April 6, 1926. 1,579,642

H. E. BURNS

INCINERATOR

Filed July 25, 1925 3 Sheets-Sheet 1

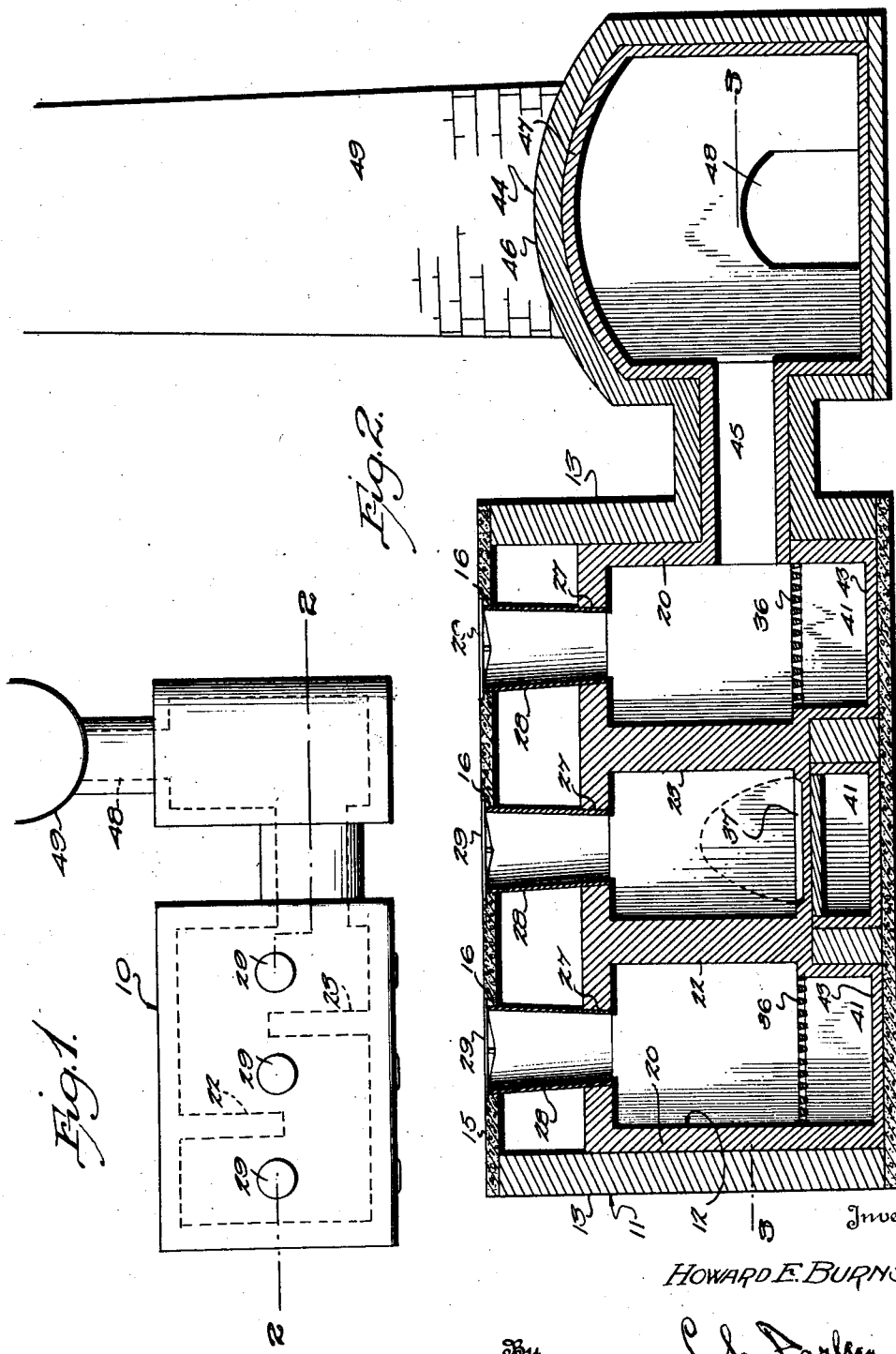


Fig. 2.

Fig. 1.

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April 6, 1926.

