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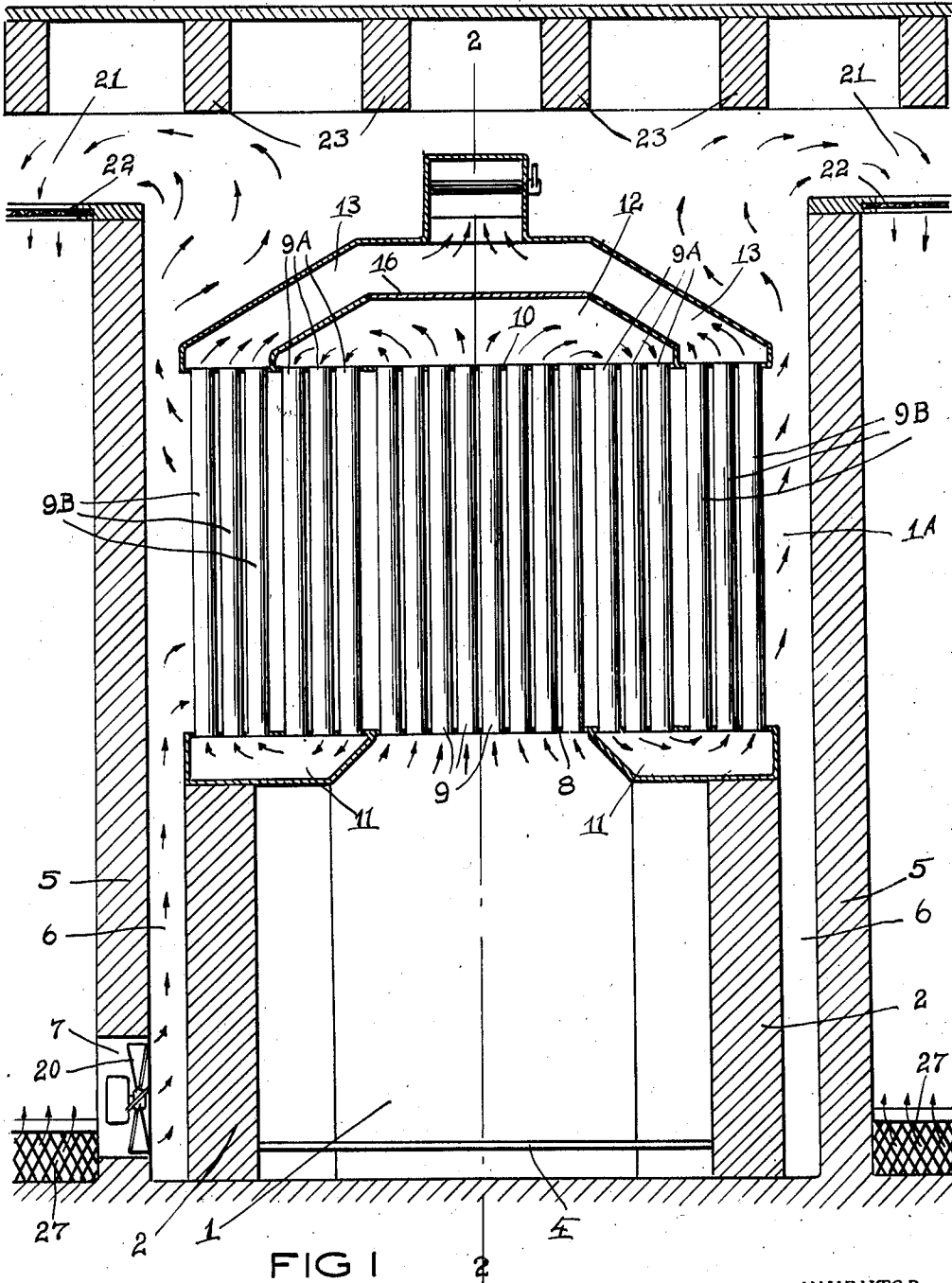
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2,331,178

