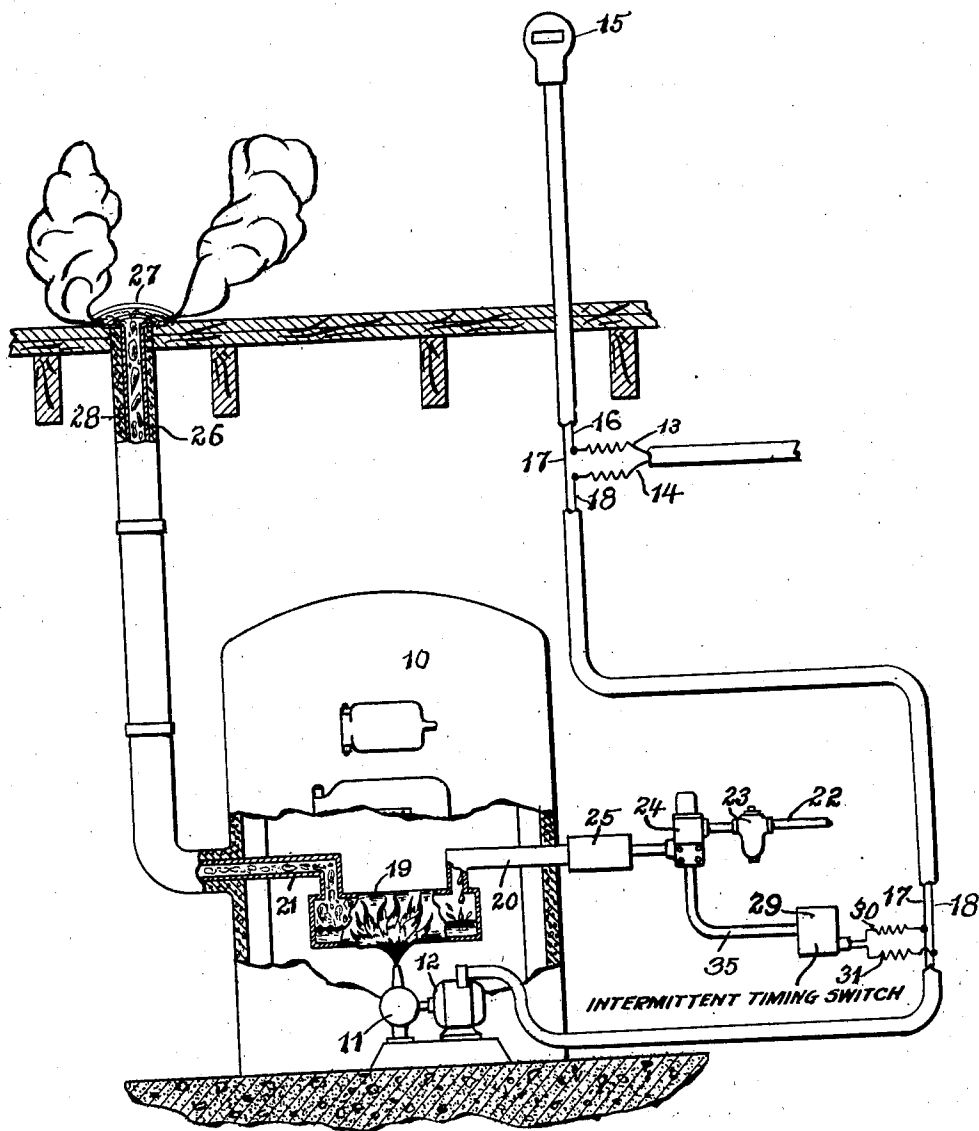


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HUMIDIFYING APPARATUS OR THE LIKE.
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HUMIDIFYING APPARATUS OR THE LIKE

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This invention relates to humidifiers or devices employed for supplying water vapor to the atmosphere of heated living apartments, homes, work-rooms, or the like.

As is well known, water vapor content, known as humidity of the atmosphere is ordinarily graded on a scale of one hundred, in which 100 represents the dew point, and zero represents dry air. Medical and laboratory research has determined that the most healthful condition exists, as regards the welfare of human beings, when the humidity of the air does not fall below approximately 45 on this scale. It is also preferable that it should not rise above about 65, as when this percentage is exceeded to any great extent, objectionable condensation of water occurs on colder objects, such as windows and pipes. It has long been known that an insufficient amount of humidity in artificially heated living quarters tends to increase susceptibility to colds and throat troubles and therefore many devices and methods have been devised to supply the needed water vapor. Such devices and methods as have heretofore been proposed however, are subject to many objections, such as the necessity for too frequent attention, refilling of water containers, etc.; failure to supply sufficient water vapor or excessive supply.

