

May 10, 1932.

O. S. HEIDE

1,857,636

OUTBOARD MOTOR

Filed Aug. 21, 1929

5 Sheets-Sheet 1

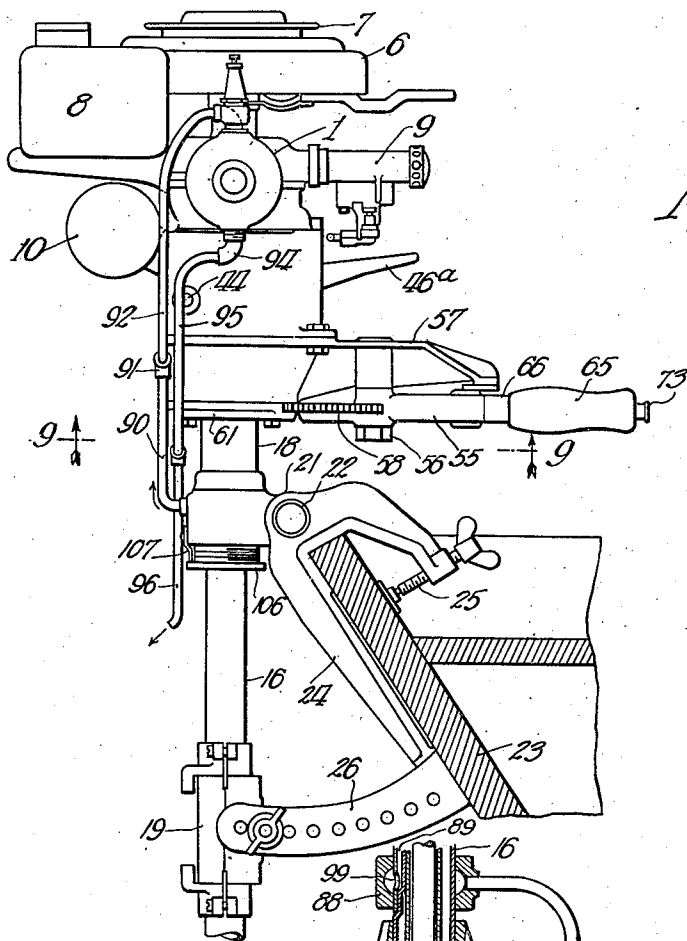


Fig. 1

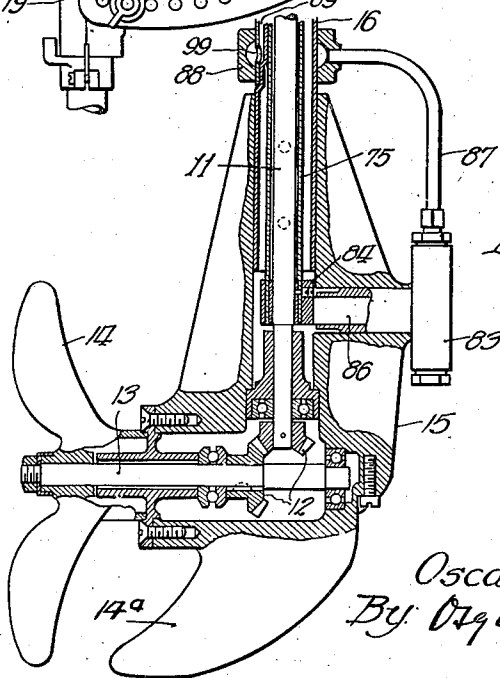


Fig. 1a

