

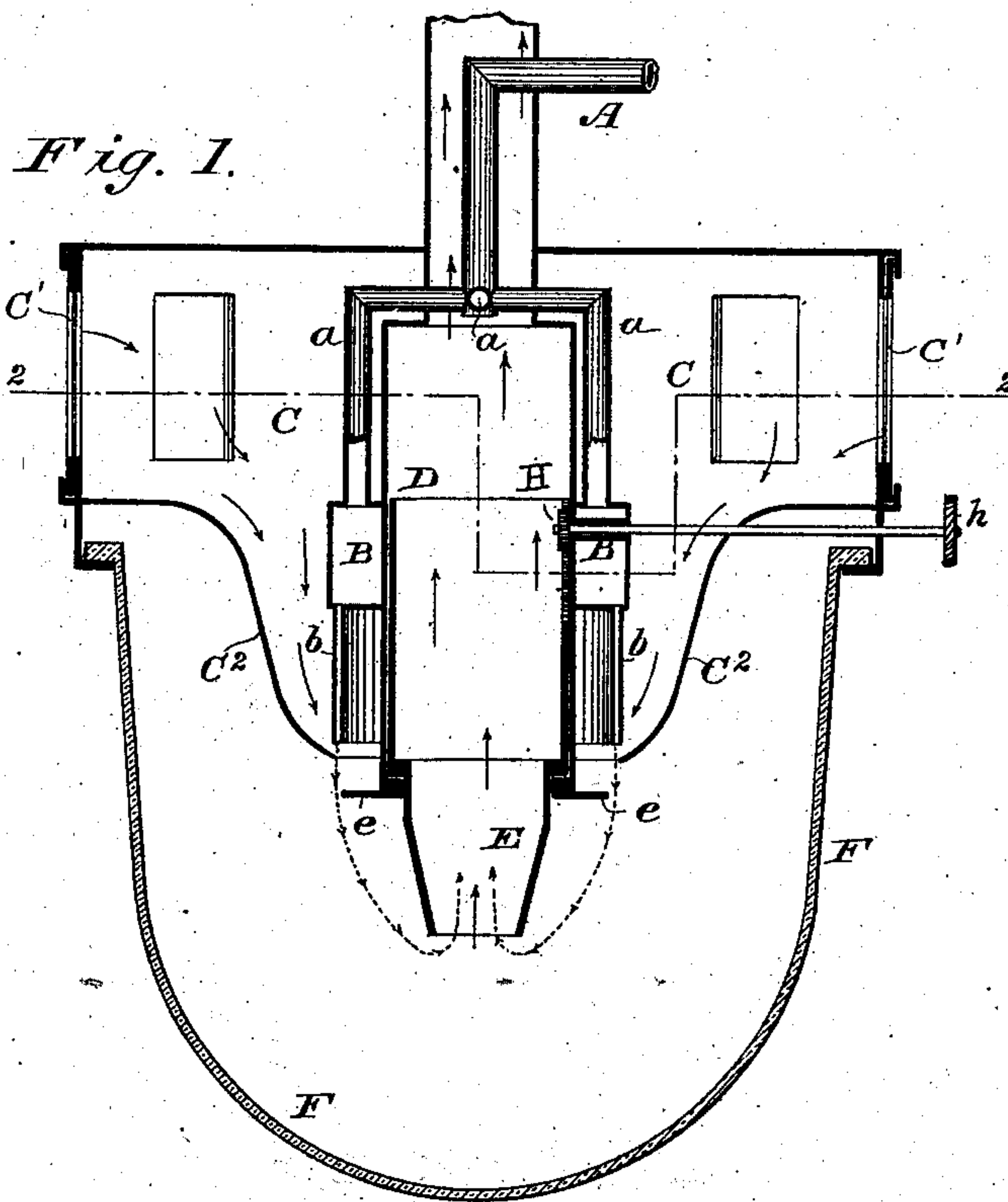
(No Model.)

