

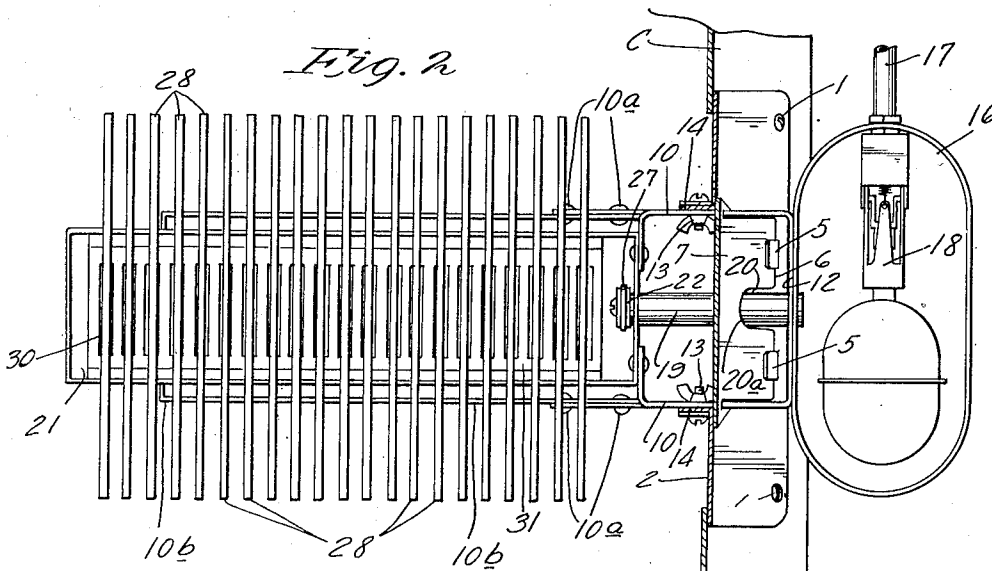
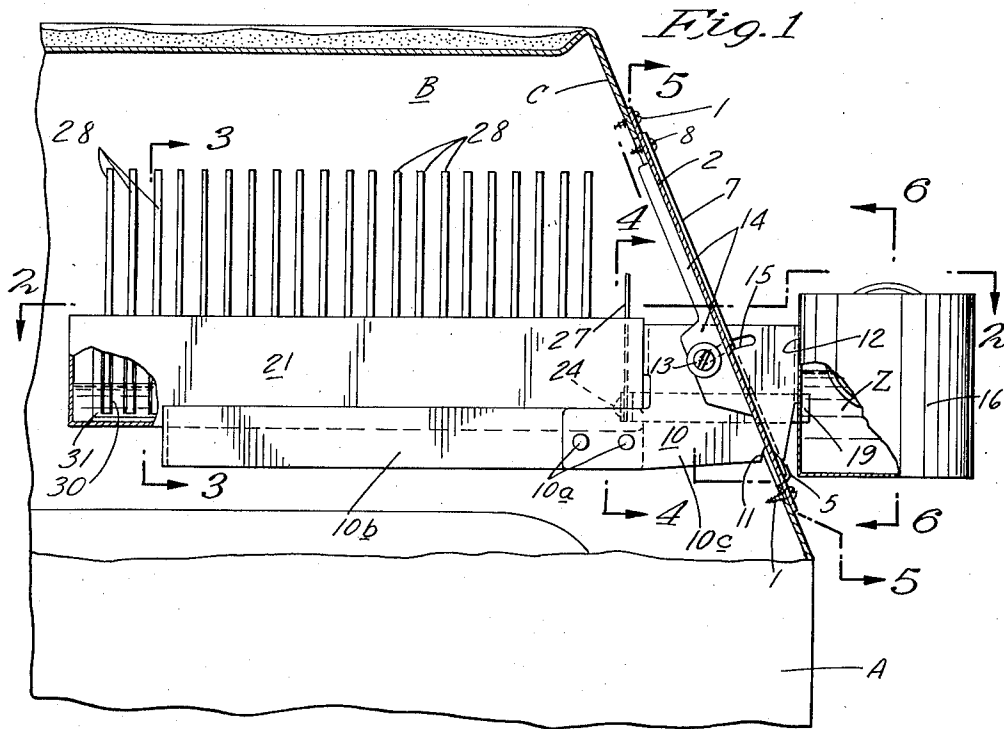
Aug. 21, 1951

