

Nov. 16, 1948.

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2,453,954

FIREPLACE HEATING SYSTEM

Filed Aug. 10, 1944

6 Sheets-Sheet 1

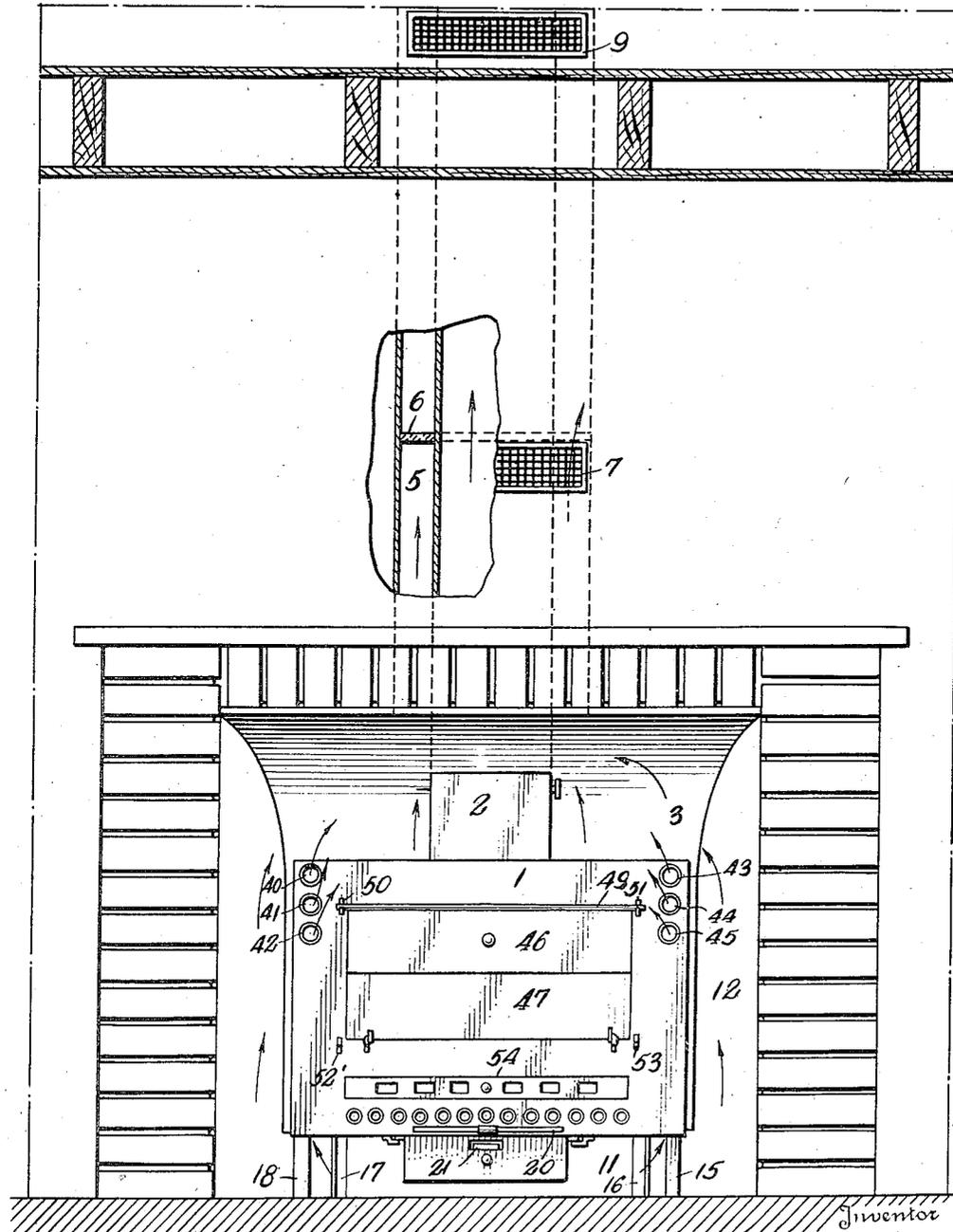


Fig. 1.

