F. M. ASHLEY.

GAS BURNER.

APPLICATION FILED MAY 25, 1899.

1,035,517. Patented Aug. 13, 1912.

Fig. 1.

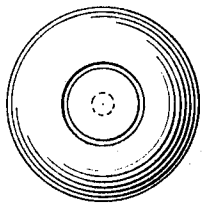


Fig. 2.

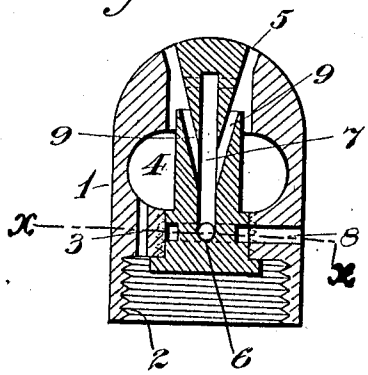


Fig. 3.

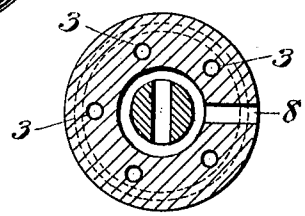


Fig. 4.

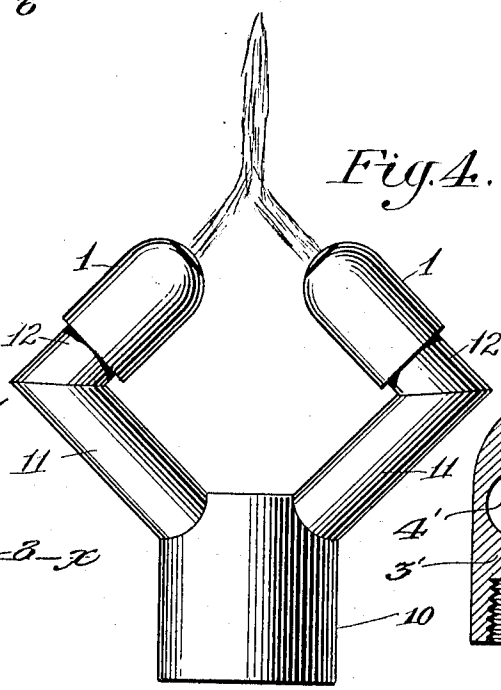


Fig. 5

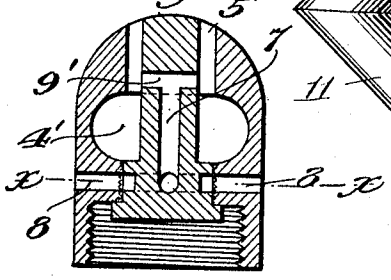
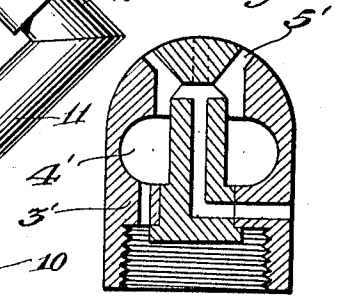


Fig. 6



WITNESSES:

Philip M. Buckler

Mudd Cooper

INVENTOR

Frank M. Ashley

BY C. V. Edwards.

ATTORNEY

UNITED STATES PATENT OFFICE.

FRANK M. ASHLEY, OF NEW YORK, N. Y.

GAS-BURNER.

1,035,517. Specification of Letters Patent. Patented Aug. 13, 1912.

Application filed May 25, 1899. Serial No. 718,239.

To all whom it may concern:

Be it known that I, FRANK M. ASHLEY, a citizen of the United States, residing at New York city, in the county of Kings and State of New York, have invented certain new and useful Improvements in Gas-Burners, of which the following is a full, clear, and exact specification.

This invention relates to gas burners, and has particular reference to burners used in the burning of acetylene gas, or other gases rich in hydro-carbons.

The object of the invention is to construct a burner which shall allow the gas burned therefrom to be completely consumed, and mix the gas with a suitable proportion of oxygen from the surrounding atmosphere, to give to the gas its maximum degree of strength.

The invention possesses various features of advantage, which will more fully appear hereinafter, and which will be pointed out in the claims.

I do not in this application claim the expansion chamber, referred to hereinafter, broadly, such chamber being described and claimed in my co-pending application for Patent No. 798,237.

In the accompanying drawings in which I have illustrated various forms which the invention may take in practice, Figure 1 is a top view of a burner tip constructed in accordance with the invention, Figs. 2 and 3 are respectively sectional, side and plan views of Fig. 1, Fig. 4 is a side view of two burner tips arranged to form a gas burner, Figs. 5 and 6 are sectional views of still further modifications.

Referring more particularly to the drawings, 1 represents a suitable body portion adapted to be connected with a suitable source of gas supply by means of a screw thread 2 or other suitable device, one or more passages 3, 3, lead from the source of gas supply to a suitable interior annular chamber 4, and from the latter chamber an annular passage 5 leads to the tip of the burner. The central core 6 is suitably connected with the body portion of the burner and extends upward therein to the top of the burner. An interior passage 7 is formed in the core 6, being closed at the top, and at the bottom connected with a passage 8 leading to the atmosphere. One or more passages 9, 9, diverge from the passage 7 upward and join the annular passage 5. The cross sectional capacities of the passages 8, 7, and 9, may, if desired, be made larger than that of the upper end of the passage 5, in order that the fullest opportunity may be given to the gas and air to combine as hereinafter noted.