FIRE PLACE CONSTRUCTION

Filed March 20, 1940

2 Sheets-Sheet 1



BY

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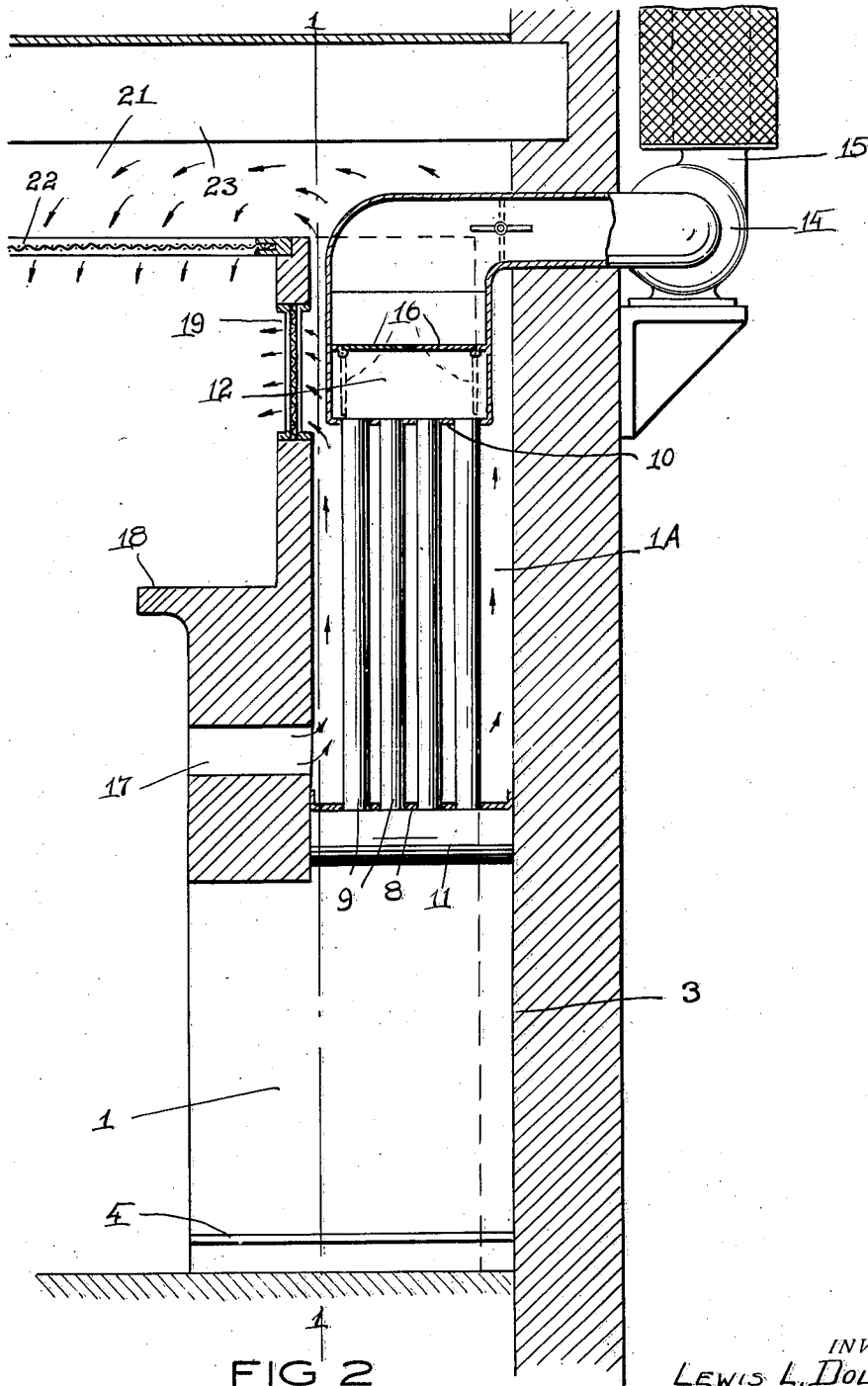


FIG 2

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FIREPLACE CONSTRUCTION

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3 Claims. (Cl. 126-121)

This invention relates to fire place constructions and has for its principal object to provide a novel construction for a fire place in combination with novel heat radiating means whereby the heat generated in the fire place may be efficiently distributed with practically no loss of heat thru the chimney.

Another object of this invention is to provide a novel, inexpensive construction for the chimney of the fire place.

A further object of this invention is to provide a novel system of distributing the heat from the fire place and its heat radiating means.

These and other objects and attendant advantages of the invention will become more readily apparent from the detailed description thereof which follows, reference being had to the accompanying drawings in which

Figure 1 is a vertical sectional view of the fire place taken on the line 1-1 of Figure 2.

Figure 2 is a vertical sectional view of the fire place taken on the line 2-2 of Figure 1.

The fire place construction and heat distributing system forming the subject matter of my present invention is adapted to efficiently distribute practically all heat generated by the fire place and thus prevent the loss of heat thru the chimney. Furthermore the distribution of the heat from the fire place is such that all parts of the room will be heated by the circulation of the heated air thru the ceiling and walls of the room.

As illustrated in the several figures, the fire place comprises the combustion chamber 1 with the jambs 2, 2 on each side and the back wall 3 at the rear thereof. A grate 4 or other suitable fuel support is placed over the hearth to provide sufficient draft for an efficient combustion of the fuel.

