Jan. 2, 1951

A. W. WANZER

OUTBOARD PROPELLER MECHANISM FOR BOATS, BARGES AND THE LIKE

2,536,894

Filed Dec. 23, 1948

3 Sheets-Sheet 1

Fig. 1.

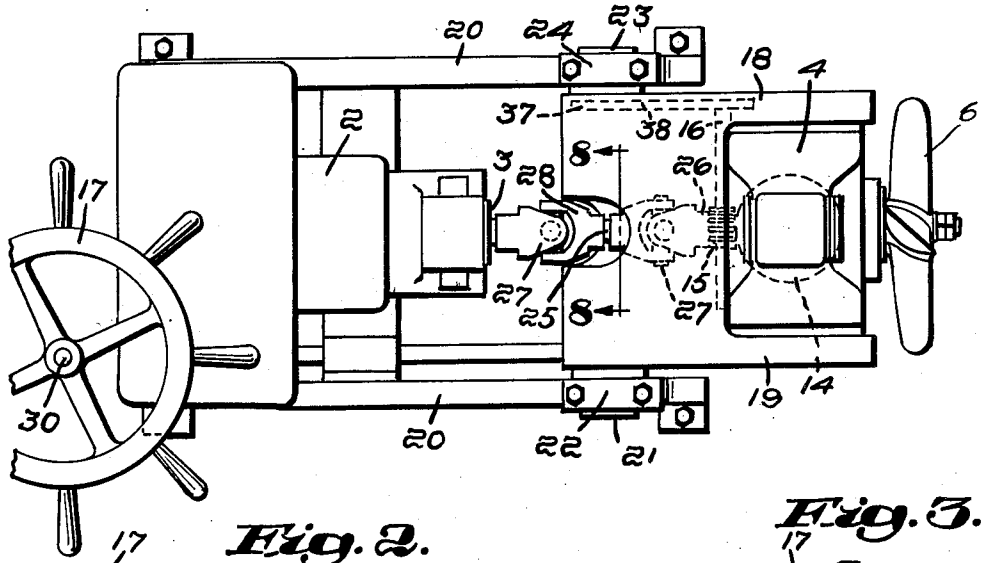


Fig. 2.

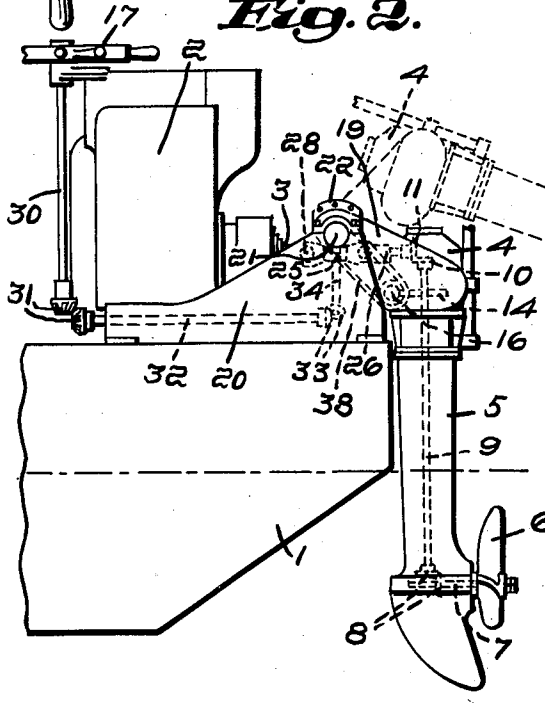
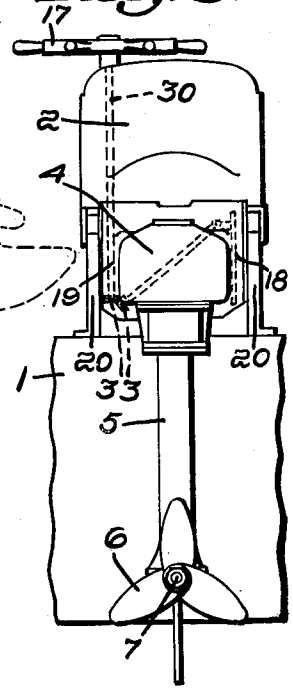


Fig. 3.



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Jan. 2, 1951 A. W. WANZER 2,536,894

OUTBOARD PROPELLER MECHANISM FOR BOATS, BARGES AND THE LIKE

Filed Dec. 23, 1948 3 Sheets-Sheet 2

Fig. 4.