1,579,642

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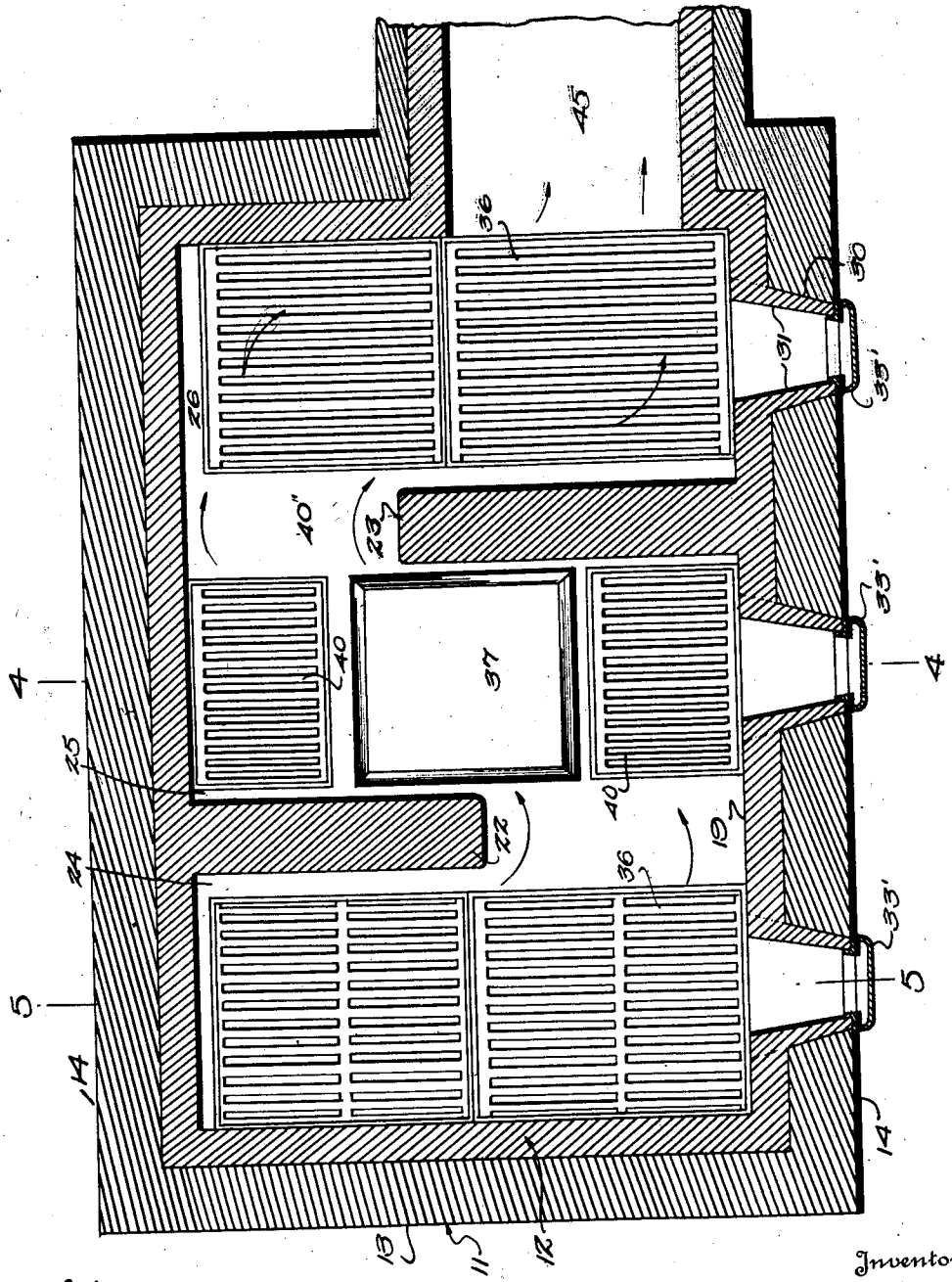


Fig. 3.

