INDEX AND INFORMATION

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WATER HEATER.

APPLICATION FILED MAR. 7, 1910.

1,089,870.

Patented June 10, 1912.

2 SHEETS-SHEET 1.

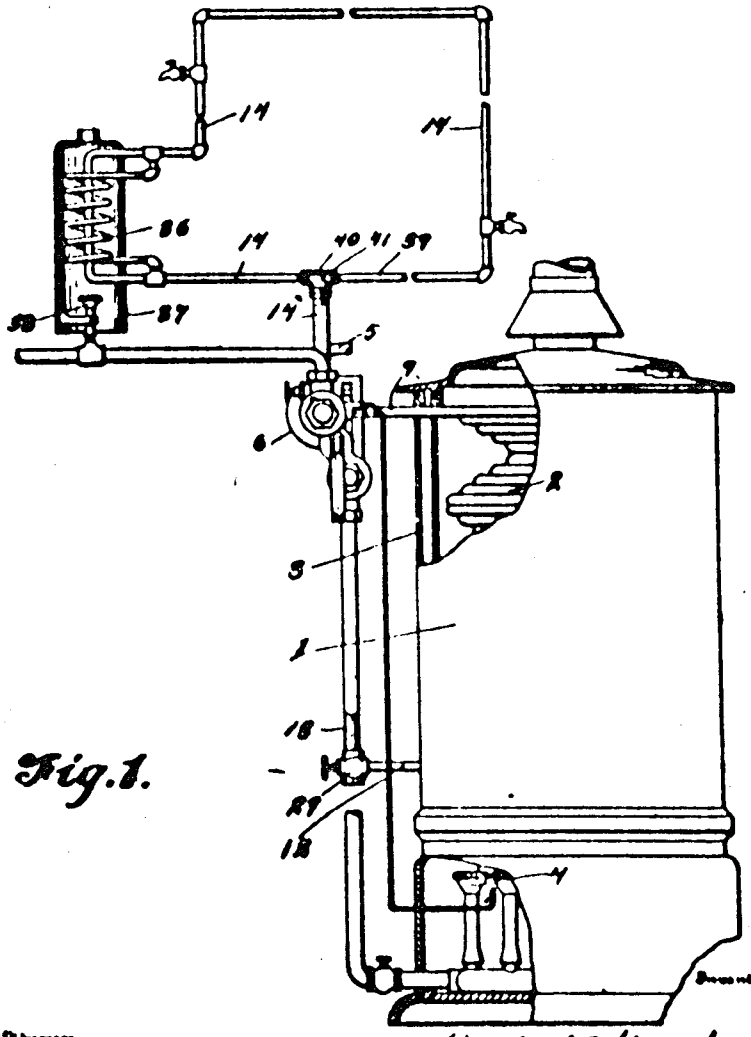

Fig. 1.

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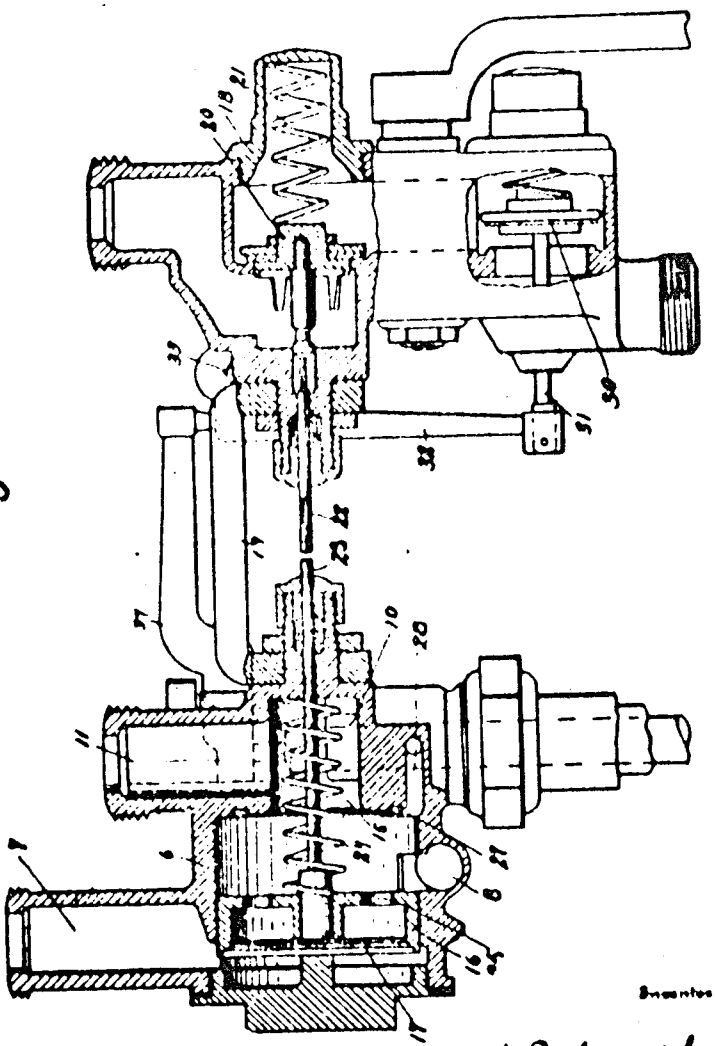
3 SHEETS-SHEET 1

