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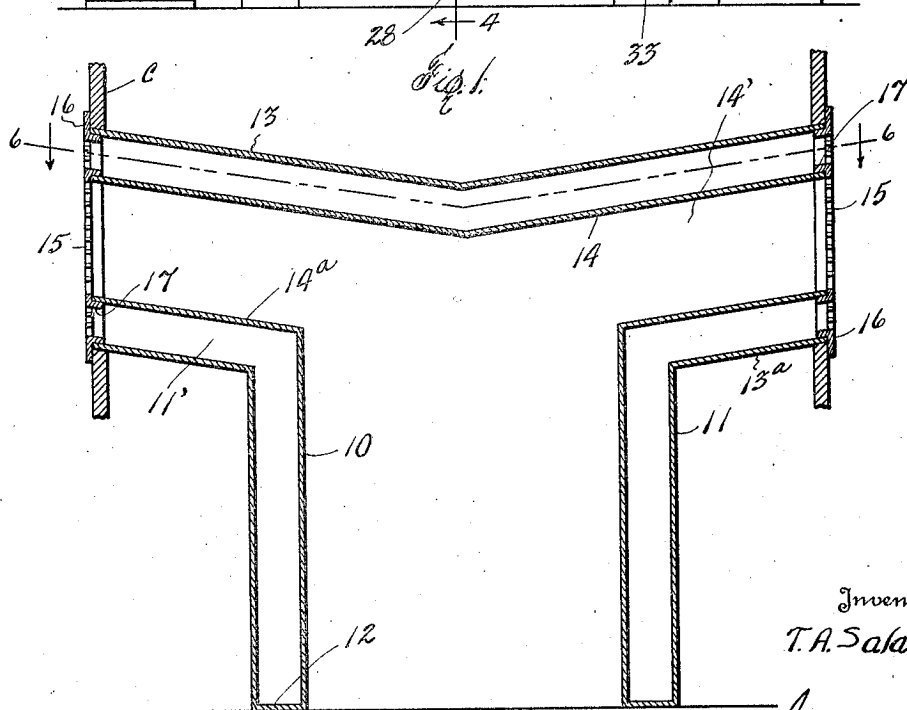
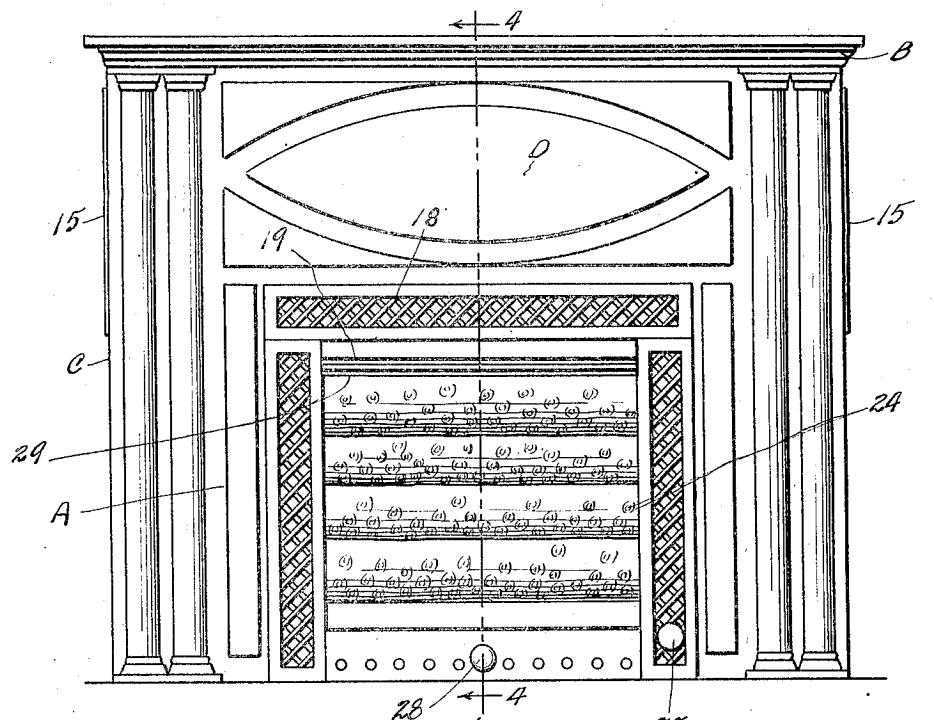
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COMBINATION HEATING STRUCTURE

