

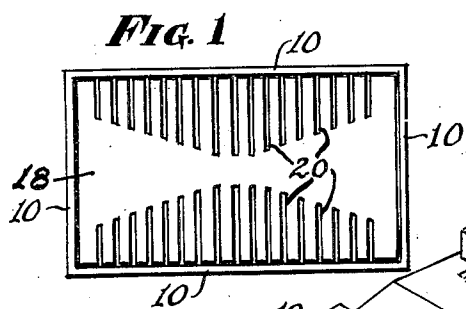
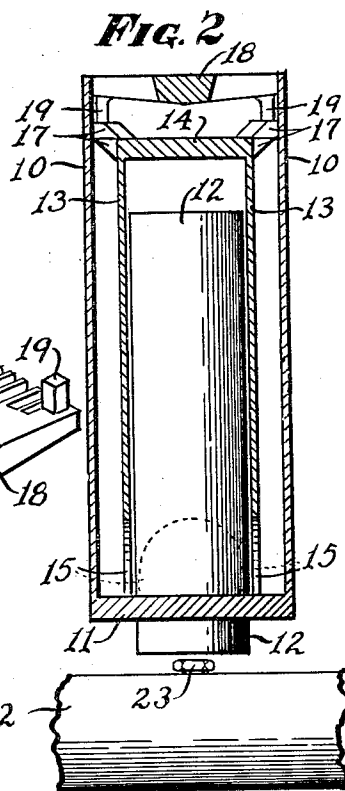
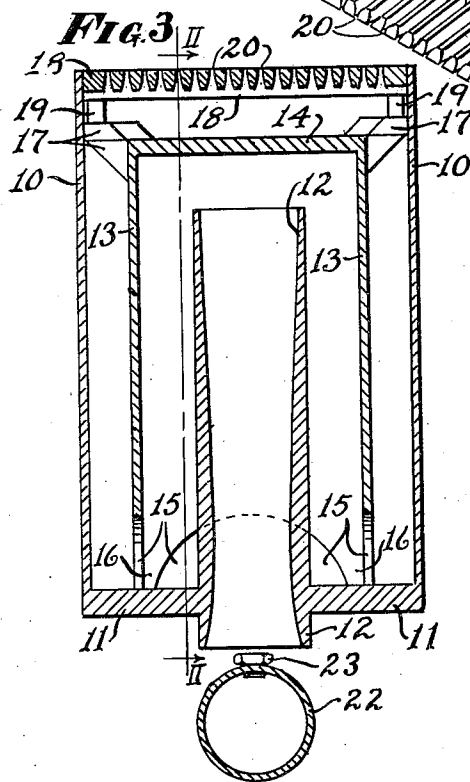
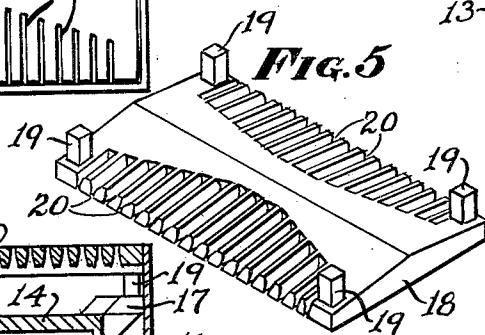
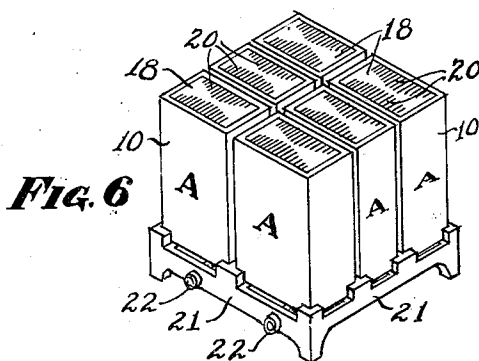
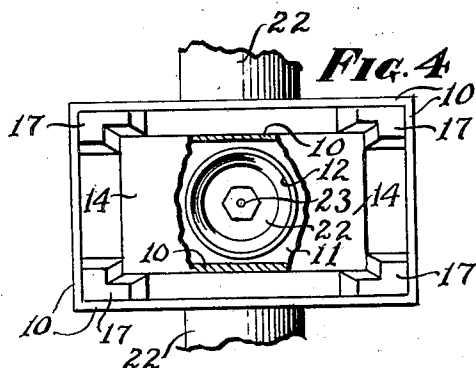
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GAS BURNER

