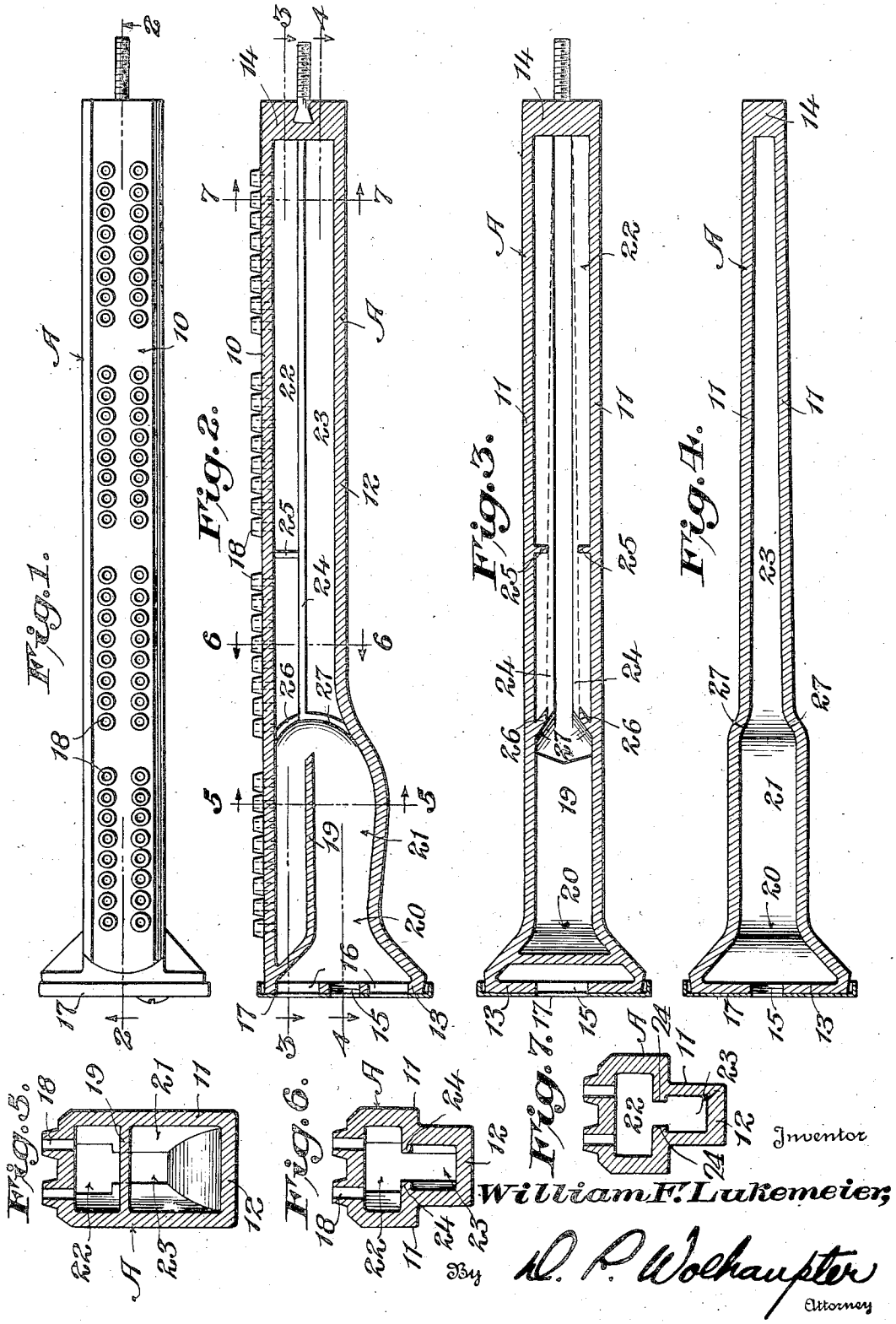
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GASEOUS FUEL BURNER

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GASEOUS FUEL BURNER

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This invention relates to gaseous fuel burners, and has generally in view to provide a gaseous fuel burner which is cheap and easy to produce, which is strong and durable, which is exceptionally simple in design and yet highly efficient in operation, and which includes means whereby substantially equal amounts of combustible fluid are supplied to the different burner tips thereof so that all of the tips burn substantially uniformly.

According to one practical and preferred embodiment of the invention the burner body is of narrow, elongated form having burner tips distributed substantially throughout the length thereof, and its design is such as to have a combustible fluid supplied thereto through one end thereof. In this connection a special object of the invention is to provide means not only to prevent air being drawn into the burner body through the burner tips adjacent to the inlet end of the body by the inflowing combustible fluid, but to assure that the combustible fluid shall be supplied to such tips, and all of the other tips, substantially uniformly.

According to a preferred embodiment of the invention, the burner body is provided at its inlet end with means for the supply of gas and air thereto for inter-mixture to form the combustible fluid, and in this connection another special object of the invention is to so form the burner body adjacent to its inlet end as to assure an intimate intermixture of the gas and air and a desired distribution of the mixture to the different portions of the burner body.

