

W. ENTERLINE.

THERMOSTAT.

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960,860.

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Fig. 1.

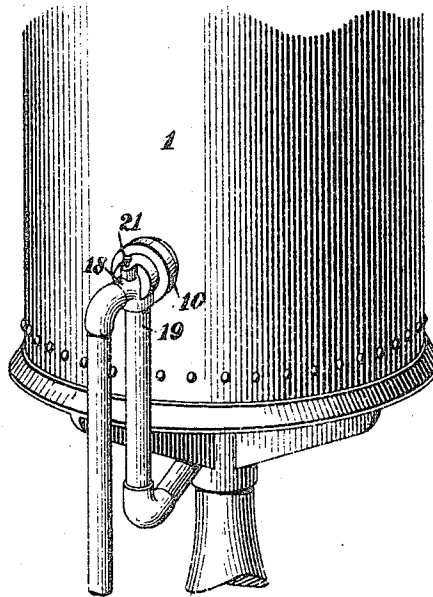
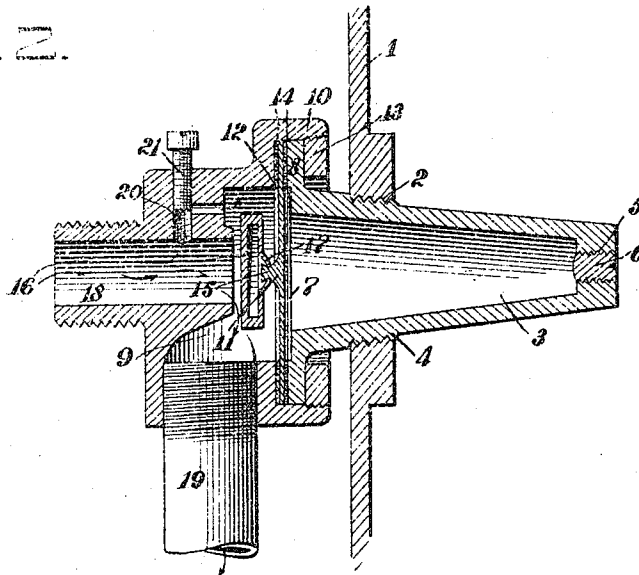


Fig. 2.



WITNESSES

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THERMOSTAT.

960,860.

Specification of Letters Patent.

Patented June 7, 1910.

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To all whom it may concern:

Be it known that I, WILLIAM ENTERLINE, a citizen of the United States, and a resident of Big Run, in the county of Jefferson and State of Pennsylvania, have invented a new and Improved Thermostat, of which the following is a full, clear, and exact description.

My invention relates to thermostats, and it has for its object to provide one for regulating the flow of gas used to heat water in boilers, which is certain in its operation, and one which may be manufactured and repaired at little expense.

In this specification I will describe the preferred form of my invention, it being understood that the scope of the invention is defined in the appended claims.

Reference is to be had to the accompanying drawings forming a part of this specification in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a perspective view showing my thermostat as applied to a boiler; and Fig. 2 is a side sectional view of my thermostat on an enlarged scale.

By referring to drawings it will be seen that the boiler 1 has a threaded orifice 2 therein through which is disposed an elongated liquid case 3, the liquid case 3 having a threaded portion 4, which meshes in the threaded orifice 2 of the boiler 1. In the liquid case 3 there is a threaded orifice 5, preferably at its inner terminal, in which is disposed a plunger screw 6. The outer terminal 7 of the liquid case 3 is open, and at this terminal there is an annular outwardly disposed flange 8. The gas case 9 has an annular threaded flange 10, which is adapted to be disposed around the flange 8 of the liquid case 7 with a diaphragm 11 disposed between the flange 8 of the liquid case 3 and an annular shoulder 12 of the gas case 9, a nut 13 being provided to engage the threads in the annular flange 10, and to press the annular flange 8 of the liquid case 3 toward the annular shoulder 12 to hold the spring diaphragm 11 in position.

Packing 14 may be disposed between the spring diaphragm 11 and the annular shoulder 12, and also between the diaphragm 11 and the annular flange 8 to prevent leakage. The spring diaphragm 11 has a nipple 15 on which is mounted a valve 16, the valve 16 having a concavo-convex surface 17 with an

orifice through which the nipple projects. A communicating means 18, the inner terminal of which forms a valve seat which is commanded by the valve 16, is adapted to lead the gas to the gas case 9, and a communicating means 19 is adapted to lead the gas to the burner under the boiler 1. A by-pass 20 connects the communicating means 18 with the gas case 9, this by-pass 20 being commanded by a screw 21.

