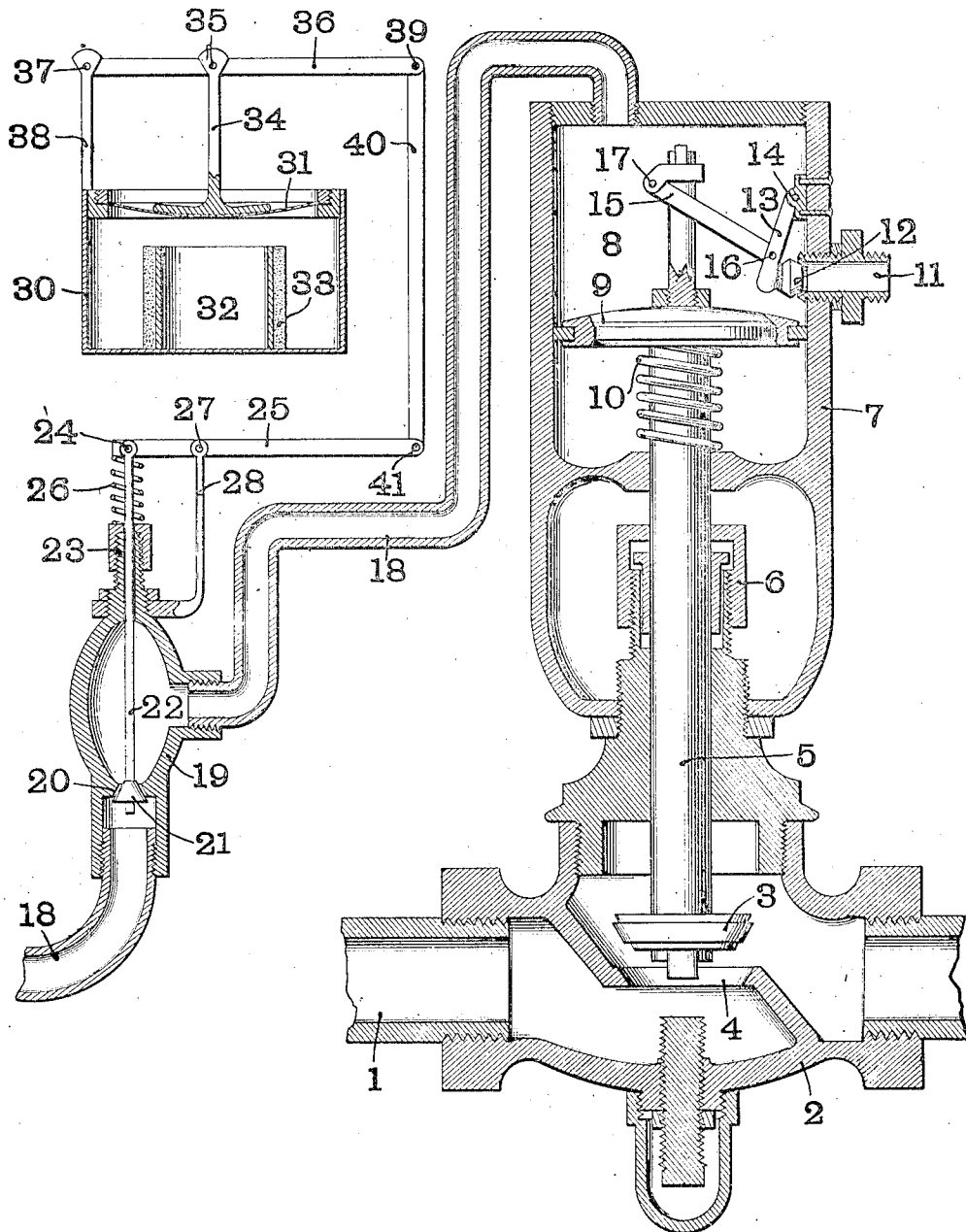


No. 857,073.

PATENTED JUNE 18, 1907.

F. B. KEMMLER.
TEMPERATURE REGULATOR.
APPLICATION FILED JULY 18, 1906.



WITNESSES:

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FREDERICK B. KEMMLER, OF ST. LOUIS, MISSOURI.

TEMPERATURE-REGULATOR.

No. 857,073.

Specification of Letters Patent.

Patented June 18, 1907.

Application filed July 18, 1906. Serial No. 326,652.

To all whom it may concern:

Be it known that I, FREDERICK B. KEMMLER, a citizen of the United States, residing at the city of St. Louis, in the State of Missouri, have invented a certain new and useful Temperature-Regulator, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a temperature regulator for use in connection with a heating system by means of which the flow of heating fluid is automatically regulated according to the rise and fall of temperature in the compartment to be heated.

The accompanying drawing is a sectional view illustrating one form of temperature regulator made in accordance with my invention.

