Dec. 29, 1925. 1,567,512

L. J. JOHNSON

WATER COOLING SYSTEM FOR OUTBOARD MOTORS

Original Filed Feb. 9, 1924

Fig. 1a

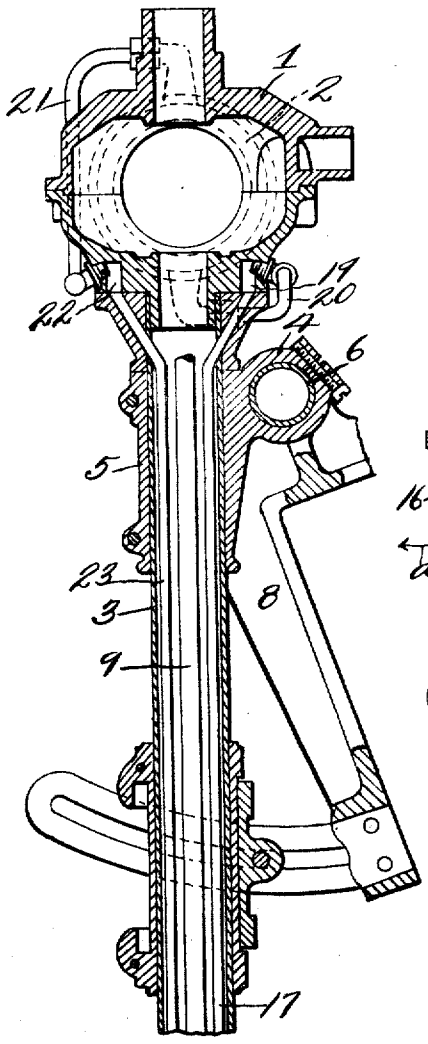
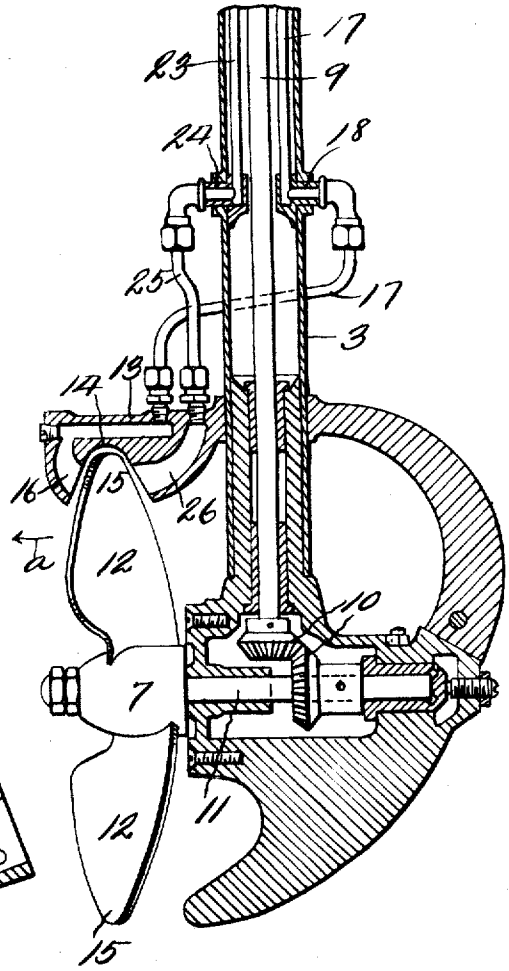


Fig. 1.



Louis J. Johnson
INVENTOR.

BY George J. Utech

ATTORNEY.

Patented Dec. 29, 1925. 1,567,512

UNITED STATES PATENT OFFICE.

LOUIS J. JOHNSON, OF MISHAWAKA, INDIANA, ASSIGNOR TO JOHNSON BROS. ENGINEERING CORPORATION, OF SOUTH BEND, INDIANA.

WATER-COOLING SYSTEM FOR OUTBOARD MOTORS.

Application filed February 9, 1924. Serial No. 691,601.

To all whom it may concern:

Be it known that I, LOUIS J. JOHNSON, a citizen of the United States, residing at Mishawaka, in the county of St. Joseph and State of Indiana, have invented certain new and useful Improvements in Water-Cooling Systems for Outboard Motors, of which the following is a specification.