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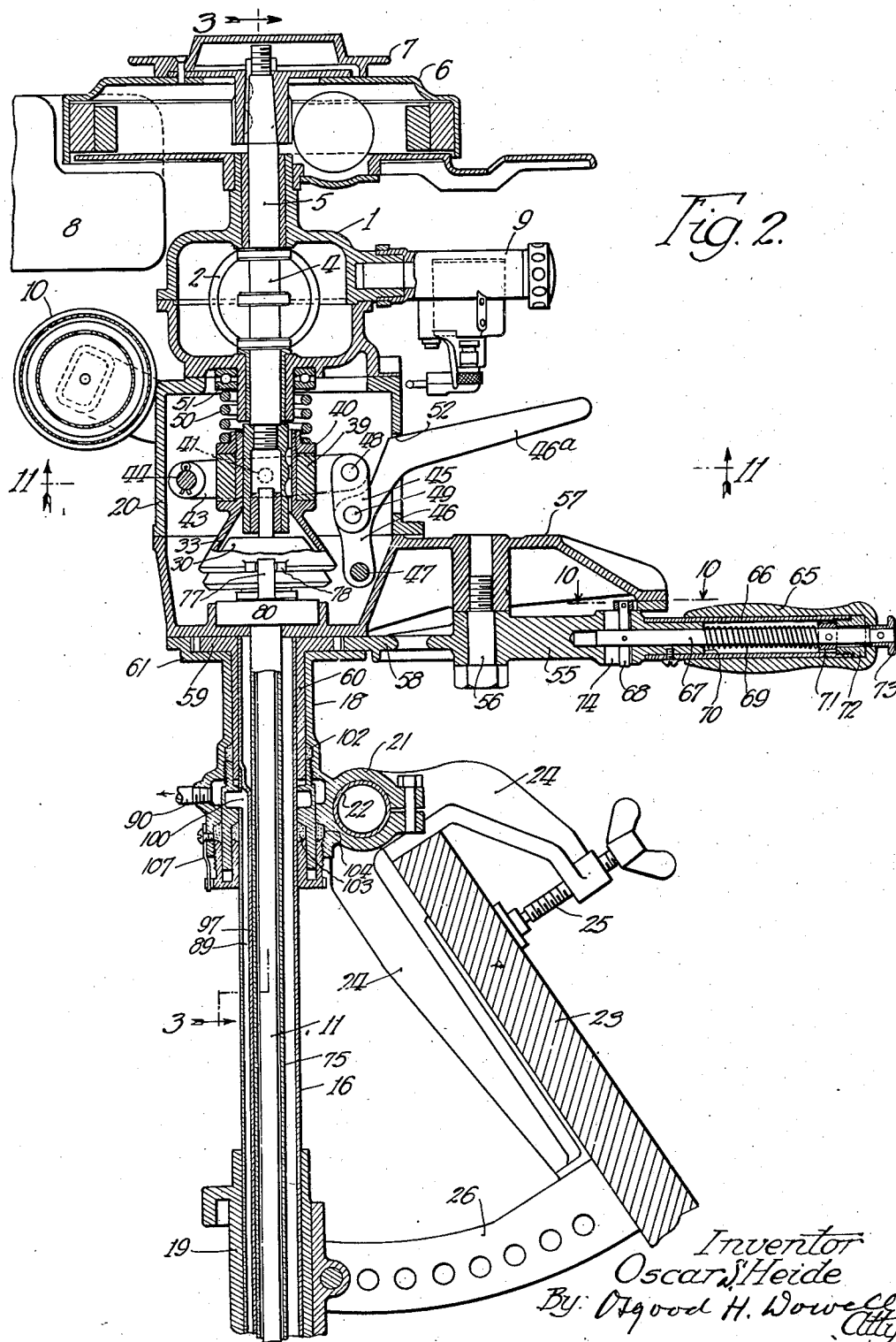
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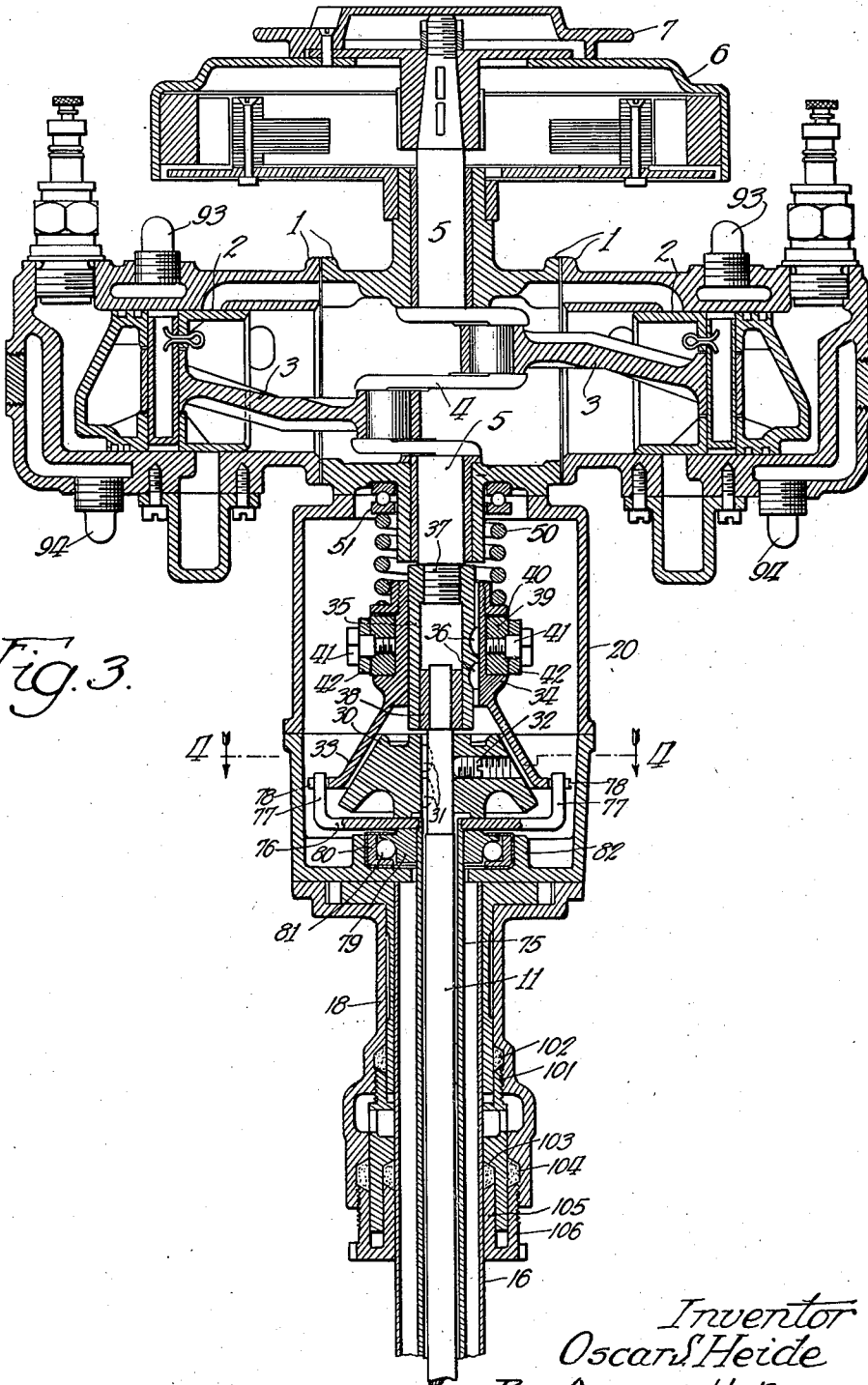


Fig. 3.

