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L. W. HOYT
HUMIDIFYING VALVE
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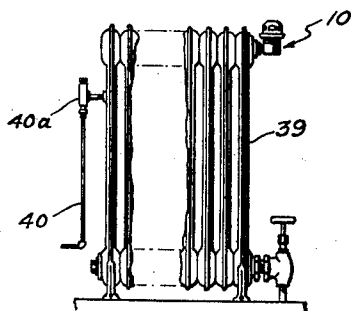


Fig. 1

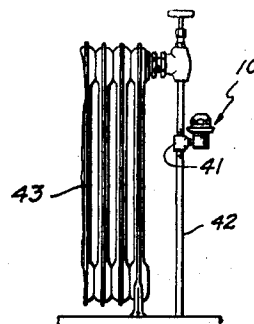


Fig. 2

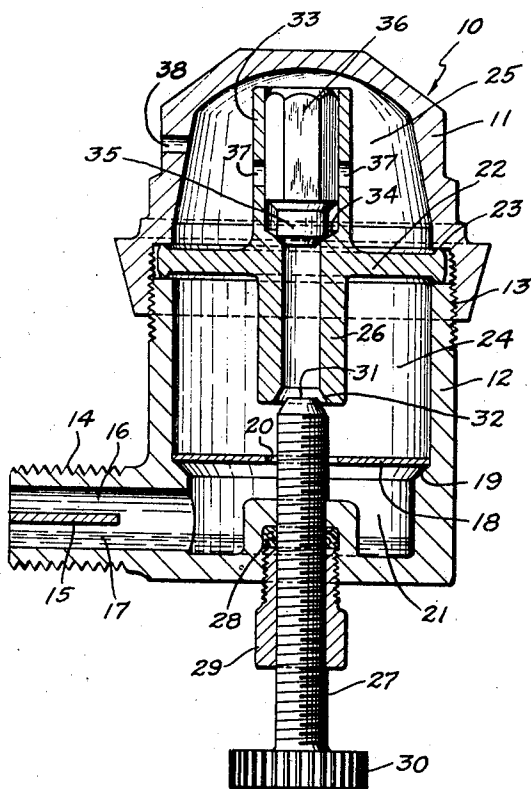


Fig. 4

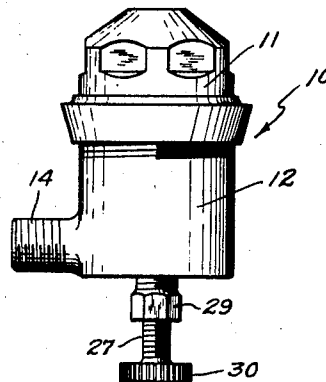


Fig. 3

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HUMIDIFYING VALVE

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10 Claims. (Cl. 237-78)

This invention relates to new and useful improvements in humidifiers, and is particularly concerned with a humidifier to be connected with a steam radiator or steam line to bring about a controlled discharge of moisture therefrom into the air to increase the humidity thereof.

An object of the invention is to provide a humidifier which when applied to a radiator or steam line will automatically release to the atmosphere moisture from such radiator or steam line when there is a pressure therein.

Another object is to provide a humidifier to be applied to a steam radiator or steam line to automatically release moisture therefrom to the atmosphere noiselessly and through the action of the heating plant connected with such radiator or steam line.

A further object is to provide a humidifier to be connected with a steam radiator or steam line and which will release to the surrounding atmosphere moisture from such radiator or line without the leakage or discharge of water.

Other objects and advantages will become apparent from a consideration of the following detailed description taken in connection with the accompanying drawing wherein a satisfactory embodiment of the invention is shown. However, it is to be understood that the invention is not limited to the details disclosed but includes all such variations and modifications as fall within the spirit of the invention and the scope of the appended claims.

In the drawing:

Fig. 1 is a view showing a portion of a radiator with the humidifier of the invention applied thereto;

Fig. 2 is a somewhat similar view but with the humidifier connected with the steam line leading to a radiator;

Fig. 3 is an elevational view of the humidifier alone; and

Fig. 4 is a vertical central sectional view, on an enlarged scale, of the humidifier alone.

Referring in detail to the drawing my improved humidifier generally designated 10 comprises a body including an upper section 11 and a lower section 12, such sections being threaded together at 13. The lower section 12 includes an externally threaded connecting nipple 14 divided by a plate or web-like portion 15 providing upper and lower passages 16 and 17 in such nipple.

A baffle 18 is located in the section 12 and may simply rest on a shoulder 19 therein as shown. This baffle is provided with a central opening 20 for the passage of steam upwardly with respect

to the inlet connection 14 but the baffle prevents upward movement of condensate in the body. Also the baffle divides the lower section 12 of the device to provide a condensate compartment 21 located at the lower side of the baffle as will presently more clearly appear.