Filed Dec. 11, 1925

4 Sheets-Sheet 1



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Fig. 2. By

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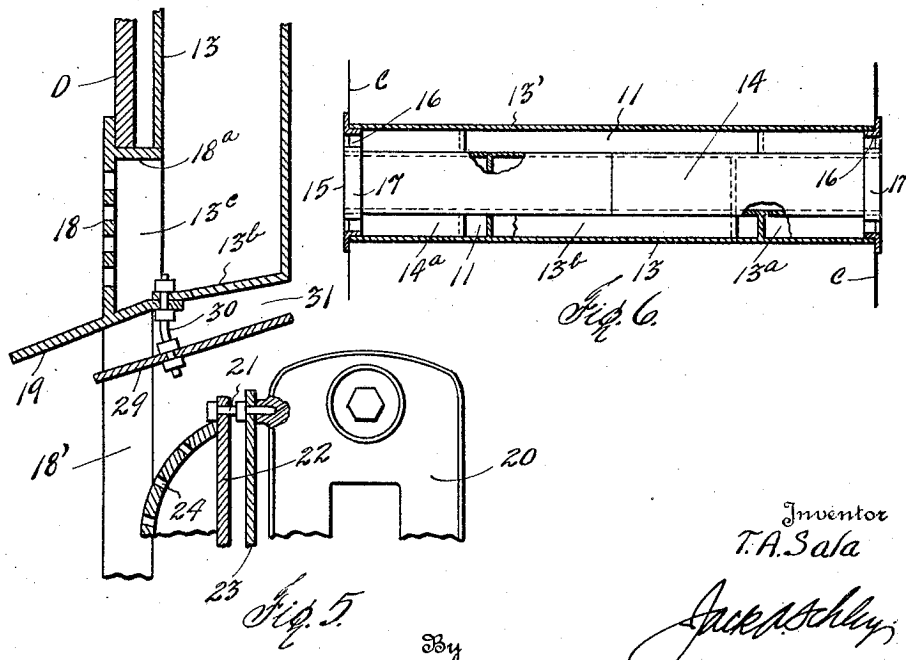
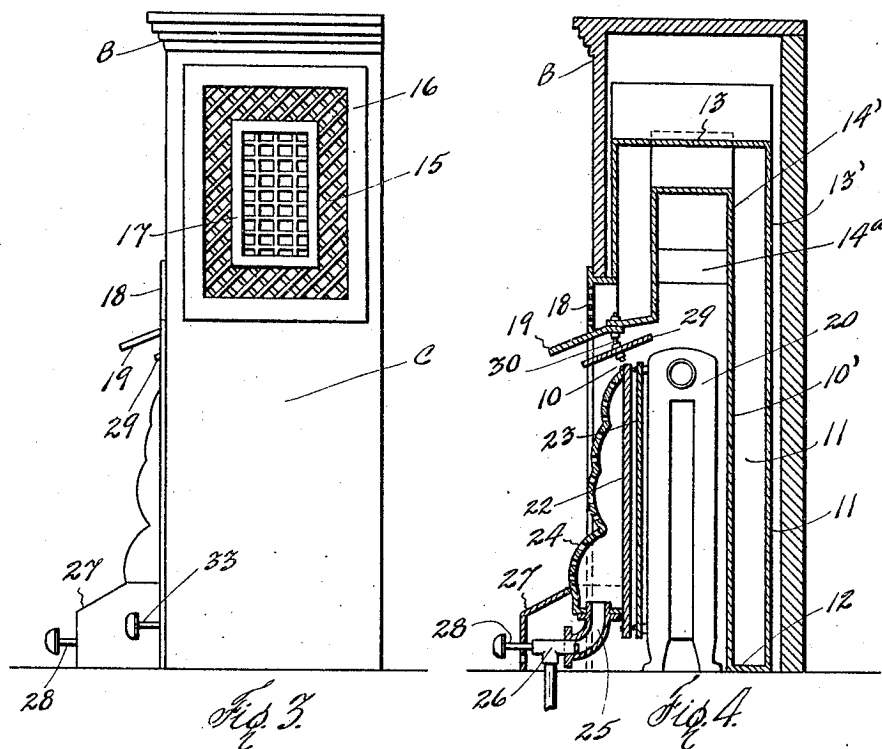
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4 Sheets-Sheet 2