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Fig. 4.

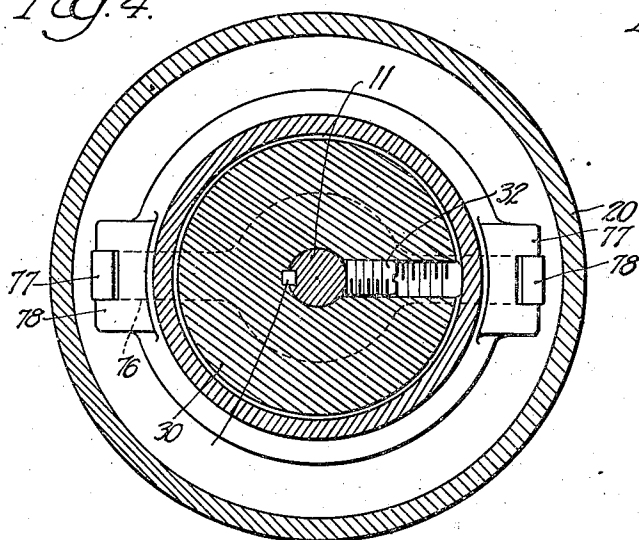


Fig. 7.

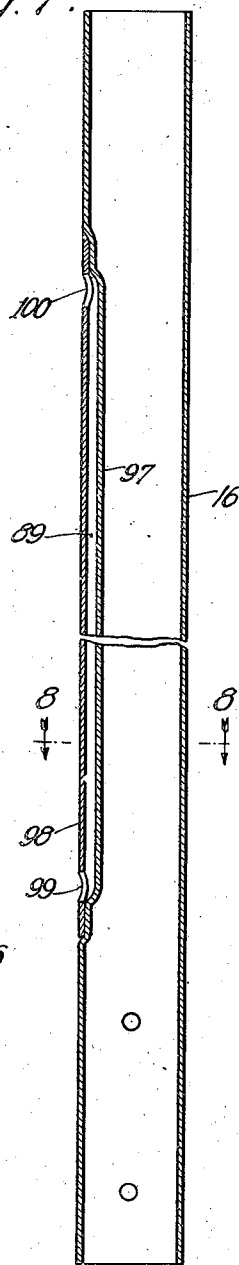


Fig. 6.

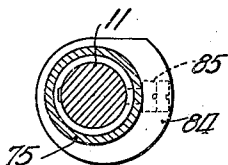


Fig. 8.

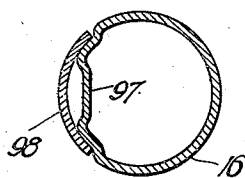
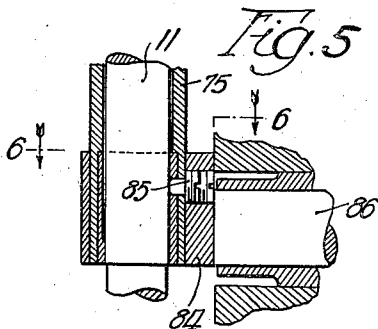


Fig. 5.



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Fig. 9.

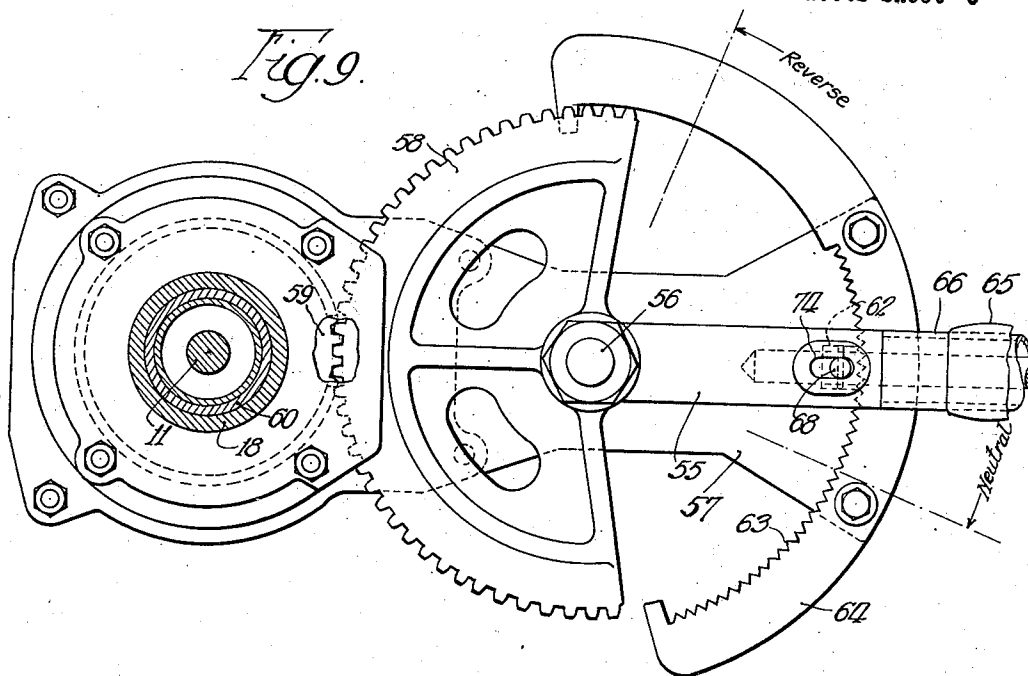


Fig. 10.

