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A. J. MACHEK

OUTBOARD MOTOR

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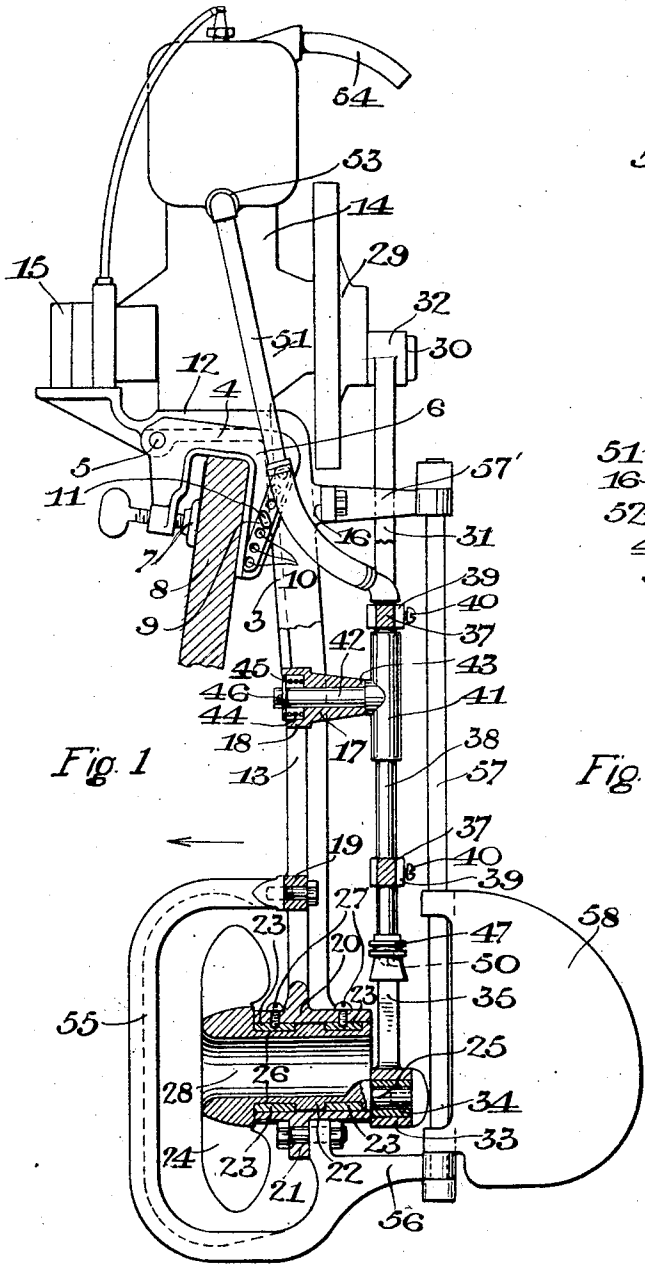


Fig. 1

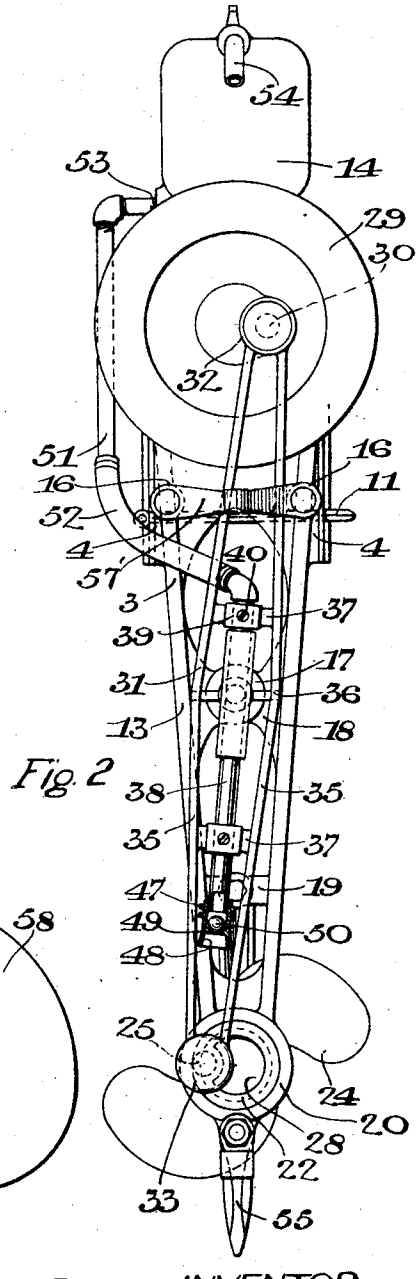


Fig. 2

WITNESSES

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UNITED STATES PATENT OFFICE.

