Feb. 13, 1951 J. W. MILLER 2,541,710

SHEET METAL MULTIPLE GAS BURNER

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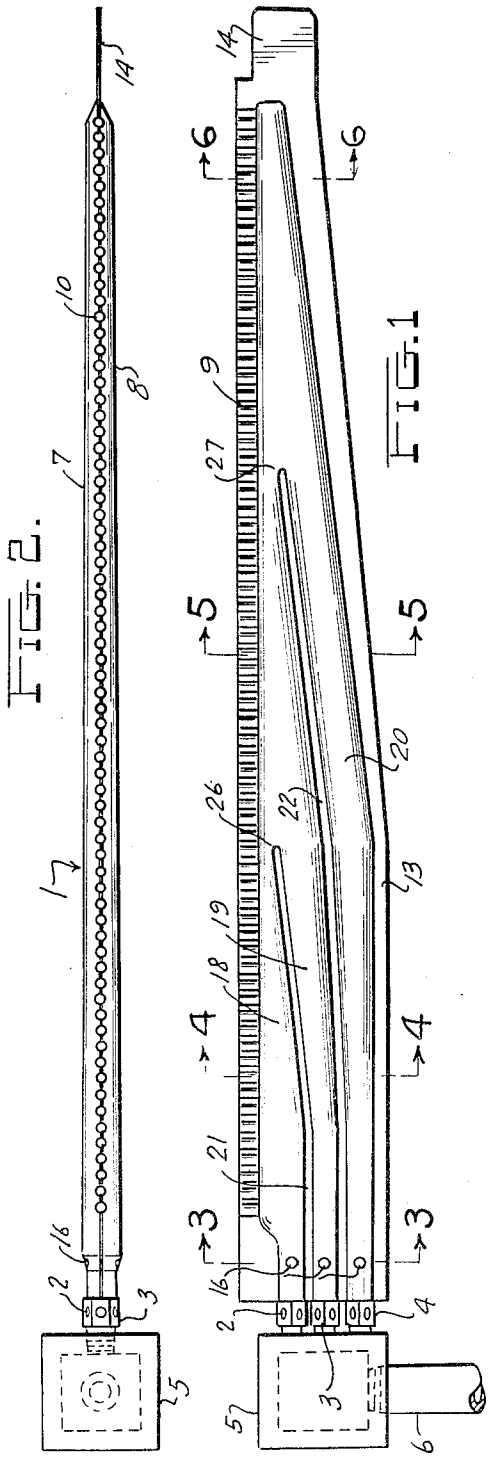


FIG. 2.

FIG. 1.

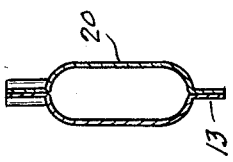


FIG. 6.

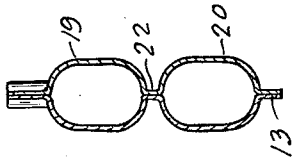


FIG. 5.

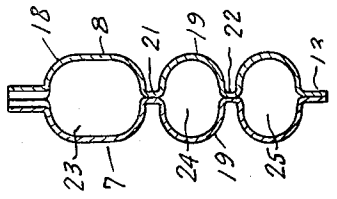


FIG. 4.

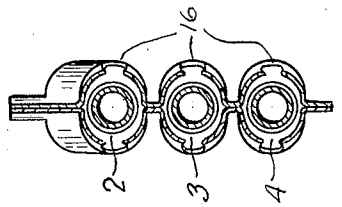


FIG. 3.

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FIG. 7.

