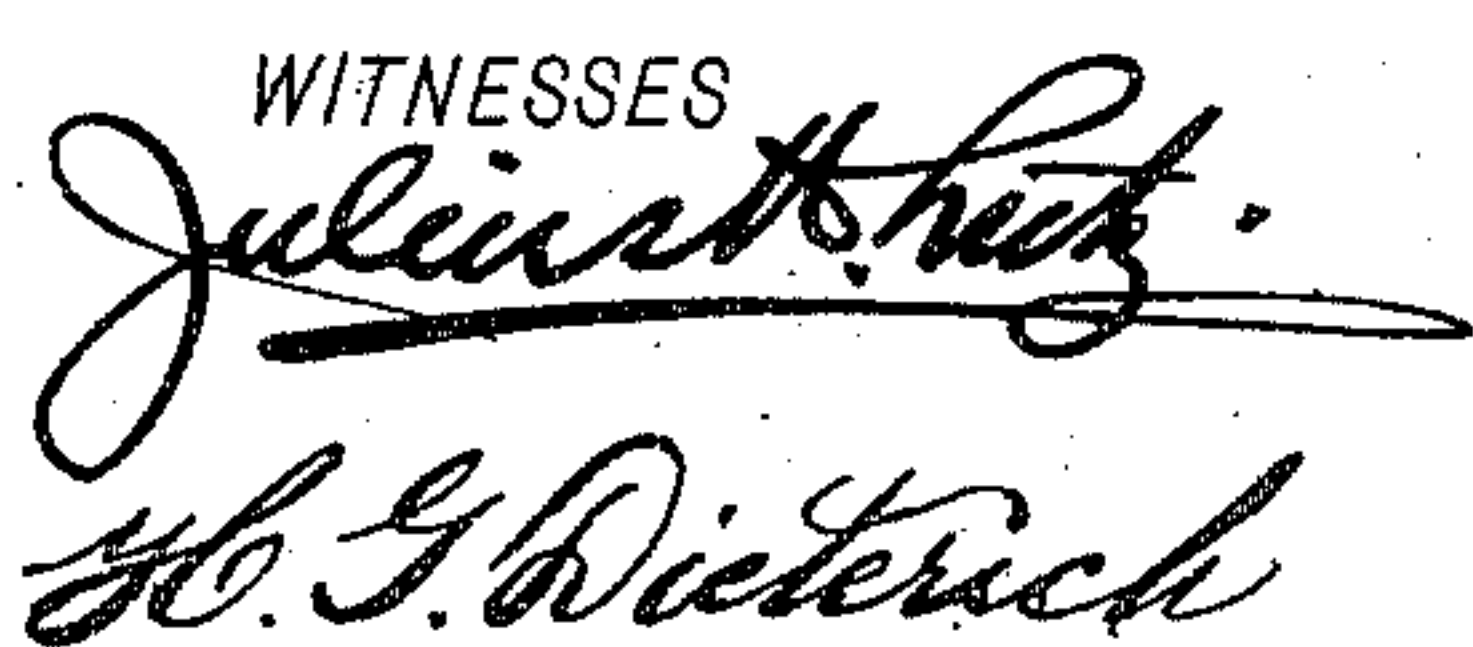


L. T. ALTON.
INCANDESCENT GAS BURNER.
APPLICATION FILED JULY 8, 1907.

3 SHEETS—SHEET 1.



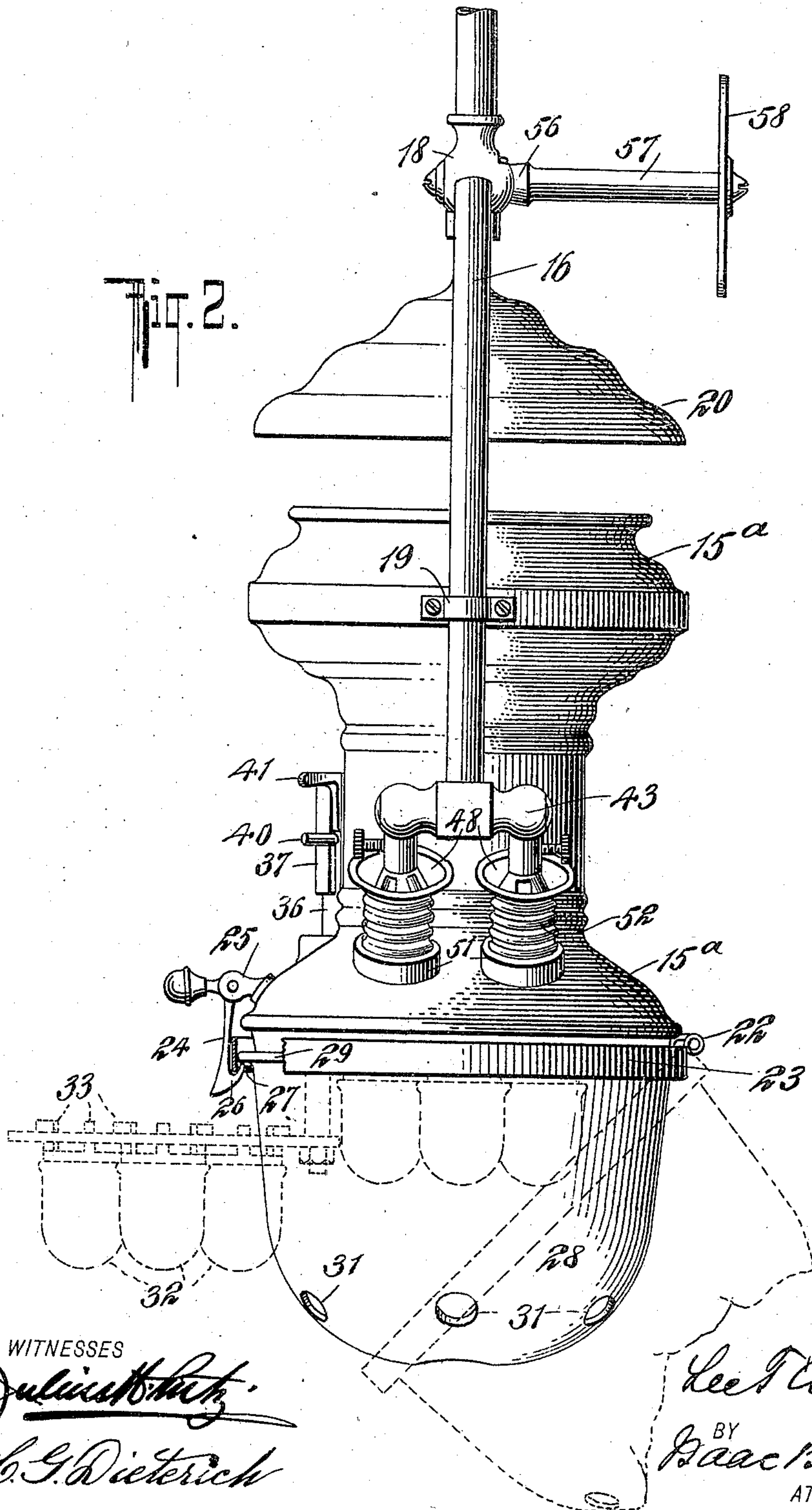
INVENTOR
Lee T Alton
BY
Daac B Owens.
ATTORNEY

984,177.

L. T. ALTON.
INCANDESCENT GAS BURNER.
APPLICATION FILED JULY 8, 1907.

Patented Feb. 14, 1911.

3 SHEETS—SHEET 2.



WITNESSES

Julius H. Hutz
H. G. Dieterich

INVENTOR

Lee T. Alton

BY

Osac B. Owens
ATTORNEY

UNITED STATES PATENT OFFICE.

LEE T. ALTON, OF BROOKLYN, NEW YORK.

INCANDESCENT GAS-BURNER.

