Oct. 28, 1930. A. H. W. SCHMIDT 1,779,714

HEATING AND VENTILATING SYSTEM

Filed Oct. 25, 1926

Fig. 1.

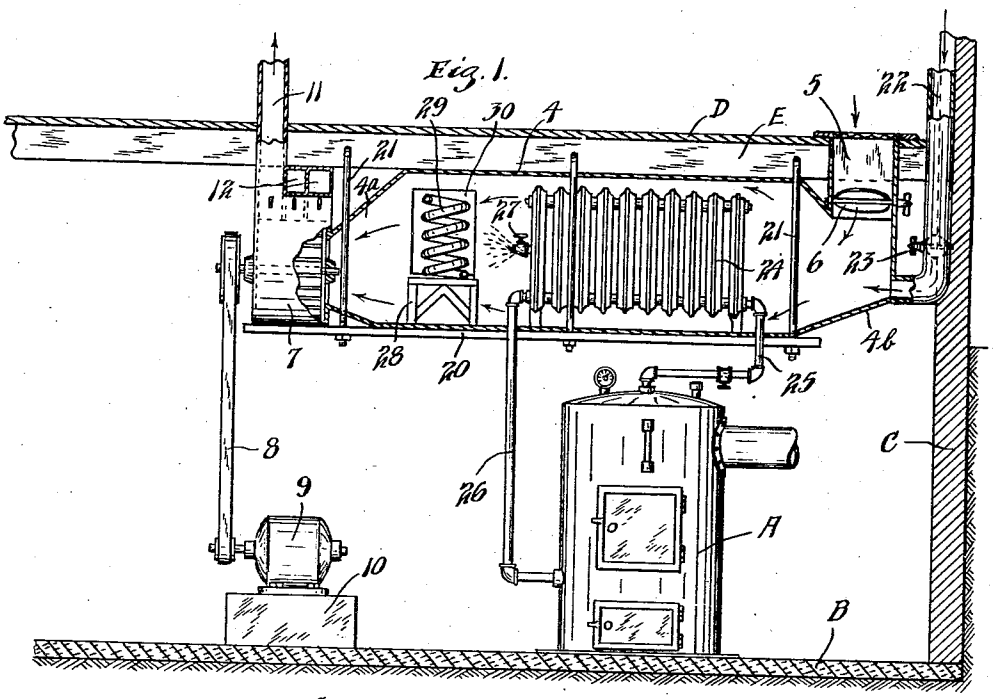


Fig. 2.

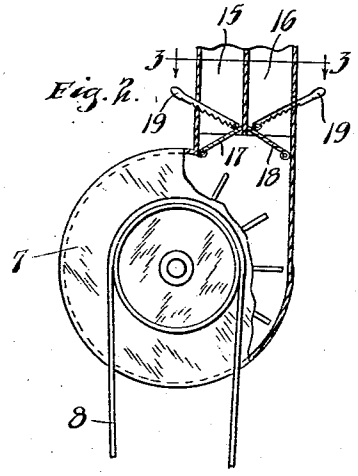
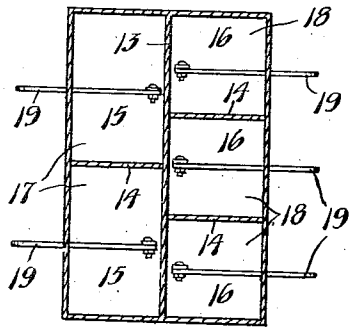


Fig. 3.



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HEATING AND VENTILATING SYSTEM

Application filed October 25, 1926. Serial No. 143,895.

This invention relates to heating and ventilating systems and more particularly to such systems of the indirect type.

It is the main object of the invention to provide a simple and highly efficient indirect heating, cooling and ventilation system capable of being easily installed in connection with a steam or hot water boiler.

This and other objects of the invention will be apparent from the following description made in connection with the accompanying drawing wherein like characters refer to similar parts throughout the several views, and in which:

Fig. 1 is a diagrammatical view, showing a preferred embodiment of my invention installed in a building;

Fig. 2 is an end elevation, showng the fan with some portions broken away to show the distributing conduits and dampers; and

Fig. 3 is a cross section taken on the line 3—3 of Fig. 2.

Referring to the drawings, in detail, a steam boiler A is illustrated supported on the basement floor B, a wall of the building being indicated by the letter C. D indicates the first floor of the building supported on the joists E.

I provide a relatively large heating chamber 4, preferably formed of sheet metal having tapered front and rear ends 4^a and 4^b respectively. The main air intake passage 5 communicates with the rear tapered end 4^b, drawing its supply of air preferably from the interior of the building and controlled by means of a damper 6. The forward tapered end 4^a of the heating chamber is connected to a fan 7, driven through endless belt 8 by means of a motor 9, illustrated as mounted on a base 10 supported by floor B. The outlet of the fan casing is divided into a plurality of compartments, best shown in Fig. 3, communicating with the distributing conduits 11 and 12. As illustrated, the outlet passage of the fan is divided longitudinally by a partition 13 and transversely by partitions 14, forming two relatively large passages 15 communicating with the distributing conduits and three smaller passages 16. Inwardly swinging dampers 17 and 18 are mounted in passages 15 and 16 respectively, controlling the admission of air therethrough. These dampers are hinged to the walls of the fan casing, outlet dampers 17 and 18 swinging oppositely and stopped by means of vertical partition 13, as shown in Fig. 2. The hinges of said dampers are disposed below the lower edge of partition 13 to cause said dampers to be diagonally disposed when closed. Damper bars 19 extend through the sides of the fan outlet.

