

[54] BURNER HEADS OF LIQUEFIED FUEL GAS LIGHTERS

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[58] Field of Search 431/354, 355; 239/419.5

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[57]

ABSTRACT

In a lighter fueled by liquified gas there is less danger of injury or damage to property when the flame is visible. If the gas is mixed with a relatively large amount of air the flame, though stable in air currents, is blue and invisible or almost so, whereas if there is little or no air mixed with the gas the flame is a visible yellow but relatively unstable. In a lighter formed according to the invention a burner is formed with two concentric upright tubes the outer of which surrounds a gas nozzle from the gas reservoir and the inner of which is coaxial with the nozzle but located a little thereabove. Air admitting apertures are provided at the lower end of the outer tube. Gas from the nozzle through the central tube mixes with little or no air and gives a central yellow flame, whilst gas passing between the tubes mixes with the air to give a blue flame surrounding and protecting the yellow flame.

4 Claims, 2 Drawing Figures

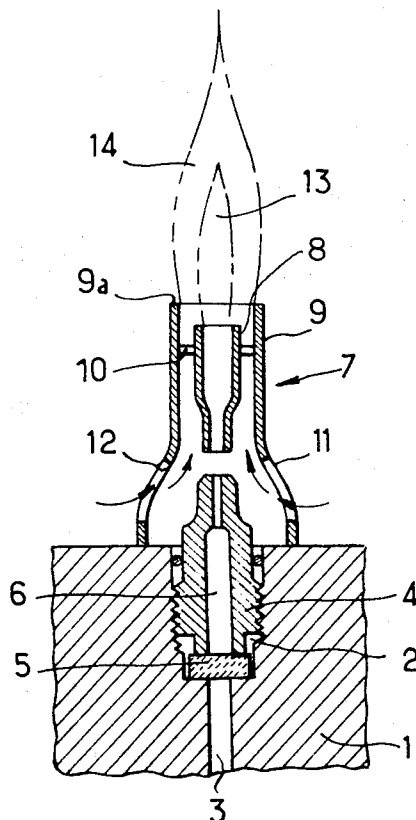


FIG. 1

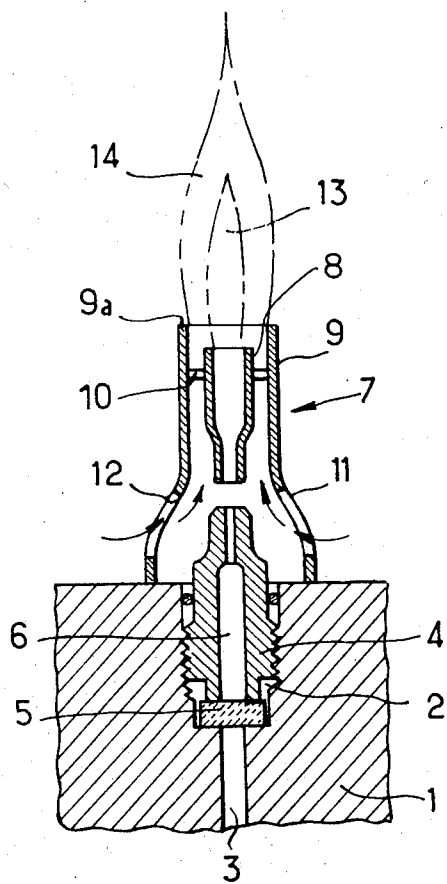
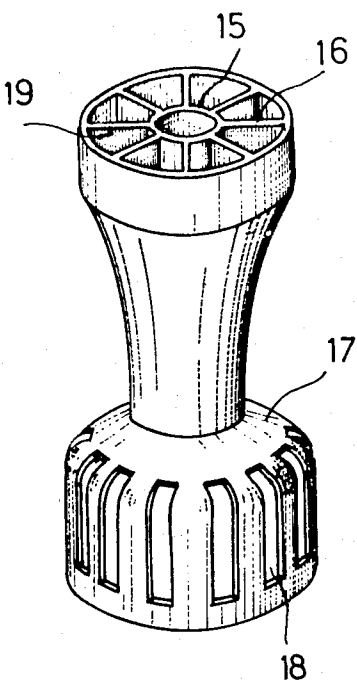


FIG. 2



BURNER HEADS OF LIQUEFIED FUEL GAS LIGHTERS

The invention relates to burner heads of liquified fuel gas lighters.