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## UNITED STATES PATENT OFFICE

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## GAS BURNER

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Serial No. 634,264

4 Claims. (Cl. 158-106)

My invention relates to an improvement in gas burners. One of the objects of my gas burner is to provide a burner that will operate efficiently on a low gas pressure as well as on a high gas pressure. Another object is to provide a gas burner which will have little or no flash back after the gas has been turned off. A still further object is to provide a gas burner which will have no flash back during the time it is burning, even though the gas pressure is extremely low. These and other objects will be more fully explained as this description progresses.

Now referring to the drawing in which the same reference characters refer to the same parts throughout the several figures. Fig. 1 is a plan view of my improved gas burner unit. Fig. 2 is a sectional view through my gas burner unit as viewed from the line II-II in Fig. 3. Fig. 3 is a longitudinal sectional view through my gas burner unit. Fig. 4 is a plan view of my gas burner unit with the gas grate removed and with parts being broken away for convenience of illustration. Fig. 5 is a perspective view of the bottom side of the gas grate. Fig. 6 is a perspective view of a gas burner assembled from my improved gas burner units.

In the drawing is shown my improved gas burner unit comprising a box-like element 10 which is open at the top and having an integral bottom 11 and Venturi tube 12 which is open at either end and is integral with the bottom 11 and passes therethrough. Positioned within the box 10 and over the Venturi tube 12 is a second box-like element 13 having an open bottom and an integral closed top 14. At the bottom of the walls of the box-like element 13 are cut away portions or openings 15 between which are formed leg or support elements 16 which rest on the bottom 11 and support the box-like element 13. Integral with the box-like element 13 and top 14 and at the corners thereof are outwardly extending portions 17 which are so positioned that they fit in the corners formed by the walls of the box-like element 10 and serve to properly space the walls of the box-like element 13 from the walls of the box-like element 10.

At 18 is shown a gas grate positioned within and preferably even with the top of the walls of the box-like element 10. On the bottom side and at the corners of the gas grate are shown legs 19 which rest on the corner projections 17 and support the gas grate a spaced distance above the top 14 of the box-like element 13. The gas grate is composed of a plate or casting 18 having a plurality of narrow slots or openings 20 extend-

ing from the edges of the plate 18 inwardly toward the center axis of the plate 18. Each of said slots runs transversely to the center longitudinal axis and each slot 20 is a little shorter than the adjacent one next toward the transverse center axis. The object of this arrangement of the slots 20 is that a large volume of secondary air may enter at the ends of the plate 18 and pass over the plate toward the transverse axis of the plate, then between each of the slots 20 to aid in the combustion of the gas and air mixture being emitted from the slots 20 as will be later explained.

At 21 is shown a frame having a plurality of seats or sockets in which a plurality of my gas burner units A may be loosely and removably set and held. The frame 21 carries a gas manifold or a plurality of gas manifolds 22 if necessary, which are positioned so they cross the center perpendicular axis of the gas burner units A. In the gas manifolds 22 are gas openings or jets 23 so positioned that gas being discharged through the gas opening or jet 23 will pass directly into and up the Venturi tube 12.

