Nov. 3, 1936. B. PRATT ET AL 2,059,534

GAS RANGE STRUCTURE

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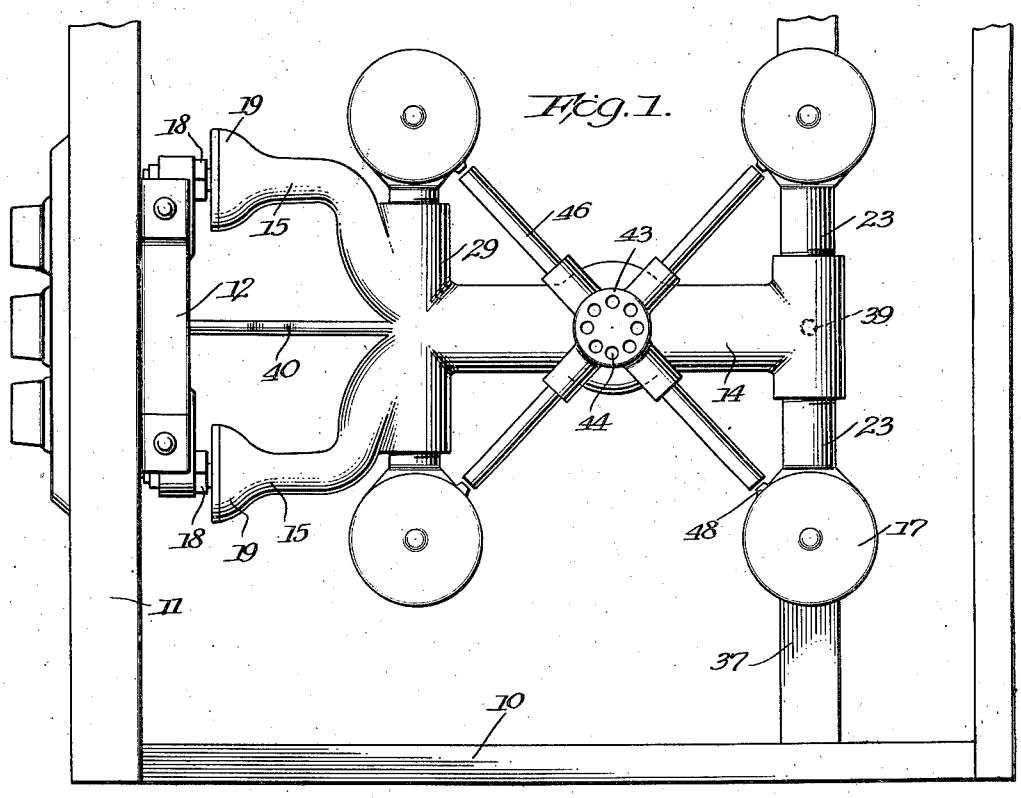


Fig. 1.

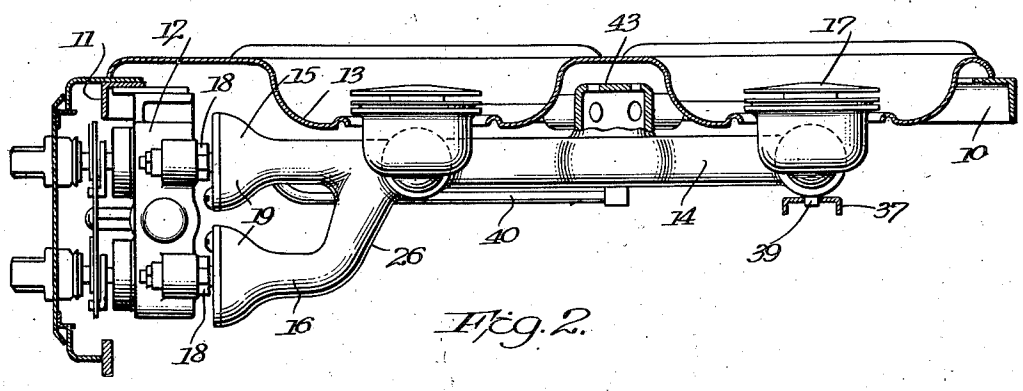


Fig. 2.

