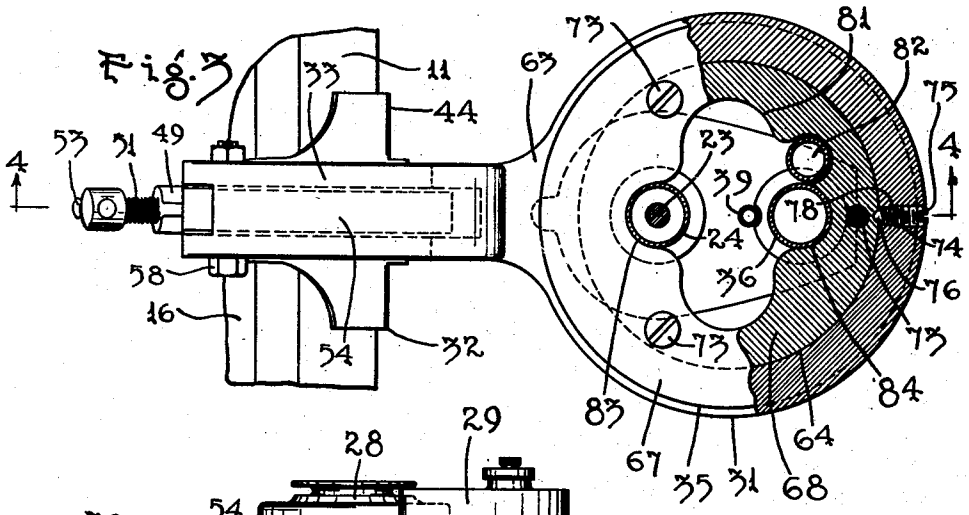
Sept. 3, 1940. K. C. SOLIE 2,213,536

OUTBOARD MOTOR

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Fig. 3



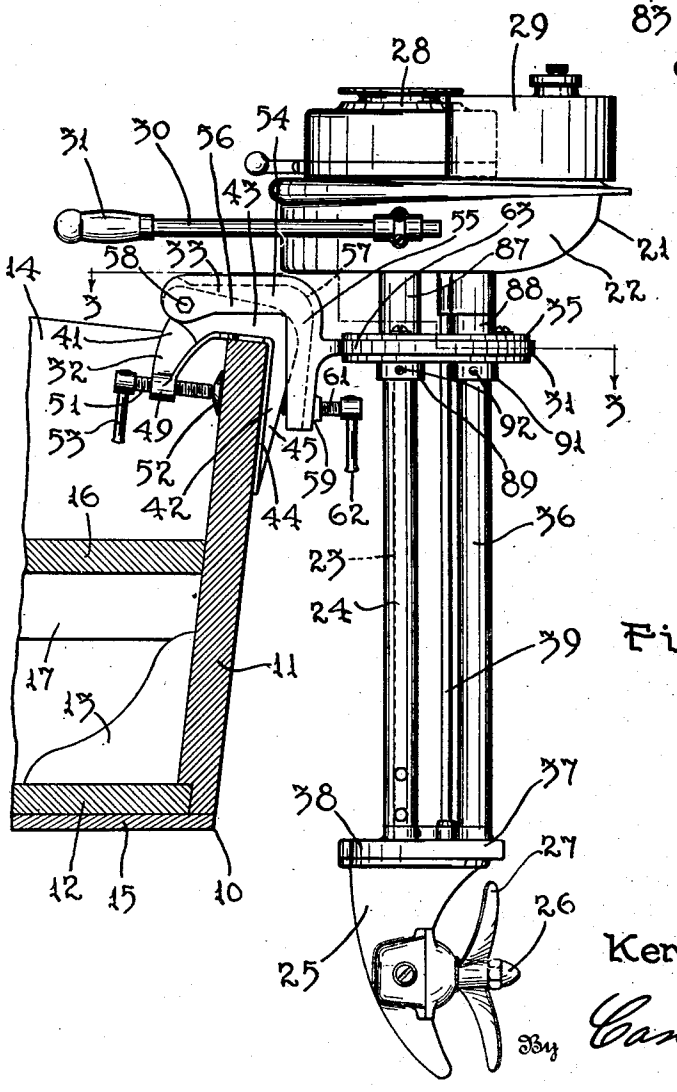


Fig. 1

