

No. 684,921.

Patented Oct. 22, 1901.

L. DENAYROUZE.
BURNER FOR INCANDESCENT GAS LIGHTS.

(Application filed Apr. 30, 1901.)

(No Model.)

FIG. 1.

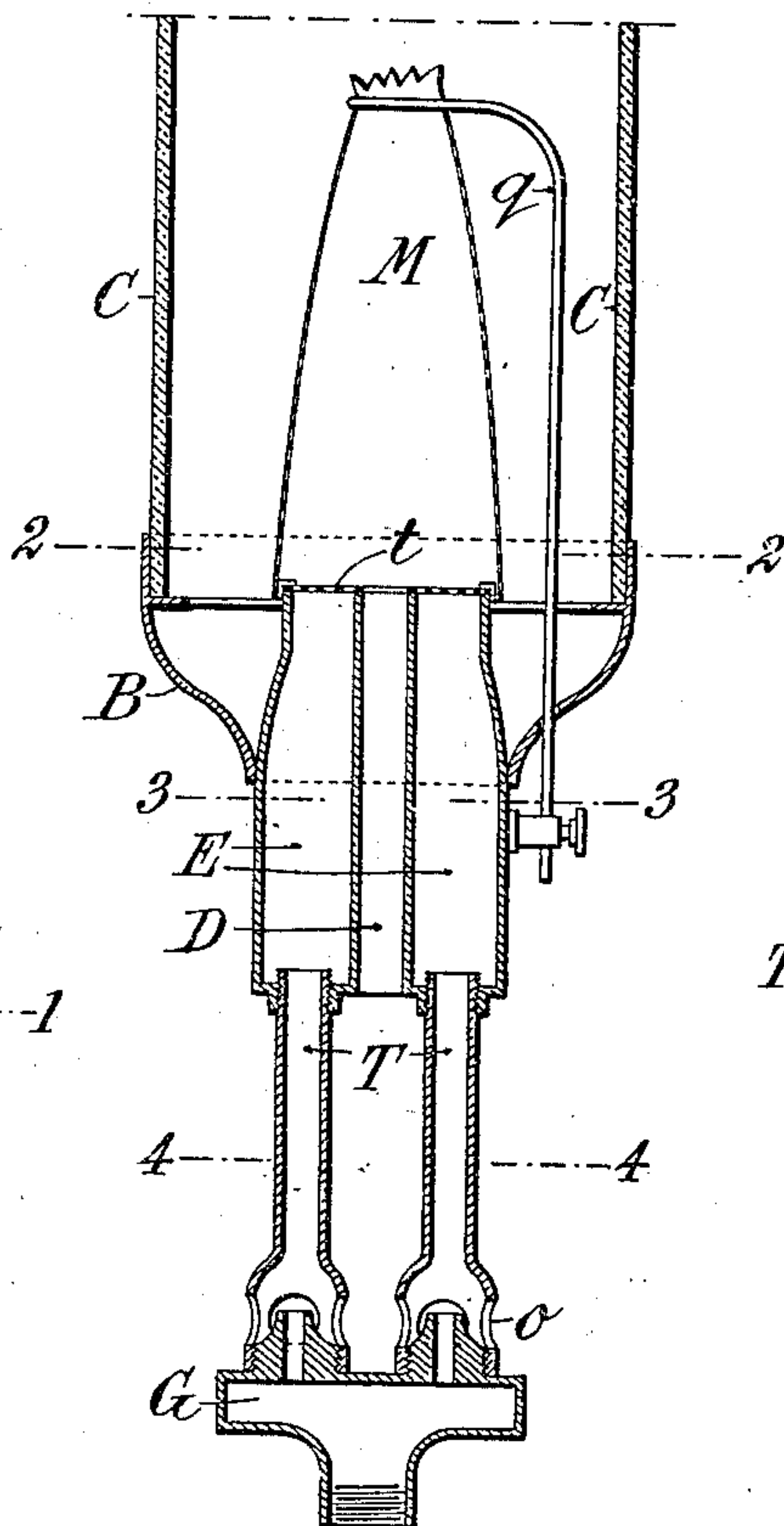


FIG. 3.

