May 7, 1929. A. O. NELSON 1,711,901

THERMOSTATIC VALVE CONTROL

Filed July 22, 1927

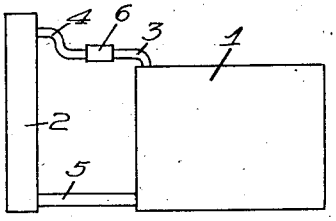


FIG. 1.

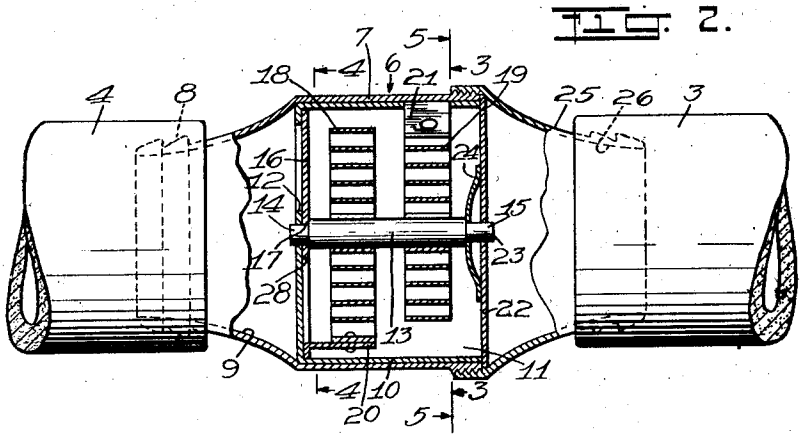


FIG. 2.

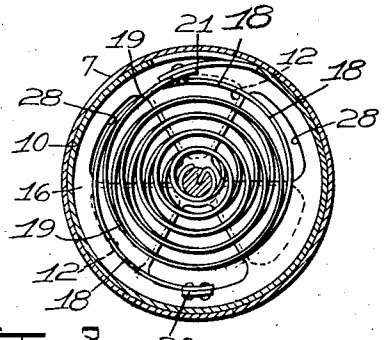


FIG. 3.

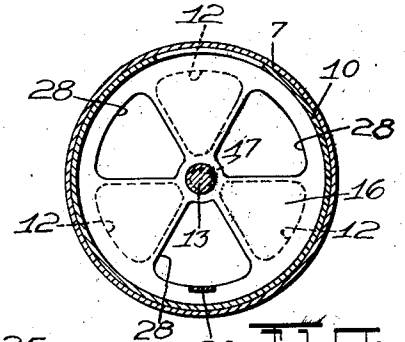


FIG. 4.

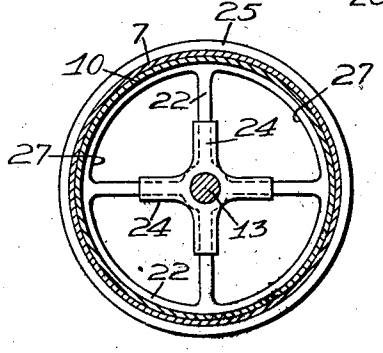


FIG. 5.

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UNITED STATES PATENT OFFICE.

ADOLPH O. NELSON, OF CHICAGO, ILLINOIS.

THERMOSTATIC VALVE CONTROL.

Application filed July 22, 1927. Serial No. 207,746.

My invention relates to improvements in thermostatic valve controls, and it consists in the combinations, constructions, and arrangements herein described and claimed.

An object of my invention is to provide a thermostatic valve control which is placed in a water circuit for controlling the flow of the water in the circuit.

A further object of my invention is to provide a device of the type described which is especially adapted to be used in connection with a motor and a radiator for automatically closing the circuit of water, whereby the motor may be warmed up more readily.

A further object of my invention is to provide a device of the type described which has a double thermostatic means, thus rendering the device more efficient.

A further object of my invention is to provide a device of the type described in which the pressure of the water does not affect the operation thereof.

Other objects and advantages will appear in the following specification, and the novel features of the invention will be particularly pointed out in the appended claim.

My invention is illustrated in the accompanying drawings, forming part of this application, in which

Figure 1 is a diagrammatic view of the device as applied to a motor and radiator,

Figure 2 is an enlarged sectional view of the device,

Figure 3 is a section along the line 3—3 of Figure 2,

Figure 4 is a section along the line 4—4 of Figure 2, and

Figure 5 is a section along the line 5—5 of Figure 2.

In carrying out my invention, I make use of a motor 1 and a radiator 2. A tube 3 extends from the outlet of the motor and a tube 4 is in communication with the inlet of the radiator. A tube 5 forms a communication between the outlet of the radiator and the inlet of the motor.