Inventor

Kenneth C. Solie

By Carwell & Lagaard

Attorneys

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Fig. 2

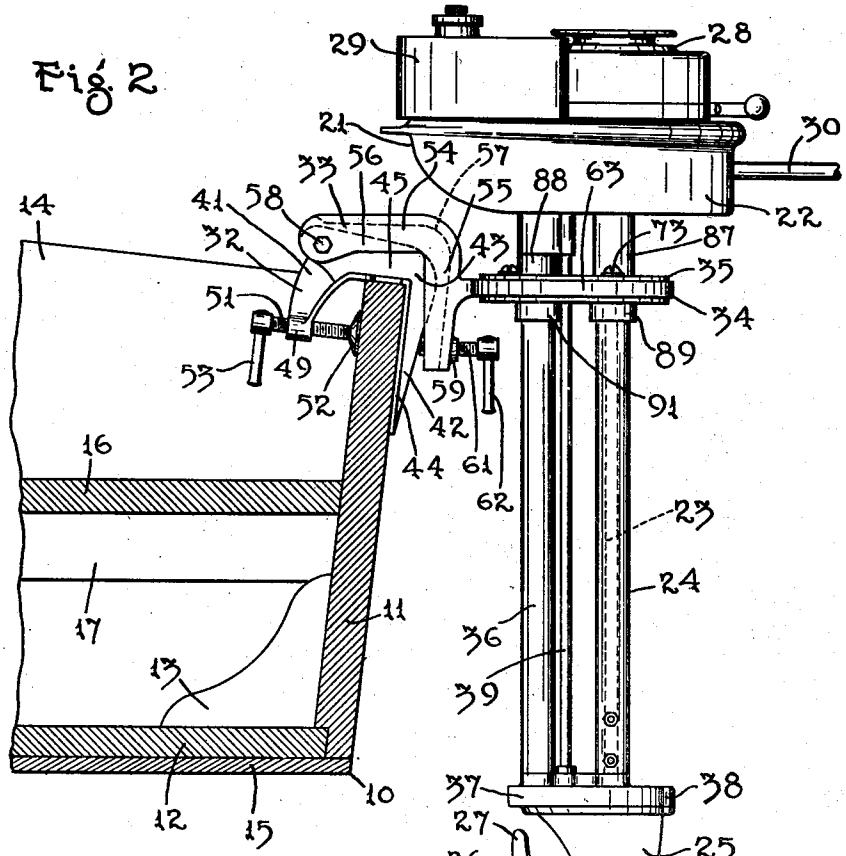
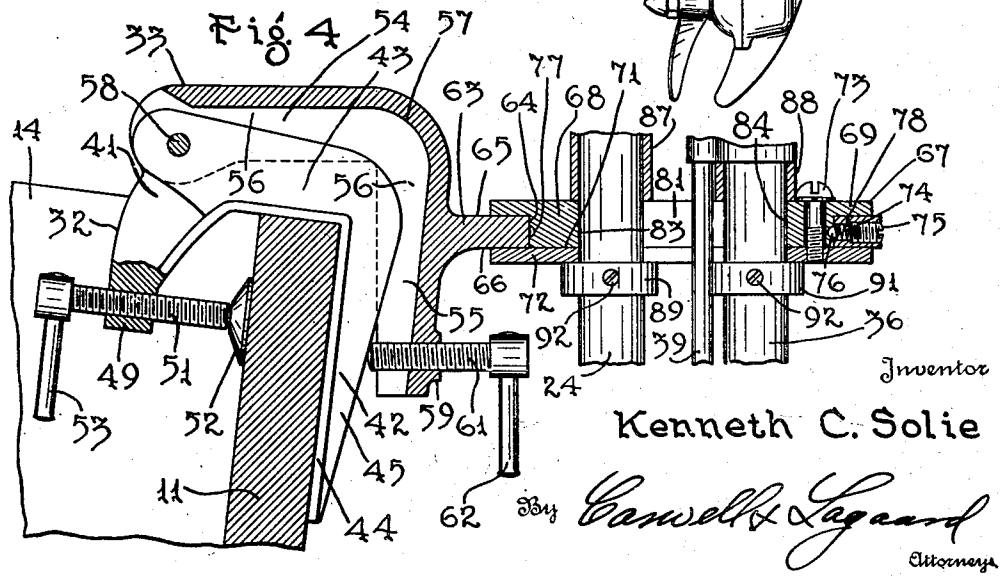


