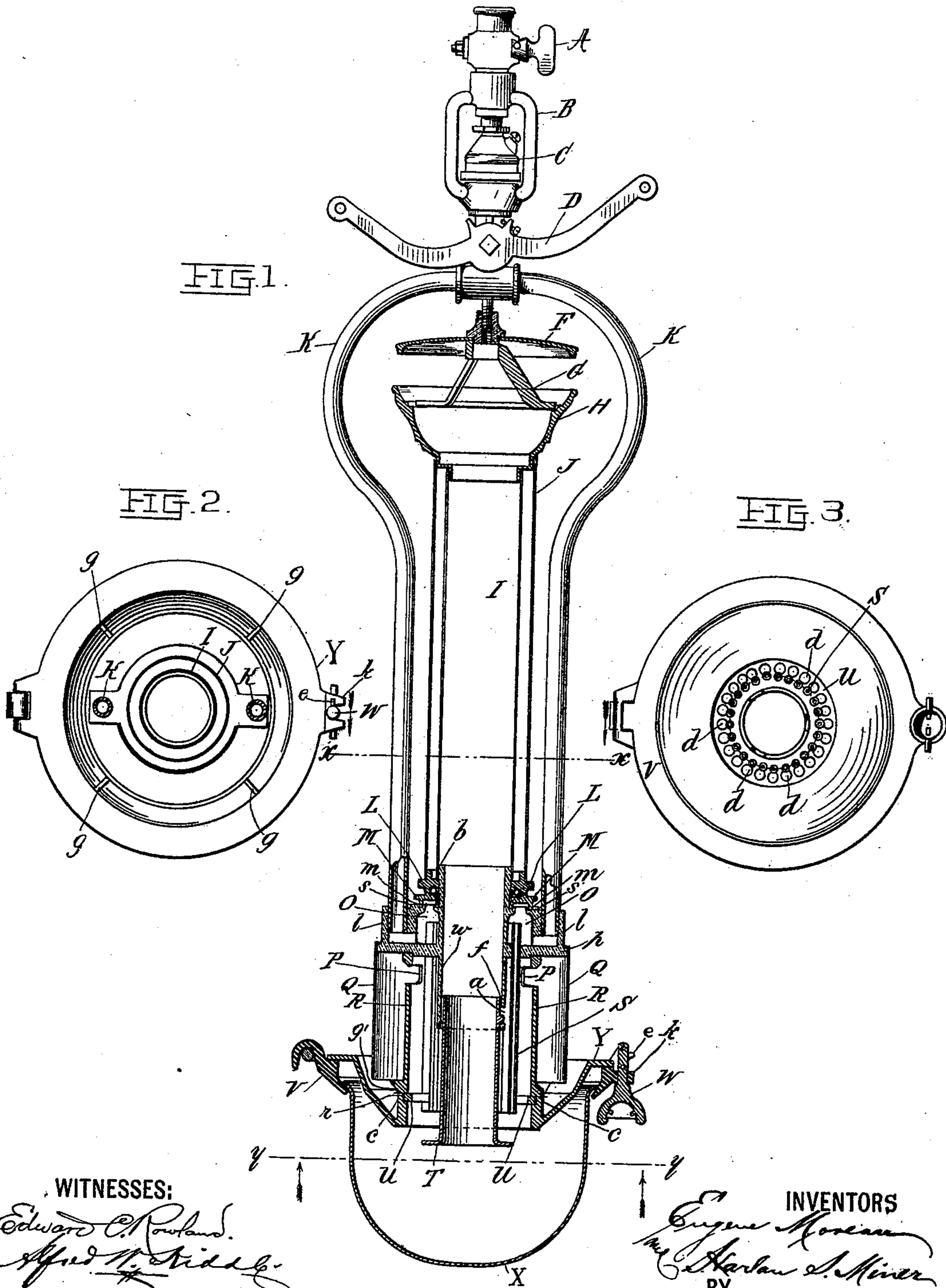


(No Model.)

E. MOREAU & H. S. MINER.
GAS LAMP.

No. 516,609.

Patented Mar. 13, 1894.



WITNESSES:

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EUGÈNE MOREAU, OF PHILADELPHIA, PENNSYLVANIA, AND HARLAN S. MINER, OF GLOUCESTER CITY, NEW JERSEY, ASSIGNORS TO THE WELSBACH LIGHT COMPANY, OF GLOUCESTER CITY, NEW JERSEY.

GAS-LAMP.

SPECIFICATION forming part of Letters Patent No. 516,609, dated March 13, 1894.

Application filed January 5, 1893. Serial No. 457,357. (No model.)

