

E. G. VAN ZANDT.
GAS BURNER.
APPLICATION FILED JULY 11, 1910.

1,045,464.

Patented Nov. 26, 1912.

3 SHEETS—SHEET 1.

Fig: 1.

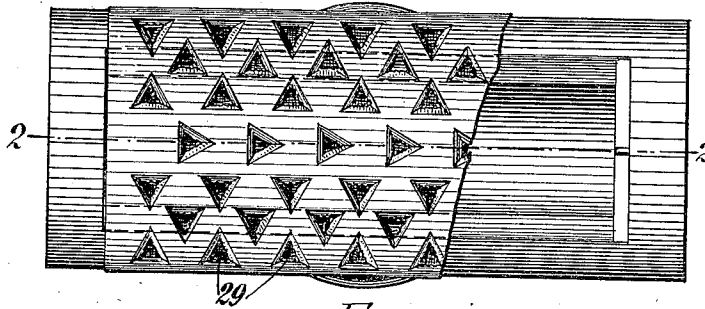


Fig: 2.

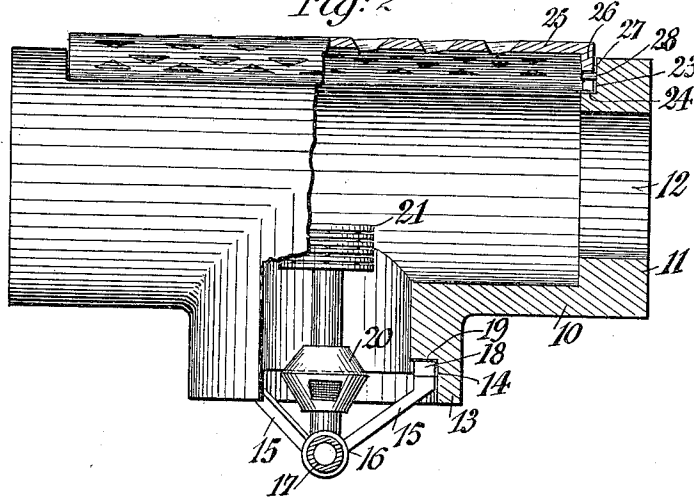
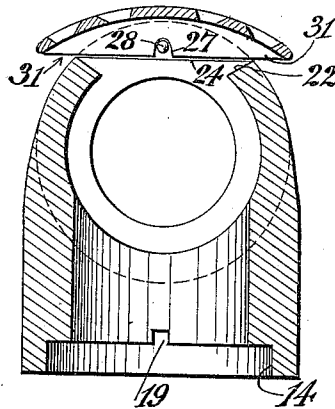


Fig: 3.



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3 SHEETS—SHEET 2.

Fig. 4.

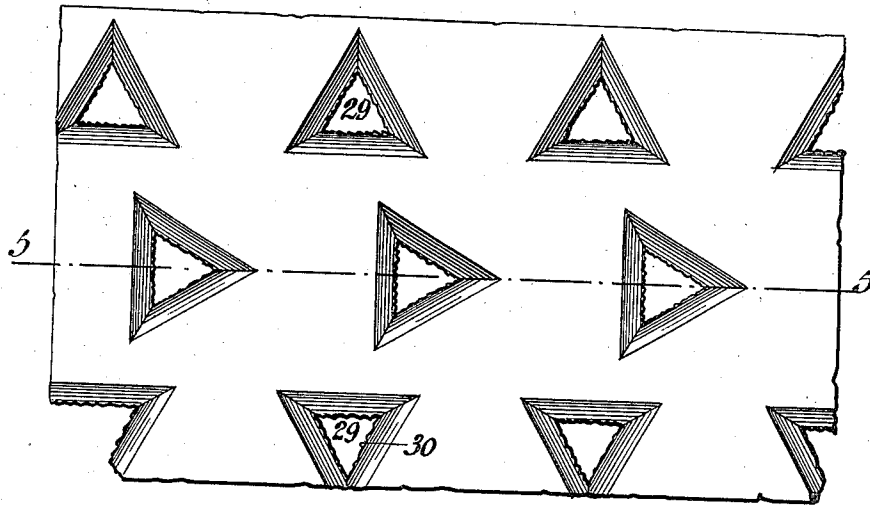


Fig. 5.