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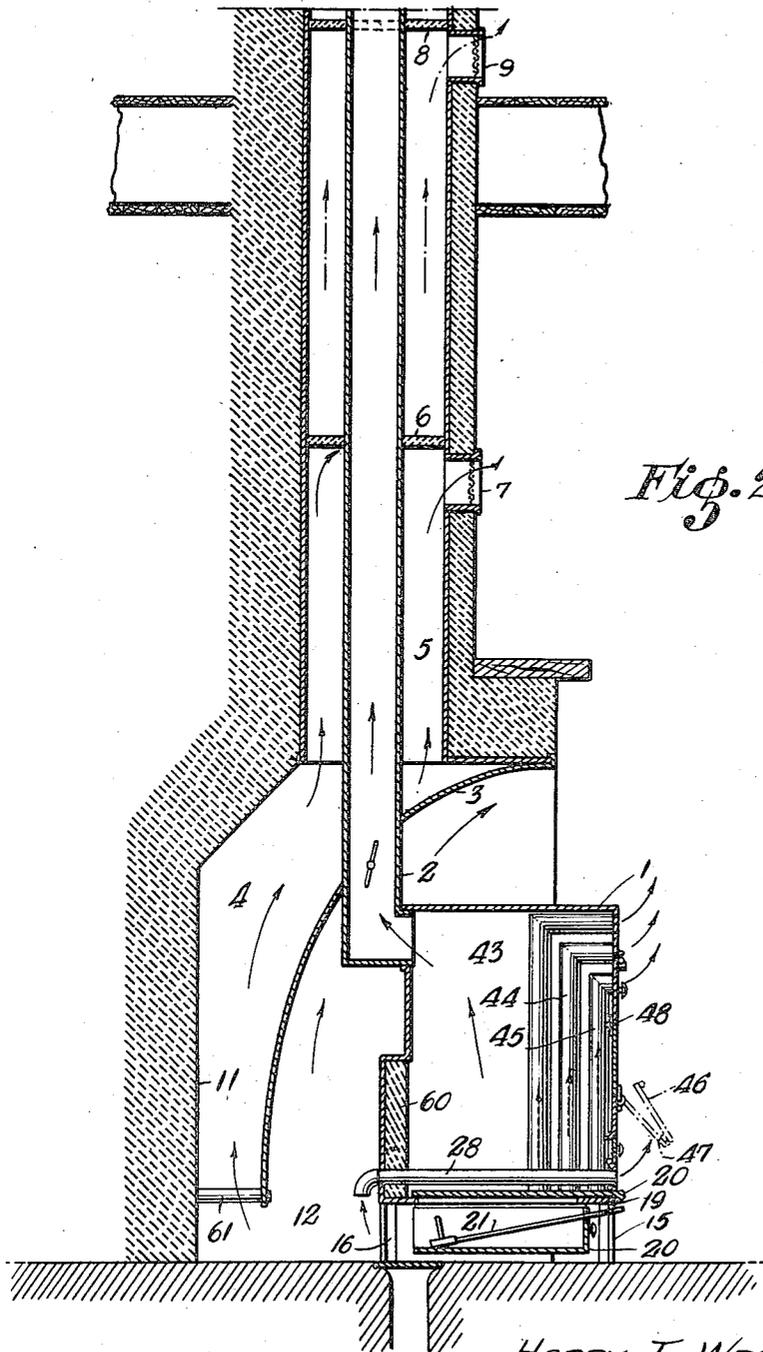


Fig. 2.

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Fig. 3.

