(No Model.) 2 Sheets—Sheet 1.

G. W. LUTZ.

GAS BURNER.

No. 392,211. Patented Nov. 6, 1888.

Fig. 1.

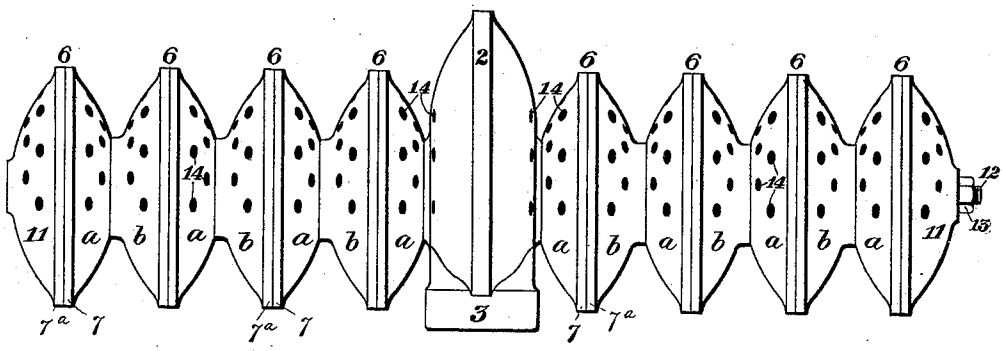


Fig. 2.

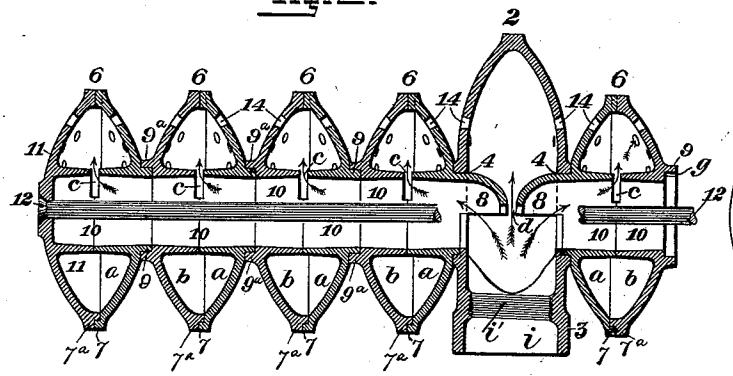


Fig. 3.

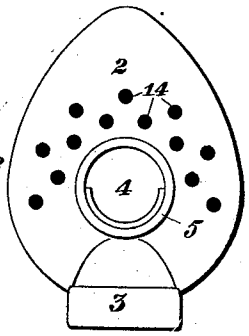


Fig. 4.

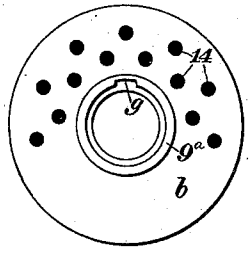


Fig. 5.

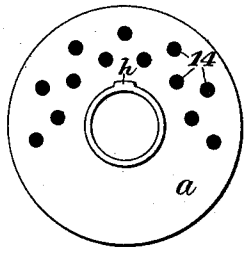


Fig. 6.

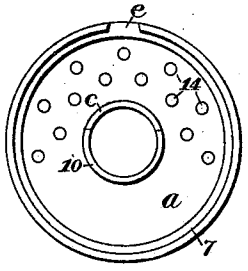
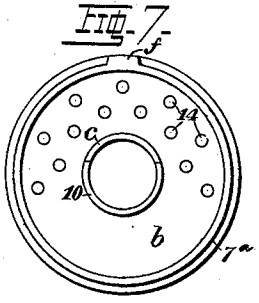


Fig. 7.



