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HUMIDIFIER FOR HEATING PLANTS

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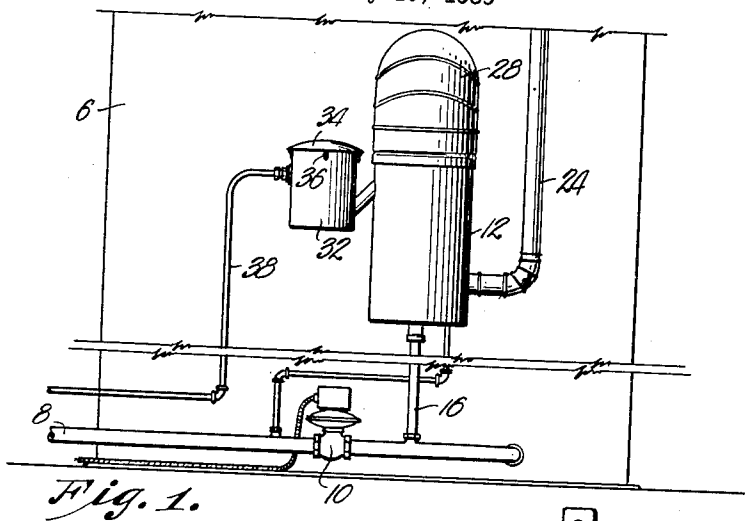

Fig. 1.

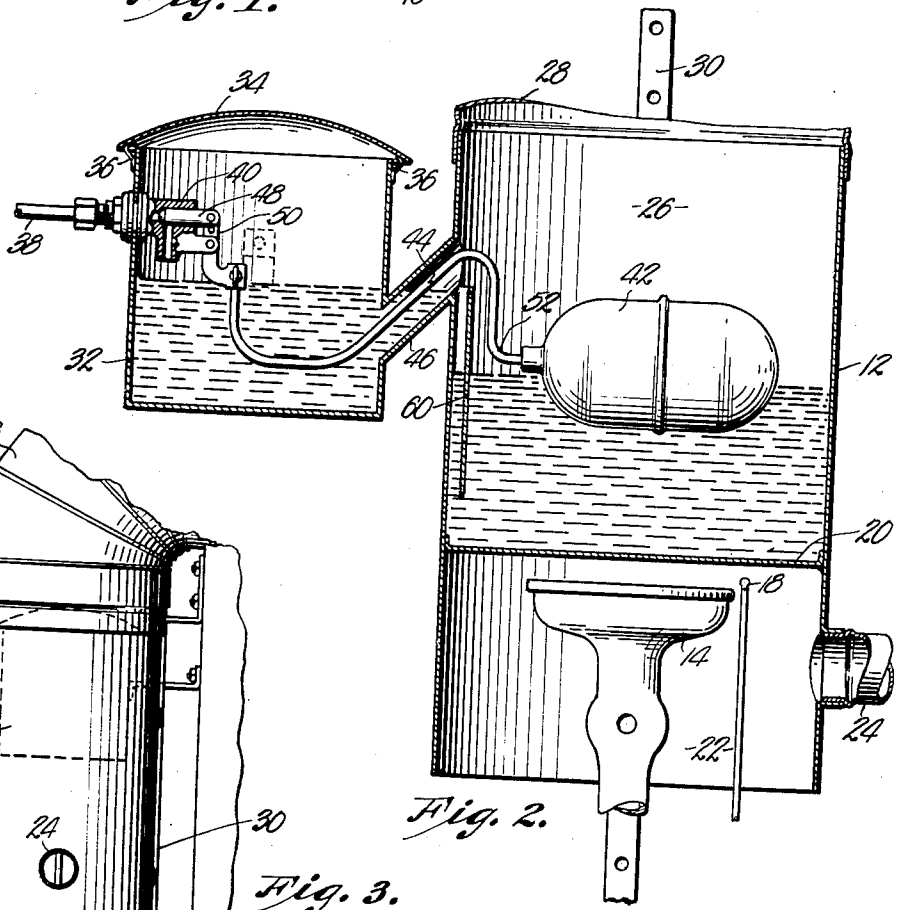

Fig. 2.

Fig. 3.

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HUMIDIFIER FOR HEATING PLANTS

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8 Claims. (Cl. 126—350)

This invention relates to automatic humidifiers for heating systems and particularly domestic heating plants in the nature of hot air furnaces or similar installations where air is forced from the plant into the rooms.

One of the important aims of the present invention is to provide a humidifier that is attachable to the conventional form of heating plant and which comprises a boiler wherein is produced steam that is introduced into the hot air prior to its entrance into the room being heated, the boiler having associated therewith, a low temperature reservoir that houses a valve, the opening and closing of which is controlled by the level of the water in the boiler.

A yet further object of this invention is to provide a humidifier of the immediately foregoing character having uniquely interconnecting means between the reservoir and boiler, said means creating a water trap or seal between the two water containing tanks so that steam created in the boiler cannot reach the water control valve to cause a detrimental action thereon due to incrustation and the deposit of minerals.

