard drive whereby, should the propeller or drive housing come into contact with any object in the water, the housing can swing upward to pass over the object, and it will at once return to its driving position either by the action of the operator or by its own weight and without effecting the rotation of the propeller or the meshing of any of the train of gears employed, or having to stop the engine.

Still another object is to provide means whereby the direction of rotation of the propeller may be quickly changed from a forward travel to reverse, or a neutral position.

Another object is to provide means where-

by the length of the device or the depth of the propeller in the water may be adjusted as desired, and furthermore the propeller may be swung so as to act as a rudder to steer the vessel with.

Other objects are that by the use of larger ring gears between the bevel pinions, and by the use of idler pinions, better bearings are secured and the housing can be swung out without disengaging the gears, also by the use of a two part housing the gears may be renewed, adjusted and examined, and the gear ratio changed if desired.

With these and other objects in view, my invention consists in a certain construction and combination of parts as will hereinafter be fully described and claimed, and illustrated in the accompanying drawings in which like figures of reference refer to corresponding parts in all of the views, but it is understood that slight changes may be made without departing from the spirit of the invention.

In the drawings:—

Figure 1 shows the side elevation of the device as attached to the stern of a vessel.

Figure 2 shows a stern view of the same.

Figure 3 shows a top plan view of the same.

Figure 4 shows a partial sectional view, taken on the line A—A of Figure 1.

Figure 5 shows a sectional view, taken on the line B—B of Figure 3.

Figure 6 shows a sectional view taken on the line C—C of Figure 3.

Figure 7 shows an enlarged partial sectional view of the top of drive unit.

Figure 8 shows a sectional view of the locking means.

Referring to the drawings:—

The stern of a vessel is indicated by the numeral 10, and within said vessel is mounted some suitable type of engine provided with a drive shaft 11 and clutch 12; while to the stern 10 is secured in either a permanent or detachable manner a mounting bracket which is formed of the attaching arms 13 having a cross member 27 and the downwardly extending arms 14 having

a cross member 28; while the arms 13 have the alined bearings 15.

The drive casing is composed of three units; an upper gear housing formed of two concentric parts 18 and 20, adapted to swivel one upon the other, and both being formed with trunnions 16 and 17 which are mounted in the bearings 15.

One of said gear housing parts 18 is formed with a depending tubular portion 19; and the other housing part 20 is formed with a bearing boss 21 and 29 at right angles to its axis.

The second unit is designated as the propeller unit, and comprises a two part casing 22 and 23 formed with the propeller shaft bearings 24 and 83 and having a tubular portion 25 which is adapted to telescope within the tubular portion 19; while below said casing 22 and 23 and forming a part thereof is a protective fin 26 which is curved as shown and adapted to strike against and ride over any obstruction in the water and swing outward and upward the propeller and housing on the trunnions 16 and 17.

Adjacent to the telescoping portion is provided an eye 30 adapted to register with a pair of eyes 31 which are formed on the cross member 28 of the mounting frame, and said eyes 30 and 31 are locked together by a shear pin 32; said eyes taking the forward thrust created by the propeller to force the vessel ahead; while should the fin 26 strike against an obstruction in the water the pin 32 will shear and allow the housing to swing outward and upward; yet the pin 32 will have sufficient strength to hold the housing in place during the act of backing the vessel.

The driving train comprises a ring idler bevel gear 40 secured on a shaft 41 rotatably mounted in the trunnion 16 and having its periphery in contact with a bearing surface 42 formed in the housing part 18; and at right angles to said ring gear 40 and in mesh therewith are two bevel pinions 43 and 44 which are rotatably mounted on a sleeve 45 which is mounted in the bearings 21 and 29 formed in the housing part 20.

The bevel pinions 43 and 44 are each formed with a clutch member 46 adapted to coact with a clutch member 47 formed on each end of a boss 48 which is part of the sliding sleeve 45 mounted between the pinions 43 and 44 and adapted to engage either of the same, so that either pinion may be rotated, thus rotating the ring gear 40 in either direction, or the sleeve 45 may be placed in a neutral position as shown.