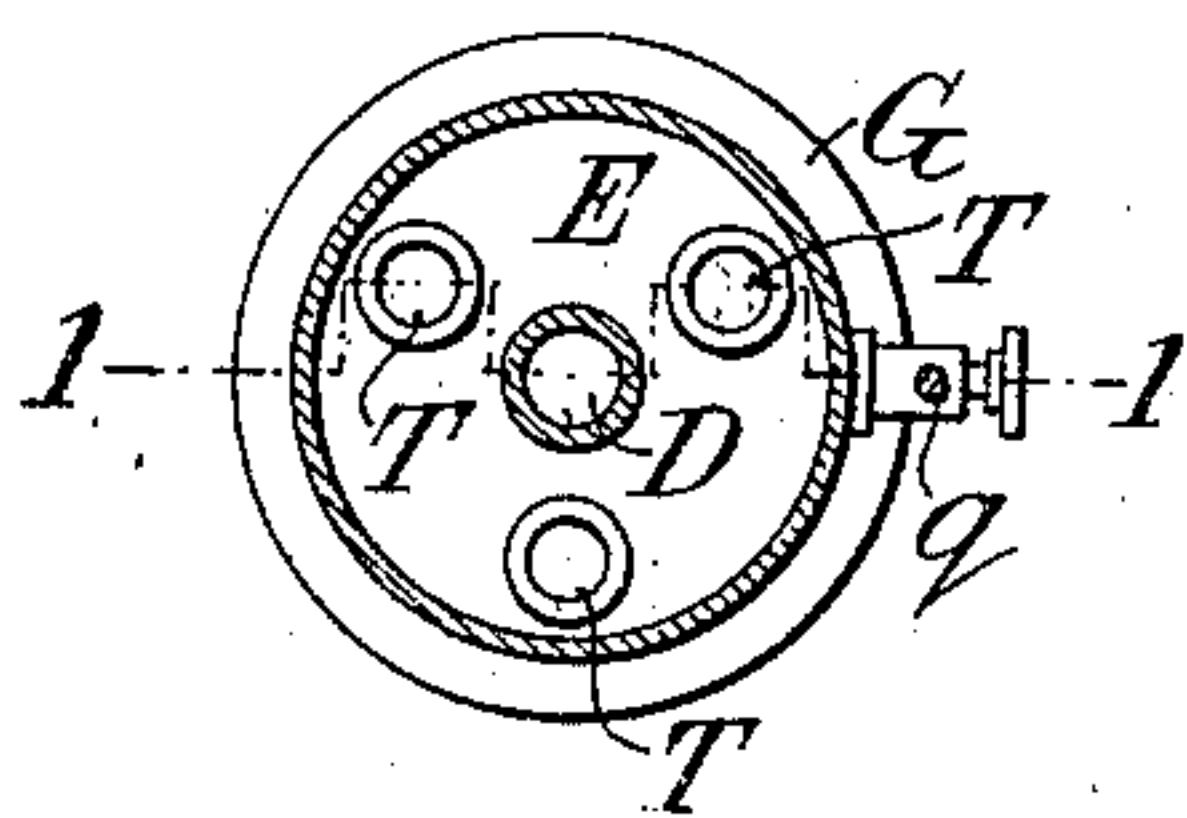


FIG. 4.