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GAS RANGE STRUCTURE

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Fig. 3.

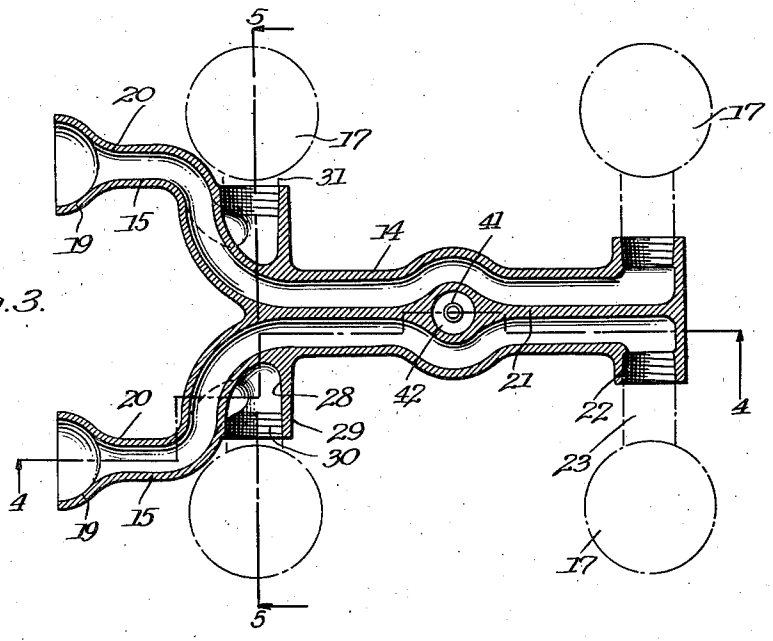
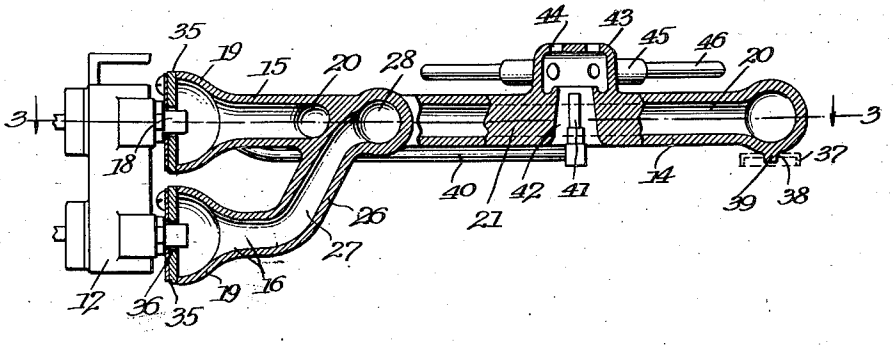


Fig. 4.



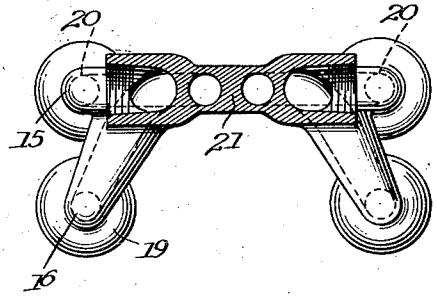


Fig. 5.

