June 26, 1951 H. C. MUN 2,558,057

GAS BURNER HAVING PROPORTIONAL GAS AND AIR MIXER

Filed Sept. 27, 1947

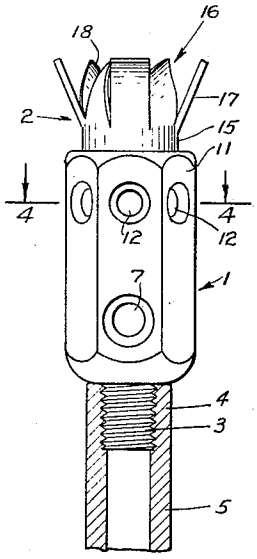



Fig. 1.

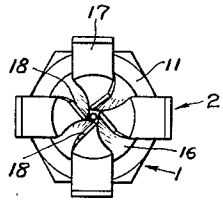



Fig. 3.

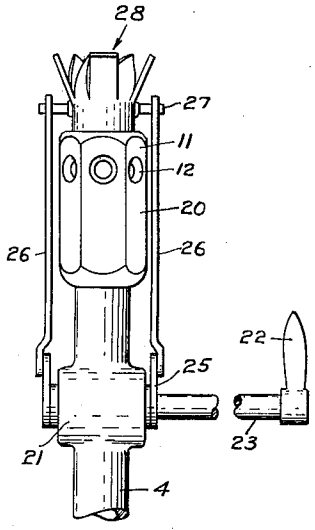



Fig. 5.

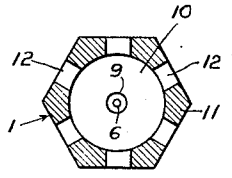



Fig. 4.

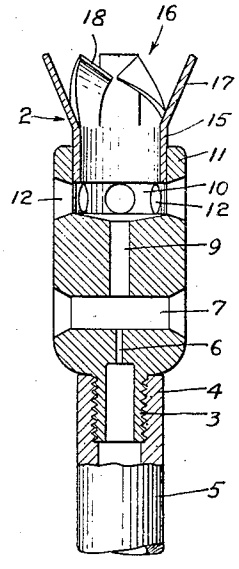



Fig. 2.

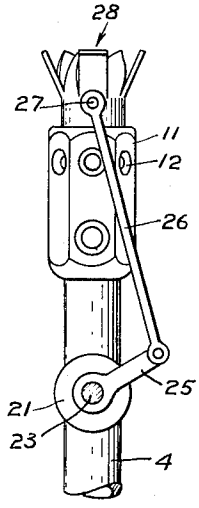



Fig. 6.

INVENTOR.
HENRY CHAN MUN
BY Alexander Riaboff
ATTORNEY

Patented June 26, 1951

2,558,057

# UNITED STATES PATENT OFFICE

2,558,057

## GAS BURNER HAVING PROPORTIONAL GAS AND AIR MIXER

Henry Chan Mun, Oakland, Calif.

Application September 27, 1947, Serial No. 776,582

3 Claims. (Cl. 158—99)

1

This invention relates to a gas burner.

The object of this invention is to provide a gas burner in which the gas is well mixed with air within the burner proper and the mixture is given a whirling motion by a special deflector which at the same time serves as a regulator of air to be admitted into the burner for mixing with the gas, and prevents the flash back when the gas is turned off.

Another object of this invention is to provide a vertical gas burner in which gas passing through said burner entrains air and the mixture is projected upwardly against a deflector at the top of said burner by means of which said mixture is thoroughly mixed by whirling motion, the amount of air in said mixture being regulated by the position of said deflector in relation to said burner.

Other objects and advantages will appear as the specification proceeds and the particular features of the invention will be specifically pointed out in the appended claims.

My invention is illustrated in the accompanying drawing in which:

Fig. 1 is a side view of the burner comprising the subject matter of the invention.

Fig. 2 is a vertical cross-section of the device taken along the center line thereof.

Fig. 3 is a top view of the device.

Fig. 4 is a section along the line 4—4 of the Fig. 1.

Fig. 5 is a front view of the modified form of my burner.

Fig. 6 is a side view of the burner shown in Fig. 5.

In detail, my gas burner consists of a body generally indicated by the numeral 1, and a deflector or outlet member 2.

The body 1 is preferably made out of a metal bar which may be hexagonal, round or of other shape in cross-section, and has an end 3 of reduced diameter, which end is externally threaded. The end 3 has screwed thereon an internally threaded end 4 of a gas pipe 5 by which gas at certain pressure is delivered to said burner.

The end 3 is hollow inside and has a centrally located bore 6 of a small diameter extending upwardly from said end 3. The bore 6 terminates in an opening 7 extending transversely in the lower part of said body 1 and passing through the vertical central axis thereof. The opening 7 is of a diameter much greater than the bore 6 and serves to bring air to the stream of gas passing through said bore.

A passage 9 is provided on the vertical central

2

axis of said burner, which passage is aligned with the bore 6 and extends from the opening 7 upwardly certain distance and leads to a chamber 10 arranged in the upper portion 11 of said body. The passage 9 is of considerably greater diameter than the bore 6 and serves to channel the greatly expanded stream of gas issuing from the bore 6, which gas is already mixed with the entrained air from the opening 7.

The chamber 10 is of considerably much greater diameter than the passage 9 and has a plurality of large apertures 12 arranged in its walls through which apertures a large amount of air is always delivered into the chamber 10.