J. G. SANDERSON.

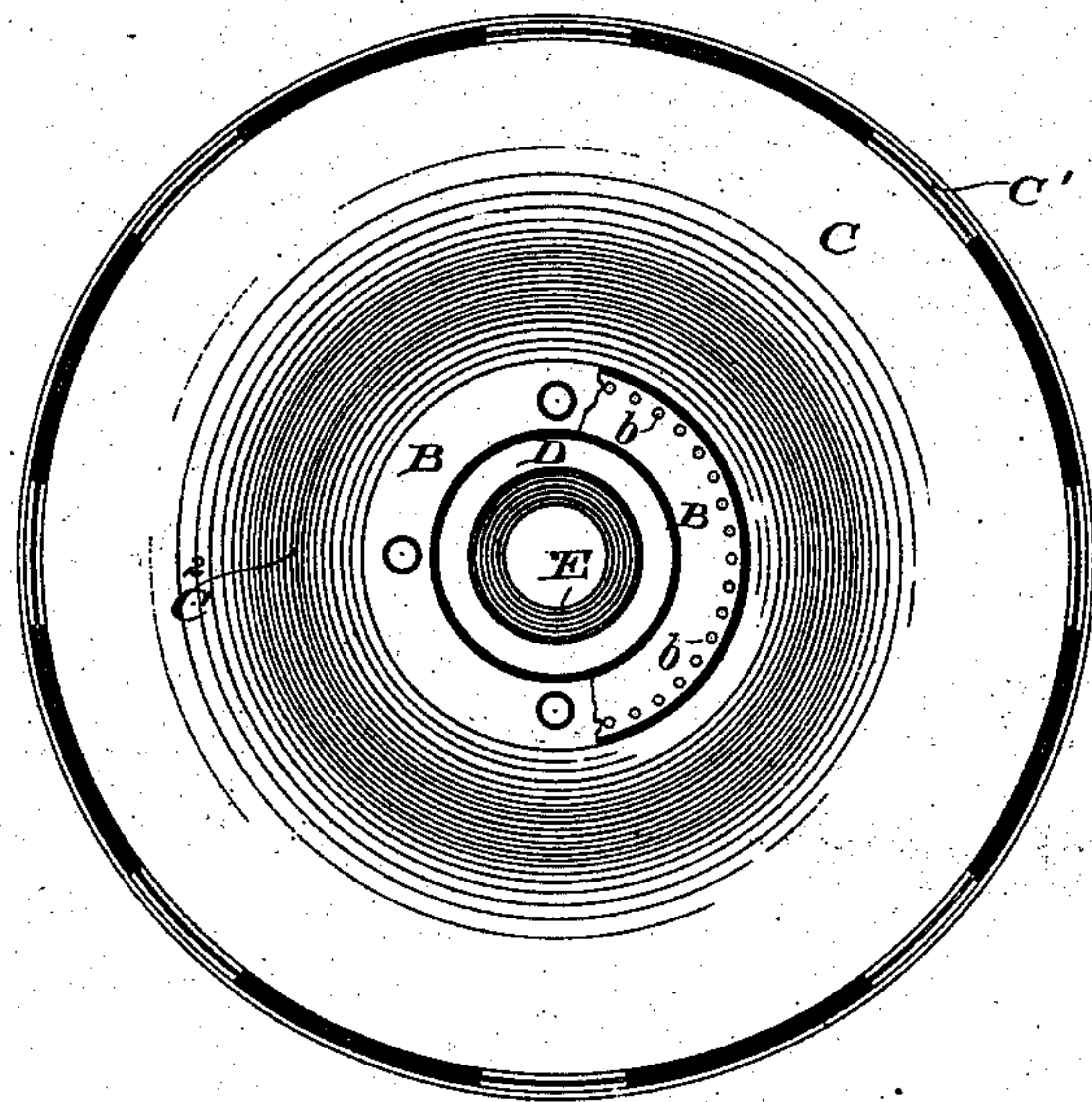
GAS BURNER.

No. 292,766.

Patented Jan. 29, 1884.



*Fig. 2.*



WITNESSES

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# UNITED STATES PATENT OFFICE.

