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W. C. RICKETTS.

GAS VALVE FOR HOT WATER BOILERS.

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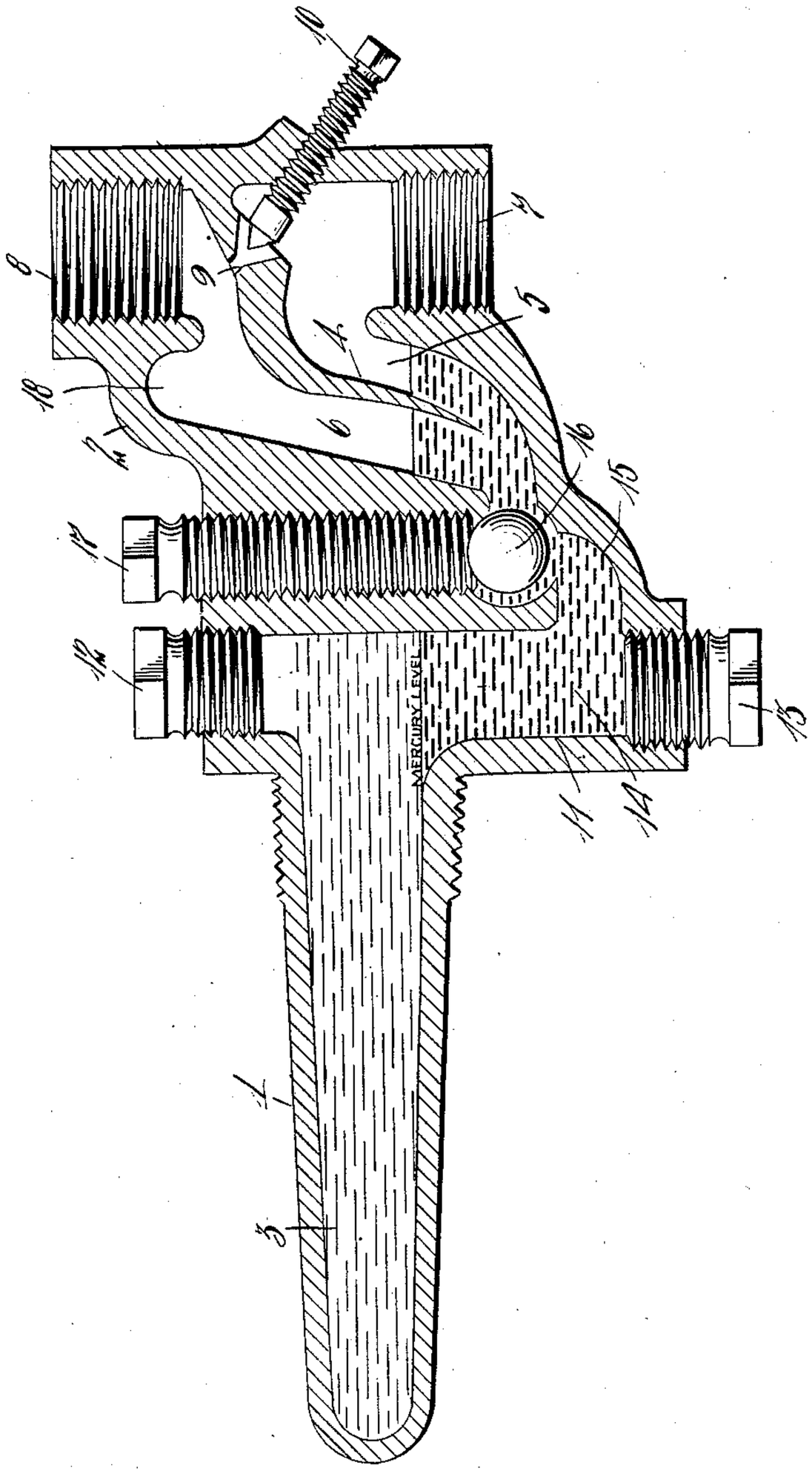

Witnesses

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GAS-VALVE FOR HOT-WATER BOILERS.

