

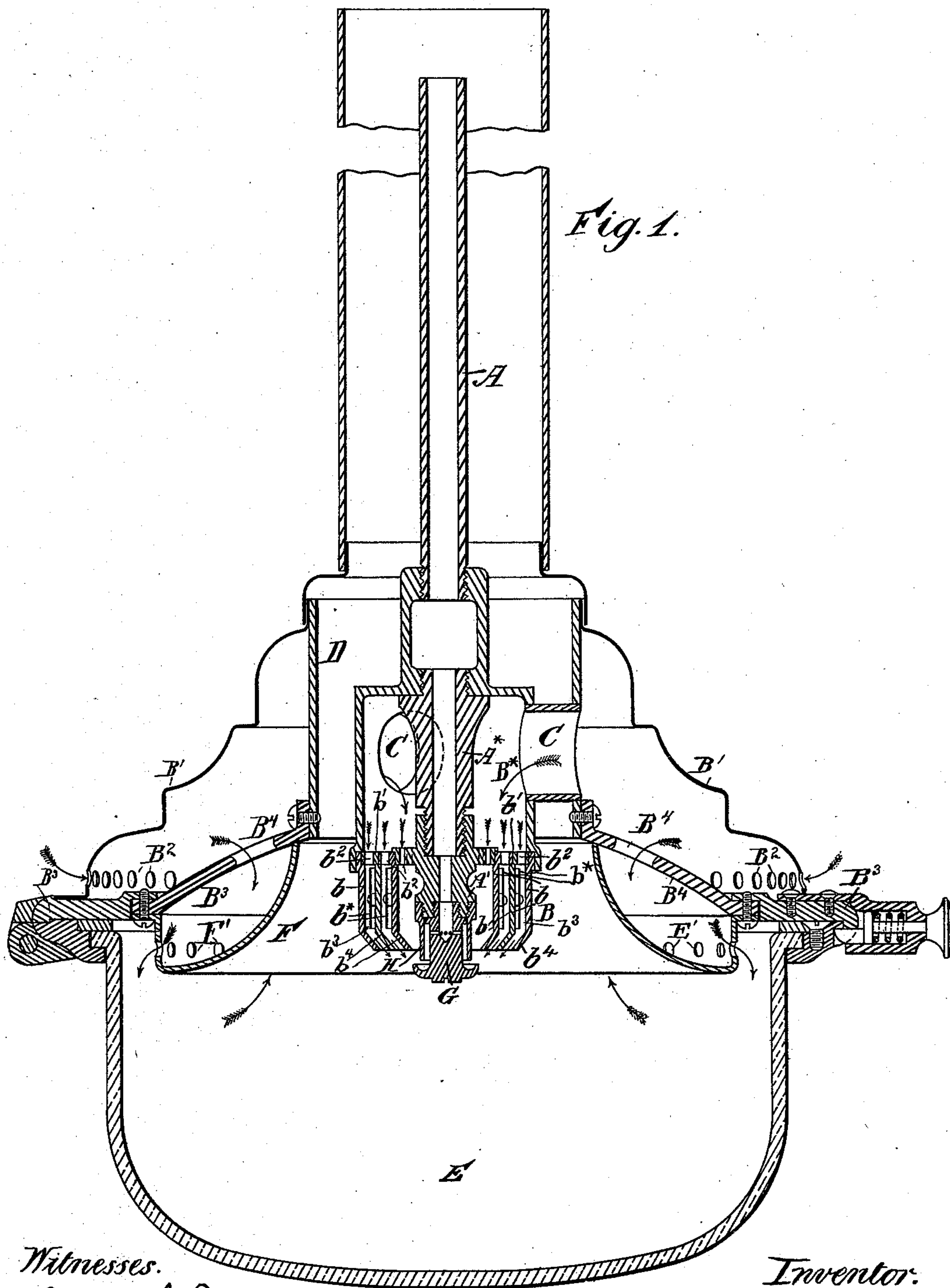
(No Model.)

