W. N. LE PAGE.

AIR HEATER.

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959,362.

Patented May 24, 1910.

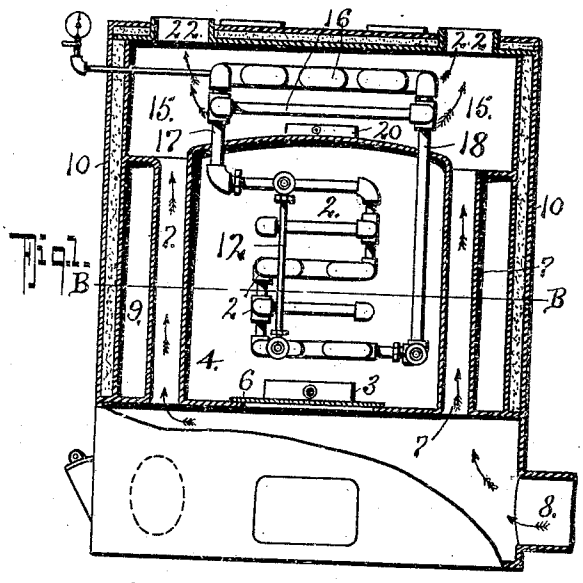

Fig. 1.

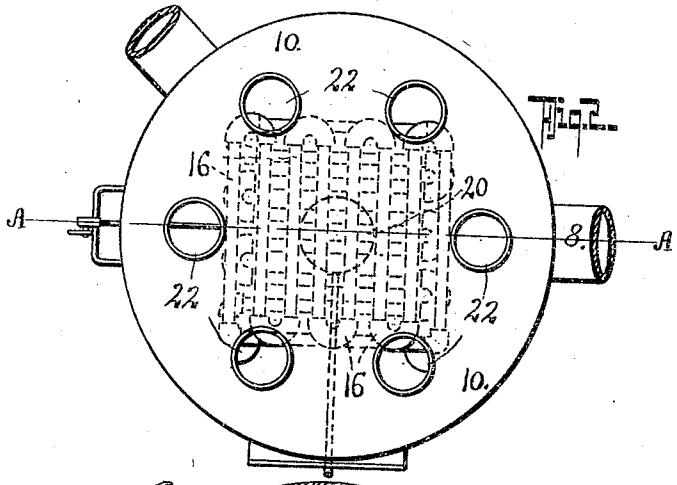

Fig. 2.

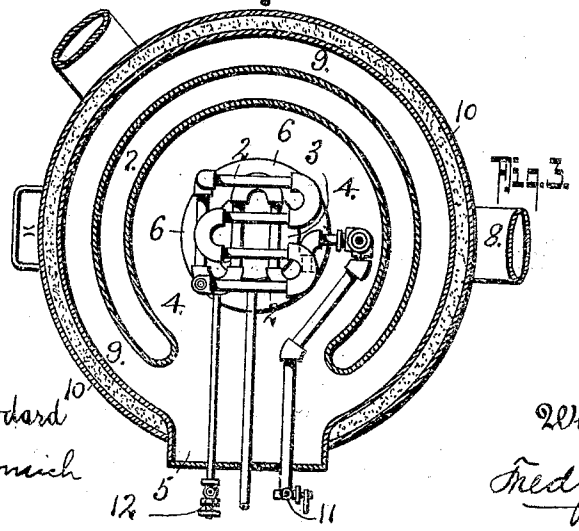

Fig. 3.

Witnesses
Hayward Woodard
May E. Innnich

Inventor
William N. LePage
Fred G. Dieterich & Co
Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM N. LE PAGE, OF VANCOUVER, BRITISH COLUMBIA, CANADA, ASSIGNOR TO ETHEL MAY LE PAGE, OF VANCOUVER, CANADA.

AIR-HEATER.

959,362. Specification of Letters Patent. Patented May 24, 1910.

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To all whom it may concern:

Be it known that I, WILLIAM N. LE PAGE, a citizen of the Dominion of Canada, residing at Vancouver, in the Province of British Columbia, Canada, have invented a new and useful Air-Heater, of which the following is a specification.

This invention relates to an air heater for domestic buildings and belongs to that class wherein a supply of pure external air is passed through a chamber in contact with water pipes heated by gas burners or other means and my object has been to obtain a greater heat than is obtainable where the air is brought in contact with hot water or saturated steam. This object I attain by the provision of a supplementary gas burner or other heater by which the steam generated in the water coils may be superheated adjacent to the final hot air delivery. The particular means by which this object is carried out is particularly described in the following specification, reference being made to the drawings by which it is accompanied, in which:

Figure 1 is a vertical part section through the heater on the line A A in Fig. 2; Fig. 2, a plan showing in dotted lines the arrangement of the supplementary heater coils; and Fig. 3, a sectional plan on the line B B in Fig. 1.

