June 5, 1934. P. L. F. FEYLING 1,961,751

GAS BURNER

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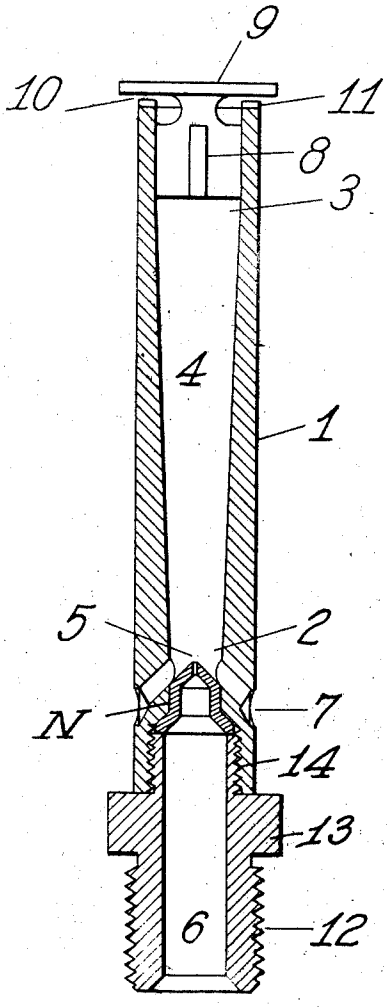


Fig. 1

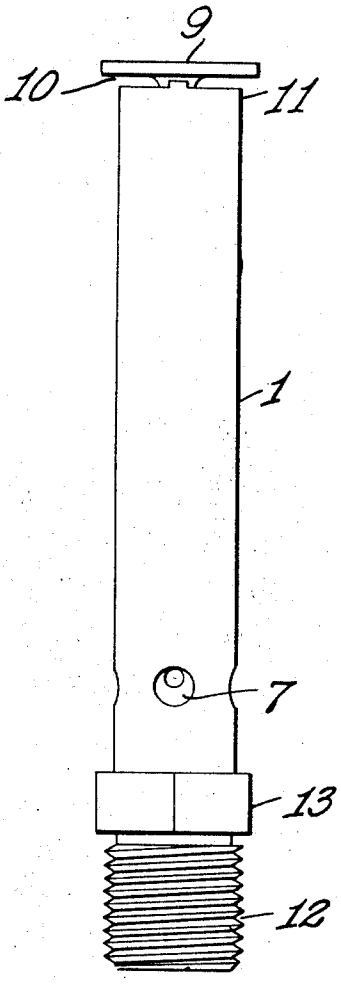


Fig. 2

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GAS BURNER

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8 Claims. (Cl. 158—106)

The present invention relates to gas burners and more particularly to a gas burner suitable for small gas consumption.

It is an object of the present invention to provide a gas burner which is especially suitable for installations where the gas consumption is relatively small, such as installations consuming less than about 10,000 B. t. u. per hour.

It is a further object of the invention to provide a gas burner capable of operating at varying gas pressures, varying gas consumptions and varying burner temperatures to give complete combustion.

It is another object of the invention to provide a gas burner which is simple in construction, inexpensive to fabricate and reliable in operation.

A further object of the invention is to provide a gas burner which will not backfire and which has such a construction that the port openings cannot easily become clogged.

It is also within the contemplation of the invention to provide gas burners in which the flame cannot lift from the ports and in which condensate dripping from heating surfaces over the burner cannot drip into the port openings.

It is also within the contemplation of the invention to provide a gas burner which has a relatively long mixer tube or chamber to permit thorough mixing of the combustible gas and primary air and which has one or more raised projections at the top of the mixer tube for causing a notch or cut in the flame to allow secondary air to flow to the top side of the flame to give complete combustion.

A further object of the invention is to provide a gas burner which has a simple opening for permitting combustible gas to burn with a small flame which is capable of igniting the combustible gas immediately around practically the entire port opening even when very lean gas mixtures and very high gas pressures are used.

Other objects and advantages of the invention will become apparent from the following description taken in conjunction with the accompanying drawing in which:

Fig. 1 is a sectional view of a preferred embodiment of the present invention and;

Fig. 2 is an elevational view looking at the right hand side of the gas burner shown in Fig. 1.

The reference character 1 designates a mixer tube of the present gas burner. In practice it is preferred to have the mixer tube of cylindrical cross section although any other shape may be used. The interior of the mixer tube expands from the lower end 2 to the wide mouth 3 at the top thereof. By constructing the top in this manner, an expanding mixer chamber 4 is provided in which combustible gas and primary air can be thoroughly mixed before combustion. Of course a straight mixer tube may also be used as one skilled in the art will readily understand.

A small orifice 5 in nozzle N connects the combustible gas inlet 6 with the mixer chamber 4. Directly above orifice 5 is a plurality of primary air inlets 7. These air inlets lead air from the atmosphere to the mixer chamber where the air, known as primary air, is mixed with the combustible gas.