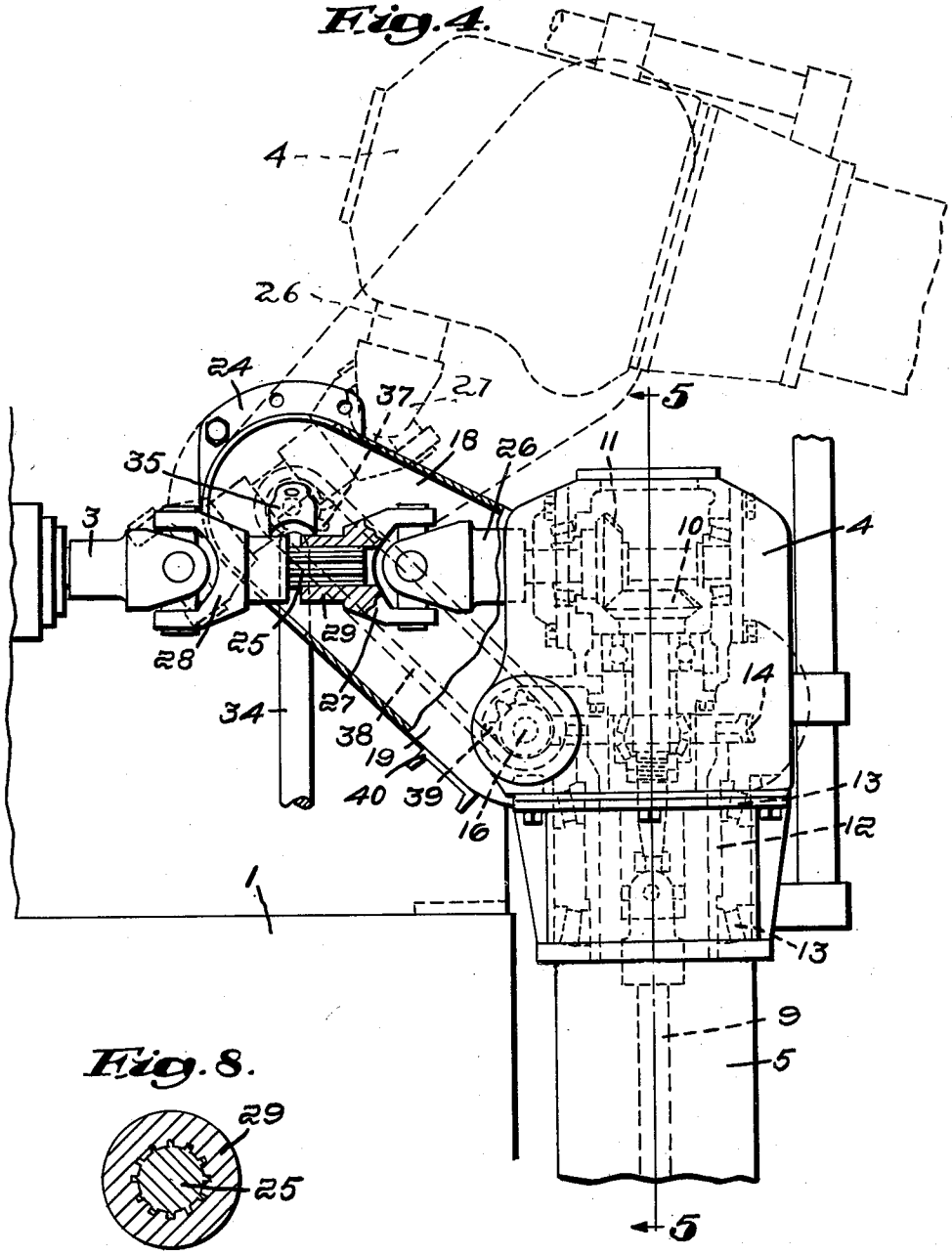


Fig. 8.

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Jan. 2, 1951 A. W. WANZER 2,536,894

OUTBOARD PROPELLER MECHANISM FOR BOATS, BARGES AND THE LIKE

Filed Dec. 23, 1948 3 Sheets-Sheet 3

Fig. 5.

