

W. P. KLOBUKOWSKI.
HUMIDIFIER FOR HEATERS.
APPLICATION FILED MAY 18, 1911.

1,057,851.

Patented Apr. 1, 1913.

2 SHEETS—SHEET 1.

Fig. 1

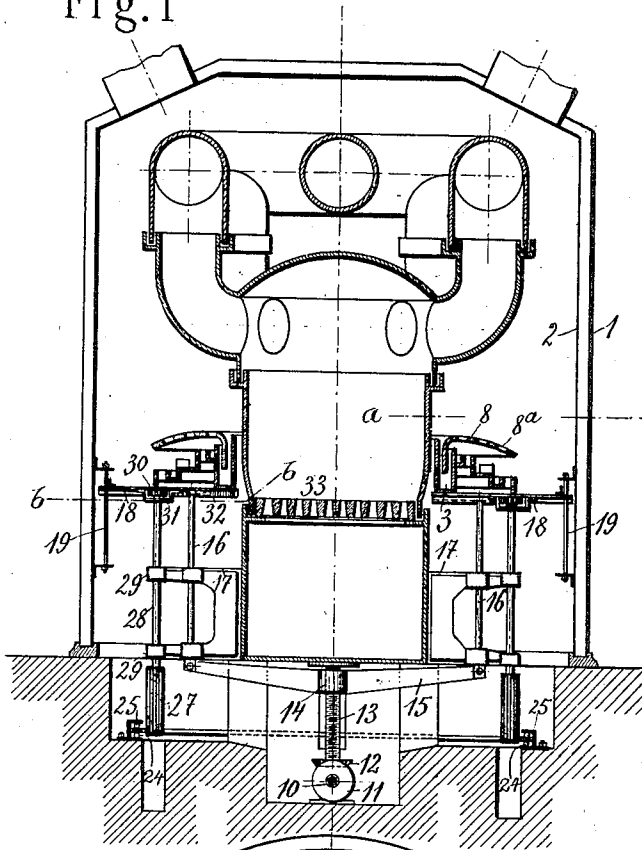


Fig. 3.

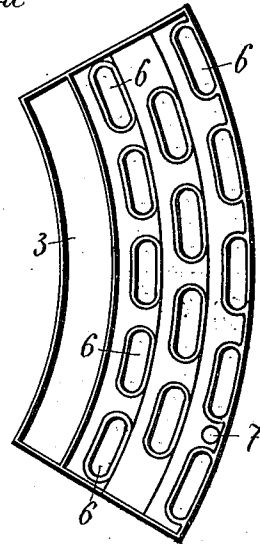


Fig. 2.

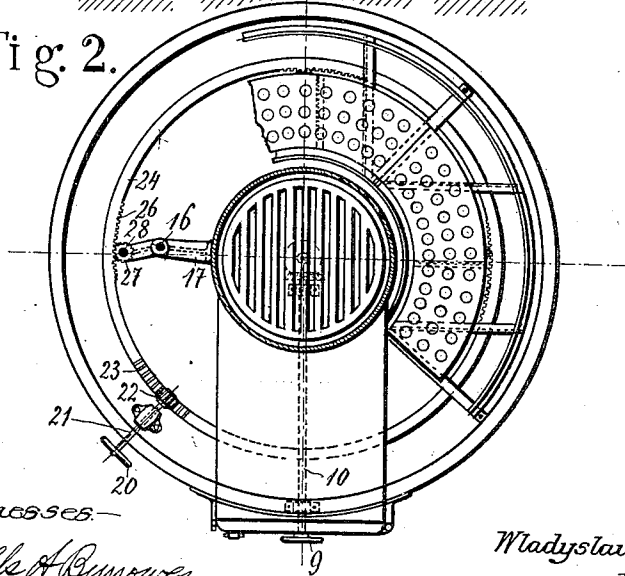
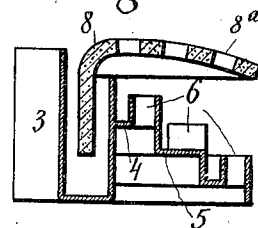


Fig. 4.



