United States Patent

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[72] Inventors **Harold J. Moss**
Charleston;
Gene S. Sliger, Cleveland; Jimmie L. Taylor, Cleveland, all of Tenn.

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[73] Assignee **Magic Chef, Inc.**
Cleveland, Tenn.

[54] **TOP BURNER STRUCTURE FOR GAS RANGES**
7 Claims, 6 Drawing Figs.

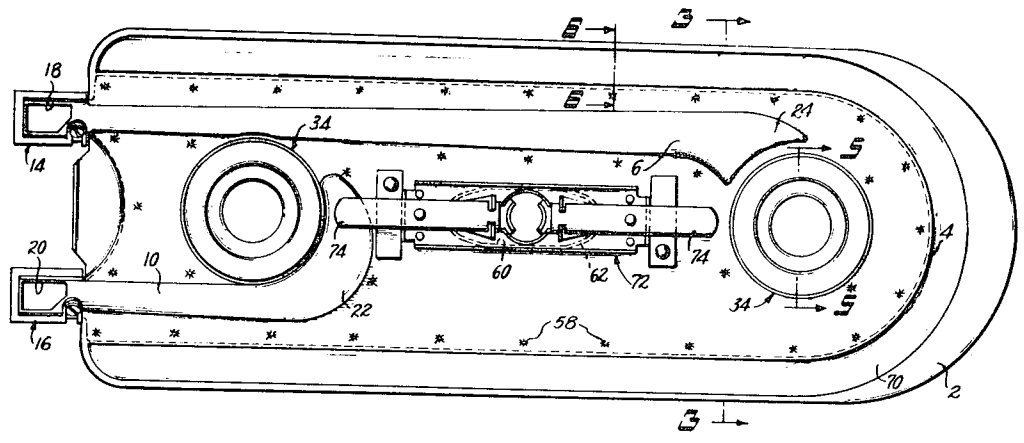
[52] **U.S. Cl.** **431/192,** 126/39
[51] **Int. Cl.** **F24c 3/10**
[50] **Field of Search** 431/192; 126/39, 24

[56] **References Cited**
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Primary Examiner—Edward G. Favors
Attorney—Bacon & Thomas

ABSTRACT: A pair of metal plates having face-to-face channels are secured together and sealed at their edges by ceramic enamel. The plates define manifold chambers communicating with the channels and an annular burner, having burner holes near its top, is secured to the plates at the manifold chamber. A depression in a side of the burner has openings for directing jets of gas fuel to mix near an igniter tube and to move upwardly toward the burner holes.



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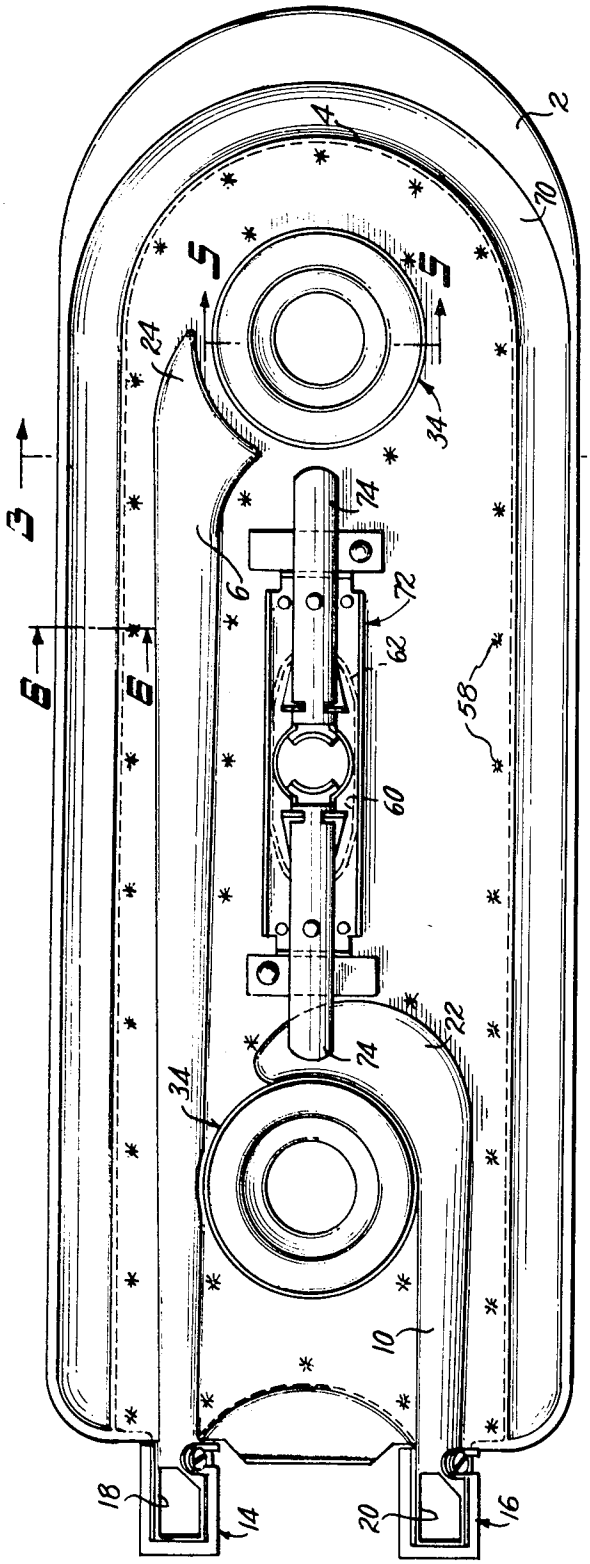