J. GARDNER SANDERSON, OF SCRANTON, PENNSYLVANIA.

## GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 292,766, dated January 29, 1884.

Application filed September 29, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, J. GARDNER SANDERSON, a citizen of the United States, residing at Scranton, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in the Construction of Gas Burners and Lamps, of which the following is a specification.

My invention relates to the well-known class of gas-burners in which the air and gas are supplied to the burner through separate flues or conduits, and are there mingled and burned, while the hot products of combustion are conveyed away through a conduit or chimney constituting a draft-tube.

The object of my invention is to simultaneously heat the air and the gas supplied to the burner by causing the air, the gas, and the hot products of combustion from the flame to pass, respectively, through adjacent flues or conduits separated by metallic heat-conducting partitions.

The invention further comprises means for regulating or controlling the relative proportions of air and gas admitted to the flame, which I effect by combining with the air-heating conduit or chamber a regulating inlet-valve controlling the air-supply.

The subject-matter claimed is specifically designated in the claims hereinafter made.

The accompanying drawings illustrate my improvements, constituting new organizations of old instrumentalities, embodied in the best way now known to me. Some of these improvements may, however, be used without the others, and the details of construction may be modified in various well-known ways, without departing from the substantial principle of my invention.

Referring to the drawings, Figure 1 represents a vertical central section of my improved lamp, and Fig. 2 a horizontal section there-through on the plane of the dotted line 2 2 in Fig. 1.

The gas-supply pipe or conduit A is shown as divided into branches *a a*, which branches terminate in a box-shaped or annular receptacle, B, which constitutes a gas-heating chamber. A series of small openings, preferably in the form of a fringe of jet pipes or burners *b*, depending from the gas-heating chamber B, and having their openings directed downward,

serve to discharge the heated gas at the point of combustion at the bottom of the lamp. The flue or conduit which conveys the supply of air downward to the flame consists of a chamber, C, which is herein shown as of annular form, within which is inclosed the gas-heating chamber B, while its inner metallic wall forms a flue, which constitutes the draft tube or chamber D, for conveying the hot products of combustion upward and away from the flame. The air-heating chamber or flue C is preferably made cylindrical in form for a portion of its length, and this portion I prefer to construct of sheet metal, perforated with openings at suitable intervals, through which the inflowing air is admitted from the room. The influx of air is regulated by a sliding gate or valve, C', of well-known construction, preferably moving laterally, like the gate or ring of a turbine water-wheel, as shown in the drawings. The lower portion of the air chamber, conduit, or flue C terminates in a conical deflecting-shield, C', which is provided with a central opening surrounding the circle of jets or burners *b* and terminating at or near the same point, so as to mingle the air and gas thoroughly just below or at the point of ignition and combustion.

A perforated conical combustion-thimble, E, connected with and depending from the draft-tube or chimney D, projects below the point of combustion to the distance through which the flame is desired to descend, which distance or length of flame may be varied or controlled by well-known regulating devices—for example, a rack-and-pinion movement, H, provided with a milled head, *h*, as shown in Fig. 1 of the drawings. A deflecting-flange, *e*, surrounds the combustion-thimble just below the point of ignition, the object of which is to deflect the flame outwardly, and thus increase its area.

A hemispherical transparent shade or globe, F, closed at the bottom, and having an open top united to the exterior of the air-chamber or top of the lamp, prevents the access of the exterior air of the room to the burner, otherwise than through the regulating-valve and air-heating chamber, and at the same time prevents the escape of the products of combustion in any direction except through the conduit or draft-tube D. It will be observed that the said conduit D, through which the hot products of combustion pass, incloses the upper portion of the



gas-conduit A. This is formed of metal, and hence, being a good conductor of heat, raises the temperature of the inflowing gas by conduction from the escaping hot products of combustion, while at the same time the gas-chamber B, which encircles the chimney or draft-tube, is also heated by conduction or radiation therefrom.

