

Jan. 8, 1935.

D. L. CAGE

1,987,252

FIREPLACE CONSTRUCTION

Filed Sept. 8, 1932

2 Sheets-Sheet 1

Fig. 1.

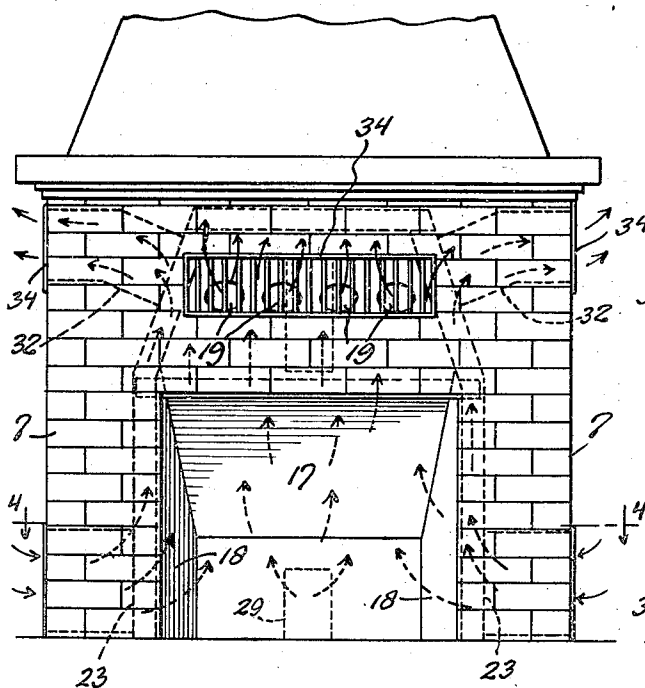


Fig. 2.

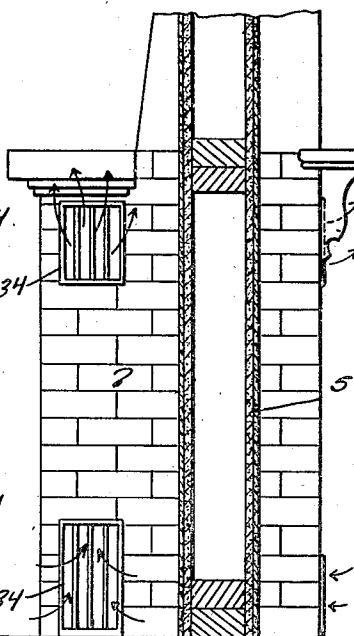
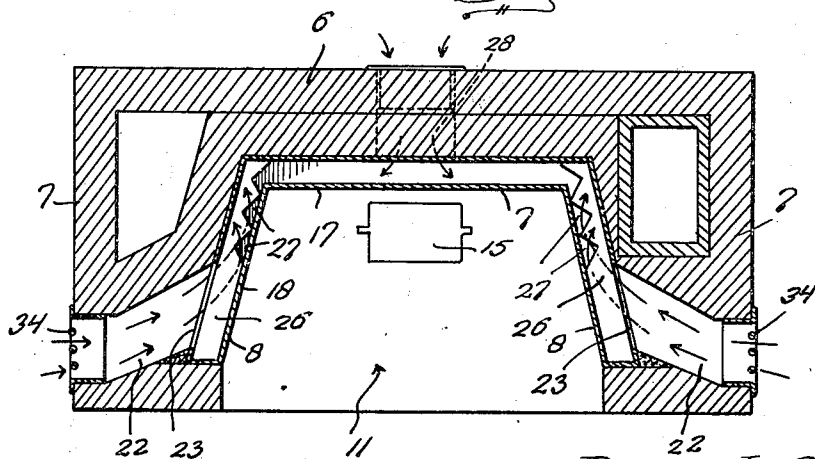


Fig. 4.