Fig. 1.

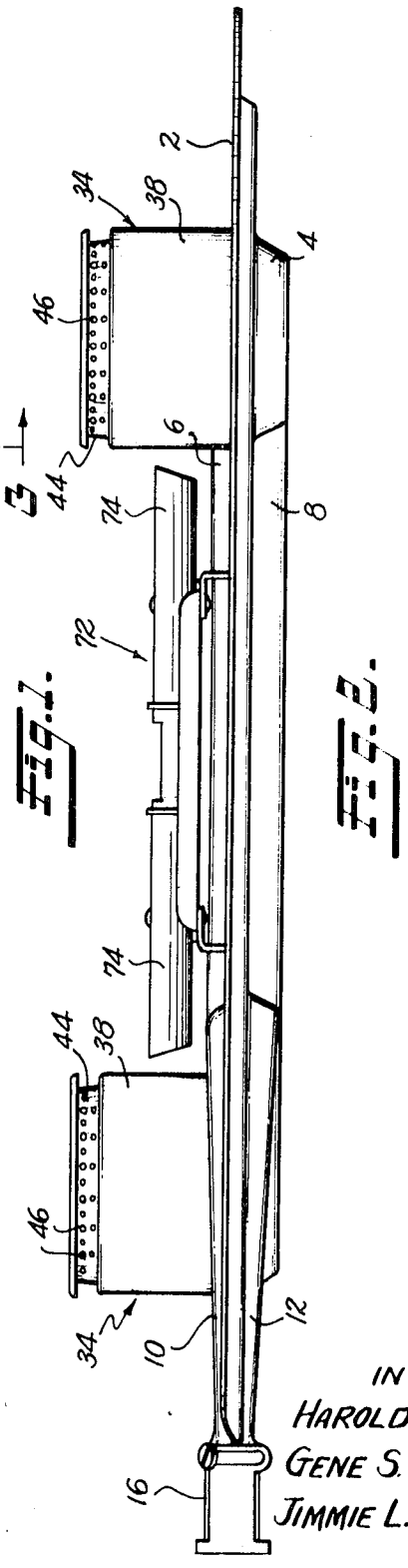


Fig. 2.

INVENTORS
HAROLD J. MOSS
GENE S. SLIGER
JIMMIE L. TAYLOR

BY
Bacon & Thomas,
ATTORNEYS

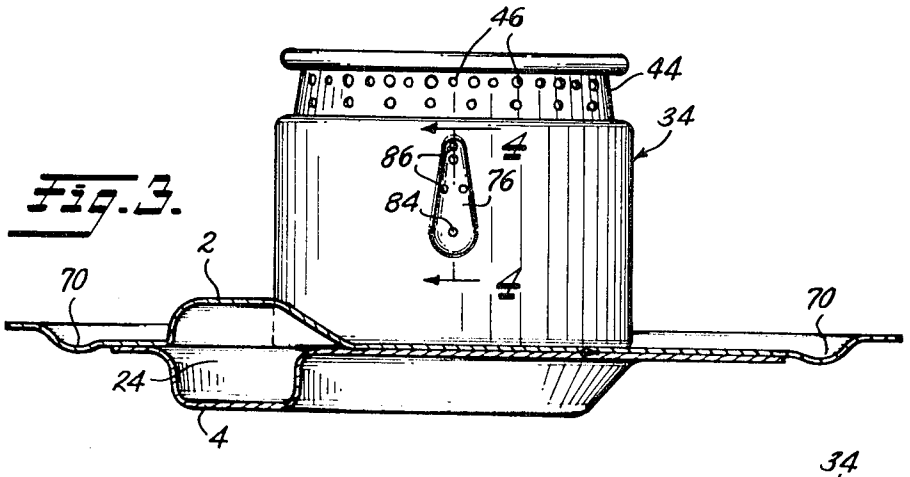


Fig. 3.

