

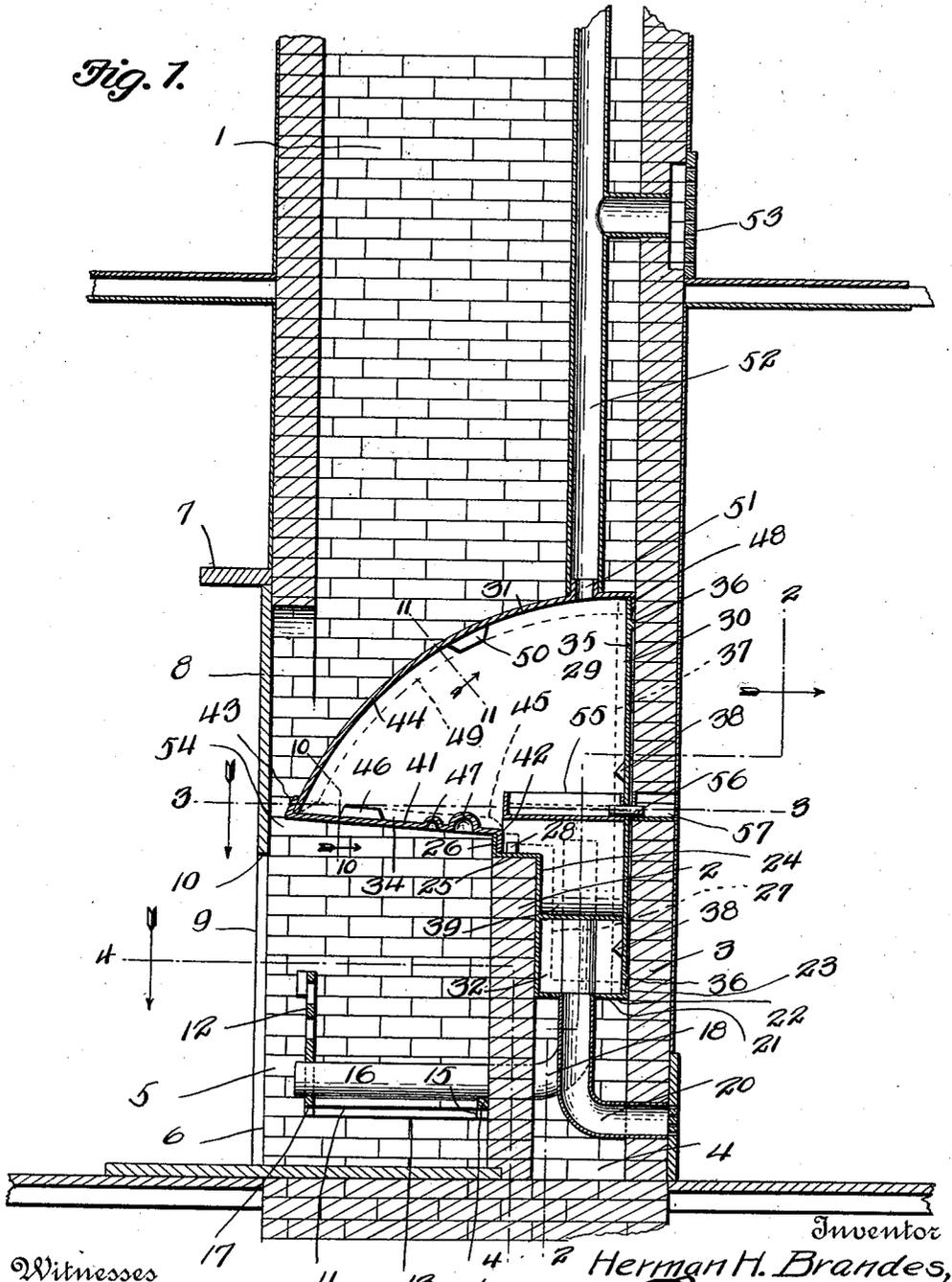
H. H. BRANDES.
FIREPLACE HEATER.

APPLICATION FILED JUNE 16, 1910.

1,013,372.

Patented Jan. 2, 1912.

