May 23, 1933. E. HERRING 1,910,105

HEATING APPARATUS FOR WARMING BUILDINGS

Filed Feb. 5, 1931

Fig. 1.

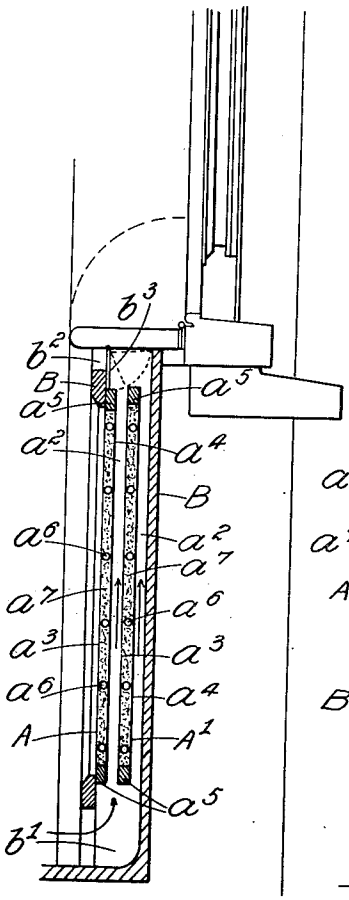
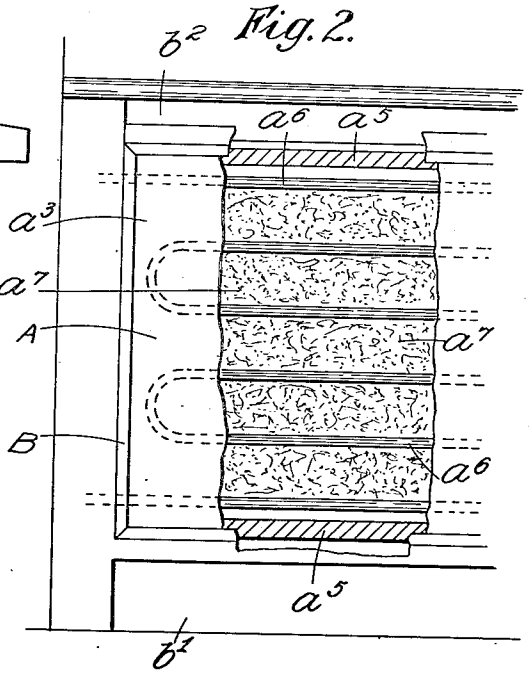


Fig. 2.



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HEATING APPARATUS FOR WARMING BUILDINGS

Application filed February 5, 1931, Serial No. 513,729, and in Great Britain March 5, 1930.

This invention has reference to an improved construction of heating apparatus forming a combined radiator and convector unit in which the heating medium may be either hot water or steam, the object of the invention being to produce a heating unit which not only serves for the purpose of direct radiation, but also for indirect heating by convection with means to enable the convected heat to be regulated as desired, and of such construction as to prevent lodgment of dust or other matter on all interior parts and ample provision for easy cleaning.

According to this invention the unit comprises any number of thin vertical sections or heating elements, each section being constructed preferably but not necessarily of two sheet metal plates spaced apart preferably by a metallic marginal strip. Located between these plates is a continuous coil of metal piping through which the heating medium circulates, such coil being connected to the flow and return service pipes in the usual manner with the necessary control valves.

Transmission of heat from the coil to the plates is obtained by contact with the plates and by embedding such coil in plaster or other suitable material having a high conduction coefficient which entirely fills up the space between said plates.

The sections are assembled to form the unit, with an intervening space between each for the passage of air, which air enters at the base of the unit and is heated by convection in its passage upwards, being discharged through an opening or grating near the upper end of the apparatus, and in order to enable any or all of such airways to be shut off when desired a flap or equivalent arrangement is provided at the top of such airways. Or each airway may have a separate regulating device.

When the unit is fixed in position one of its plain surfaces is directly exposed to the room so that direct heat radiation is obtained from such surface, but as the other plain surfaces at the rear, which form the airways for the passage of air taken from the room or direct from atmosphere, heat such air by convection as it passes upwards into said room, we obtain direct heat radiation as well as indirect heating by convection, and as one or more of the airways can be closed when required the amount of heat given off by convection can be varied without the necessity of operating the valves controlling the heating medium.

In order that the invention may be clearly understood I have appended the accompanying drawing.

Fig. 1 is a sectional side-elevation showing the heating apparatus fixed against the wall beneath the window of a room.

Fig. 2 is a broken part sectional front elevation of the apparatus shown by Fig. 1.

As illustrated at Fig. 1 I have shown the combined radiator and convector unit composed of two vertical heating elements or sections A, A^1, assembled so as to leave an intervening space a^2 between the sections, but it must be understood there may be only one or more than two of these sections if desired or found necessary.

Each of these sections is constructed of two thin sheet metal plates a^3, a^4, spaced apart by the metallic marginal strip a^5, with the continuous coil of metal piping a^6 located between, through which pipe a^6 the heating medium circulates, connections between the flow and return service pipes being provided in the usual manner with the necessary control valves.

Heat is transmitted from the coil a^6 to the plates a^3, a^4 by contact with said coil a^6, and by filling the space between said plates with plaster a^7 or other suitable material having a high conduction coefficient so as to entirely embed said coil.

The sections A, A^1 when assembled are supported and fixed in position in a frame or enclosure B to form the unit, such frame B being provided with an opening in the front so that the surface a^3 of section A is directly exposed to the room, the intervening space a^2 between the sections form a passage for air which enters through the opening b^1 at the base of the unit and is discharged through the opening or grating b^2, near the upper end thereof. A flap valve

b^3 or equivalent is provided at the top of the airways a^2 so as to enable either or both of such airways to be shut off when desired.

It will be seen as the surface a^3 of section A is directly exposed to the room, that direct heat radiation is obtained from such surface, but as the other surfaces of the sections A, A^1 which constitute the airways for the passage of air taken from the room or direct from atmosphere, heat such air by convection as it passes upwards into said room, that we not only obtain direct heat radiation, but also indirect heating by convection, and as one or both of the airways a^2 can be closed when required, the amount of heat given off by convection can be varied without the necessity of operating the valves controlling the heating medium.

The flap valve b^3 regulating the passage of air through the airways a^2 as well as the control valves may if desired be operated automatically by means of a suitable arrangement of thermostatic control.

It will be seen as the whole of the parts of the apparatus are flat and smooth that it is practically impossible for dust to accumulate on the surfaces, and also that the apparatus is constructed to facilitate cleaning.

What I claim as my invention and desire to secure by Letters Patent is:—

As a new article of manufacture a heating unit for incorporation as a wall panel in a building structure comprising a pair of imperforate substantially parallel flat sheet metal plates, a spacing strip between said plates adjacent the edges thereof and serving to enclose the space between said plates, and a continuous one piece heating coil mounted between said plates within the confines of said spacing strip, said coil being in contact with each of said plates throughout a greater portion of the length thereof, and a plastic heat conducting material filling the space between the convolutions of said coil.

In testimony whereof I have signed my name to this specification.

EDGAR HERRING.