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HUMIDIFIER

2,565,210

Filed Dec. 19, 1949

3 Sheets-Sheet 1



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*Fig. 3*

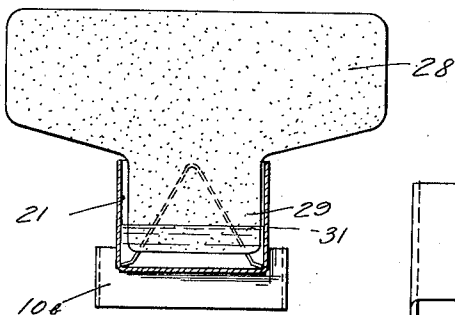


*Fig. 4*

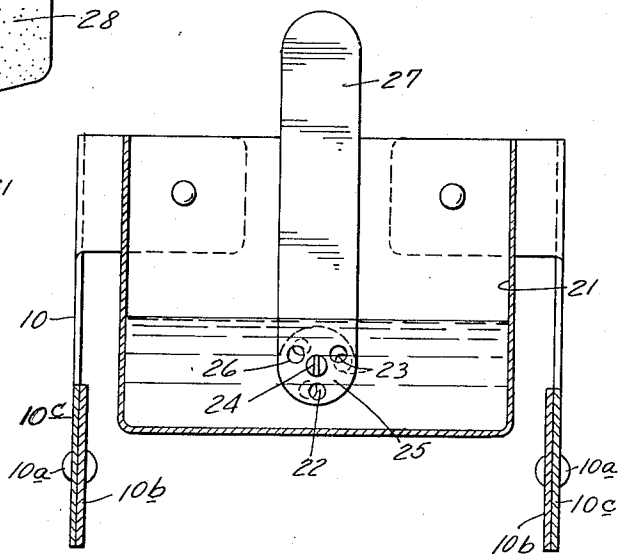
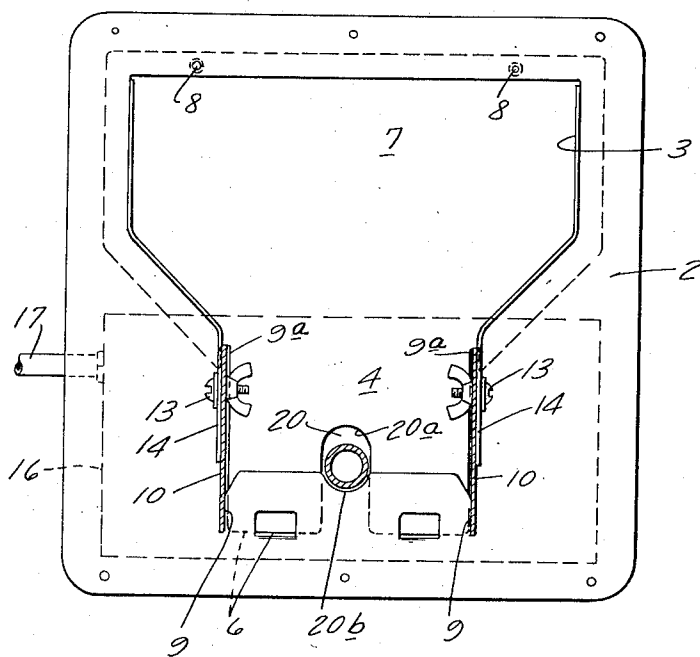


