Sept. 19, 1950 R. J. SHARP 2,522,545

MOTOR ATTACHMENT FOR BOATS

Filed June 24, 1946 2 Sheets-Sheet 1

FIG. 1

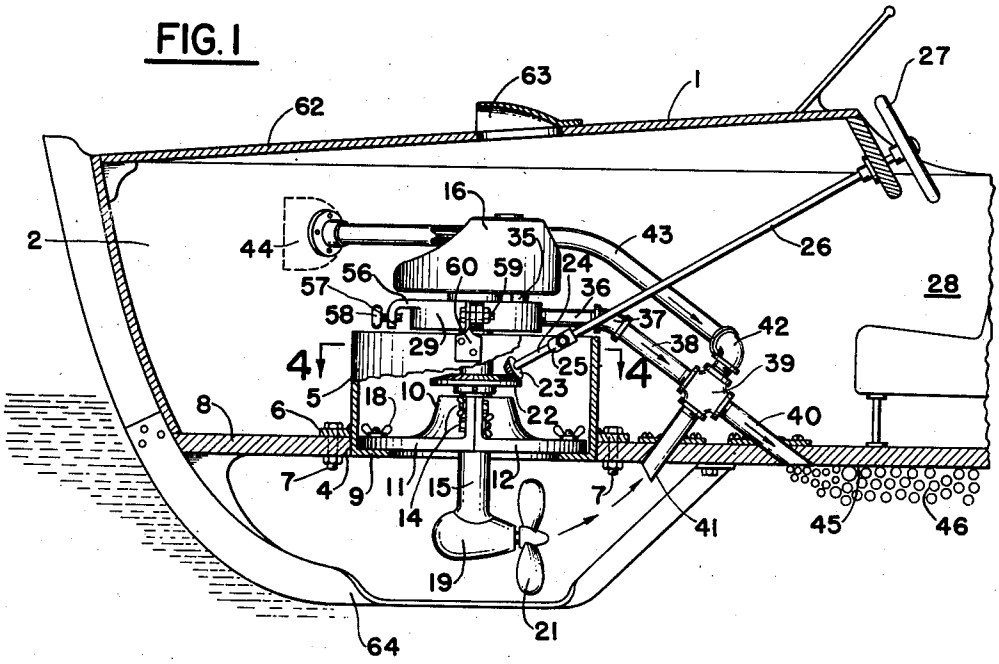


FIG. 2

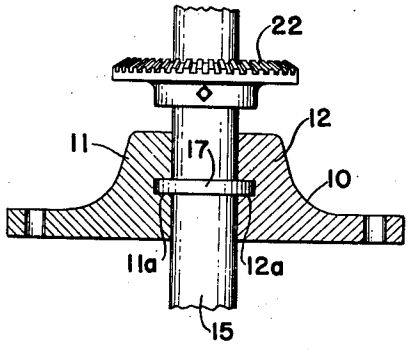
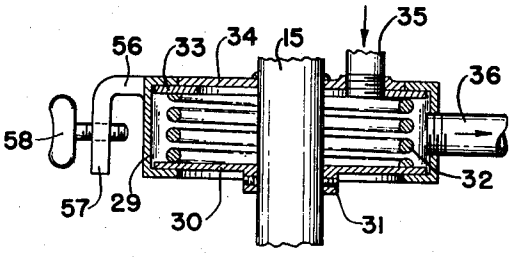


FIG. 3



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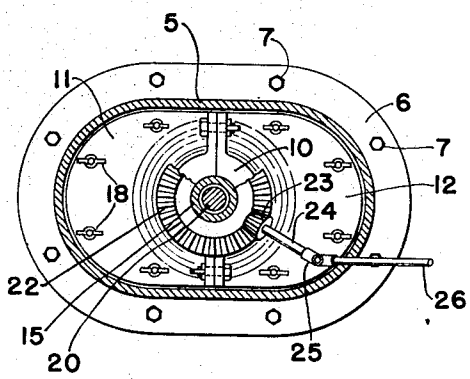


