Jan. 16, 1940. H. E. MILLS 2,187,169

STOVE

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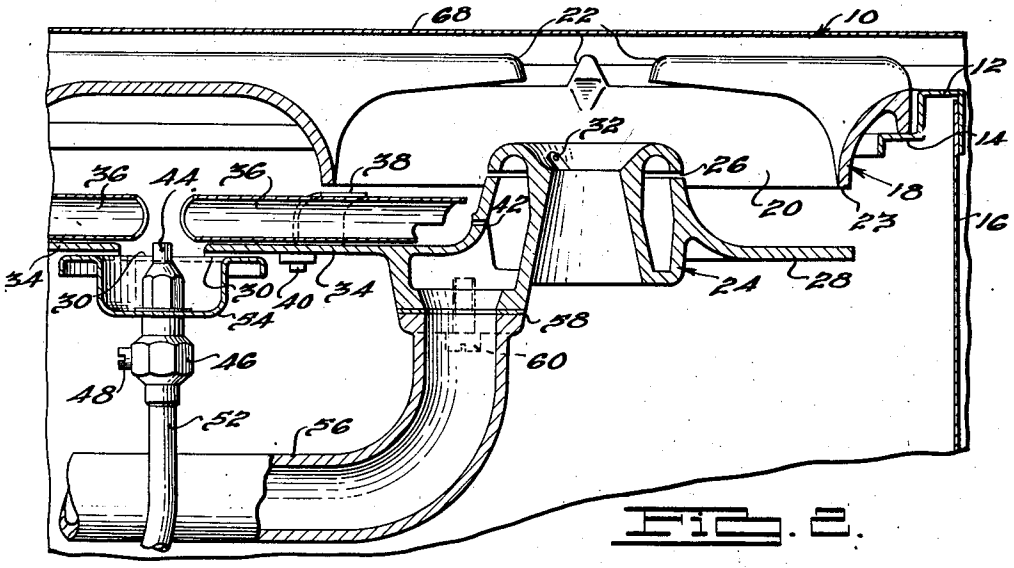


Fig. 2.

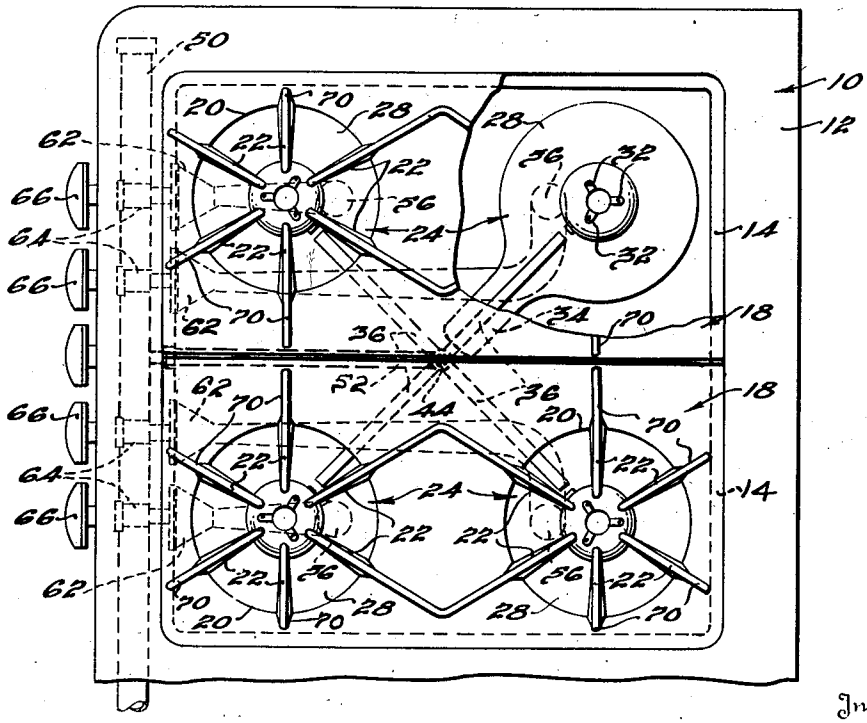


Fig. 1.

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STOVE

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3 Claims. (Cl. 126—39)

This invention relates to stoves and has particular reference to an improved type and construction of burner used therein, said improvement tending to increase the efficiency of the burner because of its ability to direct along a more definite path the secondary air, whereby the burning gases are given greater combustion and the heat therefrom caused to stay under the utensil for a longer length of time.

