May 10, 1932. M. G. STEELE 1,857,770

HUMIDIFIER

Filed Dec. 5, 1929

Fig. 1.

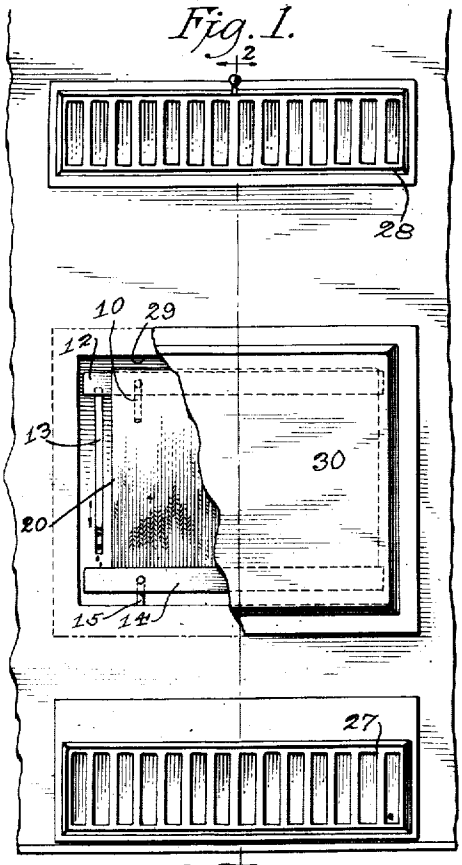


Fig. 2.

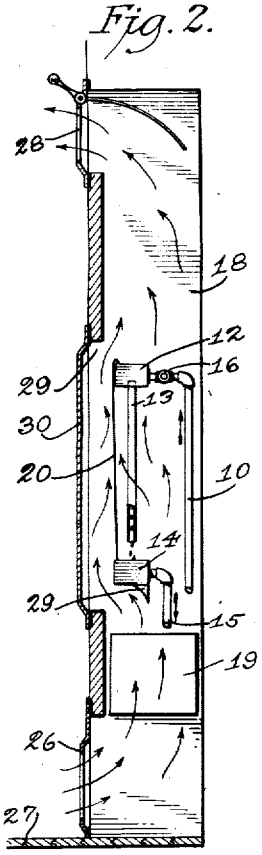
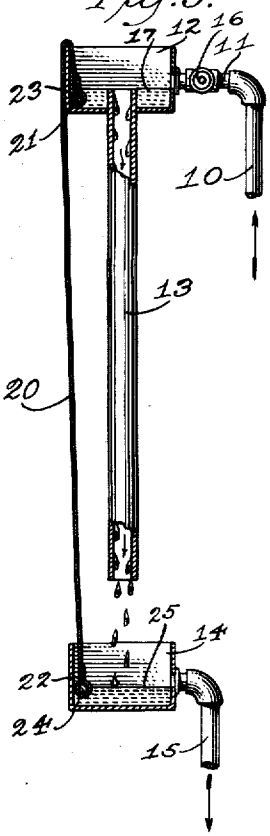


Fig. 3.



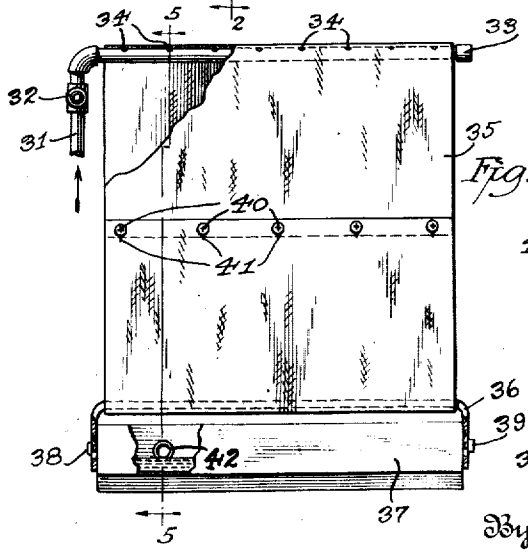


Fig. 4.

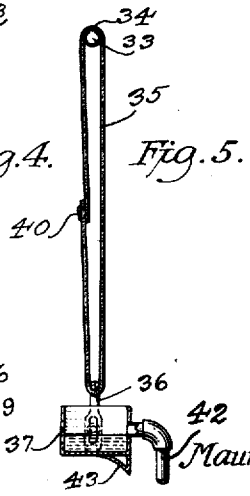


Fig. 5.

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Patented May 10, 1932 1,857,770

UNITED STATES PATENT OFFICE

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HUMIDIFIER

Application filed December 5, 1929. Serial No. 411,814.

This invention relates to a room humidifier adapted to be arranged adjacent a source of heated air, such as a radiator located therebeneath.

One object of this invention is to provide a humidifier of the above nature having a depending moistened absorbent sheet for exposing a relatively large quantity of moisture to a column of rising heated air.