With the foregoing and other objects in view, which will become more fully apparent as the nature of the invention is better understood, the same consists in the novel features of construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawing and defined in the appended claims.

In the drawing, wherein like characters of reference denote corresponding parts in the different views:—

Figure 1 is a top plan view of a burner embodying the features of the invention.

Figure 2 is a central, vertical, longitudinal section through the burner on the line 2—2 of Fig. 1.

Figure 3 is a horizontal section through the burner taken approximately on the line 3—3 of Fig. 2.

Figure 4 is a horizontal section through the burner taken approximately on the line 4—4 of Fig. 2; and

Figures 5, 6, and 7 are transverse sections through the burner taken approximately on the lines 5—5, 6—6, and 7—7, respectively of Fig. 2.

Referring in detail to the practical embodiment of the invention illustrated in the drawing, A designates, generally, the burner body which is hollow and of narrow, elongated form and which comprises, in the present instance, a top wall 10, side walls 11, 11, a bottom wall 12, and inner and outer end walls 13 and 14, respectively.

The outer end wall 14 closes the outer end of the hollow body A. On the other hand, the inner end wall 13 is provided with a central opening 15, adapted to have a gas supply pipe connected therewith, and with a plurality of air admission openings 16 disposed outwardly of said opening 15 and controlled as to effective air admission area by a valve disk 17 rotatably mounted on the body A.

The top wall 10 preferably, but not necessarily, is continuously flat and straight from end to end of the body A and is provided with a plurality of burner tips 18 distributed along the length thereof. In this connection, in order to prevent the inflowing gas and air from producing an obviously undesirable suction effect through the burner tips which are disposed adjacent to the inner end of the top wall 10, there is provided a baffle plate 19 which extends from the inner end of the body A, or from the top wall 10 of said body adjacent to the inner end thereof, inwardly a suitable distance in spaced relationship to the top wall 10 and from side wall to side wall of the body A. The gas and air inlet openings 15 and 16 communicate directly with the space below said baffle plate and not directly with the space thereabove. Consequently, the inflowing gas and air is prevented by said baffle plate 19 from drawing air into the burner body through the burner tips adjacent to the inner end of said burner body.

In the foregoing connection it also is desirable to provide means to cause the inflowing gas and air to become thoroughly intermixed prior to the same reaching the burner tips 18. Accordingly, the side walls 11, 11, the bottom wall 12 and the baffle plate 19 all are directed inwardly from the inner end wall 13 in relative converging relationship to a constricted throat 20, from whence at least one of the walls, the bottom wall 12 in the present instance, continues inwardly and divergently relative to the other walls, downwardly in the case of the bottom wall 12, to a point approximately in transverse alinement with the outer

end of the baffle plate 19, thereby forming a mixing chamber 21 which is of increasing sectional area outwardly from the throat 20. Thus, the inflowing gas and air are brought intimately together in the constricted throat 20 and at the same time their velocity is increased, and as they enter the chamber beyond said throat they expand and have turbulence imparted thereto, resulting in their intimate intermixture. In short, the inner end portion of the body A is of Venturi form and acts as a venturi in imparting turbulence to the inflowing gas and air and in increasing their velocity as well as effecting their intimate intermixture.

From a point adjacent to but beyond the outer end of the chamber 21, to the outer end of the body A, said body is formed to include an upper chamber 22 and a lower chamber 23. The upper chamber preferably is of uniform cross sectional area throughout its length and of greater cross-sectional area than the lower chamber 23. On the other hand, the lower chamber 23 is of progressively decreasing cross sectional area toward its outer end and preferably is so formed by converging the lower portions of the side walls 11, 11, of the body A toward their outer ends.

Flanges 24, 24 extend inwardly from the side walls 11, 11 at the top of the lower chamber 23 and have their inner or adjacent edges disposed in parallel, spaced relationship to each other. The chambers 22 and 23 thus are in constant and open communication with each other through a passageway which is of uniform width from end to end of said chambers.

The upper chamber 22 is of approximately the same depth as the space between the top wall 10 and the baffle plate 19, and is alined with said space, while the lower chamber 23 preferably is of somewhat less width and depth than the outer end of the chamber 21 and at its inner end is merged into the outer end of said chamber 21, being disposed in alinement therewith as shown.

At points approximately midway between the ends of the body A are vertically disposed ribs 25 which extend suitable distances inwardly from the side walls 11, 11 into the upper chamber 22. In addition, at the inner end of the chamber 22 are other ribs 26 which preferably are reversely curved as shown and which also extend suitable distances inwardly from the side walls 11, 11, respectively.