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W. P. KLOBUKOWSKI.
HUMIDIFIER FOR HEATERS.
APPLICATION FILED MAY 16, 1911.

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2 SHEETS—SHEET 2.

Fig. 5.

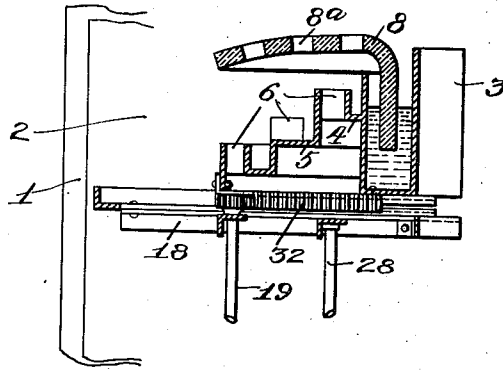


Fig. 6.

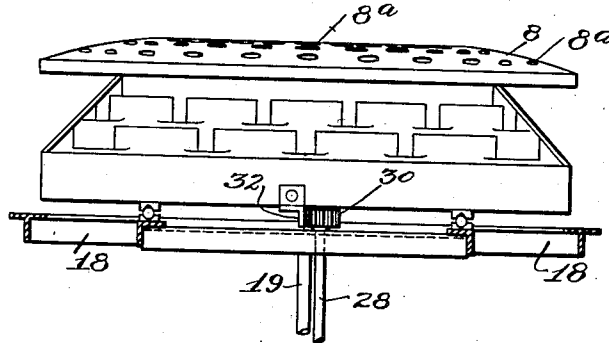
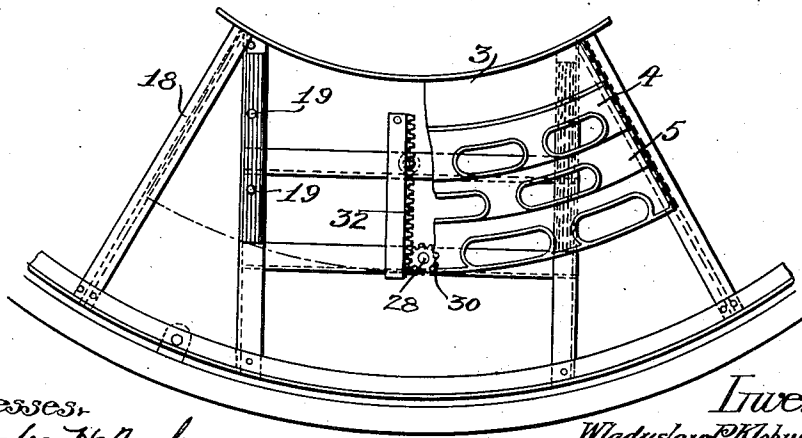


Fig. 7.



Witnesses:
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UNITED STATES PATENT OFFICE.

WLADYSŁAW P. KLOBUKOWSKI, OF WARSAW, RUSSIA.

HUMIDIFIER FOR HEATERS.

1,057,851.

Specification of Letters Patent.

Patented Apr. 1, 1913.

Application filed May 16, 1911. Serial No. 627,499.

To all whom it may concern:

Be it known that I, WLADYSŁAW P. KLOBUKOWSKI, a subject of the Emperor of Russia, and a resident of the city of Warsaw, Poland, Russia, have invented certain Improvements in Humidifiers for Heaters, of which the following is a specification.

The object of my invention is to provide a heater of the general character of that shown in my application No. 570,801, filed July 7, 1910 with improved means for supplying moisture to the heated air, in direct proportion to the quantity and temperature of said air; the arrangement of parts being relatively compact as well as substantial in construction. These objects and other advantageous ends I secure as hereinafter set forth, reference being had to the accompanying drawing, in which:—

Figure 1, is a vertical section illustrating the preferred arrangement and construction of my humidifier as applied inside the casing of a hot air furnace; Fig. 2, is a horizontal partial section, part of which is taken on the line *a—*a**, and part on the line *b—*b** of Fig. 1; Fig. 3, is a plan of a portion of the humidifier shown in Fig. 1, without the porous body; Fig. 4, is a fragmentary vertical section of a portion of the preferred form of humidifier employed as part of my heater; Fig. 5, is a section similar to Fig. 4 but illustrating a part of the adjusting mechanism associated therewith; Fig. 6, is a side elevation of the upper part of my humidifier; and, Fig. 7, is a plan of a part of my humidifier, the porous body and part of the water container being omitted.