The principal object of the present invention is to provide a new and improved construction of a humidifier which is capable of being accurately adjusted to supply exactly the correct amount of water vapor to maintain the humidity within the desired limits.

Another object is to provide a humidifier by means of which the required amount of water vapor is periodically ejected into the atmosphere automatically and in the form of water vapor, i. e. steam, thus insuring a more rapid and complete diffusion of such vapor throughout the atmosphere.

A further object is to provide a humidifier especially designed and adapted for use with domestic heating plants, such as are now in extensive use, which employ oil or gas for fuel.

Another object is to provide an apparatus to be incorporated in a heating plant of the type set forth in which the admission of water to the humidifier to be converted into steam is primarily controlled by the electrical control system for the oil or gas heating unit.

A further object is to provide in such an apparatus a secondary water admission control capable of being readily adjusted in accordance with the size, viz., cubic contents, of the quarters to be supplied with water vapor and also in accordance with the heat at which such quarters are maintained.

Another object is to provide an apparatus of the character described which will be of simple

inexpensive construction, easy of installation, either with new or existing equipment and which when installed will not include the presence of obtrusive, unsightly, or unattractive parts in the living quarters.

The above and other objects of the present invention will appear more fully from the following more detailed description and by reference to the accompanying drawing forming a part hereof, wherein is shown, by way of example, a satisfactory commercial embodiment of the invention.

The drawing shows an elevation of the invention, with portions thereof broken away and in section.

As shown in the drawing, the numeral 10 indicates a furnace which may be of any suitable construction. As the present invention is particularly adapted for use with a furnace equipped with an oil or gas burner, I have shown the furnace as provided with a heating unit or burner 11 actuated by an electric motor 12.

Electric current is supplied to the motor 12 from the electric lead lines 13, 14, leading from any suitable source of electric current, and under the control of a thermostat 15, connected by the wires 16, 17, 18 in series circuit with the motor 12 and lead lines 13, 14, all in accordance with the usual constructions.

Suitably supported within the firebox of the furnace 10 is a closed steel drum or vaporizer 19, preferably held rigidly in place by means of an inlet pipe 20 and an outlet pipe 21, said inlet and outlet pipes passing through suitable apertures in the walls of the furnace, and communicating at their inner ends, with the interior of the vaporizer 19, and thereto secured by welding, or in any other suitable way. Water is supplied to the vaporizer through the water inlet pipe 20 from any suitable source of water under pressure, for example the ordinary household water supply line, the numeral 22 indicating a water pipe line leading to such supply. A strainer or scale trap 23 is preferably inserted between the inlet pipe 20 and water pipe 22. The incoming water passes through the strainer and into an electrically controlled water inlet valve 24, the purpose of which will be later described. Interposed between the water valve 24 and the vaporizer is a small reservoir 25. The outlet pipe 21 communicates with a riser pipe 26, which terminates in a diffuser nozzle 27, placed at a convenient location in the floor of the quarters to be supplied with water vapor, for example, in the hall of a house, or in the main living room, the riser 26 preferably being jacketed with asbestos 28 or other insulating material.

The water inlet control valve 24 which is of standard construction and the details of which form no part of the present invention is preferably of the type wherein the valve is opened in-

termittently at predetermined intervals under the control of an electric switch mechanism 29 connected across the circuit to the motor 12 by the wires 30, 31; the water control valve 24 being
 5 connected by means of an electric cable, indicated by the reference character 35, and which may be of any suitable construction.

The manner in which the apparatus functions is as follows:

10 The burner motor 12 being connected to a source of electricity and under control of the thermostat 15, the motor will be energized to operate the burner whenever the temperature of the room wherein the thermostat is located falls
 15 below the degree for which the thermostat is set. When the thermostat operates to close the circuit to the motor, the current also flows to the water valve control switch 29 and as a result the valve 24 will be opened intermittently according to its
 20 adjusted setting to permit water to flow from the supply pipe 22, to the inlet pipe 20, the water first passing through the strainer 23. The reservoir 25 is interposed between the valve 24 and inlet pipe 20 for the purpose of checking the force
 25 of the jet passing through the valve 24 to the vaporizer and to insure that the flow of water to the vaporizer will be relatively slow, thereby avoiding too sudden cooling of the walls of the vaporizer and also to facilitate quicker vaporiza-
 30 tion.