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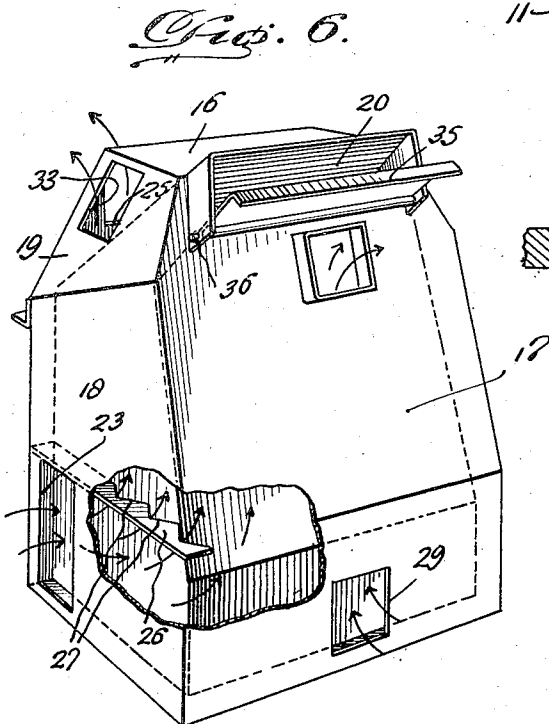
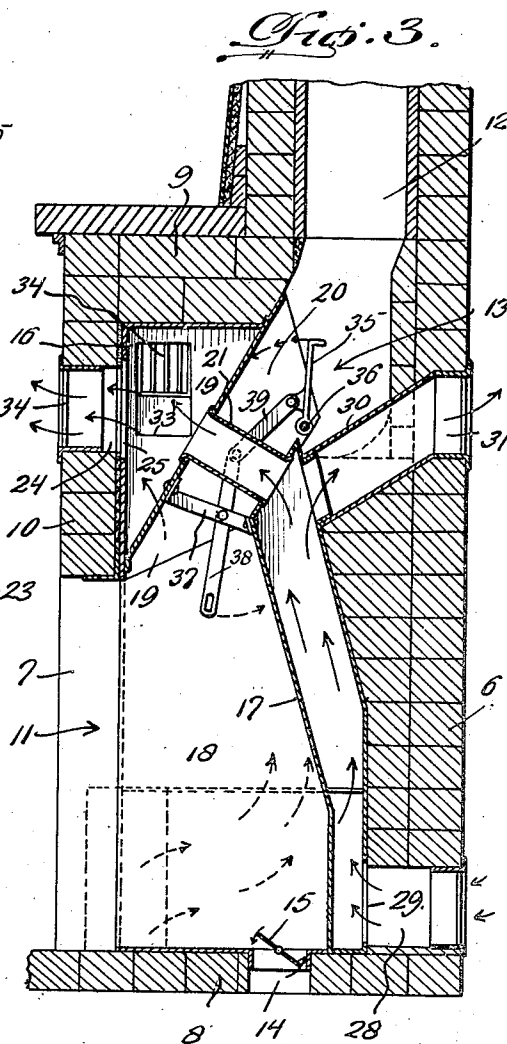
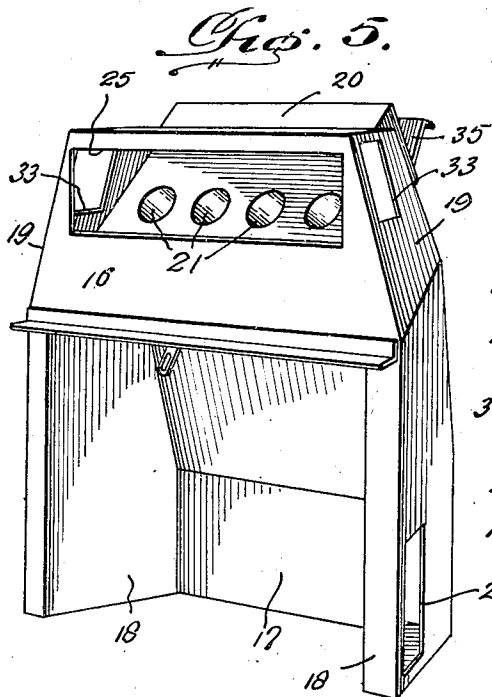
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2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

1,987,252

FIREPLACE CONSTRUCTION

Darcy L. Cage, Los Angeles, Calif.

Application September 8, 1932, Serial No. 632,209

2 Claims. (Cl. 126—121)

This invention relates to fireplace constructions, and has more particular reference to fireplaces provided with air heating means.

The primary object of the present invention is to provide an improved air heating device for fireplaces which is simple and durable in construction, and exceedingly efficient in use.

A further object of the invention is to provide an improved heater for fireplaces through which the air of an adjacent room or rooms will circulate for efficient heating thereof, and which may be conveniently installed to present a sightly and durable completed fireplace construction.

Other objects and features of the invention will become apparent from the following description when considered in connection with the accompanying drawings, in which:

Figure 1 is a front elevational view of a fireplace construction provided with an air heater in accordance with the present invention.

Figure 2 is a vertical sectional view through an inner partition wall of a building equipped with the fireplace construction of Figure 1, the latter being illustrated in side elevation.

Figure 3 is an enlarged substantially central vertical sectional view of the fireplace construction shown in Figure 1.

Figure 4 is a horizontal section on line 4—4 of Figure 1.

