May 31, 1927. 1,630,741

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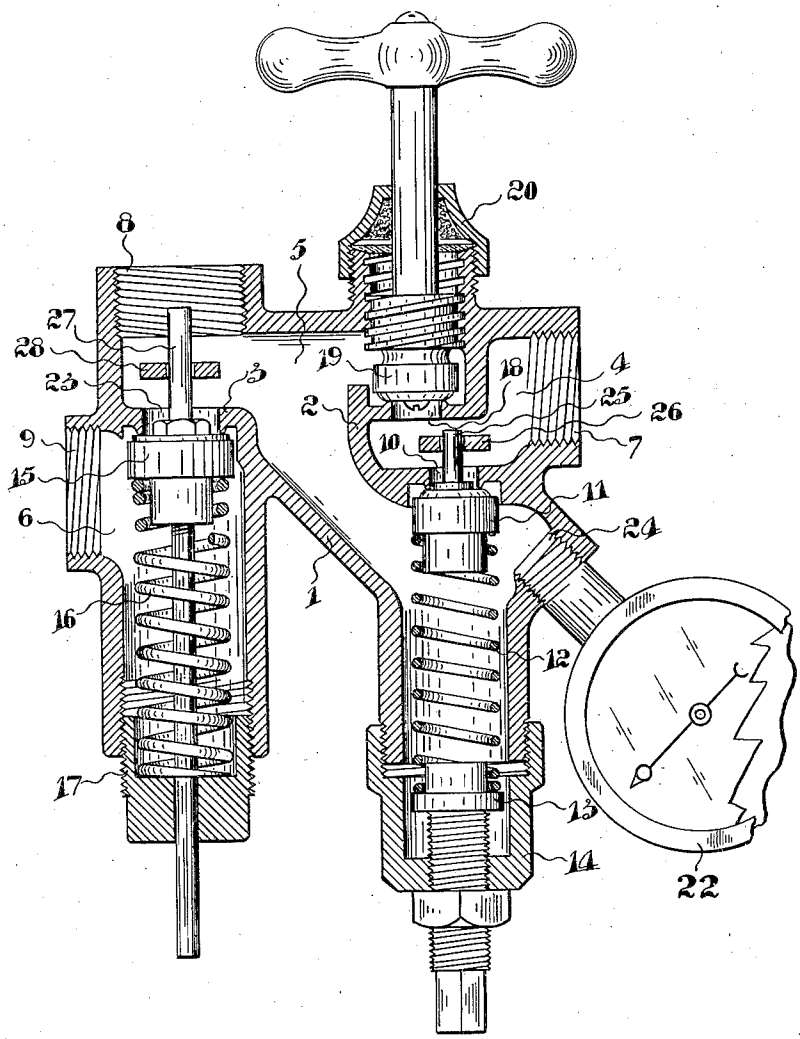
CONTROL MECHANISM FOR WATER HEATING SYSTEMS

Filed Dec. 6, 1926



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Patented May 31, 1927. 1,630,741

UNITED STATES PATENT OFFICE.

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CONTROL MECHANISM FOR WATER-HEATING SYSTEMS.

Application filed December 6, 1926, Serial No. 152,988, and in Canada August 4, 1926.

In hot water heating systems it is usual to employ an expansion tank, which is located in an upper part of the building, usually the attic, and is a source of more or less trouble, one source of trouble being through freezing in cold weather, and one object of the present invention is to avoid the use of this expansion tank by providing mechanism whereby the pressure in the system is automatically controlled, said mechanism including means adapted to automatically allow the water to escape should the pressure rise above a predetermined mark and also including means adapted to automatically allow fresh water to enter the system when the pressure falls below a predetermined mark, as well as manually operable means for allowing water to enter the system at any time as may be desired irrespective of the pressure in the system, and particularly to combine all of said means in a unitary construction.

I attain my object by means of the constructions hereinafter described and illustrated in the accompanying drawing which is a vertical section taken through my improved mechanism.

My mechanism comprises a hollow metal body 1 having partitions 2 and 3 formed therein dividing the body into three chambers 4, 5 and 6. Threaded openings 7, 8 and 9 are formed in the end of the body communicating respectively with the chambers 4, 5 and 6. In practice the opening 7 will be in communication with the water supply, the opening 8 in communication with the water heating system, and the opening 9 will be used for exhaust purposes.

In the partition 2 is formed a passage 10 which is adapted to be normally closed by means of a valve 11, a spring 12 being provided to hold the valve seated. One end of this spring engages the valve 11 and its other end engages a movable member 13 provided with a stem threaded in a bonnet 14 closing an opening in the side of the body in alinement with the passage 10. By adjusting the position of the member 13, the tension on the spring 12 may be varied and thus the amount of pressure necessary to move the valve 11 from its seat controlled.

