A. H. MERRILL.

GAS BURNER.

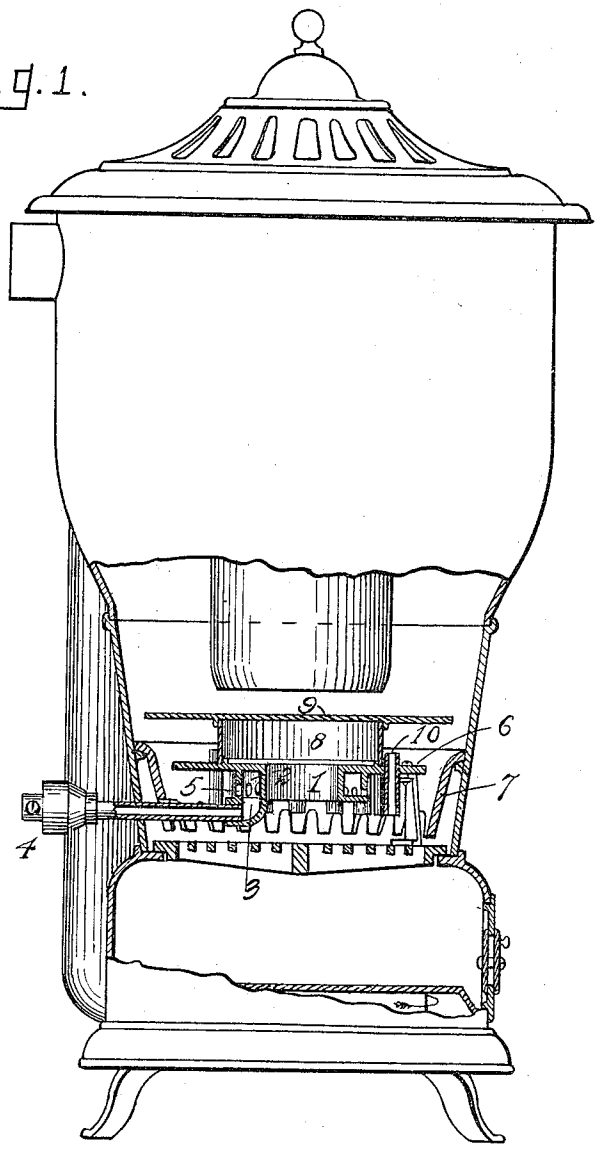
APPLICATION FILED SEPT. 11, 1914.

1,139,698.

Patented May 18, 1915.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

C. C. Walter

Gertrude Bracker.

INVENTOR:

Alfred H. Merrill

By Munn & Hall, Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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2 SHEETS—SHEET 2.

Fig. 2.

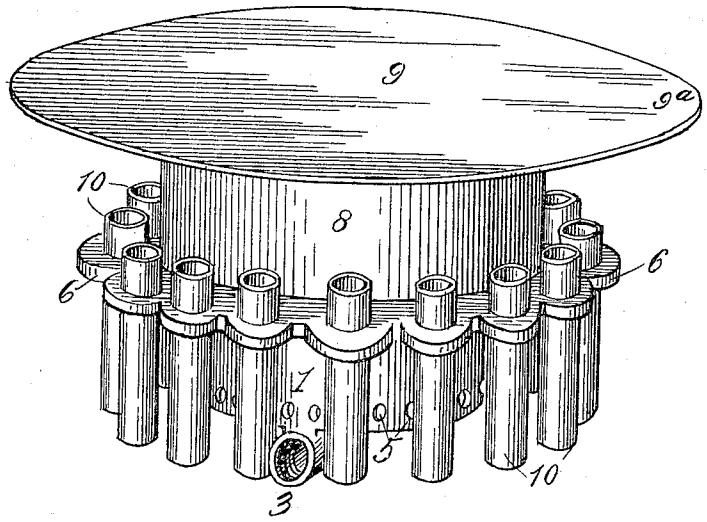
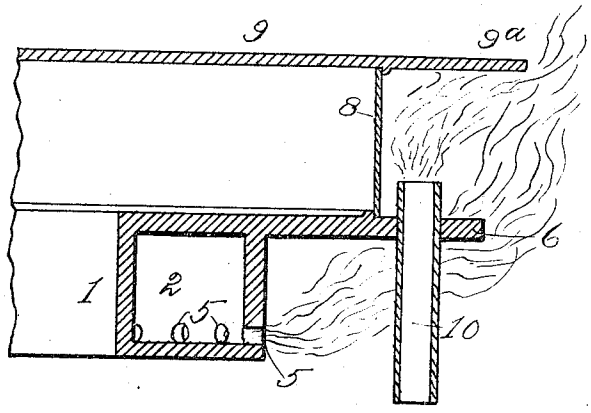


Fig. 3.



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UNITED STATES PATENT OFFICE.

