

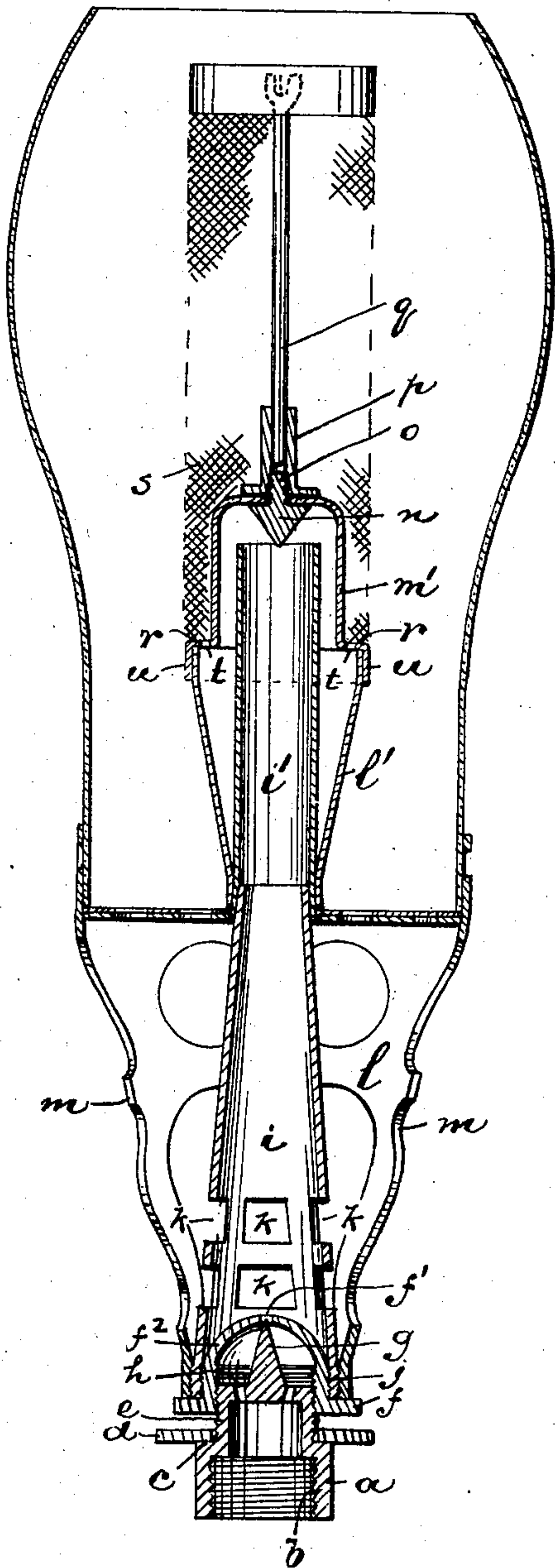
No. 742,234.

PATENTED OCT. 27, 1903.

L. J. REINHARDT.  
INCANDESCENT GAS BURNER.

APPLICATION FILED MAY 19, 1902.

NO MODEL.



WITNESSES:

*Harry Krug*

*Russell M. Everett.*

INVENTOR:

**Leonard J. Reinhardt,**

BY

*Drake & Co.*

ATTORNEYS.



# UNITED STATES PATENT OFFICE.

LEONARD JOHN REINHARDT, OF ORANGE, NEW JERSEY.

## INCANDESCENT GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 742,234, dated October 27, 1903.

Application filed May 19, 1902. Serial No. 107,960. (No model.)

*To all whom it may concern:*

Be it known that I, LEONARD JOHN REINHARDT, a citizen of the United States, residing at Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Incandescent Gas-Burners; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, and to letters of reference marked thereon, which form a part of this specification.

The objects of this invention are to reduce the cost of construction; to provide a burner which will give a greater illuminating power with a limited consumption of illuminating-gas, a greater percentage of air being employed in the illuminating mixture; to secure a more perfect mixture of the air and illuminating-gas preliminary to subjecting the same to the flame; to secure a more perfect distribution or disposition of the flame within the mantle, whereby the said mantle is rendered incandescent over a greater surface thereof, and to secure other advantages and results, some of which may be referred to hereinafter in connection with the description of the working parts.

