No. 721,650. PATENTED FEB. 24, 1903.

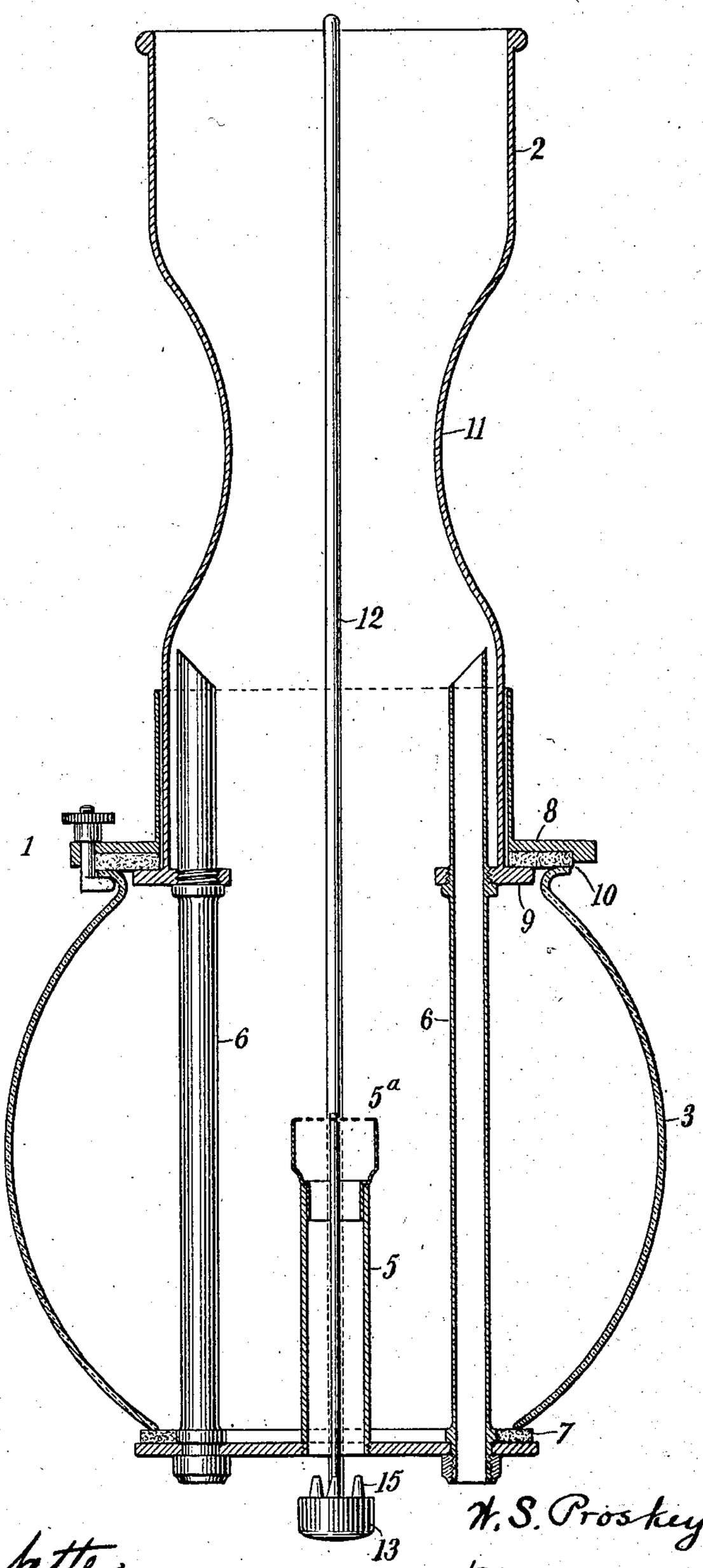
W. S. PROSKEY.

INCANDESCENT GAS LAMP.