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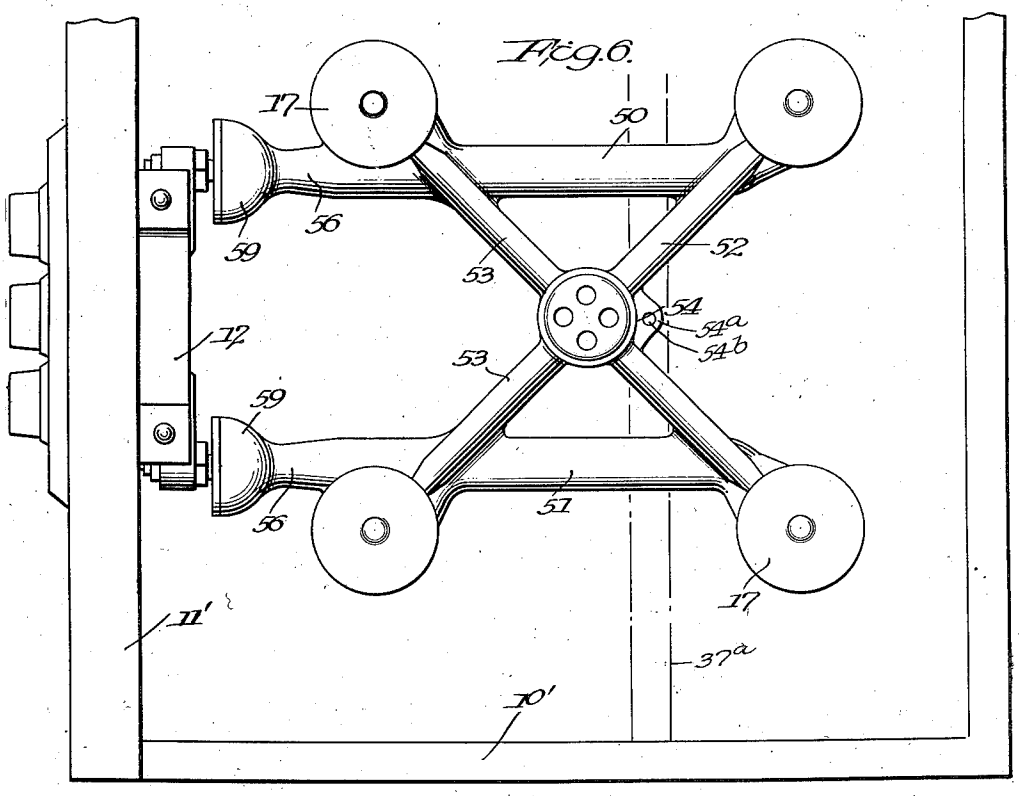
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GAS RANGE STRUCTURE

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Fig. 6.



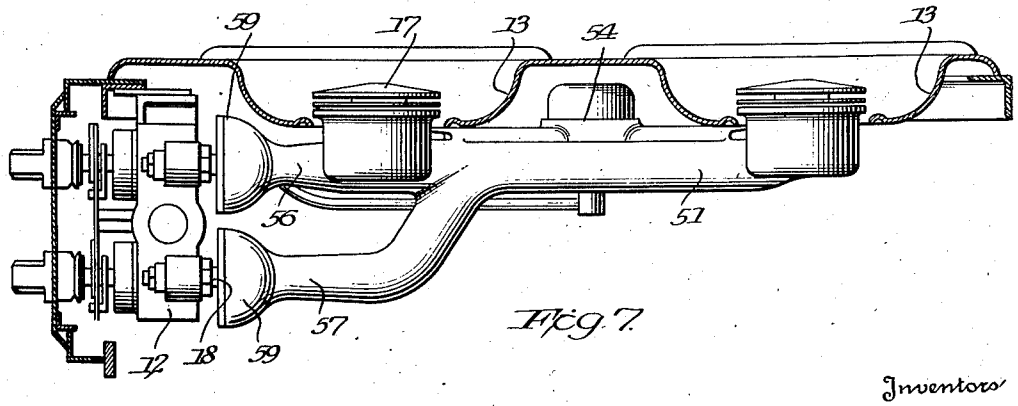


Fig. 7.

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GAS RANGE STRUCTURE

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Fig. 8.

