June 18, 1946. H. MOECKER, JR., ET AL 2,402,429

RANGE

Original Filed July 3, 1940 2 Sheets-Sheet 1

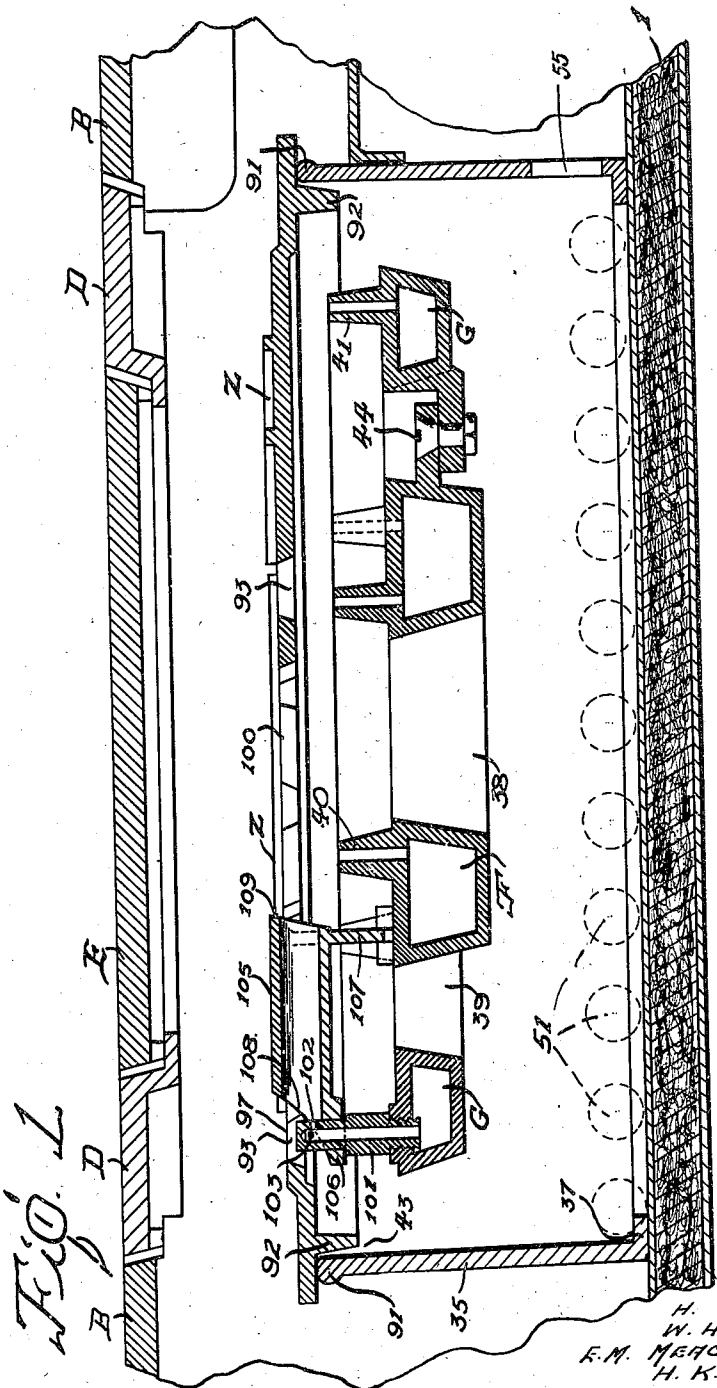


Fig. 1

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Fig 2

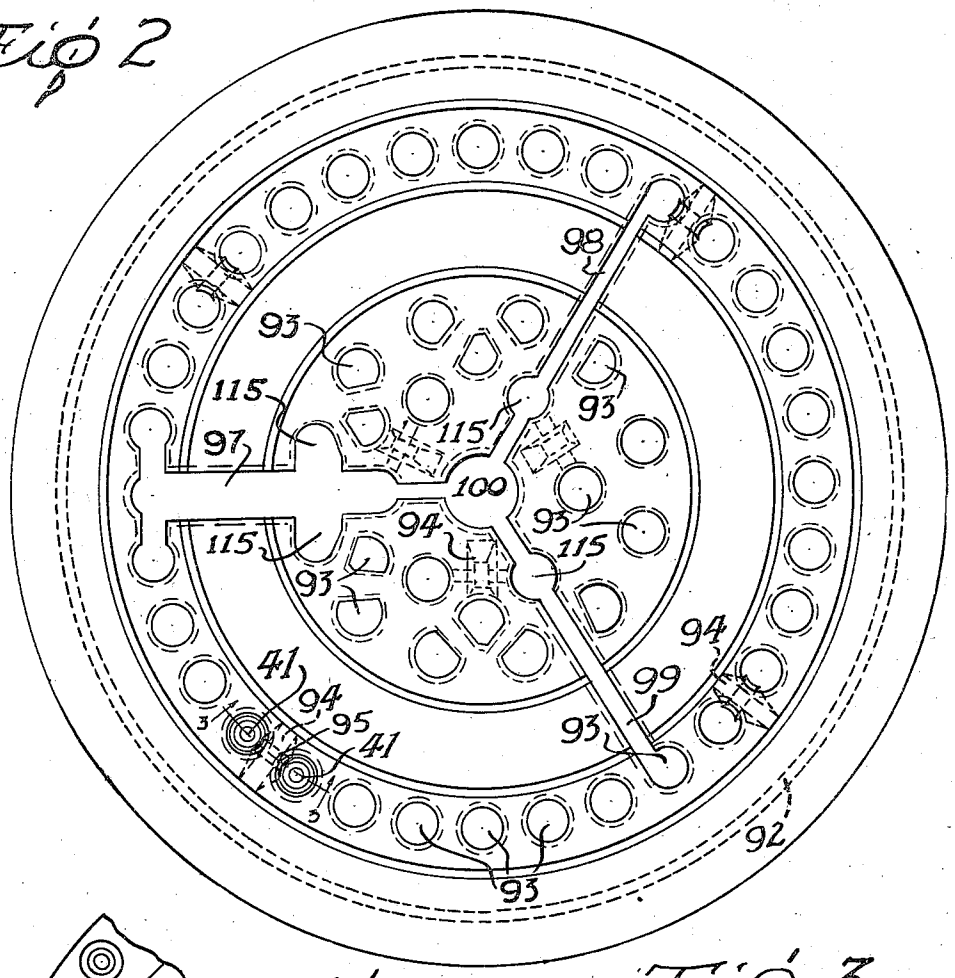


Fig 4

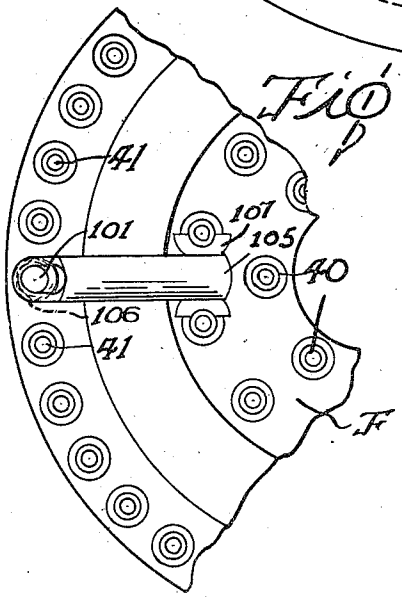
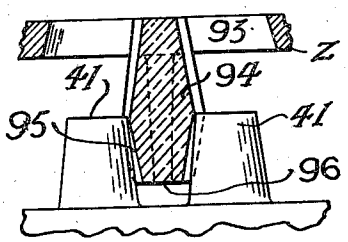


Fig 3



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RANGE

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16 Claims. (Cl. 126—39)

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This application is a division of an application in the names of the same applicants filed July 3, 1940, bearing Serial Number 343,846, and which matured into Patent No. 2,358,527, on September 19, 1944.

