E. COLE.

GAS RADIATOR.

APPLICATION FILED SEPT. 6, 1916.

1,288,516.

Patented Dec. 24, 1918.

Fig. 3.

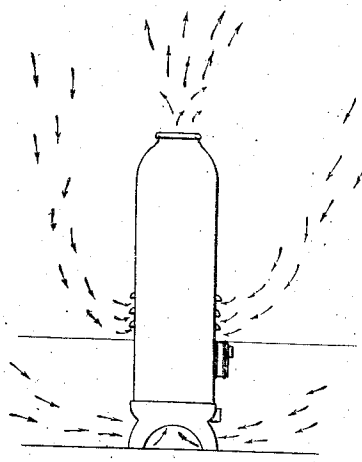


Fig. 1.

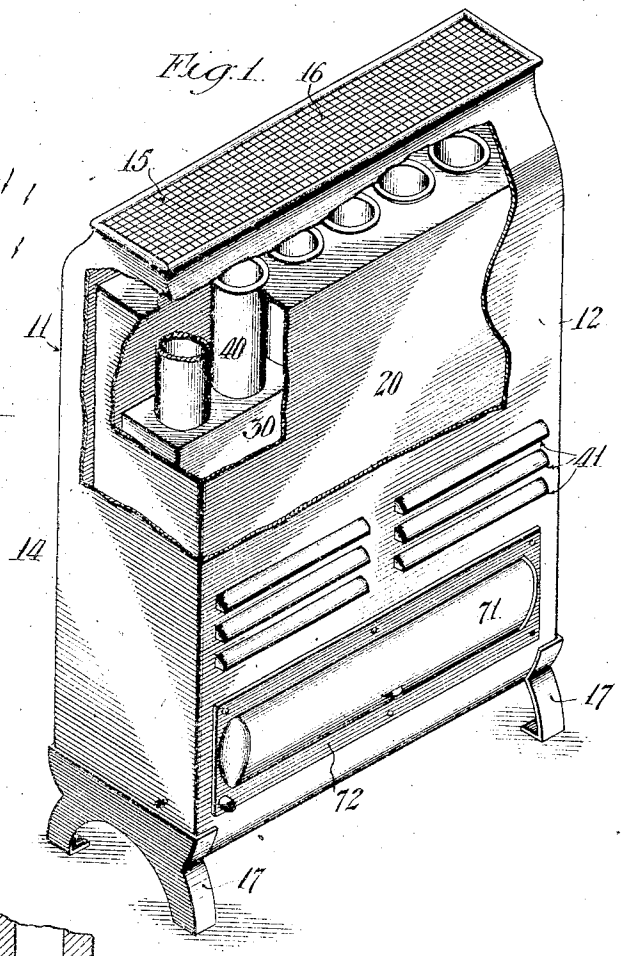


Fig. 2.

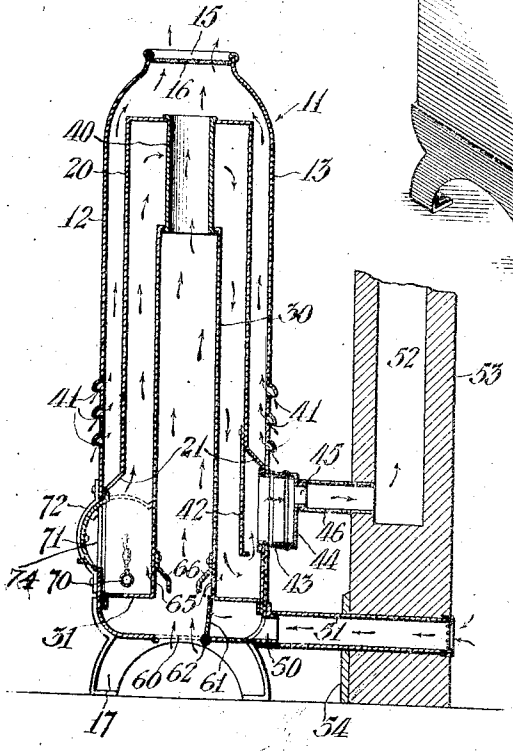
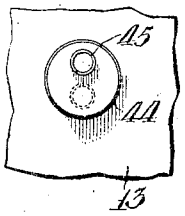


Fig. 4.



