(No Model.)

A. B. LIPSEY.

GAS BURNER.

No. 300,988. Patented June 24, 1884.

Fig. 1.

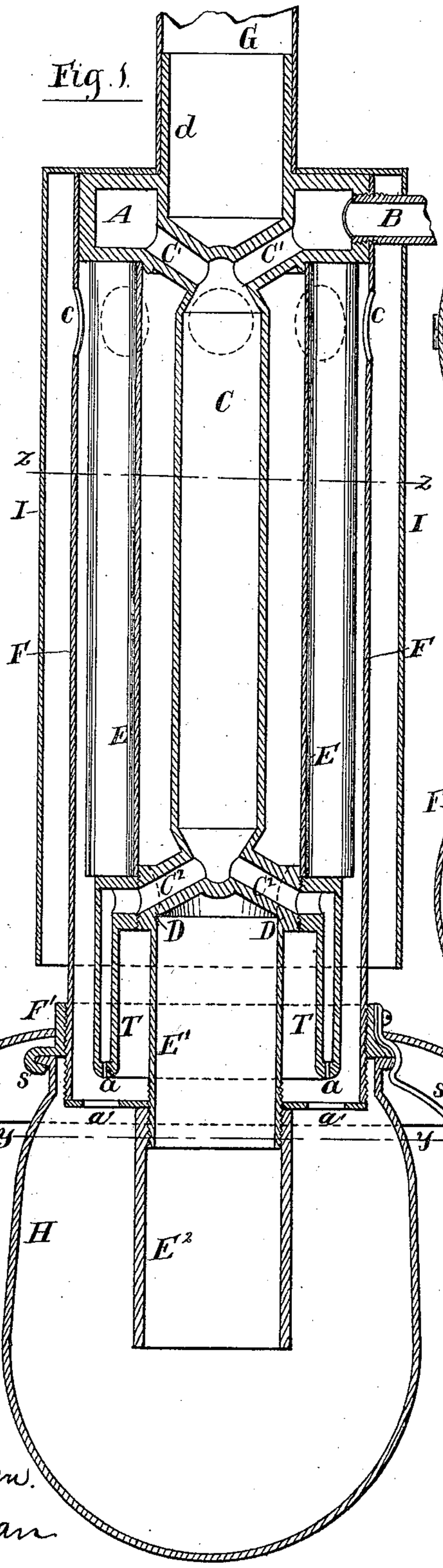


Fig. 2.

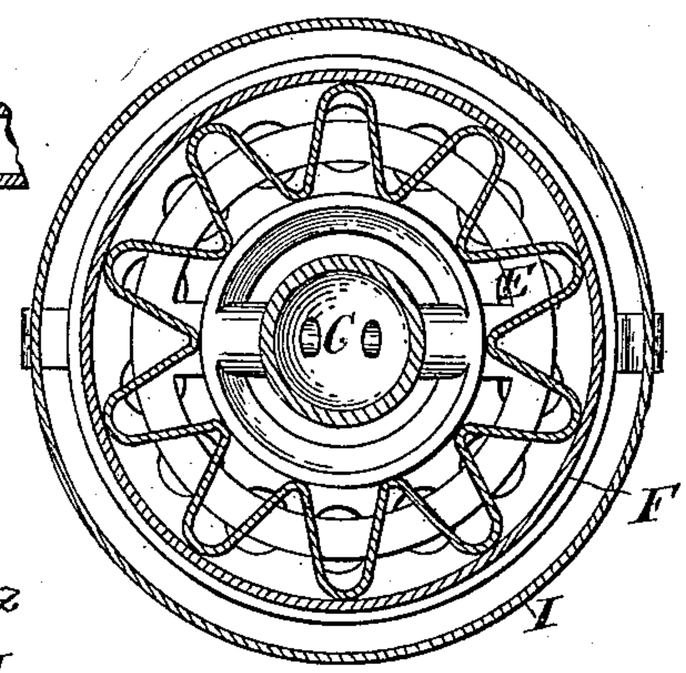
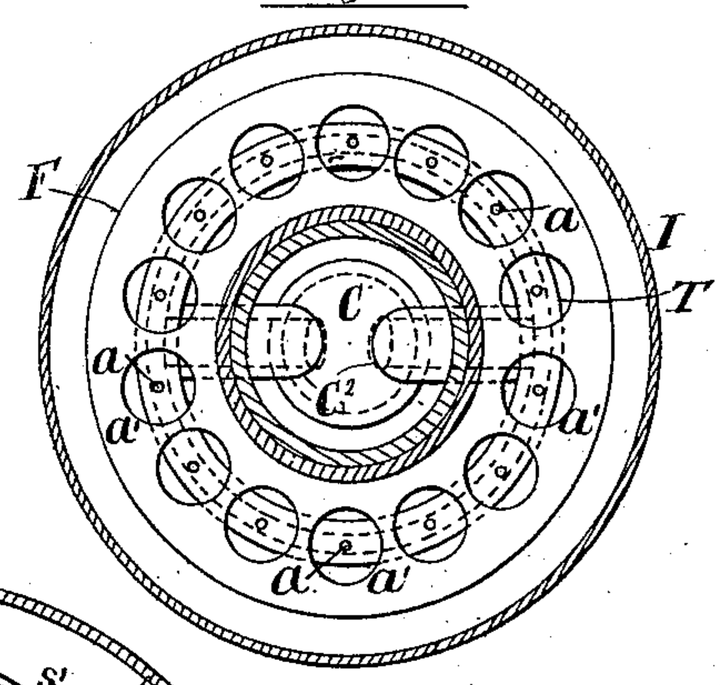