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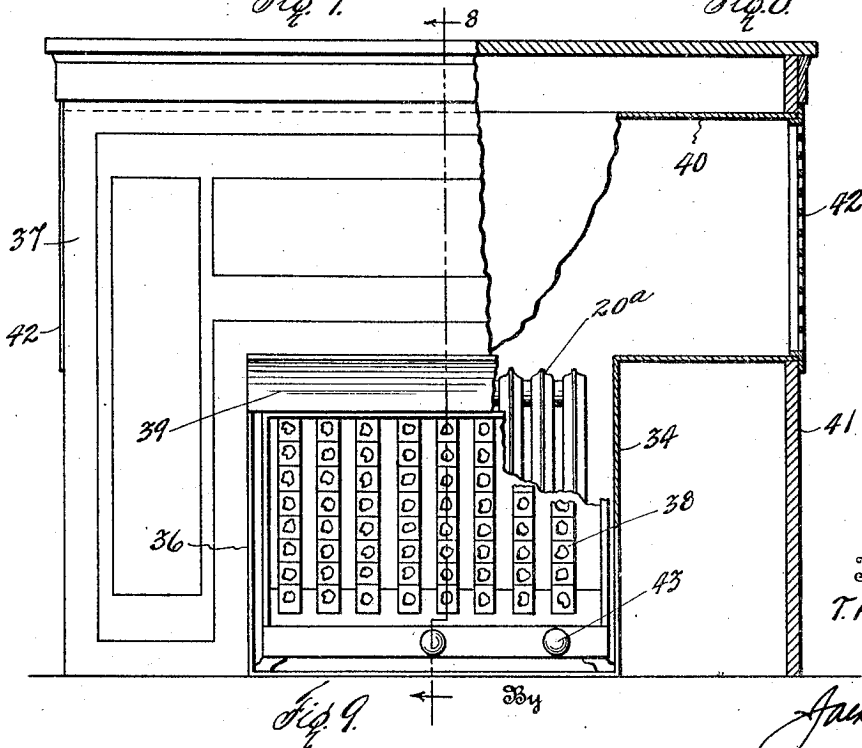
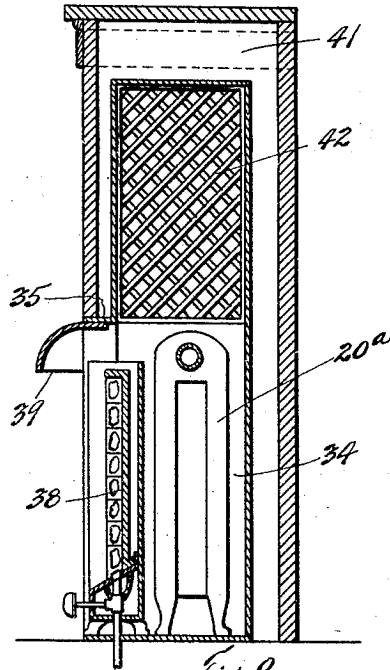
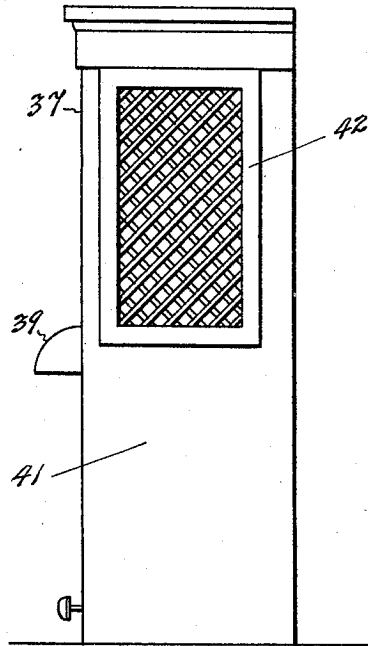
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4 Sheets-Sheet 3