No. 866,886. Specification of Letters Patent. Patented Sept. 24, 1907.

Application filed October 25, 1906. Serial No. 340,524.

To all whom it may concern:

Be it known that I, WILLIAM C. RICKETTS, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Gas-Valves for Hot-Water Boilers; and I 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 gas valves for hot water boilers.

The object of the invention is automatically and positively to control the quantity of gas fed to the burner, whereby to maintain a constant temperature in the tank or other liquid containing vessel.

With the above and other objects in view, as will appear as the nature of the invention is better understood, the same consists in the novel construction and combination of parts of a gas valve for hot water boilers, as will be hereinafter fully described and claimed.

In the accompanying drawings forming a part of this specification, and in which like characters of reference indicate corresponding parts,—the figure is a view in vertical longitudinal section through a valve constructed in accordance with the present invention.

The device embodies a thermostatic member 1 arranged to be attached to and project into the tank or other holder containing the water to be heated, and a gas chamber 2 that may be either integral with or attached to the member 1. The member 1 is tubular, is closed at one end, and is provided intermediate of its ends with threads to engage a threaded opening in a wall of the tank, thereby to secure proper coaction between the parts, and contains a filling 3, either gaseous, liquid or solid, that readily expands and contracts under the action of heat and cold, for a purpose that will presently appear. The gas chamber 2 is divided by a partition or septum 4 into two compartments 5 and 6, the former of which constitutes a gas receiving chamber and the latter a gas discharging chamber, gas being fed from the supply to the compartment 5 through an inlet 7, and discharged from the compartment 6 to the burner through an outlet 8. The inlet and outlet are herein shown as disposed in alinement, although this is not essential, and are cut off from direct communication with each other by the septum. Provision is made to permit gas to pass directly from the inlet to the outlet, and this is accomplished by providing the septum with a by-pass 9, one terminal of which is cone-shaped to form a valve seat that is engaged by a cone valve carried by a stem 10 that is threaded into the gas chamber and projects a sufficient distance beyond the same to permit of ready adjustment. This by-pass is provided to produce a constant flow of gas to the burner to maintain it always lighted should the supply of gas through the compartments 5 and 6 from any cause be cut off.

The member 1 communicates with a mercury chamber 11 that is disposed substantially at right angles to the member 1 and has its ends closed by threaded plugs 12 and 13 that are provided to allow the chamber to be emptied or filled with mercury 14 as occasion may require. The chamber 11 is connected with the gas chamber by a tortuous passage 15, which is adapted to be partially or wholly closed by a rubber or other buoyant ball valve 16, that is actuated by a threaded bolt 17, the complete closing of the passage 15 by the valve operating to prevent the mercury, and the thermostatic agent in the member 1 from escaping when the valve is shipped. The bolt 17 subserves another and very important function, viz., that of regulating the temperature of the water in the tank. It will be seen that by turning it up or down the level of the mercury at the lower end of the septum will be raised or lowered. Thus, if the bolt be turned up, say one revolution, then the level of the mercury at the terminal of the septum will be lowered and hence it will take a higher temperature of the water or a greater expansion of the thermostatic agent and mercury before the gas will be cut off at the terminal of the septum. On the other hand, if the bolt be turned down, say one revolution, the level at the terminal of the septum will be raised and hence a lower temperature of the water or a less expansion of the agent and mercury will be required before the cut off of the gas at the terminal of the septum will take place, whence it will be seen that the bolt 17 does in effect regulate the temperature of the water in the tank in addition to its function of seating the ball valve to cut off communication between the mercury chamber and the gas chamber.

The septum extends below the inlet and nearly to the bottom of the gas-chamber, thus always to insure the presence of a sufficient body of mercury in the two compartments to secure the requisite opposition to the passage of gas to the burner to keep the water in the tank at the desired temperature, the normal level of the mercury in the mercury chamber when the water is cold, being indicated by the words "Mercury level."