FIG. 4

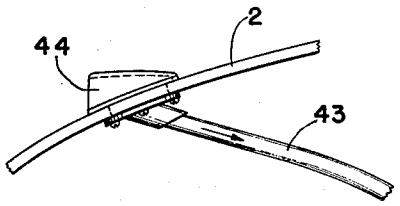


FIG. 5

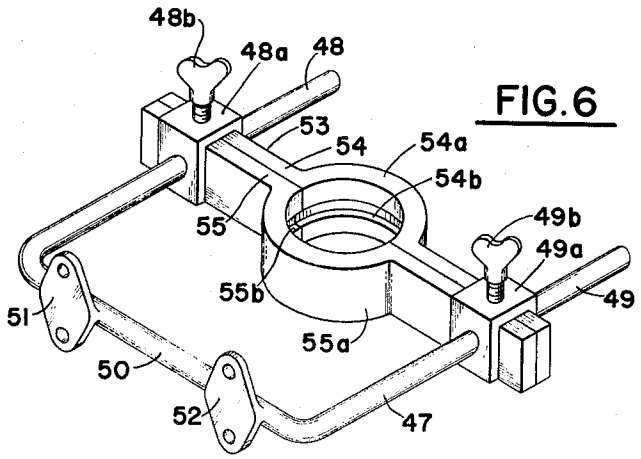


FIG. 6

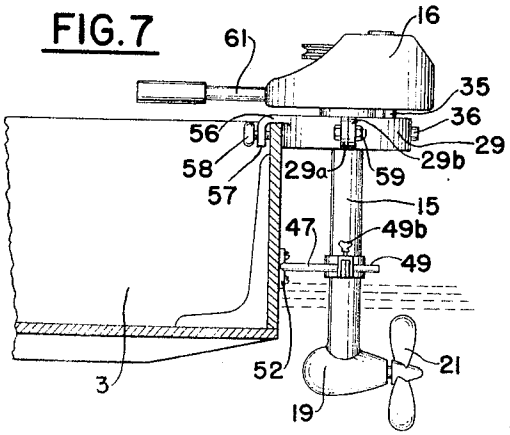


FIG. 7

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MOTOR ATTACHMENT FOR BOATS

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12 Claims. (Cl. 115—35)

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My invention relates broadly to motor boats and more particularly to an arrangement of motor drive mechanism for motor boats.

One of the objects of my invention is to provide an arrangement of motor drive for motor boats which may be mounted for either outboard or inboard operation for developing maximum driving power for the operation of motor boats at relatively high speed.

Another object of my invention is to provide an arrangement of supporting means for the driving motor of a motor boat for mounting a driving motor for either outboard or inboard operation enabling maximum power to be developed.

A further object of my invention is to provide a construction of annular support for the driving motor of a motor boat by which the driving motor may be suspended in a rotatable position for either outboard or inboard operation.

Still another object of my invention is to provide a construction of orientatable propeller and propeller housing and mounting means therefor, whereby, the motor may be mounted in outboard or inboard operation for developing maximum driving power.

Other and further objects of my invention reside in an arrangement of motor mounting means for motor boats which may be selectively employed for either outboard or inboard operation in high-speed motor boats, as set forth more fully in the specification hereinafter following by reference to the accompanying drawings; in which:

Figure 1 is a side elevational view of the motor of my invention shown mounted for inboard operation within a motor boat, the parts of which have been illustrated in section, a portion of the supporting means for the motor being broken away and illustrated in section to more clearly show the support for the motor; Fig. 2 illustrates the manner of sealing the outboard motor housing for inboard operation; Fig. 3 is a detailed sectional view illustrating the manner of supporting the outboard motor for inboard operation; Fig. 4 is a transverse sectional view taken on line 4—4; Fig. 5 is a fragmentary schematic view illustrating the manner of pickup air flow at one side of the motor boat for supplying the air to the suction system of the engine; Fig. 6 is a perspective view of a bracket mounting which I employ for mounting the outboard motor at the stern of the boat; and Fig. 7 illustrates the manner of supporting the outboard motor to the stern of the boat as an alternative arrangement to the inboard style illustrated in Fig. 1.