4 Sheets—Sheet 1.

T. C. J. THOMAS.
GAS LAMP.

No. 402,204.

Patented Apr. 30, 1889.



Witnesses.

Charles C. Brougham.
W. G. Ridgway

Inventor.

T. C. J. Thomas

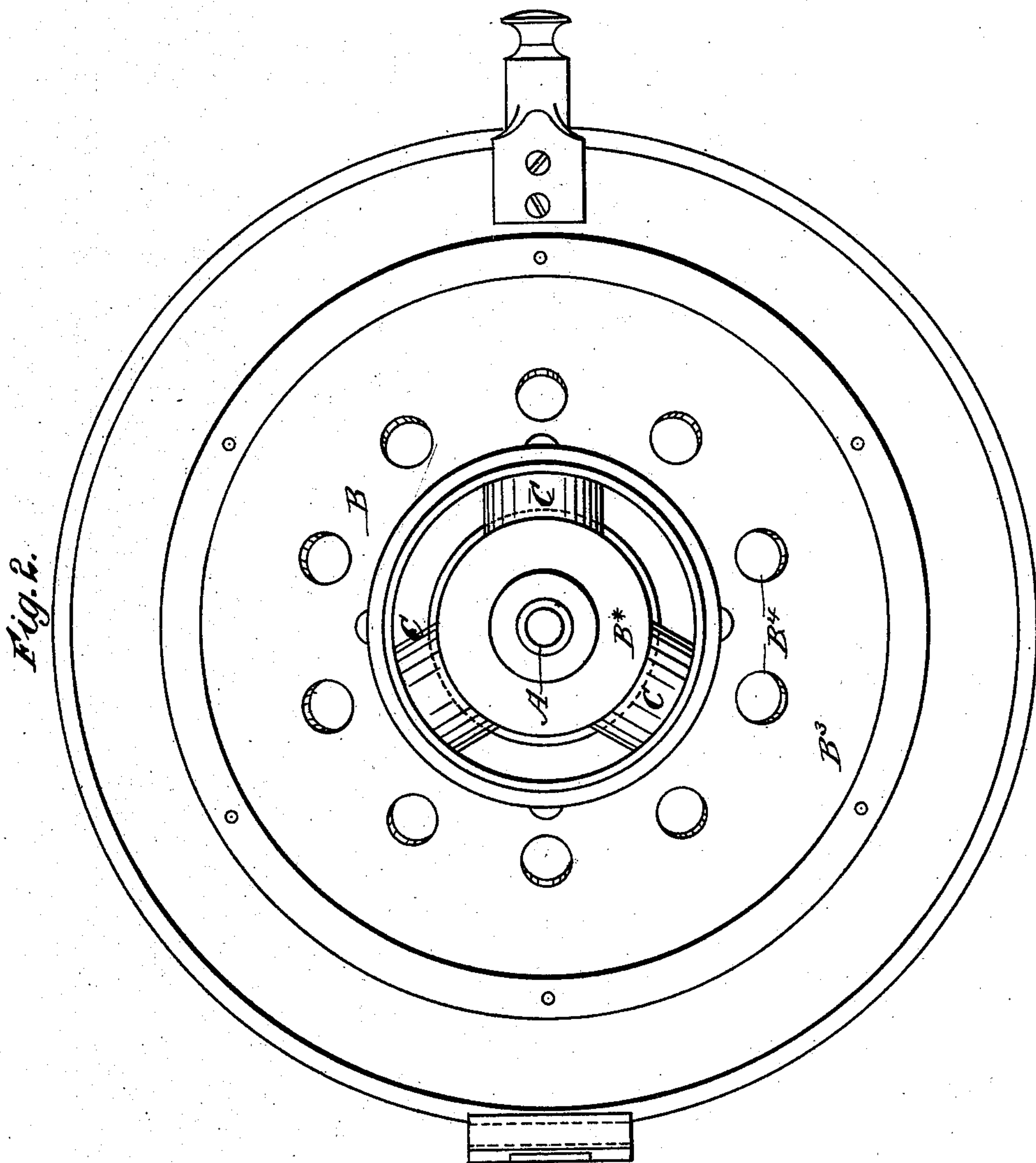
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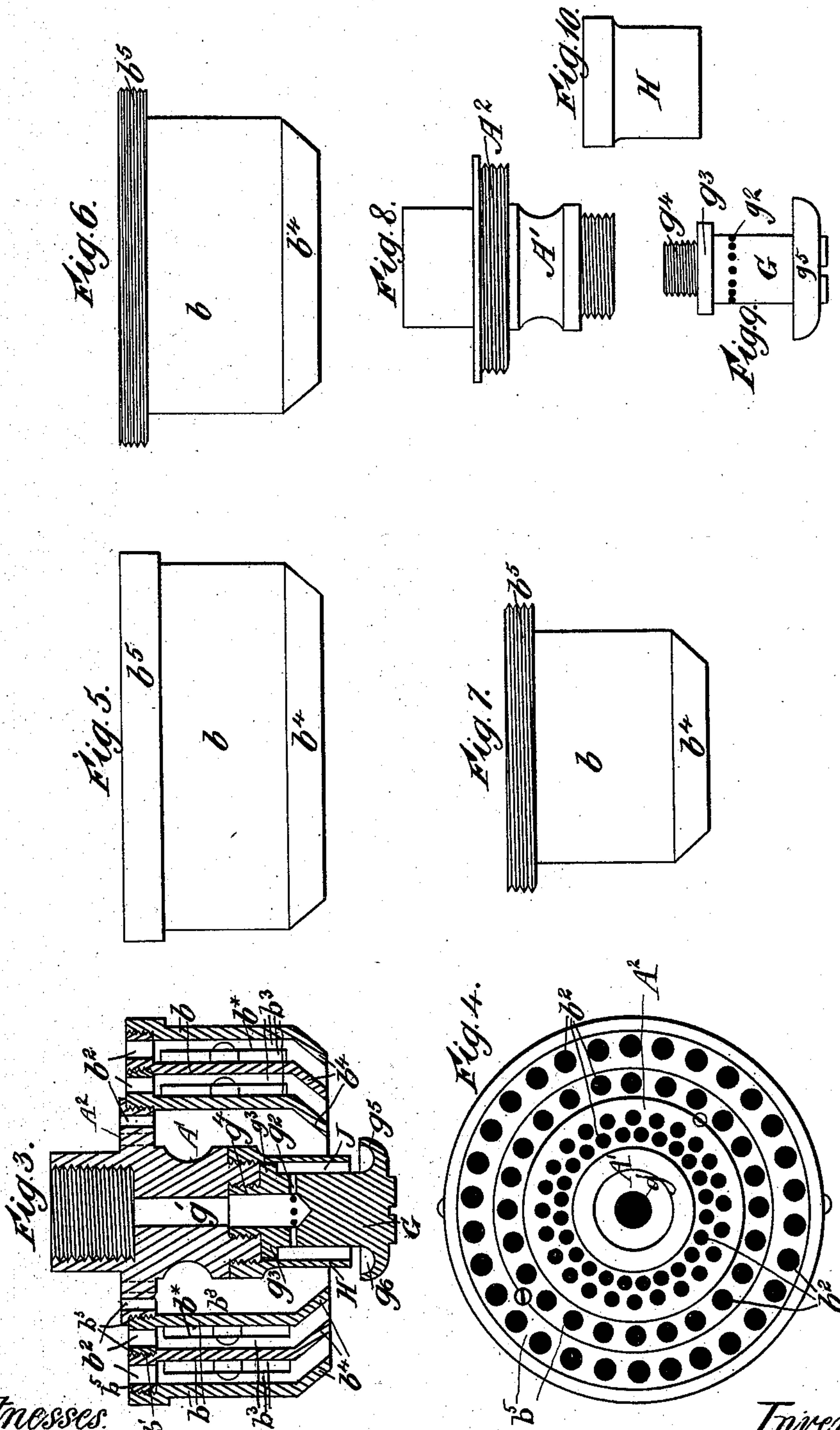