The liquid case 3 is preferably manufactured of expansion metal that expands when cooled, and contracts when heated. When the liquid is disposed in the liquid case 3 approximately a sufficient quantity with reference to its character and the size of the liquid case, its expansion will operate the diaphragm 11 to close the valve in the communicating means 18. When the liquid case 3 is disposed through the side of the boiler 1, as has been stated, with the communicating means 19 leading to a burner, not shown, under the boiler 1 the flame at the burner will heat the water in the boiler. When the water in the boiler becomes heated it will cause the liquid in the liquid case 3 to expand which will press the diaphragm 11 in the direction of the communicating means 18, and when the water becomes heated to a predetermined degree it will press the valve close against the valve seat in the communicating means 18, thereby cutting off the supply of gas.

As it is seldom considered to be advisable to completely shut off the flow of gas, which would cause the flame to go out, the by-pass 20 is provided which, when the screw 21 is opened, will permit a sufficient quantity of gas to flow around the valve to feed a small flame at the burner, even though the valve is pressed against its valve seat to prevent any flow of gas therethrough.

In adjusting the liquid case 3 the plunger screw 6 is used to obtain a fine adjustment, for it will be seen that by turning the plunger screw so that it projects into the liquid case 3, the proportion of the liquid with reference to the internal dimension of the liquid case is altered.

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

1. In a thermostat, a liquid case adapted to project through the side of a boiler, there being a threaded orifice in the liquid case, a plunger screw disposed in the threaded

orifice, flanges disposed outwardly around an opening in the liquid case, a gas case, a diaphragm, having a nipple, covering the said opening in the liquid case, means for
 5 pressing the diaphragm between the flange of the liquid case, and a shoulder on the gas case, a valve disposed in the gas case, mounted on the nipple, a communicating means in the gas case leading to the valve and forming
 10 a valve seat, which is commanded by the valve, a second communicating means leading from the gas case, a by-pass connecting the first communicating means with the gas case, and means to command the by-pass.

15 2. In a thermostat, a liquid case adapted to project through the side of a boiler, there being a threaded orifice in the liquid case, a plunger screw disposed in the threaded orifice, flanges disposed outwardly around
 20 an opening in the liquid case, a gas case, a diaphragm, having a nipple, covering the said opening in the liquid case, means for pressing the diaphragm between the flange of the liquid case, and a shoulder on the
 25 gas case, a valve disposed in the gas case, mounted on the nipple, a communicating means in the gas case leading to the valve and forming a valve seat, which is commanded by the valve, and a second communicating means leading from the gas case.
 30

3. In a thermostat, a fluid case hermetically sealed at one end, there being a threaded orifice in the fluid case, a plunger screw disposed in the threaded orifice, the fluid
 35 case having a threaded surface which is adapted to mesh in a threaded orifice in a boiler, flanges disposed around an opening in the other end of the fluid case, a gas case, a diaphragm covering the said opening
 40 in the fluid case, means for pressing the diaphragm between the flanges of the liquid case and a shoulder on the gas case, a valve disposed in the gas case which is mounted on the diaphragm, a communicating means
 45 in the gas case leading to the valve and forming a valve seat which is commanded by the valve, and a communicating means leading from the gas case.

4. In a thermostat, in combination, an elongated fluid case hermetically sealed at
 50 one end, which is adapted to be disposed in a boiler, a fluid in the fluid case, flanges disposed around an opening in the other end of the fluid case, a gas case having an annular threaded extension, a diaphragm cov-
 55 ering the said opening in the fluid case, a nut engaging the thread in the annular extension of the gas case and adapted to press against the annular flange of the liquid case, thereby forcing the diaphragm against
 60 an annular shoulder on the gas case, a valve disposed in the gas case mounted on the diaphragm, communicating means in the gas case leading to the valve and forming a valve seat which is commanded by the valve,
 65 and a communicating means leading from the gas case one of the said communicating means being disposed at an angle to the liquid case.

5. In a thermostat, a liquid case, a threaded orifice in the liquid case, a plunger screw disposed in the threaded orifice, an outwardly disposed flange around an opening
 70 in the liquid case, a gas case having an annular threaded extension, a diaphragm covering the said opening in the liquid case, a nut engaging the thread on the annular extension of the gas case and adapted to
 75 press against the annular flange of the liquid case thereby forcing the diaphragm against an annular shoulder on the gas case, a valve disposed in the gas case mounted on the diaphragm, a communicating means in the gas case leading to the valve and forming a valve seat, which is commanded by the
 80 valve, a second communicating means leading from the gas case, a by-pass connecting the first communicating means with the gas case, and means to command the by-pass.

In testimony whereof I have signed my
 90 name to this specification in the presence of two subscribing witnesses.

WILLIAM ENTERLINE.

Witnesses:

J. M. MILLER,
 S. H. GOURLEY.