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UNITED STATES PATENT OFFICE.

ELNATHAN COLE, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO COLE MANUFACTURING COMPANY, OF LOS ANGELES, CALIFORNIA, A CORPORATION OF CALIFORNIA.

GAS-RADIATOR.

1,288,516. Specification of Letters Patent. Patented Dec. 24, 1918.

Application filed September 6, 1916. Serial No. 118,777.

To all whom it may concern:

Be it known that I, ELNATHAN COLE, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Gas-Radiator, of which the following is a specification.

My invention relates to the art of heating buildings and particularly to gas radiators employed in that art.

The principal object of my invention is to provide a gas radiator which will also serve as a ventilating means for the room to be heated, taking in outside air and heating it before delivering it to the room.

Another object of the invention is to provide a gas radiator which will set up and maintain a brisk circulation in the air of the room to be heated, passing this air through the radiator and forcing it strongly toward the ceiling as it leaves the radiator.

Another object of the invention is to control the proportion of outside air to inside air delivered to the intake of the radiator.

Another object is to provide an auxiliary circulation for all the air above a certain plane in the room taking foul air from the space below this plane, using it in the combustion chamber and passing it off through the flue, so that this foul air is constantly being withdrawn.

Another object of the invention is to provide a radiator in which the heated portions are inclosed in a jacket which is kept cool by the air passing through the radiator. By using a plain outer jacket which is always cool the cost of construction is reduced as the more complicated interior parts are concealed and need no finish and the plain cool outer jacket is readily finished with ordinary paint or varnish. By placing the hot parts inside such a jacket the fire risk of such a radiator is also greatly reduced.

Another object of the invention is to provide a safety door which will shut off the interior of the radiator while the burner is being lighted so that there will be no danger of explosions within the radiator due to the presence of explosive mixtures of air and gas therein.

Another object of the invention is to provide a novel form of flue construction. Further objects and advantages will be made evident hereinafter.

In the drawings which are for illustrative purposes only:

Figure 1 is a perspective view of the radiator a portion thereof being broken away to better illustrate the internal structure.

Fig. 2 is a section through the radiator.

Fig. 3 is a diagram illustrating the circulation of air from the radiator.

Fig. 4 is a detail view showing the method of construction of the eccentric cap and the flue pipe.

In the form of the invention illustrated in these drawings a jacket 11 is provided, this jacket having flat sides 12 and 13, flat ends 14, and a hot air outlet 15 in the extreme top in which a perforated grating 16 is secured. The jacket 11 rests on legs 17. Secured inside jacket 11 is a combustion box 20 which is rectangular in shape and has its lower edges flanged out and secured to the inside of the jacket 11 as shown at 21 in Fig. 2. Secured inside the combustion box is a draft box 30, which has its sides bent out and secured to the inside of the jacket 11 as shown at 31. A series of tubes 40 are each tightly secured in openings formed in the top of the draft box 30 and extending through the space between the draft box 30 and the combustion box 20 and being tightly secured in the top of the combustion box 20 just below the perforated grating 16. A series of auxiliary air inlets 41 are provided in the sides 12 and 13 of the jacket 11, these inlets being formed at a point slightly above the point 21. A baffle plate 42 is secured to the combustion box 20 and extends down in front of a flue manifold 43. The flue manifold 43 is provided with an eccentric cap 44 which may be turned thereon and which has a projection 45 eccentrically located with relation to the center of the cap and of suitable size to receive a flue pipe 46. A projection 50 is formed in the side 13 of the jacket 11 and at the extreme bottom thereof and a cold air inlet pipe 51 is connected thereto. A flue 52 is formed in a wall 53 and the cold air inlet pipe 51 projects through the base board 54 extending to a point outside the building. A room inlet 60 is provided in the extreme bottom of the jacket 11 and a cold air damper 61 is pivoted at 62 in such a position that it will entirely shut off the draft through the cold air inlet pipe 51 or may be dropped down to entirely close the room inlet 60. Draft openings 65