Fig. 4



Inventor

Kenneth C. Solie

By Caswell & Lagaard

Attorneys

Patented Sept. 3, 1940 2,213,536

UNITED STATES PATENT OFFICE

2,213,536

OUTBOARD MOTOR

Kenneth C. Solie, Minneapolis, Minn.

Application July 20, 1938, Serial No. 220,225

5 Claims. (Cl. 248—4)

My invention relates to outboard motors adapted to be attached to boats and has for an object to provide an outboard motor which may make a complete revolution so that the direction of travel of the boat may be reversed without stopping the motor.

An object of the invention resides in providing a mounting whereby an ordinary motor may be mounted for complete rotation with respect thereto.

Another object of the invention resides in providing a clamp and in pivoting to said clamp a mounting by which the motor is carried and in further providing means for rotatably supporting said motor with respect to the mounting.

A feature of the invention resides in constructing the mounting with a circular track and in providing a turn table to which the motor is attached, which turn table is rotatable within the track.

Another object of the invention resides in constructing the mounting in the form of an angle having a horizontal leg and a vertical leg depending therefrom and in providing a bracket issuing outwardly from said vertical leg and having the track in which the turn table is mounted for rotation.

A still further object of the invention resides in constructing the clamp with a web and in forming the mounting U-shaped in cross section with flanges straddling the web of the clamp.

An object of the invention resides in providing a pintle extending jointly through the flanges of the horizontal leg at the free end thereof and through said web for pivotally supporting the mounting relative to the clamp.

An object of the invention resides in threading the lower end of the vertical leg and in providing an adjusting screw, screwed therein for engagement with the web of the clamp to adjust the angular position of the mounting.

A feature of the invention resides in providing said bracket with a circular hole providing shoulders on opposite sides of the bracket and constituting the track.

An object of the invention resides in constructing the turn table in the form of a flanged disc received within said hole and having the flange thereof resting on one of said shoulders.

Another object of the invention resides in providing a plate secured to said disc and engaging the other shoulder for holding the turn table from movement out of the hole.

An object of the invention resides in constructing the disc of sufficient dimensions so that the drive shaft housing and other elongated members such as the exhaust pipe and water pipe may be completely disposed within the confines of said disc whereby the entire motor may be rotated as a unit.

Other objects of the invention reside in the novel combination and arrangement of parts and in the details of construction hereinafter illustrated and/or described.

In the drawings:

Fig. 1 is a longitudinal sectional view of a boat illustrating an embodiment of my invention applied thereto.

Fig. 2 is a view similar to Fig. 1 showing the parts rotated through an angle of 180 degrees.

Fig. 3 is a plan sectional view taken on line 3—3 of Fig. 1 and drawn to a greater scale.

Fig. 4 is an elevational sectional view taken on line 4—4 of Fig. 3.

Since it has become the requirement of outboard motor operators that the motors exhaust under water, it has become necessary to run an exhaust pipe parallel with the drive shaft housing and spaced therefrom. Such construction makes it impossible to mount the motor so that the same may swing throughout a complete revolution where rotation is had about the axis of the drive shaft housing and thus be used for propulsion in either direction. The present invention provides a construction whereby a motor of such characteristics may be mounted so as to make a complete revolution whereby the desired advantages may be procured.

For the purpose of illustrating the application of my invention I have shown in Figs. 1 and 2 a portion of a boat 10. Inasmuch as the invention does not lie in the boat only a portion of the boat has been illustrated. The part of the boat illustrated consists of a transom 11 to which is attached a keel 12. A knee 13 is disposed between the transom and keel. The boat also includes a planking 14 which is attached to the transom 11 and which forms the sides of the boat together with planking 15 which is attached to the lowermost portion of the transom 11 and to the planking 14 to form the bottom of the boat. A seat 16 carried on stringers 17 is provided at the rear end of the boat.

