

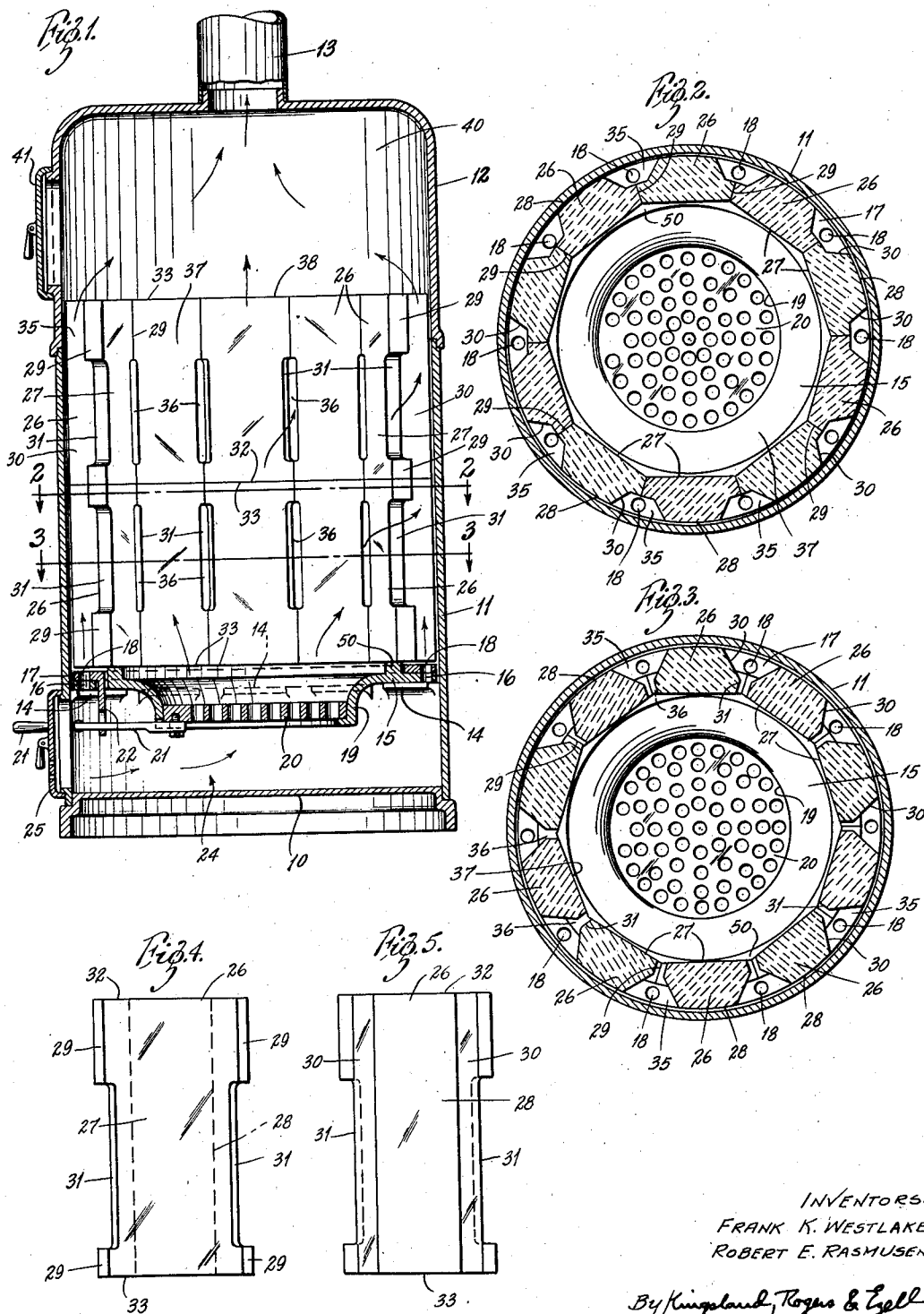
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STOVE

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STOVE

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2 Claims. (Cl. 126-73)

The present invention relates to a stove.

Briefly, the stove of the present invention comprises an outer casing, in the bottom of which is formed an ashpit into which air may enter. Above the ashpit there is a fuel box or bed, the side walls of which are spaced inwardly from the outer casing at certain points to provide flues which communicate with the ashpit and which also communicate with the inside of the fire box. Above the fire box there is a combustion chamber.