In order to supply moisture to the air in sufficient amounts to secure the best hygienic conditions, I provide a sectional annular humidifier preferably mounted upon a suitable supporting structure and immediately adjacent to the fire pot 33 of the furnace. As shown in Figs. 1 and 2, said humidifier preferably consists of a narrow, relatively deep, annular container 3 surrounding and immediately adjacent the fire pot, and formed with its outer wall less in height than its inner wall. Surrounding this container is a series of concentric steps 4, 5, etc., arranged in cascade form and having through them a number of openings 6 for the passage of air. This container is so formed as to be capable of adjustment vertically on the fire pot in order to vary the rate of evaporation of its contents, though

when made in sections it may be movable horizontally toward and from said fire pot in order to attain the same end. If desired, the water supply to the container 3 may be arranged removably and provided with an overflow to carry off the surplus water from the lowermost of the steps which is shown as a container. In order to increase the rate of evaporation of the water from this device, without adjusting it, I may mount in the container 3 an annular body of fire brick or other relatively porous refractory material 8; preferably forming this in a series of sections and flanging it outwardly. It is preferably perforated as shown at 8^a and under operating conditions liquid drawn up into it by capillary action is thoroughly exposed to the action of the rising currents of air. Instead of being made in sections, the porous evaporating body may be made in other forms having a relatively great evaporating surface without departing from my invention. By reason of the fact that this humidifying device is mounted around or immediately adjacent the fire pot, the liquid within it is heated to an extent or is evaporated at a rate in a great degree proportional to the temperature of the source of heat, that is, its temperature is dependent on the rate at which fuel is burned in the fire pot, so that the amount of liquid evaporated bears a definite relation to the volume of air which is heated. Thus when the heater is driven to its full capacity, the air delivered therefrom is more highly heated and passes through it in greater quantities than when it is burning less fuel, and the amount of moisture supplied to the air by my humidifier is automatically regulated, being at all times supplied in the desired and necessary amounts.

While I have described and illustrated the container constituting the main part of the humidifier as formed in a number of cascades, it is obvious that the angle and detail arrangement of these may be varied within wide limits without departing from my invention; the object of which is to provide a water container immediately adjacent the sides of the fire pot or other source of heat.

The moving of the humidifier in horizontal or vertical directions may be accomplished in various ways, and I have illustrated one way of carrying out the invention. The motion in a vertical direction is

obtained by means of the following device: Outside of the casing 2, a small handwheel 9 is fixed to a shaft 10 which has fixed to its opposite end a beveled gear 11 meshing
 5 with a second beveled gear 12 fixed on the end of a screw shaft 13. On this latter is threaded a nut 14 with arms 15 having at their ends vertically extending rods 16 sliding in guides 17. These rods 16 are attached to a
 10 suitable frame 18 on which the humidifier is mounted and said frame slides on and is guided by rods 19 fixed to the casing 2. Turning the handwheel 9 to the right or left hand causes the humidifier to be raised or
 15 lowered relatively to the fire pot 33 as may be desired. In order to move the humidifier horizontally toward or from the fire pot, there is provided a second handwheel 20 outside of the casing 1, 2 and fixed on a
 20 shaft 21. This latter has fixed to its inner end a gear wheel 22 meshing with a toothed rack 23 formed on or attached to an annular structure 24 supported in suitable bearings 25. This structure has teeth formed on its
 25 inner edge in position to mesh with elongated pinions 27 fixed to spindles 28 sliding vertically in guides 29 and having on their upper ends gears 30. These latter gears each mesh with a toothed bar or rack
 30 32 fixed to the under side of the humidifier sections. By turning the handwheel 20, the sections of the humidifier will be moved toward or from the fire pot 33, as the case may be.