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Referring to the drawings in detail, reference character 1 designates a motor boat having a bow portion 2 as represented in Fig. 1, and a stern portion 3 as represented in Fig. 7. The hull of the boat is apertured adjacent the bow as represented at 4 for the passage of an oval-shaped shell or drum 5. The shell or drum 5 has an externally arranged peripheral flange 6 thereon through which bolts 7 are passed for securing the shell or drum to the hull 8. The shell or drum 5 is provided with an inwardly extending flange 9 adapted to be aligned with the plane of the hull 8 when the drum or shell 5 is secured in position by means of flange 6. The flange 9 serves as a carrier or support for the base flange 10 of the outboard motor housing. The base flange 10 is formed by two interfitting portions shaped to conform with the interior contour of the oval-shaped shell or drum 5. The two portions of the base flange 10 are represented at 11 and 12 interconnected by bolts 14 and embrace the tubular rotatable housing 15 of the power transmission shaft of the outboard motor 16 when mounted for inboard operation.

The base flange 10 has the aligned sections 11 and 12 thereof transversely grooved at 11a and 12a for receiving the circular flange 17 which is carried by the tubular rotatable housing 15 of the power transmission shaft. The circular flange 17 operating in aligned grooves 11a and 12a serves as a seal against the entry of water through the hull of the boat. The peripheral portions of the flange sections 11 and 12 are bolted to the inwardly extending flange 9 through suitable securing bolts 18. Flange 17 serves as a supporting means for the outboard motor for inboard operation while permitting orientation of the outboard motor for purposes of navigating or maneuvering the boat. The housing 15 merges into the stream-lined case 19 which encloses a substantially horizontally extending propeller shaft meshing through suitable gearing with the drive shaft 20 of the engine 16 and driving propeller 21 thereby.

The housing 15 of the outboard motor has a ring gear 22 secured thereto and beveled so that pinion 23 carried by shaft member 24 may mesh therewith. The shaft member 24 is connected through steering knuckle 25 with the steering shaft 26 which is operated by steering wheel 27 from the steering position in the boat as represented at 28.

The shell or drum 5 forms substantially a "well" in the bow of the boat through which the outboard motor is mounted for inboard operation. The outboard motor when arranged for in-

board operation is free to be revolved through 360° for steering a boat through the ring gear 22 of beveled pinion 23, shaft member 24, steering knuckle 25 and shaft 26 under control of steering wheel 27. Inasmuch as the motor 16 is of the internal combustion engine type, provision must be made for delivery of exhaust gases from the engine. I accomplish this in a very special manner. The shaft 15 carries the cylinder exhaust manifold 29 on flange 30 secured to shaft housing 15, as represented at 31. The exhaust manifold 29 encloses a coil spring member 32 which at one end bears against the circular flange 30 and at the other end bears against the annual sealing ring 33. The annular sealing ring 33 closes the peripheral gap between the disc 34 fastened to the rotatable shaft housing 15 and the inner annular peripherial face of the manifold 33 as shown. The exhaust connection from the motor 16 is represented at 35, passing from the motor 16 through disc 34 and into the exhaust chamber formed within the exhaust manifold 29. A connection 36 extends from the exhaust manifold 29 through an elbow 37 and pipe extension 38 and through a four-way connection joint or coupling 39. The four-way connection joint or coupling 39 connects through a pipe member 40 to an orifice terminating beneath the hull of the boat. The four-way connection joint or coupling 39 also connects to a piping member 41 terminating in an orifice directly adjacent and facing the propeller 21 and operating to receive pressure therefrom. The four-way connection joint or coupling 39 also connects through elbow 42 with the pipe member 43 which extends through the hull of the boat and connects to an air intake fitting 44 located externally of the hull 2 and operating to direct air through the pipe system for discharge at the position 45 beneath the hull under the conjoint suction pressure created by the exhaust from the motor discharged through pipe 38 of the pressure head established by the propeller 21 through the pipe 41. The pressure which is created beneath the hull 2 in the position 45 results in the establishment of a large area of air bubbles represented at 46 incident to the air pressure which is created beneath the hull. This causes a carpet of bubbles to slip by under the hull tending to raise the hull at the rear. This in effect greases the hull for high speed operation through the water. The bow is kept down where it belongs while the stern is somewhat elevated out of the water.

