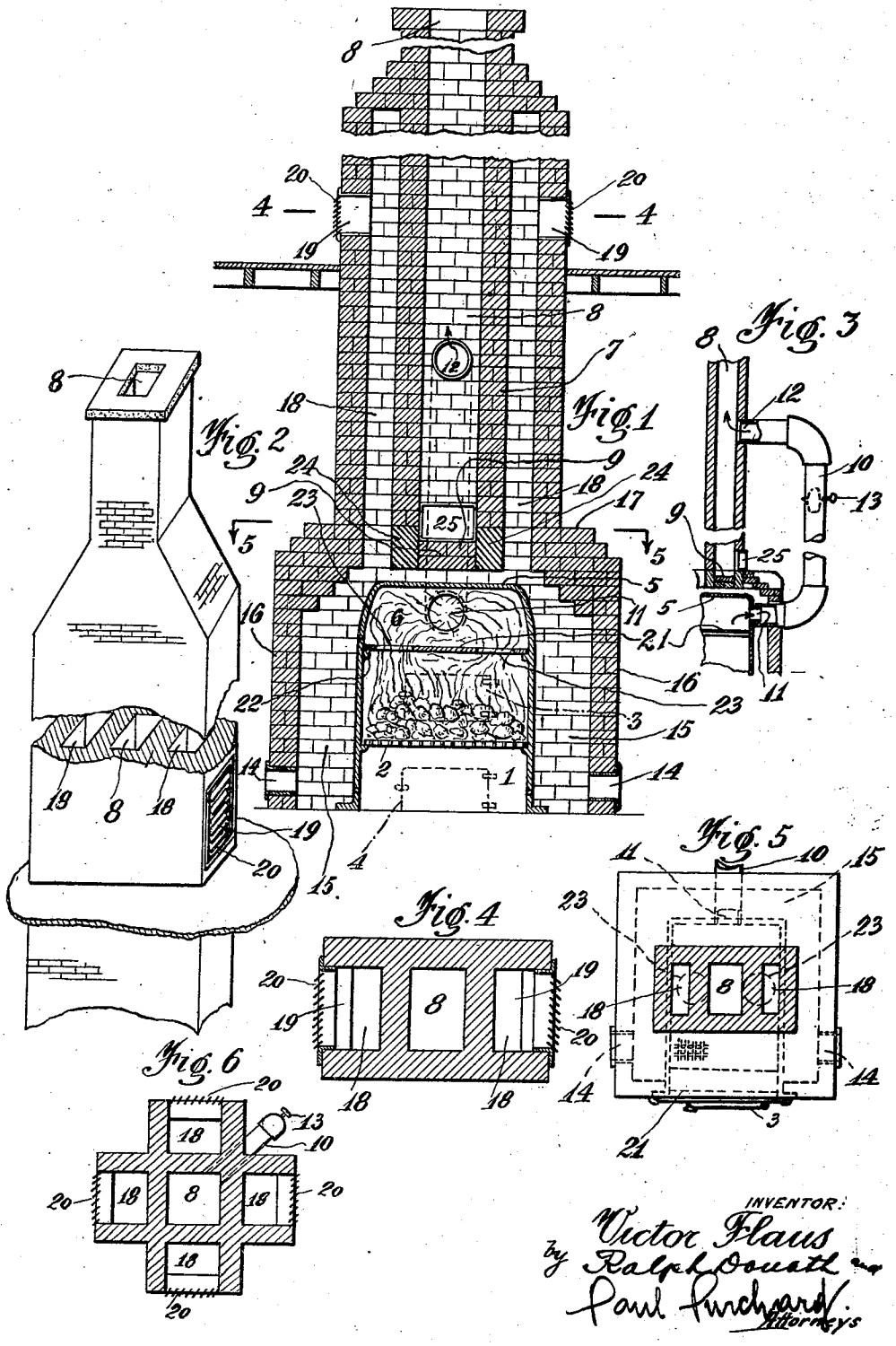
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HOT AIR FURNACE

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HOT-AIR FURNACE.

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This invention relates to furnaces and more in particular to hot air heating furnaces for dwellings.