For the purpose of keeping the valve 11 centered, I provide it with the guide 25 which is slidable in a hole formed in the bridge 26, which is cast integrally with the body.

Similarly in the partition 3 a passage 23 is formed, which is also normally closed by a valve 15, which valve is held seated by a spring 16, one end of which engages the back of the valve and the other end of which is received in a recessed plug 17 threaded into an opening in the body 1 in alinement with the valve 15.

For the purpose of keeping the valve 15 centered, I provide the guide 27, one end of which extends through a hole in a bridge 28, cast integrally with the body, and the other end of which is slidable through a hole in the recessed plug 17.

In the partition 2 is formed a second opening 18 controlled by a valve 19, the stem of which extends through a bonnet 20 closing an opening in the body 1 in alinement with the opening 18. By manually rotating the stem of the valve 19, the valve may be moved to or from its seat as desired.

In the side of the body communicating with the chamber 5 is an opening 24 in which is threaded a pipe 21 on which is mounted a pressure gauge 22.

The operation of the device is as follows. As stated above, the opening 7 is connected with the water supply, the opening 8 with the water heating system, and the opening 9 with the exhaust. Assuming the water heating system to be empty and the water supply on, the water will force the valve 11 from its seat and enter the heating system through the opening 10. Assuming, however, that the pressure in the city system is 110 pounds and it is only desired to have a pressure of twenty pounds from the city supply, the resistance of the spring 12 is made to equal ninety pounds. This will give a pressure from the city supply equal to twenty pounds, or in other words, if the pressure in the water heating system falls below twenty pounds the valve 11 will be automatically unseated by the pressure of the city water and will remain unseated until pressure in the system combined with the resistance of the spring equals that of the city water.

In case of excess pressure in the system the valve 15 will be automatically moved from its seat, the resistance of the spring 16 being such that it will give way when a predetermined pressure in the system is reached. Usually this spring will be arranged so that the valve will move from its seat at say thirty pounds pressure in the system, or in

other words, there will be a difference of say ten pounds in the pressures in the supply pipe necessary to open the two valves. In case it is desired to reduce the pressure of the system at any time below that at which the spring 16 is set, the stem 27 may be drawn upon to unseat the valve 15.

If pressure is maintained in the water heating system and the water low, fresh water may be admitted by opening the manually-controlled valve 19.

From the above description it will be seen that I have devised a construction which will satisfactorily attain the objects of my invention as set out in the preamble of this specification.

What I claim is:

1. In a control device for water heating systems, a hollow body member having its interior divided by two partitions to form three compartments, said body having a water inlet communicating with one compartment; an opening communicating with the second compartment and adapted to be connected with the water heating system and an exhaust opening communicating with the third compartment, the partition between the first and second compartments having two passages formed therethrough; a valve adapted to close one of said passages; resilient means normally tending to hold said valve in seated position; means for varying the resistance of said resilient means; a manually operable valve controlling the other passage, the partition between the second and third compartments having a passage therethrough; a valve adapted to close said last mentioned passage; resilient means normally tending to hold said valve in seated position; means for varying the resistance of said resilient means; and means extending outside the body for unseating the last mentioned valve without disturbing the adjustment of the resilient means.

2. In a control device for water heating systems a hollow body member having its interior divided by two partitions to form three compartments, said body having a water inlet communication with one compartment, an opening communicating with the second compartment and adapted to be connected with the water heating system, and an exhaust opening communicating with the third compartment, the partition between the first and second compartments having two passages formed therethrough; a valve adapted to close one of said passages; resilient means normally tending to hold said valve in seated position; a manually operable valve controlling the other passage, the partition between the second and third compartments having a passage therethrough; a valve adapted to close said last mentioned passage; resilient means normally tending to hold said valve in seated position; and a stem connected with said last mentioned valve extending outside the body whereby the valve may be unseated.

3. In a control device for water heating systems, a hollow body member having its interior divided by two partitions to form three compartments, said body having a water inlet communicating with one compartment, an opening communicating with the second compartment and adapted to be connected with the water heating system, and an exhaust opening communicating with the third compartment, the partition between the first and second compartments having a passage formed therethrough; a valve adapted to close said passage; resilient means normally tending to hold said valve in seated position, the partition between the second and third compartments having a passage therethrough; a valve adapted to close said last mentioned passage; resilient means normally tending to hold said valve in seated position; and a stem connected with said last mentioned valve extending outside the body whereby the valve may be unseated.

Signed at Toronto, Canada, this 29th day of November 1926.

WILLIAM J. GRIFFITHS.