984,177.

Specification of Letters Patent.

Patented Feb. 14, 1911.

Application filed July 8, 1907. Serial No. 382,738.

To all whom it may concern:

Be it known that I, LEE T. ALTON, of the borough of Brooklyn, county of Kings, State of New York, have invented certain
5 new and useful Improvements in Incandescent Gas-Burners, of which the following is a full, clear, and exact specification, such as will enable others skilled in the art to which it appertains to make and use the
10 same.

My invention relates to what are popularly termed "incandescent arc lamps" and particularly to that class in which the mantles and burners are inverted. In lamps of
15 this class it is customary to arrange a number of burners in a cluster inclosed in a globe common to all burners, and thus producing a powerful light closely resembling the wellknown electric arc. Since the heat
20 generated by these lamps is intense, difficulty has heretofore been experienced in effecting a proper admixture of the air and gas previous to passing the mixture into the burner tube. This difficulty is owing to the
25 fact that to obtain a mixture of the most effective proportions it is necessary to bring the elements together when relatively cold and the intense heat developed by the apparatus heretofore employed heated up all of
30 the parts of the burner rendering it impossible to properly combine the air and gas. According to my invention, I confine the heat in a metal stack or chimney and bring the gas supply tubes down outside of the
35 same, the mixing devices being located at the ends of the gas supply tube outside of the chimney and insulated from the chimney by means of porcelain or similar nonconducting material.

Preferably the burner is constructed with
40 four burner tubes arranged two at each side and inclined toward the center of the burner. The air and gas mixing devices are of peculiar construction enabling me to
45 attain the most minute adjustment and thus secure an effective mixture. I also provide a peculiarly constructed shield which surrounds the air chamber to prevent the entry of heated air and to insure drawing into the
50 mixing devices cold air from points at the side of the burner.

My invention also involves certain novel features concerned with the pilot flame which burns continually to ignite the main
55 burners when the gas is turned on.

According to my invention I employ a peculiar valve which as the main gas supply is turned on suddenly admits the full gas pressure in the pilot flame tube causing the pilot flame to flash out over the mantles
60 and insuring ignition.

My invention also involves a peculiarly constructed globe having air inlet openings to supply an excess of air to the mantles insuring combustion of any unconsumed
65 carbon which might otherwise lodge in the mantles and blacken the same, thus destroying their illuminating power. I also provide a holder for the globe which enables the globe to be readily lowered to open position for enabling the globe to be polished
70 and access to be had to the mantles.

Still a further feature of my invention resides in a novel device for sustaining the mantles. By means of this device the mantles may be raised or lowered as desired and the holder swung sidewise to facilitate placing the mantles in and removing them from position.
75

My invention involves various other features of major or minor importance and all will be fully set forth hereinafter and particularly pointed out in the claims.
80

Reference is had to the accompanying drawings, which illustrate, as an example,
85 the preferred manner of embodying the principles of my invention, in which drawings,

Figures 1 and 2 are side elevations from different points of view illustrating the
90 general construction and appearance of the lamp; Fig. 3 is a section taken vertically through the lower part of the chimney illustrating particularly the pilot flame tube and the mantle holder. Fig. 4 is a horizontal
95 section on the line 4-4 of Fig. 3; Fig. 5 is a detail vertical section through one of the mixing devices and burner tubes; Fig. 6 is a detail section of the mantle sustaining device; Figs. 7 and 8 are detail sections of
100 the gas valve; and Fig. 9 is a detail section showing the needle valve for effecting permanent regulation of the pilot flame.

15 indicates the chimney which is preferably constructed of metal having a vitreous
105 or enamel-ware covering to prevent discoloration by the heat and also to give the chimney to a certain extent, non-conducting qualities. The upper and lower ends of the chimney are preferably enlarged as indi-
110

cated at 15^a and this chimney constitutes what may be termed the body of the burner.