The invention broadly is directed to cooking ranges or the like in which the cooking is accomplished by gas or other fluid fuel burners and more particularly to what we term, and which are generally referred to in the drawings, as heavy duty ranges because they are used for commercial cooking operations such as are performed in hotels, restaurants and institutions where cooking on a large scale is performed. The invention however is not limited to heavy duty ranges but can be used in connection with ranges performing cooking operations of any character whatsoever.

The primary object of the invention is to provide a range which can be quickly and efficiently heated and one in which a novel construction and arrangement is provided for igniting the range cooking top burner or burners.

Another and further object of the invention is to provide an improved manner for supplying and distributing secondary air to the cooking top burners or burner and combining the mechanical construction which controls the distribution of said air with an ignition system for said burners in such a manner as to provide protection for said burners from "spill-overs" or "boil-overs" which inevitably occur in the operation of cooking on a range.

Another and further object of the invention is to provide a novel construction for protecting the cooking top burners against fouling and embodying in said construction a novel means of supporting and positioning said protecting means in respect to said burner and the burner ports thereof.

A still further object of the invention is to provide a range of the character described having therein the constructions for accomplishing the foregoing objects so combined and coordinated with the range construction as to provide a cooking top for the range which can be quickly, efficiently and uniformly heated.

Other objects, novel features of construction and improved results of a range built in accord with the present invention will appear from the following description and the accompanying drawings which illustrate an embodiment which the invention may take in the provision of a range which performs to accomplish the desired results.

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In the drawings:

Fig. 1 is a vertical sectional view through that portion of a range which embodies the invention.

Fig. 2 is a plan view of the aeration plate.

Fig. 3 is an enlarged detail sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a fragmentary view illustrating a portion of Fig. 1 with the aeration plate removed and showing the flash tube in top plan.

The present invention is illustrated and described as being used in a range having a solid cooking top above a burner chamber. This cooking top is illustrated in Fig. 1 of the drawings and comprises the circular plates B, D and E which are suitably supported in part upon the range frame and in part upon one another. The cooking chamber bottom 1 is of the conventional insulated construction made up of a pair of spaced walls between which is suitable insulating material.

A drum having an open top is centrally located within the burner chamber and is defined by a well 35 the lower end of which is inturned horizontally and suitably secured as at 37 to the upper face of the chamber bottom. A pair of concentrically arranged burners are positioned within the drum adjacent but slightly below the open upper end thereof. The inner of said burners is designated at F and is ring-like in form in that it has a central opening 38 while the outer burner G is a second ring surrounding the first burner and in spaced relation thereto to provide a circular opening or passageway 39. The inner burner F on its upper face is provided with a plurality of upwardly extending burner jets 40 arranged as shown in Fig. 4 of the drawings while the outer burner G on its upper face is provided throughout the length thereof with a plurality of burner jets 41 arranged in spaced relationship and extending upwardly from the top of the main burner body.

The outer burner is suitably supported from the drum wall 35 by brackets, not shown, or the like and is in spaced relationship to the drum wall to form an annular passageway 43. The inner burner is supported, as indicated at 44 in Fig. 1 of the drawings, by the outer burner.

Secondary air is admitted into the burner chamber near its bottom and exteriorly of the burner drum through a plurality of openings 51 provided in the side or end walls of the burner chamber.

The secondary air which enters the openings 51 is admitted into the lower end of the burner drum through openings, one of which is shown

at 55, provided in spaced relationship around the bottom of the burner drum. The secondary air once it has entered the bottom burner drum is then efficiently delivered to the burner ports or jets of the burners by what we have termed a combination aeration and spill-over plate Z which will now be described.

A substantially flat circular aeration and spill-over plate Z which is of a diameter slightly greater than that of the burner drum 35 is supported upon the upper ends of the side walls of said drum, as at 91 in Fig. 1 of the drawings. The plate at its under side is provided with a downwardly extending circumferential flange 92 which is inset from the peripheral edge of the plate and telescopes the upper end of the burner drum 35.