The operation of the burner is as follows:— Gas and air entering the inner end of the burner body first are intermixed in the chamber 21 and then flow outwardly, in minor amount into the inner end portion of the upper chamber 22 and in major amount into the lower chamber 23. Due to the smaller area of the inner end of the lower chamber 23 as compared with the area of the outer end of the chamber 21, and to the ribs 26, as well as to the shoulders 27 formed by the mergence of the side walls 11, 11 of the chamber 21 into the chamber 23, some of the intermixed gas and air is directed upward across the outer end of the baffle plate 19 and into the space above said baffle plate to feed the burner tips thereabove, this flow being assisted by the ribs 25 due to the same resisting free flow of the gas and air outwardly through the upper chamber 22. The remainder of the combustible mixture flows outwardly through the chamber 23 and through the space between the flanges 24, 24 into the upper chamber 22 for feeding the remaining burner tips, in which connection it is apparent that due to the outwardly decreasing sectional area of the lower chamber 23, the flow of the combustible mixture to the burner tips within the length of the chambers 22, 23 is so controlled that all of such burner tips are, or may be, uniformly supplied with fuel. In other words, it is apparent that a burner construction as shown and described will result in some of the combustible fluid being supplied to all of the burner tips, and it is equally apparent that by experimentation the proper convergence of the side walls 11 of the chamber 23 and the proper disposition and extent of the ribs 24, 25, 26, etc., may be determined to assure that the fuel will be supplied substantially uniformly to all of the burner tips.

As is manifest, the present burner is of exceptionally simple construction and embodies a design such that it may be cast exceptionally easily and economically. At the same time its design is such that it is inherently strong and unlikely to become broken either during its production or while in service.

Without further description it is thought that the features and advantages of the invention will be readily apparent to those skilled in the art, and it will of course be understood that changes in the form, proportion and minor details of construction may be resorted to, without departing from the spirit of the invention and scope of the appended claims.

I claim:—

1. A gaseous fuel burner comprising an elongated hollow body having burner tips distributed along the top thereof, means for the supply of combustible fluid into said body at one end thereof, said body being divided into upper and lower chambers, means whereby inflowing combustible fluid is delivered initially in major part into the lower of said chambers and in minor part into the upper of said chambers, said chambers being in communication with each other throughout a major portion of the length of the body through an opening which is of uniform width throughout its length, the lower chamber being of progressively decreasing cross sectional area toward the end thereof remote from the combustible fluid inlet end thereof so that fluid is delivered from the lower chamber into the upper chamber in progressively decreasing amount toward the last mentioned end of said chamber.

2. A gaseous fuel burner as set forth in claim 1 including baffle means extending transversely of the upper chamber of said hollow body within the same to resist outward flow of the combustible fluid through said upper chamber thereby to cause some of said fluid to be directed to the burner tips adjacent to the fluid inlet end of the hollow body.

3. A gaseous fuel burner comprising an elongated hollow body having burner tips in a wall thereof distributed along the length of the body, means for the supply of gas and air into said body at one end thereof, said body having a gas and air receiving and mixing chamber at said end thereof, a baffle plate extending from said end of said body inwardly a limited distance in spaced relationship to the wall of the body having the burner tips, said baffle plate forming one wall of said chamber and said chamber being in communication with the space between said baffle plate and the wall of the body having the burner tips through the body at the inner end of the baffle plate, said chamber and said space both being in communication at their inner ends with the inner end portion of the hollow body, and flanges extending inwardly from the side walls of the burner body adjacent to and inwardly of the inner

end of the space between the baffle plate and the wall having the burner tips to distribute inflowing gas and air substantially uniformly to the burner tips along the length of the inner end portion of the hollow body and to direct some of the gas and air toward the first mentioned end of the body into the space between the baffle plate and the wall of the body having the burner tips.

4. A gaseous fuel burner as set forth in claim 3 in which the gas and air receiving chamber is of Venturi shape.

5. A gaseous fuel burner comprising an elongated hollow body having burner tips distributed along the length of the top wall thereof, means for the supply of combustible fluid into said body at one end thereof, said hollow body having upper and lower chambers in open communication with each other through a space of uniform width extending throughout a major portion of the length of the body, the lower chamber being of progressively decreasing cross-sectional area from its inner to its outer end.

6. A gaseous fuel burner comprising an elongated hollow body having burner tips distributed along the length of the top wall thereof, means for the supply of combustible fluid into said body at one end thereof, said hollow body having upper and lower chambers of which the lower chamber is of progressively decreasing width from its inner to its outer end, and flanges extending inwardly from the sides of the body and defining a space therebetween of uniform width affording communication between the upper and lower chambers throughout the length of said chambers.

7. A gaseous fuel burner comprising a elongated hollow body having burner tips distributed along the length of the top wall thereof, means at the inner end of said body for the supply of combustible fluid into said body, a baffle plate extending inwardly from said ends of said body a limited distance in spaced relationship to the top and the bottom walls of the body, said baffle plate cooperating with the adjacent side walls and the bottom wall of the body to provide a mixing chamber into which is delivered combustible fluid entering the inner end of the body, the side walls of the body beyond the inner end of the baffle plate being constricted and curved to direct part of the combustible fluid from said chamber upwardly and around the inner end of said baffle into the space thereabove, the body beyond said constrictions being in open communication with said chamber and said space and being formed to distribute combustible fluid substantially uniformly to the burner tips disposed along the length thereof.

8. A gaseous fuel burner as set forth in claim 7 in which the body beyond the constrictions is divided into lower and upper chambers which are in communication with each other through their length by a passageway of uniform width, and in which the lower chamber is of progressively decreasing width toward the outer end of the body.

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