To all whom it may concern:

Be it known that we, EUGÈNE MOREAU, a citizen of the Republic of France, residing in the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, and HARLAN S. MINER, a citizen of the United States, residing at Gloucester City, in the State of New Jersey, have invented certain new and useful Improvements in Gas-Lamps, of which the following is a specification.

Our invention relates to downward burning regenerative gas lamps termed "shadowless lamps" in which the gas and air are carried in the same direction downwardly and heated before reaching the place where combustion is intended to take place, the products of combustion passing in an opposite direction up through the center of the lamp; and our invention consists in the novel devices and combinations of parts hereinafter described and particularly set forth in the claims hereinafter following.

In the accompanying drawings, forming a part hereof, is illustrated a lamp embodying our invention in which—

Figure 1 is a view in elevation partly in section showing the relative arrangement of the parts which taken together comprise the lamp and their method of union. Fig. 2, is a sectional view taken through line $x-x$ of Fig. 1 looking in the direction of the arrows; and Fig. 3, is a view of the lower end of the lamp taken through line $y-y$ of Fig. 1 looking in the direction of the arrows.

The gas which may be of any suitable character passes from a source of supply through a system of cocks A and B and a governor C which we use for the purpose of controlling or regulating the supply of gas and the pressure of the same, and thence the gas branches above the lamp into two side arms or gas pipes K through which the gas passes downwardly into the gas chamber O. Issuing from this gas chamber the gas passes through a series of drawn tubes S which are arranged in an annular ring and enter the gas chamber at its bottom; and the gas entering such tubes issues therefrom at their lower ends through the tips of the tubes and mixes with the heated air at the place where combustion takes place around the lower end of the cen-

ter flue T and when ignited it burns with a brilliant flame. The air which is supplied for the combustion of the gas is drawn from above the top plate and deflector Y under the lower edge of a draft-shield Q and thence up between this draft-shield and a cylinder R through the openings P in the sides of said cylinder near its top; and after passing through these openings the air fills all the space surrounding the tubes S between the cylinder R and the center flue T and thence passes downwardly to the tips of the gas burner tubes S where it commingles with the gas. The gas as it issues from the tips of the tubes S, which extend a short distance below a spacing and distributing ring U is thus between two currents of air, which air has become heated in its passage from the entrance on the top of the deflector Y until it is emitted at the tips of the burner tubes after having passed through the chamber formed by the draft-shield Q and cylinder R and through the above mentioned openings P at the top of said cylinder and out of the spaces or openings in the spacing tube U, where it mixes with the gas as it comes from the burner tubes as above stated. The ignition of the gas produces a flame which extending in a downward direction is then drawn around the lower end of the center flue T which extends below the tips of the burner tubes and up into said center flue which is continued above as the chimney I of the lamp through which the products of combustion pass and out at its upper end. The gas is brought to the gas chamber O through the pipe or pipes K K which are cool and the gas is thus itself kept cool, and decomposition and deposition in the pipes is prevented.

The gas chamber consists of a hollow cylindrical casting, or a casting having a cylindrical opening through its center and around that opening, and separated from it by an annular chamber O, which is the gas chamber proper, as shown in the drawings. The gas inlet pipes K are screwed into lugs ll diametrically opposite each other forming part of the upper end of the casting of the gas chamber O, and which lugs are cored out as shown, so that the gas enters the annular chamber O at the bottom thereof. There is

an annular opening in the gas chamber O directly above the tubes which is closed and made completely tight by means of an annular metal cover M preferably of the same material as the casting of which the gas chamber is made, which cover has two annular tongues *m m* on its inside and outside edges and which tongues rest in corresponding annular grooves *s s* in the top of the gas chamber casting one on each side of the opening in said gas chamber as shown in the drawings; of course, it is to be understood that the positions of the tongues and grooves may be reversed, that is to say, the tongues or grooves may be either on the cover or on the gas-chamber in either of which positions the tongues are adapted to fit into the grooves.

In the construction shown in the drawings the tongues of the cover closely fit into the grooves in the gas chamber casting and rest against the bottom of such grooves and to make the joint between them as tight as possible they are surrounded with lead, plumbago, asbestos or other suitable material to make as perfect a hermetical seal as possible when the cover M is properly fitted in place; of course the packing may be dispensed with if desired, and a perfect joint obtained when the engaging surfaces or faces of the lock-nut and gas chamber are ground so as to make a perfectly mechanical, airtight joint. The cover M is held in its position and the tongues are pressed down firmly into the grooves on the top of the gas chamber by means of a lock-nut L which screws onto the neck *b* of the gas chamber; the faced bearing of the lock-nut when screwed down presses upon the faced surface of the gas chamber cover M thereby firmly holding the cover in position over the opening in the gas chamber, as will be readily understood, and as the gas chamber cover M and the gas chamber are preferably of the same material they may have the same coefficient of expansion and thereby preserve a perfectly tight seal at all the temperatures to which the lamp is subjected.