16 indicates the gas supply tubes which are two in number extending down outside of the burner at opposite sides of the chimney and fastened to the enlarged top of the chimney by means of clips 19 or similar devices. These tubes 16 branch from a common gas supply tube 17 to which they are joined through the medium of a casing 18 of the gas valve which will be fully set forth hereinafter.

20 indicates a bell or hood which is suspended over the chimney by means of a hook 21 or similar device connected to the valve casing 18.

Connected to the enlarged lower end 15^a of the chimney by means of a hinge 22 is an annular band 23 of angular cross sectional form as shown in Fig. 2. This band is adapted to be sustained normally in the horizontal position shown by full lines in Figs. 1 and 2 through the medium of an elbow-shaped gravity catch 24 pivoted on a bracket 25 secured to the enlarged lower end 15^a of the chimney. This catch 24 is provided with a hook 26 having an inclined edge adapted to be engaged by the band 23 as the same is moved upward to automatically lock the hook in a slight opening 27 formed in the band. By this device the catch may be readily disengaged to allow the band 23 to drop with the globe to the position shown by broken lines in Fig. 2 and by the mere motion of returning the band it is automatically engaged and held by the hook.

28 indicates the globe which has a flange 29 at its upper edge engaging the flange of the band 23 thus securely sustaining the globe, but enabling it to be removed easily for cleaning and other purposes. The globe has in its extreme bottom the usual opening 30 and in addition to this it is provided at its sides near the bottom with preferably four auxiliary air openings 31. This construction is important since by this means I am enabled to supply to the environment of the mantles an excess of air insuring complete combustion of all of the fuel particles in the gas.

As shown in Fig. 3 the mantles 32 have hooks 33 or other equivalent means secured thereto and these mantles are sustained in position by means of a mantle holder plate 34 having openings 35 therein for the reception of the mantles so that the same may, when in operation, hang inverted as in Fig. 3. This plate 34, as shown best in Fig. 3, is fastened to a rod 36 which extends vertically through the enlarged lower portion 15^a of the chimney and is fitted loosely in a sleeve 37. This sleeve as shown in Figs. 1 and 6 has a vertical slot 38 communicating at its lower end with a transverse or bayonet

slot 39 and to the rod 36 is fastened a transverse pin 40 which is adapted to move loosely through the slots 38 and 39.

41 indicates a gravity catch pivoted in the upper part of the tube 37 and adapted to engage a hook 42 in the upper end of the rod 36. When the catch 41 is engaged with the hook 42, the rod 36 is held in its elevated position and the pin 40 is in the upper part of the slot 38 preventing rotation of the rod. In this position, the mantle holder plate 34 is held directly under the chimney as in Fig. 3 so that the lower extremities of the burner tubes are projected into the open upper end of the mantles in the usual manner. Upon disengaging the catch 41 from the hook 42 the plate 34 may be allowed to drop so that it clears the lower ends of the burner tubes and then the plate may be swung outward in the manner shown by broken lines in Fig. 2, the plate then occupying a position at one side of the lamp so that the mantles may be readily placed in and removed from the plate. In this connection it will be seen that to enable the mantle holder to be thus swung outward the catch 24 must first be lifted and the globe allowed to drop as shown by broken lines in Fig. 2. When the rod 36 is rotated to swing the plate 34 outward, the pin 40 moves through the transverse or bayonet slot 39 this slot limiting the turning movement of the rod. To restore the mantles to operative adjustment, it is only necessary to reverse the before described movement of the parts.

As shown in Fig. 2, the gas tubes 16 terminate in cross connections 43 with the ends of which communicate the gas regulating valve 45. These valves are adapted to be opened or closed at will. The specific construction of these parts is not essential to my present invention, although I prefer to employ the device set forth in my co-pending application for improvements in gas checks filed January 24, 1907, Serial No. 353,843. The gas passing the valve 45 is discharged into an air chamber 46 which has openings in the sides, the area of which may be regulated by an inclosing air shutter 47. This air shutter has air openings corresponding to the air openings in the air chamber and attached to the shutter is an upwardly flaring air shield 48. This shield or bell serves the double function of permitting ready regulation of the air shutter and of shielding the air chamber from the hot gases rising from the burner preventing these gases from entering the air chamber and insuring that relatively cold air be drawn from the space at the side of the burner.