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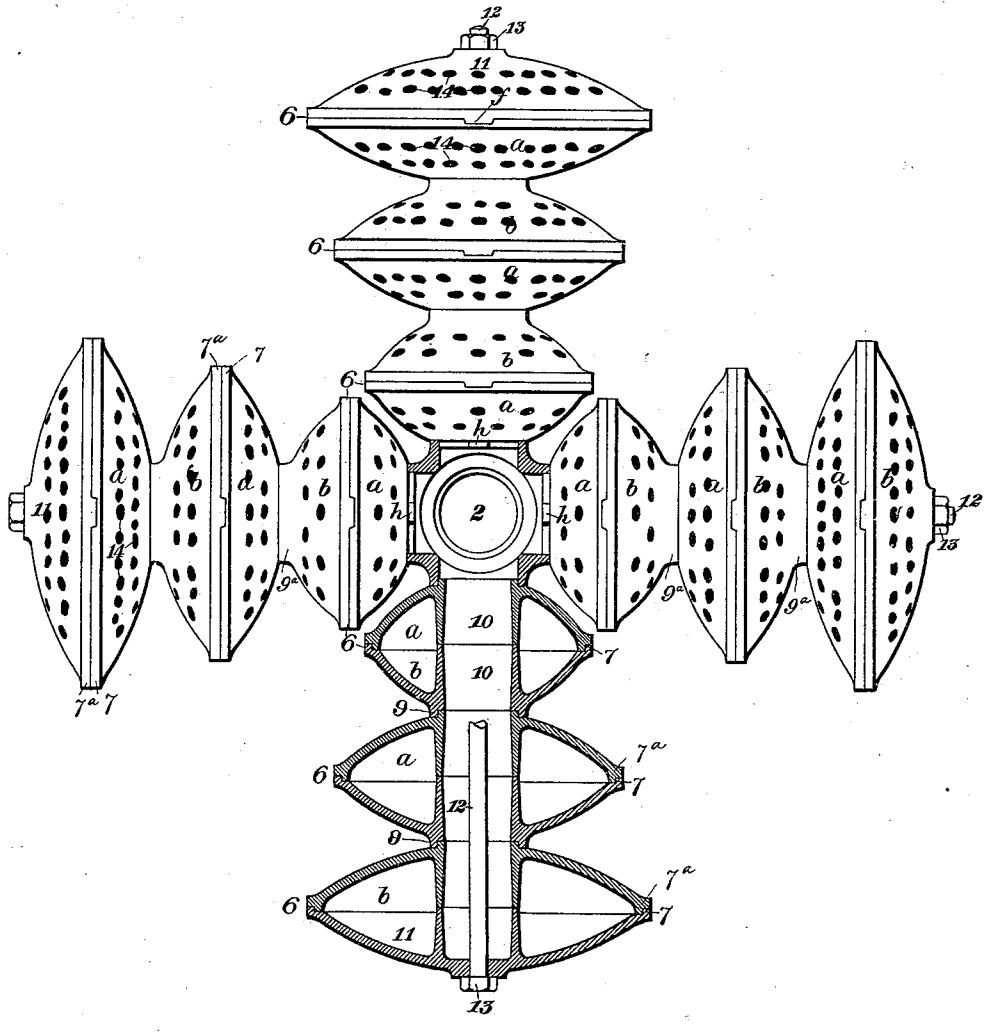
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Fig. 8.



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UNITED STATES PATENT OFFICE.

GEORGE W. LUTZ, OF WHEELING, WEST VIRGINIA, ASSIGNOR OF ONE-HALF TO JOHN S. TRIMBLE, OF SAME PLACE.

GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 392,211, dated November 6, 1888.

Application filed May 10, 1887. Serial No. 237,769. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. LUTZ, of Wheeling, in the county of Ohio and State of West Virginia, have invented a new and useful Improvement in Gas-Burners; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to an improvement in gas-burners for fire-places, stoves, ranges, &c., and is illustrated in the accompanying drawings, wherein—

Figure 1 is a side view of the burner. Fig. 2 is a vertical longitudinal section through the middle line of Fig. 1; Fig. 3, a front view of the central part, 2, of the burner. Fig. 4 is a front view of one of the parts *b*. Fig. 5 is a front view of the part *a*. Fig. 6 is an inside rear view of the part *a*. Fig. 7 is an inside rear view of the part *b*; and Fig. 8 is a plan view, partly in horizontal section, of the burner arranged in duplicate form.

Like symbols of reference indicate like parts in each.