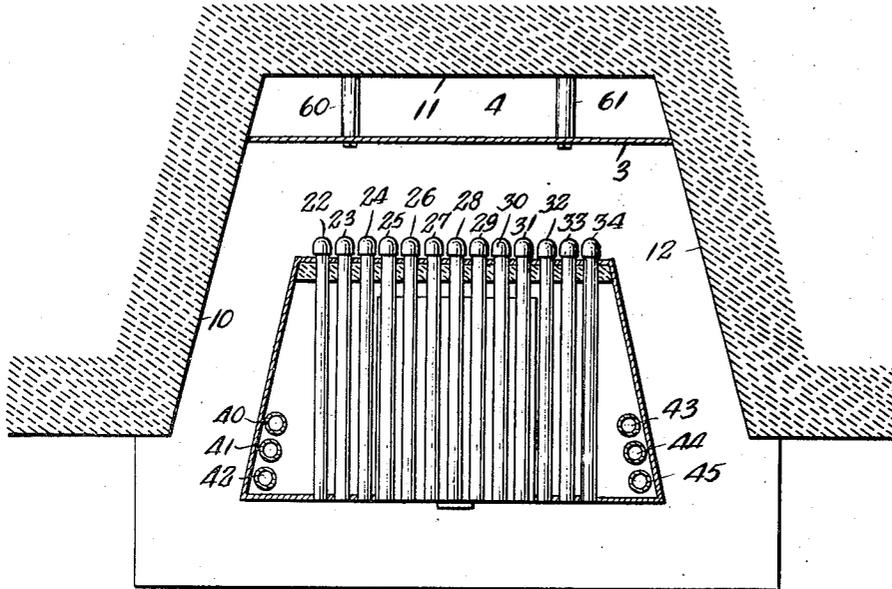
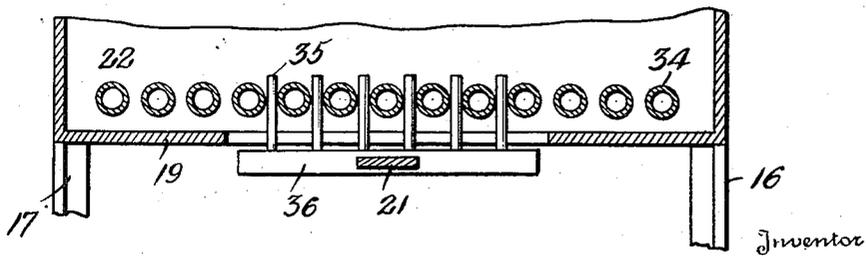


Fig. 4.



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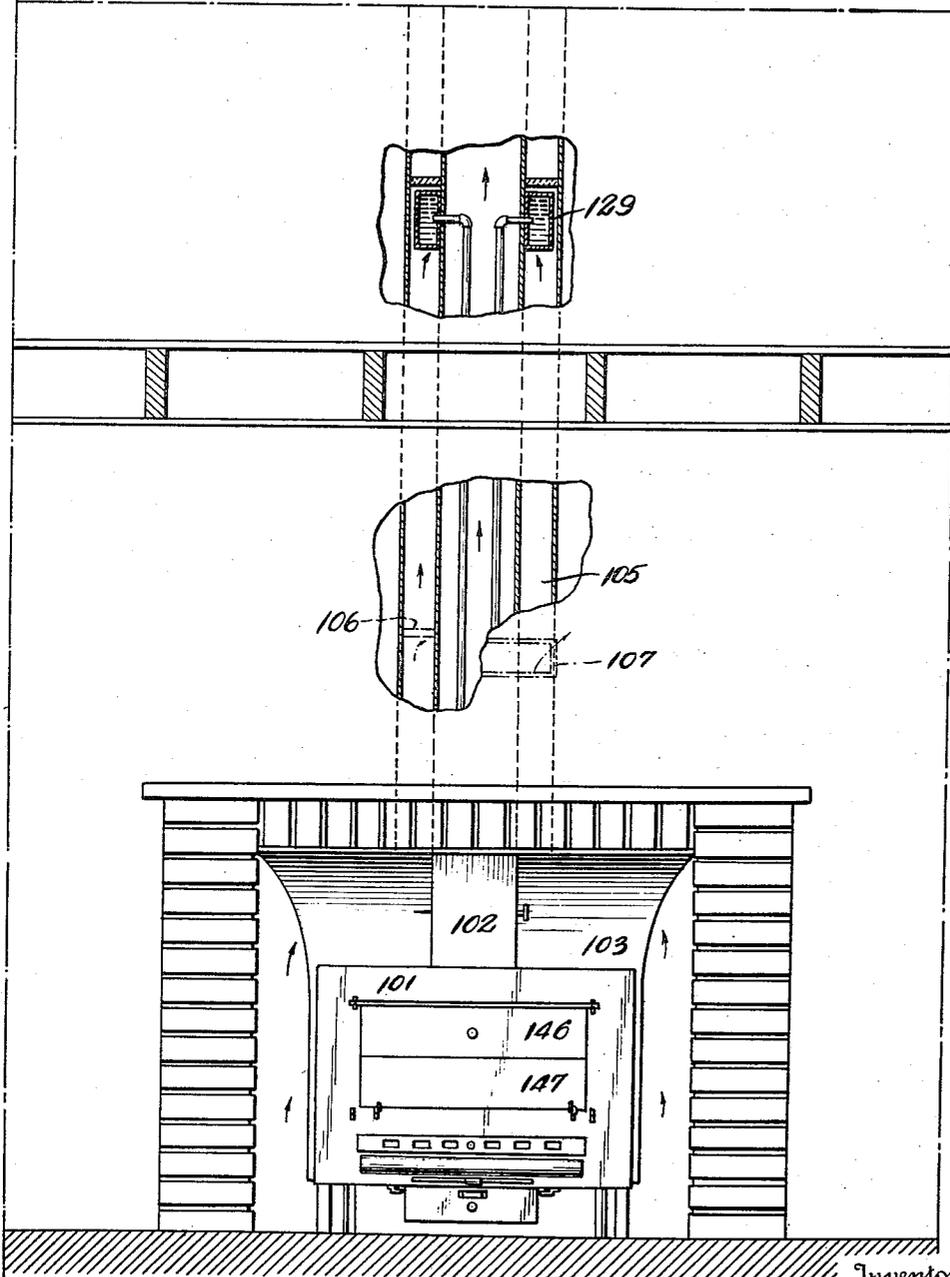
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Fig. 5.

