May 30, 1933. R. A. BELL ET AL 1,911,985

WARM AIR FURNACE

Filed Jan. 18, 1932

Fig. 2

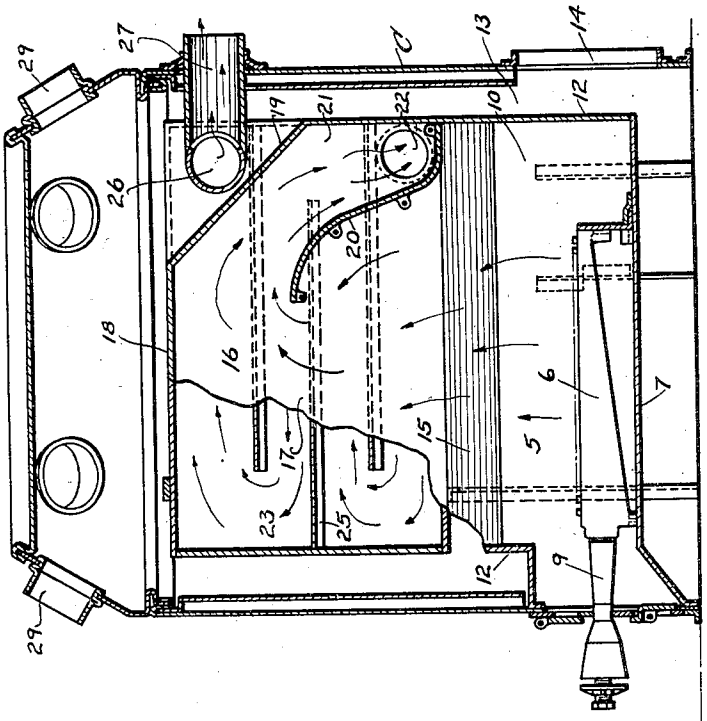
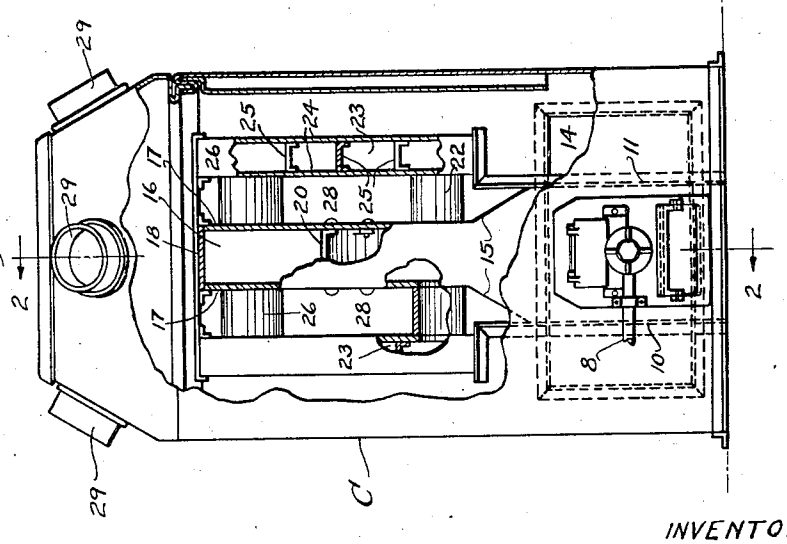


Fig. 1



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UNITED STATES PATENT OFFICE

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WARM AIR FURNACE

Application filed January 18, 1932. Serial No. 587,260.

This invention relates to a warm air furnace adapted to burn gas or other fuel which may be so controlled that little or no smoke or soot is formed. With the use of such fuel, it is feasible to conduct the hot gases, formed as the result of combustion, along a tortuous path, thereby greatly increasing the surface from which the heat may be radiated or conducted and consequently increasing the efficiency of the furnace.

With the above conditions in mind, it is the object of the present invention to provide a furnace in which the burning gas or the hot products of combustion are so directed that the heat therefrom may be utilized to the fullest extent. At the same time, the walls or partitions of the furnace are so arranged that there will be a uniform and continuous flow of the hot combustion gases along a well defined path and the most intense heat produced by the combustion is far enough away from the point where these gases impinge against the wall of the fire chamber, to avoid the rapid deterioration or disintegration of the latter, as has occurred in many furnaces heretofore used.

