Oct. 8, 1940. C. J. MILLER 2,217,375

HUMIDIFIER

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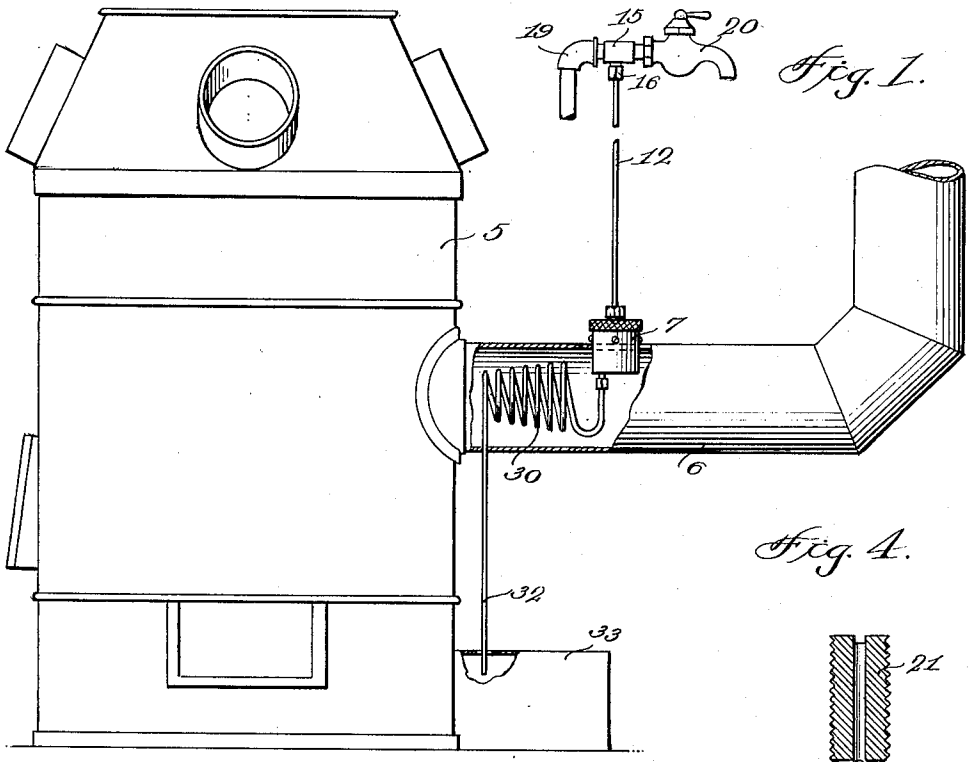


Fig. 1.

Fig. 4.

Fig. 2

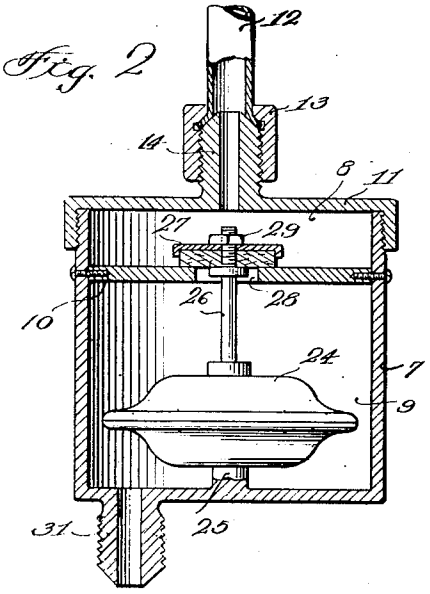
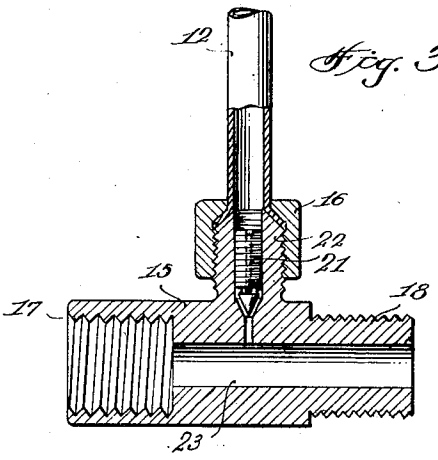


Fig. 3.



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HUMIDIFIER

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3 Claims. (Cl. 122—451.1)

The present invention relates to a new and improved humidifier primarily adapted for use with a hot air furnace for moistening the air in a room or building.

The primary object of the invention is to provide a humidifier to be installed in the smoke pipe of a furnace with means for automatically controlling the supply of water thereto to be converted into steam.

Another object of the invention is to provide a humidifier that makes use of heat discharged through the smoke pipe to convert water into steam to be fed into the air intake of the furnace for moistening the air in a room or building.

A further object of the invention is to provide a means of controlling the supply of water to a reservoir forming a part of the humidifier which is subsequently conerted into steam by combustion gases of the furnace.

A still further object is to provide a humidifier that can be readily installed in the smoke pipe of a furnace to form a permanent part thereof, whereby it is possible to dismantle the humidifier from the furnace by simply removing one joint of pipe.

The invention will be fully and comprehensively understood from a consideration of the following detailed description when read in connection with the accompanying drawing which forms a part of the application.

In the drawing:

Figure 1 is a side elevational view with parts in section and illustrating the preferred embodiment of the invention in position for use;

Figure 2 is a vertical sectional view through the reservoir forming a part of the device;

Figure 3 is a transverse sectional view of a preferred type of coupling employed for controlling the supply of water to the reservoir; and

Figure 4 is an enlarged vertical sectional view of a needle valve employed in the coupling illustrated in Figure 3.

