Aug. 1, 1944. W. A. RAY 2,354,773

HUMIDITY CONTROL SYSTEM

Filed Oct. 26, 1940

Fig. 1

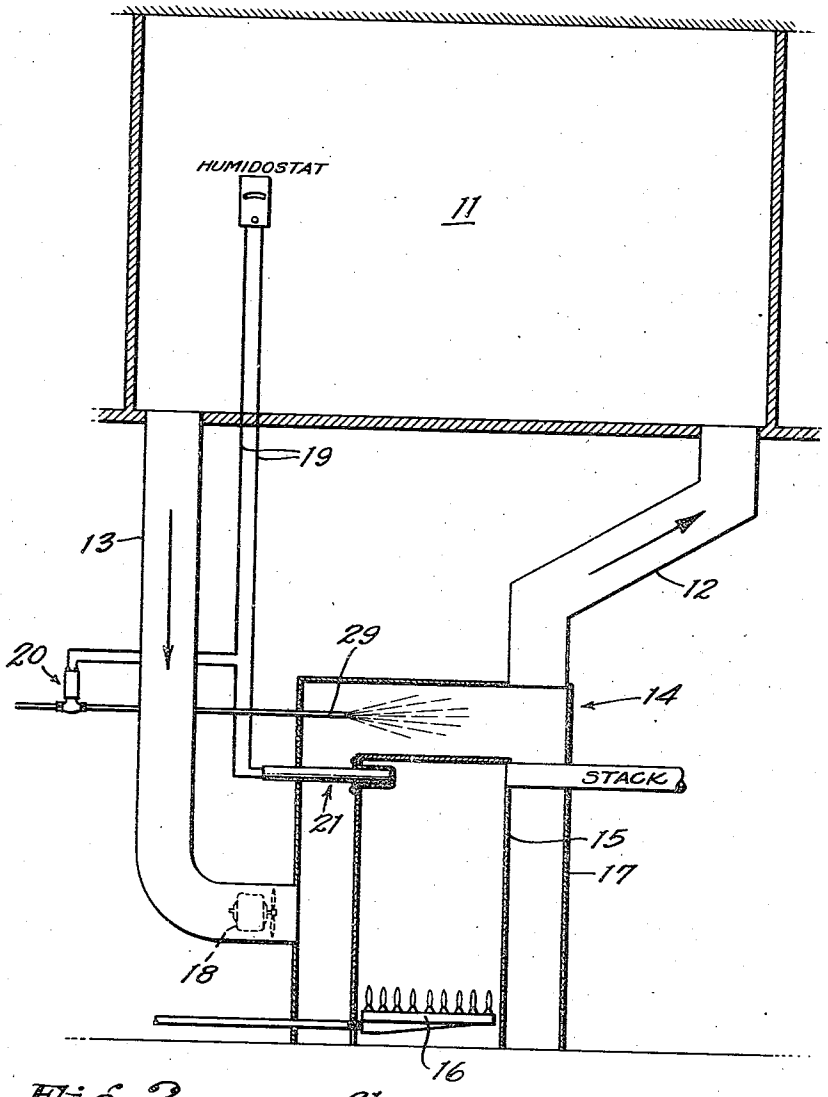
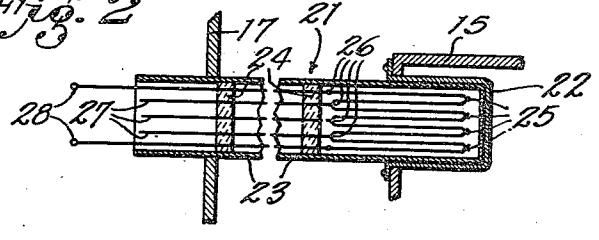


Fig. 2



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HUMIDITY CONTROL SYSTEM

William A. Ray, Glendale, Calif.

Application October 26, 1940, Serial No. 363,062

3 Claims. (Cl. 236—44)

My present invention relates to a system for controlling the humidity of heated air supplied to a space, and has for a main object the provision of a thermoelectric device, influenced by the air-heating apparatus or furnace, for energizing the moisture controlling means.