The outboard motor used with my invention may be of any of the conventional types such as are now in common use and since the invention does not reside in the specific construction of the motor proper, the same has only been generally illustrated. The outboard motor is indicated by the reference numeral 21 and consists of a power

unit 22 including one or more cylinders and pistons and corresponding connecting rods operated thereby but not shown. The connecting rods of the motor are connected to a crank shaft not illustrated which may be directly connected to a drive shaft 23 or which may be integral therewith. The shaft 23 is mounted for rotation within a drive shaft housing 24 which is tubular in form and which is attached at its upper end to the power unit 22. The lower end of the housing 24 has secured to it a gear housing 25. Within this housing are bevel gears, not shown, one of which is driven by drive shaft 23 and the other which drives the propeller shaft 26. Shaft 26 has secured to it a propeller 27. The upper end of the crank shaft or the shaft 23 as the case may be has secured to it a fly wheel 28. A fuel tank 29 extends about the fly wheel. Attached to the power unit 22 is a steering lever 30 which has mounted on the end of it a handle 31 by means of which the entire outboard motor may be rotated to steer and reverse the direction of propulsion of the boat as will presently become apparent.

The exhaust from the power unit 22 is carried through an exhaust pipe 36 which is connected at its upper end with the exhaust ports of the outboard motor and which is attached to its lower end to a muffler 37 carried by gear housing 25 and adapted to discharge below the water level. In the housing 25 is provided a pump 38 by means of which water is pumped through a pipe 39 and into the water jackets of the cylinders of the power unit 22 and subsequently discharged therefrom. The two pipes 36 and 39 lie parallel with the drive shaft housing 24 and disposed in eccentric relation thereto and spaced therefrom.

My invention comprises a clamp 32 to which is attached a mounting 33. Mounting 33 carries a bracket 34 which rotatably supports a turn table 35. The drive shaft housing 24, the exhaust pipe 36 and water pipe 39 all pass through the turn table 35 and the entire outboard motor is supported on this turn table. These various parts will now be described in detail.

The clamp 32 is C-shaped in form, being constructed with spaced vertical legs 41 and 42 and a connecting portion 43 therebetween. These portions are T-shaped in cross section and have flanges 44 and webs 45 extending outwardly therefrom. The flange 44 of the leg 42 is adapted to rest against the rear surface of the upper portion of the transom 11 of the boat 10. The lowermost portion of the leg 41 is formed with a boss 49 which is threaded to receive an adjusting screw 51. This screw carries a swivelly attached head 42 which is adapted to engage against the inner surface of the transom 11 and when the said screw is rotated by means of handle 53 the clamp is urged into engagement with the transom. The flange 44 of leg 42 is of considerable width so that a sufficient bearing surface is provided to securely attach the clamp to the boat.

The mounting 33 is anguular in form and is constructed with two legs 54 and 55. The leg 54 is arranged horizontally while the leg 55 is arranged vertically and depends from one end of the leg 54. Both of these legs are U-shaped in cross sections being constructed with flanges 56 and a web 57 therebetween. The mounting 33 is disposed so that the flanges 56 thereof straddle the web 45 of the leg 41 of clamp 32. The mounting 33 is pivoted to the clamp 32 by means of a bolt 58 which extends jointly through the two flanges 56 of the mounting 33 and the web 45 of the said leg of clamp 32. This bolt is disposed at the free end of the leg 54 of mounting 33 so that when the said mounting is swung about the bolt 58 as a pivot the angular position of the mounting is varied with respect to the boat.

At the lower end of the leg 55 of mounting 33 is provided a boss 59 which is threaded to receive a screw 61. This screw engages the web 45 of the leg 42 of clamp 32 and serves to shift the angular position of the mounting. A handle 62 carried by this screw permits of readily adjusting the same.