Referring to the drawing for a more detailed description thereof, a conventional hot air furnace is indicated generally by the reference numeral 5, and extending therefrom is a pipe 6 which is normally employed for conveying the combustion gases from the furnace to an outlet. The pipe 6, is of course, readily detachable from the furnace and provides the means for retaining the important elements of the new and improved device.

A substantially cylindrical shaped reservoir 7 is positioned in the upper wall of the pipe 6 and is held therein by any desired means and, by referring to Figure 2 of the drawing, it will be noted that said reservoir comprises upper and lower compartments 8 and 9, respectively, said compartments being formed by the transversely disposed partition 10. The removable cap 11 is threadedly attached to and encloses the upper end of the reservoir 7 and provides the necessary means for permitting access to the interior thereof. A water supply pipe 12 is coupled by the means indicated at 13 to the upwardly extending nipple 14 of the cap 11 and is the means of conveying water from a supply source into the upper chamber 8.

The upper end of the pipe 12 engages the T-shaped fitting 15 by means of the coupling unit 16 and the ends 17 and 18 of the fitting 15 are threaded as indicated for attachment to the water supply pipe 19 and discharge faucet 20, respectively. An adjusting needle valve 21 is positioned within the nipple 22 of the fitting 15, which nipple is interiorly and exteriorly threaded as indicated in Figure 3 of the drawing. Adjustment of said valve 21 controls the flow of water from the passageway 23 of the fitting 15 into the pipe 12 for discharge into the upper chamber 8. In the use of the device it is preferred that a minimum amount of water be supplied to the reservoir as the requirements dictate.

A thermostatic element 24 is supported on a fixedly secured shaft 25 within the lower chamber 9 and extending above said thermostatic element and connected thereto is a shaft 26 carrying the valve 27 which is disposed above the opening 28 formed in the partition 10. The valve 27 may be formed of any desired material and is secured to the shaft by means of a nut or the like 29. Expansion and contraction of the thermostat 24 raises and lowers the valve 27 to permit water to enter the lower chamber 9 from the upper chamber 8 through the opening 28.

A helical coil 30 is arranged in the pipe 6 and is attached on one end to the downwardly extending nipple 31 of the reservoir 7 and the opposite end 32 preferably connects with the cold air intake 33 of the furnace 5. The coil 30 is heated by gases escaping through the pipe 6 to convert water contained therein into steam which is discharged into the air intake 33 of the furnace thereby causing a discharge of moisture into a room or dwelling.

In operation, water will be supplied through the fitting 15 and pipe 12 into the upper chamber 8. Combustion gases escaping from the furnace through the pipe 6 will expand the thermostat 24 and thereby raise the valve 27 from its seat on

the partition 10 to permit water to flow into the lower compartment 9 and through the outlet 31 into the coil 30. Since the coil 30 has been preheated by the combustion gases, the water flowing therethrough will be converted into steam and discharged into the air intake of the furnace as above described.

Since the reservoir 7 and coil 30 which form the important elements of the humidifier are positioned within the smoke pipe 6, it is readily understood that the humidifier may be removed from the furnace by merely replacing the section of pipe containing these elements. The humidifier as herein described can be removed or replaced while the furnace is in operation.

Also it will be understood, of course, by those skilled in the art that variations in the hereinabove described device involving the substitution of substantial equivalents for the devices described are intended to be comprehended within the spirit of the present invention and that the invention is capable of extended application and is not confined to the exact showing of the drawing nor to the precise construction described and, therefore, such changes and modifications may be made therein as do not affect the spirit of the invention nor exceed the scope thereof as expressed in the appended claims.

What is claimed is:

1. In combination with a furnace having a smoke pipe, of a water reservoir disposed in said pipe intermediate the ends thereof, said reservoir having upper and lower compartments, valve controlled means for supplying water to the upper compartment, thermostatic means positioned in said lower compartment for supplying water thereto from the upper compartment, and a coil positioned in said pipe and having one end attached to said lower compartment for vaporizing water passing therethrough and discharging the same into an air intake of the furnace.

2. In combination with a furnace having a smoke pipe, of a water reservoir disposed in said pipe intermediate the ends thereof, said reservoir having upper and lower compartments, a thermostatic element positioned in the lower compartment, a shaft extending vertically from said thermostat into the upper compartment, a valve carried by the upper end of said shaft for controlling the supply of water into said lower compartment when actuated by said thermostat, and a coil positioned in said pipe and having one end attached to said lower compartment for vaporizing water passing therethrough from said reservoir and discharging the same into an air intake of the furnace.

3. In a humidifying means for a furnace having a flue extending therefrom through which waste gases are discharged, a substantially cylindrical-shaped receptacle supported in said flue and intermediate the ends thereof, a partition in said receptacle forming an upper and lower compartment therein, means connected to the upper end of said receptacle for supplying water to the upper compartment, a thermostatic element supported in the lower compartment, a shaft extending vertically from said thermostat through an opening formed in the partition and projecting into the upper compartment, a valve carried by the upper end of said shaft for controlling the supply of water into said lower compartment when actuated by said thermostat, a coil mounted in said flue and having one end attached to the bottom wall of said receptacle, the other end of said coil terminating in an air intake of the furnace, whereby the waste gases being discharged through said flue will heat said coil for vaporizing water passing therethrough from said receptacle.

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