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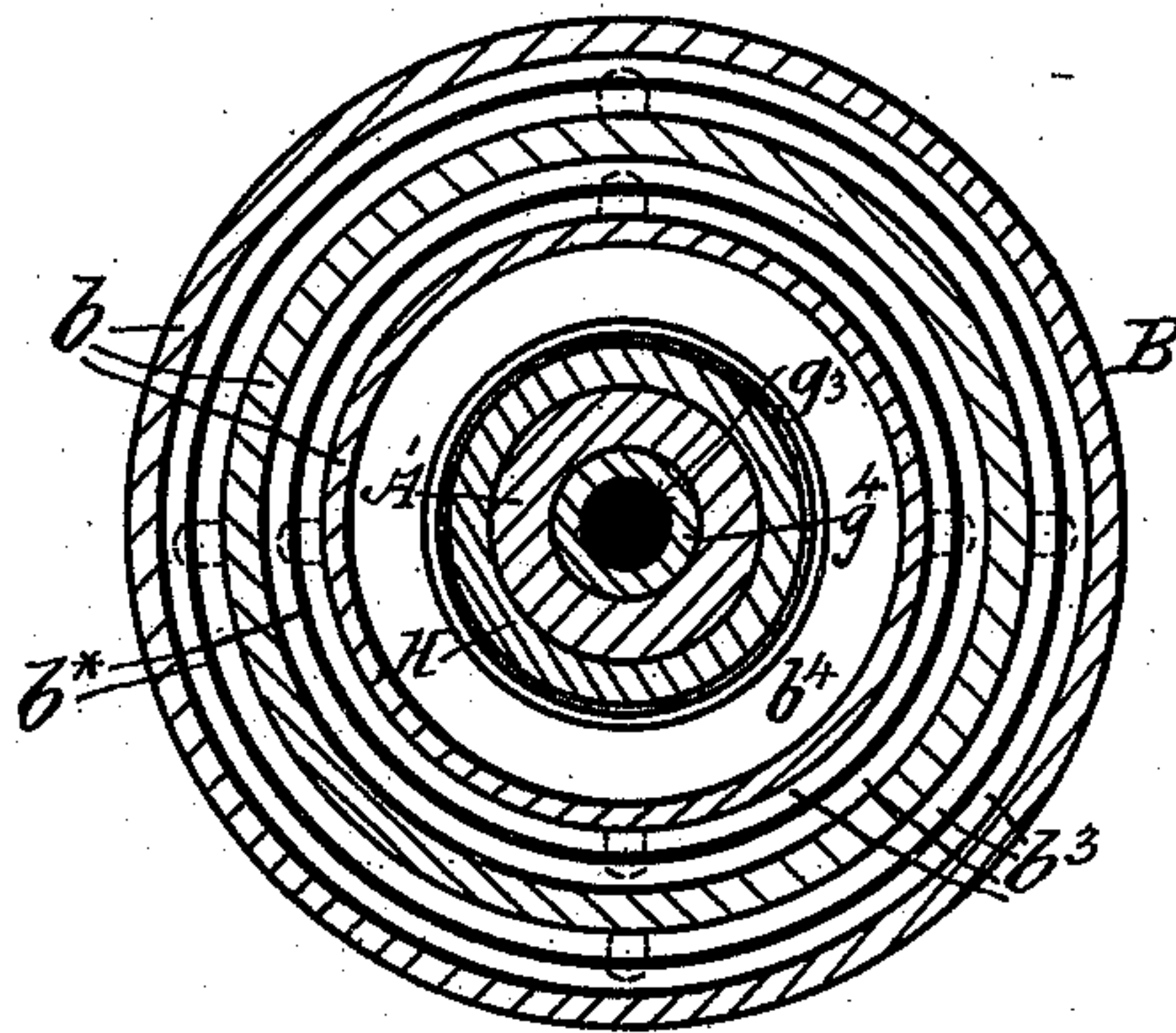
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Fig. 11.