The invention relates to water cooling systems for outboard motors, and has for its object to provide means whereby the propeller is utilized to force water as it is driven rearwardly by the propeller through the water jacket of the engine. Also to provide means whereby the suction at the forward side of the propeller is utilized for creating a suction, and materially speeding up the circulation of water in the system, as it is forced through the system by the water projected from the rear side of the propeller.

A further object is to provide a cooling system for outboard motors comprising an intake pipe and a discharge pipe, said pipes having their intake and discharge ends at opposite sides of the propeller, where the blades, during the rotation of the propeller, will pass between the intake and discharge ends of the pipes, and force water through the intake end and simultaneously suck water from the discharge end of the pipe.

A further object is to provide in combination with an outboard motor, pivotally and rotatably mounted, a water cooling system, through which water is forced and driven by the propeller blades, and sucked from the system by the propeller blades, and comprising intake and discharge ports, disposed in a bracket, means whereby said bracket is rigidly mounted, and held in position in relation to the propeller blades, and movable upon the pivotal or rotatable movement of the motor as a whole.

With the above and other objects in view the invention resides in the combination and arrangement of parts as hereinafter set forth, shown in the drawing, described and claimed, it being understood that changes in the precise embodiment of the invention may be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawing:—

Figure 1 is a vertical longitudinal sectional view through the lower portion of the outboard motor, showing the device applied thereto.

Figure 1ª is a vertical longitudinal sectional view through the upper portion of the outboard motor.

Referring to the drawing, the numeral 1 designates the engine casing, and 2 the water jacket thereof. The outboard motor, generally is of substantially the same type as that set forth in Patent No. 1,467,641, issued to Louis J. Johnson, Sept. 11, 1923. Extending downwardly from the engine casing 1 is a shaft casing 3, which casing is supported by a bracket 4 having a sleeve 5. The bracket 4 is pivotally mounted at 6 for movement in a vertical longitudinal plane, and the shaft casing 3 is rotatably mounted in the sleeve 5, therefore it will be seen that the motor may be moved in a vertical plane longitudinally, and rotated in a horizontal plane as desired for changing the angle of the axis of the propeller 7 for directional steering of a boat, to which the motor is attached by means of the bracket 8. Extending downwardly through the shaft casing 3 is a drive shaft 9, the lower end of which has gear connections 10 with the propeller drive shaft 11, for rotating the propeller. Heretofore pumps have been placed on outboard motors adjacent the lower ends thereof which have been driven in various ways mechanically, for instance as shown in the patent above referred to. To obviate the use of a mechanically operated pump, and utilize the water forced rearwardly in the direction of the arrow *a* from the propeller blades 12, a bracket 13 is provided, which bracket is carried by the drive shaft casing 3, which bracket moves with the casing during the directional steering of the boat, and during the pivotal movement of the motor as a whole, therefore it will be seen that the brackets 13 will be maintained in relative relation to the propeller blades 12 at all times during the

operation of the motor. Bracket 13 is provided on its under side with a recess 14 through which the outer ends 15 of the propeller blades pass during the rotation of the propeller, and consequently as water is thrust rearwardly in the direction of the arrow *a* from the propeller, a portion thereof will be forced through the upwardly and rearwardly curved intake port 16 of the bracket 13, and thence through the intake pipe 17 which extends through and into the drive shaft casing 3 at 18. The upper end of the pipe 17 discharges into the port 19 of the engine casing 1, and the water passes therefrom through the pipe 20, into the water jacket 2, and passes through said water jacket and is discharged through the discharge pipe 21 into the port 22, and thence through the discharge pipe 23, which extends downwardly through the drive shaft casing 3, and through the drive shaft casing at 24, from which point the water passes through the pipe 25, and discharges into the downwardly and rearwardly curved discharge port 26 of the bracket 13, rearwardly of the propeller blades 12. However during the rotation of the propeller, it will be seen, as water is thrust by the propeller blades into the port 16, a suction is created at the rear sides of the blades 12, which suction will suck water from the discharge port 26, and thereby the material speeding up of the circulation of water is accomplished. It will be seen that no matter in what direction the motor is moved in its pivotal movement, the bracket 14 will move therewith, and consequently the intake port 16, and the discharge port 26 will be maintained in relative position to the outer ends of the propeller blades 12, thereby insuring a positive operation of the device at all times, and eliminating the use of any flexible connections.