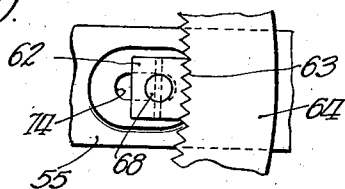
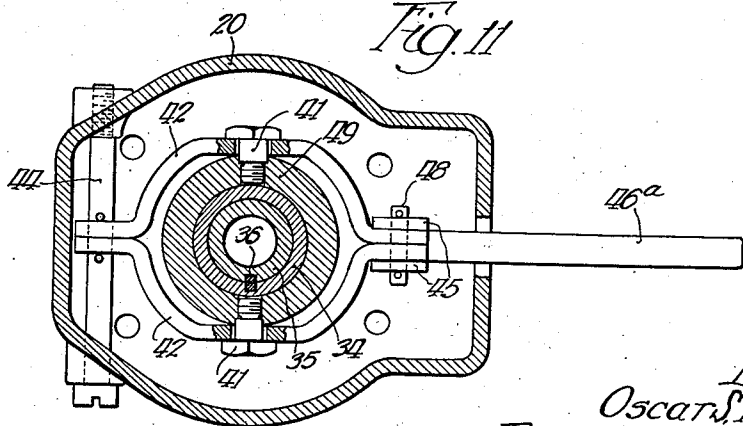


Fig. 11



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UNITED STATES PATENT OFFICE

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OUTBOARD MOTOR

Application filed August 21, 1929. Serial No. 387,298.

This invention relates to the class of devices known as outboard motors, which are used principally for propulsion of row boats and other small craft. An outboard motor is a self-contained apparatus, adapted to be attached outboard to a boat, usually astern, and which comprises a motor and a depending shaft driven thereby for operating a propeller carried by the foot of the apparatus.

Among the objects contemplated by this invention are, first, to provide an outboard motor of improved general character and operation; second, to provide a practicable construction embodying provision for disconnecting the propeller-operating shaft from the motor or engine at will, so as to permit discontinuing the propulsion of the boat without the necessity of stopping the motor; third, to provide improved means for circulating water to the water jacket or cooling system of the engine, and particularly to make provision for continual pumping of water during the running of the engine, whether the propeller is operating or not; and, fourth, to provide improved means in connection with the steering. Further incidental or contributory objects will hereinafter appear.

The invention will be explained by reference to an illustrative embodiment thereof shown in the accompanying drawings, it being understood that the following specific description of the embodiment selected for illustration is not to be taken in a restrictive sense, and that the novel and improved features, constructions, combinations and sub-combinations comprising or embraced within the invention are more particularly pointed out in the claims appended to this description.

In said drawings:

Figs. 1 and 1^a taken together represent the illustrative apparatus as a whole, Fig. 1 being a side elevation of the apparatus excepting its lower or submerged parts, and Fig. 1^a being a sectional elevation on a slightly enlarged scale of the submerged portion of the apparatus.

Fig. 2 is a central vertical section of the apparatus, except its submerged portion.

Fig. 3 is a section taken on the line 3—3 of

Fig. 2 and being therefore at right angles to the section shown in the preceding figure.

Fig. 4 is an enlarged horizontal section on the line 4—4 of Fig. 3.

Fig. 5 is a sectional fragmentary view showing a detail in connection with the water pumping means.

Fig. 6 is a horizontal section on the line 6—6 of Fig. 5.

Fig. 7 is a longitudinal section of the hollow post which contains the vertically-disposed propeller-operating shaft, this view illustrating a construction of said post to provide a water conduit.

Fig. 8 is a cross section of said post taken on the line 8—8 of Fig. 7.

Fig. 9 is a horizontal sectional elevation taken on the line 9—9 of Fig. 1 and looking upward, showing a bottom plan view of means embodied in the steering mechanism.

Fig. 10 is a detail view of a latch for the steering means.

Fig. 11 is a section taken on the line 11—11 of Fig. 2 looking in the direction of the arrows.

The motor of the illustrative apparatus is represented by a two-cylinder gasoline engine of a well-known type. Certain of its parts may be briefly referred to as follows: In the drawings, the cylinder and crank case as a whole is designated by the numeral 1. Reciprocating in the cylinders of the case are the pistons 2 suitably connected by pitmen 3 with the cranks 4 of the crank-shaft 5 (Fig. 3). The crank-shaft which is vertically disposed carries at its upper end the usual fly-wheel 6 and starting-wheel 7. In Figs. 1 and 2 the gasoline or fuel tank is indicated at 8, the carburetor at 9, and the exhaust muffler at 10. These parts other than the motor crank-shaft are referred to merely for a general explanation of the drawings. Further description of the motor is unnecessary since its construction and operation are well known to those skilled in the art. Furthermore, it will be understood that the particular motor shown is merely exemplary and typifies any suitable motor for the purpose.

In the illustrative structure, the propeller for the boat is arranged as usual at the

foot of the device and is operated from the motor through a vertically-disposed drive shaft, hereinafter referred to as the propeller-operating shaft, which is designated in the drawings by the numeral 11. It is operatively connected at its upper end with the motor shaft 5 through a clutch mechanism hereinafter referred to. At its lower end said shaft 11 is shown connected by the bevel gears 12 with the shaft 13 of the propeller 14 (Fig. 1^a). The case which carries the said gears and bearings for the propeller shaft and lower end of the shaft 11 is designated by the numeral 15. In this instance a rudder 14a is shown depending from said case in advance of said propeller. Said case 15 carrying the rudder and propeller is attached to the foot of the tubular post 16, hereinafter for convenience referred to as the rudder post, although that term does not necessarily imply use of a rudder since steering may be accomplished by change of angular position of the propeller itself. Supporting sleeves in which the rudder post is rotatably mounted are indicated at 18 and 19.

