

W. B. BASTIAN.
GAS BURNER.
APPLICATION FILED OCT. 20, 1911.

1,040,986.

Patented Oct. 8, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

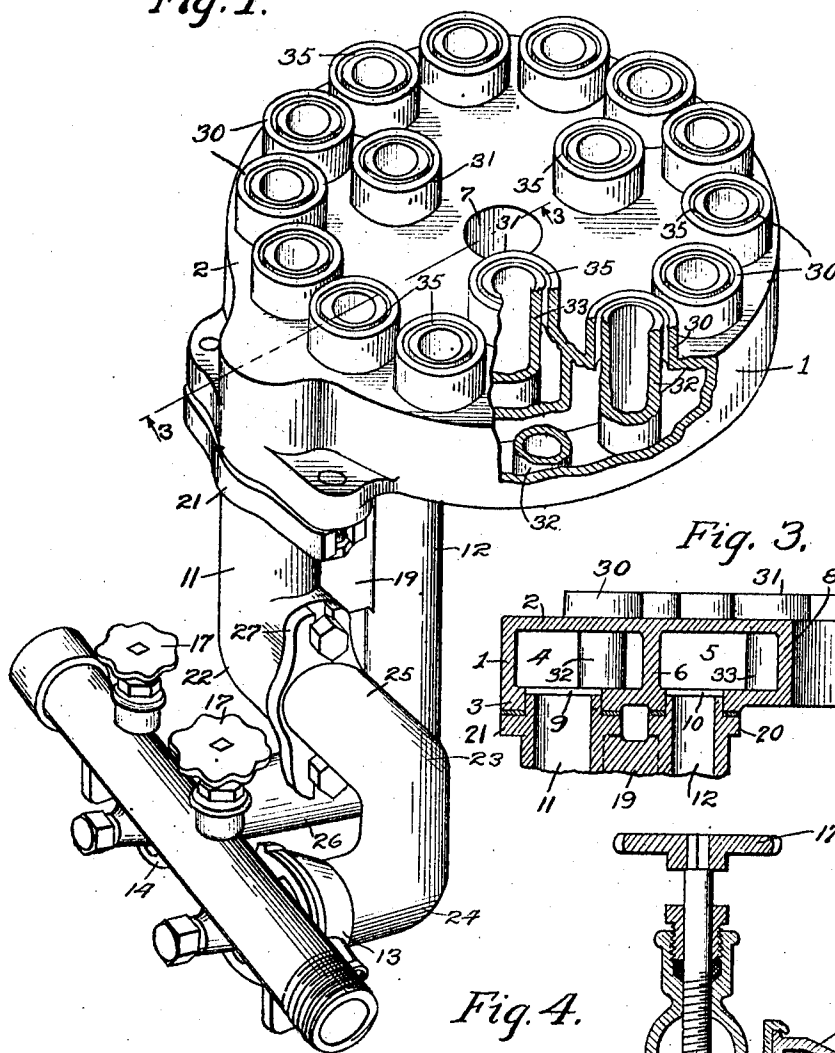


Fig. 3.

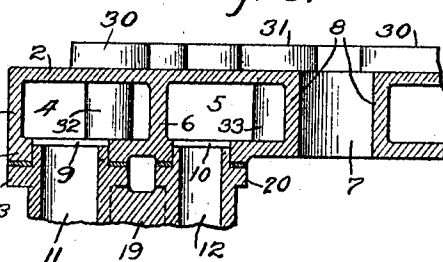
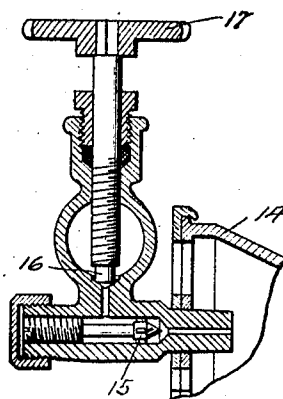


Fig. 4.



Witnesses:
L. B. Graham
Milton Lenoir

Inventor:
William B. Bastian
By W. B. Bastian Att'y.