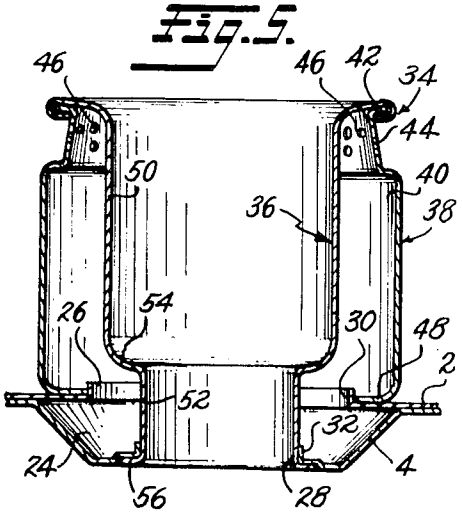


Fig. 5.

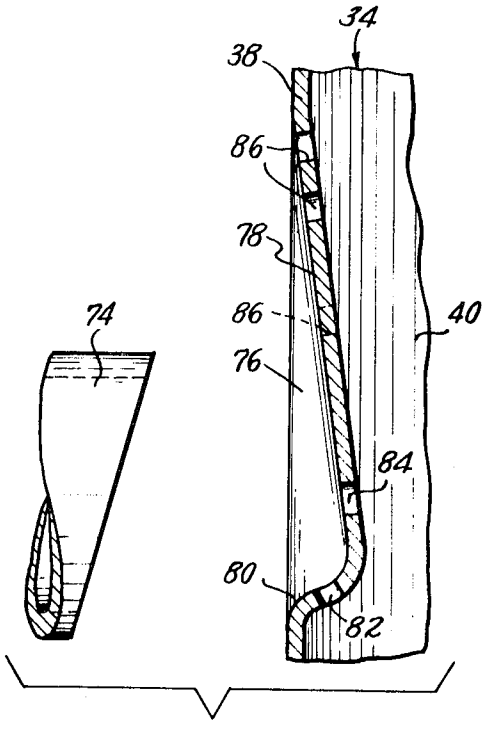


Fig. 4.

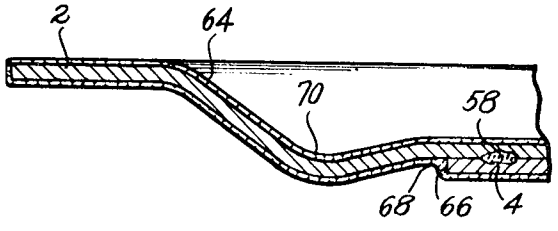


Fig. 6.

INVENTORS
HAROLD J. MOSS
GENE S. SLIGER
JIMMIE L. TAYLOR
BY Bacon & Thomas
ATTORNEYS

TOP BURNER STRUCTURE FOR GAS RANGES

BACKGROUND OF THE INVENTION

This invention relates to burner constructions for top burners of gas ranges.

It has been proposed heretofore to construct a combined drip pan and top burner assembly as a single unit, supporting one or two burners and wherein the drip pan and fuel conduits were formed by shaping sheet metal plates, then securing them together in face-to-face relation. In such constructions, however, it was necessary to resort to separate sealing materials between the plates to effect a proper seal against escape of gas or to secure the plates together by continuous welding at their edges. Such prior devices also included igniter tubes mounted on the drip pan, extending to positions adjacent the sides of the burner housings but the igniter openings from the housing have not heretofore proved completely satisfactory in such an arrangement.