The plate is provided with a plurality of circumferential openings 93 which when the plate is properly positioned are above the burner orifices or jets 41 of the burners.

It will be seen that the burner jets or orifices are raised and extend vertically above the upper faces of the burners and are in spaced relationship to one another. To assure proper positioning of the plate at the under side thereof and at a plurality of points the plate is provided with downwardly extending lugs 94. These lugs have opposed semi-circular faces 95 which are arranged at opposite sides of the wedge shaped lower ends 96 of the lugs which lug ends enter the space between a pair of burner orifices or jets 41. These lugs will properly align the openings 93 with the burner jets 41.

The plate in addition to being provided with the flame openings 93 is provided with three elongated slots 97, 98 and 99. The slot 97 at its outer end includes three flame openings 93 and terminates at its inner end in an enlarged circular opening 100. Intermediate its length the slot also is in communication with a second pair of flame openings 115. The slots 98 and 99 at their outer ends are in communication with one of the plate burner openings 93 and also communicate intermediate their lengths with a flame opening 115. Both of these slots at their inner ends communicate with and terminate in the central plate opening 100. The slots 98 and 99 are made or cast in the plate to provide for expansion of the plate and to minimize any distortion thereof which might be caused by the heat to which it is subjected.

To provide automatic ignition a lighter jet 101 is provided. This jet is formed as a vertical extension or elongated burner orifice for the outer burner ring G and has its upper end extending up into the outer end of the plate slot 97. This lighter jet has a fuel outlet orifice 102 which is directed along the slot 97 towards the center opening 100 of the plate and also it has oppositely disposed burner jets 103 which direct flames towards the next adjacent burner orifices in the outer burner ring G or in a direction which is transverse the slot 97. The flames projected outwardly from the jets 103 are however disposed in a horizontal plane beneath the plate Z and will ignite the fuel issuing from the next adjacent burner orifices of the ring and cause the flame to progress in a chain-like manner completely around the ring burner G until all of the burner orifices thereof are ignited.

A flash tube 105 is associated with the lighter jet 101. One end of this lighter tube is suitably supported on the lighter jet as at 106 while its opposite end is provided with a leg 107 which engages the upper face of the inner burner ring F and in this manner supports the inner end of the flash tube 105. The flash tube is open ended and has its outer end 108 adjacent the lighter jet orifice 102 while its inner end 109 is arranged adjacent a burner orifice 40 of the inner burner ring F. In operation, the inner burner ring is manually ignited by a match or otherwise and the gas-air mixture escaping from the lighter orifice 102 is forced through the lighter tube and is ignited by the burning jet 40 of the inner ring F. Upon becoming ignited the tube acts on the well known principle of flashing back through the tube and causing the ignition of the gas-air mixture escaping from the lighter jets 103 which jets in turn cause the ignition of the fuel escaping from the burner orifices of the outer ring G in the manner which has been hereinbefore described.

Respecting the plate Z it will be obvious that this plate will act as an aeration plate in that the secondary air admitted to the lower end of the burner drum will pass the burner orifices as this air travels upwardly to pass through the plate openings 93. Additionally this plate acts as a closure for the upper end of the burner drum to prevent the products of combustion above the plate from striking or traveling back to intermingle and thus contaminate the secondary air which is being fed to the burners.

Specific changes in the construction illustrated and described can be made without departing from the spirit of the invention which is to be limited only by the scope of the hereinafter appended claims.

