May 8, 1934. W. L. HAGER 1,957,587

GAS BURNER

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Fig. 1.

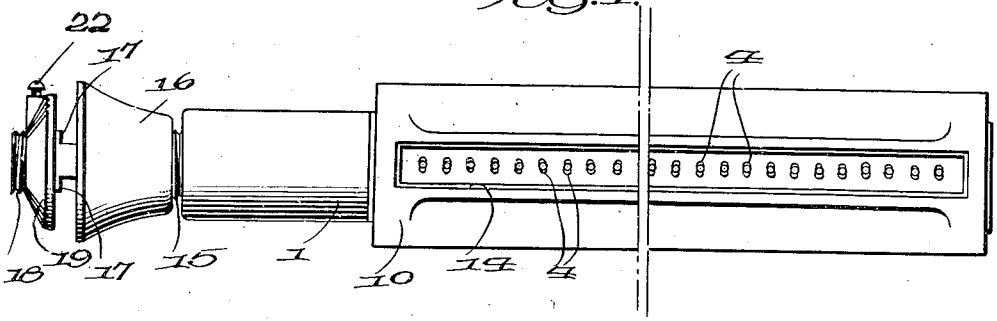


Fig. 2.

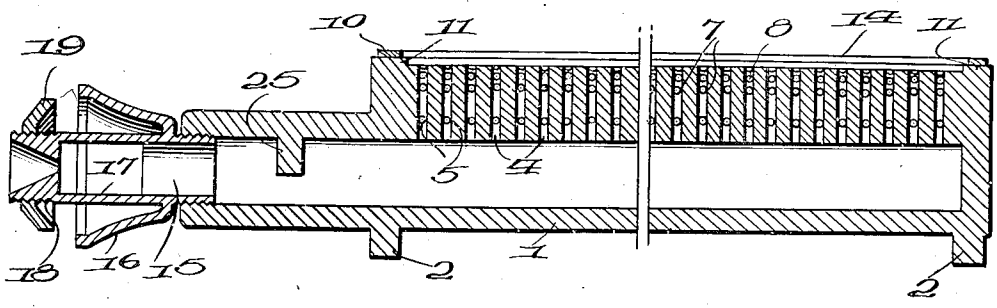


Fig. 3.

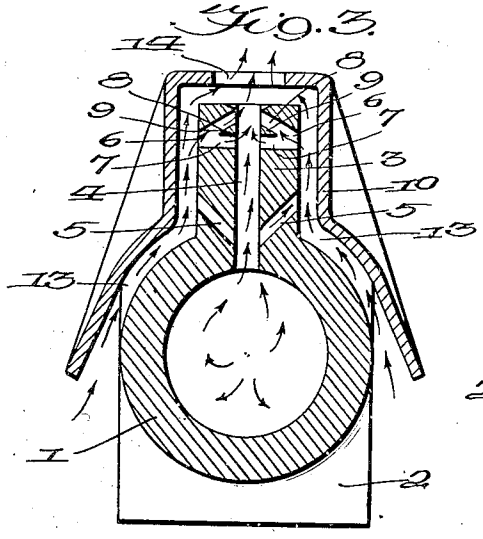


Fig. 4.

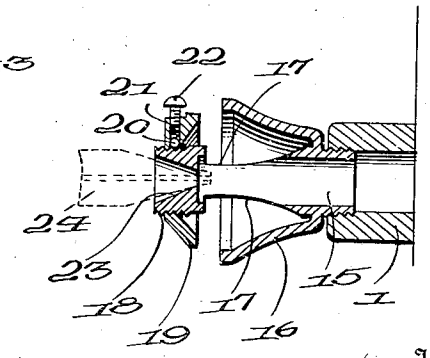
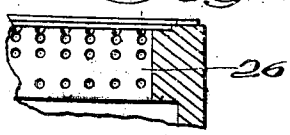


Fig. 5.



