

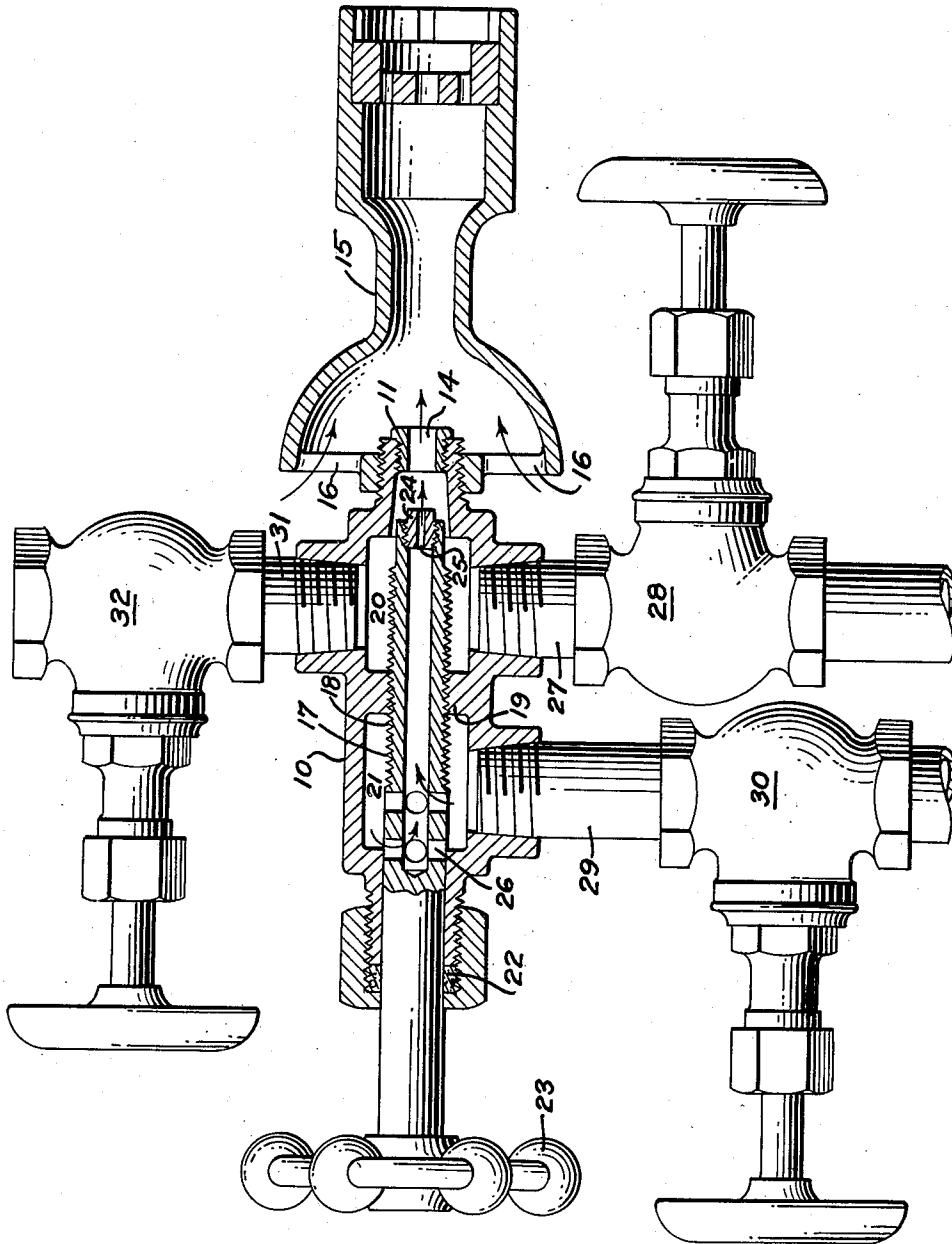
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GAS BURNER

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GAS BURNER

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This invention relates to burners using combustible gas and air as a fuel.