Figure 5 is a front perspective view of the air heater per se, forming part of the fireplace construction of Figure 1; and

Figure 6 is a rear perspective view of the air heater, partly broken away and in section.

Referring more in detail to the drawings, the improved air heater is illustrated in connection with a brick fireplace built in a partition wall 5 between adjacent rooms of a building, such fireplace including a rear wall 6 of substantial thickness, relatively thick sides 7, a bottom 8, a top 9, and a partial front wall 10 depending for a short distance from the top 9, so as to form the usual fire space or open front recess 11 in the lower portion of the fireplace structure and a chamber at the top of the fireplace structure which is closed at the front and affords communication between the fire space and the lower end of the vertical chimney 12, as generally indicated at 13. The lower portion of the rear wall 6 has the usual vertical front surface, while the upper portion of said rear wall has a front surface which slants upwardly and forwardly in the usual way as shown clearly in Figure 3. The bottom or floor 8 of the fireplace may have a fresh air inlet opening 14 controlled by a damper 15.

The air heater embodying the present invention includes a unitary metallic structure having a hollow horizontal or transverse upper front portion 16 adapted to fit within the front portion of the upper space or recess 13 directly beneath the top 9 and behind the partial front wall 10, a lower portion which is open at the top, bottom and front and composed of hollow rear and side walls 17 and 18 respectively which are closed at the bottom and communicate with each other, the hollow side walls 18 communicating at their upper ends with the ends of the hollow upper front portion 16 through upwardly converging hollow side connecting portions 19, the top of the back wall 17 terminating below and in spaced relation to the rear wall of the upper front portion 16 to provide a throat as at 20 between the top of the rear wall 17, the rear of the upper front portion 16, and the side connecting portions 19, for the passage of smoke from the fire space 11 to the rear portion of the upper space 13 and chimney 12. The rear wall of the upper front portion 16 and the top of the rear wall 17 are parallel and inclined rearwardly and upwardly so that the throat is correspondingly inclined for unobstructed passage of the smoke from the fire space to the chimney. The unitary metal structure further embodies a plurality of spaced upwardly and forwardly inclined flues 21 providing communication between the top of the hollow rear wall 17 and the rear of the hollow upper front portion 16, and between which the smoke and products of combustion from the fire space are adapted to pass in flowing to the chimney.

As shown clearly in Figure 4, the sides 7 of the fireplace are recessed to receive the side walls 18 of the air heater so as to afford a finished construction at the front of the fireplace, and the rear wall 17 is adapted to fit against the front surface of the rear wall 6 of the fireplace, being provided with a vertical lower portion and a forwardly and upwardly inclined upper portion for this purpose.

Formed in the lower portion of the side 7 of the fireplace near the front of the latter, are cold air inlet flues 22 which may open through the front surfaces of the sides 7, or through the side surfaces thereof as shown, for the purpose of permitting passage of cold air from the lower portion of the room which the fireplace faces into the lower portion of the heater, the hollow side walls 18 of the lower portion of the heater being provided with openings 23 registering with these flues, for that purpose. A suitable horizontally elongated hot air outlet opening 24 is

provided in the partial front wall 10 of the fireplace in registry with a similar opening in the front wall of the upper front portion 16 of the heater, for direct passage of heated air into the room which the fireplace faces. Arranged in the hollow side walls 18 of the heater are horizontal baffle plates or strips 26 which overlie the cold air inlet openings 23 and extend rearwardly to the hollow rear wall 17 so as to direct the major portion of the incoming cold air into the hollow rear wall 17, the rear portions of the baffle plates 26 having suitable openings as at 27 to permit a portion of the incoming cold air to pass upwardly within the hollow side walls 18 and then through the hollow connecting portions 19 into the hollow upper front portion 16, at the ends of the latter. In this way, the major portion of the incoming cold air to be heated is directed to the hollow rear wall 17 and flues 21 where the maximum heat is available for heating of the air.

In cases where the fireplace is built in a partition wall between adjacent rooms, the heater may be adapted to receive cold air from adjacent the floor of both rooms and to deliver heated air to both of said rooms, by providing the heater with an additional cold air intake and an additional hot air outlet as shown in the several views. The additional cold air inlet may be provided by forming a flue 28 in the lower portion of the rear wall 6 of the fireplace, and providing an opening 29 in the hollow back wall 17 in registry with the flue 28. The additional hot air outlet may be provided by forming the hollow back wall 17 with a top hot air outlet flue 30 extending rearwardly and upwardly and communicating with a hot air outlet opening 31 in the upper portion of the back wall 6 of the fireplace. Also, in order to increase the volume of heated air delivered to the room faced by the fireplace, the side 7 of the latter may be provided near the top with lateral hot air outlet flues as indicated by dotted lines 32 in Figure 1, opening through the side surfaces of the sides 7 of the fireplace and registered with hot air outlet openings 33 in the outer sides of the side connecting portions 19 of the heater. The intake ends and outlet ends of the cold air inlet and hot air outlet flues respectively may be provided with any suitable form of ornamental gratings or registers 34.

