

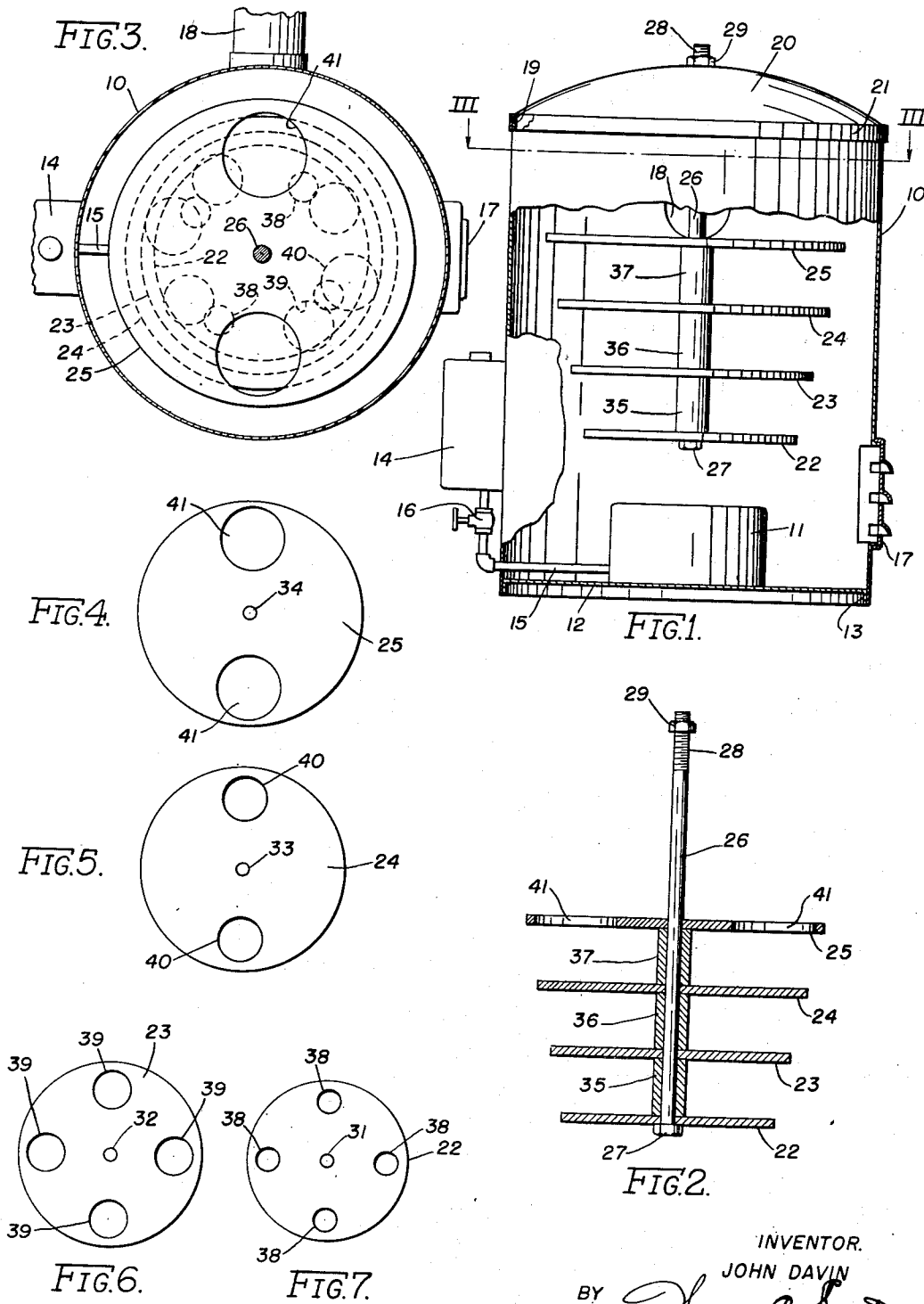
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HEATING APPARATUS

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HEATING APPARATUS

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1 Claim. (Cl. 110-97)

This invention relates to a heating apparatus and more particularly to heating and cooking stoves, although certain features thereof may be employed with equal advantage for other purposes.

It contemplates more especially an improved combustion chamber for stoves and the like to insure complete fuel combustion and greatly improved thermal efficiency.

One object of the present invention is to simplify the construction and improve the operation of heating and cooking apparatus.