Witnesses:
Chas. J. Laguerre
Chas. S. Lebrun

Inventor:
Thomas C. J. Thomas
by Curtis & Crocker
attys.

UNITED STATES PATENT OFFICE.

THOMAS COOPER JOHN THOMAS, OF FINSBURY PARK, COUNTY OF MIDDLESEX, ENGLAND.

GAS-LAMP.

SPECIFICATION forming part of Letters Patent No. 402,204, dated April 30, 1889.

Application filed March 30, 1887. Serial No. 232,974. (No model.) Patented in England January 21, 1885, No. 883, and January 13, 1887, No. 579; in France June 8, 1885, No. 169,417, and February 3, 1887, No. 181,328; in Germany June 10, 1885, No. 35,084; in Belgium February 3, 1887, No. 76,207; in Victoria June 8, 1887, No. 5,116; in South Australia June 9, 1887, No. 819; in New Zealand June 17, 1887, No. 2,383; in New South Wales August 2, 1887, No. 15; in Italy September 23, 1887, XLIV, 134; in India January 10, 1888, No. 190; in Austria-Hungary February 23, 1888, No. 37,616, and in Spain April 20, 1888, No. 7,390.

To all whom it may concern:

Be it known that I, THOMAS COOPER JOHN THOMAS, a subject of the Queen of Great Britain and Ireland, residing at Finsbury Park, in the county of Middlesex, Kingdom of Great Britain and Ireland, have invented Improvements in Gas-Lamps, (for which I have obtained the following patents, viz: in Great Britain, No. 883, dated January 21, 1885; in France, No. 169,417, dated June 8, 1885, and in Germany, No. 35,084, dated June 10, 1885; also patented in England January 13, 1887, No. 579; in France February 3, 1887, No. 181,328; in Belgium February 3, 1887, No. 76,207; in Austria-Hungary February 23, 1888, No. 37,616; in Spain April 20, 1888, No. 7,390; in Italy September 23, 1887, Reg. Att., Vol. XLIV, No. 134; in India January 10, 1888, No. 190 of 1887; in Victoria June 8, 1887, No. 5,116; in New South Wales August 2, 1887, No. 15; in New Zealand June 17, 1887, No. 2,383, and in South Australia June 9, 1887, No. 819,) of which the following is a specification.

My invention relates to lamps in which the air (or part of it) supplied to the flame is heated by the escaping products of combustion. A lamp according to my invention comprises a burner proper, an air-heating chamber with tubes or annular divisions, and a passage or passages for escape of products of combustion, heated air, &c.

Referring to the appended sheets of illustrative drawings, Figure 1 shows in central vertical section a lamp embodying my invention. Fig. 2 is a plan of the same, the lamp-casing B² being removed. Figs. 3 to 10, inclusive, are details on a larger scale. Fig. 3 is a central vertical section of the burner and air-heating chamber. Fig. 4 is a plan of same. Fig. 5 is a side elevation of the outer pipe. Fig. 6 is a similar view of the intermediate pipe. Fig. 7 is a like view of the inner pipe. Fig. 8 is a like view of the casting adapted to be screwed onto the gas-supply pipe and to connect it with the burner proper, as also to receive the inner pipe. Fig. 9 is a like view of the burner

proper without the curtain. Fig. 10 is a like view of the curtain detached. Fig. 11 is a horizontal section taken through the air-heating chamber and burner shown in Fig. 3.

It has been proposed to construct in various forms lamps in such a manner that air on its way to the flame should be heated by traveling through passages or chambers heated by products of combustion escaping through adjacent passages or chambers. Now my invention has reference to lamps of this class, and is designed to more effectually utilize the heat that would otherwise be lost in raising the temperature of air on its way to the flame, to better guide the air and gas, to facilitate the manufacture and putting together in a true and concentric manner of various parts of the lamp, and to enable the burner proper to be readily removed and replaced without disturbing certain neighboring parts.