Issuing outwardly from the leg 55 of mounting 33 is a bracket 63. This bracket is in the shape of a plate and is constructed annular in form being provided with a circular opening 64 extending completely through the same. By means of this opening two annular shoulders 65 and 66 are formed on the said bracket 63 which are at right angles to the axis of the opening 64 and which form a track extending circularly about the said opening. The bracket 63 is attached to the leg 55 at a locality above the screw 61 so as not to interfere with the operation thereof.

Rotatably mounted on the track formed by the shoulders 65 and 66 is a turn table 67 which comprises a disc 68 rotatably mounted within the circular opening 64. This disc is constructed with a flange 69 extending outwardly therefrom and which rests upon the shoulder 65. The disc 68 is of such thickness that the lowermost surface 71 thereof lies flush with the shoulder 66. Attached to the disc 68 is a plate 72 which is of substantially the same size as the flange 69 of said disc and which engages the lowermost shoulder 66 of the bracket 63. The plate 72 is attached to the disc 68 by means of screws 73 which extend through the said disc and are threaded into the plate. It will readily be comprehended that the turn table 67 becomes rotatably mounted for movement along the track of the bracket 63 and may make a complete revolution with respect thereto.

For the purpose of arresting the turn table 67 in certain positions the following construction is employed. Formed in the bracket 63 is a bore 78. A screw 75 is threaded into the outer end of this bore. Within this bore is mounted a ball 76 which is urged into engagement with a number of sockets 77 in the disc 68. A compression coil spring 74 seated at one end against the ball 76 and at its other end against the screw 75 holds the ball in operative position. The sockets 77 are of such shape that the turn table 67 is held in proper position but may be released upon the exercise of sufficient force to the handle 31.

The outboard motor of the invention is carried by the turn table 67 and is attached thereto in the following manner: Formed in the disc 68 and in the plate 72 is an opening 81 of such dimensions as to snugly receive the drive shaft housing 24, the exhaust pipe 36 and the water pipe 39. In the particular type of outboard motor shown, the air intake 82 of the motor extended to a position in proximity to the locality where it was desired to attach the turn table to the motor. To accommodate this intake, the opening 81 was constructed accordingly as shown in Fig. 3. The opening 81 is formed with two recesses 83 and 84 in which the housing 24 and the pipe 36 fit. Sleeves 87 and 88 mounted upon

the housing 24 and the pipe 36 engage the power unit 22 and support the entire structure through the disc 68. Two collars 89 and 91, provided with set screws 92, are mounted on the housing 24 and pipe 36 and engage the under side of the plate 72 and hold the parts rigidly attached to the turn table 67.

In assembling the motor on the support the gear case 25 is removed whereupon the sleeves 87 and 88 may be assembled upon the housing 24 and pipe 36. Thereafter the parts may be inserted in the proper position within the hole 81 of disc 68 and plate 72 and the collars 89 and 91 applied to said housing and pipe. After these collars are secured in place through the set screws 92 the gear case 25 is again applied and the outboard motor is ready for use.

The use of my invention is as follows: After the clamp 32 has been applied, screw 61 is used for adjusting the angularity of the propeller 27 with respect to the surface of the water. The outboard motor is then steered in the customary manner through the handle 31 by rotating the entire motor through the turn table 67 and the track formed in the mounting 33. Whenever it becomes desired to reverse the travel of the boat the entire outboard motor is completely turned around through an angle of 180 degrees until the same occupies the position shown in Fig. 2. This may be accomplished without stopping the motor. When it is desired to run the motor continuously, in a directly forward direction, the motor is shifted until the ball 76 engages the proper socket 77 which affords sufficient frictions to maintain the motor in the desired adjusted position.

The advantages of my invention are manifest. An extremely simple and practical construction is provided whereby an outboard motor having an under water exhaust may be turned throughout a complete revolution so that the motor may be used to propel the boat either in a forward or rearward direction without reversing the motor. My device operates in an exceedingly effective manner. My invention can be used with various types of outboard motors and without reconstruction thereof. With my invention adjustment of the angularity of the propeller with respect to the surface of the water can readily be made while the motor is in operation.

Changes in the specific form of my invention, as herein disclosed, may be made within the scope of what is claimed without departing from the spirit of my invention.