According to the present invention a top burner assembly is constructed from a pair of sheet metal plates secured in face-to-face relation and formed to define gas passageways therebetween leading to burner chambers to which the burner heads themselves are secured in a novel manner. Igniter openings are provided in the sides of the burner head housings defining jets extending in a plurality of directions adjacent the ends of igniter tubes to ensure proper ignition, maintenance of flame and propogation of flame toward the burner openings. In addition, the invention comprises features whereby the plates may be secured together only by spaced spot welds and the assembly is then coated with a layer of ceramic enamel, the latter filling all edge grooves between the plates and being bonded thereto to effect a perfect seal against the escape of gas.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of a burner construction embodying the present invention;

FIG. 2 is a side elevational view of the burner construction of FIG. 1;

FIG. 3 is an enlarged transverse sectional view taken on the line 3—3 of FIG. 1;

FIG. 4 is an enlarged fragmentary vertical sectional view, taken on the line 4—4 of FIG. 3;

FIG. 5 is an enlarged fragmentary vertical sectional view through one of the burner housings, taken on the line 5—5 of FIG. 1; and

FIG. 6 is an enlarged fragmentary vertical sectional view, taken on the line 6—6 of FIG. 1.

DESCRIPTION OF A PREFERRED EMBODIMENT

The burner construction of the present invention, as shown in the drawings, comprises an upper plate 2 and a lower plate 4 configured as shown in FIG. 1 and embossed or stamped to define cooperating and opposed channels 6, 8, 10 and 12, respectively, defining fuel and air passageways extending from inlet fixtures 14 and 16. The inlet fixtures 14 and 16 are of more or less conventional configuration and comprise adjustable inlet ports 18 and 20 to admit air into a stream of gas projected into the inlet ports by conventional nozzle means (not shown) each of the passageways defined by the channels 6–12 terminate in embossments defining plenum chambers 22 and 24 (see also FIG. 3 and 5).

The upper and lower plates 2 and 4 defining the plenum chambers 24 are provided with aligned openings, the opening through the upper plate being larger than the opening in the lower plate. The upper and lower openings are identified in FIG. 5 by numerals 26 and 28, respectively. Both openings 26 and 28 are provided with upstanding peripheral flanges 30 and 32. The burners 34 may be identical in construction so only one will be described in detail. With reference to FIG. 5, each burner comprises a housing formed from generally cylindrical inner and outer shells 36 and 38. As shown, the shells are arranged concentrically but spaced apart to define a burner

chamber 40. The upper end of the inner shell 36 is turned outwardly and rolled and crimped over an upper flange 42 on the outer shell which, at its upper end, defines an inset channel 44. The base wall of the channel 44 is provided with a multiplicity of burner openings 46 extending around the periphery of the burner and communicating with chamber 40.

At its lower end the outer shell 38 is provided with an inwardly directed peripheral flange 48 seated on the upper surface of the plate 2 and abutting the flange 30. The inner shell 36 is of stepped formation, the upper portion 50 being of a diameter generally comparable to that of the opening 26 and joined to a lower portion 52 of a diameter substantially less than the openings 26. The two portions are joined by an annular shoulder 54 positioned somewhat above the level of the opening 26. The lower portion 52 extends downwardly through opening 28 in the lower plate 4 and at its lower end is rolled or turned outwardly, at 56, to secure the assembly together. The inner and outer shells 36 and 38 may be made of aluminum whereby they may be assembled to the plates 2 and 4 by mechanical means only and provide complete and efficient seals around the openings 26 and 28. It will be seen that each plenum chamber 24 communicates through opening 26 with its corresponding burner chamber 40, thus directing fuel and air mixture to the burner openings 46. The shoulder 54 tends to redirect flowing gas to intimately mix the fuel gas and air and distribute the same uniformly throughout the chamber 40.

As shown in the illustrated embodiment, the upper and lower plates 2 and 4 are secured together merely by spaced spot welds, as indicated at 58 in FIGS. 1 and 6. The upper and lower plates are provided with aligned openings defining a central opening 60 (FIG. 1) for a purpose to be described. The opening at 60 in the lower plate 4 is provided with an upstanding flange 62 (shown by broken line in FIG. 1) which abuts the inner periphery of the corresponding opening in the upper plate 2.

After the plates 2 and 4 are assembled and spot welded, the assembly of plates is then coated with a layer 64 (FIG. 6) of ceramic enamel. Usually the coating is performed by heating the assembled plates sufficiently to melt a suitable ceramic frit to cause the same to flow and fuse with the surfaces of the plates. As clearly shown in FIG. 6, the peripheral edge 66 of the lower plate 4 defines a groove 68 with the adjacent surface of the upper plate 2. During the coating of the assembly with ceramic enamel the latter flows into and fills the groove 68 and bonds itself to the adjacent surfaces, thus providing a continuous and perfect seal around the periphery of the lower plate 4. The same thing occurs between the upper plate 2 and the upstanding flange 62 of the lower plate around the opening 60 previously referred to. As shown in FIG. 6, the upper plate 2 may be further provided with a depressed channel 70 adjacent the edge 66 of the lower plate to thus accentuate the depth of the groove 68 and further provide a flow channel for drippings falling on the upper plate during use of the burner, and thus functioning as a drip pan.