The lock-nut may be made with a polygonal periphery so that it may be turned by an ordinary wrench or may be of other shape and have holes drilled in it so as to be turned by an **S** wrench.

The annular ring of burner tubes S which protrude into the gas chamber are held in position at their lower extremities by the spacing ring U which spacing ring has an annular row of holes *d* arranged outside of the gas burner tubes and concentric therewith, and rests in a groove *r* in the top plate and deflector Y. The air from its entrance above the deflector Y to the time it reaches the burner tubes passes in a circuitous route and is gradually and finally very highly heated by reason of its contact with the center flue T up through which the products of combustion pass, as above explained, whereby the said center flue is heated and consequently the

air surrounding said flue will be correspondingly heated; and the air in turn imparts some of its heat to the gas tubes S and heats the gas in said tubes just before its ignition. A portion of the heated air passes through the space between the tips of the burner tubes S and the center flue T and furnishes the supply to the interior of the flame and another portion passes through the above mentioned openings *d* in the annular distributing ring U.

The center flue T which comprises the lower portion or termination of the chimney I of the lamp is preferably made of porcelain, steatite or other white refractory material; and it may be made removable and is held in position by lugs *f* which set in the grooves or bayonet-catch sockets *a* in the lower end *w* of the gas chamber casting.

The chimney I extends above to a sufficient height to give the required draft to the lamp and may be surrounded by a casing J if desired; and this chimney I is surmounted with a chimney crown H, on which rests a tripod G and on this tripod is secured a shield F constructed as shown in the drawings, (Fig. 1) whereby the heated products of combustion are kept away from the governor D and other parts situated above the chimney top.

The combination top plate and deflector Y is constructed of a single casting in the shape shown in the drawings, from which it will be seen that it is depressed in the center portion, which is hollowed out forming a cylindrical neck *c* and has a beveled under-side. By thus depressing the center of the plate and extending the lower edge of the shield which surrounds the open-topped cylinder below the surface of said plate, or into its depressed center, a more circuitous passage is provided for the air, and increased steadiness of flame is produced. To this deflector Y the globe-holder V is attached and the under beveled surface of the deflector may be enameled or painted white and being of the shape indicated acts as a deflector to the light of the flame. The lower rim of the draft-shield Q hangs down in the depression in the top plate and deflector, and rests on lugs *g* attached to the upper side of the deflector provided for that purpose, leaving a space between the lower edge of the draft-shield and the upper surface of the deflector so as to allow the air to pass down around the lower edge of the draft-shield and up into the lamp as before explained. The cylinder R rests on the lugs *h* also on the upper surface of the top plate, the lower edge of said cylinder being provided with corresponding lugs which rest on the lugs *h* and the cylinder R and deflector are fastened together by means of screws which pass through said lugs. Similar lugs are also attached at the upper end of the cylinder R and screws passing therethrough and through the rim *p* of the gas chamber O securely hold the two together at that point. When the cylinder R is securely fastened in position to the rim of the gas chamber and

on the top plate Y it fits closely around the spacing ring U, and thus holds such ring securely in position; and as the draft-shield Q fits tightly about the rim *p* of the gas chamber O, the air will be forced to enter the lamp from between the lower edge of said draft-shield and the upper surface of the top plate, as above stated. The flame as it comes from the burner tube is inclosed in a glass globe X which is held in position by the globe-holder V attached to the top plate Y, and the globe-holder V is securely locked to the rim of the deflector Y so as to make a tight joint to the same by means of the catch W which is attached to the globe-holder V, the upper end of said catch having a projection *e* which passes through a split lug *k* on the rim of the deflector Y with which the projection *e* on the catch W engages, thereby locking them together, the globe-holder V being hinged to the deflector Y at its opposite side, as will be readily understood from the drawings.

We do not limit our invention to the precise construction of lamp or parts and devices which taken together comprise the lamp above described and shown in the drawings, but

What we do claim as our invention, and desire to secure by Letters Patent, is—

1. In a gas lamp, the combination of a gas chamber, a central tubular neck, a gas pipe leading from a source of gas supply and connected with the chamber, an opening in the top of the chamber, a cover closing the opening, said cover being provided with tongues or grooves on its lower surface fitting into corresponding tongues or grooves on the upper surface of the gas chamber, and a locking nut screwing on the threaded upper end of the neck and securing the cover to the gas chamber; substantially as described.