Chamber 4 and fan 7 are supported by any suitable means, such as the horizontal platform 20, supported from the joists E, by means of hook bolts 21.

A relatively small air intake conduit 22 communicates with the tapered rear end 4^b of chamber 4 at a point below passage 5 and is provided with the damper 23 to control the admission of air therethrough. Conduit 22 draws air from without the building for the purpose of supplying, if desired, to the circulation a small amount of fresh air.

Within the central portion of chamber 4, I mount a radiator 24 of any suitable type, connected to boiler A, by means of intake and outlet pipes 25 and 26 respectively. An atomizer or distributing valve 27 is provided in the forward end of radiator 24 preferably disposed centrally of the last coil or unit and adapted to discharge vapor within the heating chamber. A support 28 is disposed between radiator 24 and fan 7, within chamber 4, adapted to support a refrigerating coil 29. A suitable door 30 is provided in one side of chamber 4 to permit coil 29 to be removed in cold weather if so desired.

Operation

The operation of my device is probably obvious from the foregoing description, but may be briefly summarized as follows:

A circulation of steam or hot water, as the case may be, depending upon whether a steam or hot water boiler is used, in connection with the system, is set up through radiator 24. Fan 7 causes a draft of air to be set up through the heating chamber normally supplied from rooms within the building and entering the heating chamber from passage

5. The warm air is thus circulated. If desired, a small amount of fresh air may be mixed with the circulating air by opening damper 23 in the smaller intake passage 22. The circulating air passes over and through radiator 24 and is subsequently moistened by means of the exhaust steam or vapor discharged by valve 27. The amount of moisture discharged may be regulated by said valve. The heated and moistened air then passes through fan 7 into the desired distributing conduits.

The construction of the passages 15 and 16 communicating with distributing conduits 11 and 12 and the mounting of dampers 17 and 18 is of considerable importance. It will be seen that the dampers when closed serve to direct the heated and moistened air to the open passages, because of their diagonal disposition and the fact that they are hinged to the sides of the fan discharge.

In warm weather the refrigerating coil 29 may be operatively connected to a refrigerating plant and the apparatus will serve as a cooling system for the building. It will be seen that the building is not only heated by means of the indirect system, but is, moreover, efficiently ventilated thereby.

The efficiency of the system is high, due to the fact that the air is circulated throughout the building and will be readily re-heated or cooled to the desired temperature by passing through the thermo chamber 4. The proper humidity may be maintained in the circulating air without requiring humidifiers in the several rooms within the building.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of parts without departing from the scope of the invention.

What is claimed is:

1. Apparatus of the class described having in combination an elongated chamber, an air intake passage adjacent one end of said chamber, means for causing air to pass through said chamber, means for thermally treating air passing through said chamber, and heat distributing means comprising a pair of oppositely disposed passages, oppositely swingable dampers in said passages adapted to form in conjunction a concavo surface when closed, and each operative to guide discharged air to one of said passages when the damper in said last mentioned passage is open.

2. Apparatus of the class described having in combination an elongated thermal chamber, an air intake passage adjacent one end thereof, means for causing air to pass through said chamber, means for thermally treating said air in its passage and heat distributing means adjacent the other end of said chamber comprising a pair of oppositely swingable plates hinged at their outer ends and disposed when closed in oppositely inclined positions, with their free ends in juxtaposition, whereby when one of said plates is opened and said other plate closed said closed plate will guide discharged air through the passage controlled by said open plate.

3. In air conditioning apparatus, an elongated chamber having an air intake passage adjacent the rear end thereof, and a discharge passage adjacent the forward end thereof, a radiator element within said chamber connected to a source of hot circulating fluid, a discharge passage at the forward end of said radiator element, a humidifying valve connected with said last named discharge passage and constructed to dispense a conical discharge of fluid centrally of said chamber and in the direction of said discharge end, a suction fan at the discharge end of said chamber adapted to set up a swift passage of air therethrough and to mix with said air and disintegrate particles of fluid dispensed by said humidifying valve, and an air delivery conduit connected with the delivery end of said fan.

4. Air conditioning apparatus built in the form of a unit, comprising an elongated substantially straight casing having an air intake passage adjacent its rear end, and an air discharge passage adjacent its forward end, means for suspending said casing from the joists of a floor, a radiator element mounted within and supported from said casing and connected with a source of hot circulating fluid, a discharge passage at the forward end of said radiator element, a humidifying valve connected with said last named discharge passage and constructed to dispense fluid centrally of said casing and in the direction of the discharge end thereof, and a suction fan secured to the forward end of said casing and adapted to set up a swift passage of air through said casing and also to mix with said air and disintegrate particles of fluid dispensed by said humidifying valve, and an air delivery conduit connected with the discharge end of said fan.

In testimony whereof I affix my signature.

ALBERT H. W. SCHMIDT.