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

1. In combination, an outboard motor having a power unit, a drive shaft housing depending therefrom, an elongated member extending in the same general direction as said housing and disposed in eccentric relation relative thereto, a support for said motor including a clamp, a mounting carried by said clamp, said mounting having a horizontal leg and a vertical leg depending from the horizontal leg, a pivot between said horizontal leg and said clamp for pivoting said mounting for swinging movement with respect to said clamp, said pivot being remotely situated relative to said vertical leg, a bracket extending outwardly from said vertical leg and provided with a circular track, a turn table mounted for complete rotation within said track, said housing and elongated member extending through said turn table, means for attaching said motor to said turn table, and means carried by said vertical leg and engaging said clamp for swinging said mounting about said pivot.

2. In combination, an outboard motor having a power unit, a drive shaft housing depending therefrom, an elongated member extending in the same general direction as said housing and disposed in eccentric relation with respect thereto, a support for said motor including a clamp, a mounting carried by said clamp, said mounting having a horizontal leg and a vertical leg depending from the horizontal leg, a pivot between said horizontal leg and said clamp for pivoting said mounting for swinging movement with respect to said clamp, said pivot being remotely situated relative to said vertical leg, a screw threaded in the lower portion of said vertical leg and engaging said clamp, a bracket issuing outwardly from said vertical leg and situated above said screw and provided with a circular track, a turn table mounted for complete rotation within said track, said housing and elongated member extending through said turn table, means for attaching said motor to said turn table, said track being disposed outwardly of said screw to cause the drive shaft housing and elongated member of the motor to clear said screw.

3. In combination, an outboard motor having a power unit, a drive shaft housing depending therefrom, an elongated member extending in the same general direction as said housing and disposed in eccentric relation relative thereto, a support for said motor including a clamp, a mounting carried by said clamp and having a plate-like bracket extending in a substantially horizontal plane therefrom, said bracket being constructed with a circular opening providing annular shoulders encircling said opening and disposed on opposite sides of said bracket and forming a circular track, a turn table in the form of a disc received within said opening, said turn table having a flange resting upon the uppermost of said shoulders, a plate secured to the under side of said disc and engaging the undermost of said shoulders, means for securing said plate and disc together to hold said turn table rotatably mounted within the track, said drive shaft housing and elongated member extending through said turn table and means for attaching said motor to said table.

4. In combination, an outboard motor having a power unit, a drive shaft housing depending therefrom, an elongated member extending in the same general direction as said housing and disposed in eccentric relation relative thereto, a support for said motor including a clamp having a web extending therefrom, a mounting carried by said clamp and comprising a horizontal leg and a vertical leg depending from the horizontal leg, said legs being U-shaped in cross section and constructed with spaced parallel flanges straddling the web of said clamp, pivot means extending jointly through the flanges of said horizontal member at the free end thereof and through said web for pivotally attaching said mounting to said clamp, the lowermost portion of said vertical leg being threaded, a screw screwed into the threaded portion of said leg for engaging said web for swinging said mounting, a bracket extending outwardly from the vertical leg of said mounting and provided with a circular track, a turn table mounted for complete rotation within said track, said housing and elongated member extending through said

turn table and means for attaching said motor to said turn table.

5. In combination an outboard motor having a power unit and a drive shaft housing depending therefrom a support for said motor including a clamp having spaced arms adapted to straddle the transom of a boat and a connecting portion extending above the transom, a screw threaded in the arm disposed upon the interior of the boat, a mounting carried by said clamp, said mounting having a substantially horizontal leg extending in the direction of the connecting portion of the clamp and across the transom of the boat and a substantially vertical leg extending along the arm of the clamp disposed upon the exterior of the boat, a pivot between the free end of the horizontal leg of the mounting and a portion of the clamp at the locality of the arm having the screw, a screw threaded in the lowermost portion of the other leg of the mounting and engaging the other arm of the clamp, and means issuing outwardly from the clamp at a locality above the second named screw for supporting said motor for rotation about an axis extending in the same general direction as the axis of the motor drive shaft housing.

KENNETH C. SOLIE.