J. H. ACKROYD.

GAS BURNER.

APPLICATION FILED MAR. 3, 1911.

1,079,281.

Patented Nov. 18, 1913.

2 SHEETS—SHEET 1.

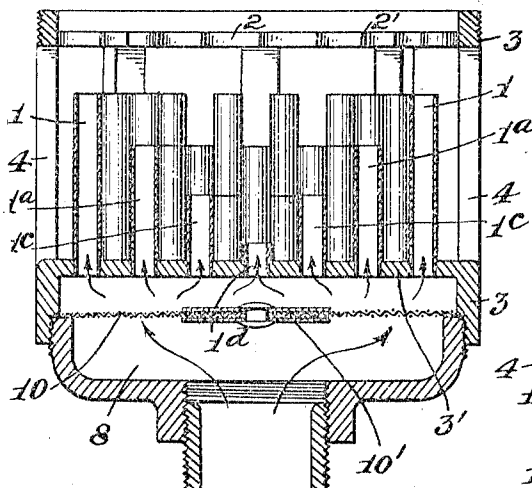


Fig. 1.

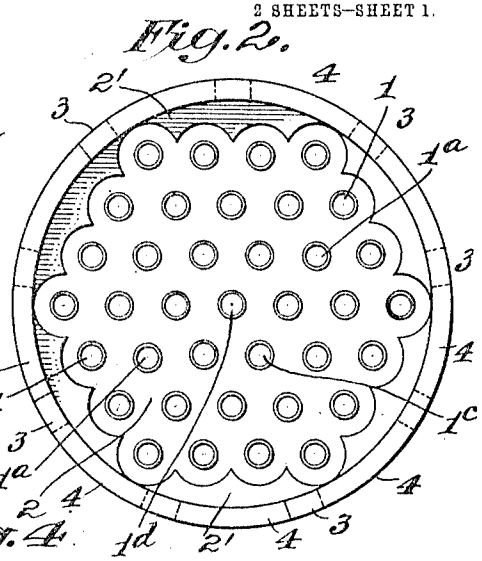


Fig. 2.

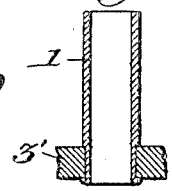


Fig. 4.

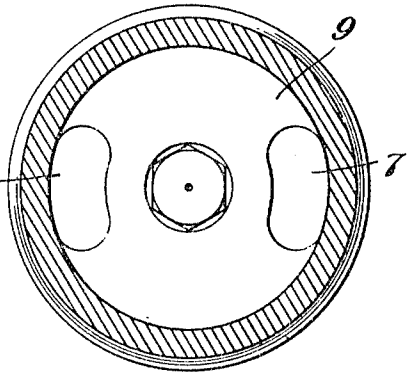
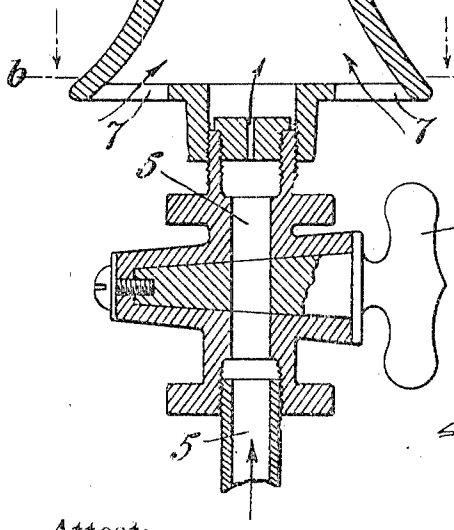


Fig. 3.