Gas lighters comprise a fluid-tight reservoir for the liquified fuel gas, a supply channel connecting said reservoir to a burner head, provided with a closure member, by the intermediary of a pressure-reducer and a lighting mechanism in the vicinity whereof said burner head opens. Generally, the pressure reducer is constituted by a compressible porous pellet disposed in the vicinity of the lower end of the burner, between a stationary member and an adjustable moving member. The porous pellet is supplied with liquid fuel from the reservoir and this fuel evaporates when the closure member is opened, and it is the gas, produced in this way, which is ignited. The actuation of the moving member makes it possible to adjust the height of the flame. Thus, the pellet fulfils the function of an evaporator and also, with the capillary channel or channels passing through the burner, contributes to limiting the supply of gas while reducing its rate of flow.

It is desired to obtain from such a lighter a so-called diffusion flame, which is made luminous by the carbon particles which are consumed therein. This luminous flame is desired for two reasons: familiarity of the users with a yellow flame and the safety problems which could result with a barely visible blue flame.

To obtain a luminous flame, it is sufficient that it contains little combustive air. Therefore, it is sufficient to prevent any air from entering the circuit between the pressure reducer and the aperture of the burner, and to discharge the gas through this aperture, the diameter of which is of the order of a millimetre, at a pressure which is sufficiently low to have a restricted jet. This technique is well known and is applied in all conventional gas lighters.

However, the diffusion flame has a serious drawback. It is very sensitive to air currents due to the fact that it is only stabilized at a single point, a point which is moreover cold. Various arrangements have been suggested to remedy this drawback, i.e., enclosing the flame, providing a coaxial rod in the bore of the burner, etc. None are completely satisfactory.

An object of the invention, is to provide a burner head by the use of which the stability of the luminous flame is obtained by "protecting" it by a ring formed by one or more blue flames i.e. formed by one or more flames resulting from a premixing of gas and air.

According to the invention, there is provided a burner head for a liquified gas lighter wherein the so called injection channel, which surmounts the pressure reducer, opens a short distance from the base of the head comprised by two concentric nozzles, the center nozzle and said injection channel being coaxial and having a diameter of the same order of magnitude.

With such an arrangement, the ambient air penetrates through the base of the head, it is partially forced outwards by the gas jet being discharged from the injection channel and the gas which penetrates the center nozzle contains little air whereas that which penetrates the outer nozzle contains much air. At the upper end of the head, a central diffusion flame is thus obtained, which is surrounded by a ring of blue flame resulting from premixing. This ring is not very sensitive to air currents: it is well stabilized and instantaneously re-

lights the central flame when the latter is extinguished.

Naturally, the outer nozzle may be radially partitioned, and to this effect its upper aperture may be partially closed by an annular washer provided with regularly or irregularly distributed perforations such that the blue ring is split into a plurality of individual flames, likewise, this outer nozzle may be stream-lined.

Advantageously, on the side of the burner aperture, the outer nozzle passes beyond the center nozzle so as to form a flame-guard ring.

The invention will now be further described with reference to the accompanying drawings showing two embodiments of the invention, by way of example.

In the drawings:

FIG. 1 is a diagrammatic section showing the arrangement of the burner head according to the invention with respect to the injection channel, and

FIG. 2 is a perspective view of the burner head according to a modification.