35 From the above description it will be seen that the humidifier may be moved up or down relative to the fire pot to vary the amount of aqueous vapor supplied to the air passing through the heater, while in addition the segmental sections of said humidifier may be moved horizontally toward or
 40 from the fire pot by suitable turning of the handle 20. As is obvious the elongated gears 27 permit of the vertical adjustment of the humidifier while continuing the operative connection between the humidifier sections and the handle 20. It is also obvious that the porous body 8 may be used in connection with the apparatus shown or omitted if desired, without departing from my invention.

I claim:—

1. The combination in a heater of a casing having conduits for supplying and discharging
 55 air respectively; a fire pot in the casing; and a water container in the form of a plurality of segmental structures each having a series of substantially concentric chambers of different diameters, communicating
 60 with each other and mounted around said fire pot for supplying moisture to the air in the casing.

2. The combination in a heater of a casing having conduits for supplying and discharging
 65 air respectively; a fire pot in the casing;

and a water container in the form of a plurality of concentric annular chambers emptying one into the other and arranged adjacent to said fire pot for supplying moisture to the air in the casing.

3. The combination in a heater of a casing having conduits for supplying and discharging
 70 air respectively; a fire pot in the casing; and a water container in the form of a series of annular concentric chambers arranged with water discharging edges at different levels in the position to deliver liquid
 75 from one chamber to another; said chambers being adjacent said fire pot in position to supply moisture to the air in the casing.

4. The combination in a heater of a casing having conduits for supplying and discharging
 80 air respectively; a fire pot in said casing; and a water container in the form of a plurality of segmental structures each provided with a series of chambers arranged in cascade form and surrounding said fire pot for
 85 supplying moisture to the air in the casing.

5. The combination in a heater of a casing having conduits for supplying and discharging
 90 air respectively; a fire pot in said casing; and a water container in the form of a series of cascades adjacent said fire pot for supplying moisture to the air in the casing; there being openings through said container
 95 terminating above the water level thereof for the passage of air.

6. The combination in a heater of a casing having conduits for supplying and discharging
 100 air respectively; a fire pot in said casing; and a water container adjacent said fire pot for supplying moisture to the air in the casing; with a body of refractory porous material having a substantially vertical portion
 105 extending into the container so as to absorb liquid therefrom and also having a substantially horizontal perforated part.

7. The combination in a heater of a casing having conduits for supplying and discharging
 110 air respectively; a fire pot in said casing; a water container adjacent said fire pot for supplying moisture to the air in the casing; with an annular flanged body of porous material also adjacent the fire pot and extending
 115 into the container so as to receive moisture therefrom by capillary action.

8. The combination in a heater of a casing having conduits for respectively supplying and discharging air; a fire pot in the casing;
 120 and a water container in the form of a series of annular concentric chambers of different diameters; there being air conduits extending through the chambers and terminating above the normal water level thereof.

9. The combination in a heater of a casing having conduits for supplying and discharging
 125 air therefrom; a fire pot in the casing; and a sectional water container movably mounted adjacent the fire pot; with mechanism for simultaneously moving the sections 130

of said container toward and from said fire pot.

10. The combination in a heater of a casing having conduits for supplying and dis-
5 charging air therefrom; a fire pot in the casing; and a sectional water container movably mounted adjacent the fire pot; with means for moving the sections of said container toward and from said fire pot; and
10 means for moving said water container up and down in lines substantially parallel with the sides of the fire pot.

11. The combination in a heater of a casing having conduits for supplying and dis-
15 charging air; a fire pot in the casing; a

water container surrounding said fire pot and consisting of a number of water holding structures arranged in cascade form; with an annular body of porous refractory material mounted in the container adjacent
20 the fire pot and extending outwardly therefrom.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

WLADYSLAW P. KLOBUKOWSKI.

Witnesses:

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