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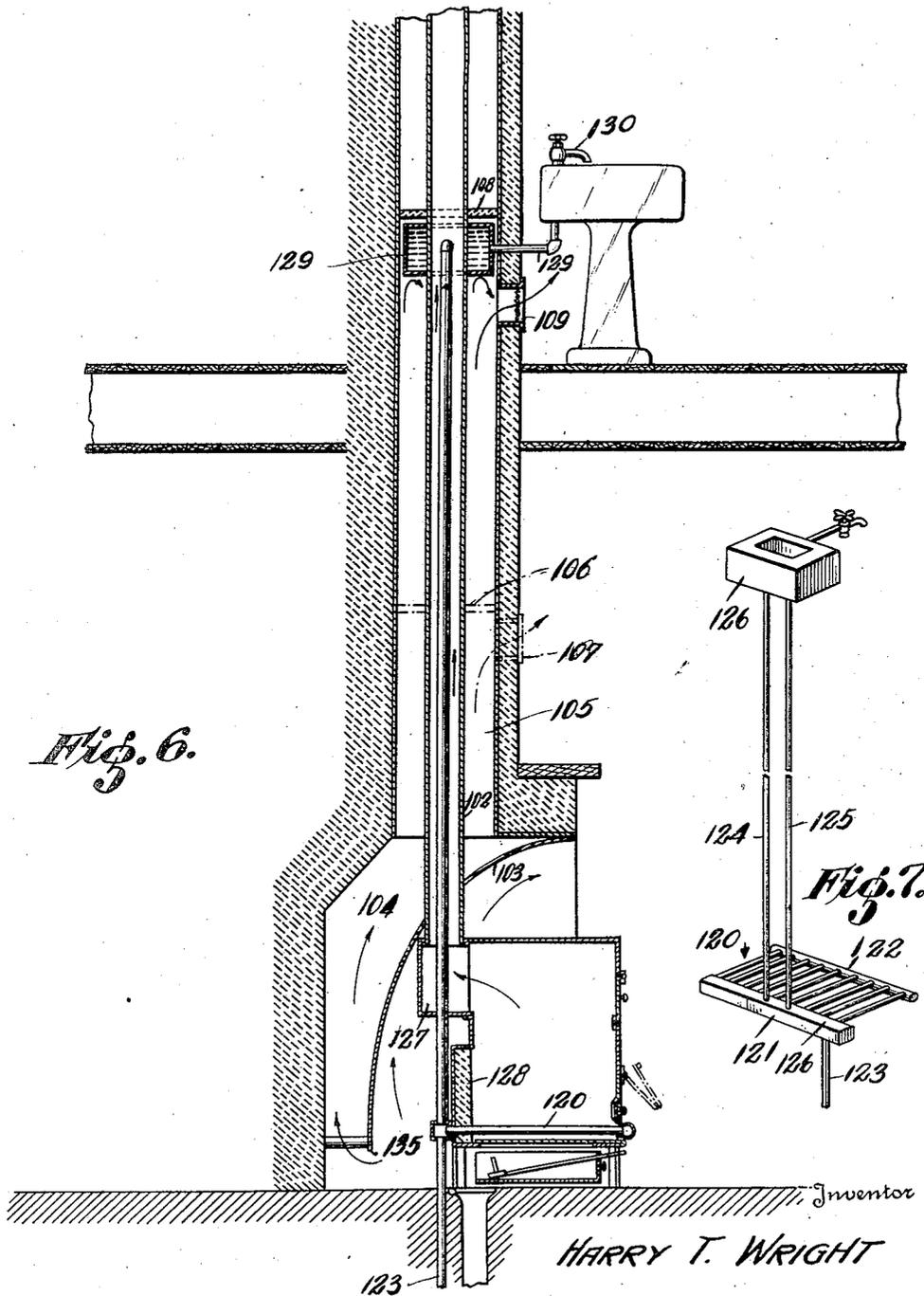


Fig. 6.