3 SHEETS—SHEET 1.



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Witnesses
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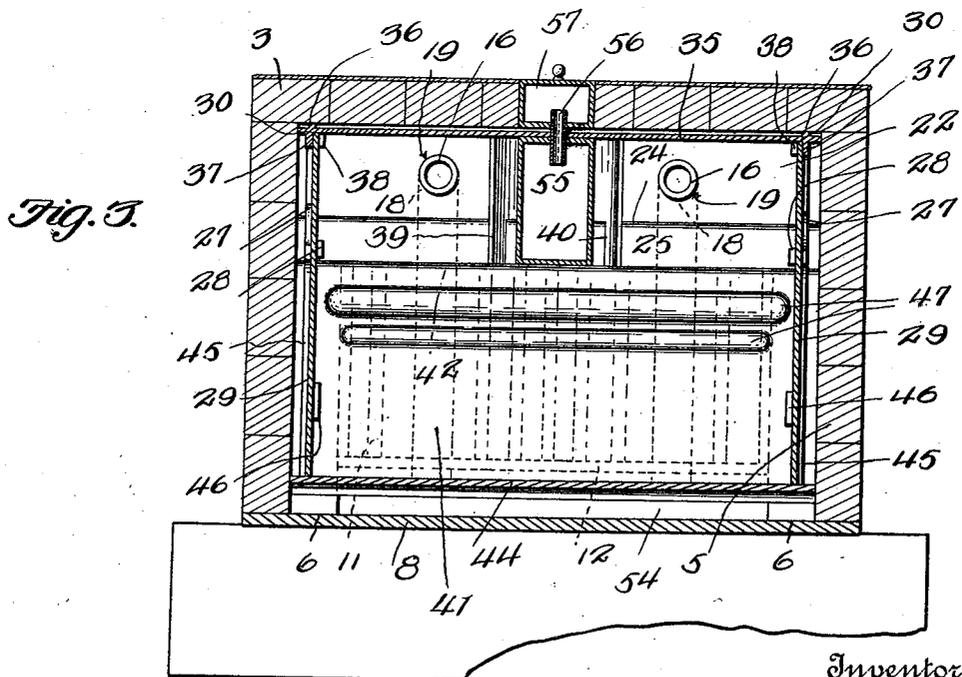
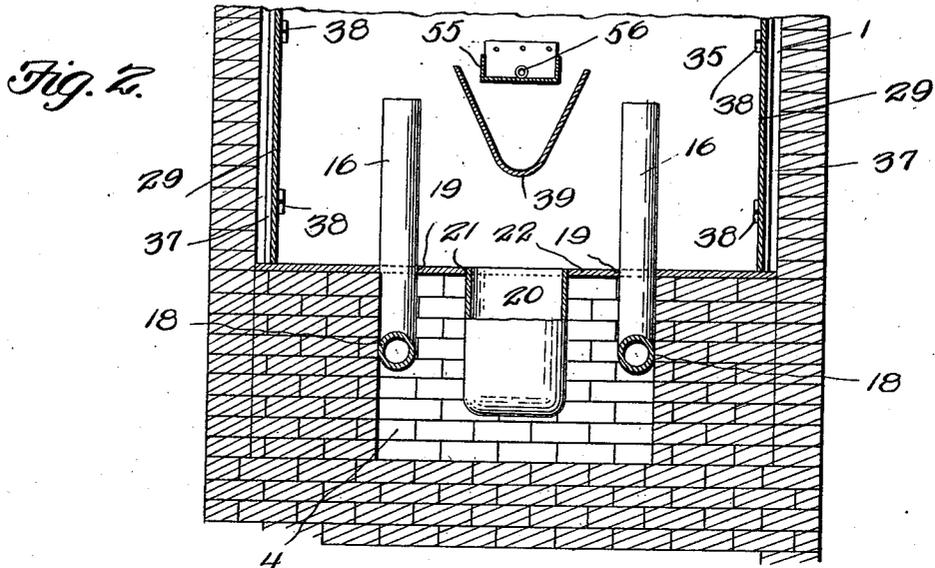
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3 SHEETS—SHEET 3.

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Fig. 4.