At the mouth 3 of the mixer chamber, a plurality of vanes 8 are provided for the purpose of dividing up the stream of gas passing through the mixer chamber. In the preferred embodiment, these vanes are made in an integral unit in the form of a spider.

Mounted over the top of the mixer tube 1 is a cap 9. This cap is spaced from the top of the mixer tube to provide a lateral port opening 10. In the preferred embodiment of the invention, cap 9 is made wider than the top of the mixer tube and is made integral with vanes 8. By providing this construction, a gas burner can be made of a few relatively small and simple parts which can be assembled easily and readily. In the present instance, the gas burner is made of four parts but it may also be made of say two parts or even made in the form of an integral casting.

It is preferred to provide one or more raised projections 11 which project from the top of the mixer tube. The small space between the underside of cap 9 and projection 11 acts as an opening where the gas will burn with a small flame. Once this small flame is established, it will ignite the gas around the entire lateral port opening. In actual tests, it has been found that even with very lean gas mixtures and with very high gas pressures the combustible gas is immediately ignited around the entire lateral port opening.

The gas burner may be mounted or connected to a gas pipe in any appropriate manner. In the gas burner illustrated and described herein, threads 12 are provided at the bottom of the burner. By means of a union (not shown) or an equivalent coupling, the present gas burner may be fixedly secured to the gas pipe.

A polygonal-shaped flange 13 is provided at an intermediate portion of the burner and preferably just above threads 12. A tool such as a wrench, plyers, or the like, may be applied to flange 13 to screw the burner into a coupling,

gas pipe, or the like. In assembling the burner, flange 13 may also be used when mixer tube 1 is screwed on threads 14 located directly above the flange. In other words, flange 13 is useful in assembling the burner and in installing the burner as those skilled in the art will readily understand.

The operation of the gas burner is obvious to those skilled in the art. A combustible gas, such as city or manufactured gas, or natural gas enters the burner through gas inlet 6. The combustible gas passes through orifice 5 and sucks primary air from the atmosphere through inclined air inlets or ports 7. The combustible gas and primary air are mixed in mixer tube 4. The stream of mixed gas and air is divided by vanes 8 and passes through the lateral port opening 10. A small opening between the top of projection 11 and the underside of cap 9 provides a small stream of gas which ignites quickly. Once this gas is ignited, a small flame causes ignition of the gas issuing all around the lateral port opening. Due to the fact that the cap extends beyond the top of the mixer tube, any condensate or the like cannot drip into the port opening and clog the same. Furthermore, it is impossible for the gas flame to lift from the port opening or for the gas-air mixture to backfire.

It is to be noted that the gas consumption can be varied by making the nozzle containing orifice 5 as a small separate piece or insert and by having air inlets or ports 7 proportional to the gas consumption desired.

Although the invention has been described herein in connection with a preferred embodiment thereof, it is to be noted that variations and modifications may be made within the spirit and the scope of the invention as defined in the appended claims.

I claim:—

1. A gas burner which comprises a tubular inlet for gas, an insert having a small gas orifice connected to said gas inlet, a tube having a plurality of spaced air ports associated with said gas orifice for supplying air from the atmosphere to gas issuing from said gas orifice, an expanding mixing chamber located within said tube and mounted above said air ports and said gas orifice for mixing said air and gas together, said tube having an outlet port at the top of said mixing chamber for burning the mixed air and gas, a cap mounted above said tube and extending beyond the periphery thereof to cause a lateral deflection of the mixed air and gas and to protect said outlet port from entry of condensate from the combustion of the mixed air and gas and other extraneous matter, and a projection from said tube and extending to a region closely adjacent to the under side of said cap whereby a small opening is formed where the mixed air and gas will burn with a small flame which will ignite the gas around the entire periphery of the outlet port.

2. A gas burner which comprises a tubular gas inlet having an external thread at its lower end for connection with a gas supply, a polygonal shaped flange at an intermediate position thereof for a tool, threads located above the top of said flange, a cylindrical tube having threads at its lower end for union with the threads on the top of said gas inlet, an insert with a gas orifice positioned between the top of said gas inlet and the lower portion of said tube, a plurality of spaced air ports incorporated in said tube and located adjacent to said gas orifice for supplying air from the atmosphere for the gas issuing from said orifice, an expanding mixing chamber located within said tube and above said gas orifice for mixing said air and gas, and a cap mounted at the top of said tube and extending beyond the periphery thereof to provide a lateral port for burning said mixed air and gas and for protecting the mixing chamber of said tube against the entry of condensate from the combustion of said mixed air and gas and other extraneous matter, and a plurality of projections from the top of said tube and extending to a region adjacent to the under side of said cap whereby small openings are formed where the mixed air and gas will burn with a small flame which will ignite the gas around the entire periphery of the outlet port.