As is well known, in most hot air furnaces as built nowadays, the gases of combustion are discharged through the chimney with such rapidity that the greater part of heat is lost, thereby causing a great waste of fuel.

The primary object of this invention is to provide a hot air furnace in which the gases of combustion may be retarded in their travel up the chimney a sufficient time to enable them to give up most of their heat to the heating-air. Another object of this invention is to provide a furnace which is built in such a manner as to act as a heat storage plant, after the supply of heat has been interrupted. A further object of this invention is to provide a hot air heating plant in which the air is heated by the furnace proper as well as by the chimney. Still a further object of this invention is to provide a furnace which is simple in construction and design and which can be manufactured from materials readily available anywhere, and at low cost. Additional features and advantages of this invention will appear from the following description, considered in connection with the accompanying drawing forming part of this application and in which:—

Fig. 1 is a longitudinal section taken through the hot air furnace.

Fig. 2 is a fragmentary perspective view showing especially the outside appearance of chimney and flue portion of the furnace.

Fig. 3 is a detail view, partly in section, showing a by-pass pipe used in the chimney.

Fig. 4 is a view showing a section taken on line 4—4 in Fig. 1.

Fig. 5 represents a section taken on line 5—5, Fig. 1.

Fig. 6 is a cross section showing a modified construction of a chimney and air flues used in my invention.

Referring to the various figures, my hot air furnace comprises a heating element 1, the shell of which is made of cast iron or other suitable heat-radiating material, possessing a grate 2 upon which the fuel is burnt and a removable baffle-plate 21 slidably mounted on the rails 22 formed on the shell. In this baffle-plate are provided apertures 23 for the passage of the combustion gases into the smoke chamber 6. In the front of said shell are suitably located the usual fuel door 3 and the ash door 4. The top 5 of the shell is closed and preferably flat.

Built above the top 5 is the chimney 7 which is vertical and perfectly straight and which traverses the various floors of the dwelling and discharges the combustion gases above the roof thereof. This chimney is built of brick or other suitable building material allowing the transmission of heat therethrough, while at the same time also adapted to retain the once imparted heat for a considerable time. The lower end of the chimney is built upon suitable supports such as angle irons or the cross-beams 24, made preferably of refractory material and placed a short distance above the heating element to enable the removal of the latter without disturbing the chimney. The bottom of the latter is closed up by the partition 9 to prevent rain-water and soot from falling on top of the cast iron heating element, thus corroding the same and vitiating the heating air. A clean-out door 25 is shown for the removal of all impurities which may have accumulated on the bottom of the chimney.

The gases of combustion are led from the smoke chamber 6 into the chimney by means of a by-pass pipe 10, made of any desired and suitable material, which connects the openings 11 and 12 positioned respectively in the back of the smoke-chamber 6 and a certain distance above the bottom 9 of the chimney. The by-pass is also provided with a damper 13 whereby the flow of the combustion gases into the chimney may be regulated to suit climatic conditions and the kind of fuel used, or completely stopped. The by-pass and the damper also introduce, of course, a certain and permanent resistance against the velocity of travel of the combustion gases, so that the latter will remain for a longer period in the heating element, thereby favoring a more perfect transmission of heat to the heating-air.

The latter is introduced through suitable inlet apertures 14 into the heating-chamber 15 which is made by building around the heating element 1 a brick structure represented by the walls 16 and the top 17. As the air is heated by the shell of the heating element, it travels upwardly in the air flues 18 which run alongside the chimney 7 and which are also formed by brick walls, as

plainly shown in the various figures. It will be seen from Fig. 1 that, on account of leaving a certain space between the top 5 of the shell and the lower end of the chimney, the top 5, (which is the hottest part of the heating element) radiates its full share of heat to the air, thereby enabling a complete use of the whole surface of the heating element 1. This feature also contributes to better equalization of the heat in the air and a better circulation of the latter around the heating element.

At every floor of the dwelling, suitable hot air outlets 19, having adjustable registers 20 are provided. It will be readily understood that by this construction, the air which has been heated in the heating chamber 15 will also absorb a considerable amount of heat from the sides of the chimney. This feature, in itself affords a great saving of fuel, as compared to old types of hot air furnaces where the air heated by the heating element loses a good amount of its heat in its upward travel to the various floors. The hot air flues are, of course, carried only high enough to supply the uppermost story with heat; they are therefore closed at the top by additional brick work, as shown especially in Fig. 1.