Fig. 2.



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1,029,870. WATER-HEATER. Herbert S. Humphrey, Kalamazoo, Mich. Filed Mar. 7, 1910. Serial No. 547,830.

To all whom it may concern:

Be it known that I, Herbert S. Humphrey, a citizen of the United States, residing at Kalamazoo, Michigan, have invented certain new and useful Improvements in Water-Heaters, of which the following is a specification.

This invention relates to improvements in water heaters.

In water heaters of the automatic type, it is desirable to employ a boiler which utilizes as great a proportion of the heat units of the fuel consumed as possible, and the coil type of boiler is frequently employed. This type of boiler usually has many feet of copper tubing which is effective in taking up the heat, but which also radiates the heat with equal facility, so that a considerable amount of fuel is required to merely compensate for this radiation or loss of heat.

It is the main object of my present invention to provide a water heater in which the water in the delivery or house system is maintained at a suitable temperature, with a minimum consumption of fuel.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification. The structure described constitutes one effective embodiment of my invention. Other embodiments would be readily devised by those skilled in the art.

The invention is clearly defined and pointed out in the claims.

A structure constituting an effective and preferred embodiment of the features of my invention is clearly illustrated in the accompanying drawing, forming a part of this specification, in which:

Figure 1 is a detail side elevation of a structure embodying the features of my invention, the delivery system for the heater being conventionally illustrated. Fig. 2 is an enlarged detail section through the valve mechanism.

In the drawings, similar reference characters refer to similar parts throughout the several views, and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

Referring to the drawing, the main heater illustrated is of the coil type, the coils 2 being arranged within the heater casing 3, which is shown as double walled to prevent radiation. The gas burners 4 are located below the heating coils. The water supply 5 is connected to the upper ends of the coils through the inlet valve casing 6. This inlet valve casing is provided with a cold water inlet connection 7, and a cold water discharge 8, the inlet being connected to the water supply 5, and the discharge 6 to the upper end of the heater coils by the pipe 9. The valve casing is also provided with a hot water inlet 10 and discharge 11, the inlet being connected to the delivery pipe 12 of the heater coils, preferably through the thermostat tube 13. The discharge 11 is connected to the draw-off or delivery system 14, which is shown in conventional form in Fig. 1.

The hot water inlet 10 is preferably connected with the cold water discharge by means of the circulation passage or port 15. The water inlet valve, preferably of the piston type, as shown, consists of an inner member 16 and an outer member 17, adapted to seat therein. When the inlet valve is in its open position, it closes or cuts off the connection between the hot water inlet 10 and the discharge 8, so that the supply water is directed to the heater.