*Fig. 5*



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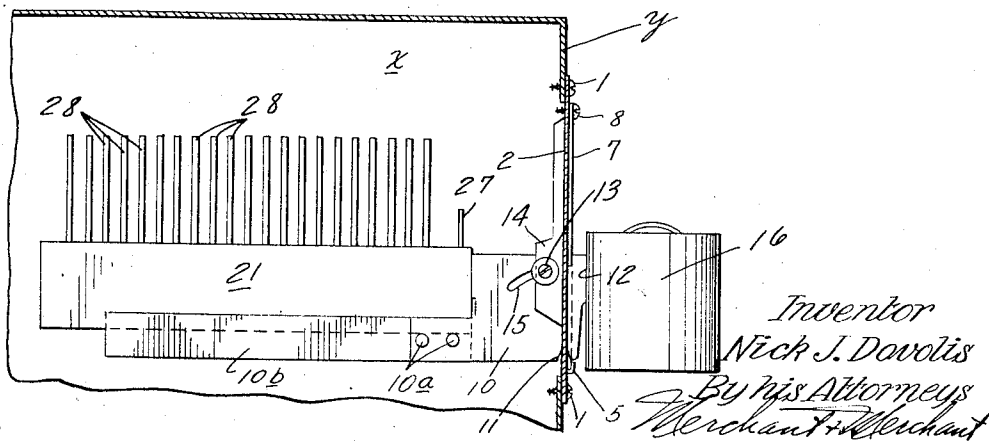
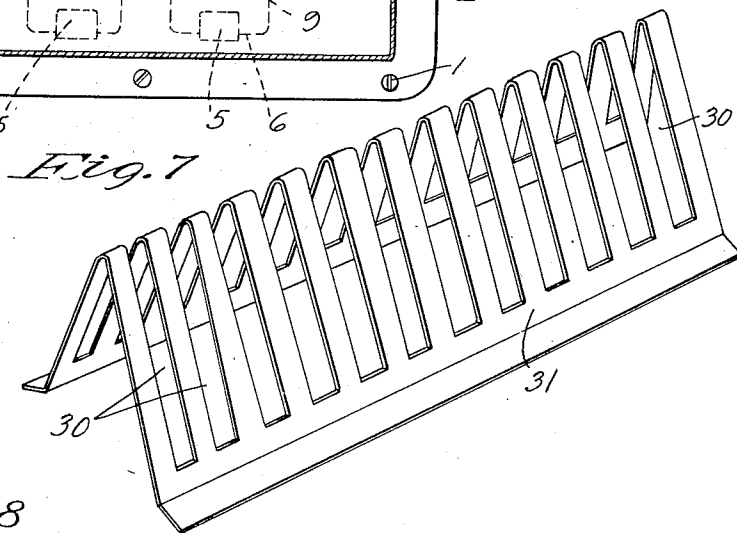
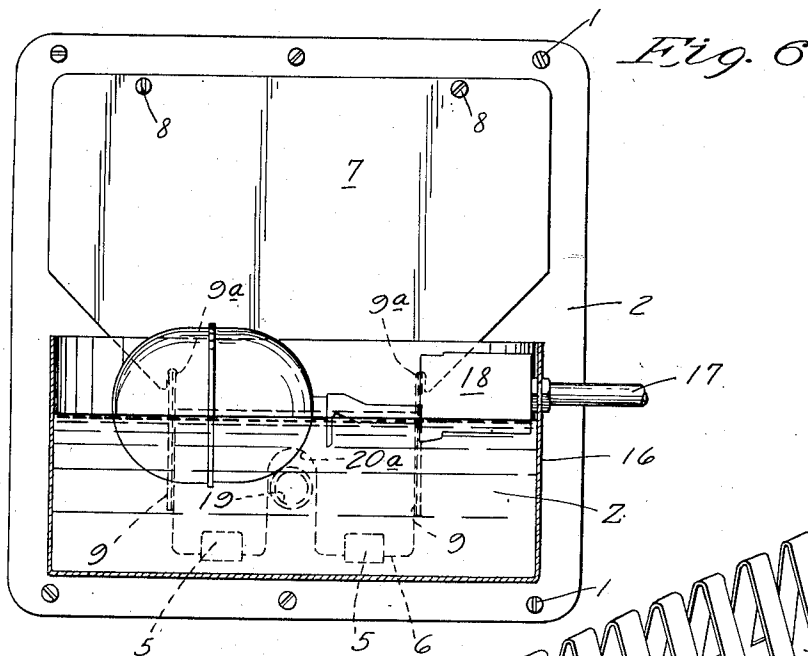
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## UNITED STATES PATENT OFFICE

2,565,210

## HUMIDIFIER

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4 Claims. (Cl. 261—119)

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My invention relates to humidifiers and, more particularly, to wick-type humidifiers adapted to be mounted on the outer shell or wall of a conventional hot air furnace with the wick and wetting chamber projecting into the plenum or hot air chamber of the furnace.

An important object of my invention is the provision of a novel arrangement and combination of parts for efficiently maintaining the water within the evaporating pan at a constant predetermined level, whereby to place a minimum of function upon the control valve in the supply tank.

Another important object of my invention is the provision of novel means for securing my structure to the wall of a hot air furnace or the like, whereby the evaporating pan may be maintained in an approximately horizontal position within the plenum chamber, irrespective of the slope of the wall to which the device is secured.