A is a gas-supply pipe, to the lower part, A*, of which the burner is secured.

B is an air-heating chamber provided with a series of concentric pipes or annular divisions to aid in distributing and heating air, and a burner, G, as hereinafter explained.

B* is a preliminary air-heating chamber arranged above the main air-heating chamber B and in communication therewith. It consists, preferably, of a casting provided with air-inlet passages C C, and to it the portions A A' of the gas-supply pipe are secured, as shown.

D is a portion of the chimney surrounding the said preliminary air-heating chamber.

E is a globe, of transparent or translucent material, serving as a combustion-chamber, and F is a top or cover therefor that surrounds the air-heating chamber B, and is provided with openings F' for admitting air to the globe and burner.

The inner surface of the top or cover F is made to form a reflector.

B' is the lamp-casing with air-inlet openings B².

B³ is the lamp-body with air-inlet openings B⁴.

The air-heating chamber B is provided at its upper part with a cover or built-up plate, 5 b', formed with a series of perforations, b², through which air can descend into the annular spaces b³ between the concentric pipes or annular divisions b b*, and between the inner 10 of these and the hollow casting A', attached to the gas-supply pipe and the burner. The pipes or annular divisions b are at their lower ends, b⁴, contracted, or made of a gradually-decreasing diameter. In the drawings their lower 15 ends resemble inverted hollow truncated cones b⁴; but they may be curved inward, the object being to guide the heated air inward toward the flame. The pipes or annular divisions b* in the example shown are shorter than the others, b, and are not contracted or re- 20 duced in diameter at their lower ends. They are secured to the pipes or annular divisions b by screws, as shown. In some cases all the pipes or annular divisions may be like b or like b*. Conveniently such an air-heating 25 chamber, B, may be composed, as shown more clearly in Figs. 3 to 11, inclusive, of a series of pipes, b b, each formed at one end with a flange, b⁵, projecting outward and perforated (except that of the outer pipe b) with holes b², 30 and at the other end made with a part, b⁴, of gradually-decreasing diameter, the arrangement being such that the flange of one pipe will enter a recess in the corresponding end of another pipe, and can be screwed into the 35 same or be secured by radial pins or screws or in any other convenient manner, as will be readily understood. In some cases the perforated plate may be a separate piece, or may even be dispensed with if suitable radial pins 40 or connections be provided to hold the pipes or annular divisions in place.

The hollow casting A' is adapted to be secured to and form part of the gas-supply pipe A*. It carries the burner proper, and is 45 formed with a perforated flange, A², onto which the inner pipe is secured by screwing or otherwise. Thus when the pipes and casting A' are put together their several flanges form a compound perforated plate, the holes of which 50 establish communication with the annular spaces between the pipes and between the inner pipe and the gas-supply pipe or burner. Such an arrangement may be employed in a lamp which in other respects may be of any 55 suitable construction, and the air may be conducted thereto in any convenient manner. It may be through a preliminary air-heating chamber, as in the case shown, or chambers, or a pipe or pipes, or not, into my improved 60 air-heating chamber, and thence to the flame.

The construction described, as will be seen, is such that the improved air-heating chamber and burner proper constitute what may be called a "compound burner," the whole of 65 which can, without taking apart its constituent pieces, be removed from the gas-supply

pipe and air-supply or preliminary air-heating chamber, as it is shown in Fig. 3.

In the construction described the number and sizes of the perforations for admitting 70 air between the several concentric pipes or annular divisions can be so proportioned as to regulate the air-supply with nicety. The burner proper, G, is made solid at its lower 75 part, with a central passage, g', for gas, lateral holes g², a flange, g³, and a screwed nozzle, g⁴, that screws into a correspondingly-tapped hole in the casting A'. Instead of there being only one row of lateral holes g², 80 the burner may have more, so as to make the holes more numerous, and thereby the better distribute the gas as it issues into the annular space inclosed by the surrounding curtain II, which is connected to the casting A', 85 as shown. At or near its closed lower end the burner G is formed with an enlargement, g⁵, extending outward and upward or cupped, so as to form an annular channel, g⁶, of curved section opposite the lower end of the surrounding curtain II and annular space I, 90 whence the gas issues from between the central portion of the burner and the curtain II.

