May 2, 1933. P. M. FORSTER 1,906,257

GAS BURNER

Filed Oct. 22, 1930

Fig. 1.

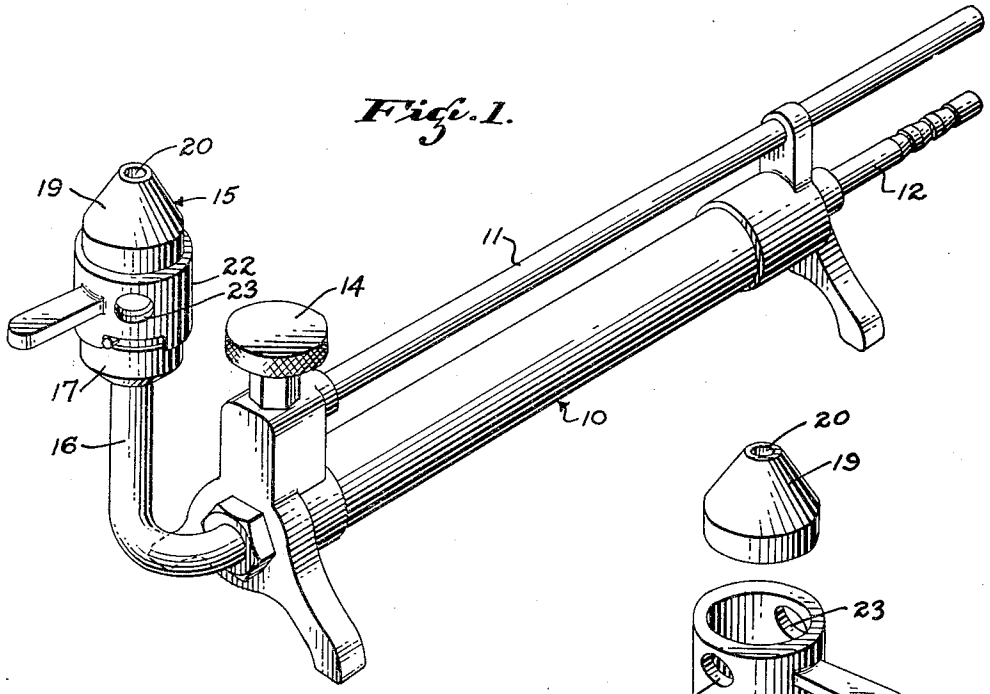


Fig. 3.

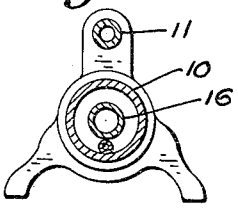


Fig. 4.

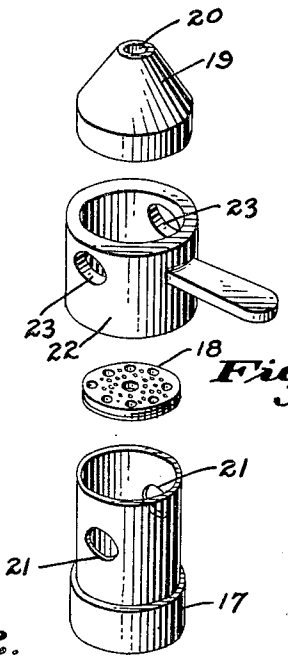


Fig. 2.

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UNITED STATES PATENT OFFICE

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GAS BURNER

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This invention relates to gas burners or torches and particularly pertains to a burner nozzle therefor.

It is the principal object of the present invention to provide a generally improved tip or nozzle for gas burners or torches which is so constructed that the gaseous mixture may be ejected at high velocity but which will maintain the velocity of propagation of the flame greater than the velocity of the mixture so that a flame of intense heat will be created which cannot be easily blown out.

In carrying the invention into practice, the gas burner includes a nozzle having a restricted orifice and a pair of ports which may be opened and closed. The ports are opened when it is desired to use the burner in order to reduce the gas velocity until the flame becomes of a temperature that its velocity of propagation will exceed the velocity of the gas through the orifice. When the latter condition exists, the ports are closed and a flame of intense heat will emanate from the orifice.

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

Fig. 1 is a perspective view of a burner fitted with a nozzle embodying the preferred form of my invention.

Fig. 2 is a central longitudinal section through the burner and nozzle.