A further object of this invention is to provide a humidifier for heating plants that is cheap to manufacture, positive in its action, easy to apply to conventional heating equipment, and requires no attention as it efficiently operates.

Further objects of the invention will appear during the course of the following specification relating to the accompanying drawing wherein but the preferred embodiment of the invention is illustrated, and wherein:

Figure 1 is a side elevational view of a heating plant having a humidifier embodying this invention associated therewith.

Fig. 2 is an enlarged fragmentary vertical central sectional view through the humidifier; and,

Fig. 3 is a fragmentary side elevational view of the boiler illustrating the manner in which the same is attached to the furnace.

Conventional hot air furnaces or heating plants of the type where air is forced into the room, includes an outer jacket 6 which houses all of the well-known parts of the furnace and within which is created a chamber forming the point of origin of the air which should be humidified prior to its introduction into the living quarters.

In the instance illustrated, the furnace is one which employs a gas burner and the supply of fuel enters pipe 8 having the thermostatically controlled valve 10 interposed therein. The humidifier which includes a boiler 12 should operate during the time that the gas burner within the furnace is heating the air therein.

Boiler 12 is equipped with a burner 14, fuel to which is supplied through a branch pipe 16 connected to supply pipe 8 at a point to one side of valve 10. Thus, when the burner in the furnace is heating the air, burner 14 in boiler 12 will be generating steam for introduction into the heated air prior to its leaving jacket 6 of the furnace.

A pilot burner 18 located adjacent to burner 14 insures that the latter will operate whenever valve 10 is open. Boiler 12 is divided by a partition 20 that forms the upper wall of a fire box 22, from which leads flue 24.

A water compartment 26 in boiler 12 has the upper portion thereof joined to jacket 6 by pipe 28, the specific form of which is that of an elbow or a 45° turn. A bracket 30 serves to mount boiler 12 to the outside of jacket 6 and pipe 28 is placed into communication with the interior of jacket 6 by merely cutting a suitable opening in the metal forming said jacket.

A low temperature reservoir 32 of relatively small capacity is placed in side-by-side relation with boiler 12. A cap 34 covers the open top of reservoir 32 and a series of fingers 36 support cap 34 in spaced relation to the upper annular edge of the reservoir.

Water supply pipe 38 ends at valve 40 within reservoir 32 and this valve 40 is connected to float 42 by a specially formed arm 44 that extends through inclined neck 46. Neck 46 extends downwardly and outwardly from boiler 12 and this specific form of neck creates a water trap between boiler 12 and reservoir 32 when the water level in both of the tanks is maintained at a place where the invention contemplates such level must be.

Valve 40 comprises a plunger 48 that is reciprocably mounted and so moved by lever 50, one end of which is attached to arm 44. Arm 44 has an inclined central portion therein to pass through neck 46 and an offset portion 52 which joins float 42.

After the humidifier has been installed the valve is set so that when the float drops below that position shown in Fig. 2, valve 40 will open and empty an additional supply of water into reservoir 32. As reservoir 32 fills, water will flow into boiler 12 through inclined neck 46 until the level of the water in the boiler is again raised to that illustrated. When this level is reached, float 42 will exert an upward force on arm 44 and

close valve 40 by moving plunger 48 against its seat.

As steam is generated from water within boiler 12, it will escape into jacket 6 and there be joined by the heated air that is passing from the furnace. This steam cannot pass into reservoir 32 because of the presence of water trap in the inclined neck 46. The water in reservoir 32 cannot be heated by burner 14 because the two bodies of water in boiler and reservoir 12 and 32 respectively, are completely separated and distinct from each other. This is an important factor in constructing the humidifier and when such arrangement is followed, valve 40 is protected and incrustation due to the production of solids when water is heated, does not occur.

In the event valve 40 becomes inoperative by sticking or because of some defect, water within reservoir 32 cannot reach the hot metal parts within the furnace due to the presence of the overflow outlet which is created between cap 34 and the upper edge of reservoir 32. When the water level rises to the upper edge of reservoir 32 it will flow therefrom and since the level of this said reservoir is below the opening into jacket 6 through which pipe 28 passes, there is no opportunity for water to enter the furnace and exert its destructive forces upon hot metal.

To avoid the relatively cool water from reservoir 32 having a detrimental effect upon the steam generated in boiler 12, it is desirable to introduce said water into the boiler adjacent the bottom thereof.

A partition 60 secured to the side of boiler 12 forms a well of small cross sectional area. This well extends from a point where neck 46 joins boiler 12 to a place adjacent to the bottom of boiler 12 and below the normal level of the water in said boiler. Such construction is desirable because the surface of the water in boiler 12 and the steam present in the upper portion thereof, is not effected by cool water from reservoir 32.