ALFRED H. MERRILL, OF ADRIAN, MICHIGAN.

GAS-BURNER.

1,139,698. Specification of Letters Patent. Patented May 18, 1915.

Application filed September 11, 1914. Serial No. 861,188.

To all whom it may concern:

Be it known that I, ALFRED H. MERRILL, a citizen of the United States, residing at Adrian, in the county of Lenawee and State of Michigan, have invented certain new and useful Improvements in Gas-Burners; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to gas burners for stoves and furnaces and is designed to furnish simple and effective means for combining with the primary products of combustion superheated air to produce a secondary combustion and to thereby greatly increase the efficiency of the fuel.

To this end my invention consists of the devices, construction and arrangement of parts hereinafter described, and shown and illustrated in the accompanying drawing, in which—

Figure 1 represents an ordinary base burner stove supplied with my gas burning device; Fig. 2, a perspective view of my device, detached, and Fig. 3, a sectional elevation on an enlarged scale of a portion of the same taken on a horizontal radial line.

Like letters and numerals of reference indicate like parts throughout the drawings.

In the drawings, 1 is a hollow ring forming an annular gas chamber 2 in which leads a gas supply pipe 3 which may, if desired, be furnished with a mixer 4. The chamber 2 is radially perforated at short intervals, near its floor, as at 5. From the top of the ring 1 a horizontal flange 6 projects outwardly to near the inner surface of the fire-pot 7. This flange is preferably scalloped as clearly illustrated in Fig. 2. For convenience of manufacture the central space surrounded by the ring 1 is left open. Since it is necessary that air be prevented from passing upwardly through this central opening and that, for the reasons hereinafter explained, the air be deflected upwardly around the outer edge of the flange 6, the central opening through the ring 1 is closed by means of a removable hoop or band 8 the lower edge of which rests upon or near the flange 6, the top of the piece 8 being covered by a removable flat disk 9 the edge of which projects beyond the edge of the flange 6 and close to the side of the fire-pot or wall of the stove or furnace. There is thus formed within and above the ring 1 a dead air space which, when heated, prevents the chilling of unconsumed gases by interior currents of cold air. There is also formed by this arrangement, between the two flanges 6 and 9^a the hoop 8 and the fire-pot, an annular combustion-chamber supplemental to the combustion chamber of which the flange 6 forms the top and the ring and fire-pot the sides. Through each of the scallops around the edge of the flange 6 is a hole through each of which passes and is secured an upright open tube 10. The lower ends of these tubes extend below the level of the orifices 5 and their upper ends extend slightly above the top of the flange 6.

Gas being admitted to the chamber 2 and issuing from the orifices 5 is ignited. The flames surround and heat the tubes 10 to a high degree and pass upwardly between the scalloped edge of the flange 6 and the fire-pot into the upper combustion chamber. A column of highly heated air is drawn upwardly through each one of the tubes 10 and mingles with the flame and partly consumed gases from below. The result is that at the top of each tube a secondary combustion occurs producing a flame usually of greenish blue and of intense heat. The heat at this point is such that it becomes necessary from time to time to renew the parts 8—9, for which reason I prefer to make these parts detachable, as above indicated. From the upper combustion chamber the hot products of combustion pass in a thin sheet, being deflected by the overhanging flange 9^a against the fire-pot or wall of the stove or furnace.

Having described my invention, what I claim and desire to secure by Letters Patent, is—

1. In a device of the described character, a member providing a gas-chamber having a gas supply inlet and on outlet orifice, there being a combustion chamber into which said orifice leads, and an air-tube supported in front of said orifice, there being a second combustion chamber in communication with the combustion chamber first mentioned and into which said tube leads.

2. In a device of the described character, a hollow member whose chamber has a gas inlet and a series of discharge orifices, means

which provide a primary combustion chamber and a secondary combustion chamber in communication with each other, and a series of air-tubes leading to the secondary combustion chamber and supported in the path of gases issuing from said orifices.

3. In a device of the described character, a gas-conduit terminating in a discharge orifice, members which provide a primary combustion chamber and a supplemental combustion chamber, an air-tube disposed in said primary combustion chamber and leading into said supplemental chamber, the arrangement being such that air passing through said tube is heated by the combustion of gases in said primary chamber and mingles with the products of such combustion in said supplemental chamber.

4. A device of the described character, comprising a hollow ring having a gas inlet and discharge orifices, a fire-pot, a flange on the ring having its edge close to the fire-pot, said ring, fire-pot and flange forming a lower combustion-chamber, members which together with said flange and fire-pot form an upper combustion-chamber, the top of said upper combustion chamber being close to the fire-pot, and a series of air-tubes disposed in the path of gases issuing from said orifices and leading into said upper combustion chamber.

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

ALFRED H. MERRILL.

Witnesses:
E. C. FROEHLICH,
GERTRUDE BRACKER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."