J. K. BARLOW & G. W. HUMPHREY.

ENGINE COOLING SYSTEM.

APPLICATION FILED DEC. 23, 1912.

1,099,684. Patented June 9, 1914.

Fig. 1.

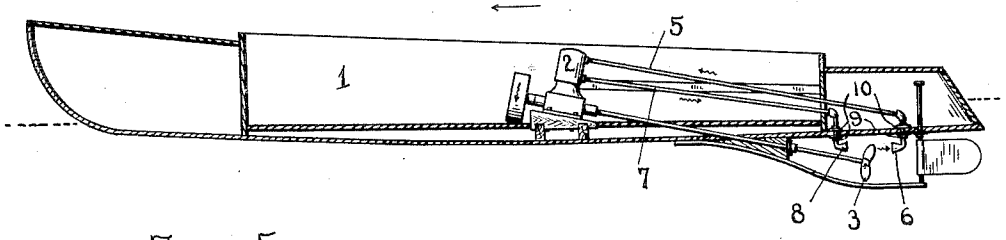


Fig. 5.

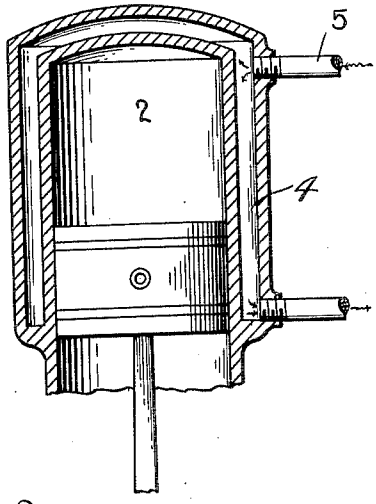


Fig. 3.

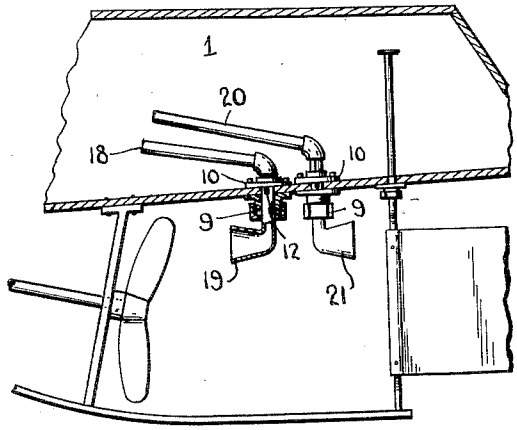


Fig. 2.

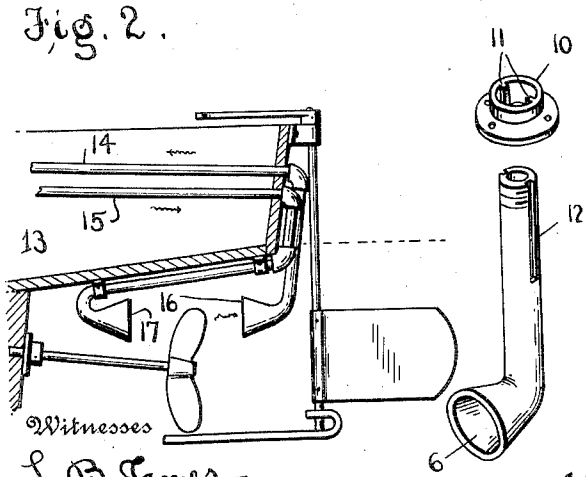


Fig. 4.

Witnesses

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ENGINE-COOLING SYSTEM.

1,099,684. Specification of Letters Patent. Patented June 9, 1914.

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To all whom it may concern:

Be it known that we, JAMES K. BARLOW and GENERAL W. HUMPHREY, citizens of the United States, residing at Savannah, in the county of Hardin and State of Tennessee, have invented certain new and useful Improvements in Engine-Cooling Systems; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in engine cooling systems for motor boats.

One object of the invention is to provide an engine cooling system for motor boats whereby the water is continuously forced up and circulated through the water jacket of the engine by the propeller of the boat when the latter is going either forward or backward.

Another object is to provide an engine cooling system of this character having under-water mouth pieces capable of being reversed so that the motion of the boat in either direction or the force of the rotating propeller will impel water in the opposite direction throughout the length of the cooling system.

With these and other objects in view, the invention consists of certain novel features of construction, and the combination and arrangement of parts as will be more fully described and claimed.

In the accompanying drawings; Figure 1 is a vertical longitudinal section through one form of a motor boat showing the application of the invention thereto; Fig. 2 is a similar view through the rear end of another form of motor boat showing a slightly different arrangement of the invention; Fig. 3 is a similar view of a portion of the style of boat shown in Fig. 1 and illustrating another slightly modified arrangement of the invention; Fig. 4 is a detail view of the outer end and mouth piece of one of the water receiving and conducting pipes of the system; Fig. 5 is a vertical sectional view through the cylinder of the engine showing the relative positions of the water conducting pipes.

Referring more particularly to the drawings, 1 denotes a motor boat, 2 denotes the engine or motor thereof, and 3 denotes the propeller which is driven by the motor in the usual or any suitable manner. Connected with the water jacket 4 of the motor near its upper end is an upper water conducting pipe 5 which extends rearwardly into the stern end of the boat and is connected at its rear end with a flaring or funnel shaped mouth piece 6 which stands below the bottom of the boat in rear of the propeller 3 and has its flared end turned toward the propeller whereby when the latter is driven to propel the boat the water is forced into the mouth piece 6 and up through the pipe 5 into the water jacket of the motor. Connected with the lower portion of the water jacket is a return or discharge pipe 7 which also extends rearwardly into the stern of the boat and is connected at its rear end with a flared or funnel shaped mouth piece 8 which stands below the bottom of the boat immediately in front of the propeller and has its flared end opening toward the latter as shown.