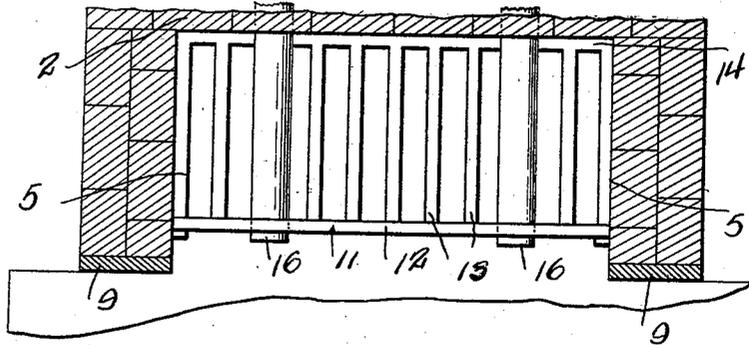


Fig. 5.

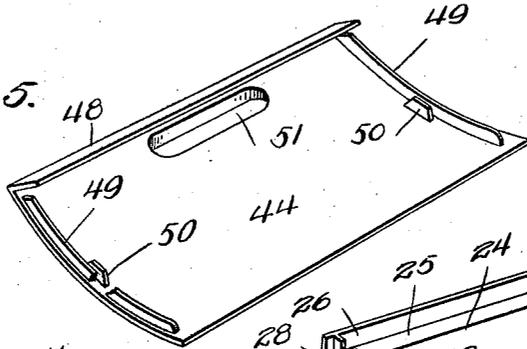


Fig. 6.

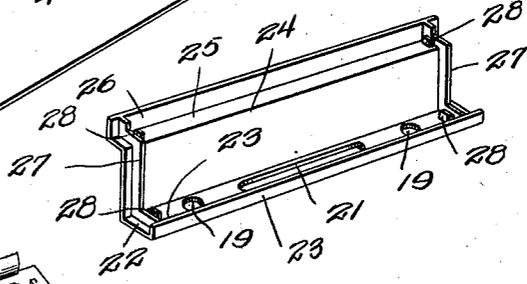


Fig. 9.

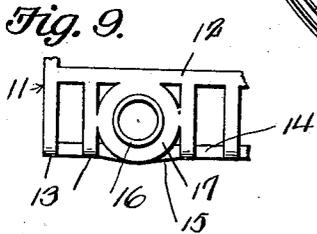


Fig. 7.

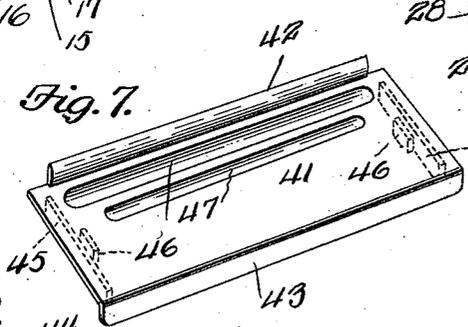


Fig. 10.

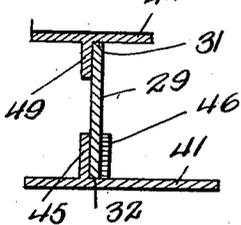


Fig. 8.

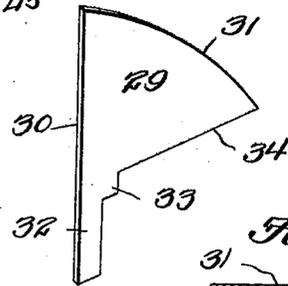
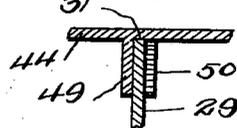


Fig. 11.



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UNITED STATES PATENT OFFICE.

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FIREPLACE-HEATER.

1,013,372.

Specification of Letters Patent.

Patented Jan. 2, 1912.

Application filed June 16, 1910. Serial No. 567,243.

To all whom it may concern:

Be it known that I, HERMAN H. BRANDES, a citizen of the United States, residing at Corydon, in the county of Henderson and State of Kentucky, have invented a new and useful Fireplace-Heater, of which the following is a specification.

This invention relates to improvements in fireplace heaters and has for its object the provision of a heater of simple construction by which the heat from a fireplace may be efficiently utilized to heat rooms other than that in which the fireplace is located.

My present improvements seek to provide a fireplace heater by which the fuel will be economically consumed and in which a supply of fresh air properly heated and tempered may be readily admitted to adjoining rooms or rooms on the upper floors of a building.

The invention also seeks to so construct the heater that the air admitted into the same will be rapidly raised in temperature so that the waste of heat units will be reduced to a minimum.