A damper is provided for the smoke flue or throat 20 of the heater, said damper comprising a closure plate 35 fixed at one edge on a horizontal transverse rod 36 hinged at its ends in the sides of the upper rear portion of said flue or throat 20, and adapted, when swung forwardly to extend across and completely close said flue or throat 20, contacting the front or upper wall of the said flue or throat above the hot air flues 21. As shown, the side and top walls of the throat or flue 20 project upwardly beyond the hollow rear wall 17 and the upper front hollow portion 16 into the rear portion of chamber 13. Extending across the smoke flue or throat 20 and secured to the opposed walls of the latter is a supporting bar 37 having a lever 38 hinged thereto intermediate its ends, the upper end of lever 38 being operatively connected to damper plate 35 by means of a link 39. The lever 38 depends into the upper part of the fire space 11 where its lower extremity is apertured for engagement by a poker or the like, whereby the damper may be conveniently actuated and regulated. The pivotal connections between lever 38

and supporting bar 37, as well as between link 39 and lever 38 and damper plate 35, are preferably friction hinge pivots which insure retention of the parts 38, 39 and 35 in any position to which they are moved, thus insuring that the damper plate will remain in any desired adjusted position to which it is moved. In this way the desired draft may be obtained through convenient regulation of the damper. It will of course be understood that the upper end of lever 38 and the link 39 operate in a space between adjacent hot air flues 21. The metallic unit constituting the major part of the present air heater rests upon the floor of the fireplace at the sides and back or may be elevated on masonry work so as to provide a durable fireplace construction in which the heater is firmly mounted in place.

What I claim as new is:

1. In a fireplace, an air heater including a unitary metallic structure having a hollow transverse upper front portion, a lower portion open at the front and top and composed of communicating hollow rear and side walls, said upper front portion being of triangular form in cross section and including a flat horizontal top wall and a flat vertical front wall connected by a flat upwardly and rearwardly inclined rear wall, the hollow side walls of the lower portion communicating at their upper ends with the ends of the transverse upper front portion, the top of the hollow rear wall of the lower portion being inclined upwardly and rearwardly and spaced from the rear wall of the transverse upper front portion to provide an upwardly and rearwardly inclined smoke flue, hot air flues extending across said smoke flue and placing the upper front portion and the rear wall of the lower portion in direct communication with each other, the side and rear walls of the lower portion being arranged to rest upon the bottom of the fireplace, said upper front portion having end openings for communication with lateral hot air outlet flues of the fireplace, and said lower portion having openings in the side walls thereof near the front of the same for communication with cold air inlet flues of the fireplace, and horizontal baffle plates arranged within the side walls of said lower portion directly above and extending rearwardly of the cold air inlet openings to deflect the major portion of the incoming cold air into the hollow rear wall of the lower portion, said baffle plates having openings in the rear portions thereof only to permit a part of the incoming cold air to pass directly into the hollow side walls of the lower portions only at the rear of said side walls.

2. In a fireplace, an air heater including a unitary metallic structure having a hollow transverse upper front portion, a lower portion open at the front and top and composed of communicating hollow rear and side walls, said upper front portion being of triangular form in cross section and including a flat horizontal top wall and a flat vertical front wall connected by a flat upwardly and rearwardly inclined rear wall, the hollow side walls of the lower portion communicating at their upper ends with the ends of the transverse upper front portion, the top of the hollow rear wall of the lower portion being inclined upwardly and rearwardly and spaced from the rear wall of the transverse upper front portion to provide an upwardly and rearwardly inclined smoke flue, hot air flues extending across said smoke flue and placing the upper front portion and the rear wall of the lower portion in direct communication with

each other, the side and rear walls of the lower portion being arranged to rest upon the bottom of the fireplace, said upper front portion having end openings for communication with lateral hot 5 air outlet flues of the fireplace, and said lower portion having openings in the side walls thereof near the front of the same for communication with cold air inlet flues of the fireplace, the upper front and side walls of the smoke flue projecting upwardly and rearwardly beyond said upper front portion and said lower portion, a rod journaled at its ends in the rear lower portions of said projecting side walls of the smoke flue, and a 5 manually adjustable damper plate for said smoke flue carried by said rod.

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