Sept. 13, 1927. 1,642,296

J. S. BRANT

MOTOR VEHICLE HEATER

Filed Oct. 5, 1926 3 Sheets-Sheet 1

Fig. 1.

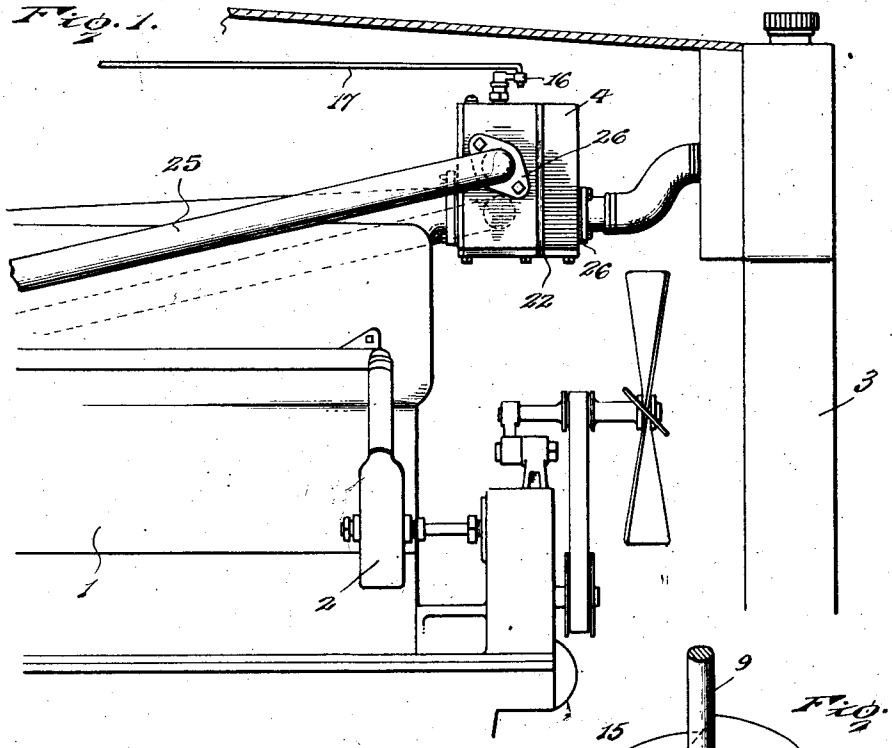


Fig. 7.

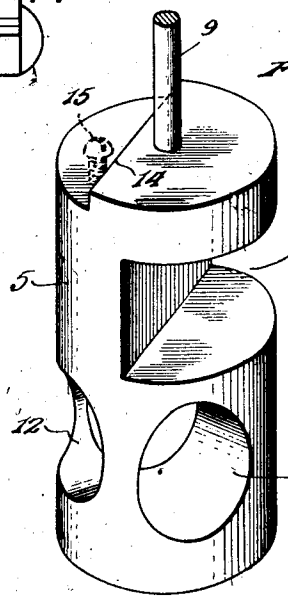
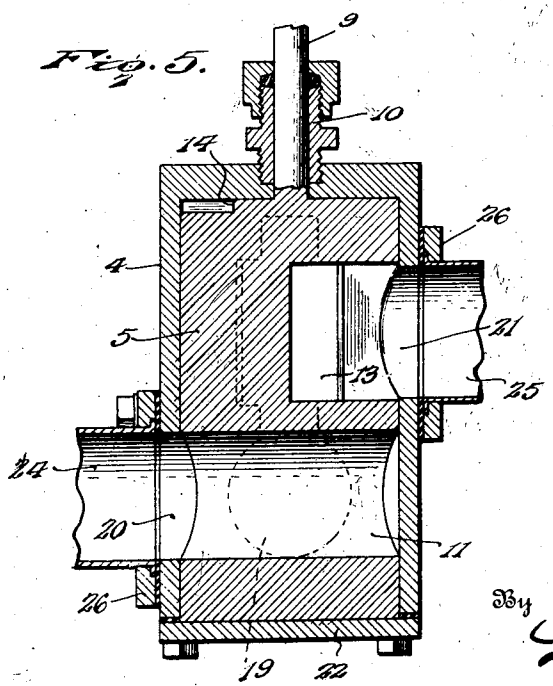


Fig. 5.



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Fig. 2.