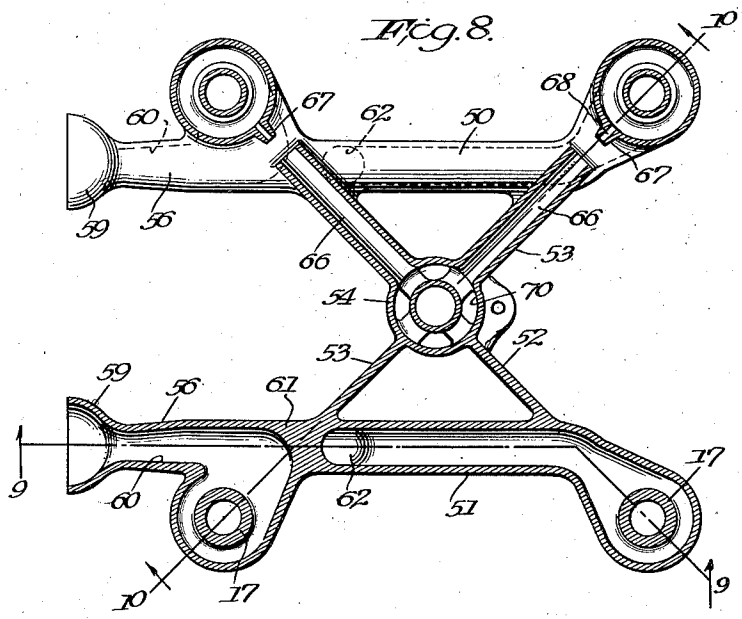


Fig. 9.

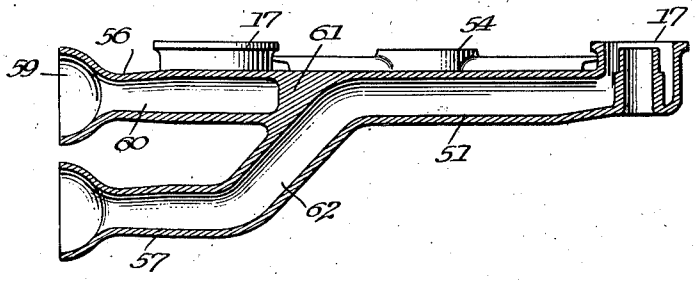
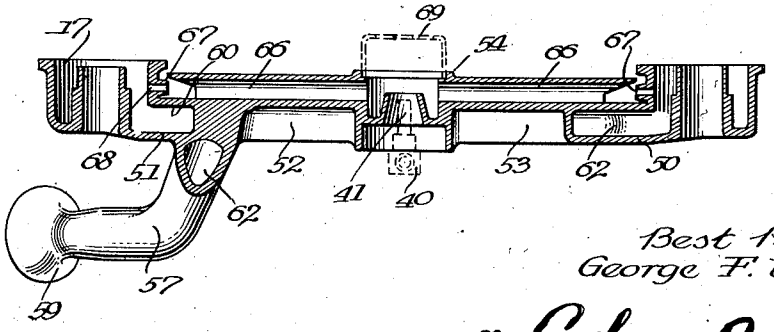


Fig. 10.



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Patented Nov. 3, 1936 2,059,534

UNITED STATES PATENT OFFICE

2,059,534

GAS RANGE STRUCTURE

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Application December 24, 1934, Serial No. 759,122

4 Claims. (Cl. 158—104)

The present invention relates to a gas range structure and, more particularly, to fuel supply units for such ranges.

The principal object of the invention is to provide a gas range structure having a fuel supply unit for the top burners wherein Venturi or supply tubes leading to the various gas burners are formed integrally, permitting all of the burners to be supported at a common level and readily removed, with the fuel supply unit, from the burner box.

Heretofore, it has been usual to provide a separate Venturi tube leading to each gas burner. Such a structure is undesirable because it requires that separate supporting means must be provided for each Venturi tube and burner. A further disadvantage of such an arrangement is that, since the Venturi tubes are independently supported, the various burners may be positioned at different levels in the burner box.

Another object of the invention is to provide a means for supporting Venturi tubes and gas burners in the burner box of a gas range.

Other objects and advantages of the invention will be apparent from the following specification and drawings:

Figure 1 is a plan view of a fuel supply unit of the present invention showing the structure applied to the burner box of a gas range.

Figure 2 is a side view of the structure shown in Figure 1, with portions thereof in vertical cross section.