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COMBINATION HEATING STRUCTURE

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4 Sheets-Sheet 4

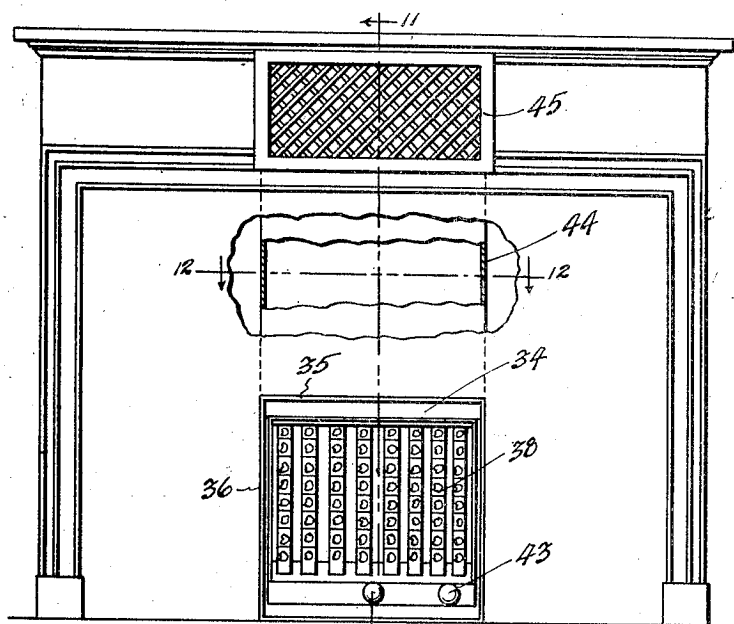


Fig. 10.

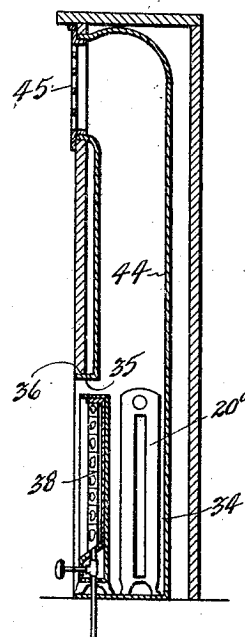


Fig. 11.

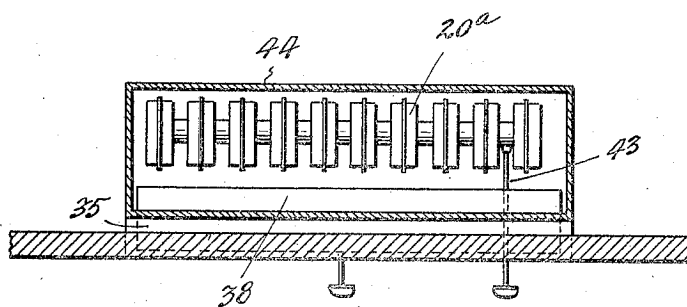


Fig. 12.

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UNITED STATES PATENT OFFICE.

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COMBINATION HEATING STRUCTURE.

Application filed December 11, 1925. Serial No. 74,895.

This invention relates to new and useful improvements in combination heating structures.

5 The object of the invention is to provide an enclosure for a radiator whereby the radiator will be concealed and at the same time the heat currents from the radiator will be discharged into the room.