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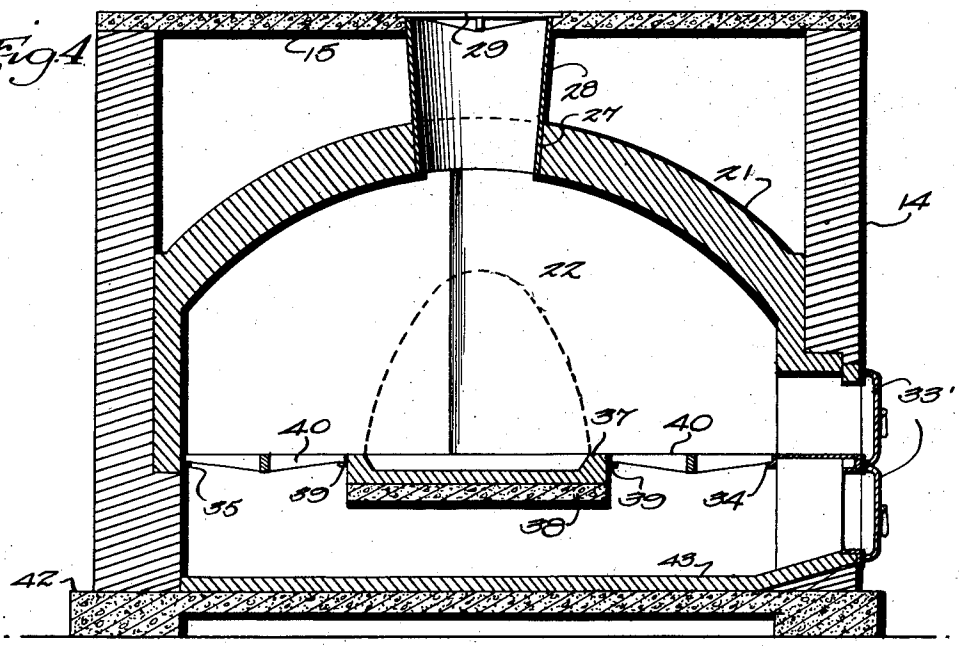
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INCINERATOR

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Fig. 4



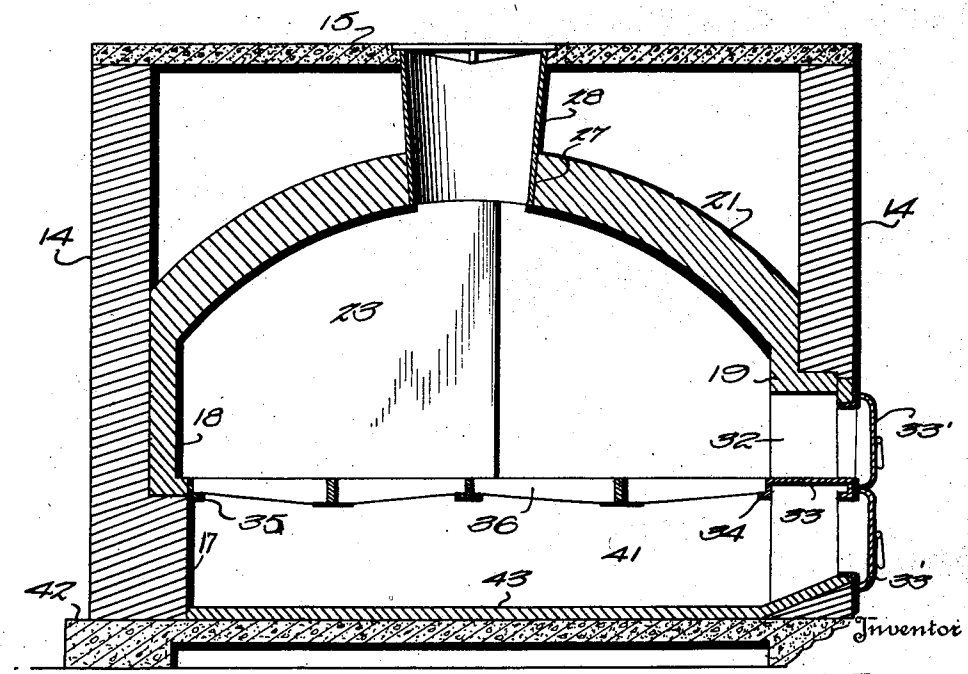


Fig. 5.

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UNITED STATES PATENT OFFICE.

HOWARD E. BURNS, OF DALLAS, TEXAS.

INCINERATOR.

Application filed July 25, 1925. Serial No. 46,125.

To all whom it may concern:

Be it known that I, HOWARD E. BURNS, a citizen of the United States, residing at Dallas, in the county of Dallas and State of Texas, have invented certain new and useful Improvements in Incinerators, of which the following is a specification.