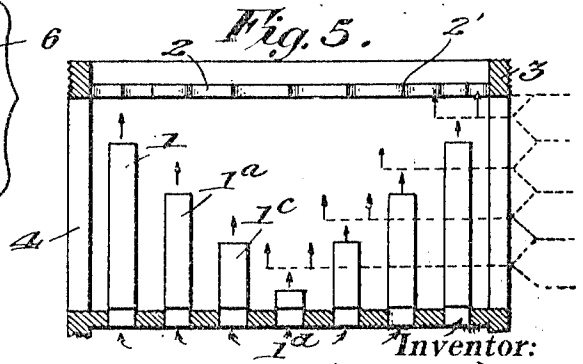


Fig. 5.

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2 SHEETS—SHEET 2.

Fig. 6.

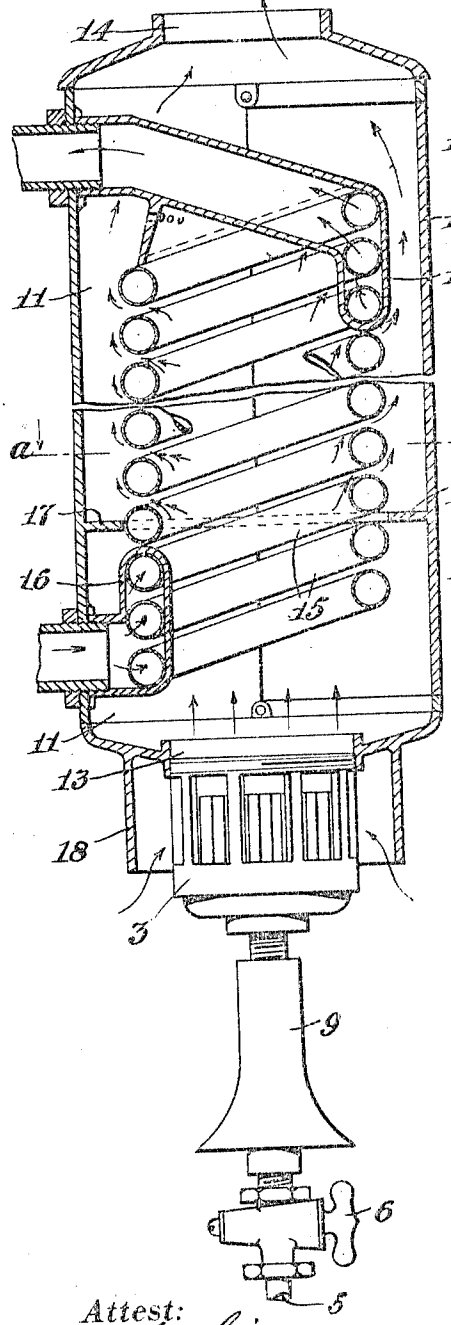


Fig. 7

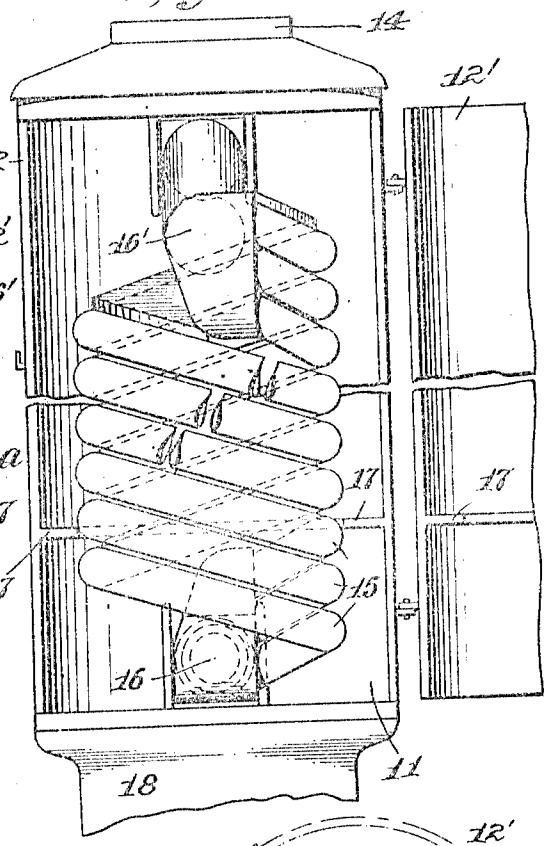
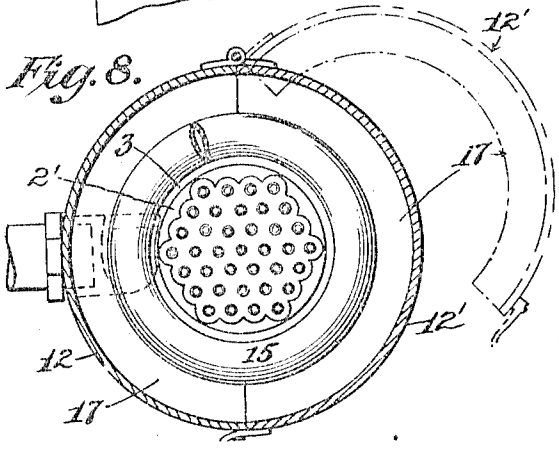