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

ANDREW B. LIPSEY, OF WEST HOBOKEN, NEW JERSEY, ASSIGNOR TO WILLIAM BELL, OF NEW YORK, N. Y.

GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 300,988, dated June 24, 1884.

Application filed June 6, 1883. (No model.)

To all whom it may concern:

Be it known that I, ANDREW B. LIPSEY, of West Hoboken, in the county of Hudson and State of New Jersey, have invented a certain new and useful Improvement in Gas-Burners, of which the following is a specification.

The object of my present improvement is to provide for very effectively heating the air and gas which pass to the burner, so as to enhance the brilliancy of the flame issuing from the burner.

In the accompanying drawings, Figure 1 is a central section of a burner embodying my improvement. Fig. 2 is a transverse section of the same, taken on the plane of the line *z z*, Fig. 1; and Fig. 3 is a horizontal section taken at the plane of the dotted line *y y*, Fig. 1.

Similar letters of reference designate corresponding parts in all the figures.

The air enters at the bottom of a shell, I, and passing upwardly between this shell and a shell, F, enters the air flue or passage proper. The air flue or passage proper consists of a space between the shell F and a shell, E. The shell E is corrugated, as shown best in Fig. 2, and its outer portion extends to or nearly to the shell F. The extent of its surface is very much increased by corrugating it.

T designates a downwardly-extending annular burner-tip.

C designates a gas-passage extending downwardly within the shell E, and arranged concentrically therewith. This gas-passage is united by branch passages C′ with an annular gas-chamber, A, at the upper end, and at the lower end it is united by branch passages C, which communicate with the burner-tip and convey gas thereto. Gas is supplied to the annular gas-chamber by a pipe, B, leading from any suitable source. The burner-tip is screwed onto the ends of the branch passages C^2, and has ducts or chambers D, which communicate with the interior of these branch passages C^2 and convey gas thence to the interior of the burner-tip. The shell E extends from the annular gas-chamber A to the burner-tip. Air passes from the space between the shell F and the shell E, not only to the exterior of the burner-tip, but also to the space encircled by the burner-tip. To reach this space it has to pass between the branch passages C^2.

From the branch passages C^2 there extends a shell, E′, which communicates between said branch passages with the interior of the shell E.

At the lower end of the shell F, I arrange a diaphragm provided with holes *a′* opposite apertures *a* in the burner-tip, whence the gas issues. These holes *a′* cause the air to impinge against the jets of gas which issue from the apertures *a* of the burner-tip. This diaphragm is shown as made integral with a shell, E^2, and with this shell E^2 is screwed onto the shell E′. The shell E^2 extends a long distance below the burner-tip.

The holder F′ for the globe or casing H is screwed onto the lower portion of the shell F, and is provided with two claws, *s*, and a spring-catch, *s′*, which engages with a laterally-extending flange on the globe or casing H. By pulling out the spring-catch the globe or casing will be released, and may be removed. A reflector, F^2, made separate from the holder, but mounted thereon, is used. The globe or casing H is intended to be made of glass. The space encircled by the annular gas-chamber communicates between the branch passages C′ with the interior of the shell E. A flange, extending from the top of the gas-chamber in line with the inner wall of the gas-chamber, has fitted to it a chimney, G, which may be of sheet metal, and of any suitable length. The extension E^2 of the shell E′ may be made of magnesia or lime. The gas issuing from the burner burns in a flame around the shell E^2, and the waste products of combustion pass around the end of this shell into its interior, thence into the shell E′, thence between the branch passages C^2 into the interior of the shell E, thence between the branch passages C′, and finally into the chimney G. Passing entirely around the gas-passage C and its branch passages C′ C^2 under the gas-chamber and through the space encircled by the latter, they thoroughly heat the gas before its arrival at the burner-tip. Owing to the very extensive interior surface of the shell E, which forms the inner wall of the air flue or passage proper, the products of combustion also heat the air very effectively before it arrives at the

flame. A circular arrangement of burner-tips might be used in lieu of a single annular burner-tip.