Between the jambs 2, 2 and outer walls 5, 5 are provided the vertical ducts 6, 6 which have the inlet 7 at the bottom thereof so that air is adapted to enter from the room to be heated by the fire place and then be re-circulated back into the room.

On top of the fire place between the jambs 2, 2 is formed the heating chamber 1A and in it are supported the plates 8 and 10 with the flues 9 between them. On the plate 8 at the bottom of the flues 9 are provided a pair of headers 11, 11 which connect the open bottom ends of a predetermined equal number of flues on each side of the header. The flues in the middle of the plates 8 and 10 thus carry off the products of combustion from the fire place into the header 12 located above the upper plate 10. From this

header the gases are directed to pass down thru a number of flues 9A into the header 11, 11 to again rise up thru another series of flues 9B into each end of the duct 13 and out thru the middle thereof into the housing of the fan 14. The fan in turn is connected to the chimney 15 so that all products of combustion are finally carried off thereby. A sufficient number of flues 9, 9A and 9B are used to carry off the products of combustion from the fire place in the manner above described so that a maximum amount of the heat generated by the fire place may be absorbed by the air which circulates between the flues 9 and around the outside of the headers and their chambers.

The fan 14, when operating, creates a partial vacuum in the duct 13 which causes the swinging doors 16 in the middle of the header 12 to be held in a horizontal position in which all of the products of combustion passing thru the plate 10 are directed thru the chamber for circulation thru the flues 9A and 9B into the duct 13. With the fan 14 inoperative, the swinging doors 16 drop and open the top of the header 12 into the duct 13 in order that the products of combustion may pass directly from the header 12 into the duct 13 and thru the fan casing into the chimney.

In this way the forced draft created by the operation of the fan causes the products of combustion to travel thru all of the flues 9, 9A and 9B to efficiently radiate substantially all of their heat for absorption by the air which circulates around them, whereas the natural draft provided by the chimney without the aid of the fan causes the products of combustion to pass thru but a portion of the flues with a corresponding reduction in the radiation of the heat of the products of combustion. Heat from the fire place may thus be regulated by the use or nonuse of the fan 14.

Air is admitted from the room for circulation around the flues thru the openings 17, 17 in the front wall of the fire place structure below the mantel 18 thereof and a screened opening 19 in the wall above the mantel 18 provides for the escape of the air back into the room after it has been heated by the flues. The natural circulation of air for heating purposes is sufficient when but a portion of the heat of the products of combustion is desired for heating the room. A forced circulation by the use of the fan 20, which is mounted in the inlet 7 at the bottom of the vertical duct 6, on the other hand effects the maximum heating capacity of the fire place. In this case the fan forces a large volume of air from

the floor of the room into the vertical ducts for circulation around the flues 9, 9A and 9B where it is efficiently heated and then driven into the space 21 between the ceiling 22 and the rafters 23, and the space 24 between the inner wall 25 and the outer wall 26.

The ceiling 22 is made up of panels of burlap or other suitable porous or perforate material which will offer but little resistance to the passage of air therethru. The heated air forced into the space 21 above the ceiling thus readily enters the room thru the ceiling to displace the cooler air in the room above. The heated air, which is forced into the space 24 between the walls, is forced into the room at the bottom of the inner wall 25 thru the screened opening 27 which extends along the floor of the room. The fact that the heated air is admitted over a large area thru the ceiling and around the bottom of the walls eliminates practically any draft which is so objectionable in other forced draft circulation systems.

I claim:

1. In a fireplace construction having a combustion chamber and an air heating chamber above said combustion chamber, a header between said combustion chamber and said air heating chamber, a pair of connecting chambers spacedly arranged in said header, a series of flues extending upwardly thru said header and air heating chamber between said connecting chambers, a header structure at the top of said air heating chamber comprising a plate having said series of flues extending therethru, a second

series of flues extending downwardly thru said header plate to said connecting chambers in the header at the bottom of said air heating chamber, a chamber connecting said first series of flues with said second series of flues above said header plate at the top of said air heating chamber, a third series of flues extending upwardly from said connecting chambers in the header at the bottom of said air heating chamber thru the header plate at the top of said air heating chamber, a duct above said connecting chamber at the top of said air heating chamber and into which the flues of said third series discharge, and door means for connecting said last mentioned duct directly with said connecting chamber located above the header at the top of said heating chamber.

2. A fireplace construction as set forth in claim 1 including means for operating said door means to cause the products of combustion from said first series of flues to pass thru said last mentioned chamber directly into said duct, and means for exhausting the products of combustion from said duct.

3. A fireplace construction as set forth in claim 1 in which said door means opens downwardly by gravity including an outlet pipe connected to said duct above said door means, an exhaust fan in said outlet pipe operating to create a partial vacuum in said duct to exhaust products of combustion and keep said door means closed on the operation of said fan.

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