Fig. 8.



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JOHN H. ACKROYD, OF ELIZABETH, NEW JERSEY.

GAS-BURNER.

1,079,281. Specification of Letters Patent. Patented Nov. 18, 1913.

Application filed March 3, 1911. Serial No. 612,091.

To all whom it may concern:

Be it known that I, JOHN H. ACKROYD, a citizen of the United States, and a resident of Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Gas-Burners, of which the following is a specification.

This invention relates to gas burners adapted for general use, and especially adapted for various uses in which a high temperature is necessary or desirable, as in mantle lamps and in various types of heaters, oven and furnaces, and the objects of the invention are to provide a simple, durable and inexpensive burner which will produce complete combustion of the gas used, in which the parts will not become unduly heated, in which there will be no suction on the burner orifices, and consequently the mixture of gas and air in the mixing chamber will remain unchanged and jumping back of the flame will be prevented, and which will develop a maximum temperature with a minimum amount of cross sectional area.

With these ends in view the invention consists in certain constructions and in certain parts, improvements and combinations which will be hereinafter described and then specifically pointed out in the claims hereunto appended.

In the accompanying drawings forming a part of this specification, Figure 1 is a sectional elevation of the lower portion of my novel burner, the heating chamber being removed; Fig. 2 a plan view corresponding with Fig. 1; Fig. 3 a section on the line *b*—*b* in Fig. 1, looking in the direction of the arrows; Fig. 4 a detail sectional view showing the manner of securing the tubes to the bottom plate of the frame; Fig. 5 a section of the frame showing the heights of the sets of burner tubes and showing diagrammatically the paths of the lateral air currents; Fig. 6 a view partly in elevation and partly in section showing the application of the invention to a water heater; Fig. 7 an elevation corresponding therewith, the door of the heating chamber being open, and the point of view at right angles to that in Fig. 6, and Fig. 8 is a section on the line *a*—*a* in Fig. 6.

5 denotes the gas supply pipe shown as provided with a cock 6. Above the gas supply pipe and secured thereto is a tube 9, having air inlets 7, by which gas and air is conducted to a mixing chamber 8. Within the mixing chamber is a diaphragm 10 which carries a central baffle plate 10 which deflects the air and gas and causes it to be thoroughly mixed in passing through the diaphragm. Above the mixing chamber and secured thereto is a frame 3 which supports a heating chamber 11, the bottom plate 3′ of the frame serving as the top plate of the mixing chamber.

1, 1^a, 1^c, and 1^d denote burner tubes secured in the bottom plate of the frame, opening into the mixing chamber and extending upward within the frame. These tubes are of progressively varying heights. At the center is preferably a single tube 1^d which is shortest. This is surrounded by a series of higher tubes indicated by 1^c. This series is surrounded by a series of still higher tubes indicated by 1^a, and the last mentioned series of tubes is surrounded by a still higher series of tubes indicated by 1. The tubes in each series are of the same height and there is a uniform difference in the heights of the several series and between series 1^c and the central tube 1^d. An important feature of the invention is that all of these tubes are placed at substantially a uniform distance apart.