Another object is to provide a combustion chamber having improved baffle structures to insure the proper distribution of the products of combustion and the useful transmission of generated heat prior to their discharge through the chimney.

Still another object is to provide an improved baffle unit that is adjustable to control the flow of the products of combustion.

A further object is to provide a combustion chamber having improved heat producing characteristics rendered possible by adjustably controlling the flow of gases therethrough for better distribution and better heat absorption.

A still further object is to provide a combustion chamber having a plurality of superposed baffle plates of sequentially varying size for control of the flow and distribution of the products of combustion therein.

Still a further object is to provide a combustion chamber having a plurality of superposed apertured baffle plates of sequentially varying size that are rotatively mounted relative to each other for the control of the flow and distribution of the products of combustion therein.

Other objects and advantages will appear from the following description of an illustrative embodiment of the present invention.

In the drawing:

Figure 1 is a side view in elevation of a combustion chamber embodying features of the present invention, parts thereof being broken away and shown in section to clarify the illustration.

Figure 2 is a front detail view shown in section of the baffle plates and mount embodying features of the present invention.

Figure 3 is a sectional plan view taken substantially along line III-III of Figure 1.

Figure 4 is a reduced plan view of the uppermost baffle plate.

Figure 5 is a reduced plan view of the next baffle plate disposed below the uppermost baffle plate shown in Figure 4.

Figure 6 is a reduced plan view of the next baffle plate disposed below the baffle plate shown in Figure 5.

Figure 7 is a reduced plan view of the next baffle plate disposed below the baffle plate shown in Figure 6.

The structure selected for illustration comprises a drum or barrel 10 defining the combustion chamber of a burner unit which, in this instance, is of the open pot type. The barrel 10 comprises one heat unit or multiple heat units that may be provided in a cooking stove or such may comprise a singular large combustion chamber for a heating stove or furnace depending upon the dictates of commercial practice. In any event a cabinet is intended to surround the combustion chamber 10 which is of cylindrical configuration.

The combustion chamber 10 is closed with a bottom member 12 having a depending peripheral flange 13 sized for telescopic reception within the cylindrical wall of the barrel 10 for attachment thereto in any suitable manner. A fuel burner, in this instance, an open oil pot 11 is mounted centrally within the combustion chamber 10 for support by its bottom plate 12. Fuel from a supply tank 14 is conducted to the burner 11 by gravity through a pipe 15 that communicates therewith. A valve 16 is provided in the pipe line 15 to control the quantity flow to the burner 11.

In the present embodiment the fuel supply tank 14 is attached to the wall of the combustion chamber 10 above the burner 11 to provide a gravity flow of fuel thereto. A louvered door 17 is provided in the wall of the combustion chamber 10 proximate to the bottom 12 thereof to supply the necessary air to the burner 11. A chimney flue opening 18 is provided in the wall of the combustion chamber 10 proximate to the top circular open edge 19 so that the waste products of combustion can be directed to the chimney for discharge to the atmosphere and to provide the necessary draft therethrough between the door 17 and the flue 18.

The combustion chamber 10 is preferably provided with a top closure 20 which, in this instance, is stamped or otherwise shaped from sheet material to provide a substantially convex surface permitting the stepped peripheral flange 21 to be sized somewhat larger than the circular periphery 19 of the combustion chamber 10 for detachable telescopic placement thereover. In order to avoid direct accessibility of the productions of combustion from above the burner 11 to

the chimney flue 18, a series of baffle plates 22, 23, 24 and 25, in this instance four, are suspended within the combustion chamber 10 directly above the burner 11.

To this end, the baffle plates are mounted on a rod or carriage bolt 26 having an integral head 27 at the lower end thereof and a threaded extremity 28 at the upper end thereof. The upper extremity 28 projects through a central opening provided in the top convex closure 20 which serves as a support therefor. The rod 26 is supported by the convex top closure 28 through the medium of a suitable fastener such as a nut 29 in threaded engagement with the projecting correspondingly threaded portion 28 of the rod 26 which adjustably depends within the combustion chamber 10 substantially along the axis thereof to within the desired distance of the burner 11.

Each of the baffle plates 22, 23, 24 and 25 are provided with central axial apertures 31, 32, 33 and 34 to receive the rod 26 therethrough. A plurality of spacer collars, in this instance three, are interposed between the baffle plates 22, 23, 24 and 25 with the supporting rod 26 therethrough to properly space the baffle plates or discs 22, 23, 24 and 25 in superposed relation above the flame produced by the burner 11.