My improved burner is made up of a number of sections, which are connected to form the complete burner, the size of which depends upon the number and size of the sections employed. 2 represents the central section, which is a hollow shell having a gas-inlet tube, 3, at the base and openings 4 at each side provided with annular flanges 5. The other sections, 6, of the burner are arranged on both sides of the central section, 2. Each is composed of two concave or saucer shaped pieces, *a b*, placed face to face and having flanges 7 7^a at their meeting edges, by which they are held firmly together.

At the center of the pieces *a b* are holes. On the outside are flanges 9 9^a around these holes, which enable the adjacent burner-sections to fit closely together, and projecting inwardly from these holes are tubular thimbles or nipples 10, which extend inside the burner-section and meet, as shown in the drawings. At the upper side of these nipples 10 are gas-outlet holes *c*, formed by partially cutting away or notching the thimbles, so that they shall not meet at these places.

The parts of the burner-sections which are next to the central section, 2, and are marked *a*, have projecting concave or trough shaped deflecting-flanges 8, the open under sides of which are directed toward the gas-inlet 3. The ends of these deflectors 8 are somewhat separated, so that as to afford a narrow intervening passage, *d*.

A sufficient number of burner-sections 6 6 are arranged in line in this way to constitute a burner of the proper length, and the outer sides of the end sections are made of concave pieces 11, which, unlike the parts 6, have no openings or ports 8, so that the ends of the continuous burner formed by these sections are closed. The burner-sections are held together by a bolt-rod, 12, passing through holes in the end pieces, 11, and having a head at one end and a nut, 13, at the other, which close the bolt-holes in the end sections, and by means of which nut the sections of the burner may be drawn tightly together.

The jet-holes, through which the gas escapes into the fire-place or stove, are at 14, preferably in the upper parts of the walls of the burner-sections. In order to keep the parts *a* and *b* of the burner-sections in proper relative position, I provide the parts *a* with notches *e* at corresponding places in the flange 7, and provide the parts *b* with tongues *f*, which fit therein. For the same purpose these sections are provided with registering notches and tongues *g* and *h* in the flanges 9 9^a. When thus constructed, the gas-supply pipe is connected to the tube 3 either by being fitted in the unthreaded part *i* or by being screwed in at *i'*. The gas then passes from the supply-pipe into the central section, 2, and thence through the tubular passage formed by the connecting-thimbles 10, and out of the several openings *c* into the burner sections, and thence out of the jet-holes 14.

The function of the deflectors 8 is to catch the entering gas as it passes into the burner and to deflect it laterally, allowing only a portion to pass through the space *d* and into the burner-section 2. These deflectors, together with the thimbles 10, prevent all the gas from passing out of the jet-holes of the first burner-sections of the series, and effect an equal distribution of the gas to the several sections, and the location of the holes *c* on the upper sides, and not on the lower sides of the thimbles, directs the gas into the upper portions of the

burner-sections, where it encounters the greatest heat, and where it is superheated before being discharged.

The lateral location of the jet-openings 14 prevents them from being clogged by the pieces of refractory clay or brick usually placed over natural-gas burners, and the meeting of jets of gas from opposite jet-holes betters the combustion and increases the heat which is derived therefrom. The contiguity of the upper portions of the burner-sections with the hot fire-brick causes the superheating of the gas above noted.

It will be observed that I have shown the central section, 2, of greater height than the other sections. This is the preferable construction, though it is not indispensable, and its purpose is to expose this section to more contact with the hot fire-brick, and thus to secure a greater initial heating of the gas before it passes into the adjacent chambers.

Of course the gas may be mingled with air on its introduction into the gas-burner by means of an ordinary air-mixer, or the gas may be introduced alone.

The burner may be modified in form without departing from the broad principles of my invention. For example, the burner-sections may be made spherical instead of the oblate form shown in the drawings. The gas-passages formed by the thimbles 10 need not be in the central line of the burner, the gas-spaces *c* may be extended all around the thimbles, and the burner may be otherwise modified by the skilled mechanic.

The advantages which the burner affords are that it is not liable to warp or crack and to leak gas at the joints, as is the case with many of the burners now in common use; the lateral situation of the jet-holes keeps the gas-exits clear of the fire-brick; the meeting jets better the combustion, and the burner may be lengthened or shortened to suit the size of any grate by a simple addition or subtraction of sections.