It is the principal object of the present invention to provide an improved gas burner which may be efficiently used either with gases of the type of natural gas or with the type of gases that are commonly termed tank gases, such as "butane" and "propane" or the like, which burner may be connected to sources of both types of gases simultaneously and by simple manipulation utilize either one efficiently as a fuel.

In practicing my invention, I provide a burner body fitted with a main orifice associated with a burner head. The burner body is provided with a connection for natural type gas and when this connection is effective, the gas is discharged into the body and then through the main orifice into the burner head. The burner body is provided with a second connection for tank type of gas, which connection is separate from the first-named. A means is provided for enabling the tank type of gas to be discharged through a secondary orifice and thence through the first-named into the burner head for ignition. The burner body is provided with a secondary air admission means for supplying additional air necessary for combustion, when using the tank type of gas. Therefore, by simple manipulation, the burner embodying my invention may be readily converted from a natural type gas burner into a tank type gas burner, or vice versa.

One form which the invention may assume is exemplified in the following description and illustrated by way of the accompanying drawing, in which:

The figure is a view in central longitudinal section through a burner embodying the preferred form of my invention.

Referring more particularly to the accompanying drawing, 10 indicates a burner body having a main orifice fitting 11 removably fitted to one of its ends. The fitting 11 is formed with a main orifice 14 of a diameter suitable for use in connection with natural gas or gas having similar combustible characteristics. Removably secured to the body 10 about the end of the same adjacent the orifice fitting 11 and projecting coaxially therefrom in axial alignment with the orifice 14 is a Venturi type burner head 15 having the usual air ports 16 for supply air necessary for combustion.

Projecting into the burner body 10 through the end thereof opposite the main orifice 14 and in axial alignment with the latter is a conductor tube 17. This conductor tube is externally

threaded as at 18 and is threaded through a transverse partition 19 separating the interior of the burner body 10 into a primary chamber 20 and a secondary chamber 21. Suitable packing means 22 is provided to prevent leakage about the conductor tube 17 where it projects through the end of the burner body 10.

At its outer end the conductor tube 17 is fitted with a hand wheel 23 by means of which it may be revolved. By revolving the conductor tube 17, its threaded engagement with the partition 19 causes its inner or orifice end to move toward or away from the main orifice 14, depending upon the direction of rotation.

The inner end of the conductor tube is hollow, as illustrated, and its extremity is fitted with a removable orifice fitting 24. This orifice fitting 24 is fitted with a secondary orifice 25 of a diameter suitable for use in connection with gases of the type of "butane" or the like. I desire to point out here that different sized orifices are necessary for tank type gases than are used in connection with the natural type of gas.

The conductor tube 17 is formed with a series of radial ports 26 forming a communication between its interior and the secondary chamber 21 so that gas entering the secondary chamber 21 will pass into the conductor tube 17 and discharge through the orifice 25. When this orifice is in proper relation to the orifice 14, the gas will be injected into the burner head 15, where it will mix with air and may be ignited.

The primary chamber 20 is fitted with a connection 27 led to a source of supply of natural type of gas. This connection 27 is controlled by a valve 28. The secondary chamber 21 is fitted with a connection 29 leading to a source of tank type of gas, such as "butane" or the like, which connection is controlled by a valve 30.

The primary chamber 20 is also connected to the atmosphere by a connection 31 and a valve 32. The purpose of this connection is to supply auxiliary air when the burner is utilizing tank type gas as a fuel. It should be pointed out here that the ordinary ratio of air to natural gas for a proper combustion is approximately eleven to one, while in connection with "butane", for example, the proportion is thirty-three to one. So, therefore, it is obvious that when using "butane" or like gases, additional air may be necessary.

In operation of the device, assuming that the parts are in the positions shown with the valves 28, 30 and 32 closed and it is desired to operate the burner on natural gas, the valve 28 is opened

and the gas discharges into the primary chamber 20, thence around the inner end of the conductor tube 17 through the orifice 14 into the burner head 15. This, of course, causes air to be drawn
5 through the ports 16 in sufficient quantity to form a proper combustible mixture for ignition at the outer end of the burner head.