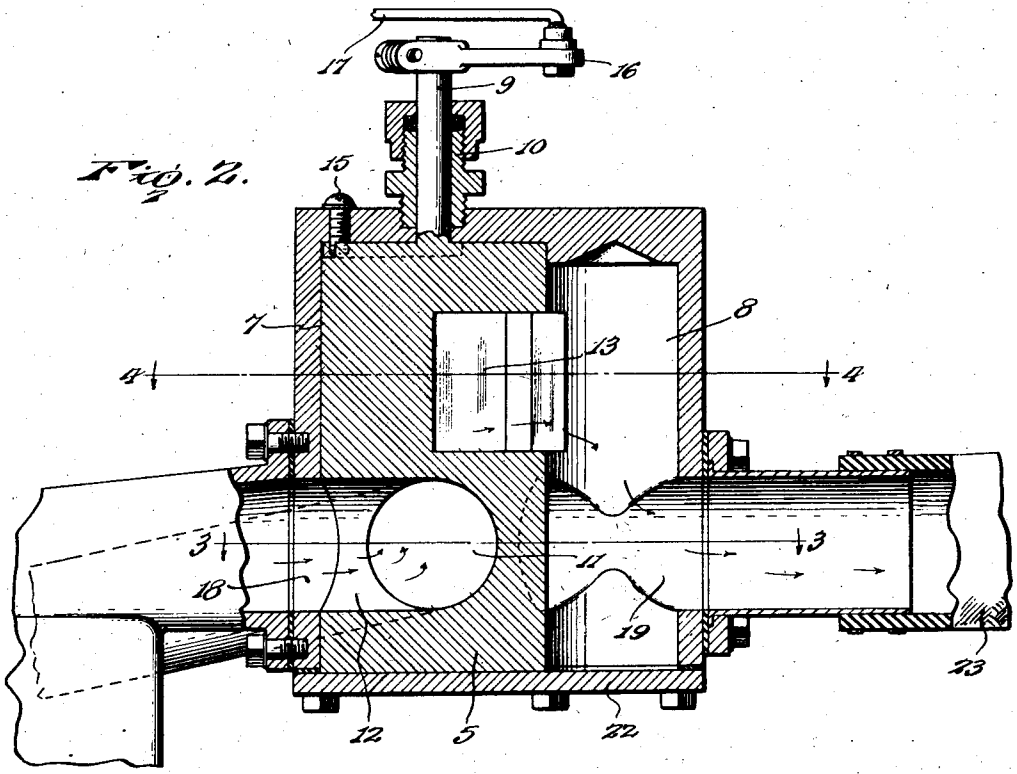
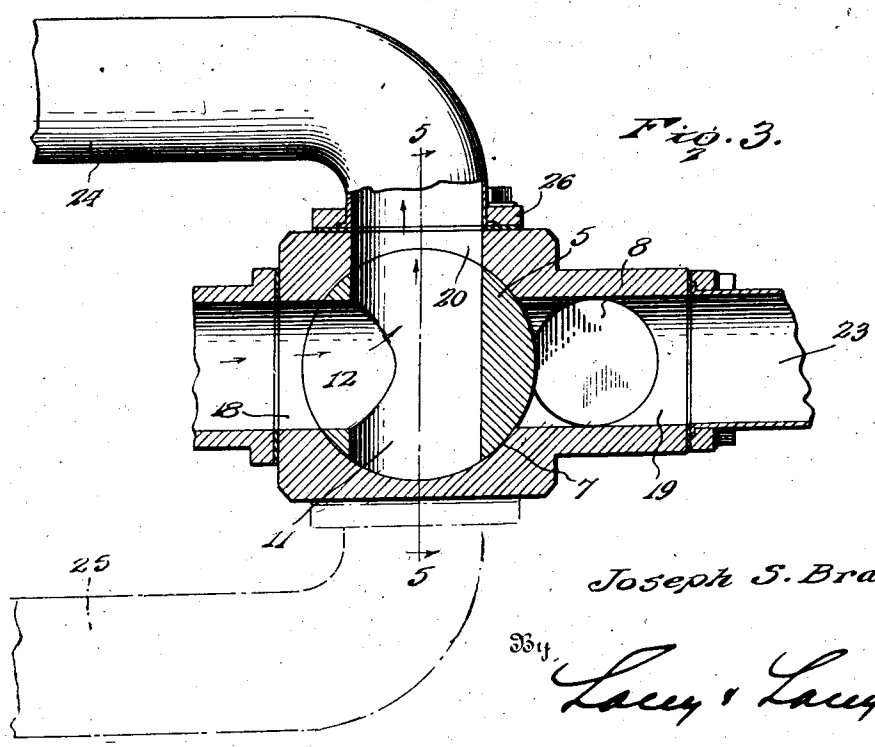


Fig. 3.