When the boat is being driven forwardly and the water forced into the mouth piece 6 and through the pipe 5 into the water jacket of the motor in the manner described the water will circulate through the water jacket and will be discharged through the return pipe 7 thus keeping up a continuous circulation or passage of the water through the water jacket as long as the propeller is operated to drive the boat in a forward direction. When the propeller is reversed and the boat backed or driven in an opposite direction the water will enter the mouth piece 8 and pass upwardly through the pipe 7 into the water jacket of the motor and out through the pipe 5 and mouth piece 6. When the boat is driven in this direction it will be seen that the water passes through the motor in an opposite direction and that the pipe 7 then becomes the supply pipe and the pipe 5 the discharge pipe. The pipes 5 and 7 are provided with stuffing boxes 9 where the same pass through the bottom of the boat and the mouth pieces are rigidly held against turning in the boat by flanged collars 10 which are secured to the inner side of the bottom of the boat and are provided with inwardly projecting ribs 11, which engage with grooves 12 in the opposite sides of the mouth pieces thereby holding the latter against turning so that the flared open ends thereof will always project in the proper direction. Each collar has two

ribs and each mouth-piece has two grooves in its shank, and therefore when it is desired to do so, the mouth-piece may be reversed so that its open inlet or outlet end will project in the opposite direction from that shown. This would cause the water to flow through the system in the opposite direction, and it would not be driven into either mouth-piece by the propeller in Fig. 1, but as will be understood in the subjoined description of Fig. 3 the reversal of the mouth-piece in the construction illustrated in that view would also cause the water to flow in the opposite direction so the propeller would still drive the water into one of said mouth-pieces.

In Fig. 2 of the drawings the invention is shown applied to a different style of motor boat 13 and in this form of boat the water conducting and discharge pipes 14 and 15 are shown as passing out through the stern end of the boat and as extending downwardly to the bottom thereof. The pipe 14 terminates at the bottom of the rear end of the boat and has connected thereto a forwardly projecting flared mouth piece 16 which opens toward the propeller and is adapted to receive the water when the boat is being driven in a forward direction. The pipe 15 at the lower end of the stern of the boat extends forwardly along the bottom of the latter and turns downwardly to a slight extent at a point a short distance ahead of the propeller and is connected at this point with a flared rearwardly projecting mouth piece 17 which also opens toward the propeller and through which the water is discharged from the water jacket of the motor when the boat is being driven in a forward direction. When the motor is reversed and the boat driven backwardly the water enters or is forced into the mouth piece 17 and is conducted to the water jacket of the motor through the pipe 15. In this operation the water returns through or is discharged by the pipe 14 and the mouth piece 16 as will be readily understood.

In Fig. 3 of the drawings is shown the stern end of the same style of motor boat shown in Fig. 1 and in Fig. 3 is also illustrated a slightly different form and arrangement of the water conducting pipes. In this arrangement of the invention one of the water pipes 18 is connected at its rear end with a forwardly projecting flared mouth piece 19 which is secured in the bottom of the boat a suitable distance in rear of the propeller, the flared end of the mouth piece opening toward the propeller as shown whereby when the boat is being driven in a forward direction, water will be forced into the mouth piece and up through the pipe 18 to the water jacket of the motor. The other pipe 20 of this arrangement of the system is connected at its rear end with a rearwardly projecting flared mouth piece 21 which is secured in the bottom of the boat immediately to the rear of the mouth piece 19 and which has its flared open end projecting rearwardly or away from the propeller whereby when the boat is backed, water will enter this mouth piece 21 and flow through the pipe 20 to the water jacket of the motor. The mouth pieces 19 and 21 are preferably constructed and secured in the bottom of the boat in the same manner as described in connection with the mouth pieces 6 and 8 shown in Fig. 1 of the drawings.

By constructing and arranging our improved engine cooling system as herein shown and described it will be seen that the water in which the boat is floating will be forced into the water jacket and continuously circulated therethrough as long as the boat is moving. By providing the water conducting pipes of the system with mouth pieces which project in opposite directions it will be seen that a continuous supply of water will be provided and conducted to the water jacket of the motor irrespective of the direction in which the boat is moving.

From the foregoing description taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of the invention as claimed.

Having thus described our invention, what we claim is:

1. A cooling system for a motor boat having a water-jacketed internal combustion engine, the same comprising pipes leading from opposite ends of said jacket through the hull of the boat at its rear end, and mouth-pieces connected with said pipes and opening in opposite directions contiguous to the propeller.

2. A cooling system for a motor boat having a water-jacketed internal combustion engine, the same comprising pipes leading from opposite ends of said jacket through the hull of the boat at its rear end, and mouth-pieces connected with said pipes and opening in opposite directions, one forward and the other rearward of the propeller and both contiguous to it.

3. A cooling system for a motor boat having a water-jacketed internal combustion engine, the same comprising pipes leading from opposite ends of said jacket to the rear of the boat, collars secured to the bottom of the boat forward and rearward of the propeller and each having a pair of internal upright ribs, and two mouth-pieces each having its shank provided with oppositely dis-

posed grooves adapted to engage a pair of said ribs in one of the collars and its upper end connected with one of said pipes, and its lower end deflected at substantially right angles to its shank and flared, for the purpose set forth.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

JAMES K. BARLOW.
GENERAL W. HUMPHREY.

Witnesses:
D. A. WELCH,
J. O. COPELAND.