As shown in Figs. 1, 2, and 5, the burner is contracted in diameter between adjacent burner-sections 6, and when it is set in position in the fire-place these contracted portions afford open passages through which the air may enter the fire-place from below. A free supply of air to the fire-place is thus secured, and by contact with the metal of the burner in its passage between the burner-sections the air is somewhat heated before reaching the gas-jets. The air is also caused by this peculiar shape of the burner to mingle very intimately with the gas as it escapes from the jet-holes. The result is, a very thorough combustion is had and as much heat as possible is obtained from the gas.

When it is desired to use the burner for the purpose of burning garbage or refuse, the position of the sections may be reversed, so that the gas-jet holes 14 shall be on the under instead of the upper part of the burner. This keeps the holes clear of the ashes, which can fall down through the spaces formed by the contracted parts between the burner-sections, and by reason of the curved convex form of the burner-sections the ashes will not lodge and choke the burner in the manner incident to most of the burners now in common use. The advantages of the burner in this regard may be had by making the burner in integral or permanently connected sections instead of having them separable, as shown in the drawings.

The burner which I show in Figs. 1 and 2, and which I have described above, is designed for use in open fire-places. For use in stoves and heating-furnaces I have devised the form of burner shown in Fig. 8, in which the central burner-section, 2, has four lateral openings, diametrically opposite to each other, and four lines of burner-sections project radially from the central section, instead of the two lines shown in the other form. The sections of each line increase in size and area of jet-openings from the center outward, so as to distribute the gas more evenly to all parts of the stove or furnace. Otherwise than as above noted, the construction of this form of burner is the same as that which I described above.

Without limiting the scope of my invention to the precise form of the parts which I show, and without limiting the item of invention specified in each claim by those specified in other claims, I claim as my invention—

1. In a gas-burner, the combination of gas-chambers, each chamber having contracted gas inlets or ports of less diameter than that of the chamber to admit of expansion of the gas after admission to said chamber, said chambers having jet-orifices, and said chambers arranged in series and communicating, substantially as and for the purposes specified.

2. The combination of a series of communicating burner-sections, each section composed of two concave pieces having gas inlets or ports and jet-orifices, said pieces arranged with their concavities facing, substantially as and for the purposes specified.

3. In a gas-burner, the combination, with a series of burner-sections, each section having gas-ports and jet-orifices, of a tie-rod connecting said burner-sections, which rod passes through the gas-ports of the several burner-sections, substantially as and for the purposes specified.

4. In a gas-burner, the combination of a series of communicating burner-sections having gas-jet orifices, each section composed of two concave pieces having internally-projecting distributing-thimbles, said pieces arranged with their concavities facing, substantially as and for the purposes specified.

5. In a gas-burner, the combination of a distributing-chamber having a gas-supply, separate chambers arranged on both sides thereof and communicating therewith, said distributing-chamber and the other chambers having gas-jet holes, and deflectors 8 on both sides of

the distributing-chamber, which deflect the gas into the other chambers, substantially as and for the purposes described.

6. In a gas-burner, the combination of a distributing-chamber and series of burner-sections, which sections are progressively of larger size as they recede from the distributing-chamber and have increasing areas of jet-orifices in like progression, substantially as and for the purposes specified.

7. In a gas-burner, the combination of a series of distinct gas-chambers arranged in line and connected by contracted passages, said chambers having jet-orifices in the opposed faces, whereby the escaping jets shall converge and cross the air-currents, substantially as and for the purposes specified.

8. In a gas-burner, the combination of gas-chambers, each chamber having contracted gas inlets or ports of less diameter than that of the chamber to admit of expansion of the gas after admission to said chamber, said chambers having jet-orifices, and said chambers being circular in cross-section and with rounded ends, arranged in series and communicating, substantially as and for the purposes specified.

In testimony whereof I have hereunto set my hand this 6th day of May, A. D. 1887.

GEORGE W. LUTZ.

Witnesses:
LOUIS E. SCHRADER,
LOUIS F. STIFEL.