Figure 3 is a horizontal sectional view taken on the line 3—3 of Figure 4.

Figure 4 is a vertical longitudinal section taken on the line 4—4 of Figure 3.

Figure 5 is a transverse sectional view taken on the line 5—5 of Figure 3.

Figure 6 is a plan view of a modified form of fuel supply unit showing the structure applied to a burner box.

Figure 7 is a side view of the structure of Figure 6, with portions in vertical section.

Figure 8 is a view partly in plan and partly in horizontal section.

Figure 9 is a vertical sectional view on the line 9—9 of Figure 8, and

Figure 10 is a view, in vertical section, on the line 10—10 of Figure 8.

Referring to Figures 1 to 5, the numeral 10 designates the burner box of a gas range provided with a front wall 11. A manifold and valve structure of the type disclosed in our application for Manifold and valve structure, filed November 14, 1934, Serial No. 753,057, and indicated by the numeral 12, is shown mounted in the front wall of the burner box. As shown in Figure 2, the burner box is provided with the usual top structure including bowls 13 surrounding each burner.

The fuel supply unit of the present invention comprises a body portion 14 having upper and lower hollow arms or Venturi tubes 15 and 16, respectively, projecting forwardly therefrom toward the valves which control the delivery of gas to the unit. The unit is cast in one piece and includes an arm or Venturi tube for each of the cooking burners 17 with which the unit is to be used.

The unit as disclosed in the present application is designed for use with four burners. In the present embodiment of the invention, particularly adapted for use with the manifold structure of our above mentioned application, the arms or Venturi tubes are arranged in pairs, each pair including an upper tube 15 and a lower tube 16, the lower tube of each pair being positioned directly beneath the upper tube of that pair, the lower tubes being positioned in a horizontal plane parallel to the horizontal plane in which the upper tubes are arranged and the outer or free ends of the tubes being spaced apart to be in alignment with the outlet nipples 18 of the valves with which they communicate. It will be understood that the relative positions of the tubes may be changed in accordance with the arrangement of the burner valves with which they communicate.

As is best shown in Figure 3, the upper tubes 15 diverge from the body portion 14 of the unit and then extend forwardly in parallel relation, the outer or forward ends or inlets 19 of the tubes being substantially funnel-shaped to give a Venturi action. The passage 20 provided within each upper tube 15 extends into the body portion 14 of the unit, these two passages being separated within the body portion by a vertically extending wall 21. At the rear end of the body portion of the unit, the passages 20 diverge at right angles and each terminates in a threaded aperture or outlet 22 in which a short length of pipe 23 is threaded. The burners 17 at the rear of the burner box are carried upon the pipes 23.

The lower tubes 16 of the unit diverge downwardly and outwardly from the body portion 14 from beneath the tubes 15 and thence forwardly, their outer ends or inlets 19 also being shaped to give a venturi action. As shown in Figure 4, the passage 27 provided in each of the lower tubes 16 extends into the body portion of the unit at a point behind the passage 20 of the up-

per tube 15 on the same side of the device. At this point, each passage 27 is provided with a return bend as at 28 (Figure 3) and thence extends outwardly in a laterally arranged nipple 29, the inner surface of which is threaded as at 30 to receive a short length of pipe 31 carrying the front burner 17 at that side of the burner box.

By the construction described above, each of the passages is of substantially uniform cross section throughout its length and the relative arrangement of the passage is such that the flow of gas will not be retarded.

The present invention includes the provision of the nipples 18 carried by the gas valves and adapted to cooperate with the inlets 19 of the various tubes to support that end of the unit. Each inlet 19 is provided with a pair of superimposed and relatively movable plates 35 arranged to permit the supply of air to the tubes to be adjusted. These plates are secured to the tubes in the usual and well known manner but are provided with central apertures 36 and the nipples 18 projecting inwardly from the manifold 12 extend into these apertures.