Fig. 3 is a vertical section through the burner taken on line III—III of Fig. 2.

Fig. 4 is a perspective view of the various parts of the nozzle shown in disassembled condition.

Referring more particularly to the accompanying drawing, 10 indicates a burner or torch utilizing natural gas as a fuel basis. This burner or torch includes a casing into which natural gas and air under pressure are delivered through separate tubes 11 and 12. The flow of the gas into the casing is controlled by an adjustable needle valve 14 as illustrated. A burner nozzle 15 is provided which is connected to the casing through the medium of a tube 16. One end of this tube extends coaxially through one end of the casing to a point short of the opposite end of the casing as most clearly shown in Fig. 2.

It will be noticed that the air and gas are delivered to a point within the casing at the end thereof opposite the end of the tube 16 which extends within the casing. Therefore, the flow of natural gas and air is caused to reverse after entering the casing before entering the tube 16 for delivery to the nozzle 15. This insures mixture of the air and gas so that proper combustion will take place at the burner. This feature is described and claimed in my copending application entitled Torch, filed November 26, 1929, serial number 409,837, which has resulted in Patent #1,782,872, issued November 25, 1930.

The burner nozzle 15 comprises a cup 17 having a tapped opening formed coaxially in its bottom by means of which it is threaded on to the outer end of the tube 16. The cup 17 is formed with an interior shoulder intermediate its ends upon which a perforated baffle plate 18 is secured. This baffle plate is for the purpose of insuring thorough mixture of the air and gas passing to the tip.

The upper end of the cup 17 is exteriorly threaded to receive a frusto-conical tip 19 which is formed with a restricted orifice 20 which communicates at its inner end with an enlarged conical bore 20*a* communicating with the interior of the cup 17.

Intermediate the tip 19 and the baffle plate 18, the cup 17 is formed with two diametrically opposed circular ports 21. A sleeve valve 22 is rotatably mounted on the exterior of the cup and collared in position by the lower end of the tip 19 and an exterior annular shoulder on the cup 17. This sleeve valve 22 is formed with ports 23 which are adapted to be placed into and out of register with the

ports 21 in the cup 17 upon rotation of the sleeve valve.

In operation of the burner, the sleeve valve is positioned with the ports 21 and 23 in register and the gas and air are then delivered to the casing and the mixture emanating from the orifice 20 is ignited. The flame will, of course, emanate through the ports and through the orifice. The air supply is then increased until the orifice flame blows out. This blowing out of the flame is due to the fact that the flame is of low temperature and its velocity of propagation is not greater than the velocity of the mixture passing through the orifice. Thus, by leaving the ports open the velocity of the mixture emanating through the ports is reduced to less than the velocity of propagation of the flame. This enables maintenance of the flame until the temperature of the latter comes within the critical condition for continuous burning through the orifice. When this stage is reached, the sleeve valve is rotated to place the ports 23 out of register with the ports 21 and the flame will emanate through the orifice 20. As the flame will have at this time reached a temperature where the velocity of propagation is greater than the velocity of the mixture through the orifice, a constant intense flame will emanate from the orifice. Due to the relative velocities, the flame cannot be easily blown out.

By adjusting the gas flow relative to the air flow, a flame of maximum temperature is obtained. Therefore, the air is first adjusted to obtain proper velocity at the tip and thereafter the gas is regulated to obtain a flame of maximum temperature.

From the foregoing it is obvious that I have provided a gas burner nozzle by means of which a flame of high temperature can be obtained from the use of natural gas 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 gas burner of the character described comprising a hollow burner head, an inlet for combustible gas at one end thereof, a restricted burner orifice at the opposite end thereof, said burner head having ports intermediate its ends, means for closing said ports, and a flame baffle in the burner head between said ports and the gas inlet, said ports being positioned relatively close to said burner orifice whereby closing of said ports when gas escaping through them is burning will result in the flame therefrom igniting gas escaping through the burner orifice.

2. A gas burner of the character described comprising a hollow burner head, an inlet for combustible gas adjacent one end thereof, a burner orifice adjacent the opposite end thereof, said burner head having ports intermediate said inlet and said orifice, means for closing said ports, and a flame baffle in the burner head between said ports and the gas inlet, said ports being positioned relatively close to said burner orifice whereby closing of the ports when gas escaping through them is burning will result in the flame therefrom igniting gas escaping through the burner orifice.

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