APPLICATION FILED APR. 19, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1



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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2

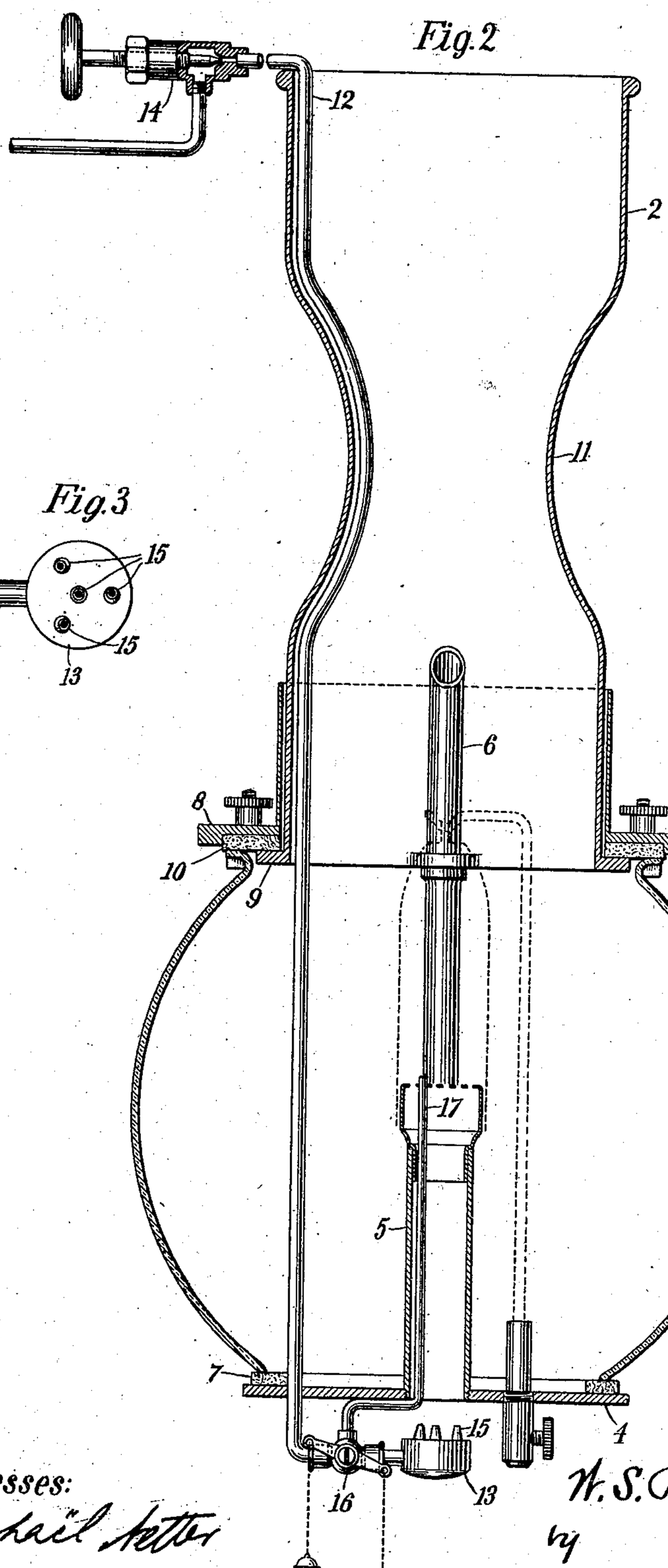
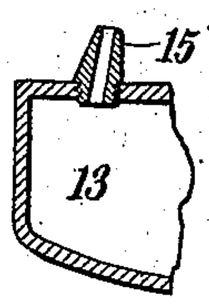


Fig. 3

Fig. 4



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UNITED STATES PATENT OFFICE.

WINFIELD SCOTT PROSKEY, OF OCALA, FLORIDA.

INCANDESCENT GAS-LAMP.

SPECIFICATION forming part of Letters Patent No. 721,650, dated February 24, 1903.

Application filed April 19, 1902. Serial No. 103,754. (No model.)

To all whom it may concern:

Be it known that I, WINFIELD SCOTT PROSKEY, a citizen of the United States, residing at Ocala, in the county of Marion, State of Florida, have invented certain new and useful Improvements in Incandescent Gas-Lamps, of which the following is a specification, reference being had to the drawings accompanying and forming part of the same.