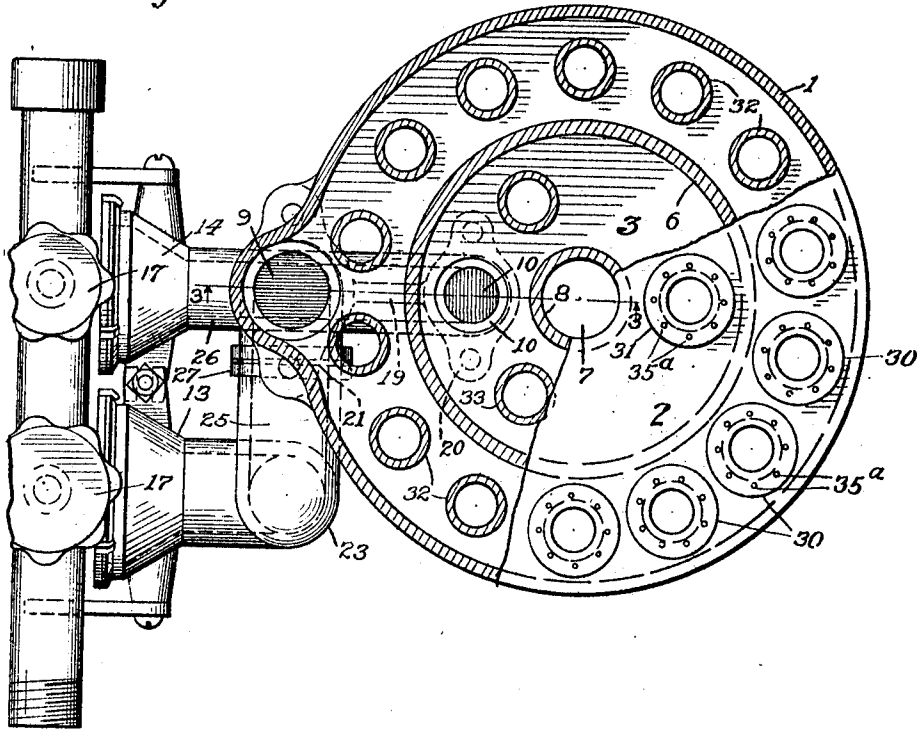
W. B. BASTIAN.
GAS BURNER.

APPLICATION FILED OCT. 20, 1911.

1,040,986.

Patented Oct. 8, 1912.
3 SHEETS-SHEET 2.

Fig. 2.



Witnesses:
L. B. Graham
Milton Lenoir

Inventor:
William B. Bastian
By: Quapping Atty.

UNITED STATES PATENT OFFICE.

WILLIAM B. BASTIAN, OF CHICAGO, ILLINOIS, ASSIGNOR TO W. B. BASTIAN MFG. CO.,
OF PIERRE, SOUTH DAKOTA, A CORPORATION OF SOUTH DAKOTA.

GAS-BURNER.

1,040,986.

Specification of Letters Patent.

Patented Oct. 8, 1912.

Application filed October 20, 1911. Serial No. 655,751.

To all whom it may concern.

Be it known that I, WILLIAM B. BASTIAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Gas-Burners, of which the following is a specification.

The subject of the present invention is a gas burner for producing heat for any and all purposes and the invention relates more particularly to burners used for cooking purposes and for the heating of water in the boilers of circulating systems used for domestic purposes. Preferably, gas burners used for these purposes are circular in outline, but the present invention has nothing to do with the general shape of the burner, which is, in all cases, determined by the shape of the article or vessel to be heated or by the shape of the space available as a combustion chamber. For the purposes of this specification, however, the burner may be considered as of general circular outline, the original aim of the invention being to provide an improved burner particularly adapted for water-heaters of the class shown and described in my application filed January 28, 1911, Serial No. 605,225, and for gas ranges.

The objects of the invention, generally stated, are to provide an improved gas burner especially adapted for the uses named—improved with respect to its efficiency and to its details in mechanical construction.

To these ends the invention consists in the features of novelty that are hereinafter described with reference to the accompanying drawings, which are made a part of this specification and in which:

Figure 1 is a perspective view of one of the improved burners of preferred construction, a fragmentary portion being broken away for the purpose of showing the interior construction. Fig. 2 is a horizontal section thereof taken in a plane between the top and bottom of the shell of the burner and showing a modification in the form of the jet openings. Fig. 3 is a vertical section of a portion thereof on the line 3—3, Fig. 1 or Fig. 2, looking in the direction of the arrows. Fig. 4 is a vertical section showing in detail the valves for regulating and controlling the admission of gas to the burner. The burner has a shell comprising an outer

cylindrical wall, 1, and top and bottom walls, 2 and 3, respectively, the interior space of the shell being divided into two separate and wholly independent chambers, 4 and 5, by an annular partition, 6, which joins the top and bottom of the shell gas-tight. For some purposes, as, for example, for use in connection with a water-heater of the class shown and described in my application aforesaid, the burner is provided with a central, vertical opening, 7, for the reception of a pipe or the like, and, in this event, the annular wall, 8, of this opening also forms the inner wall of the chamber, 5.