In FIG. 1 there is illustrated, a gas lighter which comprises a body 1 which has, at its upper part, a recess 2 communicating with a fuel reserve (not shown) by a supply channel 3. The recess 2 has an inner screw-threading and acts as a housing for a movable member 4 which is screwed into the housing. A compressible porous pellet 5 is interposed between the base of the housing 2 and the base of the member 4. An injection channel 6 passes axially throughout the moving length of member 4.

All these arrangements are known, the gas supply being regulated by more or less compressing the pellet 5 by screwing (or unscrewing) the member 4. A closure member, not shown, makes it possible to stop the gas supply at will.

A burner head 7 is mounted on body 1 and is constituted by two concentric nozzles 8 and 9, the outer nozzle 9 being connected to center nozzle 8 by cross-pieces 10 and to the body of the lighter by a collar 11. The collar 11 is provided with perforations 12 distributed over its entire periphery. The injection channel 6, the center nozzle 8 and consequently the whole arrangement of the burner head are coaxial, the collar 11 covering the upper end of the part 4 emerging from the housing 2.

Thus, the ambient air penetrates inside the burner head through the perforations 12, in the direction of the arrows indicated in FIG. 1. When the closure member is open, the gas supplied by the injection channel tends to force the air back towards the periphery and, hence a mixture containing little air enters the center nozzle 8, which mixture, which on lighting, results in a yellow diffusion flame 13. When the gas supply increases, a portion of this gas enters the outer nozzle 9 while carrying along a relatively large proportion of air and thus forming a mixture containing much air which results in a blue flame 14.

This blue flame 14 forms a ring around the yellow flame 13. By its nature, the blue flame is much less sensitive to wind than the yellow flame and, in addition, it is stabilized over a greater surface: thus it resists air currents and relights the flame 13 each time it is necessary.

Thus the whole flame is completely visible due to the yellow flame 13 and is not extinguished due to the blue flame 14.

Preferably the upper edge 9a of the outer nozzle 9 extends beyond that of the center nozzle 8 so as to constitute a flame guard which increases the stability of the flame.

Naturally, the general shape of the burner head and particularly that of the outer nozzle may notably vary. Likewise, the outer nozzle may be radially partitioned, as shown in FIG. 2 where there is shown a head comprising a center nozzle 15, an outer nozzle 16 and collar 17 provided with perforations 18. Here, the centre nozzle is connected to the outer nozzle by a plurality of radial partitions 19 which split the blue flame into a plurality of individual flames at their base. These flames join at a level which increases in height as the partitions 19 increase in thickness.

The two nozzles may even be made integral by a circular ring connecting their upper edges and comprising a plurality of perforations. The yellow flame is then surrounded by a plurality of blue flames which are more or less adjacent.

What is claimed is:

1. A burner head for a liquified fuel gas lighter, comprising an injection channel for supply of gas to be burned, two concentric spaced nozzles mounted coaxially with said injection channel and having upper and lower edges, one nozzle being a center nozzle, the other

an outer nozzle, said injection channel opening at a short distance from the lower edge of the center nozzle, said outer nozzle including a collar having air inlets for supply of ambient air to the nozzles, the upper edge of the outer nozzle being substantially at the same level as the upper edge of the center nozzle whereby there is formed between the inner and outer nozzles a passage-way for air and gas said injection channel and nozzles constituting a means for feeding a first part of the gas into the central nozzle and a second part into the outer nozzle to produce a stabilized blue flame at the outlet of said passage whereas at the center nozzle there is produced a visible yellow flame from a gas-enriched gas-air mixture.

2. A burner head according to claim 1 comprising partitions interconnecting said two nozzles, said partitions extending radially into the space separating said nozzles.

3. A burner head according to claim 1 comprising means at the outlet of the outer nozzle having a plurality of openings and forming a rigid connection between the two nozzles.

4. A burner head according to claim 1 wherein said upper edge of the outer nozzle extends slightly beyond the upper edge of the center nozzle.

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