We claim:

1. In a range, a burner chamber and a cooking top thereabove, a first burner and a second burner arranged in spaced relationship and disposed in said chamber, said chamber at a point beneath said burners provided with a secondary air inlet, a plate loosely supported upon the upper end of said chamber and acting as a closure cover therefor, each of said burners being provided with a plurality of spaced burner ports, said plate being provided with a plurality of openings one each of which is for the passage of the flame burned by one of said burner ports, some of said plate openings being adjacent the edge of said plate and being above the burner ports of the first burner, other of said plate openings being through the central portion of the plate and above the burner ports of the second burner, an elongated passageway in said plate interconnecting a plate opening above the second burner with two of said plate openings which are above the first burner, a lighter jet receiving gas from the first burner and extending upwardly into one of said two plate openings above said burner, said lighter jet being provided with an ignition burner orifice in line with said plate passageway, said burner jet further provided with a second burner orifice which is disposed to burn a flame in a direction transverse said passageway and towards the other of said two plate openings above the first burner, an open ended lighter tube having one of its ends disposed in operative ignition association with said lighter jet ignition orifice and its opposite end disposed in operative lighter association with a burner port of the second burner, said lighter tube being disposed in said elongated plate passageway and acting to ignite said lighter jet when said second burner is ignited, and said lighter jet second burner orifice acting to ignite said first burner.

2. For use in a gas heating or cooking apparatus, a gaseous fuel burner comprising a pair of spaced burners, each of said burners on its upper surface provided with burner ports, a lighter jet in one of said burners provided with an ignition burner port facing a burners port on the second of said burners, said lighter jet provided with an additional burner port which faces a burner port of the burner by which said jet is carried, an open-ended flash tube having one end in lighter relationship to the ignition burner port of said jet and its other end in gas receiving relationship to the aforementioned burner port of said second burner, a plate above and extending over both of said burners and provided with a plurality of openings one each of which is adapted to be positioned above each of the burner ports of each of said burners, and said plate including an opening for said lighter jet and an elongated slot for the reception of said flash tube.

3. A construction such as defined in claim 2 wherein, the burner ports of said burners are in vertical extensions, and the under side of said plate is provided with means for engaging said extension burner ports for positioning the openings of said plate in vertical alignment with the burner ports and position said elongated slot for the reception of said flash tube.

4. A construction such as defined in claim 2 wherein, in addition to the recited elongated slot said plate is provided with two other elongated slots, all of said slots meeting at a central opening in said plate and each of said slots at its outer end terminating in a plate opening which is positioned above a burner port of the first burner, whereby said slots act to prevent warping and distortion of said plate when the same is heated.

5. A construction such as defined in claim 2 wherein, the plate openings for the burner ports of the first burner are arranged in separated relationship and in a line adjacent the outer edge of said plate, the plate openings for the second burner ports being disposed in separated relationship and extending through the central portion of the plate, said elongated slot at one end terminating in the plate opening which receives said lighter jet and also communicating with the plate openings at the opposite sides of said lighter jet plate opening, and said slot adjacent its other end having a shorter transversely extending slot portion so that at this point the shorter transverse slot is above that second burner port which delivers gas to the flash tube and above the second burner ports which are at either side of said first named second burner port.

6. A construction such as defined in claim 2 wherein, the plate openings for the burner ports of the first burner are arranged in separated relationship and in a line adjacent the outer edge of said plate, the plate openings for the second burner ports being disposed in separated relationship in a continuous circular line and also being disposed in that portion of the plate lying within said circular line, a pair of elongated slots in addition to an elongated slot which receives the flash tube, all of said slots meeting in an opening centrally disposed in said plate, the outer ends of each of said slots terminating in a plate opening above a burner port of the first burner, that slot opening which receives said flash tube at one end having a transversely extending shorter slot portion which connects the plate openings above those burner ports of the first burner which are adjacent and at opposite sides of said lighter jet, and said flash tube receiving slot intermediate its ends provided with a transversely extending shorter slot which interconnects those plate openings which are above the second burner ports which are adjacent and at opposite sides of the second burner port which delivers fuel to the flash tube.

7. A construction such as defined in claim 2 wherein, the burner ports of said burners are in vertical extensions the under side of said plate is provided with a plurality of extensions one each of which is adapted to enter and fill the space between a pair of burner port extensions and act to position and hold said plate with the burner orifice openings thereof in vertical alignment with the burner ports and to position said elongated slot for proper reception of said flash tube.