The embodiment of the invention selected for purposes of illustration is disclosed in connection with a table top style of domestic gas range which is provided with a unitary main top panel having an opening in which is supported a top grate having a pair of sections. The panel supports the grate sections, and the latter provide the burner openings and the supporting means for the cooking utensils to be placed thereon. In each burner opening is disposed a burner body, so arranged as to have its ports just above the base of the grate forming the opening. The burner body is provided with an outwardly extending flange which lies below the burner ports and has its periphery defining an area somewhat larger than that of the burner opening and disposed therebelow. This arrangement enhances the efficiency of the burner in that it defines the path to be taken by much of the secondary air, namely, up and around the edge of the flange and then at an angle past the burner ports toward the center of the combustion chamber, and finally centrally and upwardly until it strikes the bottom of the utensil on the grate. It is seen that not only is the path taken by the secondary air definitely directed, but also that combustion is more completely carried out and the heat therefrom retained under the utensil for a longer length of time.

A principal object of this invention is to provide in a domestic gas range having a burner opening a burner body having a flange disposed below said opening and extending beyond same and adapted to direct the secondary air up and around said flange so that the path of said secondary air can be more determinably directed and controlled and the heat from the burner kept under the utensil for a longer period of time, thereby causing the efficiency of said burner to be increased.

Another object of this invention is to provide a domestic gas range with a novel arrangement of grate and burner, after improving the construction thereof, whereby these two elements serve as a combined directing means for the secondary air upon which combustion is largely dependent, and which tends not only to enhance the combustion but also to retain the heat therefrom under the utensil for a longer than usual period of time.

Another object of this invention is to provide a flanged burner body to be used in conjunction with a domestic gas range, said flanged portion being adapted to more definitely define the path to be taken by the upwardly progressing secondary air, said path comprising the air travel up and around the edge of said flange and then past the burner ports so that the heat therefrom will be directed centrally toward and upwardly from the combustion chamber above the burner and so that the heat is adapted to stay underneath the central portion of the cooking utensil for a longer period of time.

Another object of this invention is to provide a novel form of burner body construction which is inexpensive and which tends to increase the efficiency of the burner output.

Other objects and advantages of the invention will be apparent after referring to the following specification taken in conjunction with the accompanying drawing, of which there is one sheet and in which:

Fig. 1 is a plan of a stove including the invention herein and showing the stove with its burner box cover removed, said figure also showing a portion of one of the grate sections broken away; and

Fig. 2 is a vertical cross-sectional view of a part of the upper portion of a stove and showing in detail the novel form of burner and its disposition with respect to other parts of the stove.

The figures disclose a stove in part, generally indicated at 10, as having a main top panel 12 which has a shelf portion 14 extending around the top burner compartment. Panel 12 may be spot welded or otherwise secured to the side stove members the rear 16 thereof being shown, or it may be removable therefrom, as the case may be. Adapted to rest upon and be supported by the shelf portion 14 of panel 12 is a pair of removable grate members 18 provided with a plurality of bell-shaped burner openings 20 and a series of grate arms 22 integral with the grate body member 18, a like number of arms 22 being provided for each burner opening 20, said grate arms extending radially and inwardly to such an extent that a utensil of practically any size can be supported thereby without fear of tipping.

Grate body members 18 are adapted to enclose the burner compartment opening provided in panel 12, except for the burner openings 20 provided therein. Members 18 may be removed

for cleaning, and another feature (to be discussed late) is that they are bell-shaped and comparatively deep, terminating at the level 23.

Centrally disposed with relation to each burner opening 20 in members 18 is a burner body, generally indicated at 24, which is preferably provided with a radial discharge slot 26. Obviously, any type burner or port is adaptable, but the type herein disclosed has been selected. The level of slot 26, it will be noted, lies above the level 23 of grate member 18. Burner body 24 has an annular flange 28, said flange being shown to extend at least slightly beyond the periphery of burner opening 20 and said body being supported as at 30. Flange 28 is preferably integral with burner body 24 but may be, if desired, secured otherwise thereto. In the head of burner body 24 there is provided a plurality of openings 32 which are adapted, by themselves supporting a flame, to eliminate "cold spots" in the center of the flame supported by slot 26. One portion of each of the flanges 28 projects inwardly toward the center of the burner compartment, as at 34, in order to form a support for a flash tube 36, each of the latter being secured to its respective portion 34 of flange 28 by a bracket 38 which is held to portion 34 by means of a nut and bolt arrangement 40, said flash tubes communicating with the gas and air mixture within burner bodies 24 by means of an opening 42 in each body 24. Fig. 1 shows four burners symmetrically disposed with relation to the burner compartment, but it is readily seen that both the number and the disposition of the burners may be changed at will. Each of these burners is in communication with a single pilot lighter 44 by means of an individual flash tube provided for each burner.

The pilot 44 comprises a body 46 in which is disposed an adjustment plug 48. The pilot is connected to the main manifold pipe 50 by means of the pilot tube 52. The connection between pilot tube 52 and manifold 50 is shown only diagrammatically but is actually connected in any conventional manner. A flanged cup-shaped member 54 is secured to the upper portion of lighter body 46 and is arranged to support from below the portions 34 of flanges 28 of burner bodies 24.