49 indicates the Bunsen tube which projects from the air chamber into an insulating thimble 50. This thimble is constructed of porcelain or similar non-conducting material and the Bunsen tube is fitted friction

tight therein. The thimble 50 is provided at approximately its middle with an exterior bead 51 and at each side of this bead the thimble is threaded. The threaded outer end of the thimble is engaged by a correspondingly threaded sleeve 52. This sleeve is attached to the air chamber and serves to connect the same with the non-conducting thimble. The underside of the bead 51 bears against a flat surface on the enlarged lower end 15^a of the chimney and the threaded lower end of the thimble projects through an opening therein. Engaged with this threaded lower end of the thimble is a correspondingly threaded sleeve 53 which bears against the underside of the enlarged end 15^a of the chimney thus securely connecting the parts 51 and 15^a, while the lower or inner end of the sleeve 53 is attached to or formed integral with the burner tube 54. This tube projects downward and inward at approximately an angle of 45 degrees to the perpendicular and terminates in a burner nipple 55.

From the foregoing it will appear that from the cross connections 43 the air and gas mixing devices, and the burner and Bunsen tubes are in alinement extending from the gas tubes 16 at an obtuse angle diagonally downward and inward into the enlarged lower portion of the chimney. It will also be seen that four of these units are provided, two at each side, each fitted with an insulating thimble. In this manner I completely insulate the mixing devices from the heated chimney and insure mixing the air and gas at a low temperature thus obtaining a perfect mixture. Further I provide for the unobstructed flow of the gas through the air chamber where it takes up the necessary air and passes through the burner tube into the mantle, allowing me to draw into the gas the necessary volume of air and to produce complete combustion and therefore, the highest possible lighting efficiency. The four burner tubes terminate in rectangular arrangement as shown in Fig. 4 and are respectively in position to enter the four mantles sustained by the plate 34 before described.

As shown best in Figs. 7 and 8 the gas pipe 17 communicates with the valve casing 18 and from this casing the gas tubes 16 branch. Within the casing operates a valve plug 56, the stem 57 of which projects transversely from the valve as shown in Fig. 2 and is provided with a cross arm 58 to which chains 59 are attached to permit operating the valve, the chains hanging down within easy reach of the operator. Said plug 56 has three ports 60 therein which when the valve is in open position register respectively with the tubes 16 and 17 so that the gas is free to flow from the tube 17 into the tubes 16.

61 indicates the port to the pilot flame tube, this opening into the casing 18 directly adjacent to the port of one of the tubes 16, and the plug 56 of the valve is provided with notches 62 and 63 so arranged that when the valve is in closed position, as shown in Fig. 8, the notch 63 communicates with the port of the tube 17 and one notch 62 communicates with the port 61 thus allowing a minute quantity of gas to flow continually into the port 61 to sustain the pilot flame. When the plug 56 is turned to open the gas supply to the tubes 16, the ports of the plug in moving to open position move past the port 61 and throws into the same a full supply of gas, thus causing the pilot flame to flash out simultaneously with the admission of the gas to the tubes 16. Upon cutting off the gas supply from the tubes 16, the ports reassume the position shown in Fig. 8 and the pilot flame continues to burn.

Fig. 9 illustrates a device for effecting permanent regulation of the pilot flame consisting in a screw 64 terminating in a needle valve which projects into the gas port 61 to throttle the gas and by regulation of this screw any desired quantity of gas may be allowed as the maximum flow through the port. Communicating with said port is the pilot flame tube 65. This extends downward from the valve 18 alongside of one of the tubes 16 and passes into the enlarged lower end 15^a of the chimney. At its lower end the tube turns horizontally over the mantle.