When it is desired to utilize the outboard motor 16 for normal operation in the stern of the boat, I make use of a bracket support 47 as shown in Figs. 6 and 7. The bracket support 47 comprises a pair of substantially horizontally extending rod-like portions 48 and 49 interconnected through intermediate bar 50 provided with fastening means 51 and 52 thereon. The fastening means 51 and 52 are secured to the stern of the boat 3. The rod-like members 48 and 49 serve as supports along which the transverse bracket 53 is adjustable. The transverse bracket 53 is formed by two complementary members 54 and 55, each forming a semicircular frame at 54*a* and 55*a* which conjointly embrace the rotatable shaft housing 15 of the motor 16. The curved portions 54*a* and 55*a* are each provided with a grooved recess 54*b* and 55*b* therein which embrace the sealing ring 17 on the rotatable shaft housing 15 and serving as a balancing or journaling means for the rotatable shaft housing, when the motor is mounted for outboard operation. In order to

adjust the spacial relation of the outboard motor with respect to the stern of the boat 3, I provide bifurcated members 48*a* and 49*a* which embrace the opposite ends of the complementary members 54 and 55 and slide along the rods 48 and 49. Apertures are provided in the bifurcated members 48*a* and 49*a* and the complementary members 54 and 55 to permit the complementary members to be adjusted over rods 48 and 49 to the desired position. Securing screws 48*b* and 49*b* pass through bifurcated members 48*a* and 49*a* and serve to clamp the transverse bracket in the desired spacial position with respect to the stern of the boat 3.

The upper portion of the rotatable shaft housing 15 passes through the exhaust manifold 29 as heretofore explained in connection with Fig. 3. The disc 30 serves as a steadying and journaling means for the rotatable shaft housing 15 within the exhaust manifold 29. The exhaust manifold 29 has a clamp 56 connected with one side thereof and terminating in a hook-shaped portion 57 adapted to embrace the rear of the stern of the boat. A screw member 58 passes through the hook-shaped portion 57 and is adapted to grip the rear of the stern of the boat for mounting the outboard motor in place. It will be observed that the exhaust manifold 29 is formed in two semicircular portions which are clamped at diametrically opposite sides by bolt members represented by bolt 59 extending through aligned lug members 29*a* and 29*b*. When the outboard motor is installed for inboard operation as represented in Fig. 1, the securing bolts 59 are passed through the ends of upstanding lugs 60 located in diametrically opposite positions on the upper extremity of the shell or drum 5. The exhaust from the manifold 29 is shown at 36. The exhaust connection from the engine 16 to the exhaust manifold 29 is shown at 35. The engine 16 may be orientated by the tiller represented at 61.

The hood 62 of the boat is provided with a ventilator 63 for circulation of cool air around the motor 16 when the outboard motor is arranged for inboard operation. The orientatable propeller 21 is protected by a metallic frame structure 64, which is secured beneath the hull of the boat as shown.

By utilizing the outboard motor in the location of the "well" near the bow of the boat, substantial reduction in friction of the hull of the boat through the water is effected.

When the outboard motor is used in inboard style, the sealing ring 17 shown in Fig. 2 serves as a combination bearing and stuffing box. This same ring 17 serves as a bearing when the outboard motor is used in outboard style, although the stuffing box features are not employed in this latter arrangement. Whether used in inboard or outboard arrangement, the propeller may be orientated through the entire 360° while exhaust gases from the engine 16 are continuously discharged into the exhaust manifold 29 independently of the position of the engine. The arrangement of the exhaust manifold 29 permits the motor to be angularly shifted and yet the exhaust outlet remains stationary. This is accomplished by the plate 30 sliding against the lower flange of the exhaust manifold 29 and the disc 34 sliding against the annular ring 33 which in turn bears against the upper inturned flange of housing 29 and wherein spring member 32 is disposed between flange 30 and ring member 33.

It is entirely possible with the arrangement of my invention to employ two motors, one in out-

board arrangement and the other in inboard arrangement. The outboard motor may be fixed in position for propulsion purposes while the inboard motor is revolvable to 360° for greater propulsion and maneuverability. Both motors may be controlled from one position by extending the controls from the outboard motor to the steering position for the inboard motor.

It is observed that I have illustrated wing nut devices at 18, 48b, 49b, and 58 for facilitating ready manual attachment or detachment of the outboard motor for operation either in outboard or inboard arrangement.