This invention relates to incinerators and more particularly to an incinerator adapted for the burning of garbage, rubbish, etc., containing varying degrees of moisture.

An important object of the invention is to provide an incinerator having an outlet opening at one end and divided transversely to form a plurality of communicating burner chambers, the products of combustion from each chamber remote from the outlet opening being adapted to pass through successive chambers to increase the temperature therein until the gases and products of combustion pass outwardly through the outlet opening.

A further object is to provide an incinerator provided with means for receiving garbage or the like containing an excess amount of moisture and being further provided with other means to receive drier material, the products of combustion from which are adapted to pass around and through the moist material to assist in drying and burning it.

A still further object is to provide an incinerator including a plurality of communicating burner chambers each of which is adapted to contain material to be burned, the gases and products of combustion from each chamber being adapted to flow continuously through succeeding chambers to successively increase the temperatures therein whereby the gases will be completely consumed and the products of combustion rendered entirely odorless as is desired.

A still further object is to provide an incinerator divided by baffle walls extending partially thereacross to provide successive burner chambers the baffle walls being staggered with relation to each other whereby the gases and products of combustion are caused to travel a tortuous path and to pass completely across each of the burner chambers to effect proper combustion of the materials being burned.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings I have shown one embodiment of the invention. In this showing:

Figure 1 is a plan view of the apparatus,

Figure 2 is a section on line 2—2 of Figure 1,

Figure 3 is a section on line 3—3 of Figure 2,

Figure 4 is a similar view on line 4—4 of Figure 3, and,

Figure 5 is a similar view on line 5—5 of Figure 3.

Referring to the drawings, the numeral 10 designates the incinerator proper which comprises an outer wall structure 11 and an inner wall structure 12. The outer wall may be formed of any suitable material and includes end walls 13 and side walls 14. The walls 11 are covered by a top 15 of any suitable material provided with spaced openings 16 of substantial diameter for a purpose to be described. The rear wall 14 is thickened at its lower end to provide a shoulder 17 upon which rests the rear wall 18 of the inner wall construction 12. This inner construction also includes a front wall 19 and end walls 20 as shown in Figures 2 to 5 inclusive. The inner wall structure is provided with an arched crown 21 preferably formed integral with the end and side walls, and it will be apparent that the inner structure may be formed of any suitable material such as fire clay or the like.

As shown in Figure 3, the walls 18 and 19 of the inner structure are provided with oppositely extending baffle walls 22 and 23. Each of these walls extends preferably a slight distance beyond the center of the incinerator as shown and divides the space within the inner wall structure into a plurality of burner chambers 24, 25 and 26. The arch 21 is provided with a plurality of openings 27 each of which is arranged centrally of one of the burner chambers previously described. The openings 27 are also arranged in vertical alinement with the openings 16 and tubes 28 are arranged in the openings 16 and 27 to provide means for feeding refuse material into the interior of the several burner chambers. Covers 29 are arranged above the upper ends of the tubes to form closures therefor, as will be obvious.

The outer wall structure 10 is provided in its forward wall with openings 30 through which extend portions 31 of the wall 19. The extended portions 31 of the wall 19 are provided with vertically elongated openings

32 and each of the openings is divided horizontally and substantially centrally thereof by a plate 33 which divides each of the openings into a fire door opening and an ash pit opening and these openings are closed by doors 33'. Each of the plates 33 is provided within the inner wall structure with a horizontal shoulder 34 while a similar shoulder 35 is arranged adjacent the rear of the inner wall structure as shown in Figure 5. These shoulders, in the burner chambers 24 and 26, are adapted to support the grates 36 which preferably extend continuously throughout the chambers, as shown.

In the central burner chamber 25 a pan 37 is arranged as shown in Figures 3 and 4. This pan may be formed integral with the inner wall structure as shown in Figure 2 or may be formed separately, as will be obvious. The pan may be reinforced with a layer of fire clay or the like 38 arranged therebeneath. The pan is provided at its forward and rear edges with angle iron or similar supporting members 39 arranged in horizontal alinement with the shoulders 34 and 35. Grates 40 are adapted to be supported upon the angle irons and the shoulders as shown in Figure 4.