are provided in the wall of the draft box 30 near the bottom thereof and draft control plates 66 are secured inside the draft boxes 30 and project over the draft openings 65. A gas burner 70 of any of the well known types is located in the bottom of the combustion chamber which is formed between the combustion box 20 and the draft box 30. A door 71 is formed in the arc of a circle and is secured in a casing 72 so that it will close a front opening 74 and so that it may be raised to simultaneously give access to the burner 70 and close the throat of the combustion chamber between the combustion box 20 and the draft box 30.

The method of operation of the invention is as follows:

When it is decided to start the radiator, the door 71 is lifted from the position shown in full lines in Fig. 2 and to the position shown in dotted lines in that figure. This shuts off the combustion chamber from the burner 70 and connects the space around the burner 70 with the outer air. The gas may now be turned on and the burner lighted without danger of an explosion in the body of the combustion chamber. As soon as the burner is lighted the door 71 is closed and, the products of combustion and hot gases pass upwardly through the space between the combustion box 20 and the draft box 30 passing between and around the tubes 40 and downwardly through the space between the combustion box and the draft box 30. The baffle plate 42 forces the heated gases to pass to the extreme bottom of the space between the combustion box 20 and the draft box 30. The hot gases then pass around the baffle plate 42 and into the flue manifold 43. The purpose of making the cap 44 eccentric is to allow it to be turned to suit different positions of the opening into the flue 52, thus giving considerable latitude in the cutting of this opening. Air for combustion is supplied through openings 65. The direct draft of the radiator is upwardly through the draft box 30 into tubes 40 and outwardly through the grating 16. The air for the direct draft may be furnished entirely through the room inlet 60 or through the cold air inlet pipe 51. Or any proportion of air may be delivered through either opening by regulating the position of the cold air damper 61. The draft control plates 66 tend to cut off a small proportion of the draft through the draft box 30 and divert it through the openings 65. In addition to the main circulation caused by the direct draft through the draft box 30 there is a secondary circulation through the openings 41 and upwardly between the jacket 11 and the outer surface of the combustion box 20. Maximum ventilating conditions are obtained when the room inlet 60 is closed and cold outside air only is furnished to the direct draft. It is advisable, however, when it is decided to quickly heat a room to close off the cold air inlet pipe 51 and circulate the air in the room until entirely heated. The secondary circulation consists entirely in a reheating and recirculating of the air in the room through the auxiliary inlets 41.

It should be noted that the jacket 11 is formed entirely of flat sheet material which may be painted or enameled and which is always cool due to the circulation of air between it and the combustion box. The jacket also serves to cover up the internal structure of the radiator so that no particular attention need be paid to the appearance of this internal structure. It should further be noted that there are no pockets formed in the interior of the radiator, all of the space being taken up with circulating air, hot spots being thus prevented and high efficiency being attained. The baffle plates 66 are provided to bank the air from the main draft and provide a forced draft to the burner.

I claim as my invention:—

1. In a gas radiator, a jacket having a hot air outlet in its extreme upper end; a combustion box inside said jacket; a gas burner in said combustion box, said jacket having an ignition opening therein, a door in said opening adapted to close said combustion box above the burner when in open position for ignition of the burner; and flue means for drawing off the products of combustion from said combustion box.