The invention also seeks to provide a heater located within the chimney in rear of and over the grate basket which will be so constructed that the entire cubic capacity of the heater will be utilized for heating fresh air, while the smoke and products of combustion will be carried off in the usual manner.

All these stated objects, and such other objects as will hereinafter incidentally appear, are attained by the use of the device illustrated in the accompanying drawings, and the invention consists in certain peculiar features of the same which will be hereinafter first fully described and then more specifically pointed out in the appended claims.

In the drawings,—Figure 1 is a vertical sectional view of a chimney showing my improved fireplace heater in position therein. Fig. 2 is a vertical section taken on the line 2—2 of Fig. 1. Fig. 3 is a horizontal section taken on the line 3—3 of Fig. 1. Fig. 4 is a horizontal section taken on the line 4—4 of Fig. 1. Fig. 5 is a detail perspective view of the hood or cover of the heater looking at the underside of the same. Fig. 6 is a detail perspective view of the bottom plate of the heater looking at the rear side

of the same. Fig. 7 is a detail perspective view of the arch plate which extends over the grate basket and looking at the bottom of the said plate. Fig. 8 is a detail perspective view of one of the end or side plates. Fig. 9 is a front view of one end of the grate basket. Fig. 10 is a detail section on the line 10—10 of Fig. 1. Fig. 11 is a detail section on the line 11—11 of Fig. 1.

The chimney 1 is constructed in the usual manner in the wall of the building and is provided at its lower end with a bridge wall 2, of fire brick, which is located adjacent to but spaced from the rear wall 3 of the chimney whereby an air space 4 is provided, as shown in Fig. 1. In advance of the said bridge wall 2, side walls 5 are built within the chimney, and these side walls and the bridge wall 2 are constructed of fire brick so as to withstand the effects of the high temperatures given off from the grate basket. The chimney is also constructed with a fireplace opening 6 in its front side and a mantel 7 is placed against the front side wall of the chimney over a fire front 8, in which the opening 9 is so located that its upper wall 10 is located below the top of the side walls 5, as shown most clearly in Fig. 1.

The grate basket 11 is supported by the bridge wall 2 and the side walls 5 and consists of a series of longitudinal fender bars 12 extending between the side walls 5 and grate bars 13 secured to or formed with the lowermost fender bar and extending rearwardly therefrom to the bridge wall, as will be readily understood. The rear ends of the grate bars are connected by a longitudinally arranged bar 14 and at points near the ends of the said bar I provide pendant enlargements 15 in order to strengthen the said cross bar at points where it is called upon to support the pipes or flues 16. The front ends of these pipes or flues 16 are open and are supported by rings 17 formed in the front side of the grate basket, as shown clearly in Fig. 9, so that the said flues or pipes will receive the cooler air which lies near the floor of the room and will cause the said air to pass directly through the bed of fire kindled on the grate so that it will be quickly heated. These flues 16 pass through the bridge wall 2 and are turned upward in rear of the said wall as indicated at 18, and then pass upward within the

space 4 and terminate adjacent but slightly above the upper end of the bridge wall, as indicated by dotted lines in Fig. 1. The vertical portions of these flues or pipes 16 pass through openings 19 in the bottom of the heater, and a cold air flue 20 opens into the heater through the slot 21 in the said bottom so as to deliver fresh cold air into the heater between the vertical portions of the flues which pass through the grate basket. This cold air flue 20 is illustrated as passing through the chimney in rear of the bridge wall and terminating at the outer side of the chimney wall, but it will be readily understood, of course, that it may be carried to any point where a supply of pure fresh air will be guaranteed.

The bottom plate 22, through which the flues 16 and 20 pass or communicate with the interior of the heater, is provided at its rear edge with an upstanding lip or flange 23 and on its front side is constructed with a plate or wall 24 adapted to lie snugly against the rear side of the bridge wall and having its upper end formed into a step 25 adapted to rest on the upper edge of the bridge wall, the front edge of the said step being formed into an upstanding lip or flange 26.