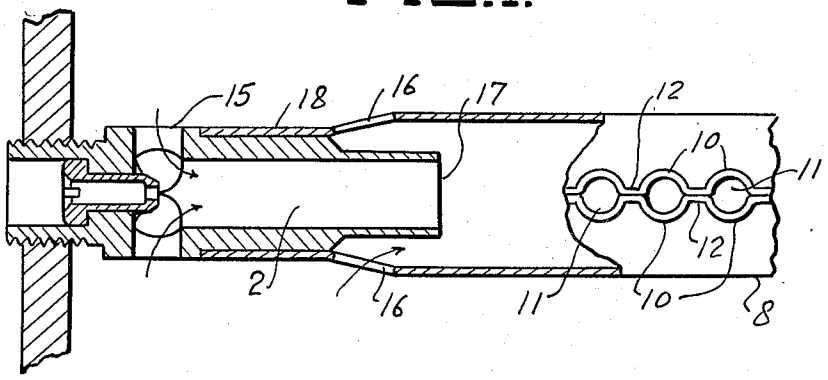


FIG. 8.

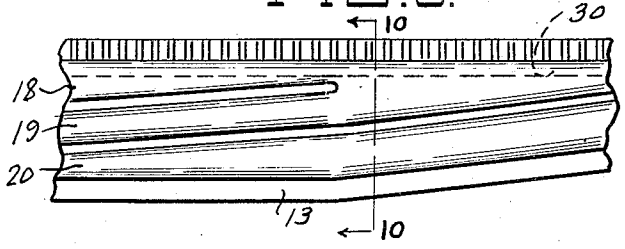


FIG. 10.

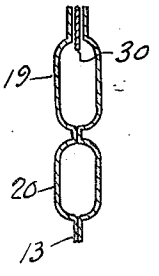
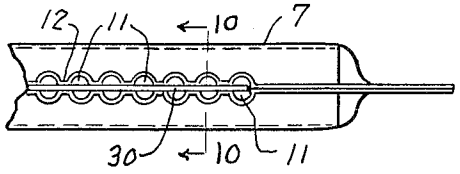


FIG. 9.



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UNITED STATES PATENT OFFICE

2,541,710

SHEET METAL MULTIPLE GAS BURNER

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Application September 21, 1948, Serial No. 50,261

8 Claims. (Cl. 158—105)

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This invention relates to a gas burner and more particularly to a gas burner made from one or more strips of sheet metal.

It is old in the art to fabricate a gas burner from two strips of steel which are stamped or rolled to shape to form complementary right and left hand members which are positioned one upon the other and then welded together along a portion of their periphery and provided with a line of ports along one of the edges. When this type of burner is made in the form of a relatively long thin unit and the gas is supplied through a jet tube at one end of the unit, a serious problem arises in respect to uniformly distributing the gas to all of the burner ports. One of the defects of this type of burner has been that the gas will not be uniformly distributed to all of the ports throughout the length of the burner, which has caused some of the ports to burn with a higher flame than others.

This invention contemplates a gas burner made of strip metal in a relatively long narrow unit in which the combustible gas (such as, natural gas 1025 B. t. u., city gas 550 B. t. u.) will be uniformly supplied to the burner ports throughout the length of the burner.

It is also an object of the invention to produce a gas burner of strip metal which is of simple structure, easy to fabricate, long-lived, and efficient in operation.

Fig. 1 is a side elevation of my burner.

Fig. 2 is a top view of my burner.

Figs. 3, 4, 5 and 6 are sections along the lines 3—3, 4—4, 5—5 and 6—6 of Fig. 1.

Fig. 7 is an enlarged horizontal sectional view through the top jet tube of the burner shown in Fig. 1.

Fig. 8 is a fragmentary side elevation of a modified form of burner, and

Fig. 9 is a fragmentary top view of the same.

Fig. 10 is a section taken along the line 10—10 of Figs. 8 and 9.

Referring more particularly to the drawings, my burner comprises a burner body, generally designated 1, to which a combustible gas is supplied through a plurality of jet tubes which, by way of illustration, are exemplified by jet tubes 2, 3 and 4, which are positioned one above the other and are threaded into a gas manifold 5 to which a combustible gas under pressure is supplied through a pipe line 6 controlled by a conventional gas valve (not shown).