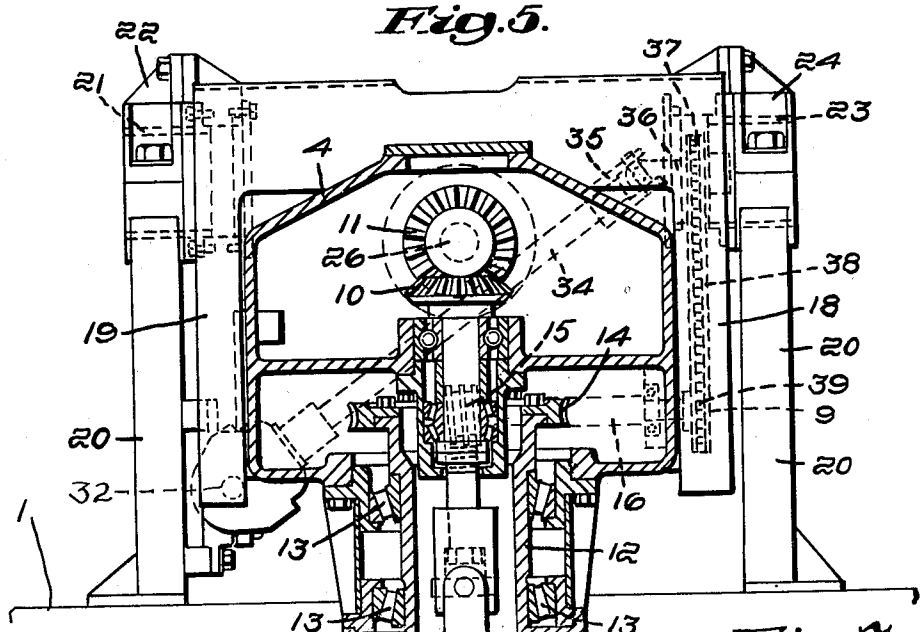


Fig. 6.

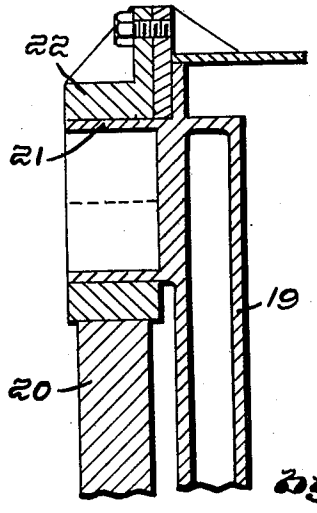
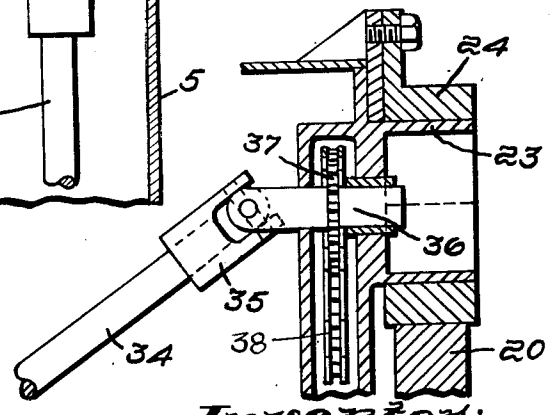


Fig. 7.



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UNITED STATES PATENT OFFICE

2,536,894

OUTBOARD PROPELLER MECHANISM FOR BOATS, BARGES, AND THE LIKE

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Application December 23, 1948, Serial No. 66,976

2 Claims. (Cl. 115—35)

1

This invention relates to outboard propeller mechanism for boats, barges and other sea-going craft and especially to the type of outboard propeller mechanism in which the propeller and its supporting means are mounted for swinging movement about a horizontal axis for raising the propeller, and in which the propeller is capable of bodily turning movement about a vertical axis for steering the boat. An outboard propeller mechanism of this type is illustrated in the Mathewson, U. S. Patent No. 2,335,597, November 23, 1943, and also in my U. S. Patent No. 2,458,813, January 11, 1949 and U. S. Patent No. 2,499,339, February 28, 1950.

In the devices shown in said patent and applications the propeller is driven from a vertical drive shaft which is operatively connected to the power shaft by bevel transmission gears, and the steering mechanism includes a steering wheel and connections from the latter by which the propeller is given its bodily turning movement about the vertical axis. Furthermore in the devices shown in said patent and applications, the construction is one which permits the propeller and its vertical drive shaft to be swung about a horizontal axis into raised position for clearing obstructions in the water or for lifting it entirely free from the water, without disrupting either the operative connections for driving the propeller or the operative connections by which the propeller is turned about its vertical axis for steering the boat.

To provide for this the gear transmission between the power shaft and the vertical drive shaft includes bevel gears which are co-axial with said horizontal axis, and the steering mechanism includes a rotary transmission element also co-axial with said horizontal axis.