It will be noticed on reference to Fig. 1 that the flange 23, the bottom 22, the front plate 24, the step 25, and the lip 26 are formed in one integral structure and that the bottom 22 is of such width as to extend entirely across the air space 4 and thereby prevent the rising air currents from passing up the chimney except through the heater. It will also be noted that the front side 24 of this member of the structure and the step 25 rest directly against the bridge wall of fire brick and, consequently, provide an extended metal surface which will be raised in temperature by the heat of the bridge wall and will radiate the said heat into the heating chamber so that the cold air emerging from the flue 20 will be rapidly raised to the desired temperature. The bridge wall, consequently, not only serves to support the bottom of the heater, but also raises the temperature of the same and, inasmuch as this bottom member extends over the bridge wall as well as in rear of the same, the higher temperature will be very quickly reached.

The bottom member, as shown in Fig. 6, is provided on its rear side, near its ends, with ribs 27 and, adjacent the said ribs, with lugs 28 slidably spaced from the said ribs and adapted to engage the edges of the side or end plates 29 which are fitted between the said ribs and lugs. These end plates 29 are provided with straight rear edges 30 adapted to rest against the back plate of the heater, and their upper edges 31 are curved forwardly and downwardly so

as to aid in supporting the hood or cover of the heater. The lower portions of these plates 29 are in the form of tongues 32 adapted to extend to the bottom plate 22 and having an angular lug or projection 33 at its upper end arranged to engage the step portion of the bottom member of the heater, while extending forward from the said angular projection 33 is a straight edge 34, inclined slightly upward at an angle corresponding to that of the upper ends of the side walls 5. The lower end and front edge of the tongue 32 and the angular projection 33 of the end plates fit closely to the bottom member and engage snugly between the rib 27 and the lugs 28 adjacent the said rib. In this manner I maintain the end plates in their proper positions and prevent lateral movement of the same, and at the same time facilitate the assembling of the several parts when setting up the heater within a building.

The back plate 35 of the heater has its lower edge resting upon the bottom 22 against the flange 23 thereof and is adapted to lie close to the rear wall of the chimney and extend to the desired height above the bridge wall and the side walls 5. The back plate is provided with ribs 36 on its rear side by which it will be spaced from the rear wall of the chimney sufficiently to accommodate the flange 23 and also prevent buckling of the back plate, while on its front side, adjacent its edges, it is provided with ribs or flanges 37 and lugs 38 between which the rear straight edges 30 of the end or side plates fit in the same manner that the front edges of the said plates fit between the ribs 27 and the lugs 28 so that the parts will be positively maintained in their proper relative positions.

Arranged between the bottom member of the heater and the back plate 35, and preferably cast integral with the back plate, is a deflector 39, which, as shown, is V-shaped in front view and is partly cut away on its front side, as indicated at 40, so as to conform to the step formation of the bottom member. This deflector is arranged midway between the inner upper ends of the flues 16 and over the flue 20, so that the supply of cold air, entering the heater from the flue 20, will be divided and deflected toward the ends of the heater directly across the ends of the flues 16 and thereby retarded so that it will be quickly heated.

The arch plate 41 rests at its ends upon the side walls 5 and is provided at its rear edge with a depending flange or lip 42 adapted to engage behind the lip 26 on the bottom member whereby the two members will be brought into the proper relative positions, it being noted that the flange 42 is shorter than the arch plate so that the ends of the said flange will fit between the ribs 27

on the bottom member. The arch plate is provided at its front edge with an upstanding rib or flange 43 against which the lower front edge of the hood or cover plate 44 is adapted to rest, and on its upper side near its ends the arch plate is provided with ribs 45 and lugs 46 spaced from and adjacent to the said ribs and arranged to fall in the same vertical plane as the ribs 27 and lugs 28 of the bottom member whereby they will be engaged by the lower straight edges 34 of the end or side plates 29, and thereby aid in holding the said side plates in their proper positions. The arch plate is constructed with grooves 47 in its under side near its rear edge which, as shown in Fig. 1, will be located directly over the grate basket so that the heat rising from the fire will be caught and held by the said grooves and, consequently, the temperature of the arch plate will be rapidly raised, the grooves serving to retain the rising heated air and retarding its escape up the chimney or into the room containing the fireplace.