Arranged within the body 10 is a means including a dividing disc or plate-like portion 22 the edges of which are clamped between the upper end of section 12 and a shoulder 23 formed on the section 11. Such plate-like portion 22 divides the interior of the body above the baffle into a steam compartment or chamber 24 and an upper evaporating or vaporizing compartment or chamber 25.

A tubular member 26 projects from the lower side of plate-like portion 22 and may as here shown be integral therewith. Through the bottom wall of section 12 a valve stem 27 is threaded, compressible packing 28 and a packing nut 29 being provided to prevent leakage at this point. Exteriously of the body the valve stem 27 may be provided with the desired type of hand piece 30.

At its inner end valve stem 27 carries a tapered valve 31 for cooperation with the tapered valve seat 32 in the lower end of the tubular member 26. With the described arrangement it will be apparent that by adjustment of the valve stem through the bottom wall of the body of my humidifier the volume of steam entering the tubular member 26 may be regulated, or the passage through such member may be closed to shut off the device if desired.

Projecting upwardly from the plate-like dividing member 22 is a tubular member 33 communicating with the tubular member 26 and having a valve seat 34 which in cooperation with a valve 35 controls such communication. Valve 35 is carried by a stem 36 located in the member 33 and having flat sides whereby on unseating of the valve steam may pass upwardly at the sides of such stem.

When valve 35 is unseated while there is steam in the compartment 24 such steam will pass upward through the member 26 and enter the member 33 passing outward thereof through the openings or ports 37 and upwardly about the flat sides of the stem 36 whereby to enter the vaporizing or evaporating compartment 25. From such compartment the vapor may escape to the atmosphere through one or more openings 38 provided for that purpose in the wall of the upper body section 11.

My improved humidifier may be connected with any steam radiator or steam supply line, and

in Fig. 1 it is shown as having its inlet or connecting nipple 14 threaded into a radiator 39 provided with a return line 40 and vent valve 40a. In Fig. 2 the humidifier is connected with a T fitting 41 located in the steam supply line 42 to a radiator 43.

When the humidifier is applied steam enters the same through the upper passage 16 in the connecting or inlet nipple 14 while condensate from compartment 21 may readily pass out through the passage 17 at the lower side of the dividing means 15. The steam passes up through the opening 20 in the baffle 18 but such baffle prevents upward movement of condensate whereby the latter collects in the lower portion of the body 10 and empties out through the passage 17, thus preventing drops of water being discharged from the device into the air to drop on the floor or other articles.

Due to the weight of the valve 35 and its stem 36 the valve remains on its seat until there is a slight pressure in the tubular member 26. At the desired minimum pressure the valve 35 lifts permitting steam to enter the vaporizing compartment 25 and pass out to the atmosphere through opening 38. As the steam enters the vaporizing compartment it expands and thus any condensate in such compartment will be picked up by the steam and become part of the vapor passing through outlet 38 to the atmosphere. As it requires slightly above atmospheric pressure for this vacuum valve 35 to release, it will cause the air in the radiator to vent through the return pipe 40 before moisture is released to the room through this unit, thus avoiding objectionable odor as the air is thus not vented through this unit.

Immediately the pressure of the steam drops sufficiently the valve 35 resumes its seat preventing air being drawn in through the unit and preserving the vacuum in the radiator.

Owing to the construction disclosed the steam follows a winding path toward the outlet 38 and will be discharged without noise. Additionally the device is automatic in its operation and depends on the steam pressure (slightly above atmospheric) and thus on the heating plant for the opening and closing of valve 35. The vapor is released near the radiator and will thus enter the air flow about the radiator. Outlet 38 being located above the bottom wall of compartment 25 there is no danger of a leakage of water from the device.

Having thus set forth the nature of my invention, what I claim is:

1. In a humidifier, a body having a vertical chamber therein, an inlet at the lower end of said chamber for connection with a steam supply, a baffle in said chamber extending transversely across the chamber adjacent and above said inlet to prevent upward movement of condensate in the chamber but having an opening permitting upward passage of steam, said body having a vapor outlet opening in its upper portion above said baffle, and valve means between the baffle and said outlet operable from the exterior of said chamber to cut off communication between said inlet and said vapor outlet.

2. In a humidifier, a body comprising detachable upper and lower sections enclosing a vertical chamber, means clamped between said sections and dividing said chamber into an upper vaporizing compartment and a lower steam compartment, an inlet to said steam compartment, communicating tubular members projecting at

the respective sides of said dividing means and providing a passage between said compartments, a valve operable from the exterior of the body and adapted to control the passage through one of said tubular members, a valve in the other tubular member and movable off its seat only on the development of a pressure in said passage, and said body having an opening communicating said vaporizing compartment with the atmosphere.