A still further object of my invention is the provision of a novel arrangement of parts whereby the evaporator pan and the wick elements maintained therein may be readily inspected and replaced with a minimum of time and effort.

A still further object of my invention is the provision of a device which may be manufactured with a minimum of cost, which has a minimum of moving parts, and which consequently will require a minimum of replacement due to wear.

Still further objects and advantages of my invention will become apparent from the following detailed specification, appended claims and attached drawings.

Referring to the drawings, wherein like characters indicate like parts throughout the several views:

Fig. 1 is a view in side elevation of my novel device secured to the plenum chamber of a hot air furnace, some parts being broken away and some parts being shown in section;

Fig. 2 is a view partly in plan and partly in horizontal section, taken substantially on the line 2—2 of Fig. 1;

Fig. 3 is a vertical section, taken on the line 3—3 of Fig. 1;

Fig. 4 is an enlarged vertical section, taken substantially on the line 4—4 of Fig. 1;

Fig. 5 is an enlarged section, taken substantially on the line 5—5 of Fig. 1;

Fig. 6 is an enlarged view, partly in section and partly in front elevation, taken substantially on the line 6—6 of Fig. 1;

Fig. 7 is a view in perspective of a wick-holding rack utilized in my invention; and

Fig. 8 is a fragmentary view corresponding substantially to Fig. 1, but showing my novel humidifier mounted on a vertical wall of a furnace.

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Referring particularly to Figs. 1 to 7, inclusive, of the drawings, the letter A indicates a hot air furnace having a hot air or plenum chamber B in its upper portion. To the inclined wall C of said plenum chamber is secured, by means of screws or the like 1, a mounting plate 2. The mounting plate 2 is provided with a centrally positioned inspection opening or aperture 3 which, at its lower central portion, is reduced as at 4. As shown, particularly by reference to Figs. 1 and 2, the mounting plate 2 is provided with a pair of integrally-formed laterally-spaced ears 5 which are pressed outwardly thereof and which are adapted to slidably receive the bottom edge 6 of an inspection plate 7 adapted to overlie and close the inspection opening 3. Screws or the like 8 are adapted to removably secure the inspection plate 7 to the mounting plate 2.

The mounting plate 2 is provided with a pair of laterally-spaced parallel slots 9, which extend vertically downwardly from the inspection opening 3. Likewise, the inspection plate 7 is provided with aligned upwardly extended slots 9a, which cooperate with the slots 9 to provide recesses for the reception of one each of a pair of elongated frame members 10. As shown, the frame members 10 are notched at 11 preferably in spaced relation to their outer ends, identified by the numeral 12. The notches 11 receive therein that portion of the mounting plate 2 at the bottom of the slots 9, whereby to prevent accidental longitudinal movements of the frame members 10.

The above arrangement obviously allows for rocking movements of the frame members 10 in the slots 9. To adjustably lock the frame members against such rocking movements, I provide a pair of thumb nut-equipped bolts 13, which project laterally through a pair of integrally formed intumed flanges 14 on the mounting plate and aligned segmental slots 15 in the frame members 10. Frame members 10 are preferably formed from a single piece of stock. Preferably and as shown, the frame members 10 are formed by securing together, by means of rivets or the like 10a, the overlapped free ends of opposed U-shaped members 10b and 10c, the latter of which projects through the slots 9 in the mounting plate. Secured by welding or the like to the closed outer end of member 10c and carried by the frame member 10 is a fluid supply tank 16 having a fluid inlet pipe 17 thereto and a conventional toggle-type float valve assembly, identified in its entirety by the numeral 18. A tubular conduit 19 in the lower part of the supply tank 16 extends through a slightly elongated opening 20 formed by cooperating notches 20a and 20b in the inspection plate 7 and mounting plate 2, respectively. At its inner end, the conduit 19

projects into a relatively shallow evaporating pan 21 carried by the inner end of the frame members 10, where its inner end is partially closed by a circular relatively stationary valve plate 22, having a circumferentially-spaced series of restricted valve openings or orifices 23. Piv-  
otally secured as at 24 to the relatively stationary valve plate 22 is a relatively movable valve plate 25, having therein a series of restricted orifices 26 corresponding to the orifices 23 in the rela-  
tively stationary valve plate 22. A handle element 27 projects radially upwardly to facilitate manipulation. A plurality of evaporating wicks 28 formed from spun glass or the like have their reduced lower ends 29 snugly received, one each within the longitudinally-spaced slots 30 of a V-shaped rack 31.