10 A particular object of the invention is to combine with a radiator, a gas or other heater in such a manner that the heater conceals the radiator and whereby the heater and the radiator may be operated individually or together.

15 Another object of the invention is to provide in connection with a fire place, a radiator mounted in the fire place, a heater at the front of the fire place for concealing the radiator and a drum connected with the fire place above the radiator and having an outlet for discharging heated air currents from the radiator into the room.

20 A construction designed to carry out the invention will be hereinafter described together with other features of the invention.

25 The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings, in which an example of the invention is shown, and wherein:

30 Fig. 1 is a front elevation of a mantel and fire place equipped with heating units and constructed in accordance with my invention.

35 Fig. 2 is a vertical sectional view of the fire chamber and drum structure,

Fig. 3 is a side elevation of the parts shown in Fig. 1,

40 Fig. 4 is a transverse vertical sectional view taken on the line 4—4 of Fig. 1,

Fig. 5 is an enlarged sectional view of the air inlet duct and component parts,

45 Fig. 6 is a reduced longitudinal cross-sectional view taken on the line 6—6 of Fig. 2,

Fig. 7 is a side elevation of a modified form,

50 Fig. 8 is a transverse vertical sectional view taken on the line 8—8 of Fig. 9,

Fig. 9 is a front elevation of the form shown in Fig. 7,

Fig. 10 is a front elevation of still another modification,

Fig. 11 is a transverse vertical sectional view taken on the line 11—11 of Fig. 10, and

Fig. 12 is an enlarged cross-sectional view taken on the line 12—12 of Fig. 10.

This application is a continuation in part of my co-pending application Serial No. 757,350 filed December 22, 1924, and includes the illustrations contained in said application together with modifications exemplifying to some extent the variations in structure, which may be made in carrying out the invention.

In the drawings the numeral 10 designates a fire chamber having its front side open. The fire chamber is surrounded on each side and on its back, by a vertical air admitting flue 11. The walls of the flue are spaced from the walls of the chamber and said walls are connected across the lower end of the flue by a bottom 12 (Figs. 2 and 4). The rear wall 11' of the flue 11 is made continuous with and in the same vertical plane, as the rear wall 13' of a transverse drum 13. I prefer to make the fire chamber rectangular in cross-section and also the drum.

The drum is shaped so as to incline upwardly from its center towards its ends and these inclined portions not only lessen the resistance to the rising air currents, but tend to divide the currents and thus cause an equal delivery to each end of the drum. The bottom 13^a is cut out contiguous to the walls of the flue 11 and at the sides and rear of the fire chamber, as is best shown in Fig. 6. However the drum has a bottom section 13^b covering the fire chamber 10 so that the products from said chamber cannot enter the drum.

Within the drum is a transverse flue 14 conforming to the shape of the drum and extending to the ends thereof. The flue 14 is preferably, but not necessarily, concentrically disposed in the drum and being somewhat smaller is spaced from the walls thereof, so as to provide ample space therebetween. The rear vertical wall 10' of the fire chamber is in the same vertical plane as the wall 14' of the flue 14 and the inclined

bottom 14^a of the flue terminates at the upper edges of the side walls of the chamber so that the upper end of the chamber opens into the flue. The fire chamber flue 11, drum 13 and flue 14 are formed integral as a unit and may be readily installed as such.