These drawings show the application of the device to an air heating furnace of a common type and to the use of Bunsen gas burners but it must be distinctly understood that the particular form and arrangement of the casing which incloses the heating coils and the use of gas burners is not material to the invention as the casing may be modified and other heating agencies employed.

As here shown the invention comprises a water coil 2 heated by a Bunsen gas burner 3 of approved design and this coil and its burner is inclosed in a chamber 4 to which access may be had by means of a doorway 5, but to or from which it is not necessary that there should be any vent or flue other than the doorway 5 as such door may be left open when the burner 3 is lighted to give exit to the products of combustion.

The heating chamber 4 has a dead plate 6 occupying the position of the furnace grate of an ordinary heater and is surrounded by an annular fresh air flue 7 to which pure air is admitted from an external source through a passage 8. As in an ordinary air heating furnace the heating chamber is surrounded by an annular flue 9 through which the products of combustion pass the same may be utilized as a means for exposing both sides of the pure air passage 7 to the heat from the burner 3 and the water coils 2. The fresh air flue or passage 7 may be of segmental arc form in cross section, as clearly shown in Fig. 3. The whole is inclosed by an external casing 10 of heat non-conducting material.

The water heating coil 2 is provided with a closable feed pipe 11 by which the coil may be filled with water to the required height as indicated by an external gage glass 12.

The annual fresh air passage 7 is in connection above with a supplementary heating chamber 15 which is inclosed within the external casing 10, and within this supplementary chamber 15 is a coil 16 connected by pipes 17 and 18 to the water coil 2 in the chamber 4 beneath. This coil 16 being designed to superheat the steam from the coil 2 is independently heated by a separate Bunsen gas burner 20 or other means and is provided with a safety valve and pressure gage. From the chamber 15 the pure heated air passes through the outlet passages 22 and is conveyed by pipes to the several rooms of a house or parts of a building. The upper gas burner may be automatically regulated by a thermostat or other means.

In use the water coil 2 is filled with water to the required height as indicated on the gage glass 12 and the filling aperture is closed. The heat is then applied to the water coil by the gas burner 3 or other heating agency and when steam is generated it passes up into the coil 16 and is there superheated by the gas burner 20 or other heating agency. The pure air entering at the inlet 8 is heated by contact with the walls of the passage 7, and passing upward enters the supplementary heating chamber 15 to receive a further increase of heat from contact with the pipes of the coil 16 which contain steam from the coils 2 beneath superheated by the Bunsen burner 20.

A means is thus provided whereby pure air is heated above the temperature of boiling water or saturated steam while advantages arise from the convenience of water and steam coils as a means for offering an

extended heating surface to the incoming air.

Having now particularly described my invention and the manner of its use, I hereby declare that what I claim as new and desire to be protected in by Letters Patent, is:

1. In an air heater, an outer casing, partitions in said casing dividing the same into three horizontal chambers, one above the other, a primary water containing coil in the intermediate chamber, a heater for said coil within said intermediate chamber, a secondary heating coil in the upper chamber, pipe connections between the secondary heating coil and the primary heating coil, a secondary burner in the upper chamber for said secondary heating coil, means for admitting fresh air into the lower chamber, means for exhausting heated air from the upper chamber, and a pipe of segmental arc form in said second chamber surrounding said primary heating coil and connecting the lower and upper chambers to permit passage of air from the lower to the upper chamber.

2. In a hot air furnace, a casing having a plurality of horizontal partitions dividing the same into an upper, an intermediate and a lower chamber, a door opening into said intermediate chamber, a primary heating coil in said intermediate chamber, a secondary heating coil in the upper chamber, pipe connections between said heating coils, means for applying heat to said primary heating coil, and independent means for applying heat to said secondary heating coil, and means within said intermediate chamber for effecting communication between said upper and lower chambers, means for admitting fresh air into said lower chamber, means for conveying air out of said upper chamber, all being arranged that said secondary heating coil and said upper chamber will also be heated from the heat in said intermediate chamber, substantially as shown and described.

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

WILLIAM N. LE PAGE.

Witnesses:

ROWLAND BRITTAIN,

ALEXANDER SMITH.