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This invention relates to motors particularly used for converting row boats and the like into power boats, and my object is to devise a motor which will be simple, cheap and of good appearance. In beaching boats provided with outboard motors, it has been necessary for the operator to lift the motor from its driving position before the boat reached the beach. A further object therefore is to devise an outboard motor which will require no attention when in shallow water. A further object is to devise an outboard motor having a low center of gravity, Further objects which I have had in mind will hereinafter appear.

I attain my objects by means of the constructions hereinafter described and illustrated in the accompanying drawings in which -

Figure 1 is a side elevation of my improved motor in an inoperative position;

Figure 2 a plan view of the same;

Figure 3 a cross section through the propeller shaft coupling;

Figure 4 a side elevation in an operative position;

Figure 5 a vertical section through the locking mechanism; and

Figure 6 a vertical section through the spark plug opening in the cylinder.

In the drawings like numerals of reference indicate corresponding parts in the different figures.

1 is a vertical internal combustion motor connected to a frame 2 in an inverted position, thus bringing the center of gravity as low as possible.

The motor is provided with a fly wheel 3, magneto 4, propeller shaft 5, propeller 6, gasolene tank 7, and cylinder 12. To enable the motor to be swung in a vertical plane, I provide a pivotal connection between the frame 2 and the motor 1 so that the motor may be moved rearwardly to immerse the propeller and forwardly to raise the propeller clear of the water. The frame 2 is preferably formed in two halves, each half being provided with adjustable clamps 8 and downwardly extending arms 9 to secure the frame to the boat. The extending arms 9 are provided with inwardly facing bosses 10 which are spaced apart by a lug 11 formed on the motor 1. The two halves of the frame are held together by a bolt 41 passing through the bosses 10, this bolt acting as a pivot for the motor 1.

To support the magneto 4, I provide a bracket 13 secured to the forward crank shaft bearing. Preferably the bracket 13 is cored so that it will fit over the bearing and a screw with a countersunk head is provided to secure it in position. A laterally extending stud 14 is secured in this bracket.

The frame 2 is provided with a slot 15 which is arc-shaped, being concentric with the center of the bosses 10. The stud 14 extends through the slot 15 in the frame 2. A small hand-wheel 16, provided with a projection 17 adapted to fit an enlargement 18 in the forward end of the slot 15, is screwed on the stud 14. It will readily be seen that by screwing the hand wheel 16 up tight when the motor is swung forward bringing the stud 14 in alinement with the enlargement 18, that the motor will be locked in a forward

position . To release the motor,or to start the boat after the motor ~~after the meyer~~ has been started,the hand wheel 16 is unscrewed until the projection 17 is clear of the enlargement 18. This allows the motor to swing rearwardly,thus submerging the propeller 6 in the water. Preferably I form a slot 15 in each half of the frame and secure two laterally extending studs 14 in the bracket 13. I find it necessary to have only one hand wheel,so on the other stud I provide a friction grip comprising a split washer and a common washer held by a nut on the outer end of the stud.

The propeller shaft 5 is secured to the crank shaft of the motor 1 by means of a coupling 19 provided with a key. A propeller shaft tube 20 is secured by means of a split collar 21 to the rear crank shaft bearing . On the tube 20 is supported a rudder sleeve 22,a water pump 23,and a collar 24 which supports tiller ropes 25. The rudder sleeve 22 is secured to the propeller shaft tube 20 by means of set screws. This sleeve has a downwardly extending pin 26 on which a rudder 27 pivots. Two laterally extending arms 28 are provided on the rudder to whichthe tiller ropes 25 are connected . The collar 24 is provided with lugs through which the tiller ropes pass. Preferably I employ the collar 24 for another purpose; to each lug is connected one end of a tension spring 29,the other end being connected to each tiller rope .The springs tend to keep the tiller ropes taut,thus keeping the boat from turning unless a greater pressure be applied to one of the ropes.

The cylinder 12 is provided with a water jacket 30, which is preferably formed with an open top. The water pump 23, which is of ordinary construction, pumps water only when submerged so I connect a water pipe 32 from the pump 23 to the upper part of the water jacket instead of to the lower part as is usual. By this arrangement air is not pumped into the water jacket to cause the water to overflow when the engine is left running with suction inlet of the pump out of the water.

Preferably I provide a transversely arranged lug 31 on the rudder sleeve 22. The rudder, being inclined on its forward edge, it tends to lift over an obstruction and the lug 31 engages the upper edge of the rudder to resist upward strain if any obstacle is encountered.

To exclude water from the spark plug, I employ a tube 33 which is secured to the combustion chamber of the cylinder 12. Preferably I make the combustion chamber L-shaped and secure a flange 34 thereto. The flange 34 is provided with a boss over which the tube 33 is secured to make a water tight joint. To prevent water from gaining access to the top of the tube 33, I extend it up through the gasoline tank 7 making tight joints at the top and bottom of the tank.

To unscrew the spark plug, I employ a box wrench 35 which is made of tubing of smaller diameter than the tube 33 so it will fit in the latter. I extend the box wrench 35 above the top of the tube 33 and form a downwardly extending slot 36 at the upper end of the wrench. A cover 37 is

provided, fitting over the upper end of the box wrench.35, serving as a handle for swinging the motor to raise or lower the propeller shaft .The spark plug is provided with an insulated high tension cable which passes up through the wrench 35 and out through the lower end of the slot 36 connecting it to the magneto 4. The cable is also used for removing the spark plug after it has been unscrewed by the wrench 35.

To prevent water reaching the cylinder 12 from the exhaust pipe 38, I bend the latter over the crank case and have its outlet end depending . The end of the depending portion of the exhaust pipe 38 is plugged and small holes, of total area equal to the area of the pipe, are drilled in the wall of said depending portion, the holes being arranged so no water entering the pipe can pass over the bend and get into the cylinder.

By securing the carbureter 39 to a side of the crank case of the motor, remote from any ports in the cylinder 12, any gasoline leakage from the former will run down into the open end of the motor piston and settle on the bottom where it would soon be evaporated.

Referring particularly to Figs. 1 and 4, it will be seen that the magneto 4 and fly wheel 3 are forward of the pivot 41 on which the motor swings, thus acting as a counterweight to the propeller shaft 5 and the other parts in the rear of the pivot .

It will also be seen that with my construction should the rudder or propeller strike an obstacle the propeller shaft will automatically raise itself until it passes over the obstacle

and then drop to its former position.

The motor may be frictionally locked in any intermediate position by tightening the hand wheel 16 to hold the projection 17 against the face of the slot 15. This arrangement permits the propeller to drive the boat in shallow water where only partial submergence is possible.