Where a great number of rooms are to be heated, especially if said rooms are situated at different levels, it may be found desirable to use separate hot air flues for the various rooms or floors. In this case, instead of using only two air flues, as shown in Figs. 4 and 5 especially, the chimney may be surrounded with flues on all sides, as suggested in Fig. 6, which shows a chimney surrounded by four separate air flues. From the latter construction it will also be noted that an even greater economy of fuel, respectively a greater heating efficiency, may be derived on account of surrounding the chimney with air flues on all sides.

A hot air furnace built according to the above described invention, enables the rapid heating of a house because, as the fire in the heating element 1 is started, the air will be quickly heated in the heating chamber by the shell of said heating element and reach the various rooms rapidly. As the furnace keeps on burning fuel, the walls of the chimney as well as of the air-ducts become also well heated, so that when the fire is discontinued, as is often done over night, the various brick walls will release their absorbed heat and maintain the whole house at a comfortable temperature until the following morning.

While I have illustrated and described the preferred embodiment of my invention, and one which I have found by actual use to be very practical, it may be found desirable in time to make slight changes in the construction and arrangement of the details of my invention, and I intend to include in this application all such variations as fall within the scope of the appended claims.

I claim:

1. In a hot air furnace, the combination of a heating element having a grate and a shell with a closed top; an air-chamber surrounding said heating element; a vertical chimney having a closed bottom positioned a distance above the top of the heating element; a plurality of hot air ducts disposed alongside of said chimney and in communication with said air-chamber; a removable baffle-plate adapted to divide the space above the grate of said heating element into a combustion-chamber and a smoke-chamber positioned above the latter, said baffle-plate having apertures to establish communication between said chambers, and a by-pass pipe adapted to connect said smoke-chamber with said chimney.

2. In a hot air furnace, the combination of a heating element having a grate and a shell with a closed top; an air-chamber surrounding said heating element; a vertical chimney having a closed bottom positioned a distance above the top of the heating element; a plurality of hot air ducts disposed alongside of said chimney and in communication with said air-chamber; a removable baffle-plate adapted to divide the space above the grate of said heating element into a combustion-chamber and a smoke-chamber positioned above the latter, said baffle-plate having apertures to establish communication between said chambers; a by-pass pipe adapted to connect said smoke-chamber with said chimney, and rails positioned inside the shell of the heating element for slidably supporting said baffle-plate.

3. In a hot air furnace, the combination of a heating element having a grate and a shell with a closed top; an air-chamber surrounding said heating element; a vertical chimney having a closed bottom positioned a distance above the top of the heating element; a plurality of hot air ducts disposed alongside of said chimney and in communication with said air-chamber; a removable baffle-plate adapted to divide the space above the grate of said heating element into a combustion-chamber and a smoke-chamber positioned above the latter, said baffle-plate having apertures to establish communication between said chambers; a smoke outlet connection positioned on a lateral side of said smoke-chamber, and a by-pass pipe communicating with said outlet connection and adapted to connect said smoke-chamber with said chimney.

4. In a hot air furnace, the combination of a heating element having a grate and a shell with a closed top; a brick structure built around the heating element and

adapted to form an air-chamber; a vertical chimney having a closed bottom positioned a distance above the top of the heating element; a plurality of cross-beams carried by said brick structure for supporting said chimney; a plurality of hot air ducts disposed alongside of said chimney and in communication with said air-chamber; means for distributing the air heated in the air chamber to the rooms of a dwelling; a removable baffle-plate adapted to divide the space above the grate of said heating element into a combustion-chamber and a smoke-chamber positioned above the latter, said baffle-plate having apertures to establish communication between said chambers; rails positioned inside the shell of the heating element for slidably supporting said baffle-plate; a smoke outlet connection positioned on a lateral side of said smoke-chamber; a by-pass pipe communicating with said outlet connection and adapted to connect said smoke-chamber with said chimney, and means positioned in the by-pass pipe to regulate the flow of combustion gases into said chimney.

In testimony whereof I affix my signature.

VICTOR FLAUS.