The provision of a pair of nipples 18 and mouths 19, or, as in the present embodiment, the provision of nipples 18 and mouths 19 at corners of a polygonal or rectangular area, serves to firmly support the forward end of the unit against horizontal and vertical movement. The burner box 10 is provided with a cross bar 37 having an aperture 38 at its center and a stud or projection 39 provided upon the lower face of the rear end of the body portion 14 of the unit fits into this aperture, thereby acting, with the nipples 18, to hold the entire unit against lateral movement. The cross bar 37 extends beneath the pipes 23 carrying the rear burners 17 and the lower wall of each rear burner may rest upon the cross bar 37, as shown in Figure 2, thereby further preventing the Venturi tube device from rocking.

It will be noted that the stud 39 is located at one apex of a triangle defined by this stud and the nipples 18 of the manifold, and since the weight of the unit will hold the stud seated in the aperture 38 of cross bar 37, the inlets 19 will be firmly held in position on the nipples 18.

A pipe 40 leads from the rear wall of the manifold structure 12 and beneath the fuel supply unit, this pipe being provided at its inner end with a pilot light burner jet 41 extending upwardly into an aperture 42 preferably centrally arranged with respect to the burners 17. A chamber 43 formed integral with the body portion 14 of the unit surrounds the upper end of the aperture 42, the chamber 43 preferably being provided with apertures 44 to permit the circulation of air therethrough. Hollow arms 45 extend from the chamber 43 toward each burner 17, as best shown in Figures 1 and 4, and tubes 46, either integral with or threaded in the arms 45, extend from the latter to a point closely adjacent an aperture 48 provided in the side wall of each burner 17.

It will be noted that by the above arrangement, the fuel supply unit is so combined with elements of the pilot burner structure that the fuel supply unit and burners and the portions of the pilot burner structure carried thereby may be readily removed from the burner box for cleaning or any replacement. In order to entirely remove the unit and burners from the burner box, it is only necessary to lift the rear end of the unit to release the stud 39 from the aperture 38 and the unit, with the burners 17, may then be drawn outwardly from the nipples 18 to entirely free the structure from the burner box. Since the pilot light burner 41 is not attached to the unit, it will not interfere with the above operation.

The form of our invention shown in Figures 6 to 10 comprises two horizontally spaced and parallel tubes 50 and 51 joined by an integral connecting structure 52. The connecting structure 52 is of X formation, comprising two intersecting arms 53. Burners 17 are positioned on the tubes 50 and 51 opposite the ends of both of the arms 53. A pilot light housing 54 is positioned at the point of intersection of the arms 53 so that it will be centrally arranged with respect to all of the burners. All of the structure described above is preferably cast as one piece.

As best shown in Figures 7 and 9, each of the tubes 50 and 51 branches into two vertically spaced arms at its forward end, the upper arm 56 preferably being a longitudinal extension of the body portion of the tube and the other arm 57 extending downwardly and thence parallel with the upper arm. Each of the arms 56 and 57 is provided with an inlet 59 which is substantially funnel-shaped to give a venturi action. The inlets are provided with superimposed and relatively movable plates arranged to permit the supply of air flowing therethrough to be adjusted, these plates being formed in the same manner as the plates 35 of the structure shown in Figures 1 to 5, and so that they may fit over the nipples 18 projecting inwardly from the manifold 12.

As is best illustrated in Figures 8 and 9, the inlet 59 of the upper arm of each of the tubes 50 and 51 opens into a passage 60 communicating with the forward burner of that tube, the passage being closed at its rear or inner end by a partition or wall 61. The inlet 59 of the lower arm 57 of each tube opens into a passage 62 which extends through the arm and through the body portion of the tube to the burner formed at the rear end of that tube, the wall or partition 61 serving to close the passages 60 and 62 to each other. As shown in Figures 6 and 8, an ear or lug 54*a* projects from the rear wall of the pilot burner housing, this ear being provided with an aperture 54*b*. By this arrangement, the fuel supply unit may be secured to a cross bar or supporting member 37*a* in the burner box by a bolt and nut, the bolt extending through the aperture 54*b* and through an aligned aperture in the cross bar, the unit thereby being prevented from moving horizontally from the nipples 18 of the manifold structure 12. If desired, the aperture 54*b* may fit over an upstanding lug on the cross bar.

