

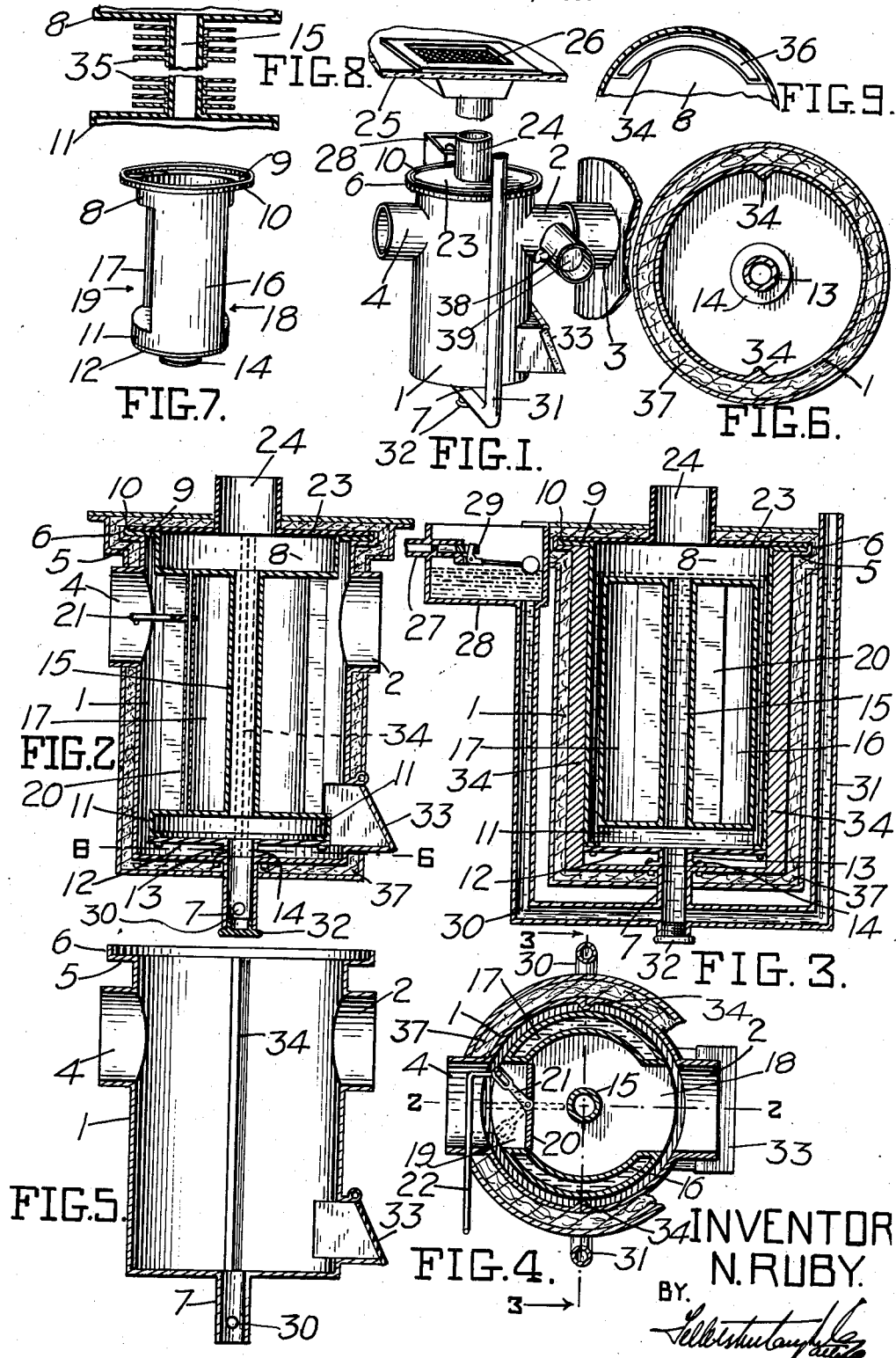
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HUMIDIFIER