The operation of my improved gas burner unit is as follows: Gas is fed to the gas manifold 22 from any suitable source of supply and discharged from the manifold 22 through the gas opening or jet 23 into the Venturi tube 12 whereupon air from the outside or around the manifold 22 is drawn into the Venturi tube 12 by the flow of gas being jetted into the tube and the gas and air together flow upwardly in the Venturi tube and are discharged therefrom and against the top 14 of the box-like element 13 whereupon the line of travel of the gas and air is diverted and caused to flow downward in the box-like element 13, whereupon a mixing of the gas and air takes place and at the bottom of the box-like element 13 the line of travel of the gas and air mixture is again diverted so that the gas and air mixture passes through the openings 15 into the box-like element 10 whereupon the gas and air are thoroughly mixed and the mixture passes upwardly in the box-like element 10 and is finally discharged through the slots 20 whereupon secondary air comes up around the outside of the box-like element 10 and over the grate plate 18 and passes between the slots 20 and mixes with the gas and air mixture being discharged through the slots 20 whereupon complete combustion of the gas and air mixture takes place.

In Fig. 6 I have shown a gas burner composed of six gas burner units A, however a gas burner

may comprise only one of my gas burner units or it may comprise as many gas burner units as are necessary to obtain the desired heating result.

In the drawing I have shown my improved gas burner unit as having a rectangular box-like form, however it will be understood that numerous box-like forms such as elliptical, round, square, triangular or any other polygonal shape or form may be made and still obtain satisfactory results from the burner unit.

Such modifications may be employed as lie within the scope of the appended claims without departing from the spirit and intention of my invention. Now having fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a gas burner unit, said gas burner unit comprising a first and a second box-like element, said second box-like element being positioned within the first said box-like element, said first box-like element having an open top and an integral closed bottom in which is an integral Venturi tube passing through said bottom, said Venturi tube being positioned vertically on the vertical center axis of the first said box-like element, said second box-like element having an open bottom and an integral closed top, openings in the bottom portion of the walls of said second box-like element and integral outwardly extending portions at the upper corners of said second box-like element, said outwardly extending portions fitting in the corners formed by the walls of the first said box-like element, a gas grate, said gas grate being positioned within and at the top of the walls of the first said box-like element and means for supporting said gas grate in said position, and means for entering gas and air in said Venturi tube.

2. In a gas burner unit, said gas burner unit comprising a first and a second box-like element, said first box-like element having an open top and an integral closed bottom, said bottom having an integral Venturi tube passing therethrough, said Venturi tube being positioned on the vertical center axis of the first said box-like element, said second box-like element being contained in said first box-like element, said second box-like element having an open bottom with openings in the lower portion of the walls of said second box-like element, and an integral closed top, said second box-like element being positioned over said Venturi tube, and means on said second box-like element to properly space its walls away from the walls of the first said box-like element,

a gas grate, said gas grate being positioned over said second box-like element and within the boundary of the walls of the said first box-like element and means for holding said gas grate in said position, and means for supplying gas and air to said gas burner unit, substantially as shown and described.

3. In a gas burner, said gas burner comprising one or a plurality of gas burner units, each of said gas burner units comprising an outer box-like element and an inner box-like element, a Venturi tube and a gas grate, said outer box-like element having an open top and a closed bottom with said Venturi tube passing therethrough, said Venturi tube being positioned on the center vertical axis of said outer box-like element, said outer box-like element containing said inner box-like element, said inner box-like element having a closed top and an open bottom and openings through the lower portion of the walls of said inner box-like element, said inner box-like element being positioned over and around said Venturi tube, said gas grate being positioned over and being spaced above the top of said inner box-like element and within the boundary of the walls of the outer box-like element, a frame, said frame having seats to receive and hold said gas burner units in spaced relationship to each other, and means of supplying gas and air to said gas burner units substantially as shown and described and for the purposes set forth.

4. In a gas burner unit, said gas burner unit comprising an outer box like element and an inner box like element, a tubular element and a gas grate, said outer box like element having a closed bottom with said tubular element passing vertically therethrough, said outer box like element containing said inner box like element, said inner box like element having a closed top and an open bottom, and means for allowing gaseous fuel to flow under the walls of said inner box like element, said inner box like element being positioned over and around said tubular element, said grate being positioned over and above the inner box like element and between the walls of the outer box like element, said gas grate comprising a plate element having openings or slots therein, said openings extending inwardly from opposite sides of said plate, said slots increasing in length as they approach the transverse axis of said plate substantially as shown and for the purposes set forth.

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