In order to catch any mercury that might splash upward, when the gas passes around the lower end of the septum, and return it to the mercury chamber, there is a mercury arrester, in the nature of a cavity 18 provided, which in this instance is located adjacent to the point where the compartment 6 communicates with the outlet 8.

In operation, the flow of gas is regulated or controlled by the rise and fall of the mercury at the lower terminal of the septum, this function being secured by the expansion and contraction of the thermostatic agent in the member 1. This agent is always at the temperature of the water being heated, since the

member 1 projects into the water tank and is thus in direct contact with the contained water. The mercury being heavier than the agent will naturally remain at the bottom of the mercury chamber and the two compartments 5 and 6. Gas enters at 7, passes down through compartment 5, thence around the lower terminal of the septum, thence up through the compartment 6, and thence out through the outlet 8 to the burner. As the temperature of the water rises, the thermostatic agent is correspondingly heated and expands and forces the mercury downward and outward through the tortuous passage 15 and into the compartments 5 and 6, thereby opposing the passage of the gas. The higher the temperature, the higher will be the level of the mercury in the two compartments and thus the resistance to the passage of gas, while the lower the temperature the lower will be the level of the mercury in the two compartments and thus the resistance to the passage of gas.

By the manner of constructing the valve herein shown, certainty of operation is assured under all conditions, and liability of damage in use is reduced to a minimum.

Having thus described my invention, what I claim as new and desire to secure by Letters-Patent, is:—

1. A gas controlling valve comprising a thermostatic member, communicating gas receiving and gas discharging compartments, a mercury containing chamber forming a passage for connecting the said member and compartments, a float valve to intercept said passage, and means for actuating the valve.

2. A gas controlling valve comprising a thermostatic member, a gas chamber combined therewith and having an inlet and an outlet, a perforated septum separating the inlet and outlet and dividing the chamber into a gas receiving and a gas discharging compartment, means for controlling said perforation a mercury chamber forming a passage for connecting said member and compartments, and means for controlling said passage.

3. A gas controlling valve comprising a thermostatic member, a gas chamber combined therewith and having a gas inlet and a gas outlet, a septum separating the inlet and outlet and dividing the chamber into a gas receiving and a gas discharging compartment, a mercury chamber forming a passage for connecting the said member and compartments, means for controlling said passage, and a valve controlled by-pass in the septum.

4. A gas controlling valve comprising a body provided with an opening and having a horizontally arranged hollow member, comprising two compartments and having a partition therebetween and a mercury chamber forming a passage between said member and the gas chamber, said passage being provided with an opening and a valve seat and the partition between the gas compartments extending down nearly to said seat, a valve for the seat, a screw for controlling the valve, and screw plugs for the openings in the body and the passage, respectively.

5. A gas controlling valve comprising a hollow body, one portion of which forms a thermostatic member, another portion comprises two compartments with a partition therebetween, said compartments being provided respectively with an inlet and an outlet opening, and another portion forms a tortuous passage between said member and said two compartments, said passage being provided with a valve seat, and a buoyant valve adapted to be moved toward and from said seat to regulate said passage or to close the same.

6. A gas controlling valve comprising a hollow body, one portion of which forms a thermostatic member and is exteriorly screw threaded, another portion is provided with a partition which divides it into two communicating chambers, each chamber being provided with an opening thereinto, and the intermediate portion is provided with screw-threaded perforations and with a passage between said member and said two chambers, said passage being provided with a valve seat in alinement with one of said perforations, a buoyant valve for said seat, and a screw plug for each perforation, one of which is adapted to engage with said valve and move the same toward said seat.

7. A gas controlling valve comprising a body having a thermostatic member, a gas chamber and a mercury chamber, the gas chamber having an inlet and an outlet and a perforated septum therebetween, the lower end of the septum extending below the inlet and nearly to the bottom of the gas chamber, a screw plug through the wall of the gas chamber with its inner end adapted to control the opening in the septum, and a screw plug for controlling the height of the mercury relative to the lower end of the septum.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM C. RICKETTS.

Witnesses:

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