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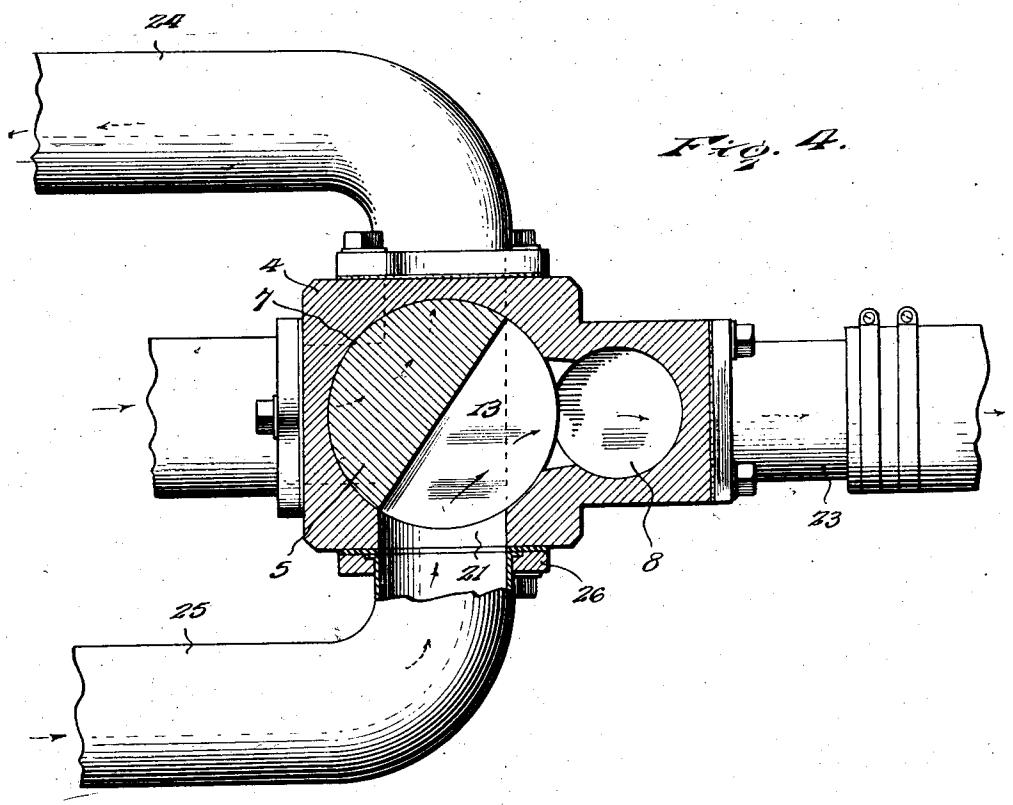


Fig. 4.

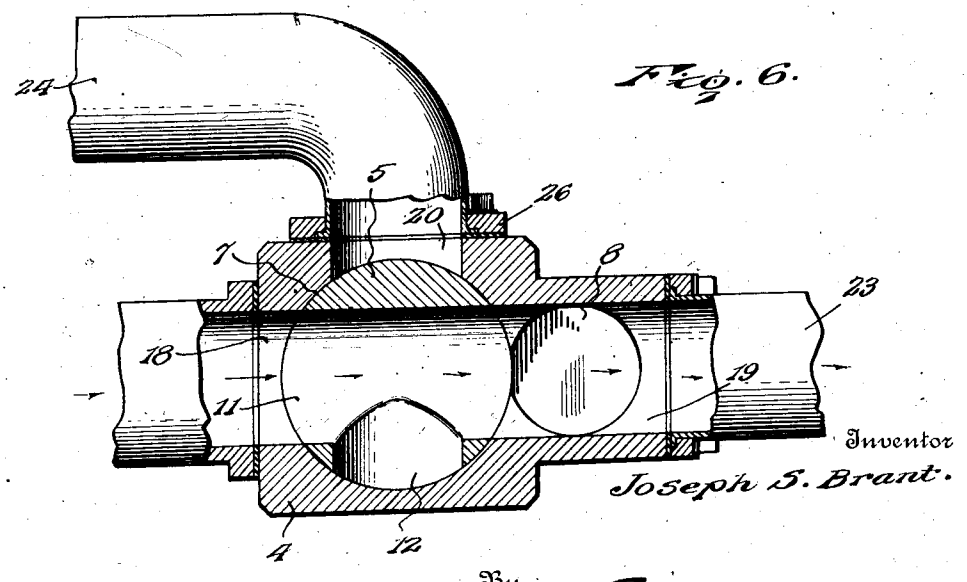


Fig. 6.

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UNITED STATES PATENT OFFICE.

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MOTOR-VEHICLE HEATER.