As will be apparent, the grates and pan 37 are arranged to form ash pits 41 therebeneath to which access may be had through the lower portions of the doors 32. The inner wall structure is provided with a horizontal wall 40' in alinement with and closing the spaces between the grates. The wall structure is adapted to be supported upon a concrete or other suitable base 42 and the inner wall structure may be provided with a portion 43 resting upon the base to provide a bottom lining for the ash pit, as will be obvious.

A combustion chamber 44 is arranged adjacent the incinerator proper and communicates with the chamber 26 thereof through an outlet passage 45. The combustion chamber also includes an outer wall structure 46 and an inner wall structure 47 similar to that previously described in connection with the incinerator proper. The top wall of the inner structure 47 is arched, as shown in Figure 2 and the combustion chamber communicates through an opening 48 with a suitable stack 49. The passage 45 is preferably of substantial width as shown in Figure 3, to permit free passage of unburned gases and products of combustion from the chamber 26 to the combustion chamber. The arrangement of the opening 48 below the passage 45 causes an agitating action within the combustion chamber for a purpose to be described.

The operation of the apparatus is as follows:

Suitable fire may be kindled upon the grates 36 in the chambers 24 and 26 in the usual manner to provide an intense fire before dumping the garbage or other refuse material into the incinerator. The garbage or the like containing an excess amount of moisture may be dumped from garbage trucks or other conveyances through the central tube 28 and upon the pan 37. The garbage or other material will assume substantially the shape shown in dotted lines in Figures 2 and 4 and excess moisture will drain into the pan 37. Garbage which is drier than that placed upon the pan 37, but which contains a material percentage of moisture may be dumped through the tube 28 in the chamber 24, upon the fire burning upon the corresponding grate 36. The garbage containing the least amount of moisture is placed in a similar manner upon the fire burning upon the grate 36 in the chamber 26.

The material in the chamber 26 consists usually of the drier forms of garbage and rubbish material such as waste paper and the like. As moisture is driven off from the chamber 24 the refuse material will gradually become ignited and will burn at a substantially high temperature. The products of combustion and unburned gases will pass from the chamber 24 around the end of the adjacent baffle 22 and into the chamber 25. It has been found that the gases and products of combustion will traverse substantially the entire length of the grate in the chamber 26 before passing into the chamber 25. These gases and products of combustion being initially highly heated, will cause the evaporation of the excess moisture contained in the garbage or other material on the pan 37. After the excess moisture has been driven out of this material it will become ignited, as will be understood. An operator may then open the central fire door 33' and with a suitable tool may pull some of the material from the pan 35 into the forward grate 40 and push some of the material rearwardly upon the rear grate 40. The material is pulled first from the top of the pile, as will be apparent, since the top becomes highly heated before the material at the bottom of the pile. The action of scraping material from the pan 37 to the grates 40 may be continued until the pan is entirely empty whereupon additional wet material may be dumped thereon.

It has been found that the gases and products of combustion from the chambers 24 and 25 will traverse substantially the entire length of the grates 40 and pan 37 and will then pass around the baffle wall 23 into the chamber 26. It will be apparent that the passage of the gases over and through the material on the pan 37 will have a tendency to lower the temperature of the gases and products of combustion before they pass into the chamber 26. The temperature is not lowered very materially however and since

the material on the grate of the chamber 26 is substantially dry it will burn very rapidly and maintain a high temperature in the chamber 26 whereby the products of combustion passing from the chamber 25 will be reheated to a higher temperature than that existing in the chambers 24 and 25. Before passing into the passage 45, the gases and products of combustion will traverse substantially the entire length of the grate in the chamber 26 to be superheated by the burning of the material thereon. The passage 45 may be connected directly to a suitable stack and very satisfactory results may be obtained, the products of combustion being thoroughly burned and odorless. I prefer, however, to provide the combustion chamber 44 in order that perfect and complete combustion may be assured under all working conditions and with refuse materials of various kinds. It will be obvious that the gases, if any, and products of combustion passing through the passage 45 will be highly heated so that combustion will continue in the combustion chamber. The arrangement of the openings 45 and 48 is such that the gases and products of combustion will be thoroughly agitated in the combustion chamber so that combustion may be completed before the products pass to the stack 49.