The frame is provided with lateral air inlets 4 which are of ample size and number to supply any quantity of air that can possibly be required. The heating chamber 11 rests upon the support or frame and may be secured thereto in any preferred manner. 17 denotes a baffle plate which is secured to the jacket 12 of this chamber.

13 denotes an inlet to the heating chamber from the frame above the burner tubes, 14 the outlet from the heating chamber, 12′ the door of the heating chamber, which is also provided with a baffle plate 17, 15 a water coil within the heating chamber and 16 and 16′ the connecting headers of the water coil. A flange 18 depending from the heating chamber surrounds the air inlets to the frame to prevent outside air currents from affecting the burner, but at such a distance from the frame as not to interfere with the free lateral entrance of air thereto. The vital feature of the air inlets is that they extend down to the level of the tops, *i. e.*, the burner orifices of the shortest burner tubes and extend above the level of the tops of the highest burner tubes so as to provide ample lateral air currents above all of the burner orifices to support com-

tubes located above and in communication with said mixing chamber, said burner tubes being spaced apart at substantially equal distances, for the purpose set forth, of a frame inclosing said burner tubes and provided with lateral air inlets extending substantially the height of said frame.

9. In a gas burner, the combination with a mixing chamber having inlet ports for gas and air and a plurality of sets of burner tubes located above and in communication with said mixing chamber, said burner tubes being spaced apart at substantially equal distances, for the purpose set forth, of a frame inclosing said burner tubes and provided with lateral air inlets for the purpose set forth, and with an inwardly extending flange above the tops of the burner tubes, whereby excess of outside air is excluded.

10. A gas burner comprising a mixing chamber, series of burner tubes leading therefrom, all of said tubes being at substantially equal distances apart and means for supplying air in lateral currents to the flames above the level of the flame orifices.

11. A gas burner comprising a mixing chamber, series of burner tubes leading therefrom, all of the tubes being at substantially equal distances apart, the tubes in each series being of the same height and the several series increasing progressively in height from the center outward and means for supplying air in lateral currents to the flames above the level of the flame orifices.

12. A gas burner comprising a mixing chamber, series of burner tubes leading therefrom, all of said tubes being at substantially equal distances apart, a heating chamber and means for supporting said heating chamber provided with means for supplying air in lateral currents to the flames above the level of the flame orifices.

13. A gas burner comprising a mixing chamber, series of burner tubes leading therefrom, all of the tubes being at substantially equal distances apart, the tubes in each series being of the same height and the several series increasing progressively in height from the center outward, a heating chamber above the burner tubes and a support for said heating chamber provided with means for supplying air in lateral currents to the flames above the level of the flame orifices.

14. A gas burner comprising a mixing chamber, series of burner tubes leading therefrom, all of the tubes being at substantially equal distances apart, the tubes of each series being of the same height and the several series increasing progressively in height from the center outward, a heating chamber above the burner tubes and means comprising a support for the heating chamber for supplying air in lateral currents to the flames of said burner above the tops of said burner tubes.

15. In a gas burner, the combination of a mixing chamber having a plurality of burner orifices leading therefrom, a heating chamber having an inlet and an outlet, and having its inlet located above the tops of the burner orifices and means for supplying air in lateral currents to the flames above the level of the burner orifices.

16. A gas burner comprising a mixing chamber having a plurality of flame orifices, a heating chamber having an inlet located above said flame orifices and an inwardly extending flange at said inlet curved to correspond with the flame orifices, whereby excess of outside air is prevented from entering the heating chamber, and means for supplying air in lateral currents to the flames above the level of the flame orifices.

Signed at New York in the county of New York and State of New York this first day of March A. D. 1911.

JOHN H. ACKROYD.

Witnesses:
HENRY GIESELER,
REGINALD W. EARLE.