Between the upper supporting sleeve 18 and the motor case 1 is an interposed clutch casing 20 hereinafter referred to. The said supporting sleeve, motor case and clutch casing are suitably secured together as a unitary or rigid structure, and the said supporting sleeve 18 may be attached to a boat in a customary manner. In this instance, the supporting sleeve 18 is shown constructed with a sleeve clamp 21 embracing a transverse supporting bar 22 which is suitably attached to the boat. For example, the supporting bar 22 with the outboard motor carried thereby may be attached to the stern-board 23 of the boat by ordinary brackets. One of such brackets is indicated at 24. A clamping screw by which the bracket is secured to the stern-board is indicated at 25. An arm 26 extending from the bracket is bolted to the lower supporting sleeve 19, the said arm having a series of perforations for adjustable connection. It will be understood that by virtue of the sleeve clamp 21 and the adjustable connection of the arm 26 with the supporting sleeve 19, the outboard motor may be mounted with provision for suitable adjustment of its position in relation to the vertical.

Referring now to the operative connection between the propeller-operating shaft 11 and the motor shaft 5, this is provided by a suitable clutch contained in the clutch casing 20. A simple and practicable type of friction clutch is shown adapted to be operated by a clutch-throw lever conveniently associated with the tiller or steering lever hereinafter referred to. The specific clutch construction shown in the drawings is as follows: Rigidly affixed on the upper end of the propeller-operating shaft 11 is a clutch member 30 in the

form of a friction cone, as best seen in Fig. 3. This conical clutch member may be secured on its shaft by any suitable means, such for instance as the keys 31 and the set screw 32. The keys 31 engaging a longitudinal groove in the shaft hold said clutch cone from turning on said shaft, and the set screw holds it from moving longitudinally on its shaft. The clutch cone 30 is shown arranged with its smaller end up and is adapted to be engaged by the downwardly extending bell-shaped interiorly conical portion 33 of a movable clutch member 34. Said movable clutch member 34 embodies a sleeve portion which is slidably but non-rotatably fitted on a sleeve 35. Such slidable and non-rotatable connection may be provided by the keys 36 carried by the sleeve 35 and engaging a longitudinal slot in the sleeve portion of the movable clutch member. The sleeve 35 is rigidly affixed on the lower end of the motor shaft, being in this instance screwed thereon at 37. As the motor shaft always turns in the same direction, and the screw threads at 37 are contrary to the direction of rotation, a sufficiently secure connection is provided by the screw. The sleeve 35 is shown extending slightly beyond the end of the motor shaft and contains a bushing 38 in which a reduced terminal of the propeller-operating shaft 11 is fitted. Swivelled on the slidable clutch member 34 is a ring or clutch collar 39, which in this instance is shown fitted between a thrust shoulder and a retaining nut 40. The ring or clutch collar 39 has diametrically opposite openings engaged by the screw studs 41 carried by the yoke arms 42 of a yoked or forked lever 43 (Figs. 2 and 3). The openings in the yoke arms for the studs 41 may be short slots to permit the necessary play as the lever is operated. The yoked lever 43 is fulcrumed at 44 in the rear side of the clutch case. The front end of said yoked lever 43 is connected by a link or parallel links 45 to a clutch-throw or shifting lever 46 which is fulcrumed at 47 and the handle portion 46^a of which extends through a vertical slot or opening in the front of the clutch case to convenient position for operation by the person seated in the stern of the boat. The pivot connection between the yoked lever and link is indicated at 48; and the pivot connection between the link and clutch-throw lever is indicated at 49.

In Fig. 2, the parts are shown positioned to hold the clutch members separated. Normally, however, the sliding clutch member 34 is depressed and held in engagement with the clutch member 30 by the coiled spring 50 which surrounds the lower crank shaft bearing and acts on the clutch collar to press the sliding clutch member 34 downward against the clutch member 30. Said spring is shown interposed between the nut 40 and the lower element of an antifriction thrust bearing 51

fitted against the bottom of the motor case. Said bearing comprises confronting grooved plates and interposed balls, so that the coiled spring 50 may rotate with the motor shaft.

When it is desired to disconnect the propeller-operating shaft from the motor shaft, the lever 46 is raised to the position shown in Fig. 2, thereby through the link connection 45 raising the forked lever 43 and the clutch collar connected therewith and so lifting the sliding clutch member 34 from engagement with the clutch member 30, this movement being against the resistance of the spring 50. The movement of the clutch-throw lever or shifting lever 46 to the position shown in Fig. 2 causes the center of its pivot connection 49 to pass rearwardly out of line with the centers of 47 and 48, and this locks the parts in position to release or separate the clutch. Such locking is in this instance assured by the fact that the rearward movement of the pivot 49 is limited due to engagement of the clutch-throw lever with the upper end of the slot in the clutch case at 52. By pressing down on the handle 46^a of the clutch-throw lever, the pivot 49 is rocked forwardly of the line of centers of the pivots 47 and 48, whereupon the upper-clutch member 34 will drop into engagement with the lower clutch member 30, such return movement being assured by the spring 50.

It will be appreciated that the clutch permits starting the motor without operating the propeller, and permits releasing the propeller and stopping its action without the necessity of stopping the motor, which is particularly advantageous when it is desired to make a number of successive short stops on a trip, as well as when it is desired to control the propeller by intermittently discontinuing its operation when making a landing.