A more specific object is the provision, in a system of the character described, of an electrically controlled valve for controlling the amount of water supplied to the heated air, and a thermoelectric device, the hot-junction portion of which is subjected to the heat of combustion in the furnace, for energizing the valve. The thermoelectric device, which may preferably be in the form of a thermopile having a plurality of hot and cold junctions, may be heated by radiation or conduction from the outer portion of the "stove" of the furnace, or by radiation within the stove, or directly by the heat of the burning fuel. The moisture, under the control of the valve, may be introduced into the air by a water spray or other evaporating means such as a moistened pad.

A feature of my invention is the fact that water can flow through the valve only while the furnace is hot, regardless of the condition of the humidostat or other control means; the valve being so arranged that it is closed when deenergized.

Other objects and advantages of my invention will be found in the description, the drawing, and the appended claims.

For complete understanding of the invention, reference may be had to the following detailed description and accompanying drawing, wherein:

Figure 1 is a diagrammatic view of a humidity control system embodying my invention; and

Figure 2 is a broken diagrammatic view, in enlarged scale, of the thermoelectric device shown in Fig. 1.

In the drawing, the numeral 11 indicates a room or space connected by air ducts 12 and 13 with a furnace generally indicated at 14 and comprising an inner stove portion 15, containing a burner 16, and an enclosure 17 wherein the air is heated and circulated to the space 11, if desired, by a fan 18. A humidostat, located in the space 11 and indicated by the legend, is connected by wires 19 to a valve 20 and to a thermoelectric device 21 for energizing the valve.

The thermoelectric device extends through the outer portion or wall 17 of the furnace and its inner end is received in a cup-shaped member 22 extending within the stove 15 and secured thereto. This device comprises a metallic tubular member 23, having a closed inner end, wherein are mounted, by insulating supports 24, a plurality of thermocouples having hot junctions 25 and cold junctions 26 interconnected in series. To each of the intermediate cold junctions of the series is connected a wire 27 of good heat-conducting metal which extends, along with the terminal wires 28, to the outer open end of the tube to aid in cooling this junction. The thermoelectric device shown herein is a subject of the copending application of William R. Ray, Serial No. 265,974, filed April 4, 1939.

The valve 20, which may be of the sensitive electromagnetic type disclosed in my U. S. Patent No. 2,294,421, issued Sept. 1, 1942, is adapted to control water flow to a spray nozzle 29 mounted in the bonnet of the furnace; the valve preferably being remote from the furnace to avoid the harmful effect of the furnace heat which may tend to cause "liming" and thus faulty operation of the valve.

When the furnace is put into operation, by automatic or other control means, the thermoelectric device is heated, generating current to operate the spray control valve to open position, if the humidostat is then calling for moisture. When operation of the furnace is discontinued, upon cessation of the electric current caused by the cooling of the thermoelectric device, the valve will close, regardless of the condition of the humidostat. It is thus seen that a new and beneficial result is produced by providing a thermoelectric device for energizing the humidity control means.

I wish it to be understood that, without departing from the spirit of the invention, modifications may be made in the embodiment herein shown and described and that I intend therefore to be limited only by the scope of the appended claims.

I claim as my invention:

1. In a system for supplying conditioned air to a space: a furnace for heating said air; an electrically controlled valve for supplying water to said air; a thermoelectric generating device, the hot-junction portion of which is subjected to the heat of combustion in said furnace, for energizing a circuit including said valve; and means responsive to the humidity of the air in said space for controlling said circuit to said valve.

2. In a system for supplying conditioned air to a space: a furnace for heating said air; an electrically controlled valve for supplying water to said air; a thermoelectric generating device, the hot-junction portion of which is subjected to the heat of combustion in said furnace; means responsive to the humidity of the air in said

space; switching means actuated by said last-named means; and an electrical circuit for said system including said valve, said thermoelectric generating device, and said switching means.

3. In a system for conditioning the air in a space: apparatus for heating said air, a normally closed electrically controlled valve for controlling the admixture of moisture with said air, a thermoelectric generating device influenced by the heat of said apparatus for energizing a circuit including said valve, and means responsive to the humidity of the air in said space for controlling said circuit to said valve.

WILLIAM A. RAY.