The motor 16 which has been illustrated is the conventional gasoline type. The motor unit includes the associated generator, fuel feed tank, pulling cord starting mechanism, ignition system, and all appurtenances built into the unit and supportable from the exhaust manifold 29. The mounting of the unit is such that the driven shaft 20 operated by the motor extends through the rotatable housing 15 which is free to revolve carrying the stream-lined casing 19 and propeller 21 therewith. The orientation of the rotatable tubular housing 15 is effected independently of the continued driving torque which is applied to the driven shaft 20 for driving propeller 21. This same arrangement is employed whether the motor is used in outboard or inboard arrangement.

While I have described my invention in certain preferred embodiments, I realize that modifications may be made, and I desire that it be understood that no limitations upon my invention are intended other than may be imposed by the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is as follows:

1. In a motor boat, a hull structure, a driving engine, a substantially vertically dependable shaft driven by said engine, a rotatable tubular housing surrounding said shaft and terminating in a stream-lined casing, a propeller driven by said shaft and projecting from said stream-lined casing, a circular exhaust manifold disposed in a horizontal plane and surrounding said rotatable tubular housing, a clamp projecting from said hull structure and connected to one side of said manifold and means embracing said rotatable housing and extending in rotatable sliding relation to said exhaust manifold for supporting said engine through said manifold and housing.

2. In a motor boat, a hull structure, a motor unit having a downwardly depending driven shaft, propulsion means operated by said driven shaft, a housing for said driven shaft, a pair of spaced parallel plates carried by said shaft, an annular channel-shaped member having coextensive parallel upper and lower flanges surrounding said shaft, means for mounting said member on said hull structure, one of said plates engaging the innner surface of the lower flange and the upper flange extending coplanar with said other plate, an annular sealing ring overlapping the joint between said upper flange and said last mentioned plate, spring means disposed between said sealing ring and said first mentioned plate whereby said housing is orientatable with respect to said annular channel-shaped member, an exhaust connection from said motor unit extending through said first mentioned plate and a discharge connection extending from said annular channel-shaped member and means extending from said hull structure for supporting said housing concentrically within said channel-shaped member in a position free for orientation through substantially 360° within said channel-shaped member.

3. In a motor boat, a hull structure, supporting means extending from said hull structure, a motor unit including a substantially vertically depending shaft housing, a driven shaft and propulsion mechanism operated thereby, a cylindrical exhaust chamber concentrically surrounding said shaft housing and supported from said hull structure, said chamber being formed by composite overlapping closure portions one of said portions being fixed with respect to said hull structure and the other of said portions being fixed with respect to said shaft housing, means for maintaining a gas-tight seal between said portions, an exhaust connection from said motor unit extending through said last mentioned portion and a discharge connection extending from said first mentioned portion and means for suspending said shaft housing from said supporting means for orientation of said shaft housing axially with relation to said exhaust chamber through substantially 360°.

4. In a motor boat, a hull structure, a substantially horizontally extending circular exhaust manifold a bracket connected with the periphery of said manifold and removably connected to said hull structure, a supplemental support carried by said hull structure in spaced relation to said exhaust manifold, a motor unit including a substantially vertically disposed rotatable housing extending through the exhaust manifold and through said spaced supplemental support, means for maintaining a gas-tight seal between said rotatable housing and said exhaust manifold and a motor driven shaft disposed within said housing for operation of propulsion mechanism, said housing being selectively orientatable within said exhaust manifold and within spaced support.

5. In a motor boat a hull structure, a support carried by said hull structure including an annular grooved portion disposed in a substantially horizontal plane, a motor unit including a rotatable shaft housing having an annular flange thereon rotatably journaled in the said grooved portion of said support, an annular manifold arranged in a substantially horizontal plane and surrounding said rotatable shaft housing, means for supplying said manifold from said hull structure, and means for journaling said rotatable shaft housing with respect to said manifold for orientation in a horizontal plane.

6. In a motor boat, a hull structure, motor supporting means carried by said hull structure including a grooved ring support and a circular exhaust manifold spaced therefrom in a substantially horizontal plane, a motor unit including an engine, a rotatable shaft housing, a driven shaft within said housing depending from said unit concentrically within said circular exhaust manifold, propulsion means operated by said shaft, and means for rotatably journaling said rotatable shaft housing within said grooved ring support and within said exhaust manifold.