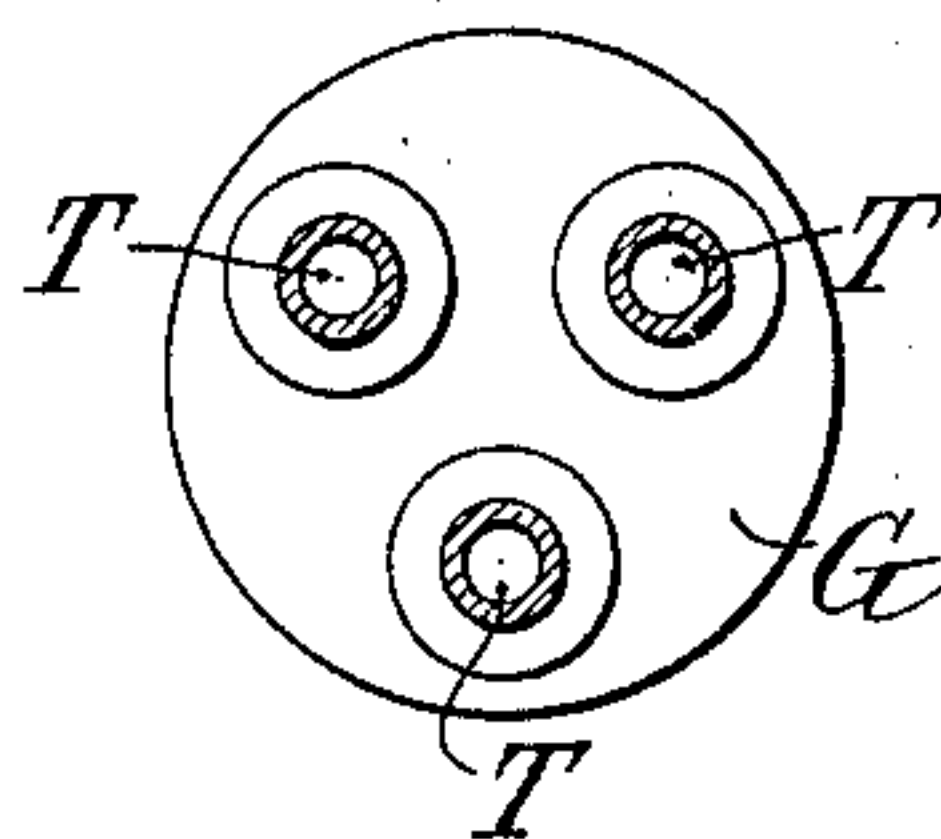
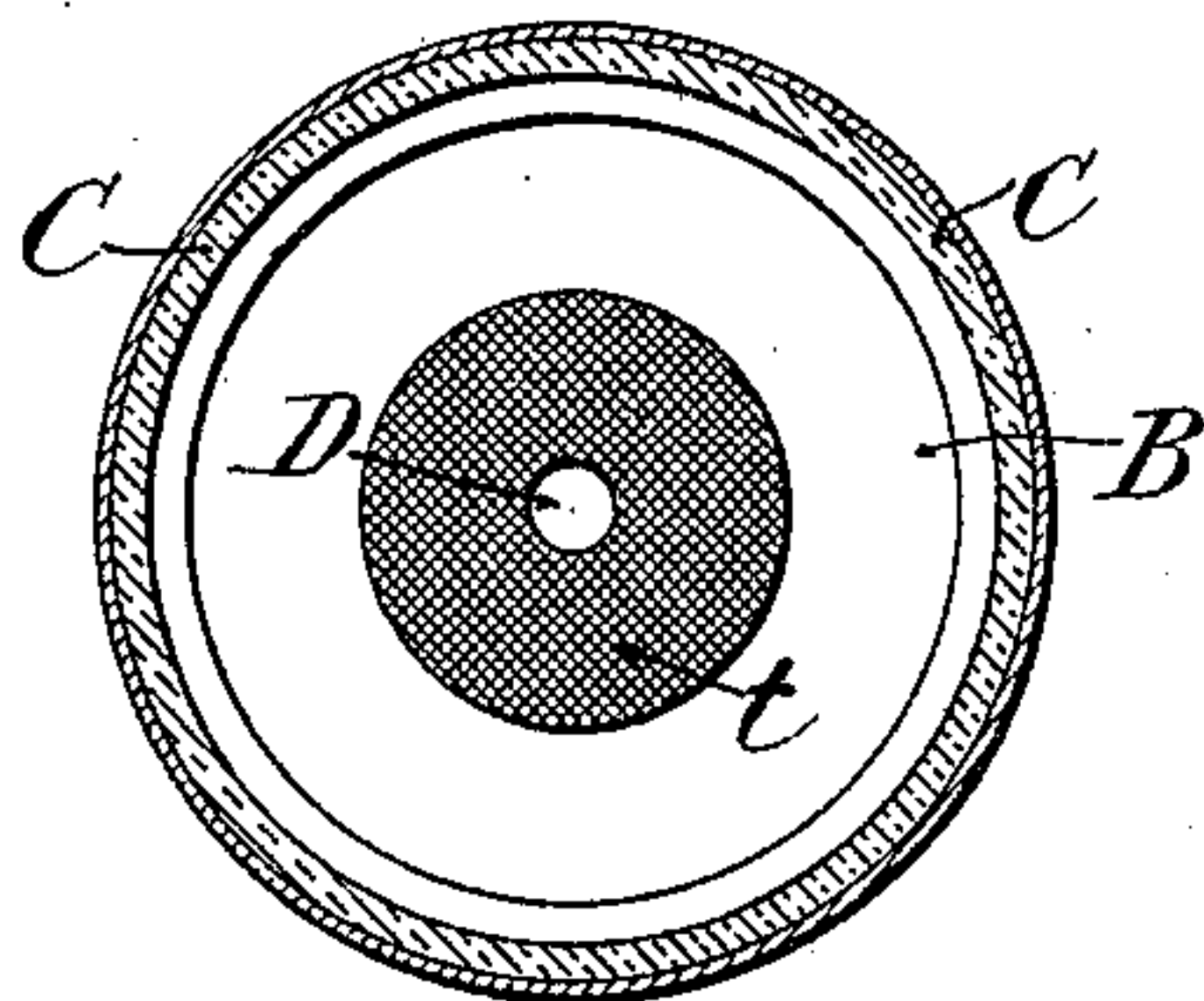


FIG. 2.