Each of the intersecting arms 53 of the tube connecting structure 52 includes passages 66 opening from the pilot burner housing 54 and extending to a point close to the burner housing arranged opposite the end of that arm. Each burner housing includes a nipple 67 extending toward the aligned passage 66, the aperture 68 provided in the nipple being formed during the casting of the unit. By this arrangement, the opening of the valve communicating with any one of the top burners will cause the gas issuing from the burner to be ignited by the pilot light burner with which it communicates through the aperture 68 and passage 66.

The pilot light housing 54 may be provided with a removable apertured cover 69 and the

lower wall of this housing is preferably provided with openings 70 to admit air thereto. As is the case with the structure shown in Figures 1 to 5, the present form of fuel supply unit is entirely free of the pilot burner so that the unit may be removed from the burner box without disconnection of the pilot burner 41 or the pilot burner supply tube 40.

Since the apertured nipple 67 provided in each top burner housing is formed during the casting of the unit, the difficult problem heretofore presented in the drilling of such a hole is eliminated in the present structure.

It will be observed that the fuel unit shown in Figures 6 to 10 can be readily removed from the burner box by lifting the inner end of the unit to release the sockets from the lugs and by then sliding the inlet plates of the unit from the nipples 18 of the manifold 12.

The arrangement whereby the gas flowing from the lower nipples 18 moves upwardly through the lower arms of the tubes 50 and 51 insures that there will be a full and free flow of gas to the rear burners, because of the fact that the gas naturally tends to flow upwardly.

Since the structure of Figures 6 to 10 is cast integral, it can be readily manufactured. Its integral construction also enables it to be readily installed in a range.

It will be understood that the invention is not limited to the details of construction shown in the drawings and described in the specification and that the examples of the uses of the inventions which have been given do not include all of the uses of which they are capable; also, that the phraseology employed in the specification is for the purpose of description and not of limitation.

We claim:—

1. As an article of manufacture, a fuel mixing structure for gas ranges comprising an element having a plurality of non-communicating passages therein, each passage including an inlet and an outlet, the inlets of the passages being respectively spaced in one plane to define the corners of a rectangular planar area and to fit upon the nozzles of a gas supply manifold, the outlets of the passages being spaced in a plane at right angles to the first plane to support range burners at the corners of a substantially rectangular planar area, and pilot burner flame tubes projecting from a point between said passages toward the corners of the last-named rectangular area.

2. As an article of manufacture, a fuel mixing structure for gas ranges, including a pair of spaced tubular elements, each element being provided with a passage having an inlet and an outlet, burner flame tubes rigidly connecting said tubular elements, said tubes projecting from and being rigidly connected to a central pilot burner housing positioned intermediate the two elements and having their outlets positioned adjacent the tubular element outlets.

3. As an article of manufacture, a fuel mixing structure for gas ranges, including a pair of spaced tubular elements, each element being provided with a pair of passages having an inlet and an outlet, the inlets of the passages of the two elements terminating and being spaced in one plane to define the corners of a polygonal planar area, and the outlets being spaced in a plane at right angles to the first plane to substantially define the corners of a second polygonal planar area, the tubular elements being also spaced in the latter plane, pilot burner flame tubes rigidly connecting said elements, said tubes projecting from and being rigidly connected to a central pilot burner housing positioned between said elements and having their outlets positioned adjacent the tubular element outlets.

4. As an article of manufacture, a fuel mixing structure for gas ranges, including a pair of spaced tubular elements, each element being provided with a pair of passages having an inlet and an outlet, the inlet of one passage of each element being arranged above the inlet of the other passage thereof and the outlet of one passage being positioned in advance of the outlet of the other passage, pilot burner flame tubes rigidly connecting said elements, said tubes projecting from and being rigidly connected to a pilot burner housing arranged intermediate the two elements and having their outlets positioned adjacent the tubular element outlets.

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