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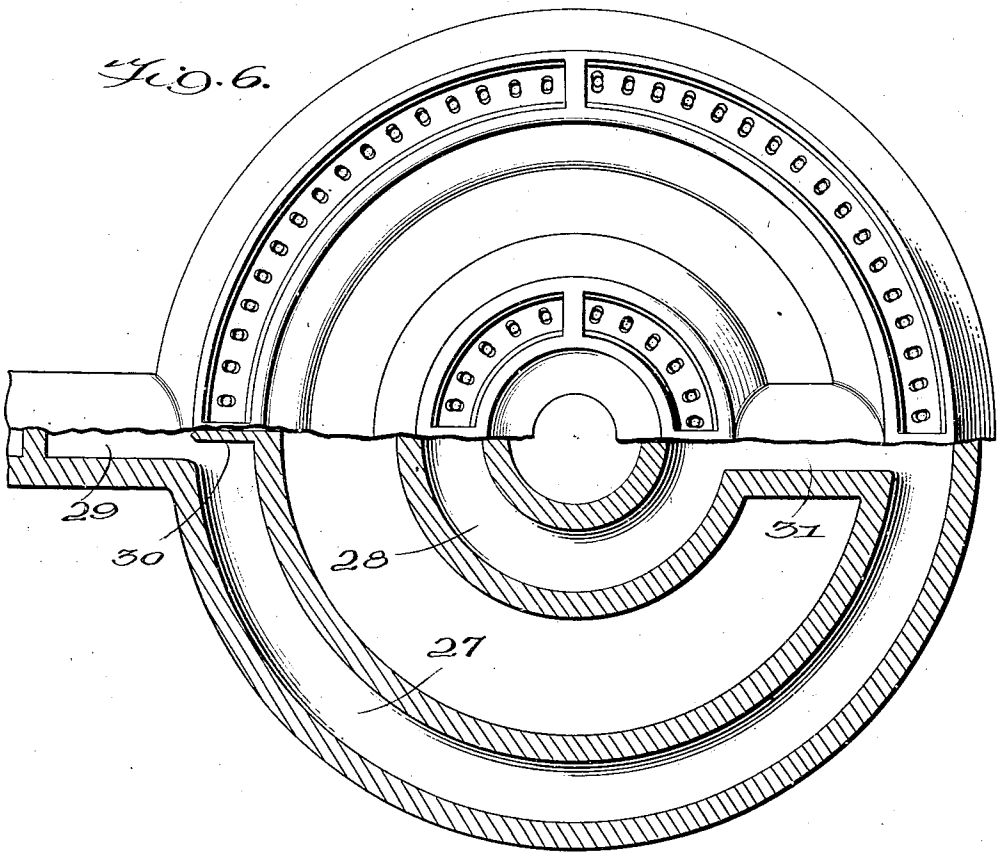
his Attorney

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Fig. 6.



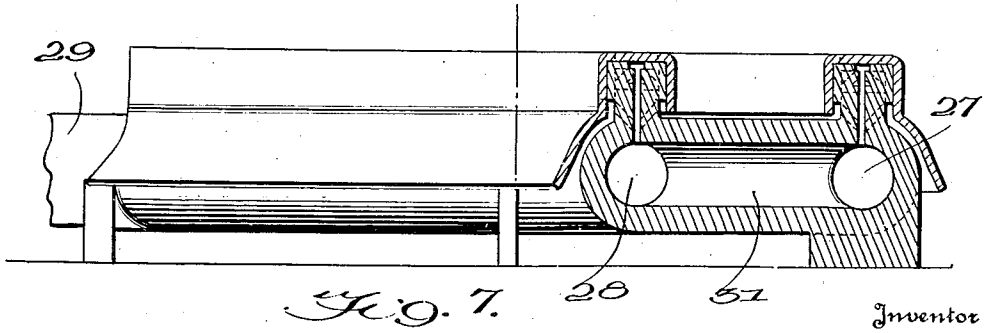


Fig. 7.

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Patented May 8, 1934 1,957,587

UNITED STATES PATENT OFFICE

1,957,587

GAS BURNER

William Louis Hager, Ogden, Utah

Application March 5, 1932, Serial No. 597,071

9 Claims. (Cl. 158—104)

This invention relates to an improvement in gas burners.

The object of the invention is to provide an improved gas burner which will more readily effect a combustion of the gas at the outlet thereof from the burner. To accomplish this, flames are created which heat the inner wall of a shield and afford a means of heating air which arises and passes toward the point of the flame. Two heated air currents are created on opposite sides of the shield which strike the gas arising from the gas burner at different angles and afford a mixture of gas and air before the gas reaches the point of flame thus pre-heating the gas. Orifices are provided at different angles in the sides of the gas burner, communicating with the gas outlet thereof, the lowermost passages creating small gas flames at the sides of the burner to pre-heat the passages of air both inside and outside the shield and additional passages are provided near the top of the burner to permit the thus heated air to flow into the main gas orifice and pre-heat the gas at a point below the point of combustion.

In the accompanying drawings:

Fig. 1 is a top plan view of a gas burner showing my improvements applied.