The clutch sleeve 45 is adapted to be rotated by and slide upon a drive shaft 50 mounted therein and connected to the drive shaft 11 of the engine, said sleeve 45 being secured thereon by a spline 60 of the usual type, and a suitable shift lever 52 is pivoted

to the cross member 27 as at 90 and is provided with a pin 91 riding in a groove 92 formed in said sleeve 45, and suitable catches may be provided for locking said shift lever 52 in its several positions, such as ahead, reverse and stop.

For securing the two parts 18 and 20 of the housing together in a manner that will permit of the part 18 being swung upon the part 20, the part 20 is formed with a flange 55 which is counterbored as at 56 to receive a flange 57 formed on the part 18, and a locking ring 58 is provided which is secured to the flange 55 by the bolts 59.

Within the tubular members 19 and 25 is mounted a two part telescoping vertical shaft 60 and 61, the upper end of the part 60 having secured thereon a bevel pinion 53 which is mounted in a bearing 63 and in mesh with and driven by the ring gear 80 which is formed on the back of the ring gear 40.

And there is also provided an idler bevel pinion 81 mounted in the casing 18 in line with the pinion 53 and for the purpose of creating a better mounting for said ring gear 80.

Within the propeller casing parts 22 and 23 is mounted a second idler ring bevel gear 64 on a shaft stud 65. Mounted in a bearing 83 formed in the part 23 and at right angles to said shaft 65 is mounted a propeller shaft 66 in the bearings 24, and on this propeller shaft 24 is rigidly secured a bevel pinion 67 and rotatably mounted a second bevel pinion or idler 68; while upon the end of said shaft 66 is secured the propeller 69; and for driving said bevel gear 64 there is secured upon the lower end of the telescoping drive shaft 61 a bevel pinion 70 mounted in the bearings 71.

The two parts 22 and 23 of the casing are each formed with a flange 72 which are secured together by the bolts 73 and a part of each of the flanges 72 are extended to form the fin 26.

Should it be desirable to employ the propeller to steer the vessel with in place of a rudder, this may be done by turning the tubular member 25 within the member 19 by suitable means such as the yoke 100 which is formed with the clamp 101 secured upon the tubular member 25 by the bolt 102; while the upper end of said yoke 100 is pivoted on a stud 103 secured to the bearing on the upper housing, and this end of said yoke has hinged thereto a hand lever 104 by the pin 105 while a stop pin 106 prevents its movement in one direction so that by pressing downward on said lever 104 the propeller may be raised in the water.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. An outboard propeller drive for vessels,

comprising in combination with an engine shaft and a propeller shaft, of a gear casing having its upper part pivoted to the vessel and means for retaining it in a semi-locked position therewith, the lower part of said gear casing pivoted and telescoped to the upper part of said casing and means for swinging the lower part of said casing with respect to the upper part thereof, a vertical shaft mounted within said telescoping parts, gears carried thereby, a drive shaft mounted in the upper parts of said casing and adapted to be driven by the engine shaft, a pinion secured thereon and an idler ring gear mounted in the upper part of said casing in mesh with said gear on the vertical shaft and the pinion on the engine drive shaft, a propeller shaft mounted within the lower part of said casing, a pinion secured thereon, and an idler ring gear mounted in said lower part of the casing and in mesh with the pinion on the propeller shaft and the pinion on the vertical shaft.

2. In an outboard propeller drive and in combination with a vessel having an engine driven shaft and a propeller shaft, of means for transmitting rotary movement to the propeller shaft from the engine shaft, comprising a gear casing having its upper part pivoted to the vessel, a drive shaft mounted in said casing and means for rotating said drive shaft, comprising a gear secured on the upper end thereof and a gear secured on the lower end thereof, a gear secured on the engine shaft and an idler ring gear mounted within said casing and in mesh with the gear on the engine shaft and the gear on the upper end of the drive shaft, a propeller shaft drive comprising a gear secured on the propeller shaft, and an idler ring gear mounted in the lower end of the casing and in mesh with the gear on the propeller shaft and the gear on the lower end of the drive shaft.

In testimony whereof I affix my signature.

SYLVANUS H. H. PARSONS.