The bottom of the shell is provided with openings 9 and 10, communicating with the chambers, 4 and 5, respectively, for the inlet of gas to said chambers and with these openings communicate the delivery branches, 11 and 12, respectively, of mixing chambers, which have open bell-shaped inlet ends, 13 and 14, respectively, of the customary Bunsen type, the supply of gas to each of said chambers being regulated by a valve, 15, and controlled by a valve, 16, having a hand wheel, 17, as shown in Fig. 4. This figure shows only one of the valve devices for regulating and controlling the supply of gas to one of the mixing chambers but it will be understood that the valve devices for both mixing chambers are precisely alike. The delivery branches, 11 and 12, of the mixing chambers are connected by an integral web, 19, so that they may be handled as a single part and held permanently in fixed relation to each other, and the upper ends of these branches are provided with flanges, 20 and 21, which are bolted to the bottom 3, of the shell. The mixing chamber, 12, has a single right angular bend dividing it into a vertical and a horizontal branch joining each other in the shape of an L, while the mixing chamber, 11, has three right angular bends, 22, 23 and 24, dividing it into four branches which join each other in the shape of two L's so arranged that the two branches of one of said L's lie with their axes in a plane perpendicular to the plane in which the axes of the two branches of the L first aforesaid lie, while the second of said two L's lies with the axes of its two branches in a plane which is parallel with the plane last aforesaid. In other words, the vertical branches of the two L's of the mixing chambers, 11 and 12, lie with their axes in the same plane, while their

respective horizontal branches, 25 and 26, cross each other at right angles, the horizontal branch, 26, lying in the plane of the axes of the aforesaid two vertical branches, while the horizontal branch, 25, lies in a plane perpendicular to the common plane of the axes of said vertical branches. This arrangement allows the vertical branches of the two mixing chambers to be located one behind the other and also allows the horizontal branch, 26, of the chamber, 12, and the horizontal branch resulting from the bend, 24, of the chamber, 11, to lie in the same horizontal plane and terminate in proximity to a gas supply pipe which is common to both of them. For convenience in construction, the mixing chamber, 11, may be formed in two parts and their meeting faces provided with flanges, 27, adapted to be secured together by bolts.

The top of the shell is provided with a plurality of tubular projections, 30, located directly over the chamber, 4, and with a plurality of similar projections, 31, located directly over the chamber, 5, which projections extend upward from the top of the shell to a sufficient distance to allow the free circulation of atmospheric air at the area of combustion. Extending through the chambers, 4 and 5, from top to bottom are a plurality of tubes, 32 and 33, respectively.

In the preferred form of the invention all of the several parts of the shell, including the tubular projections and the tubes, are cast integrally, so that the lower ends of the tubes join the bottom of the shell gas-tight, while their upper ends, when the casting comes from the mold, joins the top of the shell gas-tight. In this connection, it should be explained that all downwardly presented surfaces which are exposed to the interiors of the chambers, 4 and 5, are to be considered as parts of the top of the shell. In this preferred form of the invention each of the tubular projections is provided with a minute annular orifice or jet opening, 35, thereby forming a burner tip. Each of the jet openings is preferably made by the use of an annular cutter, the internal diameter of which is equal to the external diameter of one of the tubes (32 or 33) so that a portion of the tubular projection which extends upward from the top of the shell as it comes from the mold forms an upward continuation of the tube, the cutting being continued far enough to cause the annular orifice to communicate with the chamber, 4 or 5, as the case may be. The tubes, 32 and 33, form ducts through which a sufficient quantity of air to properly support combustion passes upward and is discharged within the hollow jets of gas which escape from the annular jet openings, after the manner of an Argand

burner. Or, in place of a single annular cut, a plurality of minute openings or drill holes, 35^a, may be made in each of the tubular projections and arranged in a circular series around the upper end of each of the air tubes or ducts.

It will be understood that the invention is not limited to any particular number of burner tips or tubular projections having jet openings, nor is it limited to a burner having any particular number of chambers, each common to a number of such burner tips. It will be understood also that the object in providing a plurality of such chambers is to enable a greater or less number of burner tips to be used, accordingly as more or less heat is desired.

What I claim as new is:

1. A gas burner having a hollow shell, a partition within the shell dividing its interior into a plurality of separate and independent chambers, said shell having openings, communicating with said chambers, respectively, for the admission of gas thereinto, separate and independent mixing chambers, the discharge branches of which communicate with said openings, respectively, a separate valve mechanism for controlling the supply of gas to said mixing chambers, each of said mixing chambers having two branches united in the form of an L, the discharge branches being vertical and located one behind the other in a plane which is common to their axes, while one of the horizontal branches is located with its axis in the same plane and the other of said horizontal branches is located with its axis in a plane perpendicular to the plane first aforesaid.

2. A gas burner having a hollow shell, a partition located within the shell and dividing its interior into a plurality of chambers, said shell having openings communicating with said chambers, respectively, for the admission of gas thereinto, a plurality of burner tips communicating with said chambers, respectively, separate mixing chambers, the discharge branches of which communicate with said openings, respectively, and lie in a vertical plane which is common to their axes, while their intake branches lie in a horizontal plane which is common to their axes, one of said chambers having an intermediate off-set portion which lies with its axis in a horizontal plane above the horizontal plane aforesaid and in a vertical plane which is perpendicular to the vertical plane aforesaid.

WILLIAM B. BASTIAN.

Witnesses:

H. C. HILL,
L. M. HOPKINS.