2. In a gas radiator, a jacket having a hot air outlet in its extreme upper end; a combustion box inside said jacket; said combustion box having its lower edges tightly secured to the inside of said jacket; and said jacket having air inlets above the point where said box is secured to said jacket; a gas burner in said combustion box; a draft-box centrally located in said combustion box and extending upwardly to a point slightly below the top of said combustion box; a series of tubes tightly secured at one end in the top of said combustion box and tightly secured at the other end in the top of said draft box thus providing an open draft between the interior of said draft box and the open space above the combustion box inside the jacket; and flue means for drawing off the products of combustion from said combustion box.

3. In a gas radiator, a jacket having a hot air outlet in its extreme upper end; a combustion box inside said jacket; said combustion box having its lower edges tightly secured to the inside of said jacket; and said jacket having air inlets above the point where said box is secured to said jacket; a draft box centrally located in said combustion box and extending upwardly to a point slightly below the top of said com-

bustion box; a series of tubes tightly secured at one end in the top of said combustion box and tightly secured at the other end in the top of said draft box thus providing an open draft between the interior of said draft box and the open space above the combustion box inside the jacket; a gas burner in the space between said combustion box and said draft box at one side of said draft box; and flue means connecting with said space at the other side of said draft box.

4. In a gas radiator, a jacket having a hot air outlet in its extreme upper end; a combustion box inside said jacket; said combustion box having its lower edges tightly secured to the inside of said jacket; and said jacket having air inlets above the point where said box is secured to said jacket; a draft box centrally located in said combustion box and extending upwardly to a point slightly below the top of said combustion box; a series of tubes tightly secured at one end in the top of said combustion box and tightly secured at the other end in the top of said draft box thus providing an open space above the combustion box inside the jacket; a gas burner in the space between said combustion box and said draft box at one side of said draft box; flue means connecting with said space at the other side of said draft box; a cold air inlet pipe connecting with the space inside said draft box which is also fed with room air through a room inlet opening in the lower end of said jacket; and damper means for regulating the relative proportion of cold and room air admitted to the space inside said draft box.

5. In a gas radiator, a jacket having a hot air outlet in its extreme upper end; a combustion box inside said jacket; said combustion box having its lower edges tightly secured to the inside of said jacket; a gas burner in said combustion box; a draft box centrally located in said combustion box and extending upwardly to a point slightly below the top of said combustion box; a series of tubes tightly secured at the other end in the top of said combustion box and tightly secured at the other end in the top of said draft box thus providing an open draft between the interior of said draft box and the open space above the combustion box inside the jacket; and flue means for drawing off the products of combustion from said combustion box.

6. In a gas radiator, a jacket having a hot air outlet in its extreme upper end; a combustion box inside said jacket; said combustion box having its lower edges tightly secured to the inside of said jacket; a draft box centrally located in said combustion box and extending upwardly to a point slightly below the top of said combustion box; a series of tubes tightly secured at the other end in the top of said combustion box and tightly secured at the other end in the top of said draft box thus providing an open draft between the interior of said draft box and the open space above the combustion box inside the jacket; a gas burner in the space between said combustion box and said draft box at one side of said draft box; and flue means connecting with said space at the other side of said draft box.

7. In a gas radiator, a jacket having a hot air outlet in its extreme upper end; a combustion box inside said jacket; said combustion box having its lower edges tightly secured to the inside of said jacket; a draft box centrally located in said combustion box and extending upwardly to a point slightly below the top of said combustion box; a series of tubes tightly secured at the other end in the top of said combustion box and tightly secured at the other end in the top of said draft box thus providing an open draft between the interior of said draft box and the open space above the combustion box inside the jacket; a gas burner in the space between said combustion box and said draft box at one side of said draft box; flue means connecting with said space at the other side of said draft box; a cold air inlet pipe connecting with the space inside said draft box which is also fed with room air through a room inlet opening in the lower end of said jacket; and damper means for regulating the relative proportion of cold and room air admitted to the space inside said draft box.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 31st day of August, 1916.

ELNATHAN COLE.