The unit may be installed in a chimney breast or a pilaster may be built in the room which does not have a chimney breast. In the drawings I have shown the unit installed in a chimney breast A having a mantel B. The drum 13 and flue 14 extend longitudinally through the breast. Grilles 15 are set into the sides C of the chimney breast. Each grille has a marginal flange 16 fitting in the end of the drum (Fig. 2) and a central flange 17 in which the end of the drum 14 engages. From this it will be seen that air currents entering the flue will be conducted separately from the grille, from those entering the drum and conducted thereby to the grille. The air currents will be separately discharged from the grilles. The unit is installed behind the front panel D of the mantel and chimney breast. An arched grille 18 is placed at the front of the flue 11 contiguous to the front opening of the fire box. The grille has vertical flanges 18' on its rear side fitting in the front of the flue 11, whereby air enters directly into the flue. Across the under side of the top of the arched grille, is a hood or deflector plate 19. This plate is inclined downwardly and is over the opening to the fire chamber, only; however its shape and limits are subject to variation. The plate may be cast integral with the grille. Above the plate the grille has a marginal flange 18^a on its rear side entering an opening 13^c in the front wall of the drum 13. The bottom section 13^b is fastened to this flange. The top of the grille 18 admits air from above the deflector plate 19 direct into the bottom of the drum. This structure may be changed according to the building conditions and laws or to suit manufacturing conditions, all within the scope of the claims appended hereto.

In the fire chamber 10 I have shown a radiator 20 which may be of steam, hot water or gas type and which has its upper end under the opening to the flue 14. To the front of the radiator is secured in any suitable manner, as by stud bolts 21, a casting 22, constituting a gas log. The casting is made with a vertical back which is spaced from the radiator to provide for a protecting metal plate 23 also mounted on the stud bolts and spaced from both the radiator and the back of the casting. The casting is made hollow and gradually reduced in thickness from its bottom to its top. The front of the casting is made to simulate logs, one laid upon the other and has a plurality of ports

24, through which the gas escapes and is ignited.

A gas mixing elbow 25 is fastened in the bottom of the casting 22 at the center thereof and a gas valve 26 extends into the elbow. An ornamental shield 27 resting on the hearth in front of the casting, fits against the casting and conceals the valve and elbow as well as giving a pleasing appearance. The stem 28 of the valve extends through the shield and the latter has suitable draft openings. Above the gas log casting 22 an inclined baffle plate 29 is suspended by a bolt 30 from the flange 18^a of the front grille. This plate extends transversely across the front of the fire chamber, but terminates short of the front edge of the plate 19. The plate 29 however extends inwardly to the flue 14 and thus in conjunction with the plate 19 and the bottom section 13^b, forms a duct 31 for conducting air currents directly to the flue 14. This plate 29 also protects the section 13^b which may be of sheet metal, from the flames of the gas log. If desirable perforations 32 may be made at the bottom of the back wall 10' of the fire chamber, but this is not essential.

In operation with either the gas log 22 or the radiator in use, the air from the room is drawn into the fire chamber through the shield 27 as well as through the open front. Air is also admitted to the flue 11 through the grille 18, likewise to the front of the drum 13 and through the duct 31 to the flue 14. The air current entering the fire chamber mixes with the products of combustion, is heated and escapes into the flue 14. The air currents entering through the duct 31 will also be heated and delivered to the flue 14. The heated air currents quickly pass through the flue and escape through the side grilles 15 into the room.

The air entering the flue 11 will be heated by radiation from the walls of the fire chamber, but it will not become as hot as the air heated in the fire chamber. The air entering the drum through opening 13^c will be warm, but of a lower temperature than the air currents rising from the flue 11. The air currents pass through the drum and escape through the side grilles 15. It will be noted that air currents entering and passing through the drum do not come into contact with the currents entering and passing through the flue 14. The air currents discharged from the flue 14 being of a higher temperature than those discharged from the drum, will promote circulation in the room and through the heater; also the heated areas exposed to the air currents will adequately heat a large volume of air. If gas fumes become objectionable a suitable vent could be connected with the flue 14. The stem 33 of the radiator valve extends

through one of the legs of the grille 18, so as to be handy for operation.

It will be seen that the radiator 20 is completely concealed by the gas log casting 22.

6 However air admitted through the grille 18 or through the draft openings of the shield 27 will be heated by either the gas log or the radiator or by both and discharged into the room from the grilles 15. If the drum and
10 grilles 15 or their equivalents were not provided, very little heat would be obtainable from the radiator. By this arrangement shown even more heat is derived from the radiator than if it was exposed in the room.
15 At times when it is not desired to use the radiator the gas log may be operated or they may be both operated together. The radiator may of course be operated without the gas log.