The gas valve casing 18 is preferably connected to the water valve casing by means of the yoke 19, so that the parts are held in proper alinement. The gas valve 20 is held normally on its seat by means of a spring 21. The gas valve, in the embodiment of my invention illustrated, is opened by the water inlet valve. The stem 22 of the gas valve is arranged to be engaged by the stem 23 of the water valve. The stem 23 is carried by the member 17 of the inlet valve, so that in the event of the member 16 becoming clogged or retained in its open position on account of sand or sediment, the member 17 is returned to its initial position by means of the gas valve spring 21, thus permitting the gas valve to close when the drawing of water from the heater is discontinued, even though the member 16 of the inlet valve shall be retained in its open position.

The inlet valve is normally returned to its closed position, when the drawing of water is discontinued, by means of the spring 24. The inlet valve member 16 is preferably provided with circulation ports 25, which are normally closed to the inlet water by the member 17 of the inlet valve. Should, however, the member 16 be retained in its open position, the water is free to circulate through the ports 25, not only the water contained in the heater, but any water drawn from the system on the opening of a draw-off faucet of the delivery system. The heater is thus rendered inoperative until

the valve member 16 is freed,—that is, the main gas valve will not open until the member 16 is freed.

The discharge port 8 is preferably located in the bottom of the valve chamber, and provided with a wide mouth extending well across the bottom of the chamber, so that the tendency is to carry or wash the sediment out of the valve chamber, thus reducing the possibility of clogging, and also keeping the valve chamber clean and reducing the wear on the valve and chamber walls. To further this result, I preferably provide a transverse groove 27 at the inner end of the valve chamber, and a discharge passage 28 opening into the discharge connection for the heater to the valve casing. The valve, in its operation, has a tendency to wipe any sediment that may collect in the valve chamber, either into the water discharge 6 or into the passage 28. When the water is being drawn from the heater, any sediment that may collect in this passage 28 is sucked into the discharge and drawn off, or it will settle in the thermostat tube, from which it may be drawn off by means of the valve 29 at its lower end. I preferably provide, in this connection, a thermostat actuated gas valve 30, the stem 31 of which projects to be engaged by the lever 32, which is actuated by the thermostat rod 35. The lever 32 is pivoted at 33 and is acted upon by the lever 34, which is actuated by the thermostat rod 35. The main advantage of this thermostat actuated valve is to regulate the temperature of the water passing through the heater. Also, in the event that the gas valve 18 should fail to close, although the possibility of this is reduced to a minimum when used in connection with my improved water inlet valve illustrated, the thermostat, by the circulation of the water through the heater, will promptly close the valve 30. This valve mechanism I have illustrated and described is that shown in my application for Letters Patent filed January 28th, 1910, Serial Number 540,579.

It is, of course, desirable that the water in the delivery or house system shall be maintained at a suitable temperature. When the water in the system is permitted to circulate through the heater, as is shown in my Patent, No. 890,057, of June 9, 1908, a considerable amount of fuel is required to compensate for the radiation in the heater tubes, as before pointed out. This I obviate by providing an auxiliary heater which I arrange in the delivery system, so that the water is permitted to circulate through this auxiliary heater independently of the main heater. By this means, I am enabled to maintain the temperature of the water in the system at the desired point, without circulating it through the main heater.

In the structure shown, the auxiliary heater consists of the heating coil 36, which is connected in the system as is diagrammatically or conventionally illustrated. This coil is inclosed in a casing 37, at the lower end of which is a burner 38. The circulation connection 39 connects the delivery system 14 to the auxiliary heater so that the water may circulate through the auxiliary heater independently, as stated, of the main heater. Means are preferably provided for directing the water drawn from the main heater through the auxiliary heater. This, in the structure illustrated, consists of the coupling 40 having a deflector 41 therein. It is obvious that a check valve would answer this purpose, but the deflector is preferably used as there are no parts to become wedged or clogged.

When water is not being drawn from the delivery system, the water therein circulates through the system to the auxiliary heater, and is maintained at the proper temperature. When, however, water is drawn from the delivery system, the incoming water must pass through the main heater and this opens the gas valve thereof automatically so that the main heater is in use as long as water is being drawn from the system, and is automatically cut out when the drawing of water is discontinued. I am thus enabled to have a supply of hot water for immediate use without the necessity of keeping the main heater in action, and this results in a considerable saving of fuel.