The object of my invention is to produce an incandescent gas-lamp of high candle-power, yet of simplicity and economy in manufacture. This object I attain by the following construction.

Referring to the drawings, Figure 1 shows my lamp in a central longitudinal section; Fig. 2, a similar section in a plane perpendicular to that of Fig. 1; Fig. 3, a top plan view of the gas-chamber and gas-nozzles, and Fig. 4 a section through one of the nozzles.

The casing of my lamp is designated by 1, consisting of the chimney 2 and the globe 3, with its connections supported by the base 4, and extending within the globe 3 is an ordinary Bunsen tube 5, having a burner 5^a, over which is supported a mantle in the usual manner. It is not necessary that the Bunsen or mixing tube be wholly within the globe, as it may extend some little distance below the base; but I have found that the heating of the mixture is more effectual in the former arrangement.

The base 4 is suspended from the chimney 2 by means of tubular supports 6 6, extending through the base and open at the top and bottom for a purpose soon to be described. The tubes 6 6 may be said to be alongside the burner in the sense that they are not "chimneys," properly so called, surrounding the burner and mantle; but it is not to be understood that they must necessarily be closely adjacent thereto.

The globe 3, normally resting on a cushion 7 on the base 4, is carried by the ring 8, which rests on a flange 9 of the chimney. The globe is supported against a cushion 10 on the under side of the carrier-ring, the purpose of these non-combustible cushions being not only to constitute a yielding contact-surface, but also the better to render the casing-joints substantially air-tight. When it is desired to expose the burner for any purpose, the globe may be easily raised with the carrier from the flange 9.

The chimney 2 may be of the usual form; but for the present purpose I have found that more satisfactory results are obtained by making it with a constricted portion 11.

Gas is supplied to the burner through the gas-tube 12, adapted to be connected to a source of gas. In order to heat the gas to the highest possible temperature before consumption, the tube 12 enters the casing at the top of the chimney, and, conforming to the contour of the chimney, extends downward parallel and close to the mantle to the gas-chamber 13. On the gas-chamber are a number of tubes or nozzles for the discharge of gas into the mixing-tube, the outer ones of which are inclined from the perpendicular. Considered with reference to the circumference of the chamber, the nozzles are inclined in the same direction in order to impart a whirling or rotary motion to the ascending column of air and gas, by which the two are more effectually mixed. It is not necessary that the orifices be minute for the purpose of increasing the speed of the escaping gas, since the strong draft of the lamp aids in entraining air. The whirling motion is counteracted to some extent by the high draft through the mixing-tube; but the resultant motion is sufficient to effect a complete mixture. The valve 16 is of any convenient by-pass construction and controls the pilot-tube 17. The quantity of gas consumed is regulated by the valve 14. This valve should, I have found, be located at some distance from the lamp, at least far enough away not to be appreciably affected by the heat of the lamp either by direct radiation or by conduction along the pipe 12. If the valve 14 is too close to the lamp, the gas becomes heated before passing the valve with considerable expansion. The result is that the pressure of the gas at the valve is altered and the steady flow disturbed. As this disturbance occurs only after the lamp has been in operation some little time, it is necessary to readjust the regulating-valve, and often considerable difficulty is experienced in making the adjustment such that the supply of gas to the burner will not fall below the initial rate; but by locating the valve some distance from the lamp, so that it does not become