The vaporizer 19 is located preferably adjacent to the rear wall of the furnace boiler and relatively close to the burner 11 so that the flames from the latter will impinge against the outer
 35 walls of said vaporizer and heat it to a degree sufficient to cause the water admitted thereto to be converted into steam. The steam generated in the vaporizer passes through the outlet pipe 21 through the riser 26 and is ejected through
 40 the diffuser nozzle 27 to be spread or diffused thereby into the surrounding atmosphere.

As the water valve switch 29 is connected in shunt with the line to the motor no current will flow to said switch when the burner motor circuit is opened and consequently the water valve
 45 24 will not be opened and no water will flow to the vaporizer except at such times as the burner is actually in operation and the vaporizer is being heated.

50 The intermittent water valve switch 29 may be of any suitable construction, of which there are a number obtainable in the open market and which includes means for adjusting the time intervals between its closing of the circuit to actuate the water valve 24, and when an installation
 55 of the humidifying system herein disclosed is made the switch 29 is adjusted in accordance with the cubic contents of the quarters whose atmospheric humidity is to be controlled.

60 As the admission of the water is primarily controlled by the opening and closing of the thermostatic switch of the burner system, the amount of water vaporized and diffused will be in accordance with the temperature control effected
 65 by the thermostat, so that if the thermostat is adjusted for a lower room temperature, the burner will not be in operation as frequently or as long as when higher room temperatures are desired and as the amount of water vapor needed
 70 for ideal humidity conditions varies as the temperature, a variation of the setting of the thermostat results in producing a corresponding variation in the amount of water vapor supplied.

Should it be found that the apparatus is supplying a greater or lesser amount of water vapor than desired the intermittent water valve switch 29 provides a secondary control, a simple adjustment of which enables the necessary correction
 5 to be made.

As will be seen from the foregoing the humidifying apparatus herein disclosed, is of marked simplicity, and can be readily installed in any
 10 existing heating plant. Although designed primarily for use with thermo-electrically controlled oil or gas burners the apparatus is not limited to such use but is of general application.

While I have described and illustrated a satisfactory installation that has proven highly successful in practical operation, it will be understood that the invention is not limited to specific
 15 constructional details shown and described, but that many changes, variations, and modifications may be resorted to without departing from the
 20 principles of the invention.

I claim:

1. The combination with a furnace having a burner and a thermostatic control therefor, of a humidifying apparatus comprising a vaporizing
 25 drum located within said furnace in juxtaposition to said burner to be subjected to the direct heat thereof, means for supplying water to said drum to be converted therein, into steam, said
 30 means including a water valve, electric means for intermittently opening said valve at predetermined intervals, and a means for leading steam from said vaporizer to the atmosphere to be
 35 humidified and diffusing it into said atmosphere, said electric means being in circuit with and primarily under the control of said thermostatic control.

2. A humidifying apparatus for supplying water vapor to an atmosphere heated by a furnace comprising a vaporizing drum adapted to be located
 40 in said furnace and subjected to the heat thereof, means for supplying water to said drum including a water valve and an electric control system for actuating said valve, said control system comprising a primary control automatically
 45 responsive to temperature changes in the atmosphere to be humidified and a secondary control connected in series with said primary control for actuating said water valve, said secondary control including means for regulating the amount
 50 of water supplied to said drum.

3. The combination with a furnace having a burner and a thermostatic control therefor located in the atmosphere to be heated by said furnace, of a humidifying apparatus comprising
 55 a vaporizing drum located within said furnace in juxtaposition to said burner to be subjected to the direct heat thereof, means for supplying water to said drum to be converted therein into steam, said means including a water valve, an
 60 electrical control system for actuating said valve, said control system including primary and secondary control members, the primary control member of said system comprising the said thermostatic control and the secondary control
 65 including an electric switch in series with said thermostatic control, said secondary control being provided with means for regulating the volume of water supplied to said drum, and means leading from said drum to the atmosphere to be
 70 humidified for conducting steam from said drum and diffusing it into said atmosphere.

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