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HUMIDIFIER

Norman Ruby, Stratford, Ontario, Canada

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2 Claims. (Cl. 122—20)

My invention relates to improvements in humidifiers, and the object of the invention is to devise a humidifier which will utilize the hot gases in the outlet flue leading to the stack for vaporizing the water in the humidifier or may employ a gas or electric burner for this purpose, in which a maximum extent of heating surface is provided and a minimum quantity of water brought into contact with such surface so as to bring about rapid vaporization of the water, in which the heat supplied will be always under control, in which the formation of lime on the walls of the humidifier is reduced to a minimum, which may be readily cleaned from time to time, from which there will be a ready outlet for exploding gases and from which soot or any other matter collecting in the heating chambers thereof may readily be withdrawn. The invention consists essentially of an outer heating chamber having diametrically opposite inlet and outlet openings through which the hot gases from the furnace pass as they enter and pass out of the heating chamber, an inner water chamber spaced from the walls of the heating chamber and having an inlet leading through the bottom of the heating chamber, and an outlet for the vapor leading through the top of the heating chamber. The water chamber comprises upper and lower cylindrical chambers connected within their circumference by a tube and at their circumference by segmental tubular portions forming diametrically opposite slotted openings for the passage of the gases entering the heating chamber, a damper for closing the slotted opening adjacent the outlet opening of the heating chamber, a water supply duct leading to the inlet of the water chamber, ribs extending from top to bottom of the heating chamber and across the interspace between the heating chamber and the water chamber, as hereinafter more particularly described.

Fig. 1 is a perspective view of my humidifier, a fragmentary portion of a furnace wall, and a grating to which the humidifier is connected, the insulating cover being removed.

Fig. 2 is an enlarged vertical sectional view through the humidifier and taken on line 2—2 Fig. 4.

Fig. 3 is a similar view to Fig. 2 taken on line 3—3 Fig. 4.

Fig. 4 is a sectional plan through my humidifier.

Fig. 5 is a sectional view through the heating chamber as shown in Fig. 2 with the water chamber and other parts removed.

Fig. 6 is a sectional plan view on line 6—6 Fig. 2.

Fig. 7 is a perspective detail of the water chamber on the same scale as Fig. 1.

Fig. 8 is a sectional fragmentary detail of the central portion of the water chamber showing heat absorbing discs mounted on the central water tube.

Fig. 9 is a fragmentary plan sectional detail showing a filler member for one of the segmental water tubes.

In the drawing like letters of reference indicate corresponding parts in the different views.

The heating chamber 1 of the humidifier is provided with the inlet 2 connected to a furnace, a fragmentary portion of which is indicated at 3 (Fig. 1) and an outlet 4 to which a pipe (not shown) leading to a chimney stack is connected. The upper end of the chamber 1 is provided with an annular flange 5 provided with an exterior annular rim 6. The lower end of the heating chamber is provided with a depending tube 7.

Within the heating chamber 1 is supported a water chamber, the walls of which are in spaced relation to the walls of the heating chamber. The water chamber comprises a circular dished portion 8 from the edge of which extends an annular flange 9 provided with a rim 10 fitting on the flange 5 and within the rim 6 of the heating chamber. The lower portion of the water chamber is in the form of an inverted dish 11 provided with a cover 12 secured thereto. The cover 12 is provided with a depending tubular portion 13 provided with an annular flange 14 which is secured to the lower end of the heating chamber so that the tubes 7 and 11 are in axial alignment.

Between the dished portions 8 and 11 extends a pipe 15 more or less centrally thereof and segmental shaped diametrically opposite tubes 16 and 17 forming diametrically opposite slotted openings 18 and 19. The opening 19 is provided with a closing valve 20 to control the flow of the hot gases through the humidifier. The valve 20 is operated by a lever arm 21 and pull rod 22 or by any other suitable means. The dished portion 8 is provided with a cover 23 fitting within the rim 10 thereof and from which extends a pipe 24 leading through the floor 25 of a dwelling to a grill 26.