heated, these difficulties are to a great extent overcome. The temperature of the gas being the same on both sides of the constricted passage of the valve 14, its flow is not retarded. It would seem that the subsequent heating of the gas within the casing would exert a back pressure sufficient to disturb the flow at the valve; but I find that it does not and believe the causes therefor to be the momentum of the gas-stream, the practically unrestricted outflow through the expansion-chamber and nozzles, and the high draft of the lamp. The first of these causes exists, of course, independent of the distance of the regulating-valve from the lamp; but its effect is insufficient unless aided by some other means, such as those just stated. By making the orifices of the outlets or nozzles 15 of considerable size the flow of gas is not restricted at the point of issuance—that is, the fuel under pressure produced by heating the pipe 12 finds an opportunity for free expansion in the direction of its flow, and this free expansion by the discharge of the gas through the nozzles 15 is assisted by the strong draft through the Bunsen tube 5, as will be readily understood. Several causes coöperate to produce the high draft necessary for the best operation of the lamp. Among these are the initial velocity of the discharging gas, the fact that the joints of the casing are practically air-tight, the draft-tubes 6 6, and the constricted chimney. The first of these starts the draft, which as the parts of the lamp become heated is increased by the other means. The casing being air-tight, any air which enters while the lamp is in operation must enter through the Bunsen tube, the draft-tubes, or downward through the top of the chimney. When the burner is first lighted, there is a certain quantity of air in the globe; but the oxygen therein is rapidly exhausted by combustion at the surface of the mantle, its place being taken by the resulting products until the globe is entirely filled with such products and the inert constituents of the air all in a highly heated condition, and in this way the tubes 6 6 are heated, setting up a swift current of hot air therethrough. The use of these tubes, I have found, obviates the necessity for a very long draft-chimney. They are carried above the top of the globe well up into the chimney until their openings are close to the constricted part, where the current through the chimney is swiftest, and by discharging the draft-tubes at that point the speed is still further accelerated. The velocity of the ascending currents there is so high and the outlets of the draft-tubes so far above the burner that no back drafts or circulation of air in the globe can be set up either from the tops of the tubes or from the chimney. The same results could not be obtained without one or more draft-tubes and without reducing the chimney. If air were admitted through simple openings in the base of the globe, the currents would be diffused, and while they would have a generally upward direction of flow they would nevertheless affect the flame; but by confining them to the draft-tubes and discharging them into the constricted part of the casing the flame is not only undisturbed, but the momentum of the two streams issuing from the comparatively small outlets of the tubes has an appreciable effect in increasing the draft of the entire system. Of course the suction of the chimney will to a certain extent carry off some of the gases from the lower part of the casing; but this action is so slow and the supply of the products of combustion to fill the globe so even and constant that the flame is not noticeably affected.

The structure which I have just described is a convenient embodiment of my invention; but it will be understood that I am not limited to the precise form shown.

What I claim is—

1. In an incandescent gas-lamp, the combination with a casing, a burner in the lower part of the casing, and means for supplying fuel to the burner, of one or more draft-tubes extending from the lower part of the casing and discharging within the same at a point above the burner, said burner being outside said draft-tubes, as and for the purpose set forth.

2. In an incandescent gas-lamp, the combination with a casing having its upper part constricted, a burner in the lower part of the casing, and means for supplying fuel to the burner, of one or more draft-tubes extending from the lower part of the casing and discharging within the same adjacent the constricted part, said burner being outside said draft-tubes, as and for the purpose set forth.

3. In an incandescent gas-lamp, the combination with a burner, of means for supplying fuel thereto, comprising a mixing-tube, a gas-chamber adapted to be connected with a source of gas, and a plurality of nozzles on said gas-chamber discharging into the mixing-tube, said nozzles being inclined from the perpendicular, whereby a whirling or rotary motion is given to the air and gas in the mixing-tube, as and for the purpose set forth.

4. In an incandescent gas-lamp, the combination with a casing substantially air-tight in its lower part and a burner therein, of means for supplying fuel to the burner comprising a mixing-tube, a gas-chamber having an opening for discharging gas into the mixing-tube, a gas-tube adapted to be connected with a source of gas, extending within the casing and connected to the gas-chamber, and a valve for regulating the supply of gas located in the gas-tube without the casing and beyond the range of the heat of the lamp, as and for the purpose set forth.

5. In an incandescent gas-lamp, the combination with a casing having its upper part constricted, a burner in the lower part, and one or more draft-tubes extending within the casing from the lower part and discharging ad-

jacent the constricted part, of means for supplying fuel to the burner, comprising a mixing-tube, a gas-chamber having an opening for discharging gas into the mixing-tube, a gas-tube adapted to be connected to a source of gas extending within the casing so as to be heated from the burner and connected to the gas-chamber, and a valve for regulating the supply of gas located in the gas-tube without the casing and beyond the range of heat of the lamp, as and for the purpose set forth.

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