1 represents the main passage for the flow of the heating fluid, which may be steam, hot water or hot air. Interposed in the passage 1 is a valve casing 2 provided with a valve 3 adapted to cooperate with a seat 4 to interrupt the flow of fluid through the passage 1. The valve 3 is provided with a stem 5 extending through the top of the casing 2 and surrounded by a stuffing box 6. Carried by the upper portion of the casing 2 is a second casing 7, in which is formed a pressure chamber 8. In this pressure chamber 8 is a piston 9 secured to the upper end of the stem 5. The piston 9 is normally held in a raised position by means of a spring 10 surrounding the stem 5 below the said piston 9, thus holding the valve 3 out of contact with the seat 4, as shown in the drawing. Formed in the wall of the casing 7 is an outlet 11 adapted to be closed by a relief valve 12. This valve 12 is carried by an arm 13 pivoted to the casing 7 at 14. The arm 13 is connected to the upper end of the valve stem 5 by means of a link 15, one end of which is pivoted to the said arm 13 at 16, and the other end to the said valve stem at 17. 18 is a fluid pressure passage communicating with the pressure chamber 8 and leading to any suitable supply of fluid under pressure. Interposed in the passage 18 is a valve casing 19, in which is formed a conical seat 20. Cooperating with the seat 20 is a conical valve 21 carried on a valve stem 22. The valve stem 22 extends through the top

of the valve casing 19 and is surrounded by a stuffing box 23. The upper end of the stem 22 is pivoted at 24 to a lever 25. Interposed between the lever 25 and stuffing box 23 and surrounding the stem 22 is a coil spring 26, which normally holds the valve 21 in raised position against the seat 20, so as to interrupt the flow of fluid through the passage 18. The lever 25 is pivotally carried at 27 by a bracket 28 secured to the upper part of the casing 19. 30 is an inclosed vessel, the top of which is formed by means of a flexible diaphragm 31. Within the vessel 30 is a support 32 preferably cylindrical in form, on which is carried a wick 33 adapted to be saturated by a suitable volatile liquid. Carried by the diaphragm 31 is a rod 34 pivoted at 35 to a lever 36. One end of this lever 36 is pivoted at 37 to an arm 38 carried by the casing 30 and the opposite end is pivoted at 39 to one end of a link 40, the opposite end of which is pivoted at 41 to the lever 25 hereinbefore described.

The vessel 30 is situated at any convenient point in the compartment, the temperature of which is to be regulated, and the valve casing 19 is preferably arranged adjacent to the chamber 30 on account of the mechanical connection between the valve in said casing and the diaphragm of the vessel 30. The remaining parts of the mechanism may be situated at any suitable point either within or without the compartment in which the temperature is to be regulated. When the temperature of the compartment is at or below normal temperature, the valve 3 will be held out of contact with the seat 4 by means of the spring 10, as shown in the drawing, so that the heating fluid may pass through the main passage 1 to heat the compartment. As soon, however, as the temperature in the compartment rises above the normal the volatile liquid contained in the vessel 30 will be expanded so as to force the diaphragm 31 upwardly. This movement will be communicated through the rod 34 to the lever 36 and thence through the link 40 to the lever 25, thus moving the said lever against the spring 26 and forcing the valve 21 out of contact with its seat 20, so that the fluid under pressure may pass through the passage 18 into the pressure chamber 8. The pressure of the fluid on top of the piston 9 will force the said piston down against the pressure of the spring 10 and thus force the valve 3 against its seat 4 and cut off the

flow of heating fluid through the passage 1. When the piston 8 has been forced down its movement will be communicated through the link 15 and arm 13 to the relief valve 12, thus seating said valve and closing the outlet 11 from the pressure chamber 8, so that the main valve 3 will remain seated and thus prevent the escape of the fluid in the chamber 8 while the valve 21 is open. As soon as the temperature in the compartment falls below the normal, the fluid in the vessel 30 will contract and thus allow the diaphragm 31 to resume its normal position, so that the valve 21 will again be closed, thus cutting off the pressure from the chamber 8. After the pressure has been cut off from the chamber 8 the pressure in said chamber will soon fall slightly. In case of steam this will be caused by condensation of the steam in said chamber, and in case of other fluid, such as air, will be caused by a slight leakage. As soon as the piston 9 rises slightly it will withdraw the relief valve 12 from the outlet 11, so as to cause the speedy escape of the fluid from the chamber 8 and the consequent rapid rise of the piston 9 to open the main valve 3.

While my regulator is adapted for use in connection with heating systems of various kinds, it is particularly designed for use in connection with systems for heating railway cars in which difficulty has been heretofore experienced in properly regulating the temperature.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent of the United States is—

1. In a temperature regulator, the combination with a main passage for the heating fluid, of a valve in said passage, a pressure chamber provided with a piston controlling said valve, a pivotal relief valve for said pressure chamber, a link connecting said relief valve and piston, a pressure passage leading to said pressure chamber, a valve in said pressure passage, and a thermostat controlling said latter valve.

2. In a temperature regulator, the combination with a main passage for the heating fluid, of a valve in said passage, a pressure chamber, a piston in said chamber and secured to the stem of said valve, a pivoted relief valve in said chamber, a link connecting said piston and relief valve, a pressure passage leading to said pressure chamber, a valve in said pressure passage, a closed chamber adapted to contain a volatile liquid and provided with a movable abutment, and operating connections between said abutment and said latter valve.

In testimony whereof, I have hereunto set my hand and affixed my seal in the presence of the two subscribing witnesses.

FREDERICK B. KEMMLER. [L. s.]

Witnesses:

W. A. ALEXANDER,
BENNETTE PIKE.