One object of the present invention is to provide an improved outboard propeller mechanism of the above type in which the driving connection between the power shaft and the vertical drive shaft is simplified by being reduced to a single pair of intermeshing bevel gears, one on the power shaft and the other on the vertical drive shaft, but which is so constructed as to permit the propeller to be raised and lowered, and also to be turned about the vertical axis for steering the boat while maintaining intact and operative the driving connections between the power shaft and the propeller and also the steering mechanism by which the propeller is given its bodily turning movement about a vertical axis.

In order to give an understanding of the invention, I have illustrated in the drawings a selected embodiment thereof, which will now be described after which the novel features will be pointed out in the appended claims.

2

In the drawings,

Fig. 1 is a top plan view of an outboard propeller mechanism embodying my invention.

Fig. 2 is a side view thereof showing a portion of the barge or other vessel on which the mechanism is mounted.

Fig. 3 is a rear view of Fig. 2.

Fig. 4 is an enlarged side view with parts broken out showing the upper gear housing member and the manner in which it is pivotally mounted for swinging movement.

Fig. 5 is a sectional view on the line 5—5, Fig. 4.

Fig. 6 is a fragmentary sectional view of one of the pivoted bearings for the gear housing member.

Fig. 7 is a fragmentary sectional view of the other pivoted bearing for the gear housing member.

Fig. 8 is a section on the line 8—8, Fig. 1.

In the drawings 1 indicates the stern of a barge, boat, or other sea-going vessel on which my improved outboard propeller mechanism is mounted and 2 indicates a motor, which may conveniently be of the internal combustion type, for operating the propeller mechanism, said motor having the horizontally extending power shaft 3 for delivering power to the propeller mechanism.

The mechanism herein shown comprises an upper housing member 4, which is in the nature of a gear housing, and from which depends a lower housing 5 that supports the propeller 6. Said propeller is, as usual, mounted on a horizontal propeller shaft 7 carried at the lower end of the housing member 5, said propeller shaft being connected by bevel gears 8 with a vertical drive shaft 9 which extends through the housing 5 and into the gear housing 4, said drive shaft 9 being connected to the power shaft 3 through a single pair of bevel gears 10, 11 which mesh with each other, the gear 10 being mounted on the upper end of the drive shaft 9 and the gear 11 on the end of the power shaft 3.

The upper end 12 of the lower housing 5, which may conveniently be called a propeller-supporting housing because it supports a propeller 6, extends into and is mounted for turning movement within the lower portion of the gear housing 4, said propeller supporting housing 5 being mounted in suitable roller bearings 13.

Said upper end 12 of the housing 5 has fast thereon a worm gear 14 which meshes with and is driven by a worm 15 carried by a transverse shaft 16 that is journaled in the gear housing 4 and said shaft 16 is connected by connections hereinafter described to the steering wheel 17 so that by operating the steering wheel, the lower housing 5 may be turned in one direction or the other about its vertical axis for steering the boat in the manner set forth in the above patent and applications.

As stated above, one feature of the present invention relates to a pivotal mounting for the housing members 4 and 5 which permit them to swing about a horizontal axis for raising the propeller without disrupting either the driving connections between the power shaft 3 and the drive shaft 9 or the operative connections between the steering wheel 17 and the worm 15 and its worm gear 14.

The upper gear housing 4 is provided with two extensions 18, 19 which are pivotally connected to a supporting frame 20 that is mounted on the deck of the vessel to provide for swinging the gear housing 4 about a horizontal axis. The extension 19 carries at its free end a trunnion 21 which is journaled in a bearing 22 carried by the supporting frame 20, and the other extension 18 carries at its free end another trunnion 23 which is journaled in a bearing 24 carried by the supporting frame 20. The trunnions are co-axial and constitute a horizontal axis about which the gear housing 4 and the propeller-supporting housing 5 may be swung as a unit, said axis being located above the axial line of the power shaft 3 as best seen in Figs. 2 and 4.

In order to provide for such swinging movement of the housings 4 and 5 as a unit from their operative position shown in full lines Figs. 2 and 4 into a raised position indicated by dotted lines and without disconnecting the bevel gears 10 and 11, I propose to provide the power shaft 3 with a plurality of sections pivotally connected together and to make one of the extensions extensible and contractible. Accordingly said power shaft is formed with the two end sections 25, 26 which are connected by a universal joint 27. The section 25 is also connected to the main power shaft section by means of another universal joint 28. The shaft section 26 is journaled in bearings in the gear housing 4, and the bevel gear 11 is mounted thereon

The shaft section 25 is made extensible and contractible. One end of said shaft section is slidably mounted in the hub portion 29 of the universal joint 27 and is splined thereto.