An object of the invention is to provide a stove of this kind having a deep fire box wherein the burning of the fuel takes place at the bottom and wherein coking of the fuel takes place above the burning, together with means to carry the gases obtained by coking into the lateral flues wherein they may mix with secondary air and burn; and also to provide a combustion chamber above the fire bed wherein any and all additional gases may be burned.

A further object is to provide a grate and a control combined therewith for determining the amount of secondary air admitted to the flues and also to provide clean-out means for the flues. Other objects and advantages will be apparent from the following description taken with the drawing.

In the drawing:

Fig. 1 is a vertical mid-section through the stove;

Fig. 2 is a horizontal 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 an inside view of one of the tiles; and,

Fig. 5 is an outside view thereof.

The stove includes a base member 10 on which is disposed an outer casing 11 of steel or cast metal. Surmounting this is a dome or cap 12, from the upper end of which extends a smoke pipe 13.

Spaced above the base member 10 is a plurality of ledges 14, or the like, formed on or secured to the inside of the outer casing 11 which receive a supporting member 15 of the configuration shown having ports 16 therein for a purpose to be described. Supported on the supporting member 15 is a ring 17, which has ports 18 adapted to register with the port 16. The supporting member 15 has a sunken center portion 19 which receives a grate 20, and an annular raised flange portion 50.

A shaker handle 21 is secured to the grate 20 and also engages a loop 22 depending from the

ring 17 so that operation of the shaker handle 21 simultaneously shakes the grate 20 and the ring 17.

The base 10 and the member 15 together with the lower part of the casing 11 form an ashpit 24 having a clean-out and draft door 25.

Supported upon the flange portion 50 of the member 15 is a plurality of tiles 26. The tiles 26 are disposed in two superposed courses and all tiles 26 are identical. The tiles 26 are thus supported out of contact with the ring 17 which is thereby free to be rotated.

Each tile 26 has a cross-sectional shape as shown in Fig. 2 to provide an inner face 27, an outer face 28 preferably arcuate so as to fit against the casing 11, and opposite end faces 29 that are radial with respect to the arcuate face 28 so as to fit against corresponding faces of adjacent tiles. In addition, each tile 26 is provided with notches 30 cut out of the corners between the arcuate face 28 and the edges 29. Further, each tile 26 is provided in its edges 29 with grooves 31 disposed between the upper edge 32 and the bottom edge 33 thereof.

When the tiles 26 are disposed together as shown in the drawing, the edges 29 of each tile 26 engage against corresponding edges of adjacent tiles 26. The notches 30 of adjacent tiles 26 unite to form vertical flues 35. The grooves 31 come together to form ports 36 leading from the several flues 35 to the fuel box or bed 37 formed within the cylinder of tiles.

As a result, there is a deep fuel bed that may reach to the top of the upper course of tiles, which is indicated separately at 38.

Above the edge 38 is the dome or combustion chamber 40. Into it both the fuel bed 37 and the flues 35 open. It is provided with a fuel door 41.

To illustrate what have been determined to be very satisfactory proportions, the inside of the shell 11 may have a 19" diameter. For this size, preferably each tile is 9½" in height, giving a total lining or fire box height of 19" above the member 17. There are ten tiles employed in each course.

The flues 35 are radially 1" deep and the edges 29 are also 1" deep radially. The cordal dimension of the flues 35 at their narrow inner portion is 1⅜". The cordal dimension of the face 28 is 3". Adjacent the ports 36, the sloping edges 30 are continued inwardly to a point ¼" from the edges 29, making the ports 36 to be ½" wide. They are also 5½" in height and are disposed 1" from the near end of each tile.

The foregoing dimensions have been given for purposes of illustration because it has been found that the relative air capacities of the ports and flues and fire box are more or less critical.

The operation of this stove is as follows:

In starting a fire, a small amount of fuel is placed over the grate 20. The ashpit door 25 is opened to increase the air supply and the handle 21 is moved so that the ports 16 do not register with the ports 13, thus cutting off the draft to the flues 35 and causing the air to flow through the grate 20 to provide rapid and thorough combustion.

When a supply of burning coals is established, a large supply of coal may be put in through the door 41 until the entire fuel box is filled up to the edge 38. Then the shaker handle 21 may be operated to open the ports into the flues 35. By this means, some of the air entering through the ashpit passes through the grate 20 as primary air and additional air passes into the flues directly as secondary air. The primary air, of course, continues the combustion at the bed of coals. It causes heat to rise up through the coals and also generates from the coals gases in varying states of incomplete combustion.