Fig. 7.

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Fig. 8.

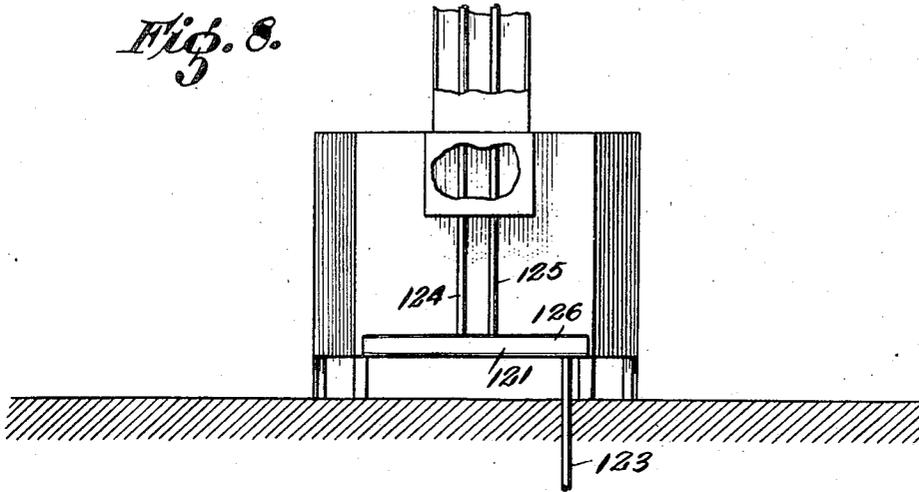
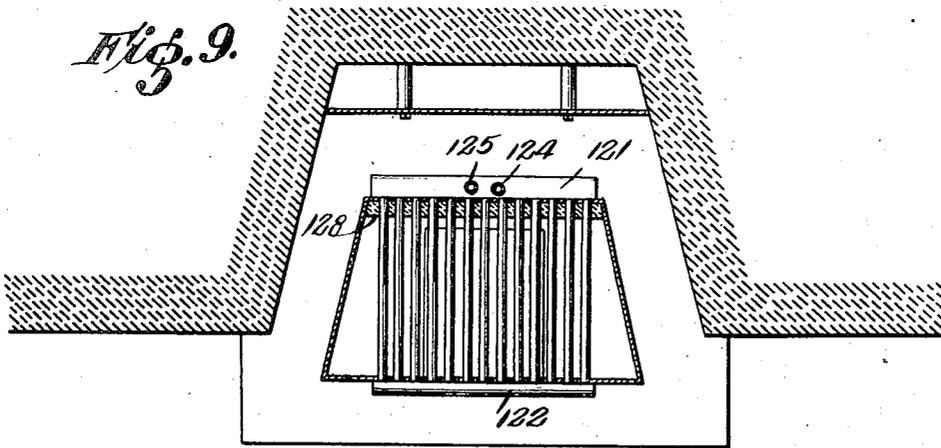


Fig. 9.



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UNITED STATES PATENT OFFICE

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FIREPLACE HEATING SYSTEM

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3 Claims. (Cl. 237-51)

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This invention, relating as indicated to a fireplace heating system, is more particularly directed to the combination of a fireplace stove of novel construction and a flue arrangement whereby products of combustion can be taken off through a stack or chimney, while heated air can be radiated into the room containing the fireplace and also conducted to rooms above the fireplace.

It is an important object of the invention to provide a means of heating the air which comes in contact with the fireplace stove and at the same time utilizing the heat of the products of combustion as they ascend the chimney.

It is a more detailed object of the invention to provide a grate formed of hollow tubular members so that the fluid such as air may be efficiently heated and expelled into the room in which the stove containing the grate is located.