The burner body is made from two strips of metal 7 and 8 which are formed complementary right and left handed. Members 7 and 8 are placed together to form a body. Burner sections 7 and 8 are preferably formed by stamping but conceivably can be made as rolled sections.

Each section 7 and 8 has its upper longitudinal edge portion 9 provided with a plurality

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of parallel transversely extending flutes 10. Each flute 10 is in the form of a semi-cylinder so that when sections 7 and 8 are juxtaposed in complementary relation the flutes cooperate to form gas outlet ports 11. Fluted edges 9 of sections 7 and 8 contact as at 12 between the flutes and are preferably spot welded together at these contacting portions 12. Sections 7 and 8 can be joined together in any suitable manner but preferably are welded together along their lower edge portions 13 and the outer end portion 14.

Each jet tube 2, 3 and 4 is of the Bunsen type and provided with a plurality of air inlets 15 in the body of the jet tube. Burner body 1 is provided with two air inlets 16 for each of the jet tubes adjacent the outlet ends 17.

Each burner section 7 and 8 is provided with three longitudinally extending parallel corrugations or flutes 18, 19 and 20 which, when sections 7 and 8 are secured together in juxtaposed complementary relation, provide sockets into which the jet tubes 2, 3 and 4 respectively are received in tight fitting relation. Preferably there should be one corrugation for each jet tube. Accordingly, since, by way of illustration, I have shown my burner with three jet tubes (2, 3, 4), the burner body will be provided with three corrugations (18, 19, 20). Corrugation 18 will extend about one-third of the length of the burner body, corrugation 19 about two-thirds of the length of the burner body, and corrugation 20 will extend substantially throughout the length of the burner body. Burner sections 7 and 8 fit tightly together along the troughs 21 between corrugations 18 and 19 and also along troughs 22 between adjoining corrugations 19 and 20. Since the burner sections come tightly together along troughs 21 and 22, it is not necessary to weld these corrugations together but they can be welded along elongated contacts 21 and 22 if desired.

Top corrugations 18 form top channel 23 through which a mixture of combustible gas and air is fed from jet tube 2 to substantially one-third of ports 11. Corrugations 19 form channel 24 through which a mixture of combustible gas and air is fed primarily from jet tube 3 to the middle one-third portion of ports 11 and corrugations 20 form a lower channel 25 through which a mixture of combustible gas and air from jet tube 4 is fed to the outer or right hand substantially one-third of ports 11. Channels 23 and 24, of course, communicate at the end of troughs 21 as at 26 and channels 24 and 25 communicate at the ends of troughs 22 as at 27. Thus, abutting trough portions 21 and 22 can also be considered as baffles extending from the jet tube end of the burner approximately one-third and two-thirds respectively of the length of burner body 1. Thus, the effect of corruga-

tions 18, 19 and 20 is to distribute and direct the combustible gas-air mixture from jet tubes 2, 3 and 4 through the burner body 1 so that the gaseous mixture is uniformly distributed to all of the ports 11. With my arrangement of feeding channels I have obtained a burner in which the gaseous mixture is uniformly distributed to ports 11 and the flames over ports 11 will be of uniform height during the operation of the burner.

The form of burner shown in Figs. 8, 9 and 10 is identical with the principal form of burner shown in Figs. 1 to 7 except that ports 11 are divided by a thin strip of metal 30 running lengthwise of the burner body. Strip 30 can be conveniently retained in place by spot welding the same at a plurality of points to trough portions 12 of the fluted edges of sections 7 and 8.

During operation of this modified form of burner ribbon 30 tends to lower the temperature of the burner at ports 11.

Burner body 1 is preferably made from two strips of stainless steel.