I have illustrated and described my present improvements largely in diagrammatic or conventional form, as the structural details thereof may be very greatly varied, as will be readily understood by those skilled in the art to which this invention relates.

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

1. The combination of a main water heater; a heating means therefor comprising a fuel valve; a delivery system for said main heater; a fuel valve actuating member actuated by the drawing of water from said system to open the fuel valve, there being means for automatically closing the fuel valve when the drawing of water is discontinued; an auxiliary heater controlled independently of the said water actuated control means of the main heater and interposed in said system and connected to permit the water in said system to circulate therethrough without passing through said main heater; and means for directing the water passing from said main heater to said

system through said auxiliary heater.

2. The combination of a main water heater; a heating means therefor comprising a fuel valve; a delivery system for said main heater; a fuel valve actuating member actuated by the drawing of water from said system to open the fuel valve, there being means for automatically closing the fuel valve when the drawing of water is discontinued; and an auxiliary heater controlled independently of the said water actuated control means of the main heater and interposed in said system, and connected to permit the water in said system to circulate therethrough without passing through said main heater.

3. The combination of the main water heater; a water inlet connected thereto; heating means for said main water heater comprising a fuel valve; a member for opening said fuel valve actuated by the drawing of water from said heater, there being means for automatically closing said fuel valve when the drawing of water is discontinued; a water delivery system for said main water heater; an auxiliary heater controlled independently of the said water actuated control means of the main heater and interposed in said delivery system; and a circulation connection for said delivery system to said auxiliary heater arranged so that the water of the system may circulate through said auxiliary heater without passing through said main heater.

4. The combination of the main water heater; heating means therefor; a water supply connected to said main water heater; a control member for said heating means actuated by the drawing of water to turn on said heating means, said heating means being automatically cut off when the drawing of the water is discontinued; a delivery system for said main water heater; an auxiliary heater interposed in said system and through which the water of said system may circulate without passing through said main water heater, the auxiliary heater not being cut off by the cutting off of the main heater; and means for directing the water passing from said main water heater through said auxiliary heater.

5. The combination of the main water heater; heating means therefor; a water supply connected to said main water heater; a control member for said heating means actuated by the drawing of water to turn on said heating means, said heating means being automatically cut off when the drawing of the water is discontinued; a delivery system for said main water heater; and an auxiliary heater interposed in said system and through which the water of said system may circulate without passing through said main water heater the auxiliary heater not being cut off by the cutting off of the main heater.

6. The combination of the main water heater; heating means therefor; a water supply connected to said main water heater; a control member for said heating means actuated by the drawing of water to turn on said heating means, said heating means being automatically cut off when the drawing of the water is discontinued; a delivery system for said main water heater; and an auxiliary heater interposed in said delivery system, there being a circulation connection for said system to said auxiliary heater whereby the water in said system may circulate through said auxiliary heater independently of said main water heater, the auxiliary heater not being cut off by the cutting off of the main heater.

7. The combination of the main water heater; a water supply connected to said main water heater; a delivery system for said main water heater; means for controlling the delivery of fuel to said main heater actuated by the drawing of water from the system to deliver fuel and adapted to cut off the fuel when the drawing of water is discontinued; an auxiliary heater interposed in said system and through which the water of said system may circulate independently of said main water heater; and means for directing the water passing from said main water heater to said system through said auxiliary heater, the auxiliary heater not being cut off by the cutting off of the main heater.

8. The combination of the main water heater; a water supply connected to said main water heater; a delivery system for said main water heater; means for controlling the delivery of fuel to said main heater actuated by the drawing of water from the system to deliver fuel and adapted to cut off the fuel when the drawing of water is discontinued; and an auxiliary heater interposed in said delivery system, there being a circulation connection for said system to said auxiliary heater whereby the water in said system may circulate through said auxiliary heater independently of said main water heater, the auxiliary heater not being cut off by the cutting off of the main heater.

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

HERBERT S. HUMPHREY. [L. S.]

Witnesses:

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MARGARET L. GLASGOW.