With devices of this type, it is desirable to initially position the evaporating pan in a substantially horizontal position, and thereafter maintain the same in a horizontal position, in order that the lower ends 29 of all of the evaporating wicks 28 be adequately submerged in fluid, irrespective of their position within the evaporating pan 21. With my novel arrangement of parts, this may be accomplished by adjustment of the thumb nut-equipped bolts 13 in the slots 15 of the frame members 10, irrespective of whether the mounting plate 2 is secured to an inclined wall C, as in Figs. 1 to 7, inclusive, or whether the same is secured to a vertical wall, as in Fig. 8. In Fig. 8, the plenum chamber is identified by the letter X, and the front wall thereof by the letter Y. All other parts are identical with Figs. 1 to 7, inclusive, and bear the same numbers.

As the water Z in the supply tank 16 reaches a given level, the float valve assembly 18 cuts off the supply thereof entering from the fluid inlet pipe 17, said water or other evaporating fluid enters the conduit 19 where its flow into the evaporating pan 21 may be regulated as desired by manipulation of the handle 27. It will be understood that by manipulation of the orificed valve plates 22 and 25, the rate of flow into the evaporating pan 21 from the constant level reservoir 16, and the resultant rate of evaporation, may be variably maintained as desired substantially independently of the fluid level or slight variations in fluid level within the constant level reservoir 16. In the device illustrated, the rate of humidification or evaporation is controlled by regulation of the orificed valve plates 22 and 25 to restrict the flow through conduit 19 to something below the maximum rate of evaporation from the wick-equipped evaporating pan 21, which, of course, results in the maintenance of varying fluid levels in the evaporating pan from a maximum level determined by the level in reservoir 16 to a low level point where some of the wicks 28 are wholly or largely starved or deprived of liquid. In this manner, very precise regulation of the rate of evaporation or humidification is achieved substantially independent of the fluid level in reservoir 16, or such slight variations therein as are inevitable under control of float valve 18, and the frequency of operation of the float valve is greatly reduced as compared to devices wherein the rate of evaporation is controlled ahead of or at the inlet side of the constant level float valve 18 or its equivalent.

My invention has been tested and found to be completely satisfactory for the accomplishment of the above objects, and while I have illus-

trated and described a commercial form of my invention, it should be obvious that the same is capable of modification without departure from the scope of the appended claims.

What I claim is:

1. In a device of the class described, a mounting plate adapted to be secured to the wall of a heating chamber, a pair of laterally-spaced vertically-extended slots in said mounting plate, a pair of laterally-spaced frame members extending through said slots, said frame members having notches in their lower edges, said notches receiving that portion of the mounting plate defining the lower ends of said slots and mounting said frame members for rocking movements, means for adjustably locking said frame members to said mounting plate against rocking movements, a fluid supply tank carried by said frame members outwardly of said mounting plate, a generally horizontally-disposed evaporator pan carried by said frame members inwardly of said mounting plate, and a gravity flow conduit through said mounting plate connecting said supply tank with said evaporator pan.

2. In a device of the class described, a mounting plate adapted to be secured to the wall of a heating chamber, said mounting plate being provided with an inspection opening, an inspection plate movably secured to said mounting plate and forming a closure for said inspection opening, said mounting plate and inspection plate defining a pair of laterally-spaced parallel vertically-extended slots, a pair of laterally-spaced frame members each extending through a different one of said slots, cooperating means on said frame members and the mounting plate mounting the former in the latter for rocking movements, means for adjustably locking said frame members against rocking movements in said slots, a fluid supply tank carried by said frame members outwardly of said mounting plate, a generally horizontally disposed evaporator pan carried by said frame members inwardly of said mounting plate, and a gravity flow conduit through said mounting plate connecting said supply tank with said evaporator pan.

3. The structure defined in claim 2 in which said means for adjustably locking said frame members in said slots comprises integrally formed inturned flanges on said mounting plate, and thumb nut-equipped screws extending laterally through said flanges and engageable with segmental slots in said frame members.

4. The structure defined in claim 2 in which said mounting plate and inspection plate cooperatively defining an elongated slot intermediate said spaced slots for the reception of said conduit.

NICK J. DOVOLIS.

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