In the event that it is desired, for any reason, to utilize tank gas, which is connected to the
10 burner body 10 through the connection 29, instead of natural gas, the valve 28 is closed and the valve 30 is opened so that the tank gas will discharge into the secondary chamber 21, thence into the conductor tube 17 through the radial
15 ports 26. The gas so entering the conductor tube 17 will discharge through the orifice 25 and thence through the orifice 14 into the burner head 15. At the same time, the hand wheel 23 is turned in a direction to advance the orifice
20 end of the conductor tube 17 into the proper co-operating relation with the orifice 14. I find that it is necessary to have the orifice 25 in close proximity to the inner end of the orifice 14 for the best results.

For supplying additional air to support the combustion when using tank type of gas, the valve 32 is opened so that the air may flow into the primary chamber 20 and be drawn around the inner end of the conductor tube 17 and
30 through the orifice 14 with the gas discharging through the secondary orifice 25. It is obvious that a sort of a suction action will be created by the jet emerging from the secondary orifice 25.

In the event that it is desired to switch back from tank type gas to natural gas, the valves 30 and 32 are closed, the conductor tube 17 is withdrawn sufficiently to permit the flow of natural gas through the orifice 14, and the valve 28
40 is then opened and the device will operate with natural gas as a fuel.

It is seen that by the provision of my present invention a stand-by may be provided for a burner. That is to say, a burner normally operating on natural or manufactured gas and connected with the usual mains may also be connected with a tank of tank type gas so that in the event of failure of the supply of natural or manufactured gas, the tank type gas may be immediately utilized to maintain the burner in operation. It is readily obvious that this situation may be the reverse, but that the same is of no particular importance to the present invention.

From the foregoing it is obvious that I have provided a very simple and efficient gas burner which is readily adaptable to the use of different types of gas as a fuel, and while I have shown the preferred form of my invention, it is to be understood that various changes may be made in its construction by those skilled in the art without departing from the spirit of the invention as defined in the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A burner of the character described comprising a burner body having a primary chamber and a secondary chamber formed therein, said body having a main orifice in direct communication with the primary chamber, a hollow
5 conducting member extending from the secondary chamber into the primary chamber to a point adjacent the main orifice, the said conducting member having a secondary orifice in its end adjacent the main orifice and in axial
10 alignment therewith, the said conducting member communicating with the secondary chamber, a separate valve controlled means for admitting the flow of gas into each chamber, valve controlled means for admitting air into said primary
15 chamber, and a burner head carried by the body in cooperative relation to the main orifice.

2. A burner of the character described comprising a burner body formed with a primary chamber and a secondary chamber, said body
20 having a main orifice formed therein in direct communication with the primary chamber, a hollow member extending from the secondary chamber into the primary chamber with its inner end adjacent the main orifice, said member
25 being movable coaxially of the main orifice toward and away from the same, the inner end of said member being formed with a secondary orifice in axial alignment with the main orifice, the interior of said member communicating with
30 said secondary chamber, a separate valve controlled gas delivery means for each chamber, a burner head carried by the body in cooperative relation to said orifice, and a valve controlled means for admitting air to said primary chamber.
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3. A burner of the character described comprising a burner body, a partition in said body dividing the interior thereof into primary and secondary chambers, said body having an orifice
40 formed therein at the end of the primary chamber opposite the secondary chamber and in direct communication with the primary chamber, a conductor member projecting into the body through the opposite end thereof and extending
45 through the secondary chamber threaded through said partition and projecting into said primary chamber in axial alignment with said main orifice and with its inner end positioned adjacent the main orifice, the inner end of said member being formed with a secondary orifice in axial alignment with the main orifice, means for turning said member to advance or retract its inner end with respect to said main orifice, the interior of said member being in communication
50 with the secondary chamber only, separate valve controlled means for admitting the flow of a gas into either the primary or secondary chambers, a valve controlled means for admitting air into the primary chamber, and a burner head carried
60 by the body in cooperative relation to the main orifice.

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