The hood or cover 44 is a curved plate having its lower edge resting against the inner side of the lip 43 and having its ends resting upon the upper curved edges 31 of the end plates 29, while its rear edge is provided with a depending flange or lip 48 arranged to engage over the upper edge of the back plate 35, as shown most clearly in Fig. 1. This hood or cover plate 44 is also provided on its under side with ribs 49 and lugs 50 adapted to engage the curved edges 31 of the end plates whereby the several plates which constitute the heater will be firmly held in their proper positions so as to provide a compartment of large cubic capacity which will serve to raise the temperature of the air admitted thereto without waste of heat or the consumption of a large quantity of fuel. In the cover plate or hood 44, near the rear edge of the same, is provided an opening 51 or a plurality of said openings from which a heating flue 52 may extend to convey the heated air to a hot air register or a series of hot air registers, one of which is shown at 53.

The arch plate 41 is of such width that it will terminate at a point in rear of the fire front 8 and thereby provide an opening 54 through which the smoke and other products of combustion will escape to the chimney.

Formed on or supported by the front face of the back plate 35 is a water receptacle 55 from which a pipe 56 extends through the back plate and enters a smaller water box or receptacle 57 located within the rear wall of the chimney. This water box 57 is of less capacity than the box or receptacle 55 and is in the same horizontal plane therewith, so that water brought into the water box 57 will flow through the tube 56 into the inner larger receptacle 55 and furnish an

agent for humidifying the air within the heater before the same passes into the flues 52, and thence through the building. The water box 57 may be permitted to project somewhat beyond the wall of the chimney, but I have illustrated it as arranged to be moved in and out of the cavity in which it is placed when it is necessary to replenish the supply of water. Inasmuch as the filling box 57 is of less capacity than the inner holding receptacle 55, overflowing of the said inner receptacle cannot occur.

By arranging the bottom member of the heater upon the top of the bridge wall as well as against the rear side of the same, I utilize the heat imparted to the said wall so as to raise the temperature of the bottom member of the heater very rapidly and thereby avoid the waste of heat which has heretofore occurred and, consequently, effect an economy in the consumption of fuel. The same result follows from the particular disposition and construction of the arch plate, inasmuch as this plate extends directly over the fire and is provided with a plurality of grooves in its under side which will serve to retard the heated currents from the grate, which currents will whip around within these grooves and, consequently, will not be lost. The provision of the flues or pipes running directly through the bed of fire immediately over the grate bars and supported by the grate and opening into the heating chamber above the bottom of the same also serves to economize fuel, inasmuch as the heated currents passing through these tubes are directed into the heating chamber through the bottom of the same in a vertical direction and will, consequently, aid in creating the necessary circulation through the heater. The deflector arranged adjacent the upper ends of these flues will throw the incoming cold air directly across the path of the heated currents escaping from these hot air flues so that the air within the heater will be very rapidly raised to the desired temperature.

While I have described the principle of operation of the invention, together with the apparatus which I now consider to be the best embodiment thereof, I desire to have it understood that the apparatus shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims appended hereto.

Having thus described my invention, what I claim is:—

1. A fire-place heater comprising a grate, a heating chamber back of and overhanging the grate, heating flues extending through the grate and entering and extending into the heating chamber in an upward direction, and a cold air flue also entering the heating chamber in the same direction as the heating flues, the terminal portions of

the heating flues being at a higher point in the heating chamber than the terminal portion of the cold air flue.

2. In a fire-place heater, a grate, a heating chamber back of and in overhanging relation to the grate, a cold air flue entering the bottom of the heating chamber in an upward direction, and terminating at said bottom portion of the heating chamber, and hot air flues traversing the grate and also entering and extending into the heating chamber in an upward direction through the bottom thereof, and continued into the latter to a higher point than the discharge end of the cold air flue within the heating chamber.

3. In a fireplace heater, the combination of a grate provided in its front side with rings and in its rear side with pendant enlargements in alinement with the said rings, a heating chamber arranged above the grate, and open-ended flues having their front ends supported by and within the rings on the grate and their intermediate portions resting upon the rear of the grate immediately over the enlargements thereof and their inner ends turned upward and entering the heating chamber through the bottom of the same.

4. The combination with a chimney, of a bridge wall located therein and spaced from the rear side of the chimney, a grate supported in front of the bridge wall, a heating chamber supported by the bridge wall and extending over and in advance of the same and having a depending portion fitting between the bridge wall and the rear side of the chimney, a cold air flue entering the bottom of the said depending portion, and flues passing through the grate and having rear upturned ends entering the bottom of the said depending portion of the heating chamber.