Fig. 2 is a longitudinal sectional view therethrough.

Fig. 3 is a slightly enlarged transverse sectional view through the burner.

Fig. 4 is a detailed sectional view through the main air inlet of the burner.

Fig. 5 is a detailed sectional view of a portion of a burner showing a slot instead of main orifices for the discharge of the gas.

Fig. 6 is a top plan view partly in section showing the invention applied to a round burner; and

Fig. 7 is a side elevation thereof partly in section.

Referring to the form of burner shown in Figs. 1, 2 and 3, the body portion thereof 1 is tubular in shape and is provided with supporting legs 2. The body portion 1 is provided with a neck 3 which in the form shown in Figs. 2 and 3 has a series of vertical orifices 4, extending upwardly therethrough and communicating at their lower ends with the body portion 1.

Extending laterally in opposite directions from the orifices 4 to the sides of the neck 3 are gas passage-ways 5 which communicate at their inner ends with the gas orifices 4 to divert to the sides of the neck small streams of gas to create air heating flames at the sides of the neck 3. These passage-ways 5 extend at oblique angles of approximately 45°.

Arranged along the opposite sides of the neck 3 at points above the passage-ways 5 are openings 6 from which horizontal air passage-ways 7 and oblique passage-ways 8 extend, these being divided by baffles 9 so as to create two currents of air leading inward through each of the openings 6.

These air passage-ways 7 and 8 communicate at their inner ends with the main gas orifices 4 near their upper ends so as to direct heated air into the gas streams at points below the points of combustion.

A shield 10 fits over the upper portion of the gas burner enclosing the neck 3 and sides of the body portion 1 as shown in Fig. 3. The shield 10 rests upon flanges 11 at the ends of the burner which hold it spaced from the sides of the neck and body portion, forming air channels 13 extending upwardly beside the neck and body portion and on the inside of the shield 10, communicating with the gas passage-ways 5 and the openings 6. A slot 14 is formed in the top of the shield 10 above the orifices 4 to permit combustion at the top of the burner.

The design of the burner is such that flames are created at the outer ends of the gas passage-ways 5 which heat the inner wall of the shield 10 and afford a means of heating the air which arises and passes toward the point of the flame. The openings 6 which communicate with the air channels 13 and have two air passage-ways 7 and 8 leading in from each of these openings 6 to the main gas orifice 4, are designed to create air currents leading to the gas arising from the tubular body portion toward the top of the burner and at different angles to afford a mixture of gas and heated air below the point of combustion which pre-heats the gas and facilitates ready combustion thereof. At the top of the neck 3 and along the sides of the neck the air channels 13 direct the air currents arising between the shield and the burner into the flame and gas orifices affording an additional source of air or combustion. These hot air currents are auxiliary to the normal cold air which enters the gas in the body portion of the burner.

The body portion 1 has an air inlet nozzle 15 connected therewith and provided with a flaring flange 16 for directing air into the nozzle 15 through slots 17 formed in the sides thereof. The outer end of the nozzle 15 is externally screw threaded as at 18 and receives an air regulator

19 which is screw threaded thereon to be moved toward or from the flange 16 and cooperating therewith to vary the air supply. A ball 20 is carried by the air regulator 19 in position to engage the screw threads 18 and tending to oppose a rotary movement of the regulator, a spring 21 acting on the ball and having its tension regulated by a screw 22 as shown in Fig. 4.

The outer end of the nozzle 15 is provided with a bevelled inlet 23 for receiving the end of the gas supply pipe 24 to direct the stream of gas into the center of the nozzle 15.

A baffle 25 extends downwardly in the body portion 1 in front of the inner end of the nozzle 15 to cause an intimate mixture of the air and gas entering the body portion through its outer end. This baffle sets up currents in the gas mixture which effect the inter-mixture of the air and gas. Without the baffle and the consequent currents set-up in the gas there would be a suction occasioned which would prevent the burner jets nearest the cold air inlet from working effectively as in some cases the currents would be reversed and air would be drawn down through the burner jets.

The main gas orifices 4 may be of any desired shape such as circular or ovoid or these orifices may be omitted and a slot provided in lieu thereof as shown in Fig. 5 in which the slot is designated by the numeral 26 which functions in the same manner, the slot being provided with the lateral gas and air passage-ways in the same manner as the gas orifices 4.