The baffle plate 22 is preferably of smallest relative diameter and should be somewhat larger in expanse than the burner 11 so that it will be directly in the path of the flame and within the desired distance therefrom to effectively deflect the products of combustion therefrom and serve as a heat absorbing medium. So that the proper draft may be maintained and the proportion of the heat produced by the products of combustion may pass to the next superposed baffle or disc 23, the lowermost baffle 22 is provided with a plurality of circumferentially spaced holes or ports 38, in this instance four, of a diameter approximating one-eighth of the diameter of the baffle or disc 22.

The next succeeding superposed baffle or disc 23 is of somewhat larger diameter than the lowermost disc 22 and is also provided with a plurality of circumferentially spaced holes or ports 39, in this instance four, which are of somewhat proportional diameter than the increased baffle size. In this instance, the ports 39 are approximately twice the diameter of the ports 38 as a maximum relative thereto and the baffle 23 is preferably positioned so that the ports 39 therein are alternately disposed relative to the ports 38 in the disc 22.

The next succeeding and superposed baffle disc 24 is of somewhat larger diameter than the baffle 23 and is also provided with a plurality of holes or ports 40, in this instance two, that are somewhat larger in diameter than the ports 39 in the last mentioned baffle or disc 23. In this instance, also, the baffle 24 is so positioned that the ports 40 preferably are disposed intermediate the ports 39 in the baffle 23 so that the products of combustion will be directed along a circuitous path for comingling with the air passing therethrough and therearound.

The next succeeding and superposed disc 25 is of somewhat greater diameter than the last mentioned baffle or disc 24 and has a plurality of ports 41 therein having a diameter substantially one and one-half times the diameter of the ports 40 in the last mentioned baffle or disc 24. In this in-

stance, there are two ports 41 in the uppermost baffle 25 which is positioned so that the ports 41 are in alignment with or alternately disposed relative to the ports 41 in the baffle 24 depending upon the extent of the draft available through the combustion chamber 10.

The relative rotative positions of the baffles 22, 23, 24 and 25 is dependent upon the available draft in that the greater the draft the more the ports 38, 39, 40, and 41 will be displaced relative to each other and conversely they may be positioned for more direct alignment should the draft be of limited extent. It should be noted that the diameter of the uppermost baffle 25 is such as to extend substantially to the wall of the combustion chamber 10 so that the products of combustion will strike a portion thereof and be partially obstructed from the flue 18 to insure sufficient time for complete combustion and also enable the surfaces of the combustion chamber 10 as well as the baffles 22, 23, 24 and 25 to absorb the maximum heat for transmission and rotation before the products of combustion escape through the flue 18.

Not only are the baffles 22, 23, 24 and 25 mounted for relative rotative adjustment, but these may be lowered or raised in the combustion chamber 10 by turning the nut 29 relative to the threads 28 on the rod 26 serving as the suspension mount therefor. It will be apparent, therefore, that the draft, deflection, circuitous flow of the products of combustion, the extent of combustion, and the degree of heat absorption are controllable factors by virtue of the relative rotary adjustment of the baffles 22, 23, 24 and 25 as well as their vertical position relative to the burner 11.

Various changes may be made in the embodiment of the invention herein specifically described without departing from the invention or sacrificing any of the advantages or features thereof, and nothing herein shall be construed as limitations of the invention, its concept or structural embodiment as to the whole or any part thereof except as defined in the appended claim.

I claim:

In a device of the character mentioned, the combination with an enclosed combustion chamber, of a burner in said chamber, means for directing fuel to said burner, there being air intake and flue discharge means at spaced points in said combustion chamber, a rod adjustably suspended in said combustion chamber, a series of superposed baffle plates spaced along said rod for support in said combustion chamber between said air intake and flue discharge, said baffle plates being relatively rotatable on said rod and of sequentially larger size from the lower end of said rod, and means exteriorly of said combustion chamber in operative connection with said rod to vary the vertical position of said baffle plates relative to said burner, each of said baffle plates having a single circumferential series of apertures therein, said apertures being spaced inwardly from the circumferential edge of said baffle plates so that their respective diameters are in overlapping relation, the size of the apertures in each of said baffle plates being generally proportional to the sequential size of said baffle plates to provide a substantial variation in the baffling of the products of combustions depending upon the relative rotative position of the baffle plates to each other.

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