Arranged beneath the clutch-throw lever is a tiller or steering lever 55. The fulcrum for this tiller or steering lever is provided in this instance by the vertical bolt 56, the head of which supports the tiller. Said bolt is shown screwed to a boss depending from the frame member 57, which projects from the clutch case. The tiller carries at its rear end a toothed segment 58 concentric with the bolt on which the tiller is mounted. See Figs. 2 and 9. The toothed segment 58 engages a pinion 59 rigidly affixed on the upper end of the rudder post 16. In this instance said pinion is shown formed with an extended hub or tubular portion 60 which is rigidly secured on the rudder post and is journaled in the supporting sleeve 18 (Figs. 2 and 3). Said supporting sleeve 18 is shown formed at its upper end with a case portion 61 enclosing the pinion, said case portion being bolted or otherwise rigidly secured to the clutch case 20. The toothed segment works in a slot in the front side of the case portion and meshes

with the pinion. The ratio of diameters of the toothed segment and pinion is preferably two to one. The arcuate extent of the toothed segment is preferably substantially over 180 degrees. At the neutral position of the propeller and rudder, the tiller or steering lever will be at the position indicated by the line marked "Neutral" in Fig. 9. At this neutral position of the tiller, the toothed segment extends more than 45 degrees to one side of its point of engagement with the pinion, and more than 90 degrees to the opposite side. Hence by swinging the tiller from its neutral position through a 45 degree angle in either direction, the rudder and propeller may be correspondingly swung through a 90 degree angle in either direction, for steering the boat as required. Also the tiller can be swung a full 90 degrees to the right (as viewed in Fig. 9), while continuing the engagement of the toothed segment with the pinion, so as to completely reverse the position of the propeller and rudder, when it is desired to propel the boat backward.

The tiller carries a spring-actuated toothed latch 62 engaging the teeth of a segmental rack 63 formed on the inner edge of a curved bar 64 which is affixed to the frame member 57. This toothed rack 63 has an extent of over 90 degrees, i. e., an extent of over 45 degrees in either direction from the line of the neutral position of the tiller. The whole arcuate extent of the curved bar 64 is substantially greater than 135 degrees. It will be apparent that this arrangement provides for swinging the tiller through an angle of 45 degrees in either direction from its neutral position for steering the boat, and securing the tiller in any desired adjusted position for steering by engagement of the latch 62 with the toothed rack 63; and when it is desired to reverse the position of the propeller the tiller may be swung to the right to the position marked "Reverse" in Fig. 9, this position being 90 degrees from the neutral position, and the corresponding position of the propeller being 180 degrees from its normal neutral position. When the tiller is thus brought to its reverse position indicated, there is still ample reach of the bar 64 and ample reach of the toothed segment 58 to permit movement of the tiller in either direction through a substantial angle from the reverse position for such steering as ordinarily required when the propeller is reversed. The specific construction shown permits a movement of the tiller through an angle of 22½ degrees beyond its reverse position, so that it will be seen that there is ample provision for steering when the propeller is reversed.

While reference has been made in the foregoing description to the rudder, it will be understood that the swinging of the propeller itself would control the steering if there

were no rudder and hence the mechanism described will function for steering purposes even though the rudder may be omitted.

The handle 65 of the tiller extends forward sufficiently beyond the handle 46^a of the clutch-throw lever, so as to leave the tiller handle unobstructed for steering, while at the same time the handle of the clutch-throw lever is conveniently located in proximity to the tiller handle so that the steersman may readily shift his hand from one handle to the other. In Fig. 2, the tiller handle is shown mounted on a tube 66 affixed as an extension to the tiller. In the handle is a spring-pressed rod 67 extending into a longitudinal bore in the main portion of the tiller. This rod carries a transverse pin 68 which carries the latch 62. The rod 67 is spring-pressed outward by the expansive action of the coil spring 69 surrounding the rod, said spring bearing at its inner end against the shoulder 70 and bearing at its outer end against the stop collar 71 affixed to the rod. Said stop collar abuts against the tubular nut 72, limiting the outward motion of the rod. The rod has on its outer end the push button 73 which may be pressed with the thumb to force the rod inward for releasing the latch 62 from the toothed rack 63. In this inward movement of the rod the transverse pin 68 moves in a slotted portion 74 of the tiller.

It will be observed that the construction described provides for the rigid mounting of the outboard motor on the boat while the rudder post may be rotated by the tiller for steering. In other words, the rudder post instead of being rigidly connected with the motor casing as in previous constructions is rotatably fitted in reference to the mounted structure, so that the steering may be accomplished without accompanying swinging of the motor itself, which has been an objection to prior outboard motors.

In an outboard motor, water for cooling purposes is pumped to the engine by a submerged pump driven by the propeller-operating shaft. As the light type of engine usually employed has only restricted spaces in its cylinder heads for circulation of cooling water, it is desirable to have fresh cold water constantly supplied to these spaces during the running of the engine. Where, as in this case, a clutch mechanism is provided for releasably connecting the motor to the propeller-operating shaft, with a view to disconnecting said shaft and allowing the propeller to be at rest at will while the engine is running, the problem is presented of maintaining continuous operation of the water pump. In the illustrative apparatus, this problem is met by associating with the propeller-operating shaft a pump operating device which may be continuously driven from the motor shaft.

The specific means illustrated in this connection will now be described.