WITNESSES:

Ired White
Rene' Brune

INVENTOR:

Louis Denayrouze,

By Attorneys,

Julien C. Dresner & Co.

UNITED STATES PATENT OFFICE.

LOUIS DENAYROUZE, OF NEUILLY-SUR-SEINE, FRANCE.

BURNER FOR INCANDESCENT GAS-LIGHTS.

SPECIFICATION forming part of Letters Patent No. 684,921, dated October 22, 1901.

Original application filed July 8, 1897, Serial No. 643,794. Divided and this application filed April 30, 1901. Serial No. 58,208. (No model.)

To all whom it may concern:

Be it known that I, LOUIS DENAYROUZE, a citizen of the Republic of France, residing in Neuilly-sur-Seine, (Seine,) France, have invented certain new and useful Improvements in Burners for Incandescent Gas-Lights, of which the following is a specification.

This invention is the subject-matter of Letters Patent in France, No. 259,985, dated September 25, 1896; in Belgium, No. 123,759, dated September 28, 1896; in Austria, No. 46/4,466, dated November 4, 1896; in Italy, No. 42,772, dated October 4, 1896; in Great Britain, No. 28,491, dated December 12, 1896, and in Switzerland, No. 14,035, dated January 27, 1897.

This is a division of my application filed July 8, 1897, Serial No. 643,794. (Patent No. 673,705, granted May 7, 1901.) In that application I have set forth certain improvements in gas-burners for use with refractory mantles, the object being to obtain a more brilliant light with a smaller consumption of gas. This object is attained according to the invention set forth in my said application by effecting an absolutely intimate mixture of gas and air in suitable proportions and by maintaining a very small pressure of the mixture at the burner with a sufficient velocity of the mixture discharged within the mantle.

The invention which forms the subject of my present divisional application has the same objects in view and provides an alternative means of attaining these objects.

Figure 1 of the accompanying drawings is a vertical section cut in the plane denoted by the line 1 1 in Fig. 3, showing the preferred form of my invention. Fig. 2 is a transverse section thereof, cut on the line 2 2 in Fig. 1. Fig. 3 is a transverse section thereof, cut on the line 3 3 in Fig. 1. Fig. 4 is a transverse section thereof, cut on the line 4 4 in Fig. 1.

In my aforesaid application for patent I have illustrated the principle underlying my invention by reference to an ordinary Bunsen burner. From the top of the tube of such burner the flame expands toward the middle of its height, and thence tapers toward a point at its top. (See Fig. 1 of Patent No. 673,705.)

In the lower part of the flame is a relatively dark conical core, around which is a brighter

or luminous zone. In such flame the mixture is incomplete beneath the level of the apex of the dark core. According to the form of my invention set forth in my said application I divide such Bunsen flame by a foraminous or gauze screen placed horizontally shortly above where the apex of such dark core would occur and confine the ignition to the space above this screen, and I inclose the space below the screen in an envelop or shell conforming approximately to the shape of the lower and expanding portion of such flame, (see Fig. 2 of said patent,) whereby this space below the screen constitutes a mixing-chamber adapted to effect an intimate admixture of the gas and air, which mixture on issuing through the interstices of the gauze screen burns in a solid or coreless flame, which is enveloped by the mantle. The heat thus generated is very great, and the mantle is raised to a luminosity greatly exceeding that of an ordinary Welsbach mantle in burners heretofore constructed. The burner will burn without a chimney by reason of the perfect mixture of the gas and air. The use of a chimney, however, arranged so that the suction created thereby acts mainly upon the air which must pass into the mantle further improves the mixture and increases the velocity of the mixture beneath the mantle, thereby increasing the luminosity.

The arrangement of the parts thus far described has given very satisfactory results; but I have found that, especially when a plurality of Bunsen tubes is employed, a certain additional air-supply from below serves to produce a still more thorough mixture of air and gas.

Referring now to the drawings, let T T designate a plurality of Bunsen tubes forming a group in any suitable number, three being shown. These tubes receive gas from nozzles at their bases in the usual way, the gas entering from a chamber G, connected with the supply-pipe, and receive air at their bases through suitable inlet-openings o o, as usual. The upper ends of the tubes T T are connected to a mixing-chamber E of annular shape, its height being greater than that of the internal dark cores which flames from the Bunsen tubes. 100

sen tubes T T would have if these tubes were employed as ordinary Bunsen burners. The top of this mixing-chamber E is covered over by a foraminous metallic screen or gauze *t*, which prevents communication of the flame to the mixed gases within the chamber. The usual mantle M is mounted above this screen *t*, being supported in any suitable manner, as by a rod *q*.