The operation of my improved lamp will be readily understood from the foregoing description. The lamp is preferably suspended, either by means of the gas-inlet pipe or by the draft-tube or outlet-pipe, from the wall or ceiling of the room which is to be lighted. When the gas escaping from the jets or burners is ignited, the hot products of combustion flow upward and escape through the draft tube or conduit D, at the same time imparting a high degree of heat to both the adjacent air and gas chambers. The highly heated air and gas mingle at the point of ignition, and the resulting annular flame is deflected outward by the flange *e*, but is immediately drawn in again toward the tip of the combustion-thimble E, through the lower opening of which the hot products of combustion pass to the draft-tube. The gas-supply is regulated by a gas-cock in the ordinary manner, while the air-supply is controlled by opening or closing the valve *C*, thus varying the volume of their respective flow as desired to secure the best results.

My improved lamp is particularly well adapted for chandeliers, inasmuch as no shadow whatever is cast downward. The lamp may be attached to a vertical wall, so that the draft-tube will project laterally therefrom; but such an arrangement is less effective than that hereinbefore described, as the natural tendency of the hot products of combustion is to rise directly upward, and thus in my organization they readily heat the incoming gas and air without the necessity of employing a supplementary heating-burner—a device which is dangerous, for the reason that it occasionally produces explosions of the mingled but unburned gas and air, which sometimes escape from this class of burners when they are first lighted.

It is obvious that my improved lamp, instead of vitiating the air of a room, as is the case with ordinary burners, constitutes a very efficient ventilator.

I am aware that lamps have heretofore been constructed in which the air and the hot products of combustion from the flame are made to pass in opposite directions through adjacent conduits separated by metallic heat-conducting partitions, and that the said air was admitted through an adjustable register, whereby the proportions of air and gas could be controlled as desired. I therefore do not claim such feature, broadly, the distinguishing feature of my invention being the dependent shield for deflecting the air to the flame.

I claim as my invention—

1. The combination, substantially as hereinbefore set forth, of the suspended air-heating chamber or conduit, the gas-heating chamber through which the gas descends to the jets or burners, the draft tube, chimney, or conduit, the combustion-thimble depending therefrom, and the conical dependent shield for deflecting a current of air downward from said air-heating chamber to the combustion-thimble and flame.

2. The combination, substantially as hereinbefore set forth, of the air-heating chamber or conduit, its inclosing regulating-valve and dependent shield, the inclosed gas-heating chamber, the draft tube, chimney, or conduit, and the combustion-thimble depending therefrom.

3. The combination, substantially as hereinbefore set forth, of the draft tube, chimney, or conduit, the gas-heating chamber, the downwardly-directed jets or burners, the air-heating chamber or conduit, the regulating-valve, and the vertically-adjustable combustion-thimble.

4. The suspension gas-lamp hereinbefore described, consisting of the combination of the air-heating chamber or conduit, its inclosing regulating-valve, the conical depending shield for deflecting a current of air downward from said chamber and toward the flame, the inclosed gas-heating chamber, and the downwardly-directed jets or burners, the draft tube, chimney, or conduit, the combustion-thimble depending therefrom, and the shade depending from the air-heating chamber or conduit.

5. The combination, substantially as hereinbefore set forth, of the gas-heating conduit, the jets or burners, the air-heating conduit, the regulating-valve, and the conical dependent shield for deflecting a current of air downward from said air-heating conduit to the flame.

6. The combination, substantially as hereinbefore set forth, of the gas-heating chamber or conduit, the jets or burners, the air-heating chamber, the regulating-valve, the conical dependent shield for deflecting a current of air downward from said air-heating chamber to the flame, and the conduit for conveying away the hot products of combustion.

7. The air-heating chamber or conduit, substantially as hereinbefore described, consisting in the combination of the draft-tube, the perforated cylindrical adjustable valve, and the conical dependent shield for deflecting a current of air downward to the flame.

In testimony whereof I have hereunto subscribed my name this 27th day of September, A. D. 1881.

J. GARDNER SANDERSON.

Witnesses:

MILLER C. EARL,  
WILLIAM H. KENYON.