The invention which, in its present embodiment, is associated with a gas burning warm air furnace, will be particularly described in connection with the accompanying drawing, in which—

Figure 1 is a front elevation of the furnace with parts of the walls broken away and shown in section; and

Figure 2 is a longitudinal view on the line 2—2 of Fig. 1, but with parts broken away.

As shown in the drawing, the furnace comprises an exterior casing C having a lower inlet 14 for the air to be heated and upper outlets 29 for the heated air. Within the casing is a radiator which comprises among other things a combustion chamber 5 within which a gas burner 6 is supported on a base 7. Gas is supplied to the burner 6 from a supply pipe 8 through a mixing tube 9.

The combustion chamber 5 has side walls 10 and 11 connected by end walls 12, the side walls converging upwardly as shown at 15 and then continuing upwardly to define a comparatively narrow radiator section 16 the sides of which are indicated at 17 and the top at 18. The upper rear portion of the section 16 is inclined downwardly as shown at 19 and its lower portion is provided with two opposed outlet passages 22. In order to establish proper circulation of the burner gases within the section 16 before they reach the outlet passages 22, a baffle or partition 20 is provided to define a downwardly and rearwardly extending flue 21 which leads to the laterally disposed passages 22. Said partition extends upwardly and forwardly from below said passages 22 and terminates at a point below the top of and between the end walls of the said section 16. The passages 22 lead into narrow radiator sections 23 which are spaced from the central section 16 and which are defined by the side walls 24 and which at their upper rear corners are connected by an exhaust conduit 26 which in turn is connected with a final flue 27, it being noted that the conduit 26 is outside of the radiator section 16 and above the inclined portion 19 of the latter. Each radiator section 23 is similarly provided with baffles 25 extending alternately from the front and rear ends of the section so that the path of the gases from the passage 22 is to and fro until it reaches the top of the section whence it leads to the exhaust conduit 26 and outlet flue 27 which is connected with the chimney.

The air to be heated enters the enclosure 13 inside of the casing C by way of the opening 14 in the casing and flows directly upwardly about the radiator as a whole, some of the air passing through the spaces 28 between the central radiator section 16 and the side sections 23.

The course of the combustion gases through the radiator sections is indicated by the arrows in Fig. 2. It will be seen that these gases, as they ascend from the burner 6, are gradually deflected forwardly by the curved baffle or partition plate 20 so that they flow upwardly along the front wall of the section 16, passing rearwardly along the top of the section and thence downwardly in an inclined direction toward the

lateral passages 22. As a consequence, the intensely hot gases resulting from the combustion at the burner do not beat directly against the upper wall 18 but flow in a more or less circuitous course along the front, top and rear walls of the section.

While we have shown and described in detail the preferred adaptation of the invention, it is to be understood that the same may be modified considerably without any material departure from the scope of the invention as claimed.

What is claimed is:

1. A warm air furnace comprising in combination an outer casing wherethrough the air to be heated passes, a radiator within said casing, said radiator comprising: a combustion chamber having a top opening which is of greater length than width, a relatively long and narrow central radiator section projecting upwardly from the top of and being in direct communication with said chamber and having opposed outlets at a lower corner, a partition underlying said outlets and extending upwardly and forwardly within said section and terminating at a point below the top and between the end walls thereof, rectangular radiator sections disposed at opposite sides of and spaced from the central radiator section, conduits extending laterally from the said opposed outlets to the adjacent radiator sections, and an exhaust conduit connecting similar corners of the side radiator sections.

2. A warm air furnace comprising in combination an outer casing wherethrough the air to be heated passes, a radiator within said casing, said radiator comprising: a combustion chamber having a top opening which is of greater length than width, a relatively long and narrow central radiator section projecting upwardly from the top of and being in direct communication with said chamber and having opposed outlets at a lower corner, a partition underlying said outlets and extending upwardly and forwardly within said section and terminating at a point below the top and between the end walls thereof, rectangular radiator sections disposed at opposite sides of and spaced from the central radiator section, conduits extending laterally from the said opposed outlets to the adjacent radiator sections, and an exhaust conduit connecting similar corners of the side radiator sections, said central radiator section having that portion of its top wall above said partition sloping downwardly.

In testimony whereof we have affixed our signatures.

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VILYNN O. BEAM.