From the foregoing, one skilled in the art will observe that the humidifier automatically operates. The size of burner 14, the capacity of boiler 12, and the relation of water supply parts, may be altered to suit conditions met when different size heating plants are to be equipped with this humidifier. It is conceivable that automatic humidifiers embodying the instant invention may be made to present different physical characteristics than those illustrated and described, and it is therefore desired to be limited only by the scope of the appended claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A humidifier for heating plants comprising a low temperature reservoir; a boiler having connection with the heating plant; a neck joining the reservoir and said boiler; a valve for controlling the flow of water into said low temperature reservoir positioned within the latter; a float in said boiler; and an arm operably interconnecting the valve and said float, said neck being formed to maintain the water in the reservoir separate from that in the boiler and to create a water trap therein whereby to preclude heating the water in the reservoir and to seal the reservoir against the entrance of steam from the said boiler.

2. A humidifier for heating plants comprising a low temperature reservoir; a boiler having connection with the heating plant; a neck joining the reservoir and said boiler; a valve for controlling the flow of water into said low temperature reservoir positioned within the latter; a float in said boiler; and an arm operably interconnecting the valve and said float, said neck being inclined downwardly and outwardly from the boiler as it approaches the low temperature reservoir whereby to maintain the water in the reservoir separate from that in the boiler and to establish a water seal between the reservoir and said boiler.

3. A humidifier for heating plants comprising a low temperature reservoir; a boiler having connection with the heating plant; a neck joining the reservoir and said boiler; a valve for controlling the flow of water into said low temperature reservoir positioned within the latter; a float in said boiler; and an arm operably interconnecting the valve and said float, said neck being formed to maintain the water in the reservoir separate from that in the boiler and to create a water trap therein whereby to seal the reservoir against the entrance of steam from the said boiler, said arm being offset to join the float below the point of connection between the neck and said boiler.

4. A humidifier for heating plants comprising a low temperature reservoir; a boiler having connection with the heating plant; a neck joining the reservoir and said boiler; a valve for controlling the flow of water into said low temperature reservoir positioned within the latter; a float in said boiler; and an arm operably interconnecting the valve and said float, said float and valve being disposed and set respectively to maintain a water level in the boiler below the point of connection between the neck and said boiler and to maintain the water in the reservoir separate from that in the boiler.

5. A humidifier for heating plants comprising a low temperature reservoir; a boiler having connection with the heating plant; a neck joining the reservoir and said boiler; a valve for controlling the flow of water into said low temperature reservoir positioned within the latter; a float in said boiler; and an arm operably interconnecting the valve and said float, said neck being formed to maintain the water in the reservoir separate from that in the boiler and to create a water trap therein whereby to seal the reservoir against the entrance of steam from the said boiler, said low temperature reservoir having overflow openings therein below the connection between said boiler and the heating plant.

6. A humidifier for furnaces or the like comprising a reservoir; a boiler to one side of the reservoir having a burner for heating water contained therein; a pipe connecting the upper portion of the boiler and the furnace; an inclined neck joining the reservoir and said boiler, the point of connection between one end of the neck and the boiler being higher than the point of connection between the reservoir and the other end of the neck; a water supply valve in the reservoir; a float in the boiler; and an arm passing through the neck and operably interconnecting the valve and said float, said float and the valve being set to maintain the level of the water in said boiler below the level of the water in said reservoir and to maintain the water in the reservoir separate from that in the boiler, said neck joining the reservoir below the level of the water therein and having connection with the boiler above the level of the water in said boiler whereby to form a water seal between the tank and said boiler.

7. A humidifier for furnaces or the like comprising a reservoir; a boiler to one side of the

reservoir having a burner for heating water contained therein; a pipe connecting the upper portion of the boiler and the furnace; an inclined neck joining the reservoir and said boiler, the point of connection between one end of the neck and the boiler being higher than the point of connection between the reservoir and the other end of the neck; a water supply valve in the reservoir; a float in the boiler; and an arm passing through the neck and operably interconnecting the valve and said float, said float and the valve being set to maintain the level of the water in said boiler below the level of the water in said reservoir and to maintain the water in the reservoir separate from that in the boiler, said neck joining the reservoir below the level of the water therein and having connection with the boiler above the level of the water in said boiler whereby to form a water seal between the tank and said boiler, said reservoir having an overflow outlet formed therein above the normal level of water in said reservoir and below the point of connection between the furnace and the pipe.

8. A humidifier for furnaces or the like comprising a reservoir; a boiler to one side of the reservoir having a burner for heating water contained therein; a pipe connecting the upper portion of the boiler and the furnace; an inclined neck joining the reservoir and said boiler, the point of connection between one end of the neck and the boiler being higher than the point of connection between the reservoir and the other end of the neck; a water supply valve in the reservoir; a float in the boiler; and an arm passing through the neck and operably interconnecting the valve and said float, said float and the valve being set to maintain the level of the water in said boiler below the level of the water in said reservoir and to maintain the water in the reservoir separate from that in the boiler, said neck joining the reservoir below the level of the water therein and having connection with the boiler above the level of the water in said boiler whereby to form a water seal between the tank and said boiler, said boiler having a well formed therein along one side extending downwardly from the point of connection between the neck and the boiler to a point to the bottom of the boiler and below the normal level of the water therein.

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