3. A gas burner which comprises an inlet for gas, a tube having an air inlet port adapted to deliver air from the atmosphere to gas coming from said gas inlet, a mixing chamber located within said tube for said gas and air, an outlet port at the top of said tube for said mixed air and gas, a cap mounted over said outlet port to cause a lateral deflection of said mixed air and gas and to protect said outlet port from entry of condensation products from the combustion of mixed air and gas and the like, and a projection from said tube and extending to a region closely adjacent to the under side of said cap whereby a small opening is formed where the mixed air and gas will burn with a small flame which will ignite the gas around the entire periphery of the outlet port.

4. A gas burner which comprises an inlet for gas, an insert having a small gas orifice connected to said gas inlet, a tube having an air port associated with said gas orifice for supplying air from the atmosphere to gas issuing from said orifice and having a mixing chamber located above said air port and gas orifice for mixing air and gas together, an outlet port at top of said tube and arranged at the end of said mixing chamber for the burning of said mixed air and gas, a cap mounted over said outlet port and arranged to cause a lateral deflection of said mixed air and gas and to protect said outlet port from entry of condensate from the combustion of mixed air and gas and other extraneous matter, and a projection from said tube and extending to a region closely adjacent to the under side of said cap whereby a small opening is formed where the mixed air and gas will burn with a small flame which will ignite the gas around the entire periphery of the outlet port.

5. A gas burner which comprises a tubular inlet for gas, an insert having a small gas orifice connected to said gas inlet, a tube having a plurality of spaced air ports associated with said gas orifice for supplying air from the atmosphere to gas issuing from said gas orifice and having an expanding mixing chamber mounted above said air ports and said gas orifice for mixing said air and gas together, an outlet port located in said tube at the top of said mixing chamber for burning the mixed air and gas, a cap mounted above said outlet port and extending beyond the periphery thereof to cause a lateral deflection of the mixed air and gas and to protect said outlet port from entry of condensate from the combustion of the mixed air and gas and other extraneous matter, and a projection from said tube and extending to a region closely adjacent to the under side of said cap whereby a small opening is formed where the mixed air and gas will burn with a small flame which will ignite the gas

around the entire periphery of the outlet port.

6. A gas burner which comprises a tubular inlet for gas, an insert having a small gas orifice connected to said gas inlet, a tube having a plurality of spaced circular air ports associated with said gas orifice for supplying air from the atmosphere to gas issuing from said gas orifice, said air ports being inclined upwardly towards the mouth of said gas orifice, said tube having a conical mixing chamber mounted above said air ports and said gas orifice for mixing said air and gas together and having an outlet port at the top of said mixing chamber for burning the mixed air and gas, a cap mounted above said outlet port and extending beyond the periphery thereof to cause a lateral deflection of the mixed air and gas and to protect said outlet port from entry of condensate from the combustion of the mixed air and gas and other extraneous matter, and a plurality of projections from the top of said tube and extending to a region adjacent to the under side of said cap whereby small openings are formed where the mixed air and gas will burn with a small flame which will ignite the gas around the entire periphery of the outlet port.

7. A gas burner which comprises a tubular inlet for gas, an insert having a small gas orifice connected to said gas inlet, a tube having a plurality of spaced air ports associated with said gas orifice for supplying air from the atmosphere to gas issuing from said gas orifice and having an expanding mixing chamber mounted above said air ports and said gas orifice for mixing said air and gas together, an outlet port at the top of said tube for burning the mixed air and gas, a plurality of vanes positioned within said tube and adjacent to said outlet port for dividing the stream of mixed air and gas, a cap mounted above said outlet port and extending beyond the periphery thereof to cause a lateral deflection of the mixed air and gas and to protect said outlet port from entry of condensation from the combustion of the mixed air and gas and other extraneous matter, and a plurality of projections from the top of said tube and extending to a region adjacent to the under side of said cap whereby small openings are formed where the mixed air and gas will burn with a small flame which will ignite the gas around the entire periphery of the outlet port.

8. A gas burner which comprises a tubular gas inlet having an external thread at its lower end for connection with a gas supply, a polygonal-shaped flange at an intermediate position thereof for a tool, and threads located above the top of said flange, a cylindrical tube having threads at its lower end for union with the threads on the top of said gas inlet, an insert with a gas orifice positioned between the top of said gas inlet and the lower portion of said tube, a plurality of spaced air ports incorporated in said tube and located adjacent to said gas orifice for supplying air from the atmosphere for the gas issuing from said orifice, an expanding mixing chamber located within said tube and above said gas orifice for mixing said air and gas, a cap mounted at the top of said tube and extending beyond the periphery thereof to provide a lateral port for burning said mixed air and gas and for protecting the mixing chamber of said tube against the entry of condensate from the combustion of said mixed air and gas and other extraneous matter, and a plurality of projections from the top of said tube and extending to a region adjacent to the under side of said cap whereby small openings are formed where the mixed air and gas will burn with a small flame which will ignite the gas around the entire periphery of the outlet port.

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