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OUTBOARD MOTOR.

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To all whom it may concern:

Be it known that I, ARTHUR J. MACHEK, a citizen of the United States, and resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Outboard Motors, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

The invention relates to outboard motors for rowboats and other small water craft.

One object of the invention is to simplify the transmission mechanism and reduce the weight of motors of this character.

A further object of this invention is to provide a simple, novel and efficient power transmission mechanism between the engine and the propeller and to operate the water pump by said mechanism.

A further object of this invention is to provide a passageway through the propeller hub and shaft to reduce the resistance of the propeller in advancing through the water and to decrease the slip of propeller and to largely eliminate cavitation or the forming of a large air space immediately behind the propeller.

A further object of the invention is to provide a novel form of tip-up construction.

The invention further consists in the several features hereinafter set forth and more particulaly defined by claims at the conclusion hereof.

In the drawings: Fig. 1 is a side elevation view of an outboard motor embodying the invention, parts being shown in section; Fig. 2 is a rear elevation view of motor shown in Fig. 1.

In the drawings, the numeral 3 designates the main frame member or support and 4 clamps which are pivoted on opposite sides of the member 3 on a pin or pins 5. The clamps 4 include the usual U-shaped members 6 and the adjustable clamping screws 7 by which the device is securely clamped to the stern board 8 of a rowboat or to a suitable part of other small water craft.

The jaw portion 9 of each member 6 is provided with a series of holes 10 arranged at different distances from the inner face of the jaw so that a cotter pin 11 or other suitable stop passed through one set of alined holes in the member 6 forms an abutment for the member 3 and permits said member 3 to be tilted at different angles with respect to the stern of the boat. As hereinafter explained the action of the propeller tends to keep the member 3 against the stop but the free pivoting of the member 3 on the clamps permits an automatic back tilt of the member 3 to clear obstructions encountered by the immersed portions of the device.

The frame member 3 is preferably made in one piece and comprises a top portion 12 and a depending girder portion 13. The top portion 12 forms a support for the internal combustion engine 14 and the magneto 15, if such form of ignition system is used. The girder portion 13 has bosses 16, a boss 17 extending from a transversely extending part 18, a transversely extending part 19, a propeller shaft housing 20 and a lug 21 projecting from said housing.

A propeller shaft 22 is journalled in split bearings 23 in the housing 20. This shaft is preferably formed integral with the propeller 24 and a crank pin 25 and is of a diameter to be slipped into the housing with annular recesses 26 formed in it for receiving the split bearings 23 which are secured in any suitable manner as by screws 27 to the housing so that the shaft, while free to rotate, is held against longitudinal movement in said housing. A passageway 28 extends through the hub of the propeller and its shaft 22 whereby a free passage of water is provided to reduce the resistance of the propeller in its progress through the water and to decrease the slip of the propeller and to a great extent eliminate cavitation, or the forming of a large air space immediately behind the propeller.

The fly wheel 29 of the engine carries a crank pin 30 and a girder-like transmission member 31 has its upper end 32 pivotally mounted on said pin 30 and its lower end 33 pivotally mounted on pin 25, said end 33 preferably carrying a bearing bushing 34. This member 31 has side portions 35 inclining outwardly from the ends 32 and 33 to a central point 36 and transversely extending portions 37 provided with apertured bosses 39. A slide member 38 extends through the apertures in the bosses 39 on the parts 37 and is secured thereto in any

suitable manner as by screws 40. This member 38 is slidably mounted in the bore of a guide member 41 which is provided with a pin extension 42 pivotally mounted in the boss 17 and held against endwise movement in said boss by means of a shoulder 43 on said member pressed against the end of said boss by a spring 44 interposed between the boss and a washer 45 on the pin 42, said washer being held against the spring in any suitable manner as by a cotter pin 46 passed through the pin 42. With the construction thus far described it will be observed that the rotation of the engine shaft and consequently the wheel 29 will cause an oscillatory and longitudinal movement of the member 31 produced by the swinging of the members 31, 38 and 41 and the relative sliding movement between the members 38 and 41 which in turn produces a rotary movement of the propeller shaft 22. This construction eliminates the use of shafting and gearing commonly employed and aids materially in reducing the weight of the device.