8. A construction such as defined in claim 2 wherein the burner ports of said burners are in vertical extensions, the under side of said plate is provided with a plurality of downwardly extending members, each of said members being of a size and configuration to completely fill the space between a pair of burner port extensions and to embrace the opposing sides of said pair of burner port extensions.

9. A construction comprising, a pair of spaced gaseous fuel burners provided with burner ports, a lighter jet in one burner, a flash tube interconnecting said lighter jet and one of the burner ports of the second burner, a plate supported in spaced relationship above said burners, said plate provided with a plurality of openings one each of which is adapted to be positioned in vertical alignment above a burner port of said burners, and said plate further provided with an elongated slot for the reception of said flash tube.

10. A construction such as defined in claim 9 wherein, said plate is provided with two elongated slots in addition to the first mentioned one, said slots meeting in a common opening, and said slots acting to prevent said plate from warping or breaking due to the heat to which it is subjected by said burner.

11. A construction such as defined in claim 9 wherein, said plate at its under side is provided with extensions each of which is adapted to engage the opposite sides of a pair of burner ports of said burners to position the plate so that each of its openings is in vertical alignment with a burner port and its elongated slot is positioned to properly receive said flash tube.

12. In a range or the like, a burner chamber having a pair of spaced burners therein, each of said burners having a plurality of spaced burner ports, a lighter jet in the upper face of one of said burners and receiving gas therefrom, said jet provided with oppositely disposed burner orifices one each of which is disposed to burn a flame in a direction toward a burner port of said burner, said jet provided with a third orifice, a lighter tube having an open end disposed in spaced but operative ignition association with said lighter jet third orifice and an opposite open end disposed in spaced but operative lighter association with a burner port of the other and second of said burners, said lighter tube acting to light all of said lighter jet orifices when the second burner is ignited, and said lighter jet oppositely disposed burner orifices acting to ignite the burner which carries said lighter jet.

13. A construction as defined in claim 12 wherein one end of the lighter tube is provided with a ring which encircles and is supported upon said lighter jet, the other end of said tube being pro-

vided with a leg having a foot portion provided in its opposite faces with depressions, and the foot portion of said tube leg being of a size to span the space between a pair of burner ports on said second burner with said depressions of said foot partially encircling said burner ports.

14. A construction as defined in claim 12 wherein, the lighter jet extends vertically upwardly from its burner and all of its burner orifices are in a plane above the tops of the burner ports of the burners, said lighter tube being disposed horizontally with one end supported upon said lighter jet and its other end upon the second burner, the support of the tube upon the lighter jet positioning the adjacent end of the tube in proper operative ignition relationship with the lighter jet, a leg supporting the opposite end of the tube by engaging said second burner, said leg positioning said end of the lighter tube in proper operative ignition association with one of the burner ports of said second burner, and said leg engaging a pair of burner ports of said second burner and preventing said lighter tube from swinging in a horizontal direction in respect to the lighter jet and the particular burner port of the second burner with which it is in ignition association.

15. A construction as defined in claim 9 wherein, said plate and the burner ports of said

burners have interlocking connection, and said connection positioning the plate so that each of its openings is in vertical alignment with a burner port and its elongated slot is positioned to properly receive said flash tube.

16. In a range or the like, a burner chamber having therein a pair of spaced burners each of which is provided with a plurality of spaced burner ports, a lighter jet receiving fuel from one of said burners and adapted to ignite the burner ports of said burner, said jet having an ignition orifice, an open-ended lighter tube having one of its ends disposed in ignition association with said jet ignition orifice and its opposite end disposed in operative lighter association with a burner port of the other and second of said burners, said lighter tube when said second burner is ignited and when fuel is being delivered to the lighter jet acting to ignite said lighter jet, said ignited lighter jet acting to ignite the burner ports of the burner in which it is carried, and one end of said lighter tube being supported upon said lighter jet, and the other end of said lighter tube being supported upon said other and second burner.

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