The propeller-operating shaft is enclosed by a tubular shaft 75 which is employed for operating the pump, as will presently be explained. Rigidly secured on the upper end of said tubular shaft 75 is a cross arm 76 (Figs. 3 and 4). Said cross arm 76 has upturned ends 77, which are slidably engaged by bifurcated lugs 78 of the slidable clutch member 34. As the slidable clutch member is lifted to release the clutch, it maintains its engagement with the upright ends 77 of the cross arm. The tubular shaft 75 is therefore continuously driven from the motor shaft through the slidable clutch member 34 regardless of whether or not the clutch members 30 and 34 are in engagement. When the clutch members are in engagement, the propeller-operating shaft and the surrounding pump-operating shaft will rotate together, but when the clutch is released the pump-operating shaft will be driven alone. A suitable bearing designed for radial and axial thrust is interposed between the cross member 76 and the bottom plate of the clutch case. As shown in Fig. 3, this bearing comprises the concentric members 79 and 80 and interposed balls 81. The bearing is fitted in a seat in the clutch case provided by the circular flange 82, whereby the bearing is properly centered in relation to the shafts. The bearing member 79 is affixed on the tubular shaft 75 and supports the cross arm 76.

The water pump is indicated at 83 in Fig. 1^a. As shown in said Fig. 1^a, and more clearly in Fig. 5, the tubular shaft 75 is provided with an eccentric 84 fastened to said shaft by the set screws 85. This eccentric operates against the end of and reciprocates the pump plunger rod 86, the rod being driven in one direction by the eccentric and returned by a spring which is not shown. The pump itself is or may be of a well-known type employed in connection with outboard motors and its details are therefore not illustrated.

As shown in Fig. 1^a, a pipe 87 conducts water from the pump. This pipe connects through the casing 88 with a conduit 89 in the rudder post. As shown in Fig. 2, the conduit 89 in the rudder post connects with a pipe 90. Said pipe 90 is shown in Fig. 1 and connects at the T 91 with two pipes, one of which is indicated at 92, respectively leading to the water jacket spaces in the cylinder heads. The inlet connections for the cooling water are indicated at 93 in Fig. 3. Outlet connections are indicated at 94, these being in communication through piping 95 with the water discharge pipe 96.

Referring to the conduit 89 in the rudder post, a special construction of the post to provide such conduit is shown in Figs. 7 and 8. As shown the post is longitudinally deformed to provide the trough-like part 97,

and a curved cover plate 98, the curvature of which corresponds substantially to that of the tubular post, is welded to the post over the deformed portion. In this cover plate are the inlet and outlet openings 99 and 100, the inlet 99 being in connection through the casing 88 with the pipe leading from the water pump (Fig. 1^a), and the outlet 100 being in communication through the sleeve 18 with the pipe 90 (Fig. 2).

As shown in Fig. 2, the supporting sleeve 18 contains the gland 101 which compresses the packing 102 so as to prevent the water passing up to the pinion 59. Below the water outlet 100 and pipe 90 are the packings 103 and 104 compressed by the tubular gland members 105 and 106. A latch for the last mentioned member is indicated at 107.

It will be understood that the present invention is not limited to the particular embodiment thereof herein shown and described, and that various features of the invention may be advantageously used in various different combinations and subcombinations.

What I claim as my invention, and desire to secure by Letters Patent, is:

1. An outboard motor having a propeller-operating shaft separate from the motor shaft, a propeller shaft with which the propeller operating shaft is in constant driving connection, a clutch connecting said motor shaft to the propeller operating shaft, means for releasing the clutch, and means in operative connection with the motor shaft, regardless of whether or not the propeller-operating shaft is connected therewith, for operating a submerged pump for pumping cooling water to the engine.

2. An outboard motor having a propeller-operating shaft separate from the motor shaft, a clutch connecting said shafts, means for releasing the clutch, a tubular pump-operating shaft enclosing the propeller-operating shaft, and means maintaining operative connection between the motor shaft and pump-operating shaft regardless of whether or not the said clutch is released.

3. An outboard motor having a propeller-operating shaft separate from the motor shaft and means releasably connecting said shafts comprising cooperating clutch members, one fixed on the upper end of the propeller-operating shaft and the other slidably but non-rotatably connected with the motor shaft, means for shifting said slidable clutch member to release the clutch, a tubular pump-operating shaft enclosing the propeller-operating shaft, and means carried by the pump-operating shaft slidably but non-rotatably engaged by said shiftable clutch member, whereby the motor shaft will drive the pump-operating shaft whether or not the propeller is being driven.

4. An outboard motor having a propeller-

operating shaft separate from the motor shaft and means releasably connecting said shafts comprising cooperating clutch members, one fixed on the upper end of the propeller-operating shaft and the other slidably but non-rotatably connected with the motor shaft, means for shifting said slidable clutch member to release the clutch, a tubular pump-operating shaft enclosing the propeller-operating shaft, and a cross arm on the upper end of said tubular shaft, said cross arm and shiftable clutch member having cooperating means by which they are slidably but non-rotatably connected.

5. An outboard motor having a propeller-operating shaft separate from the motor shaft, a clutch connecting said shafts, said clutch including a shiftable member, a lever operatively connected therewith, a hand lever, and a link connecting said levers, the arrangement being such that when said hand lever is moved to clutch-releasing position the pivoted connection with said link is moved beyond a dead center position relatively to the fulcrum of said hand lever and the pivoted connection between the link and first mentioned lever, thereby locking the parts in position to maintain the clutch released.

6. An outboard motor having a propeller-operating shaft separate from the motor shaft and means releasably connecting said shafts comprising cooperating clutch members, one fixed on the upper end of the propeller-operating shaft and the other slidably but non-rotatably connected with the motor shaft, a spring normally maintaining said clutch members in engagement, and releasing means including a hand lever and connections between said lever and shiftable clutch members whereby the clutch may be released and the parts self-locked in clutch-releasing position.