I have found that the arrangement of the staggered baffle walls described will, in actual practice, cause the gases and products of combustion to traverse substantially the entire width of the incinerator when passing through the various burner chambers whereby more perfect combustion is obtained and no dead and unburned material will be left in the corners of the burner chambers. I have also found that the hot gases and products of combustion from the chamber 24 have been very effectual in drying and igniting the material placed upon the pan 37. As previously stated, I preferably burn the drier refuse materials such as dry garbage, waste paper and the like, in the chamber 26 to develop a high temperature therein to more effectually complete the combustion and to destroy all odors in the gases and products of combustion.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

I claim:—

1. Apparatus of the character described comprising a furnace including opposite side walls, laterally spaced baffle walls extending inwardly alternately from opposite walls of the furnace to provide a plurality of burner chambers, said furnace being provided with an outlet, said burner chambers communicating with each other to form a continuous passage extending to said outlet, a pan arranged in one of said chambers between an adjacent pair of said baffle walls substantially centrally of the width of the furnace, and a grate arranged in said last named chamber, said grate being arranged between said pan and one of the side walls of the furnace to the side of said pan remote from said outlet.

2. Apparatus of the character described comprising a furnace including side walls, laterally spaced baffle walls extending inwardly alternately from opposite side walls of the furnace to form a plurality of burner chambers, a pan arranged in one of said chambers between an adjacent pair of said baffle walls substantially centrally of the width of the furnace, grates arranged in said last named chamber on opposite sides of said pan between said pan and the side walls of the furnace, and grates arranged in the others of said chambers.

3. Apparatus of the character described comprising a furnace including side walls, laterally spaced baffle walls extending inwardly alternately from opposite side walls of the furnace to form a plurality of burner chambers, a pan arranged in one of said chambers between an adjacent pair of said baffle walls substantially centrally of the width of the furnace, grates arranged in said last named chamber on opposite sides of said pan between said pan and the side walls of the furnace, and grates arranged in the others of said chambers, said furnace being provided directly over said pan with a filling opening.

4. Apparatus of the character described comprising a furnace including side walls, a pair of laterally spaced parallel baffle walls extending inwardly alternately from opposite walls of the furnace to form a plurality of burner chambers, the end of each of said baffle walls being spaced a material distance from the opposite wall of the furnace, a pan arranged in the central burner chamber and substantially equal in width to the space between said baffle walls, the ends of said pan being spaced from the side walls of the furnace, grates arranged adjacent the ends of said pan and extending substantially to the opposite walls of the furnace, and grates arranged in the others of said burner chambers.

5. Apparatus of the character described comprising a furnace including side walls, a pair of spaced parallel baffle walls extending inwardly alternately from opposite walls of the furnace to form a plurality of burner chambers of substantially equal width, the end of each of said baffle walls being spaced from the opposite walls of the furnace a dis-

tance substantially equal to the width of each of said burner chambers, a pan arranged in the central burner chamber and substantially equal in width to the space between said baffle walls, the ends of said pan being spaced from the side walls of the furnace, grates arranged adjacent the ends of said pan and extending substantially to the opposite walls of the furnace, and grates arranged in the others of said burner chambers and substantially co-extensive therewith.

6. Apparatus of the character described comprising a furnace including side walls, a pair of spaced parallel baffle walls extending inwardly alternately from opposite walls of the furnace to form a plurality of burner chambers, the end of each of said baffle walls being spaced a material distance from the opposite wall of the furnace, a pan arranged in the central burner chamber and substantially equal in width to the space between said baffle walls, the ends of said pan being spaced from the side walls of the furnace, grates arranged adjacent the ends of said pan and extending substantially to the opposite walls of the furnace, grates arranged in the others of said burner chambers, said furnace being provided with a filling opening arranged directly above and centrally of each of said burner chambers, and covers normally closing said openings.

7. Apparatus of the character described comprising a furnace including side walls, a pair of spaced parallel baffle walls extending inwardly alternately from opposite walls of the furnace to form a plurality of burner chambers, the end of each of said baffle walls being spaced a material distance from the opposite wall of the furnace, a pan arranged in the central burner chamber and substantially equal in width to the space between said baffle walls, the ends of said pan being spaced from the side walls of the furnace, grates arranged adjacent the ends of said pan and extending substantially to the opposite walls of the furnace, grates arranged in the others of said burner chambers and a combustion chamber communicating with one of said last named burner chambers.

In testimony whereof I affix my signature.

HOWARD E. BURNS.