5. In a fire-place heater, a grate, a heating chamber in operative relation to the grate, a cold air flue entering the heating chamber at the lower end thereof and discharging upwardly into said heating chamber, and hot air flues traversing the grate and entering the heating chamber through the bottom thereof on each side of the cold air flue and continued into the heating chamber in the same direction as the direction of entrance of the cold air flue and terminating at a higher point within the heating chamber than the discharge end of the cold air flue.

6. The combination of a heating chamber, a cold air flue communicating therewith through the bottom of the same, warm air flues communicating with the said chamber through the bottom thereof at the sides of the cold air flue, and a V-shaped deflector within the chamber between the warm air flues and over the cold air flue.

7. In a fire-place heater, a grate, a heating chamber in operative relation to the grate, a cold air flue entering the heating chamber at the lower end thereof and discharging upwardly into said heating chamber, hot air flues traversing the grate and entering the heating chamber on each side of the cold air flue and continued into the heating chamber in the same direction as the direction of entrance of the cold air flue and terminating at a higher point within the heating chamber at the discharge end of the cold air flue, and a deflector in the path of cold air entering the heating chamber from the cold air flue and diverting the cold air toward the discharge ends of both hot air flues.

8. In a fire-place heater, a grate, a heating chamber in overriding relation to the grate and having a depending portion extending back of the grate, a cold air flue entering the depending portion of the heating chamber at the lower end of the same and discharging thereinto in an upward direction, means within the depending portion of the heating chamber for diverting cold air entering by the cold air flue toward the sides of said heating chamber, and hot air flues traversing the grate with their inlet ends at the front of the grate and their discharge ends entering the bottom of the depending portion of the heating chamber on opposite sides of the cold air flue and continued in an upward direction within the chamber and terminating in operative relation to the cold air diverting means within said heating chamber.

9. The combination of a heating chamber, a cold air flue communicating therewith through the bottom thereof, warm air flues communicating with the said chamber through the bottom thereof at the sides of the cold air flue, a V-shaped deflector within the chamber between the warm air flues and over the cold air flue, and a water box within the heating chamber and between the legs of the deflector, said water box having accessible means for filling exterior to said heating chamber,

10. In a fire-place heater, a grate, a bridge wall at the back of the grate, a heating chamber in overhanging relation to the grate and provided with a depending portion extending back of the bridge wall and terminating short of the level of the bottom of the grate, a cold air flue entering through the bottom of the depending portion of the heating chamber at the lower end thereof and discharging upwardly into said heating chamber at an intermediate point of the width of the same, and heating flues extending through the grate with their inlet ends in front of the grate and also extending through the bridge wall and then directed upwardly through the bottom of the depending portion of the heating chamber on

opposite sides of the cold air flue and having their discharge ends above the discharge end of the cold air flue and adjacent the main portion of the heating chamber.

5 11. The combination with a chimney having a bridge wall located therein and spaced from the rear wall of the chimney, a grate supported in front of the bridge wall, a heating chamber supported by the top of
10 the bridge wall and extending over and in advance of the same so as to lie directly in the path of the products of combustion arising from the grate, said chamber having a depending portion fitting between the bridge
15 wall and the rear wall of the chamber and directly against the rear side of the bridge wall and also having outlet means for heated air, a cold-air flue entering the bottom of the said depending portion, warm air flues
20 communicating with the chamber through the said depending portion at opposite sides of the cold-air flue, and a deflector arranged midway between the upper ends of the warm-air flues and directly over the cold-air
25 flue.

12. The combination with a chimney having a bridge wall spaced from the back wall

of the chimney, of a grate supported in front of the bridge wall, a heating chamber carried by the bridge wall and having a substantially horizontal lower wall or arch plate extending forwardly from the bridge wall in overhanging relation to the grate, a back plate adapted to lie close to the rear wall of the chimney above and below the top of the
30 bridge wall, a curved hood or cover plate extending forwardly and downwardly from the back plate to the outer edge of the arch plate, side plates connecting the corresponding edges of the back plate, arch plate and
35 hood plate to complete the heating chamber and having depending portions fitting between the bridge wall and the rear wall of the chimney, and another plate within the space between the bridge wall and rear wall
40 of the chimney and connected to the depending portions of the side plates.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

HERMAN H. BRANDES.

Witnesses:

C. F. KING,
H. E. YOUNG.