The burner proper, with or without the parts hereinabove referred to as constituting 95 with it the compound burner, I in some cases coat by a suitable known process with platinum to prevent corrosion and deposit. As will be evident, any desired number of pipes or annular divisions may be employed.

What I claim is — 100

1. In a gas-lamp, the combination, with a gas-supply pipe and a burner, of an air-heating chamber provided with a series of annular divisions placed one within the other and open at both ends for the direct downward 105 passage of air therethrough, said divisions being so arranged that their lower ends form a series of concentric annular openings located above the flame or flames passing laterally from said burner, substantially as described. 110

2. In a gas-lamp, the combination, with a gas-supply pipe and a burner, of an air-heating chamber provided with a series of annular divisions placed one within the other and 115 open at both ends for the direct downward passage of air therethrough, said divisions being contracted or made of gradually-decreasing diameter at their lower ends and so arranged as to form a series of concentric an- 120 nular openings located above the flame or flames passing laterally from said burner, substantially as described.

3. In a gas-lamp, the combination, with a gas-supply pipe, a burner, and an air-heating 125 chamber provided with a series of annular divisions open at both ends and so arranged one within the other that their lower ends form a series of concentric annular air-outlet passages located above the flame or flames from 130 said burner, of a perforated cover or plate secured at the upper ends of said divisions, sub-

stantially as herein described, for the purpose set forth.

4. In a gas-lamp, the combination, with a gas-supply pipe, of a preliminary air-heating chamber with air-inlet openings, a main air-heating chamber arranged below said preliminary air-heating chamber, and provided with a series of annular divisions placed one within the other and so arranged that their lower ends form a series of concentric annular openings, the spaces between said divisions being in communication at their upper ends with said preliminary air-heating chamber, a burner secured to the under part of said main air-heating chamber, and a nipple or socket carried by the upper part of said main air-heating chamber and adapted to be connected to said gas-supply pipe, substantially as herein described, for the purposes set forth.

5. In a gas-lamp, the combination, with a gas-supply pipe, of an air-heating chamber provided with annular divisions b , formed at one end with perforated flanges b^5 , and a hollow casting, A' , with perforated flange A^2 , said flanges being adapted to enter the tops of said annular divisions and form a perforated cover or plate, substantially as herein described, for the purpose specified.

6. In a gas-lamp, the combination, with a gas-supply pipe, of an air-heating chamber provided with annular divisions b , formed at one end with perforated flanges b^5 and at the other end with conoidal parts b^4 , and a hollow casting, A' , with perforated flange A^2 , said flanges being adapted to enter the tops of said annular divisions and form a perforated

cover or plate, substantially as herein described, for the purpose specified.

7. In a gas-lamp, the combination, with a gas-supply pipe and an air-heating chamber provided with a series of annular divisions open at both ends and so arranged one within the other that their lower ends form a series of concentric annular air-outlet passages, of an inverted burner from which flame passes laterally below said outlet-passages, substantially as herein described.

8. In a gas-lamp, the combination of a gas-supply pipe, A , a preliminary air-heating chamber, B^* , secured to said gas-supply pipe and provided with air-inlets C , a main air-heating chamber, B , arranged below said preliminary air-heating chamber and comprising a hollow casting, A' , screwed to said gas-supply pipe A , a perforated top or plate, b^2 , carried by said hollow casting, and a series of concentric annular divisions, b , depending from said top or cover, contracted at their lower ends and arranged to form a series of concentric annular outlet-passages for air, and a burner secured to said hollow casting A' , substantially as described, for the purposes specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS COOPER JOHN THOMAS.

Witnesses:

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Not. Pub.