In the general operation of the burner when the gas valve is turned to the closed position shown in Fig. 8, a minimum flow of gas is allowed to flow through the tube 65 and burns at the lower end thereof in a minute flame. To light the lamp, it is only necessary to throw the valve to open position as shown in Fig. 7, bringing about a flash of the pilot flame over the mantles and simultaneously admitting gas to the burner tubes. The gas flowing from these tubes is instantly ignited by the flashing pilot flame and the burner is then in operation. In this connection it will be seen that the instant the valve plug 56 resumes the position shown in Fig. 7, one of the notches 62 moves over the port 61 and partly closes the port so that a maximum flow of gas through the port no longer takes place, but instead a minimum flow passes the port so that upon cutting off the gas from the tubes 16, the pilot flame continues to burn as before described. The hot gases from the mantles are confined by the enlarged lower end of the chimney and rise through the same passing out at the top thereof. The shield 20 deflects these gases transversely and prevents them from heating up the valve 18 and the tubes adjacent thereto. The air for mixing with the gas to form the combustible mixture is drawn in

from the side into the air chambers 46, the shield 48 deflecting the hot air rising from the chimney and insuring the formation of a cold mixture.

5 It will be seen that the burner is constructed with the greatest simplicity consistent with its necessary functions and that the parts are all so formed that they may be manufactured cheaply, thus adapting the
10 apparatus to the conditions necessary to a commercially successful incandescent lamp.

Having thus described the preferred embodiments of my invention, what I claim as new and desire to secure by Letters Patent
15 of the United States is:—

1. An incandescent gas burner having a chimney with enlarged ends, substantially vertical gas tubes extending down the sides of the chimney and fastened to the enlarged
20 upper end thereof, thereby supporting said chimney, Bunsen burner devices extending downward and inward through the enlarged lower end of the chimney into the interior thereof, the upper portions of said Bunsen
25 burner devices projecting outside the chimney being accommodated in the annular recess formed between the enlarged ends thereof, and means outside of the chimney for admitting air to the burner devices.

30 2. An incandescent gas burner having a chimney with enlarged ends, gas tubes extending downward closely adjacent to the sides of the chimney and fastened to the enlarged upper end thereof, thereby support-
35 ing said chimney, Bunsen burner devices extending through the enlarged lower end of the chimney into the interior thereof, the portions of said burner devices outside the chimney being accommodated in the annular
40 recess formed between the enlarged ends thereof, means insulating the burner devices from the chimney, and means outside of the chimney for admitting air to the burner devices.

45 3. An incandescent gas burner having a chimney, a support and gas supply pipe over

said chimney, gas tubes extending therefrom down along the sides of the chimney, said tubes being non-intercommunicating, short cross-connections at the lower ends of said
50 tubes, and a plurality of Bunsen burner devices extending from each of said cross-connections into the lower part of the chimney and having air admission means outside of the chimney. 55

4. An incandescent gas burner having a chimney, with enlarged ends, a support and gas supply pipe over said chimney, a deflector between the upper end of said chimney and said supply pipe, gas tubes extending
60 downward and outward from said supply pipe and then vertically downward, said tubes being non-intercommunicating and being fastened to the enlarged upper end of said chimney, thereby supporting said chim-
65 ney, short cross-connections at the lower ends of the vertical portions of said tubes, and two Bunsen burner devices extending diagonally downward and inward from each cross-connection through the enlarged lower
70 part of said chimney into the interior thereof, means insulating said burner devices from said chimney, and means outside of the chimney for admitting air to the burner devices. 75

5. An inverted incandescent gas burner having a chimney, a multiple mantle holder located at the lower end thereof, a rod attached to the mantle holder at one side, a sleeve secured to the chimney and in which
80 the rod is loosely received, the sleeve having a bayonet slot therein, a pin secured to the rod and playing in the slot and a catch mounted on the sleeve and coacting with the rod to hold it raised. 85

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

LEE T. ALTON.

Witnesses:

ISAAC B. OWENS,
THOMAS GREGORY.