From the above it will be seen that a water cooling system is provided, which is particularly adapted for use in connection with outboard motors wherein the thrust of water from the propeller is utilized as a circulating medium through the engine for cooling purposes, and the circulation is materially increased in speed by suction adjacent the discharge end of the system, and located rearwardly of the propeller.

The invention having been set forth what is claimed as new and useful is:—

1. The combination with an outboard motor pivotally movable in a substantially horizontal plane and having a water jacket, a propeller, of means whereby water forced rearwardly by said propeller will be forced through the water jacket, said last named means being constant in relation to the propeller during the pivotal movement of the propeller.

2. The combination with a pivotally movable outboard motor movable in a horizontal plane and comprising a water jacket, a propeller, of means whereby water forced rearwardly by said propeller will be forced through said jacket, said means comprising a water conductor having its intake end disposed rearwardly of the propeller, said last named means remaining constant in relation to the propeller during the movement of the propeller.

3. The combination with a pivoted outboard motor movable in substantially a horizontal plane and having a water jacket, a propeller having blades, of means whereby water forced rearwardly by the outer ends of the blades during the rotation of the propeller will be conveyed and forced through the water jacket, said last named means remaining constant in relation to the propeller during the pivotal movement of the motor.

4. The combination with a pivoted outboard motor having a water jacket, a propeller, of means whereby said propeller will force water through the water jacket and suck water from the water jacket, said means remaining constant in relation to the propeller during the movement of the motor.

5. The combination with a pivoted outboard motor having a water jacket, a propeller, intake and discharge pipes connected to said water jacket, the intake end of the intake pipe being disposed rearwardly of the propeller, the discharge end of the pipe being disposed forwardly of the propeller, said intake and discharge ends of the pipes remaining constant in relation to the propeller during the pivotal movement of the motor and propeller.

6. The combination with a pivoted outboard motor movable in substantially a horizontal plane and having a water jacket, a propeller, an intake pipe connected to said water jacket, said intake pipe having its intake end disposed rearwardly of the propeller in a position whereby water will be forced therein by the propeller, said intake end of the pipe remaining constant in relation to the propeller during the pivotal movement of the motor.

7. The combination with an outboard motor having a water jacket, a drive shaft casing, a bladed propeller, a bracket carried by said casing and provided with a recess through which the ends of the propeller blades move, intake and discharge pipes connected to the water jacket and the the bracket in registration with intake and discharge ports located respectively rearwardly and forwardly of the ends of the propeller blades.

8. The combination with a pivotally mounted outboard motor having a water jacket and a propeller, of a bracket carried by and movable with said motor and arching the propeller and provided with intake

and discharge ports, and pipe connections between the intake and discharge port and the water jacket.

9. The combination with pivoted outboard motor movable in substantially a horizontal plane and having a water jacket, a propeller, of means whereby the current of water produced by the propeller will induce a flow of water through the water jacket, said means remaining constant in relation to the propeller during the movement of the motor.

In testimony whereof I affix my signature.

LOUIS J. JOHNSON.

and discharge ports, and pipe connections between the intake and discharge port and the water jacket.

9. The combination with pivoted outboard motor movable in substantially a horizontal plane and having a water jacket, a propeller, of means whereby the current of water produced by the propeller will induce a flow of water through the water jacket, said means remaining constant in relation to the propeller during the movement of the motor.

In testimony whereof I affix my signature.

LOUIS J. JOHNSON.

DISCLAIMER

1,567,512.—*Louis J. Johnson*, Mishawaka, Ind. WATER-COOLING SYSTEM FOR OUTBOARD MOTORS. Patent dated December 29, 1925. Disclaimer filed June 23, 1930, by the assignee, *Johnson Brothers Engineering Corporation*.

Therefore, enters the following disclaimer to said patent:

Hereby disclaims from the scope of claim 1 any structure except one in which the "means whereby water forced rearwardly by said propeller will be forced through the water jacket," includes a frame pivotally turnable relatively to the motor drive shaft for steering which frame is provided with a duct or ducts disposed within the confines of its exterior surfaces and through which the circulating water flows.