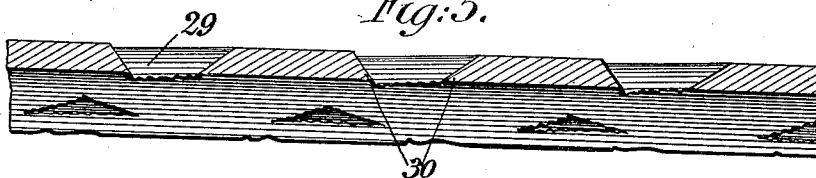
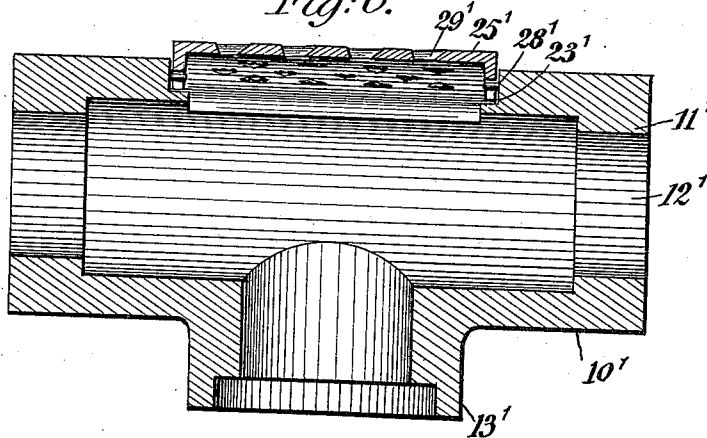


Fig. 6.



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3 SHEETS—SHEET 3.

Fig: 7.

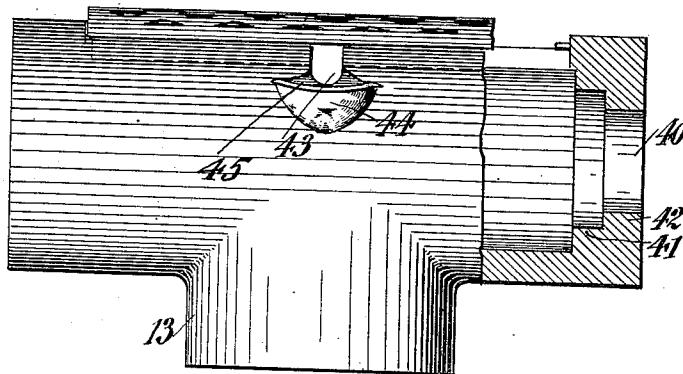
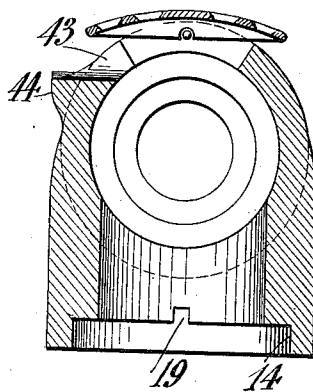


Fig: 8.



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UNITED STATES PATENT OFFICE.

EDWIN G. VAN ZANDT, OF ST. LOUIS, MISSOURI, ASSIGNOR TO VAN ZANDT GAS APPLIANCE COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

GAS-BURNER.

1,045,464.

Specification of Letters Patent.

Patented Nov. 26, 1912.

Application filed July 11, 1910. Serial No. 571,346.

To all whom it may concern:

Be it known that I, EDWIN G. VAN ZANDT, a citizen of the United States of America, residing in the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Gas-Burners, of which the following is a specification.

This invention relates to gas-burners.

More particularly it relates to improvements in the structure shown in the U. S. Letters Patent No. 838,596 dated Dec. 18, 1906, and U. S. Letters Patent No. 876,507, dated Jan. 14, 1908.

The principal object of this invention is to provide an improved gas-burner in which the combustion of the gas will be practically complete. To accomplish this I have provided a gas-burner having an elongated shell surrounding the initial burner, with an opening in its top of substantially its entire area and covered over with a curved perforated plate.

A further object is to provide an improved top-plate detachable from the shell and having a plurality of openings, of substantially the same size and of such a size as to permit the gradual egress of gases from said burner but to so retard the flow thereof that the gases are caused to burn at the exterior of the plate. Also to provide an improved means for holding the elongated shell over the initial burner and a novel means for holding the curved plate over the shell.

A further object is to provide the shell or container with an ignition opening whereby the ignition of the burner may be readily effected and lastly one of the objects of the invention is to provide a shell or container with openings of varying diameters to increase the retardation of the products of combustion and facilitate their burning at the top of the plate at the exterior of the shell.