The construction shown in Fig. 4 consists of a lower cylindrical part 10, provided at its upper end with diverging branches 11, and said branches are each provided with a projection 12, and inclined toward each other as shown. The ends of said projections are attached to the parts 1, which are constructed as set forth in the other figures of the drawings.

The parts 10—11— and 12, are hollow, and serve to carry the gas from a source of supply to the inlets 3 in the body portions 1. By this construction, the gas may be projected from each of said bodies 1, in such a manner as to unite said gases midway between them and somewhat above the same.

Since the construction of the body 1 is such that the gases issue therefrom in tubular form, the gases are projected together in said form and the streams unite and when ignited produce a single flame. By this construction I am able to mix sufficient air with the gas to burn the same without smoking, which has been a hard thing to accomplish when used with acetylene gas, especially in large burners where a considerable quantity was burned per minute.

In Figs. 5 and 6, the gas is led by a passage 3′ to the interior annular chamber 4′, substantially as shown in Fig. 2, and the air is drawn in through passages 8 in the side of the burner into the central passage 7, and thence by passages 9′ is led into the annular passage 5′.

Fig. 4 shows a burner comprising two end pieces or tips such as illustrated in Figs. 1 and 2, screwed on the tubular arms shown and inclined at an angle toward each other in such a manner that the gases from the tips will be united and form a single flame as will be easily understood.

In the operation of the burner the gas is ignited at the top, and its flow through the passage 3 through the annular chamber 4

and into the annular passage 5, induces the air to flow from the surrounding atmosphere through passages 8. The gas will expand in the annular chamber 4 and thereby provide for even pressure of the gas in the burner, irrespective of variation of pressures in the mains. The air being drawn in at the side of the burner away from contact with the flame, will under ordinary conditions be cool, and will not increase the heat of the flame.

Having thus described my invention, I declare that what I claim as new, and desire to secure by Letters Patent, is—

1. A gas burner comprising a construction containing an annular gas expansion chamber, one or more gas passages between said chamber and a source of gas supply, an annular passage above said expansion chamber forming a gas and air mixing chamber leading directly upwardly from said expansion chamber and terminating in an annular discharge orifice which opens into the atmosphere, and a passage for air leading from the atmosphere, from a point near the bottom of the burner, upwardly to the inner side of said annular passage, at a point above the inlet of the gas thereto.

2. A gas burner comprising a construction containing an annular gas expansion chamber, an annular gas passage communicating with said chamber and leading directly therefrom upwardly to the atmosphere, a gas inlet communicating with said annular chamber, and an air passage leading from the side of the burner and adapted to lead the air under atmospheric pressure only from without the burner to the inner side of the annular gas passage, at a point above the inlet of the gas thereto.

3. A gas burner comprising a construction containing a gas expansion chamber, an annular passage forming a gas and air mixing chamber placed above and communicating with said expansion chamber and leading directly and upwardly from said chamber to the atmosphere, a gas inlet communicating with said expansion chamber, an axial air passage arranged within the annular passage, having diverging passages opening into the annular passage at a point above the inlet of the gas thereto, while the other end of said air passage communicates freely with the atmosphere.

4. A gas burner composed of two parts consisting of a body portion and an inner portion, an annular gas expansion chamber formed between the two parts, an annular passage forming a gas and air mixing chamber located above and in open communication with the said chamber and leading in a constantly upward direction therefrom directly to the atmosphere, and an air passage communicating with the atmosphere at one of its ends, and at its other end also with the annular passage at a point above the inlet of the gas thereto.

5. A gas burner composed of two parts comprising a body portion and an inner portion, an annular gas expanding chamber formed between the said parts, an annular passage forming a gas and air mixing chamber, communicating with the said expanding chamber and leading therefrom directly and upwardly to the atmosphere, a gas inlet, and an air passage formed within the said inner portion, communicating with the atmosphere at one end, and also having diverging passages opening into the said annular passage at a point above the inlet of the gas thereto.

6. A gas burner formed in two portions, a body portion, and an inner portion, a gas expansion chamber formed by and between the said portions, a gas inlet formed in the body portion and leading into said expansion chamber, an air inlet formed in said body portion leading from the atmosphere to and upwardly through the said inner portion, an annular passage formed by and between the said body and inner portion, the said air inlet discharging into the said passage above the inlet of gas thereto, the structure having an annular outlet leading from said annular passage and through which the combined air and gas may flow.

7. A gas burner comprising a construction containing a gas expansion chamber, an annular passage forming a gas and air mixing chamber, communicating with said expansion chamber and leading directly and upwardly therefrom to the atmosphere and forming an annular outlet adapted to discharge the air and gas in tubular form, a gas inlet for said chamber, and an air passage communicating with the atmosphere at one end and having diverging passages also opening into the annular passage at a point above the inlet of the gas thereto.