I provide a thermostatic valve control 6 which consists of a housing 7 having a tube or hose connection 8 which is adapted to receive the free end of the tube 4. The connection 8 is provided with an outlet passageway 9. A cup-shaped casing 10 is provided with an opened end 11. The end of the casing opposite the opened end is provided with equally spaced-apart substantially triangular openings 12. The casing 10 is disposed in the housing 7 so that the openings 12 are positioned in communication with the passageway 9.

An arbor 13 is centrally disposed in the casing 10 and is provided with a reduced end 14 and a reduced end 15. A shutter or valve 16 is disposed concentric with the reduced end 14 and is adapted to rotate thereon. The reduced end 14 extends through a central opening 17 in the end wall of the casing 10 which provides a bearing therefor. Two sets of coil springs 18 and 19 are wound about the arbor 13 and have their inner ends rigidly secured thereto. The outer end of the spring 18 is rigidly secured to a stamped out lip 20 which is integral with the shutter 16. The outer extremity of the coil spring 19 is rigidly secured to a lip 21 which is stamped inwardly from the casing 10. The coil springs 18 and 19 are constructed of thermostatic metal, that is, one ply of steel and another ply of brass.

A bearing plate 22 is disposed adjacent the ends of the casing 10 and the housing 7 and is provided with a central opening 23 for receiving the reduced end 15 of the arbor 13. A resilient member 24 is disposed concentric with the reduced end 15 and in engagement with the bearing plate 22 for holding the shutter 16 in close engagement with the end of the casing 10. A cover 25 is secured to the housing 7 and is adapted to receive and retain the hose or tube 3. The cover 25 is provided with a passageway 26 which is in communication with the tube 3. The bearing plate 22 is provided with relatively large openings 27 which provide communication between the passageway 26 and the inner portion of the casing 10.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood. It is obvious that the device can be attached to any type of water plant. I have shown it attached to a motor and radiator merely to illustrate the manner in which it operates. Let us assume that the motor and radiator are of an automobile which has stood for some time during cold weather without running. It is understood that the water in the motor and radiator would be relatively cold and that the effect upon the thermostatic springs would actuate the shutter so as to move the shutter in closed position.

While the device is in this position, when

the operator wishes to start the motor, the motor can heat up more readily, owing to the fact that the circulation of the water has been shut off between the motor and the radiator, and that the small amount of water within the motor can be readily heated. As the temperature of the water within the motor increases, the heat of the water affects the thermostatic springs 18 and 19 in the following manner. It is understood that heat tends to cause thermostatic metal to expand. Therefore, as the spring 19 is rigidly secured at its outer end to the rigid casing 10, the expansion thereof would cause rotation of the arbor 13 in one direction. The same effect is had upon the thermostatic spring 18 and as one end is rigidly secured to the shutter at 20, the other end tends to rotate the arbor 13. Therefore, the rotation of the arbor 13 by the spring 19 also rotates the spring 18, together with the shutter, and in this manner the shutter is moved a certain distance by the expansion of the spring 19. The expansion of the spring 18 tends to move the shutter 16. Therefore, the double effect upon the shutter, that is, the movement thereof for a certain distance by the spring 19 and a further movement thereof for the remaining distance by the spring 18 causes the shutter 16 to operate rapidly.

The shutter 16 is held in its opened position, that is, that position in which the openings 28 therein are in alignment with the openings 12 of the casing 10 as long as the water adjacent the springs 18 and 19 is at a relatively high temperature. The water then is allowed to pass from the motor through the tube 3, the thermostatic valve control 6, through the tube 4, the radiator 2, through the tube 5, and again through the motor 1.

This circulation may be continued until the motor is stopped and the water therein has again reached a low temperature. The low temperature of the water will cause the springs 18 and 19 to contract, thus actuating the shutter 16 for moving the openings 28 out of alignment with the openings 12, thus shutting off the passageway therethrough.

I claim:

A device of the type described comprising a housing having an outlet passageway therethrough, a cover for said housing having an inlet passageway adapted to direct a liquid into said housing, a cup-shaped casing disposed in said housing and having spaced-apart openings positioned in communication with said outlet passageway, a shutter having spaced-apart openings adapted to be moved into and out of communication with the openings in said casing, an arbor disposed in said casing, thermostatic means disposed in said housing between the inlet passageway and said shutter and rigidly connected to said casing and said arbor for rotating said arbor as the temperature of the liquid changes, and a second thermostatic means disposed in said housing between the inlet passageway and said shutter and rigidly connected to said arbor and to said shutter and adapted to be rotated with said arbor by said first-named thermostatic means, said second-named thermostatic means being adapted to move said shutter as the temperature of said liquid changes.

ADOLPH O. NELSON.