Each burner has connected thereto a mixer tube 56 which is separated from burner body 24 by means of a gasket 58 and is secured to burner body 24 by means of a series of cap screws 60 which pass through openings provided therefor in a flanged portion of tube 56 and into threaded portions provided therefor in burner body 24. Mixer tube 56 terminates in a bell mouth 62 which is provided with the usual air openings and communicates with the manifold pipe 50 in any conventional manner, such as, through the usual gas cock 64 provided with the usual needle valve and orifice arrangement. A manual control (or gas cock handle) 66 is connected in any conventional manner to the gas cock 64 and is adapted to control the flow of gas into the burner.

A burner box cover 68 is provided for completely enclosing the burner compartment during the inoperation of the stove and is adapted to be lowered out of sight by means (not shown) when it is desired to use the stove top burners.

It will be noted that the grate arms 22 of each grate member 18 diverge from the burner opening 20 and form rib portions 70 some of which extend substantially to that edge of member 18 most adjacent each rib, and some of which are continuations of other of said rib portions. These rib portions are an aid to the operator since they permit her to slide the kettle or utensil from one grate member, or portion thereof, to the other grate member, or portion thereof, without having to raise the utensil therefrom.

When the control 66 has been turned to the desired temperature, the pilot lighter 44 operates to ignite the gas and air mixture emitted through the slot 26 in burner body 24. The heat generated thereby causes secondary air to be drawn up through the central opening in the burner body and also up into the combustion chamber through the annular orifice defined by the base of the wall of grate member 18 (at the level 23) and the top of the flange portion 28 of burner body 24. The air that is drawn through this orifice loses much of its velocity through the throttling action of the orifice and the resulting air volume increase, and loses even more velocity when it is caused to change from a horizontal to a vertical direction upon striking the abrupt but smooth curve in the burner body member. By the time the air reaches the flame, it is moving slowly upwardly at right angles to the flame, following in a general manner the outer vertical wall of the burner body and tending, rather than to extinguish the flame, to support it and carry it along with it. The vertical nature of the burner body wall necessarily causes the air and flame to continue directly upwardly so that substantially the entire amount of heat generated first acts upon the central portion of the utensil, and any heat that escapes must first traverse the underside of the utensil before leaving the combustion chamber to pass up and around the sides of the utensil, thus remaining under the utensil for at least the time it takes the heat to traverse the full radius of the under surface of the utensil. The flanged portion 28 of body member 24 extends somewhat beyond the periphery of the opening formed by the base of grate member 18 for the purpose of preventing the upward travel of secondary air through the orifice between the wall of member 18 and the flange 28 of member 24 until after said air has entered said orifice. The level 23 of member 18 is below the level of slot 26 in burner 24 so that the air entering the aforementioned orifice will be below the center line of slot 26 so that the air entering said orifice will not be directed against the flame as it is being emitted from slot 26. These two features, together with the curved connection between body 24 and flange 28, combine to lend a predetermined path for the air to assume in order to acquire the above-mentioned results.

It is to be understood that the invention is not to be considered as limited to the embodiment and application thereof which has been selected here for the purpose of illustration, but is intended, rather, to embrace and include all other embodiments and applications of the new and useful principles thereof which are to be considered reasonably within the scope of the appended claims.

I claim:

1. In a stove, a burner body having a horizontal burner slot, means forming an inverted bell shaped opening around said slot, a wall of said opening extending below said slot and means integral with said body member having an upwardly curved connection therewith and extending horizontally therefrom below said wall for

defining with said wall an air passageway through which air is drawn horizontally and deflected upwardly across said burner slots.

2. In a stove having a burner body and a source of fuel thereto, a horizontal burner opening in said burner body for supporting a flame, a grate member supported over said burner and defining an opening for said burner body, a wall of said grate opening extending below the level of the opening in said burner body and an annular flange having an upward curve near the burner body formed integrally with said burner body and extending therefrom beyond and at a level below the wall of said grate member opening whereby said wall and said flange define an annular passageway for air to support combustion of said fuel, said air entering said passageway radially inward and being deflected upwardly at right angles to said flame.

3. In a stove, a burner body provided with a horizontal opening for supporting a flame, said body having a filleted flange integral with and encircling said body at a level below the opening therein, a grate member supported independently of said body above said flange and providing an opening for said burner body, said latter opening being formed by an upwardly concave wall the base of which being at a level between said first mentioned opening and said flange and so that the space between said wall and said flange defines an annular passageway through which secondary air is drawn horizontally and deflected vertically by the fillet of said burner body flange for supporting combustion at said first mentioned opening.

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