8. A gas burner comprising a construction containing a gas expansion chamber, an annular elongated passage forming a gas and air mixing chamber, opening out of the said expansion chamber and leading directly and upwardly therefrom and terminating in a flaring circular outlet adapted to discharge mixed gases in tubular form, a gas inlet opening into the said expansion chamber, and an air passage communicating with the atmosphere at one end and having diverging passages into the said annular passage at a point above the inlet of the gas thereto.

9. A gas burner comprising a construction containing an annular gas expansion chamber, a gas inlet opening into said chamber, an elongated annular passage forming a gas and air mixing chamber opening out of the expansion chamber and leading therefrom directly and upwardly so as to form an annular outlet through which the mixed air

and gas may flow in tubular form, an air passage communicating with the atmosphere and having diverging passages opening into the said annular passage at a point above the inlet of the gas therein.

10. A gas burner formed in two portions, one of which is a surrounding body portion, the other an inner portion forming a core for said body portion and passing longitudinally therethrough, an annular gas expansion chamber and an annular gas passage formed between the walls of said body and inner portions, a gas inlet leading to said expansion chamber, an air passage leading from the atmosphere to, and through the inner portion to the annular gas passage where it discharges the air at a point above the gas inlet thereto, and an annular outlet from the gas passage to the atmosphere.

11. A gas burner, formed in two portions, one of which forms an outer, containing body portion, the other an inner core portion passing longitudinally through said body portion, an annular gas expansion chamber, and an annular gas passage, formed between the walls of said two portions, a gas inlet is said body portion opening into said expansion chamber, an air passage leading to the said inner portion and continued therein and therethrough to the annular gas passage into which it discharges at a point above the gas inlet thereto, and a flaring outlet from the said gas passage to the atmosphere.

12. A gas burner, formed in two portions, one of which forms an outer containing body portion, the other an inner core portion passing longitudinally through said body portion, an annular gas expansion chamber and an annular gas passage formed between the walls of the two portions, a gas inlet leading through said body portion to the said expansion chamber, an air passage from a point near the bottom of the burner leading through said body and inner portions to said gas passage and discharging therein above the said expansion chamber and above the gas inlet to said gas passage, and an outlet from the gas passage to the atmosphere capable of discharging gases in tubular form.

13. A gas burner, formed in two portions, one of which forms an outer containing body portion, the other an inner core portion passing longitudinally through said body portion, an annular gas expansion chamber and an annular gas passage formed between the walls of the two portions, a gas inlet through said body portion to said expansion chamber, an axial air passage from a point near the bottom of the burner through said body and inner portions to the annular gas passage into which it is adapted to discharge the air at an angle with relation to the flow of gas therethrough, and a flaring outlet from said gas passage to the atmosphere.

14. A gas burner formed in two portions, an outer containing body portion and an inner core portion passing longitudinally through the outer portion, an annular gas expansion chamber and an annular gas passage formed between the walls of the said portions, a gas inlet formed in said body portion and leading to said expansion chamber, an air passage open to the atmosphere, at a point near the bottom of the burner, leading through said body and inner portions to said gas passage into which it discharges above said gas expansion chamber at a point above the gas inlet to said gas passage, and at an angle to the flow of gas therethrough, a mixing chamber formed by the union of the air and gas passages in the upper part of the burner, and a flaring annular discharge outlet from said gas passage to the atmosphere.

15. A gas burner formed in two portions, an outer containing body portion and an inner core portion passing longitudinally through the outer portion, an annular gas expansion chamber and an annular gas passage formed between the walls of the said portions, an air passage entering the body portion above but near the bottom thereof and passing through said body and inner portions discharging into the said gas passage at an angle to the flow of gas therethrough at a point above the gas inlet thereto but at a considerable distance from the outlet therefrom, thereby forming a mixing chamber in which the gases are intimately mixed before ignition, and a flaring annular outlet from said gas passage to the atmosphere into which the said gases are discharged in tubular form.

16. A gas burner formed in two portions, an outer containing body portion and an inner core portion passing longitudinally through the body portion, an annular gas expansion chamber and an annular gas passage formed between the walls of the said portions, a gas inlet leading to said expansion chamber, and an axial air passage in said core portion communicating with the atmosphere through a suitable inlet and having diverging passages communicating with the said gas passage at a point above the gas inlet thereto, the said diverging passages being disposed at an angle to the axis of the said gas passage, and an annular discharge outlet from the gas passage to the atmosphere.

17. A gas burner formed in two portions, a body portion and an inner core portion, an annular gas expansion chamber and an elongated annular gas passage formed between the walls of said portions, a gas inlet communicating with said expansion chamber, an axial air passage communicating

with the atmosphere through a suitable inlet and having diverging passages opening into said gas passage at a point above the gas inlet thereto and disposed at an angle to the axis of the gas passage, the upper part of said elongated gas passage forming a mixing chamber in which the gases may be intimately mixed before ignition, and a discharge outlet from said gas passage to the atmosphere.

In testimony whereof I affix my signature, in presence of two witnesses.

FRANK M. ASHLEY.

Witnesses:

PHILIP H. BUCKLER,

ALEX FERGUSON.