The flexibility of the power shaft resulting from the use of the universal joints therein as well as the extensibility of the shaft section 25 enables the housing members 4 and 5 to be swung as a unit about the horizontal axis of the trunnions 21, 23 while the gears 10 and 11 remain in mesh with each other, and thus the raising of the propeller can be accomplished without disrupting in any way the driving connections between the power shaft 3 and the propeller 6.

The steering connections between the steering wheel 17 and the worm shaft 16 comprise a vertical shaft 30 on which the steering wheel 17 is mounted and which is connected by bevel gears 31 to a horizontal shaft 32 which in turn is connected by bevel gears 33 with a shaft 34 that is journaled in the supporting frame 20. Said shaft 34 extends diagonally and at its upper end is connected by a universal joint 35 with a horizontally extending shaft section 36 that is co-axial with the trunnion 23 and is mounted for rotative movement therein. The shaft section 36 has rigid therewith a sprocket wheel 37 which is connected by a sprocket chain 38 with a sprocket wheel 39 on the worm shaft 16.

The operative connections between the steering wheel 17 and the shaft 16 thus includes a rotary transmission element 36 which is co-axial with the horizontal axis about which the housing members 4 and 5 swing when the propeller is being raised and lowered, and because of this co-axial relation, the swinging of the housing members 4 and 5 about their horizontal axis will not disrupt or effect in any way the operativeness of the driving connections between the steering wheel 17 and the worm shaft 16.

I claim:

1. An outboard propeller for boats and the like comprising a supporting frame adapted to be mounted on the deck of a boat, a gear housing member having two spaced upwardly and inwardly directed extensions, means pivotally connecting said extensions to the supporting frame for swinging movement of the gear housing about a horizontal axis, a propeller-carrying housing depending from the gear housing, a propeller carried by the propeller-carrying housing, the latter being turnable relative to the gear housing about a vertical axis to steer the boat, means for operating the propeller including a horizontally extending power shaft having one end journalled in the gear housing and located below said horizontal axis, a vertical drive shaft enclosed in the propeller-carrying housing, gears connecting said power shaft and vertical drive shaft, steering means for turning the propeller-carrying housing about its vertical axis, said steering means including a rotary transmission element coaxial with said horizontal axis and mounted on one of the extensions of the gear housing, a shaft journalled on said supporting frame below the power shaft and extending parallel thereto, a transversely extending upwardly inclined shaft connected by bevelled gears at its lower end to the longitudinally extending shaft, a universal joint connection between the upper end of said inclined shaft and the rotary transmission element, a shaft carried by the gear housing, gears connecting said latter shaft to the propeller-carrying housing, and a sprocket chain connecting said rotary transmission element to said last-named shaft, the portion of said power shaft adjacent the gear housing being made in sections connected by universal joints.

2. An outboard propeller mechanism for boats comprising a supporting frame adapted to be mounted on the deck of a boat and having two spaced upright portions, a gear housing member having two upwardly and inwardly directed extensions, each of which has a trunnion element journalled in one of the upright portions of the supporting frame and one at least of said extensions being hollow, said trunnions being aligned horizontally, a propeller-carrying housing depending from the gear housing, a propeller carried by the propeller-carrying housing, the latter being turnable relative to the gear housing about a vertical axis to steer the boat, means for operating the propeller including a horizontally extending power shaft located below the horizontal axis of the trunnions and having one end journalled in the gear housing, a

vertical drive shaft enclosed in the propeller-carrying housing, gearing connecting said drive shaft and power shaft, steering means for turning the propeller-carrying housing about its vertical axis, said steering means including a rotary transmission element journalled in one of said extensions coaxially with the trunnion thereof, a shaft mounted on the supporting frame below the power shaft and extending parallel thereto, a transversely extending, upwardly inclined shaft connected by gears at its lower end to the longitudinally extending shaft, a universal joint connection between said upwardly inclined shaft and the rotary transmission element, a shaft carried by the gear housing, gearing connecting said latter shaft to the propeller-carrying housing, a sprocket chain connecting said rotary transmission element and said last-named shaft, said sprocket chain being enclosed in the corresponding hollow gear housing extension, the portion of the power shaft adjacent the gear housing being made in sections connected by universal joints.

ARTHUR W. WANZER.

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