In the accompanying drawings, Figure 1 is a top plan view of the burner, part being broken away, Fig. 2 is a front view of the burner partly in elevation and partly in longitudinal section, Fig. 3 is a central, transverse, vertical sectional view of the shell and plate, Fig. 4 is a fragmental top plan view of the plate, on an enlarged scale, showing the perforations of the plate, Fig. 5 is a sectional view taken on the line 5—5 of Fig. 4, Fig. 6 is a central, longitudinal,

vertical sectional view of a modification of the shell and plate, Fig. 7 is a front view of a second modification of the shell and plate partly in longitudinal vertical section showing the igniting means and ends of varying diameters, and Fig. 8 is a vertical, transverse section of the same.

Similar letters of reference indicate corresponding parts throughout the several figures of the drawing.

Referring to the drawings, and more particularly Figs. 1 to 6, the shell or container 10 is cylindrical in shape and has inwardly projecting flanges 11 forming restricted end openings 12. The lower part of the shell is provided with a downwardly projecting cylindrical flange 13 having at the lower edge of its inner face an annular recess 14 adapted to receive the upper ends of the legs 15 of a bracket or inverted tripod mounted upon the inlet pipe 17. The upper end of one of said legs 15 is provided with an upwardly projecting lug 18 engaging in a downwardly opening recess 19, shown most clearly in Fig. 3. Upon the pipe 17 is mounted the usual mixer 20 communicating with the initial burner 21. The upper part of the shell 10 is almost entirely open, that is, the shell is provided with an opening in its top of substantially its entire area the said opening being provided with approximately radial side faces 22 and vertical end faces 23 slightly offset from the inner faces of the flanges 11 thereby forming an upwardly disposed shoulder 24. The top plate 25 is upwardly curved to form a segment of a cylinder without side flanges but having vertical downwardly projecting end flanges 26 adapted to contact said faces 23 and lie upon the upwardly disposed shoulders 24. The said downwardly projecting flanges are provided with downwardly opening recesses 27 adapted to snugly receive studs 28 projecting from said faces 23, whereby said plate 25 is held against lateral displacement, the faces 23 holding the same against endwise displacement. The flanges fit closely against the shell, in such a manner as to prevent a passage of gases therebetween. The plate 25 is provided with a plurality of angularly shaped restricted openings 29 having roughened beveled edges outwardly flaring, whereby the cross-section of said openings is approximately V-shaped, the various openings being substantially

of the same size, but all being so restricted as to permit only a gradual egress of gases from said burner, and to so retard the flow thereof that the gases are caused to burn at the exterior of the plate. The side edges of the plate 25 extend beyond and are spaced above said approximately radial faces 22, whereby are formed longitudinal side-openings 31, shown clearly in Fig. 3.

10 The modified form of burner illustrated in Fig. 6 has the plate 25 much shorter as shown by the plate 25' than the distance between the inner faces of the flanges 11, but is otherwise substantially the same in construction, having a shell 10', flange 11', opening 12', lower cylindrical flange 13', end faces 23', lugs 28', and openings 29'.

In Figs. 7 and 8 is shown a structure like that shown in Figs. 1 to 5, though the plate used does not necessarily extend the full length of the shell since it could be made like the plate shown in Fig. 6. The front of the shell of the structure shown in Fig. 7 is provided with a slot 43 and in front of the slot is arranged a shelf-like projection 44 having a curved upper face 45, the object of the shelf being to support a burning match or taper. This arrangement permits the ignition of the burner by the user simply placing a burning match on the shelf before the turning on of the supply gas. The match thus placed being in proximity to the upper part of the heater and initial burner 21 therein, enables the heater to be readily ignited without any explosion or noise. The position of the shelf and slot is such as to enable the ignition to take place without noise and immediately.

In the structures shown in Figs. 1 to 6, the ends of the shell are restricted so as to retard the outflow of unignited products of combustion at the ends, and to enable such retarded products of combustion to be treated in the shell and when passing out of the shell at the detachable top-plate to be burned at the exterior thereof. To secure such retardation and the necessary and proper re-heating of the products of combustion before their emission from the shell, the ends of the shell are provided with a double restriction, that is, an end opening 40 formed by a flange of different diameters one step 42 of smaller diameter than the other step 41. This step-like passage prevents the outward flow of the products of combustion and subjects such as are retarded thereby to varying temperature and atmospheric conditions. The heating of the retarded products of combustion has the effect of causing them to pass out of the top of the shell at the top plate and to be burned at the exterior of the plate. By this arrangement the flow out of the ends of the shell is prevented and no unburned gases permitted to escape.