7. An outboard motor having a motor-driven propeller-operating shaft, a rotatably mounted hollow post carrying the propeller, in which post said shaft is arranged, a gear on said post, a toothed segment in mesh with said gear, a tiller or steering lever carrying said segment, a fixed arcuate bar having a rack, a releasable latch carried by the tiller engageable with said rack, the arcuate extent of said segment being such as to permit rotating the propeller fully ninety degrees in either direction and more than one hundred and eighty degrees in one direction for reversing the propeller, and the arrangement and arcuate extent of the rack being such as to permit locking the tiller in any desired position at which the propeller works forwardly.

8. An outboard motor adapted to be removably secured to a motor boat embodying a rudder post rotatable with respect to said motor and carrying the submerged parts of the apparatus, a propeller-operating shaft

journalled within said post and operatively connected to said motor, a support for carrying said motor and securing the same to a boat, said support comprising a sleeve depending from the motor case and within which the rudder post is rotatably mounted, said rudder post having a shoulder and said supporting sleeve having a seat therefor by which said post is suspended and a tiller connected with the rudder post whereby the position of the submerged parts of the apparatus may be varied for steering purposes without affecting the position of the motor.

9. An outboard motor adapted to be removably secured to a motor boat embodying a rudder post rotatable with respect to said motor and carrying the submerged parts of the apparatus, a propeller-operating shaft journalled within said post and operatively connected to said motor, means for securing said propeller shaft against axial movements, a support for carrying said motor and securing the same to a boat, said support comprising a sleeve depending from the motor case and within which the rudder post is rotatably mounted, said rudder post having a shoulder and said supporting sleeve having a seat therefor by which said post is suspended and a tiller connected with the rudder post whereby the position of the submerged parts of the apparatus may be varied for steering purposes without affecting the position of the motor.

10. An outboard motor adapted to be removably secured to a boat and having a propeller-operating shaft journalled for independent rotation with respect to the motor shaft, a propeller shaft with which the propeller operating shaft is in constant driving relation, a post carrying the propeller, said post being rotatable with respect to the motor, a tiller for rotating said post for steering purposes, a clutch for selectively connecting the motor shaft to said propeller-operating shaft and means including a hand lever arranged in convenient proximity to the tiller for releasing the clutch, said clutch being operable independent of the tiller.

11. An outboard motor adapted to be removably secured to a boat having a propeller-operating shaft journalled for rotation independently of the motor shaft and in constant driving relation to the propeller shaft, a clutch selectively connecting the propeller-operating shaft to the motor shaft, means for maintaining the propeller-operating shaft disconnected from said motor shaft at will and means for rotating the propeller and propeller-operating shaft for steering purposes independent of said motor and of said clutching mechanism.

12. An outboard motor adapted to be removably secured to a boat and having a propeller-operating shaft journalled for rotation independently of the motor shaft,

a clutch connecting said shafts, a rigid structure incorporating a motor and clutch case and a supporting sleeve adapted to secure said motor to a boat, clutch releasing means including a hand lever projecting through an opening in the case, a hollow post rotatably supported within said sleeve, said post carrying the submerged parts of the apparatus and means connected with said post for rotating the same relatively to said motor for steering purposes.

13. An outboard motor having a propeller-operating shaft separate from the motor shaft, a propeller shaft with which the propeller-operating shaft is in constant driving connection, a clutch connecting said motor shaft to the propeller-operating shaft, means for releasing the clutch, and means in operative connection with the motor shaft, regardless of whether or not the propeller-operating shaft is connected therewith, for operating a pump for pumping cooling water to the engine.

14. An outboard motor adapted to be removably secured to a boat and having a propeller-operating shaft journalled for rotation independently of said motor shaft, a clutch selectively connecting said shafts and releasing means for said clutch including a hand lever, a hollow post enclosing the propeller-operating shaft and having an external gear thereon, a supporting sleeve rigid with the casing in which said post is journalled, means for securing said sleeve to a boat, a tiller carried by a member rigid with the motor casing, said tiller having a toothed segment meshing with said external gear, a segmental rack carried by said rigid member to which the tiller is connected, a releasable latch carried by the tiller for engaging said rack, and latch releasing means carried by the tiller handle, the clutch releasing lever being connected above and extending to a point conveniently near the tiller and being operable independently of the latter, said tiller extending forward beyond said clutch releasing lever so that the tiller handle is unobstructed for steering.

15. An outboard motor adapted to be removably secured to a boat and having a propeller-operating shaft journalled for rotation independently of said motor shaft, a clutch selectively connecting said shafts, a rigid structure incorporating a motor and clutch case and a supporting sleeve, means for securing said sleeve to a boat, clutch releasing means including a hand lever projecting through an opening in the case, a hollow post rotatably supported in said sleeve, said post carrying the submerged parts of the apparatus, a gear on the upper end of said post, said structure including a casing portion for said gear provided with a front horizontally disposed slot, and a tiller or steering lever

having a toothed segment working in said slot and meshing with said gear.

16. An outboard motor adapted to be removably secured to a boat and having a propeller-operating shaft, a rotatably mounted
5 hollow post carrying the propeller, in which post the said shaft is arranged, and means including a tiller or steering lever connected with the post for rotating the same for steering,
10 said means being constructed and arranged to reverse the position of the propeller and to permit steering in either direction with the propeller either in normal or reverse position.

15 In witness whereof, I have signed my name to this specification.

OSCAR S. HEIDE.

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