The ascending streams of gas and air in the tubes T T expand on entering the larger area of the chamber E and in ascending through this chamber become intimately commingled, so that upon issuing through the screen *t* the mixture burns with intense heat within the mantle.

It is preferred to use a chimney to further improve the mixture and to increase the velocity beneath the mantle. I show in Fig. 1 a chimney or globe C, which is placed upon a closed socket B, which is connected in a substantially air-tight manner to the envelop or shell forming the mixing-chamber E. This socket B does not permit air to be drawn directly into the chimney outside of the chamber E, as with usual burners. Hence the draft is made more effective to draw in air at the holes *o* of the Bunsen burners.

Through the center of the mixing-chamber E is a tube D, through which air in the form of a central column is drawn and freely admitted to the center of the mantle M. This column of pure air slightly pushes the mixture of air and gas issuing from the annular chamber E against the surface of the mantle. By this lateral action from the center toward the mantle the molecules of mixed air and gas are more thoroughly mixed and for a longer time, so that even at a low pressure and under the action of a globe concentrating the draft at the lower part of the Bunsen jet a high illuminating effect is obtained.

It will be seen that whatever the pressure of the gas in the distributing-pipe may be it is possible by means of a suitable chimney to create artificial draft by the waste gases of combustion. My improved burner provides the advantage of a perfect mixture of the gas and air, maximum velocity due to the draft, and conservation of a high temperature around the mantle, whereby the luminous effect is very brilliant and the consumption of gas is reduced to a few liters per carcel.

In applying my invention I may make use, in connection with the parts here shown, of any of the features or details of the apparatus shown in my said original application. For example, I may surmount the chimney C by an elongated draft-tube of smaller diameter to the effect therein set forth.

I claim as my invention the following defined novel features, substantially as hereinbefore specified, namely:

1. In a gas-burner, the combination of one or more mixers, a chamber located above and communicating with said mixers and of

greater height than that which would be assumed by the blue cores of flames issuing from such mixers, a draft-tube passing through said chamber, a screen closing the top of the chamber, and a mantle surmounting the chamber, substantially as and for the purpose set forth.

2. In a gas-burner, the combination of one or more mixers, a chamber located above and communicating with said mixers and of greater height than that which would be assumed by the blue cores of flames issuing from such mixers, a draft-tube passing through said chamber, a screen closing the top of the chamber, a mantle surmounting the chamber, and a chimney surrounding the mantle and closed at its lower end, substantially as and for the purpose set forth.

3. A Bunsen burner having a mixing-chamber surmounting the tube thereof, of greater height than that which would be assumed by the dark core of a flame issuing from said tube, and expanding to a diameter equal to the greatest diameter of such flame, and a gauze screen covering the top of said chamber, said chamber being free from any obstruction to the vertical flow of the gases, whereby the flame is confined to the space above said gauze and the flame is solid or devoid of a dark core, combined with an incandescent mantle surmounting such chamber and inclosing the flame above said gauze, and a draft-tube opening beneath to the atmosphere and passing through said chamber to admit air to the interior of the flame to press the latter outwardly against the mantle.

4. The combination with a group of Bunsen burners, of a mixing-chamber surmounting their tubes, of greater height than that which would be assumed by the dark cores of flames issuing from said tubes, a draft-tube passing up centrally through said chamber, a gauze screen covering the top of said chamber, and a single incandescent mantle surmounting said chamber, said draft-tube opening beneath to the atmosphere and admitting air to the interior of the flame and pressing the latter outwardly against the mantle.

5. The combination with a group of Bunsen burners, of a mixing-chamber surmounting their tubes, a gauze screen covering the top of said chamber, a mantle surmounting said chamber, a draft-tube passing up centrally through said chamber to admit air to the interior of the flame to press the latter outwardly against the mantle, and a chimney inclosing the mantle substantially closed at its bottom to prevent any material direct access of air and to substantially confine the entering air to that which passes through the Bunsen burners and through said draft-tube.

6. The combination with a group of Bunsen burners, of a mixing-chamber surmounting their tubes, a gauze screen covering the top of said chamber, an incandescent mantle

surmounting said chamber, a draft-tube passing up centrally through said chamber, an enlarged chimney inclosing said mantle substantially closed at its bottom, and an elongated draft-tube surmounting said chimney and of smaller diameter than the chimney.

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In witness whereof I have hereunto signed

my name in the presence of two subscribing witnesses.

LOUIS DENAYROUZE.

Witnesses:

ARMENGAUD, Jeune,
MARCEL ARMENGAUD.