I am aware that a gas-passage arranged wholly within a passage for conveying away the waste products of combustion from a gas-burner is old.

I have obtained Letters Patent No. 278,568, dated May 29, 1883, for an improvement in gas-burners. In this improvement a gas-pipe passed upwardly into a flue, by which the waste products of combustion were conveyed away; and from the upper end of this gas-pipe a number of smaller gas-pipes extended downwardly to a large gas-pipe surrounding the gas-pipe first mentioned and communicating with the burner-tip.

I have also obtained Letters Patent No. 282,337, dated July 31, 1883, for an improvement in gas-burners. In this improvement I employed an annular gas-chamber and a number of passages extending thence through a pipe which conveyed away the waste products of combustion.

I have filed an application, No. 77,087, on the 4th day of November, 1882, for an improvement in gas-burners. This improvement involves the same construction of burner as that which is the subject of my Letters Patent No. 282,337.

I have also filed an application, No. 99,750, on the 2d day of July, 1883, for an improvement in gas-burners. In this improvement there were the same parts as mentioned in my reference to Letters Patent No. 282,337; but these parts were in the last improvement differently arranged and combined.

I have also filed an application, No. 110,490, July 11, 1883, for a patent for an improvement in gas-burners. In this improvement I show a very large cylindric gas-chamber, through which the gas will flow or pass quite sluggishly, and in this chamber I arrange a number of pipes which conduct away to a chimney the products of combustion that emanate from the burner tip or tips. These pipes are so small and numerous that they secure the heating of the gas in the gas-chamber at all points, and at the same time they afford a passage for the products of combustion, which in the aggregate is so large that the products of combustion can pass away easily.

I have also filed an application, No. 109,176, on the 16th day of October, 1883, for an improvement in gas-burners. The construction of this burner is like that which is the subject of my application for Letters Patent No. 99,750, except for the presence of a deflector arranged between the burner-tips for directing air to the inside of the flame from one burner-tip and the outside of another.

I have also filed an application, No. 114,969, on the 18th of December, 1883, for an improvement in burners. The construction of this burner is very similar to that which is the subject of my Letters Patent No. 282,337. It differs therefrom principally in that in this burner I show a flue for carrying off the products of combustion, and a retort arranged in said flue in such a position as to be subjected to escaping products of combustion, a hydrocarbon or oil tank connected thereto, and means for connecting the retort with the burner-tip, and a gas-holder, means for connecting the retort with the gas-holder, and means for connecting the gas-holder with the burner. In the present application I show an annular gas-chamber and a concentrically-arranged gas-passage extending downwardly therefrom and communicating with the burner-tip. Surrounding this gas-passage is a corrugated shell, the interior of which forms a flue for conveying away the waste products of combustion, and the exterior of which forms one wall of an air-passage.

In none of my former patents or applications is the above construction shown.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a gas-burner, the combination of a downwardly-extending burner tip or tips, a flue or passage for conducting air thereto, and a flue or passage for conveying away the waste products of combustion, the exterior wall of the waste flue or passage and the inner wall of the air flue or passage being formed by a corrugated shell, substantially as specified.

2. In a gas-burner, the combination of a downwardly-extending burner tip or tips, an annular gas-chamber, a gas-passage, branch gas-passages connecting the upper end of said passage with said annular chamber, and other branch gas-passages connecting its lower end with said burner tip or tips, and a flue or passage for conveying away the waste products of combustion, surrounding the main gas-passage from its upper to its lower end, substantially as specified.

3. In a gas-burner, the combination of a burner tip or tips, an air flue or passage surrounding the same, so that both air and gas will be caused to flow in the same direction, and a diaphragm extending across the air-flue or passage beyond the burner tip or tips, and having perforations opposite the holes or apertures whence the gas issues from the burner tip or tips, substantially as specified.

ANDREW B. LIPSEY.

Witnesses:
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