Application filed October 5, 1926. Serial No. 139,702.

The invention relates to the heating of motor vehicles propelled by means of an internal combustion engine embodying a water cooling jacket and a radiator included in the cooling system.

The invention contemplates a heater of any make, connected with the water cooling system to utilize the hot water as a heating medium, and a valve of novel structural formation for controlling the circulation of the hot water for shunting it through the heater when it is required to warm the car or other desired place.

The invention provides a valve, embodying a casing having two chambers and openings, and a plug within the casing having a limited rotary movement and formed with passages for directing the hot water in its travel as required, according to the adjusted position occupied by the plug which is operable from the driver's seat at will.

While the drawings illustrate a preferred embodiment of the invention, it is to be undertsood that in adapting the means to meet specific needs and requirements, the design may be varied and such other changes in the minor details of construction may be resorted to within the scope of the invention as claimed, without departing from the spirit thereof.

For a full understanding of the invention and the merits thereof, reference is to be had to the following description and the drawings hereto attached, in which,—

Figure 1 is a fragmentary side view of an internal combustion engine and radiator illustrating the application of the invention.

Figure 2 is a vertical, central sectional view of the valve on a larger scale and showing the position of the plug when adjusted to shunt the hot water through the heater.

Figure 3 is a horizontal section on the line 3—3 of Figure 2.

Figure 4 is a horizontal section on the line 4—4 of Figure 2.

Figure 5 is a sectional view on the line 5—5 of Figure 3, looking in the direction of the arrows.

Figure 6 is a horizontal sectional view similar to Figure 3 showing the plug adapted to cut off the flow of water from the heater and establish a direct passage to the radiator, and

Figure 7 is a detail perspective view of the plug.

Corresponding and like parts are referred to in the following description and designated in the several views of the drawings by like reference characters.

The numeral 1 designates the block of an internal combustion engine having the usual water jacket for cooling the cylinders. The pump for creating a positive circulation of the water is indicated at 2, and 3 represents the usual radiator through which the water passes to be cooled prior to its return to the water jacket in a cycle of operation.

The valve constitutes the essential feature of the present invention and is interposed in the connection between the radiator and the water jacket of the engine and comprises a casing 4 and a plug 5. The casing is provided with two chambers 7 and 8, disposed in parallel relation and intersecting at their adjacent sides. The chamber 8 is of less diameter than the chamber 7 and constitutes a by-pass when the valve is adjusted to shunt the water through the heater. The plug 5 has a snug fit within the larger chamber 7, and its stem 9 operates through a stuffing box 10 provided at the top of the casing 4 in line with the center of the chamber 7. The valve plug 5 is formed with a diametrical opening 11 and a lateral opening 12. These openings are in the same plane and communicate. The valve plug has a side portion cut away, as indicated at 13, to provide an opening or passage for the return of the shunted water. The opening or passage 13 is in a different plane from the intersecting openings 11 and 12. An end portion of the plug is cut away to provide a stop shoulder 14 and a screw 15 threaded into an opening formed in the end of the casing acts jointly with the shoulder 14 to limit the turning of the valve plug in each direction. In one position of the plug the water from the jacket of the engine has a direct passage through the radiator. In the other position of the valve plug the water is shunted and caused to pass through the heater, not shown, before entering the radiator and returning to the water jacket. To admit of the valve being operated from the driver's seat, an arm 16 is made fast to the projecting end of the valve stem, and a rod 17 leads therefrom to a convenient point, so that the valve may be operated at will to control the flow of the water as required.

The valve casing 4 is provided in its sides

with a plurality of openings which are in communication with the chambers. The openings 18 and 19 are in line and in the same plane as the openings 11 and 12 of the valve plug 5. The opening 18 constitutes the inlet for the water from the jacket of the engine. The opening 19 constitutes the outlet for the outflow of the water from the valve through the radiator. In one position of the valve, as indicated most clearly in Figure 6, the water from the jacket of the engine has a direct passage through the valve to the radiator 3. In this position of the valve the water is cut off entirely from the heater. Other openings of the valve casing 4 are designated by the numerals 20 and 21 and are in different planes, the opening 20 being in the plane of the opening 18 of the casing and the openings 11 and 12 of the plug valve 5. The opening 20 constitutes the passage for the outflow of the water from the valve to the heater, when the valve 5 is in the position shown in the several views with the exception of Figure 6. The opening 21 is in position to register with the cut away portion or opening 13 of the valve plug 5, as shown most clearly in Figures 4 and 5. When the valve plug 5 is turned to cut off the direct flow through the openings 18, 11 and 19 the opening 13 registers with the opening 21 and the chamber 8. The water on its return from the heater enters the opening 21 and passes through the opening 13 into the chamber 8 and out from the chamber or by-pass 8, through the opening 19 to the radiator. The two extreme positions of the valve plug 5 are indicated most clearly in Figures 3 and 6. Obviously, the valve plug may be turned part way so as to shunt a portion of the water only through the heater when it is not required to obtain the maximum amount of heat. The opening 21 constitutes the return for the water shunted through the outflow 20.