A further object is to provide a humidifier of the above nature having means for supplying water to both ends of the absorbent sheet.

A further object is to provide a humidifier of the above nature especially designed for location within a radiator stack concealed within the wall of a room.

A further object is to provide a device of the above nature which will be simple in construction, inexpensive to manufacture, easy to install and manipulate, compact, and very efficient and durable in use.

With these and other objects in view there have been illustrated on the accompanying drawings two forms in which the invention may be conveniently embodied in practice.

Fig. 1 represents a fragmentary front view of the first form of air humidifier as it appears when installed within a concealed radiator stack.

Fig. 2 is a side sectional view of the same, taken along the line 2—2 of Fig. 1, looking in the direction of the arrows.

Fig. 3 is a side sectional view, on an enlarged scale, of the humidifier of Figs. 1 and 2, shown apart from the radiator stack.

Fig. 4 is a fragmentary front view of a modified form of air humidifier.

Fig. 5 is a side sectional view of the same, taken along the line 5—5 of Fig. 4, looking in the direction of the arrows.

The present invention provides an air humidifier for a room, such as in a dwelling house or office building, capable of maintaining the relative humidity within the room at any desired point.

Referring now to the drawings in which like reference numerals denote corresponding parts throughout the several views, the numeral 10 indicates a vertical water feed pipe adapted to be supported by suitable brackets or clips, not shown. The pipe 10 is connected, as by a horizontal pipe 11, to a rectangular upper tank 12 having a vertical overflow pipe 13 extending downwardly into proximity to a similar lower tank 14, having a drain pipe 15.

In order to adjust the amount of water fed into the upper tank 12, the pipe 11 is provided with a manual control valve 16. The overflow pipe 13 extends upwardly a short distance into the upper tank 12, so as to constantly maintain the water in said tank at the fixed level 17 shown in Fig. 3.

The humidifier is preferably though not necessarily located within a stack 18 concealed within the wall of a room and having an air-heating radiator 19 located below said humidifier. The air rising from the radiator is caused to flow around both sides of an absorbent towel or wick 20 having hems 21 and 22 at its upper and lower ends, through which are passed weighted rods 23 and 24.

The upper part of the wick 20 is hung over the edge of the upper tank 12 with the rod 23 resting upon the bottom of said tank, as clearly shown in Fig. 3. The remainder of said wick 20 extends downwardly and is of such a length that the rod 24 is suspended within the lower tank 14 below the level 25 of the water contained therein, but somewhat above the bottom of said tank, so as to keep the wick 20 taut at all times.

The air to be heated is preferably drawn from the room through a lower grille 26 located near the floor 27 of the room, up through the radiator 19, around the humidifier, and then out into the room again through an upper grille 28, this cycle of air circulation being continued as long as the radiator and humidifier are in operation. The action of the humidifier will be made more efficient by the provision of a deflector 29 under the lower tank 14 for causing a portion of the upflowing air to pass forwardly so that it will impinge on the front of the wick 20, while the remainder of the hot air will be permitted to pass up the rear of the stack 18 and come into contact with the rear of said wick 20.

In order to render the parts of the humidifier accessible, the stack 18 is provided with a front opening 29 which is normally closed by a removable ornamental panel 30.

Operation

In the operation of the first form of invention shown in Figs. 1 to 3, water from the feed pipe 10 passes through the pipe 11 and the control valve 16 into the upper tank 12, where it is drawn upwardly by capillary action into the wick 20, over the edge of said tank, and then downwardly, assisted by gravity, for moistening the entire surface of said wick. The lower part of the wick will be supplied with additional moisture by the capillary upward flow of water from the lower tank 14.

The excess water from the wick 20 and the overflow pipe 13 will flow down into the lower tank 14, from which it will be removed through the drain pipe 15. As clearly shown in Fig. 1, the drain pipe 13 is preferably located beyond the side edge of the wick 20, whereby said pipe 13 will serve as a visible "sight feed" for indicating the amount of excess water flowing down from the upper tank 12 into the lower tank 14.

In the modified form of the invention shown in Figs. 4 and 5, the upper tank is omitted and the water is supplied from a vertical feed pipe 31, from which is passes through a control valve 32 to a horizontal spray pipe 33 having perforations 34 in its upper side. Suspended from both sides of the spray pipe 33 is a moisture absorbing towel or wick 35 having its lower end passed around the upper part of a U-shaped bracket 36 secured to the ends of a lower tank 37, as by adjustable nuts 38 and 39.

The ends of the wick 35 are detachably joined together, as by a series of buttons 40 adapted to fit into button-holes 41. An overflow pipe 42 similar to the drain pipe 15 is provided in the tank 37 for draining the water therefrom. The bottom of the tank 37 is preferably provided with a deflector 43 similar to the deflector 29, previously described.