7. A motor boat comprising a hull structure, a circular exhaust manifold supportable on said structure in a substantially horizontal plane, a motor unit including an engine, a substantially vertically extending rotatable shaft housing depending from said engine concentrically through said circular exhaust manifold, a driven shaft extending through said rotatable shaft housing and operated by said engine, propulsion means op-

erated by said shaft, and means for adjusting said rotatable shaft housing and propulsion means associated therewith, through an angular path of substantially 360°.

8. A motor unit for motor boats comprising an engine, a rotatable shaft housing depending from said engine, a shaft extending through said rotatable shaft housing and driven by said engine, propulsion means operated by said shaft, an exhaust manifold serving as a support for said engine and surrounding said rotatable shaft housing, said exhaust manifold including a pair of plate members associated with said rotatable shaft housing, an annular frame for which said plate members constitute end closures, a sealing ring between said frame and one of said plate members at one end of said frame, and spring means within said exhaust manifold for maintaining said sealing ring in position for sealing the periphery of one of said plate members with respect to the frame of the exhaust manifold, an exhaust connection between the engine and said last mentioned plate member leading into said exhaust manifold, a discharge connection leading out of said frame structure, whereby, said rotatable shaft housing is free to be revolved within said exhaust manifold while exhaust gases are discharged therethrough.

9. In a motor boat, a hull structure, a motor unit supportable in either inboard or outboard arrangement with respect to said hull structure, said motor unit including an engine, a rotatable shaft housing extending from said engine in a substantially vertical axis, a driven shaft extending through said rotatable shaft housing, propulsion mechanism operated by said driven shaft, an exhaust manifold disposed in a substantially horizontal plane encircling said rotatable shaft housing and serving to support said motor unit with respect to said hull structure, an exhaust connection between said engine and said exhaust manifold, an exhaust discharge connection between said exhaust manifold and a position beneath the hull structure, and a coupling unit interposed in said last mentioned exhaust discharge connection and connected at one end to an air supply connection external to said hull structure and at the other end to the pressure area beneath said hull structure adjacent said propulsion mechanism, whereby, the pressure developed through said exhaust discharge connection and through said connection to said propulsion area continuously draw air from said air supply connection for delivery beneath said hull structure continuously during the operation of said engine.

10. In a motor boat, a hull structure, a frame carried by said hull structure, a motor unit projecting through said frame including an engine, a rotatable shaft housing depending through said frame on a substantially vertical axis, a shaft extending through said shaft housing and driven by said engine, propeller means external to said hull structure and operated by said driven shaft, an exhaust manifold supported by said frame and encircling said rotatable shaft housing in a substantially horizontal plane and having an exhaust connection with said engine, an exhaust discharge connection leading from said exhaust manifold to a discharge position beneath said hull structure, sealing means carried by said frame and journaling said rotatable shaft housing, and means for orientating said rotatable shaft housing through a range of substantially 360°.

11. In a motor boat, a hull structure, an outboard motor for operation with respect to said hull structure, said outboard motor including an engine, a rotatable shaft housing, a shaft extending through said housing and driven by said engine, propulsion means operated by said shaft an exhaust manifold encircling said shaft housing and a bracket for mounting said rotatable shaft housing with respect to said hull structure, said bracket including a pair of bar members for slidably supporting a pair of transverse members, said transverse members embracing said rotatable shaft housing, and means carried by said rotatable shaft housing and interengaging said transverse members for rotatably journaling said rotatable shaft housing with respect to said hull structure for orientation through substantially 360°.

12. In a motor boat, a hull structure, an outboard motor unit including an engine, a rotatable shaft housing depending therefrom, a driven shaft operated by said engine and extending through said rotatable shaft housing, a propeller mechanism operated by said shaft, an exhaust manifold encircling said shaft housing a bracket carried by said hull structure and having arms extending on opposite sides of said rotatable shaft housing, a pair of transversely extending members selectively adjustable on said arms, said transversely extending members each having a central semicircular portion embracing said rotatable shaft housing, the interior faces of each of said central semicircular portions being annularly grooved and a flange carried by said rotatable shaft housing and projectable into the groove in said central semicircular portions, whereby, said rotatable shaft housing may be orientated through substantially 360° with respect to said hull structure.

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