2. In a gas lamp, the combination of a gas chamber, a central tubular neck, a gas pipe leading from a source of gas supply and connected with the chamber, an opening in the top of the chamber, a cover closing the opening, said cover being provided with tongues or grooves on its lower surface fitting into corresponding tongues or grooves on the upper surface of the gas chamber, a series of burner tubes leading from the gas chamber, a lock nut screwing on the threaded upper end of the neck for securing said cover to the chamber, and a central flue surrounded by the series of burner tubes; substantially as described.

3. In a gas lamp, the combination of a pipe leading from a source of gas supply, a gas chamber connected with said pipe, a series of burner tubes leading from the chamber, said chamber having a central tubular neck and an opening in its top and provided with tongues or grooves on its upper surface, a cover closing said opening, said cover being provided with openings or grooves fitting the tongues or grooves on the gas chamber, a lock nut screwing upon the threaded upper

end of the neck and securing said cover upon the chamber, a chimney seated on the ledge on said nut, and a central flue surrounded by the series of burner tubes, said flue being connected to the lower end of the neck of the gas chamber; substantially as described.

4. In a gas lamp, the combination of a gas chamber having a tubular neck and a central flue depending therefrom, a hollow cylinder depending from the under side of said chamber and having an opening or openings near its upper end for the entrance of air, a shield surrounding the cylinder and open at its lower end, and a plate connected with the lower end of the cylinder, said plate having a central opening and depressed below its outer edge, the open end of the shield depending below the upper edge of the plate into the depression; substantially as described.

5. In a gas lamp, the combination with a hollow cylinder having an opening or openings therein, a metal shield surrounding said cylinder with the air space between, a plate connected with the lower end of said cylinder, said plate being depressed in its center and having a central opening therein, said plate being also provided with lugs on its upper surface on which the shield rests so as to leave a space between the upper surface of the plate and the lower edge of the shield; substantially as described.

6. In a gas lamp, the combination of a gas chamber having a tubular neck and a central flue depending therefrom, a hollow cylinder depending from the under side of said chamber and having an opening or openings near its upper end for the entrance of air, an open-ended shield surrounding the cylinder, and a plate connected with the lower end of said cylinder, said plate having a central opening and a beveled reflecting under surface and depressed upper surface, the open-end of the shield depending below the upper edge of the plate; substantially as described.

7. In a gas lamp, the combination of a gas chamber connected with a source of gas supply, said chamber having a central tubular neck, a series of burner tubes surrounding the neck and connected with said chamber at their upper ends, a cylinder depending from said chamber outside of the series of tubes, a metal ring secured inside the cylinder near its lower end, through which ring the burner tubes project, a series of air openings in the ring outside of the gas tubes, an opening or openings in the cylinder near its upper end, a central flue connected to the neck of the gas chamber and surrounded by a series of burner tubes, an open-ended shield depending from the gas chamber outside of the cylinder, and a plate connected with the lower end of the cylinder, said plate having a central opening and a beveled under surface and depressed upper surface, the open-end of the shield depending below the upper edge of the plate; substantially as described.

8. In a gas lamp, the combination of a pipe

leading from a source of gas supply, a gas chamber connected with said pipe, an opening in the top of said chamber, tongues or grooves around the opening, a cover closing
5 said opening, said cover being provided with tongues or grooves fitting into the openings or grooves on the top of the gas chamber, a tubular neck projecting upwardly from the center of the gas chamber, a lock nut screw-
10 ing upon the threaded end of the neck for securing the cover in place on the chamber, a chimney seated on a ledge on said nut, a central flue depending from a lower projection of the tubular neck, a series of burner tubes
15 surrounding the flue and leading from the gas chamber, a cylinder depending from the under side of the chamber outside of the series of tubes, said cylinder having an air opening or openings near its upper end, an open-
ended shield depending from the gas cham- 20
ber outside of the cylinder, a metal ring secured inside the cylinder near its lower end through openings in which ring the lower
ends of the burner tubes pass, a series of air
openings in the ring outside of the gas tubes, 25
and a plate connected with the lower end of the cylinder, said plate having a central opening and a beveled under surface and depressed upper surface, the open-end of the
shield depending below the upper edge of the 30
plate; substantially as described.

This specification signed and witnessed this
29th day of November, A. D. 1892.

EUGÈNE MOREAU.
HARLAN S. MINER.

In presence of—
TOWNSEND STITES,
C. E. STOKES.