The burner shown in Figs. 1 through 7, as an exemplification of my burner, has ports 11 the size of a #29 drill and ports 11 are spaced four per inch. The length of the burner body 1 is approximately 22 inches, the overall height in the area of section 4—4, $2\frac{9}{16}$ inches, and the thickness $\frac{5}{8}$ of an inch. From the above dimensions it is evident why this burner has been characterized as a strip burner and why it has been defined as a long thin unit.

"Gas" is used herein generically to cover both combustible gas and air or mixtures thereof.

I claim:

1. A gas burner comprising a hollow body formed of sheet metal the side walls of which are secured along one longitudinal edge, a row of substantially parallel flutes formed in the other longitudinal edge of each side wall of said burner, said flutes extending substantially perpendicular to the longitudinal axis of said burner, the flutes in each edge being juxtaposed in aligned relation with the flutes in the other edge and with the concave faces of the flutes opposed whereby the flutes form a row of ports in the one longitudinal edge of said burner, a plurality of lengthwise corrugations of different lengths in the side walls of said burner extending from one end of said body to said row of ports, each of said lengthwise corrugations in one side wall being juxtaposed to a corresponding lengthwise corrugation in the other side wall and with their concave faces opposed and with their trough portions in contact substantially throughout their lengths, the shorter corrugation being positioned between the said row of ports and the next longer corrugation, said corrugations having their concave faces positioned inwardly of the burner body whereby the corrugations cooperate to form enclosed channels of different lengths in the burner body and extending from one end thereof to said row of ports, and means at said end of the burner body for supplying gas under pressure into said channels whereby the gas is distributed by said channels to different portions of said row of ports, the shorter channel distributing gas to a portion of said row of ports closer to the jet tube end of said burner than the portion of said row of ports supplied by said longer channel.

2. The gas burner claimed in claim 1 wherein said means comprises a jet tube for each of said channels and the jet tubes extend into the outer ends of said channels.

3. The gas burner claimed in claim 2 wherein said flutes and corrugations are stamped in said sheet metal burner body.

4. The gas burner claimed in claim 3 wherein the number of lengthwise corrugations correspond to the number of jet tubes and the length of each corrugation is substantially a multiple of the shorter corrugation whereby each of said channels supplies substantially a corresponding number of ports with gas.

5. The gas burner claimed in claim 4 including a manifold communicating with said jet tubes for supplying gas thereto.

6. The gas burner claimed in claim 5 wherein each jet tube is provided with at least one port for supplying air to the combustible gas flowing through said jet tube and wherein the side wall of the burner is provided with an air inlet port adjacent the outlet end of said jet tube.

7. A gas burner comprising a hollow body formed of sheet metal, the side walls of which are secured along one longitudinal edge, a row of substantially parallel flutes formed in the other longitudinal edge of each side wall of said burner, said flutes extending substantially perpendicular to the longitudinal axis of the burner, the flutes in each edge being juxtaposed in aligned relation with the flutes in the other edge and with the concave faces of the flutes opposed, whereby the flutes form a row of ports in one longitudinal edge of said burner, a plurality of lengthwise corrugations of different lengths in the side walls of said burner, said corrugations extending generally longitudinally of said body from one end thereof and being vertically spaced and inclined toward said row of ports, each of said lengthwise corrugations in one side wall being juxtaposed to a corresponding corrugation in the other side wall and with their concave faces opposed and with their trough portions in contact substantially throughout their lengths, the shorter corrugation being positioned between said row of ports and the next longer corrugation, said corrugations having their concave faces positioned inwardly of the burner body whereby the corrugations cooperate to form enclosed channels of different lengths in the burner body extending from one end of said body to said row of ports, and means at said end of said burner body for supplying gas under pressure into said channels whereby the gas is distributed by said channels to different portions of said row of ports, the shorter channel distributing gas to a portion of said row of ports closer to the jet tube end of said burner than the portion of said row of ports supplied by said longer channel.

8. The gas burner as claimed in claim 7 wherein the cross sections of the inclined portions of at least the longer corrugations progressively increase in size toward said row of ports.

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