The member 38 is preferably made in the form of a pipe or conduit and carries a fitting 47 at its lower end. This fitting is tubular and preferably provided with a flaring mouth 48 adjacent a seat portion 49 for a valve, such as a ball 50. The ball is free to move between the seat 49 and the lower end of the pipe and does not close off the lower end of the pipe in its upper position. The upper end of the pipe is connected by suitable piping 51, including a flexible pipe section 52, with the inlet 53 to the lower part of the water jacket space of the engine 14. With this construction the repeated downward movements of the pipe 38 by the movement of the transmission member 31 of which it forms a part, causes repeated lifts of the valve 50 and an upward forcing of water through the pipe 31, piping 51 to the cooling space of the engine, the water passing from the top of the jacket through the waste pipe 54. On the upward movements of said member 31 the ball valve seats over inlet to the pipe so as to retain the water in the system. A screen, not shown, may be placed over the mouth 48 of the fitting 47 if desired to prevent foreign matter interfering with the seating of the valve 50.

A skeg 55 extending around the propeller has its upper end bolted or otherwise suitably secured to the part 19 and its lower end bolted or otherwise suitably secured to the lug 21 and it also has an extension 56 forming a lower bearing for the rudder post 57. A bracket 57′ formed to straddle the member 31 so as not to interfere with its movements has its ends bolted or otherwise suitably secured to the bosses 16 and provides an upper journal for the rudder post 57 carrying the rudder 58.

In the particular construction shown it will be noted that the propeller works at the inner side of support 3 and creates a pull in the direction of the arrow to propel the boat and this pull normally serves to keep the support 3 against the pin but should the skeg 55 encounter an obstruction then the support 3 with the parts connected thereto is automatically tipped upwardly to enable passing over the obstruction.

I desire it to be understood that this invention is not to be limited to any specific form or arrangement of parts except in so far as such limitations are specified in the claims.

What I claim as my invention is:

1. In an outboard engine, the combination with the engine including a drive member provided with a crank, of a propeller shaft having a crank, an oscillatory and slidable transmission member to operatively connect said cranks, and a water pump carried by said transmission member and operated by the movements thereof.

2. In an outboard engine, the combination with the engine including a drive member provided with a crank, of a propeller shaft having a crank, a support on which said engine is mounted and in which said shaft is journalled, a guide member pivotally mounted on said support, a transmission member connecting said cranks and provided with a pipe slidably mounted in said guide member, said pipe having a valve controlled inlet at its lower end, and piping connecting said pipe with the water jacket of said engine.

3. In an outboard engine, the combination with the engine and transmission mechanism, of a propeller and its shaft driven thereby and having a passageway extending therethrough and open at both ends.

4. In an outboard engine, the combination with a frame and an engine mounted thereon including a drive member provided with a crank, of a propeller and its shaft having a passageway extending therethrough, said shaft being journalled in said frame and provided with a crank, a transmission member operatively connecting said cranks together, and a member pivotally mounted on said frame and slidably connected with the intermediate portion of said transmission member.

5. In an outboard engine, the combination with a crank-shaft driven by the engine, a propeller-shaft having a crank, an oscillatory guide, an oscillatory transmission member drivingly connecting said cranks, and a sliding connection between said guide and said transmission member.

6. In an outboard engine, the combination with a crank directly connected to the engine-shaft, a propeller-shaft having a crank, a support, an oscillatory transmission guide mounted on said support, and an oscillatory

transmission member forming a driving connection between the cranks and having a part slidably connected with said guide.

7. In an outboard engine, the combination with a frame, an engine mounted thereon with a crank directly connected to the engine-shaft, a propeller journalled in said frame and having a crank, an oscillatory transmission guide mounted on said frame, a beam forming a driving connection between said cranks, and a member sliding in said guide and detachably connected to said beam on opposite sides of said guide.

In testimony whereof, I affix my signature.

ARTHUR J. MACHEK.