20 It is apparent that the invention may be carried out in a much more simple manner than has been described in connection with Figs. 1 to 6 and I have shown in Figs. 7 to 12 simplified forms in which the three elements, viz, the radiator, the concealing heater
25 and the drum are employed.

In Figs. 7 to 9 the radiator 20^a is mounted in a fire chamber 34 having a forwardly extending collar 35 fitting in the fire place
30 opening 36 of the mantel 37. A suitable gas heater 38, as a radiant type, may be fitted snugly in the collar, except at the top, where the collar is spaced from the top of the heater. A hood 39 extending outwardly
35 from the collar conceals the said space and the top of the radiator. Air may enter under and above the heater.

The top of the fire chamber 34 is open and enters the bottom of a longitudinal drum 40
40 extending from one side of the mantel to the other, above the radiator. The drum has its ends in the side members 41 of the mantel covered by grilles 42 suitably secured therein. The stem 43 of the radiator valve
45 has its head exposed at one side of the fire place opening.

When the heater 38 is used the air currents pass under the hood 39. These hot air currents enter the drum 41 and are discharged through the grilles 42 at each end.
50 When the radiator is used air is drawn under the heater 38 and into the fire chamber 34. Hot air currents from the radiator rise into the drum 40. The heater acting
55 as such and forming a shield for concealing the radiator, makes a practical and simple heating structure in which each heating element is separately controlled and operable.

In Figs. 10 to 12 I have shown a structure similar to Figs. 7 to 9 except that instead of the drum 40, a vertical drum 44
60 extends upwardly from the fire chamber 34. The upper end of the drum is curved forwardly and connected with a grille 45 in
65 the front of the mantel just under the shelf.

The vertical drum promotes circulation and enhances the heating qualities.

Various changes in the size and shape of the different parts, as well as modifications and alterations may be made within
70 the scope of the appended claims.

What I claim, is:

1. In a fire place heater, a vertical fire chamber having an open front, a vertical air admitting flue surrounding the sides and
75 back of the chamber and having an open front, a radiator in the fire chamber, a heater mounted in front of the radiator, a protector plate supported at the front of the radiator and spaced therefrom and from the
80 heater, a transverse drum connected with the top of the vertical flue, a transverse flue within the drum extending the length thereof and connected with the top of the fire chamber, a front grille covering the front
85 of the vertical flue, a deflector plate extending outwardly at the top of the front of the flue chamber, a baffle plate above the heater spaced from the deflector plates, and grilles at each end of the drum with
90 which the ends of the transverse flue engages.

2. In a fire place heater, a vertical fire chamber having an open front, a gas log disposed therein, a vertical air admitting
95 flue surrounding the sides and back of the chamber and having an open front, a transverse drum connected with the top of the vertical flue, a transverse flue within the drum and connected with the top of the
100 fire chamber, a deflector plate extending outwardly at the top of the front of the fire chamber and beyond said gas log, a baffle plate above the gas log disposed inward from the outer edge of the deflector
105 plate and spaced therefrom to provide a flue duct, and a vertical protector plate supported upon the radiator and spaced therefrom and from the gas log.

3. In a fire place heater, a vertical heater
110 chamber having an open front, air conducting flues surrounding and communicating with said chamber, a radiator disposed therein and having forwardly projecting supporting members, a heater mounted upon
115 said members, and a protecting plate carried by the members intermediate the heater and radiator and spaced from each thereof.

4. In a combination heating structure, the combination with a mantel having a front,
120 sides and a shelf and also a fire place opening in its front, of a fire chamber connected with the fire place opening, a longitudinal drum within the mantel extending between the sides behind the front and connected
125 with the fire chamber, grilles in the sides of the mantel connected with the ends of the drum, a unit of an independent heating system in the fire chamber, and a heater mounted in the front of the fire chamber at the
130