In the operation of the modified form of humidifier shown in Figs. 4 and 5, water will flow out continuously at any desire rate, as determined by the adjustment of the control valve 32 through the perforations 34 of the spray pipe 33. The moisture will then be drawn by capillary action into the wick 35, and will flow downwardly, assisted by gravity, to the bottom of said wick. The excess water which drips from the wick 35 will be caught in the tank 37 and will flow out therefrom through the drain pipe 42. In other respects the operation of this form of the invention is identical with that of the first form.

While there have been disclosed in this specification two forms in which the invention may be embodied, it is to be understood that these forms are shown for the purpose of illustration only, and that the invention is not to be limited to the specific disclosures but may be modified and embodied in various other forms without departing from its spirit. In short, the invention includes all the modifications and embodiments coming within the scope of the following claims.

Having thus fully described the invention, what is claimed as new, and for which it is desired to secure Letters Patent, is:

1. In a humidifier, upper and lower water tanks, a moistened absorbent sheet having one end resting on the bottom of said upper tank, the other edge being suspended in the lower tank below the water level therein, weighted means in the ends of said sheet to keep it taut, and overflow pipes in each of said tanks, the overflow pipe from the upper tank discharging into said lower tank.

2. In a humidifier, upper and lower water tanks, a moistened absorbent sheet having one end resting on the bottom of said upper tank, the other edge being suspended in the lower tank below the water level therein, and overflow pipes in each of said tanks, the overflow pipe from the upper tank discharging into said lower tank.

3. In a humidifier, upper and lower water tanks, an absorbent sheet having its upper end overhanging the edge of said upper tank and disposed below the level of water therein, the lower end of said sheet being suspended below the level of water in said lower tank, and an overflow pipe depending from said upper tank and discharging into said lower tank.

4. In a humidifying system, an enclosed stack, an air inlet at the bottom of said stack located within a wall, an air outlet at the top of said stack, a radiator above said air inlet for heating the air therefrom, and a humidifier directly above said radiator, said humidifier including a depending moistened absorbent sheet.

5. In a humidifying system, an enclosed stack, an air inlet at the bottom of said stack, an air outlet at the top of said stack, a radiator above said air inlet for heating the air therefrom, and a humidifier above said radiator, said humidifier including a depending moistened absorbent sheet, and a deflector for causing the upflowing stream of air to divide so that part will flow over the front of said sheet and part over the rear of said sheet.

6. In a humidifying system, an enclosed stack, an air inlet at the bottom of said stack, located within a wall, an air outlet at the top of said stack, a radiator above said air inlet for heating the air therefrom, and a humidifier directly above said radiator, said humidifier including a depending moistened absorbent sheet, said stack having a removable front

panel for permitting access to said humidifier.

7. In a humidifier, upper and lower water tanks, a moistened absorbent sheet having one end resting on the bottom of said upper tank, the other edge being suspended in the lower tank below the water level therein, weighted means in the ends of said sheet to keep it taut, an overflow pipe in each of said tanks, and a manually controlled valve for adjusting the rate of water feed to said upper tank, the overflow from said upper tank discharging into said lower tank.

8. In a humidifier, a moistened absorbent sheet suspended in vertical position, a perforated pipe for supplying water to the upper end thereof, and a tank below said sheet for receiving excess water dripping from said sheet, said sheet being in the form of a loop, the upper end of said loop being hung on said pipe, and a horizontal U-shaped rod connected at its ends to said lower tank for holding the lower end of said loop, said rod being located in said lower tank.

9. In a humidifier, an enclosed stack a moistened absorbent sheet suspended in vertical position within said stack, means for supplying water to the upper end thereof, a tank below said sheet for receiving excess water dripping from said sheet, means for delivering a stream of hot air beneath said tank, and a curved wedge-shaped deflector on the bottom of said tank for dividing said stream of air into two parts and increasing the rate of air circulation.

In testimony whereof, I have affixed my signature to this specification.

MAURICE G. STEELE.

CERTIFICATE OF CORRECTION.

Patent No. 1,857,770. **May 10, 1932.**

MAURICE G. STEELE.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, lines 106 and 124, claims 4 and 6, respectively, after the word "stack" first occurrence, insert the words located within a wall, and lines 107 and 125, strike out the words "located within a wall"; page 3, line 25, claim 9, after the word "stack" insert a comma; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 5th day of July, A. D. 1932.

M. J. Moore,
Acting Commissioner of Patents.

(Seal)

panel for permitting access to said humidifier.

7. In a humidifier, upper and lower water tanks, a moistened absorbent sheet having one end resting on the bottom of said upper tank, the other edge being suspended in the lower tank below the water level therein, weighted means in the ends of said sheet to keep it taut, an overflow pipe in each of said tanks, and a manually controlled valve for adjusting the rate of water feed to said upper tank, the overflow from said upper tank discharging into said lower tank.

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