Since there is a steady flow of air up through the flues 35, this air flowing with some velocity, there will be entrained in the flues these gases from the incomplete combustion of the coking coal drawn from the fire box 37 through the ports 36. These gases are very hot but within the fire bed are supplied with an inadequate amount of oxygen to support combustion. At least this is true of those coming from the upper parts of the fuel bed. Those coming from right off the bed of coals may actually be burning. In any event, when a mixture of these gases with the free air entering the flues 35 from the ashpit occurs, combustion takes place in the flues 35. This combustion occurs right against the casing 11 and heats the same to provide a very desirable disposition of the fire within the stove to a maximum heating of the room.

All of the combustion does not take place in the flues. Some of the gases leaving the upper ends of the flues and passing into the dome 40 are not completely burned. Likewise, there are gases coming from the top of the bed 37 itself. Hence, the provision of the dome 40 gives means for effecting the complete combustion of all of these remaining gases. Those coming from the flues 35 are actually in flame to insure the burning of those coming from the fire box 37. Hence, the gases going up the smoke stack 13 are almost wholly burned.

Normally, one filling of fuel into this stove will last from one and a half to two days without refill.

As heretofore suggested, the flues 35 must not be so large that they draw all of the air from the ashpit or that they cool down the gases coming off the fire. Either case will result in incomplete burning of these gases. Likewise, the fire bed must be deep enough not only to hold a supply of coal sufficient for a long operation of the stove, but also to insure that the coal will have sufficient time to coke completely by the time it reaches the fire bed itself. Yet the flues must be large enough to insure some velocity of air adequate to encourage the flow of the gases from the fire bed through the ports 36 into the flues.

It is apparent that there has been provided a

stove which fulfills all of the objects and advantages sought therefor.

It is to be understood that the foregoing description and the accompanying drawing are provided for purposes of illustration and not limitation, the invention being defined by the claims which follow.

We claim:

1. In a heater, a round casing providing an ash pit, a fuel chamber area above the ash pit and a combustion dome above the chamber, grate supporting means above the ash pit, a plurality of tiles supported above the grate, said tiles each being generally arcuate, with radial side edges that converge toward the center of the casing, and the tiles being sized so that when disposed in the casing they will fit with their outer surfaces substantially against the inner wall of the casing for support outwardly, their side edges will engage to give support radially inwardly, said tiles thereby having cooperating inner surfaces forming a fuel chamber, and said chamber being at least as deep as it is wide, each of said tiles having its side edges cut away adjacent their outer surfaces to cooperate with corresponding parts of adjacent tiles to form, with the casing, vertical flues adjacent the casing and extending from the ash pit to the combustion dome, said side edges being likewise cut away adjacent their inner surfaces to provide ports connecting the vertical flues with the fuel chamber, the cross sectional area of the vertical flues being only sufficient, relative to their length, to admit substantially enough air to provide an entraining flow of secondary air from bottom to top thereof, to support complete combustion for the gases drawn therein through the connecting ports, and the connecting ports being only large enough to pass gases from the fuel chamber to be mixed in said flues to provide combustion thereof in the flues and in the dome.

2. In a heater, an outer casing providing an ash pit, a fuel chamber above the ash pit and a combustion dome above the chamber, grate means across the casing above the ash pit, a plurality of tiles supported above the grate, said tiles being set side by side around the inner surface of the casing with the outer tile surfaces against the inner casing surface to form a lining therefor, each tile having its side edges against the side edges of the adjacent tiles, and the combined inner surfaces of the tiles forming a fuel chamber, said fuel chamber being at least as deep as it is wide, the tiles being cut away at their side edges adjacent their outer surfaces to provide a plurality of vertical flues closed by the casing, said flues being separately disposed at least substantially all around the casing, said flues extending from the ash pit to the combustion zone, said tiles also being cut away at their side edges from their inner surfaces to said flues to provide ports therethrough connecting the fuel chamber with said vertical flues, the cross-sectional area of the several vertical flues being only sufficient to admit substantially enough air to provide an entraining flow of secondary air from the bottom to the top thereof, to support complete combustion for the gases drawn therein through the connecting ports, and the connecting ports being only large enough to pass gases from the fuel chamber to be mixed in said flues to provide combustion thereof in the flues and in the dome.

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