A water supply pipe 27 feeds water into the tank 28, the in-flow through the pipe 27 being controlled by a float controlled valve 29. 30 is a pipe leading from the tank 28 to the tube 7. 31 is a vent pipe for preventing the formation

of a vacuum and thus ensure that a free water flow is maintained. The lower end of the tube 7 is provided with a closure plug 32 which may be removed to permit the flushing out of the

5 water tank.

A flap valve 33 is provided to permit of the withdrawal of soot and to form a safety outlet to permit the blowing out of exploding gases. Ribs 34 extend from top to bottom of the heating chamber at diametrically opposite points and between the interior of the wall of such chamber and the exterior of the wall of the water chamber.

When the humidifier is in operation, the gases 15 entering from the furnace through the inlet 3 pass into the centre of the water chamber around the pipe 15 and against the interior of the segmental pipes 16 and 17. The gases also pass between the segmental pipes 16 and 17 and the interior face of the heating chamber 1 until they strike the ribs 34 which direct them downward to pass beneath the lower end of the water chamber and then upward on the opposite side of the ribs to the gas outlet 4 leading to the stack.

25 The water level in the upper dished portion 8 of the water chamber and in the tank 28 are the same. Such levels dropping simultaneously so as to operate the float controlled valve 29 to allow more water to enter from the pipe 27.

30 In Fig. 8 I have shown the pipe 15 surrounded by a pile of spaced apart copper discs 35 which absorb the heat of the gases and aid in heating the water in the pipe 15.

When a great heat is not available in the heating chamber 1, the body of water in the tubes 34 35 may be reduced by inserting filler members 36 leaving a thin sheet of water between each filler and the walls of the tube 34 in which it is inserted for heating. The inlet 2 is provided with a branch pipe 38 for supplying cold air to the inlet to regulate the heat of the gas entering the humidifier, the amount of cold air supplied being controlled by the valve 39. In order to retain the heat within the heating chamber 1 I provide it with an insulating cover 37.

45 If found desirable the water chamber may con-

tain closely packed fragments of porcelain or other similar material to decrease the body of water and thereby make it more readily subject to heat.

In rooms of apartment houses where humidity- 5 fication from the furnace cannot be depended on, the water pipe 15 may be placed at one side so as to allow the insertion of a gas or electric heater into the bottom of the heating chamber below the water chamber, the heat from which 10 serves to vaporize the water, the inlet 2 and outlet 4 being either dispensed with or provided with closing covers.

What I claim as my invention is:

1. In a humidifier, a cylindrical heating chamber 15 insertable in a pipe connection between a furnace outlet and stack and having diametrically opposite inlets and outlets in its upper portion, a water chamber comprising inwardly dished ends and segmental tubular portions connecting 20 such dished ends at their circumference and forming between them diametrically opposite slotted openings, a closing valve for the slotted opening adjacent to the heating chamber outlet, covers for the dished ends, a water supply 25 pipe leading into the lower dished end, and a vapor outlet pipe leading from the upper dished end.

2. In a humidifier, a cylindrical heating chamber 30 insertable in a pipe connection between a furnace outlet and stack and having a diametrically opposite inlet and outlet in its upper portion, a water chamber comprising inwardly dished ends and segmental tubular portions spaced apart at each side of the diameter and connecting such 35 dished ends at their circumference, a cover for each dished portion, a water supply pipe leading into the lower dished portion, a vapour outlet pipe leading from the upper dished portion, and means for either directing the gases diametrically between the segmental portions from 40 the inlet to the outlet or into contact with the interior and exterior walls of such segmental portions as they pass from the inlet to the outlet.

45 NORMAN RUBY.