The mixture of gas and air being forced by the pressure in the gas pipe 4 to pass rapidly through the passage 9 enters the chamber 10 wherein it further entrains a considerable amount of air delivered into said chamber through the apertures 12 and proceeds to travel upwardly.

The upper portion 11 of said body 1 carries the outlet member 2. The latter is preferably made out of a piece of a round tube 15 of the outside diameter big enough to fit slidably the inside diameter of the chamber 10.

The upper portion of said tube 15 is longitudinally split into a plurality of narrow strips 16, there being shown eight of such strips in the drawing. The strips 16 are arranged in a symmetrical pattern by bending every other strip 17 outwardly at an angle and by bending the rest of the strips 16 inwardly toward the center of said outlet member and twisting the outer ends thereof so that each of the tops 18 of said strips forms substantially a 45 degree angle with the central vertical planes passing through the middle of the strips 17.

The mixture of gas and air passes through the chamber 10, enters the outlet member 2 and on its way upwardly strikes the twisted deflecting strips 16 and is thereby given a whirling motion. The latter thoroughly mixes gas and air and for that reason the mixtures burn evenly and without forming and depositing carbon on the object placed above said burner. The mixture burns just beyond the strips 16.

The outlet member 2 in addition to the above described function also performs another one, to-wit: that of a regulator of the amount of air to be admitted into the chamber 10. The outlet member 2 is slidably retained in the chamber 10 and may be pushed downwardly so as to cover the apertures 12 in any desired degree and thereby to restrict the amount of air to be admitted into said chamber accordingly. By this

arrangement the amount of air admitted into the chamber 10 is regulated in accordance with the gas pressure in the gas pipe 4 and the chemical properties of the gas so as to produce a hottest flame burning cleanly and fully.

The Figures 5 and 6 show a further modification of my burner in which the numeral 20 indicates the body, which is in all respects identical with the body 1 of the previously described burner. The gas pipe 5 is shown as having a standard gas valve which may be opened or closed by a handle 22. The handle 22 is set on a shaft 23 which carries the core of the valve 21, which core closes or opens the valve in usual manner. An arm 25 is affixed to the shaft 23 on each side of the valve 21 to which arm is attached a link 26 by one end and the free end of which is swingably attached by pins 27 to the deflector 28 which is identical with the above described deflector 2.

The Figures 5 and 6 show the valve 21 as wide open and the outlet member 28 raised upwardly. If the valve 21 is partially closed by turning the handle 22 downwardly, the arms 26 will pull the outlet member 28 also downwardly, thus partially closing the apertures 12. By moving the handle 22 further downwardly, the amount of gas admitted into the burner is reduced, and in proportion thereto the amount of air admitted into the chamber 10 is also restricted, thus permitting to maintain the most economical proportion of gas delivered thereto.

If desired, a separate and independent manual control can be provided for regulating the flow of air into the chamber 10, by connecting the arms 25 to a separate shaft, or by any other means which may effect the upward and downward movement of the outlet member 2 in the chamber 10.

It shall also be noted that the flame burns above the outlet member 2 and, when the gas is turned off, is extinguished also above said outlet member, thus preventing the flash back inside of said burner.

Having thus described my invention, I claim:

1. A gas burner comprising a body having a small longitudinal bore in one end of said body, means for delivering gas to said bore, said bore terminating in a transverse hole of much greater diameter than said bore; said body having a passage of a diameter considerably greater than the bore and aligned therewith, said passage extending from said hole and terminating in a chamber provided in the other end of said body and having an open top; said body having a plurality of apertures in the body portion forming said chamber; a manually adjustable outlet member having a portion inserted into the open top of said chamber and frictionally retained therein, said portion being arranged to close or open said apertures,



said member having a further portion arranged to give whirling motion to the mixture of gas and air issuing from the chamber.

2. A gas burner comprising a comparatively short cylindrical body having a small central longitudinal bore in the lower end thereof; means for delivering gas under pressure to said bore; said bore terminating in a transverse hole of a much greater diameter than said bore so that gas passing through said hole entrains air therein; said body having a passage of a diameter considerably greater than the bore and aligned therewith, said passage extending from said hole and terminating in a chamber provided in the upper portion of said body and having an open top; the body portion forming said chamber having a plurality of apertures; a manually adjustable outlet member inserted into the open top of said chamber and frictionally retained therein, said member being arranged to close or open said apertures.

3. A gas burner comprising means for issuing a narrow stream of gas at a pressure into a comparatively narrow air space provided in said burner and communicating with the atmosphere wherein said gas stream entrains a certain amount of air; said burner having a passage through which said gas and entrained air travel from said air space into a chamber in the upper part of said burner, said chamber being open on the top, said upper part having a plurality of apertures for introducing air into said chamber, so that said gas and entrained air passing through said chamber receive additional amount of air necessary for complete combustion; a manually adjustable outlet member having a portion inserted into the open top of said chamber and frictionally retained therein, said portion being arranged to close or open said apertures, said member having a further portion arranged to give whirling motion to the mixture of gas and air issuing from the chamber.

HENRY CHAN MUN.


## REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

| Number | Name | Date |
|---|---|---|
| 541,212 | Pettibone | June 18, 1895 |
| 703,625 | Treen | July 1, 1902 |
| 740,750 | Free | Oct. 6, 1903 |
| 1,840,453 | Keith | Jan. 12, 1932 |

FOREIGN PATENTS

| Number | Country | Date |
|---|---|---|
| 224,431 | Germany | July 19, 1910 |
| 420,096 | France | Sept. 6, 1910 |