In the preferable construction of the valve the chambers 7 and 8 are bored into the casing from an end thereof, and a plate 22 is bolted to the casing closing the open ends of the chambers. The valve is located in the length of the connection 23 between the radiator 3 and the outlet of the water jacket. Pipes 24 and 25 connect the valve casing with the heater, not shown, and may be of any construction. When metal pipes are employed, the ends coupled to the valve casing may be flanged outwardly and clamped thereto by collars 26. When the collars 26 are loosened, the pipes may be turned to any adjusted position and are made secure by tightening the collars by screwing home the bolts or other fastening means employed for connecting the collars to the valve casing. When the valve plug 5 is turned to shunt the water through the heater, the flow is as follows: from the water jacket into the valve casing, through the inlet 18, thence through the openings 12 and 11 into the outflow 20, through the pipe 24 to the heater, not shown, thence out through the pipe 25 into the valve casing through the opening 21, thence through the opening 13 into the chamber, or by-pass 8, and out through the opening 19 to the radiator 3 through the connection 23. When the heater is not required, the valve plug 5 is turned to cut off the outflow 20, thereby bringing the diametrical opening 11 of the valve into registering position with the inlet 18 and the outlet 19, thereby establishing a direct passage for the water through the valve to the radiator. The several openings and passages are of a uniform size corresponding approximately to the passage through the connection 23, so as to offer a minimum resistance to the flow of the water.

The invention is adapted for general use in connection with water cooled engines including a radiator in the water circulation, thereby admitting of the water being shunted so as to be utilized for heating purposes, the arrangement being such as to insure a circulation of the water through the heater and radiator, when required, or through the radiator only when the heater is not required to be used.

Having thus described the invention, I claim:

1. In a water cooling system for internal combustion engines, including a radiator, a valve interposed in the connection between the radiator and water cooling jacket of the engine, the same comprising a casing having a valve chamber, a by-pass in communication with the valve chamber, a direct inlet, a direct outlet, an outflow and a return, and a movable valve member within the valve chamber and provided with openings which in one position of the valve admit of a direct flow of the water through the inlet and the outlet, and which, in another position, of the valve shunt the water to cause it to pass from the casing through the outflow and back through the return and by pass before discharging through the said outlet.

2. In a water cooling system for internal combustion engines including a radiator, a valve in the length of the connection between the radiator and the water jacket of the engine, the same including a casing having a direct inlet and a direct outlet, and an outflow and a return, and a plug valve within the casing having a diametrical opening to register with the said inlet and the outlet and having a lateral opening to register with the said inlet and provided with an opening in position to register with the said return, the valve casing having a by-pass to establish communication between the said outlet and the return.

3. A valve adapted to be located in the

circuit of a water cooling system for an internal combustion engine, said valve comprising a casing having a valve chamber and a by-pass in communication with the valve chamber and provided with a direct inlet, a direct outlet, an outflow and a return, and a valve plug snugly fitted within the valve chamber and having a diametrical opening to register with the inlet and the outlet, a lateral opening leading from the diametrical opening to register with the said inlet and having an opening to register with the said return and establish communication between it and the by-pass, the latter being in communication with the said outlet.

4. A valve of the character specified comprising a casing having intersecting chambers, the one constituting a by-pass and the other a valve seat and of larger diameter than the by-pass, said casing having a direct inlet, a direct outlet, an outflow and a return, and a plug valve snugly fitted within the valve chamber and having a limited movement and provided with a diametrical opening to register with the inlet and the outlet, a lateral opening leading from the diametrical opening and adapted to register with the said inlet, and having an opening in position to register with the said return and establish communication between it and the by-pass.

5. A valve of the character specified comprising a casing having intersecting chambers, the one constituting a by-pass and the other of larger diameter and adapted to receive a valve, and having a direct inlet, a direct outlet, an outflow and a return, and a valve plug snugly fitted within the valve chamber and having a limited movement and provided with a diametrical opening, a lateral opening leading from the diametrical opening, and having a cut away portion to establish communication between the said return and the by-pass.

In testimony whereof I affix my signature.

JOSEPH STEWARD BRANT. [L. S.]