Another object of the invention is to provide a grate of hollow tubular construction adapted to receive a fluid such as water, the grate performing the double function of maintaining the fire bed properly and at the same time heating water so that the same may be piped to a service outlet in the building in which the stove containing the grate is located.

A more detailed object is to provide means for conducting water from a hollow tubular grate to a service outlet in the building in which the stove containing the grate is located.

Another object of the invention is to extract as much heat as possible from the products of combustion as they ascend a flue, this extraction being performed by means of a water tube located in the flue.

A detailed object of the invention is to provide a combustion chamber with an apertured base and a slidable plate mounted above the base to permit ashes to be withdrawn at desired intervals of time.

A more detailed object of the invention is to provide an ash receiver somewhat in the form of a drawer, this receiver having associated therewith a tined gratebar for removing clinkers and ashes from between the individual elements of the grate.

Another detailed object of the invention is to provide a fireplace stove with a two-piece folding door mounted in such manner that a rather large opening is provided when the door is opened, thus imparting the visual aspect of a conventional fireplace.

Other objects and advantages will be evident upon further reading of the description.

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The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings:

Fig. 1 is a front elevation with parts in section.

Fig. 2 is a central vertical section taken transversely of Fig. 1.

Fig. 3 is a horizontal section taken just above the grate shown in Fig. 2.

Fig. 4 is a partial vertical section of the lower portion of the stove shown in Fig. 2.

Fig. 5 is a front elevation of a modification.

Fig. 6 is a central vertical section of Fig. 5.

Fig. 7 is a detail perspective showing the water system.

Fig. 8 is a rear elevation of the fireplace stove.

Fig. 9 is a horizontal section taken just above the grate shown in Fig. 6.

Referring now to the drawings, and more particularly Figs. 1 to 3, it will be seen that I have provided a fireplace stove generally indicated by the numeral 1, such stove being connected to a flue 2 that extends upwardly in the chimney. A deflecting plate 3 is mounted with its forward edge in sealed relationship with the upper interior horizontal edge of the fireplace. This deflector extends arcuately down behind the stove 1, terminating above the floor of the fireplace. It is maintained in desired relationship with the walls 10, 11 and 12 by means of bolts 60 and 61.

This arrangement of the deflector 3 provides a space 4 to the rear of the deflector, this space communicating with an annular conduit 5 that extends upwardly and surrounds the flue 2. From the foregoing, it will be seen that air is drawn beneath the stove 1 and then upwardly through the chamber 4 where it contacts the deflector 3 and flue 2. This contact heats the air causing the same to rise through the annular chamber 5. Partitions 6 and 8 are provided to cause the air to flow through registers 7 and 9, it being understood that a part or all of partition 6 may be omitted, depending upon the number of registers such as 9, which may be located above the register 7.

Referring now more particularly to the stove construction, it will be seen that the base 19 is provided with a relatively large aperture and that the slidable plate 20 is mounted on the base immediately above the aperture. An ash receiver 20 is slidably disposed beneath the base and in registry with the aperture in the base.

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The ash receiver 20 has a slot in its forward surface to receive the shaft of a gratebar 21. This gratebar is shown in Figs. 2 and 4 and comprises a shaft 21 connected to a cross piece 36, the cross piece having secured thereto tines 35. The tines are adapted to extend between the tubular grate members 22 to 34 inclusive when it is desired to remove ashes and clinkers.

Immediately above the removable slidable plate 20, I have provided a grate formed of hollow tubular members such as piping, each pipe extending transversely and in parallel relation with the other pipes as shown in Fig. 3. These pipes open to the atmosphere at the front portion of the stove as shown in Fig. 1 and are provided with elbows also open to the atmosphere as shown in Fig. 3. Air is drawn upwardly first, passing through the elbows and then across the grate and out into the room in which the stove is located.

I have also provided two additional sets of air conduits, these being located along the interior sides of the stove. Each of the conduits 40 to 45 inclusive extend upwardly from openings in the piece 19 and then are curved or bent to extend horizontally to pots in the front face of the stove as shown in Fig. 1. From this description, it will be seen that cool air is drawn from beneath the stove, heated in the combustion chamber and expelled out into the room in which the stove is located.