Hereby disclaims from the scope of claim 2 any structure except one in which the "water conductor having its intake end disposed rearwardly of the propeller," is disposed within the confines of the exterior surfaces of a frame which is pivotally turnable relatively to the motor drive shaft for steering.

Hereby disclaims from the scope of claim 3 any structure except one in which the "means whereby water forced rearwardly by the outer ends of the blades during the rotation of the propeller will be conveyed and forced though the water jacket," includes a frame pivotally turnable relatively to the motor drive shaft for steering which frame is provided with a duct or ducts disposed within the confines of its exterior surfaces and through which the circulating water flows.

Hereby disclaims from the scope of claim 4, any structure except one in which the "means whereby said propeller will force water through the water jacket and suck water from the water jacket," includes a frame pivotally turnable relatively to the motor drive shaft for steering, which frame is provided with a duct or ducts disposed within the confines of its exterior surfaces and through which the circulating water flows.

Hereby disclaims from the scope of claim 5 any structure except one in which "said intake and discharge ends of the pipes" are located within the confines of the exterior surfaces of a frame pivotally turnable relatively to the motor drive shaft for steering.

Hereby disclaims from the scope of claim 6 any structure except one in which "said intake pipe having its intake end" is located within the confines of the exterior surfaces of a frame pivotally turnable relatively to the motor drive shaft for steering.

Hereby disclaims from the scope of claim 9 any structure except one in which the "means whereby the current of water produced by the propeller will induce a flow of water through the water jacket" includes a frame pivotally turnable relatively to the motor drive shaft for steering, which frame includes within its exterior surfaces a duct or ducts through which the circulating water flows.

[*Official Gazette July 15, 1930.*]

DISCLAIMER

1,567,512.—*Louis J. Johnson*, Mishawaka, Ind. WATER-COOLING SYSTEM FOR OUTBOARD MOTORS. Patent dated December 29, 1925. Disclaimer filed June 23, 1930, by the assignee, *Johnson Brothers Engineering Corporation*.

Therefore, enters the following disclaimer to said patent:

Hereby disclaims from the scope of claim 1 any structure except one in which the "means whereby water forced rearwardly by said propeller will be forced through the water jacket," includes a frame pivotally turnable relatively to the motor drive shaft for steering which frame is provided with a duct or ducts disposed within the confines of its exterior surfaces and through which the circulating water flows.

Hereby disclaims from the scope of claim 2 any structure except one in which the "water conductor having its intake end disposed rearwardly of the propeller," is disposed within the confines of the exterior surfaces of a frame which is pivotally turnable relatively to the motor drive shaft for steering.

Hereby disclaims from the scope of claim 3 any structure except one in which the "means whereby water forced rearwardly by the outer ends of the blades during the rotation of the propeller will be conveyed and forced though the water jacket," includes a frame pivotally turnable relatively to the motor drive shaft for steering which frame is provided with a duct or ducts disposed within the confines of its exterior surfaces and through which the circulating water flows.

Hereby disclaims from the scope of claim 4, any structure except one in which the "means whereby said propeller will force water through the water jacket and suck water from the water jacket," includes a frame pivotally turnable relatively to the motor drive shaft for steering, which frame is provided with a duct or ducts disposed within the confines of its exterior surfaces and through which the circulating water flows.

Hereby disclaims from the scope of claim 5 any structure except one in which "said intake and discharge ends of the pipes" are located within the confines of the exterior surfaces of a frame pivotally turnable relatively to the motor drive shaft for steering.

Hereby disclaims from the scope of claim 6 any structure except one in which "said intake pipe having its intake end" is located within the confines of the exterior surfaces of a frame pivotally turnable relatively to the motor drive shaft for steering.

Hereby disclaims from the scope of claim 9 any structure except one in which the "means whereby the current of water produced by the propeller will induce a flow of water through the water jacket" includes a frame pivotally turnable relatively to the motor drive shaft for steering, which frame includes within its exterior surfaces a duct or ducts through which the circulating water flows.

[*Official Gazette July 15, 1930.*]