The operation of the burner is as follows: The mixer 20 having been properly adjusted the gas is allowed to flow until it is possible to ignite the same by placing a lighted match at or into some one of the openings of the plate, and in the structure shown in Figs. 7 and 8 by placing such lighted match on the shelf 44. The gas flowing from the initial burner 21 is thereby ignited and the initial burning takes place. The products of combustion of the initial burner pass through the openings 29 in an unignited state, before doing so being heated, and these openings being restricted in the manner indicated, they form burner openings for the gases passing therethrough, which are burned at the exterior of the plate. The openings 29 are not enough restricted to force the unburned gases out at the end openings, but are so restricted as to cause the proper combustion of all the products and their burning at the exterior of the plate, while the restricted ends formed by the single flange in the structures of Figs. 1 to 6 and by the plurality of flanges of varying diameters serve to retain the products of combustion within the shell and subject them to treatment therein.

In use the top-plate 25 becomes red hot and aids greatly toward proper combustion.

By my improvements a burner is produced which, when in use, is readily ignited and simple in operation, free from noise and from ignited gases passing out at the ends of the shell, and gives almost perfect combustion. The burner, being composed of detachable parts, is cheaply manufactured and easily examined and repaired.

The invention, therefore, consists of an improved gas-burner comprising a shell or container having a detachable top-plate provided with a plurality of openings. And the invention consists further of a gas-burner comprising a shell having restricted open ends and a top opening having a plate with a plurality of openings therein so arranged as to permit the gradual egress of gases from said burner but to so retard the flow thereof that the gases are caused to burn at the exterior of the plate, said openings forming burner openings. And the invention consists further in the specific attaching means of the plate to the shell, and further in the attaching means of the shell to its support. And the invention consists further in a shell having a plurality of flanges at its ends forming restricted end openings of varying diameters. And the invention consists further in the improved igniting slot and shelf.

I do not wish to limit myself to the specific details herein necessarily described for showing an embodiment of my invention, since changes may be made therein within the scope of the claims without departing from the spirit of my invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In a gas burner having an initial burner, a shell or container surrounding said burner, having an opening in its top free to the atmosphere, and a detachable burner plate for said opening provided with a plurality of openings said plate being so arranged that the gases are caused to burn at the exterior of the plate, said openings forming burner openings for the gases passing therethrough.

2. In a gas-burner having an initial burner, an elongated shell surrounding said burner, having an opening in its top, said opening being substantially the entire area of said top, and a plate disposed over said top and joining said shell at the opposite ends of the opening, said plate being spaced from the sides of the opening and having a plurality of burner openings.

3. In a gas-burner having an initial burner, a cylindrical shell surrounding the initial burner having end flanges forming end openings and having an open top, and a perforated plate disposed over said open top and spaced from the side edges of the open top.

4. In a gas-burner having an initial burner, a shell or container having open ends surrounding the initial burner, said open ends being provided with stepped flanges forming end openings of varying diameters.

5. In a gas-burner having an initial burner, a shell surrounding said initial burner having inwardly-flanged end openings and an open top, shoulders at the ends of the open top, a lug projecting from each of the ends, and a curved perforated plate disposed over the open top, having downwardly-extending flanges at the ends of the

curved plate contacting with said shoulders, said flanges having recesses adapted to receive said lugs.

6. In a gas burner, a plate having closely adjacent openings of substantially triangular shape, and having sharp roughened inner edges, the sides of the walls forming the openings being beveled.

7. In a gas-burner having an initial burner, a shell with an open top surrounding said initial burner, and a detachable plate on the shell over said top, having restricted openings, so arranged as to permit the gradual egress of gases from said burner but to so retard the flow thereof that the gases are caused to burn at the exterior of the plate, said openings forming burner openings for the gases passing therethrough.

8. In a gas-burner, a shell having a downwardly-projecting cylindrical flange having an internal shouldered annular recess and an additional recess communicating with the annular recess, a support for engaging the annular recess, and a lug on the support engaging the additional recess.

9. In a gas-burner having an initial burner, a shell or container surrounding the same, said shell or container having a slot in proximity to the burner and a shelf-like projection adjacent the slot.

10. In a gas-burner having an initial burner, a shell or container surrounding the same having an opening at the top substantially the width of the shell, and having a slot at the upper part of the shell and communicating with the opening of the shell.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

EDWIN G. VAN ZANDT.

Witnesses:

LOUIS BLUM,
LENA WIDRIG.