In the modified construction shown in Figs. 5 to 9 inclusive, the stove and flue are of the same general construction, as well as the air flow. That is, air flows around the stove, becomes heated and it is then deflected out into the room surrounding the stove. At the same time, some of the air passes beneath the stove, due to the provision of legs 15, 16, 17 and 18. This air then passes under the lower edge 135 of the deflector 103. As this air passes upwardly, it contacts first the relatively hot deflector and next the hot flue 102. Obviously, instead of losing heat, the air becomes hotter as it ascends and finally it is expelled outwardly through registers 107 and 109.

The major differences between the construction shown in Figs. 1 and 5 is the grate which in the latter case is designed to receive relatively cool water and to heat the same after which it may be conducted to a desired point of use. The grate generally indicated by the numeral 120 comprises two parallel header members 121 and 122 connected by a series of parallel cross tubes which are adapted to receive the fire bed. Water is admitted to the header 121 through pipe 123 but is prevented from passing immediately to the pipes 124 and 125 by means of a partition 126 located in the interior of header 121. This causes the coldest water to pass across the grate to header 122 and after this, it may pass backward and forward, eventually leaving the grate through pipes 124 and 125. These pipes are located within the flue 102 and extract more heat from the products of combustion passing upwardly within the flue. A tank 129 is located in the upper portions of the chimney and this tank surrounds the flue 102. Heated water may be led from this tank to any desired service outlet.

In Fig. 6, one mode of usage is shown comprising a pipe 129 connected to a faucet 130. From the foregoing it will be seen that water arising in the pipes 124 and 125 is maintained in heated

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condition since the flue will be relatively hot as long as the stove is in operation. At the same time, the water in tank 129 is maintained in heated condition since the air in the chamber 105 rises upwardly.

In both stoves, I have provided a firebrick located in the lower rear vertical portion thereof, this being identified by reference numeral 60 in Fig. 2 and by reference numeral 128 in Fig. 6.

The door is the same in both embodiments of the invention so that a description of one will suffice. Referring to Figs. 1 and 2, it will be seen that the door consists of two sections 46 and 47 connected by means of a hinge 48 in such manner that the panel 46 will overlie the panel 47 when the door is in full opened position. At this time, the rod 49 which is secured to the panel 46 is received in brackets 52 and 53. In opened position, the stove presents the appearance of a conventional fireplace while there are no cumbersome doors to obstruct the view or to interfere with the normal function of the various parts. In closed position, the rod 49 is received in the brackets 50 and 51.

Other modes of applying the principle of the invention may be employed, change being made as regards the details described, provided the features stated in any of the following claims, or the equivalent of such, be employed.

I therefore particularly point out and distinctly claim as my invention:

1. A fireplace heating system comprising, a fireplace, said fireplace having a floor and an upper interior surface, a fireplace stove mounted above the floor of said fireplace, a deflector mounted to the rear of said stove, a flue extending upwardly from said stove and passing through said deflector, said deflector being sealed to the upper interior surface of said fireplace and then extending rearwardly and downwardly, the deflector being provided with an opening adjacent the floor communicating the space in back of said deflector with the space in front of said deflector, whereby air passing under said stove may move upwardly along said deflector and also upwardly behind said deflector, there being an air space surrounding said flue, such air space being a continuation of the space behind said deflector and means forming an outlet from said air space into the interior of the building in which said fireplace is located.

2. A fireplace heating system comprising, a chimney, a fireplace, a fireplace stove, said fireplace having an upper interior surface, a deflector mounted to the rear of said stove, a flue extending upwardly from said stove and passing through said deflector, said deflector being sealed to the upper interior surface of said fireplace and then extending rearwardly and downwardly, the deflector being provided with an opening adjacent the floor communicating the space in back of said deflector with the space in front of said deflector, said flue being mounted in said chimney and being surrounded by an air space, said air space forming a continuation of the space in back of said deflector and means forming an outlet from said air space to the interior of the room in which said fireplace is located, whereby cold air may be drawn around said stove, heated and then forced outwardly into said room along said deflector and also along said air space and through said outlet.

3. A fireplace heating system comprising a chimney, a fireplace, a fireplace stove, a deflector mounted to the rear of said stove, a flue extending upwardly from said stove and passing through

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said deflector, said deflector being sealed to the upper interior surface of said fireplace and then extending rearwardly and downwardly, means forming an opening communicating the space in back of said deflector with the space in front of said deflector, said means being located adjacent the lower end of said deflector, said flue being mounted in said chimney and being surrounded by an air space, a partition in said chimney, mounted in said air space and an outlet from said air space to the interior of the room in which said fireplace is located.

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