3. In a humidifier, a body comprising detachable upper and lower sections enclosing a vertical chamber, means clamped between said sections and dividing said chamber into an upper vaporizing compartment and a lower steam compartment, an inlet to said steam compartment, a baffle in said steam compartment above said inlet but spaced from said dividing means and serving to prevent upward movement of condensate in the compartment but having an opening permitting of upward movement of steam in the compartment, communicating tubular members projecting at the respective sides of said dividing means and providing a passage between said compartments, a valve manually operable from the exterior of said body and adapted to control the passage through one of said tubular members, a valve in the other tubular member and movable off its seat only on the development of a pressure in said passage, and said body having an opening communicating said vaporizing compartment with the atmosphere.

4. In a humidifier, a body having a vertical chamber therein and an inlet toward the lower end of said chamber for connection with a source of supply of steam, a transverse wall dividing said chamber into a lower steam compartment and an upper vaporizing compartment connected by a restricted passage, a transversely extending baffle in said steam compartment above said inlet but spaced from said dividing wall and serving to prevent upward movement of condensate in the compartment but having an opening permitting of upward movement of steam in the compartment, said body having an opening placing said vaporizing compartment in communication with the atmosphere, and a valve in said restricted passage and movable off its seat on development of a predetermined pressure in said steam compartment.

5. In a humidifier, a body having a vertical chamber therein and an inlet toward the lower end of said chamber for connection with a source of steam supply, a transverse wall intermediate the top and bottom of said chamber dividing said chamber into a lower steam compartment and an upper vaporizing compartment connected by a restricted passage and providing means for transfer of heat from the steam compartment to the vaporizing compartment, said body having an opening placing said vaporizing compartment in communication with the atmosphere, a valve in said restricted passage and movable off its seat on development of a predetermined pressure in said steam compartment, and a valve means at the inlet of said passage from the steam compartment and manually operable from the exterior of said body to positively cut off communication between said compartments.

6. In a humidifier, a body having a vertical chamber therein and an inlet toward the lower end of said chamber for connection with a source of supply of steam, a transverse wall dividing said chamber into a lower steam compartment and an upper vaporizing compartment connected by a

restricted passage, a valve controlling said passage opened by pressure in the steam compartment, a transverse baffle in said steam compartment above said inlet but spaced from said dividing wall and serving to prevent upward movement of condensate in the compartment but having an opening permitting of upward movement of steam in the compartment, and said body having an opening placing said vaporizing compartment in communication with the atmosphere.

7. In a humidifier, a body enclosing a vertical chamber, a transverse wall dividing said chamber into an upper vaporizing compartment and a lower steam compartment, an inlet to said steam compartment, a tubular means carried by said wall and providing a passage between said compartments, a valve operable from the exterior of the body and adapted to control the passage through said tubular means, a valve in said tubular means controlling said passage and movable off its seat on the development of a given pressure in said steam compartment, and said body having an opening from said vaporizing compartment to the atmosphere.

8. In a humidifier, a body enclosing a vertical chamber, a transverse wall dividing said chamber into an upper vaporizing compartment and a lower steam compartment, an inlet to said steam compartment, a baffle in said steam compartment above said inlet but spaced from said dividing wall and serving to prevent upward movement of condensate in the compartment and having an opening permitting upward movement of steam in the compartment, a tubular means carried by said wall and providing a passage between said compartments, a valve manually operable from the exterior of said body and adapted to control the passage through said tubular means, a valve in said passage movable off its seat on develop-

ment of a given pressure in said passage, and said body having an opening forming a communication from said vaporizing compartment with the atmosphere.

9. In a humidifier, a body enclosing an upright chamber, means dividing said chamber into an upper vaporizing compartment and a lower steam compartment, an inlet to said steam compartment, communicating tubular members projecting at the respective sides of said dividing means and providing a passage between said compartments, a valve operable from the exterior of the body and adapted to control the passage through one of said tubular members, a valve in the other tubular member and movable off its seat only on development of a pressure in said passage, and said body having an opening leading from said vaporizing compartment to the atmosphere.

10. In a humidifier, a body enclosing an upright chamber, means dividing said chamber into an upper vaporizing compartment and a lower steam compartment, an inlet to said steam compartment, a baffle in said steam compartment above said inlet but spaced from said dividing means and serving to prevent upward movement of condensate in the compartment but having an opening permitting of upward movement of steam in the compartment, communicating tubular members projecting at the respective sides of said dividing means and providing a passage between said compartments, a valve manually operable from the exterior of said body and adapted to control the passage through one of said tubular members, a valve in the other tubular member and movable off its seat only on the development of a pressure in said passage, and said body having an opening communicating said vaporizing compartment with the atmosphere.

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