The burner may also be of any desired shape and need not be of the elongated type shown in Fig. 1 for it may be of other shapes such as round, as shown in Figs. 6 and 7 in which concentric gas channels 27 and 28 extend through the body portion and the channel 27 is provided with a gas inlet 29 and has a baffle 30 dividing the gas entering through the inlet to force it in both directions around the channel 27. The channels 27 and 28 communicate as at 31, the point of communication being disposed diametrically opposite the inlet 29 so as to assure a flow of gas to all points of the burner. Any number of circles may be provided as desired and depending upon the size of the burner and the amount of heat desired but each of these would be similar to the burner shown in section in Fig. 3 and provided with the air and gas passage-ways as above disclosed.

In these various forms, air is introduced into the gas before it reaches the point of combustion, first through the normal cold air inlets and second through the air passage-ways leading through the sides of the neck, one entering approximately horizontally from each side and the other at an oblique angle and causing, by reason of currents set up through the different angles, a more complete mixture of the gas with the air and a heating of the cold air and gas mixture entering from the main air inlet. The shield not only permits the super-heating of the gas and air but it also provides a current of air running between the top of the burner and the shield and striking the flame at the top of the burner approximately at right-angles so that there are really three air jets entering the gas approximately at the point of combustion and all of heated air striking the upwardly flowing gas mixture which assures a ready combustion of the gas and a hotter flame than is ordinarily obtained.

I claim:

1. A gas burner comprising a body portion having one or more gas orifices, an air passage-way leading laterally to each orifice from a side of the body portion for directing heated air into the gas, and a gas passage-way communicating with the orifice and extending laterally to the side of the burner below the air passage-way for heating the air which passes into the air passage-way.

2. A gas burner comprising a body portion having one or more gas orifices, an air passage-way leading laterally to each orifice from a side of the body portion for directing heated air into the gas, a gas passage-way communicating with the orifice and extending laterally to the side of the burner below the air passage-way for heating the air which passes into the air passage-way, and a shield extending over at least a portion of the burner and spaced from the sides thereof for directing the heated air into the gas or flame.

3. A gas burner comprising a tubular body portion having a neck attached thereto, said neck having one or more orifices arranged therethrough and communicating with the tubular body portion, a pair of laterally directed gas passage-ways leading in opposite directions through the neck from each orifice, and one or more air passage-ways leading laterally from the opposite sides of the neck to the orifice at a point above the gas passage-ways.

4. A gas burner comprising a tubular body portion having an upstanding neck attached thereto, said neck having one or more orifices extending therethrough from the tubular body portion, a pair of laterally directed gas passage-ways extending in opposite directions from each orifice to the surface of the neck, openings formed in the sides of the neck above the gas passage-ways and having air passage-ways leading therefrom inwardly to the orifice.

5. A gas burner comprising a tubular body portion having an upstanding neck attached thereto, said neck having one or more orifices extending therethrough from the tubular body portion, a pair of laterally directed gas passage-ways extending in opposite directions from each orifice to the surface of the neck, openings formed in the sides of the neck above the gas passage-ways and having air passage-ways leading therefrom inwardly to the orifice, said air passage-ways being arranged at different angles to the orifice and directing heated air to the gas passing therethrough.

6. A gas burner comprising a tubular body portion having an upstanding neck attached thereto, said neck having one or more orifices extending therethrough from the tubular body portion, a pair of laterally directed gas passage-ways extending in opposite directions from each orifice to the surface of the neck, openings formed in the sides of the neck above the gas passage-ways and having air passage-ways leading therefrom inwardly to the orifice, said air passage-ways being arranged at different angles relative to the orifice and directing heated air to the gas passing therethrough, and a shield extending about the neck and portions of the tubular body portion for directing heated air upward from the regions of the gas passage-ways to the air passage-ways.

7. A gas burner comprising a body portion having one or more gas orifices therefor, gas passage-ways extending laterally from each ori-

fice to the sides of the body portion, and a shield extending over at least a portion of the body portion and spaced therefrom for directing heated air upwardly from the regions of the gas passage-ways to the region of the point of combustion.

8. A gas burner comprising a tubular body portion having a neck attached thereto, said neck having one or more gas orifices extending outwardly therethrough from the tubular body portion and having laterally directed gas passage-ways extending from each orifice to the sides of the neck, and a shield extending about the neck and spaced therefrom and arranged to direct heated air from the regions of the ends of the gas passage-ways approximately to the outer end of each gas orifice.

9. A gas burner comprising a tubular body portion arranged in annular form and having co-axial passage-ways communicating at a side of the burner, and an inlet communicating with the outer passage-way only and approximately at the opposite side of the burner from the first mentioned communication.

WILLIAM LOUIS HAGER.