Secured to the plate assembly is an igniter tube assembly 72 (FIG. 1) having a pair of igniter tubes 74 extending from inner positions over the opening 60 to positions closely adjacent the corresponding burner head housings 34. The conventional gas range is provided with a pilot burner providing a constant flame. That pilot burner, not shown, would be positioned in the opening 60 so that the flame thereof burns adjacent the inner ends of the igniter tubes 74. Thus, when a burner is turned on, gas therefrom is caused to enter the outer ends of the associated tube 74 and to progress therealong toward the pilot flame. The pilot flame then ignites that gas and the flame travels back along the igniter tube to a position adjacent the burner to ignite the gas fuel issuing from the openings 46 thereof.

The present invention comprises a novel means for providing igniting fuel to the tube 74 and propogating flame therefrom to the burner openings 46. As shown, particularly in FIGS. 3 and 4, the outer shell 38 of each burner head is pro-

vided with a generally teardrop-shaped depression 76, the lower portion of which is directly opposite the end of an adjacent igniter tube 74. The depression 76 is formed to define upwardly and outwardly tapering side and rear surfaces 78 and an upwardly facing bottom surface 80. An upwardly directed jet opening 82 is formed in the bottom surface 80 and communicates with the chamber 40 to thus project a stream of gas fuel upwardly past the adjacent end of tube 74 and toward the burner openings 46 of the burner. In addition to the opening 82 the inner wall 78 is provided with a first opening 84 directed generally outwardly along substantially the central axis of the tube 74. The jet issuing from this opening crosses the jet issuing from opening 82 to create turbulence and to direct a substantial amount of gas fuel into the end of tube 74 and toward the pilot flame at the other end thereof. This ensures prompt ignition. A large portion of the gas fuel issuing from the openings 82 and 84, however, moves generally upwardly along the outer surface of the burner casing and past additional openings 86 in the back wall of the depression 76. The jets issuing from these additional openings, arranged as indicated in FIG. 3, cause additional turbulence in the igniting flame and effect efficient distribution of the flame over a substantial portion of the periphery of the burner head at the upper end thereof whereby to efficiently ignite gas fuel issuing from the openings 46.

While a single specific embodiment of the invention has been shown and described herein, the same is merely exemplary of the principles involved and other forms may be resorted to.

We claim:

1. A top burner for a gas range, comprising:

upper and lower plates secured together in face-to-face relation by spaced spot welds and configured to define therebetween at least one elongated gas passage;

one of said plates having a boundary edge lying within the peripheral edge of the other plate and defining therewith a groove extending along said boundary edge; and

a layer of ceramic enamel covering the outer surfaces of said plates, said ceramic enamel filling said groove and being bonded therein to thereby seal the joint between said boundary edge and said other plate.

2. A burner as defined in claim 1 wherein said other plate is provided with a rib extending along and adjacent said boundary edge, said boundary edge and said rib defining said groove therebetween.

3. A burner as defined in claim 1 wherein said plates are provided with aligned openings therethrough, the periphery of the opening in said other plate having a peripheral flange extending through the opening in said one plate adjacent the boundary edge thereof, said groove being defined by said flange and said boundary edge.

4. A gas burner comprising means defining an upstanding gas fuel chamber and burner openings around the upper periphery of said chamber;

an inwardly extending depression in a sidewall of said chamber below said burner openings;

an igniter tube having an open end adjacent and facing said depression; and

an upwardly directed opening through the bottom portion of said depression for directing gas fuel from said chamber upwardly toward said burner openings.

5. A gas burner as defined in claim 4 including a further opening in said depression arranged to direct gas fuel outwardly toward said igniter tube and across the path of flow of fuel gas issuing from said upwardly directed opening.

6. A gas burner as defined in claim 5 wherein said depression is defined by side surfaces tapering generally upwardly and outwardly; and additional openings through said side surfaces arranged to direct additional gas fuel from said chamber to mix with gas fuel from said upwardly directed and further openings.

7. A gas burner as defined in claim 6 wherein said upwardly directed opening is larger than said further and additional openings. L

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