The invention consists in the improved gas-burner and in the arrangements and combinations of parts of the same, all substantially as will be hereinafter set forth and finally embraced in the clauses of the claim.

The single figure of the drawing represents a gas-burner in central vertical section and is deemed sufficient to fully illustrate the construction and operation of the several parts thereof.

In said drawing, *a* indicates the needle section or member of the governing-valve, the said section being provided with internal screw-threads *b*, adapted to be applied to the ordinary gas-fixture as commonly found within houses. On the outer side the said section *a* is provided with a shoulder *c*, adapted to limit the downward movement of a certain lock-nut *d*. Above said shoulder the said section or member *a* is reduced in diam-

eter and is provided with an exterior screw-thread *e*, adapted to receive the second section or member *f* of the governing-valve, the said second section being provided at the top and at the center thereof with a gas opening or passage *f'*, adapted to receive the pointed extremity of the valve-needle *g*, the said needle *g* being formed upon or secured to the central upper part of the section or member *a*. Around the base of said needle the member *a* is perforated with a series of perforations *h*, through which the hydrocarbon gas flows to the passage *f'*.

By turning the member *f* on the threaded member *a* the former is raised or lowered from or toward the latter, and the opening *f'* is opened or closed or increased or diminished in flow area by the insertion or withdrawal of the tapering needle, and thus the flow of gas to the mixing-chamber is increased or diminished at will. Above said member *f* is arranged the mixing-chamber *i*, comprising a hollow piece of somewhat conical form and provided at or near its base with screw-threads *j*, adapted to engage corresponding screw-threads formed on the outer periphery of the dome *f'* of the valve member or section *f*. Above the said screw-threads, and preferably above the upper end or dome of the member or section *f*, the said mixing-chamber *i* is perforated, as at *k k*, the perforations being of large area and through which the atmospheric air may enter the mixing-chamber *i* from the guarded air-chamber *l*, formed around the outside of the said mixing-chamber. The said guarded chamber is preferably exteriorly inclosed by a flanged partition *m* of suitable metallic open-work, which is preferably ornamental in character, but which under some conditions may be dispensed with.

At the upper or smaller end of the perforated mixing-chamber *i* is telescopically fitted an extension *i'* of the mixing-chamber and extending above the point of ignition. At the lower end thereof a flaring sleeve *l'* is arranged, which is capped at the top by a gas-preheater *m'*, the top of said gas-preheater *m'* lying a little above the top of the extension *i'* and above the point of ignition, so that



there is a space or passage between it and the upper end of the said extension. At a point in line with the vertical passage through said extension said cap is provided with a spreader *n*, consisting of an inverted conical metallic piece, the apex of which lies at or near the axial center of the extension and nearly flush with the upper end thereof.

The spreader *n* is preferably a solid piece of metal and provided at its upper or base portion with a shank *o*, which extends through a central perforation in the preheater or cap and is threaded to receive a flanged tubular socket *p* to receive the mantle rod or support. The threaded socket serves as a nut, by means of which the spreader is firmly screwed in place within the heater.

At the base of the heater the same is provided with a perforated horizontal flange *r*, the perforations *t* being formed in an annular series around the burner, so that the mixed gases will be directed vertically upward around the outer vertical sides of the heater-cap and will be prevented from contracting at once toward the axial center of the flame after issuing from the perforations. Thus the gas issuing from the said annular series of perforations being ignited will be held in contact with the cylindrical sides of the mantle *s*, so that said mantle will be maintained in a high state of incandescence from its base upward to or near to the top. At the outer edges of the flange *r* the same are turned downward, as at *u*, to engage the outer sides of the inverted conical sleeve *v*, maintaining an impervious joint therewith, so that the gas will all pass out through the said annular series of perforations *t*.

The relation of the burner-sleeve *v* to the extension *i* is such that the gas after being mixed with air entering through the openings *k* flows upward to the top of the burner and thence is given a downward course, the spreader serving to mix the gases and render the flow uniform at all sides. Following the inside walls of the heating-cap the mixed gas forms a comparatively thin film and is thoroughly heated by the flame at the outside of the cap before arriving at the annular series of perforations *r*. Thus the gas is more thoroughly mixed and perfectly ignited and its illuminating power is increased.

The mantle *s* is formed and arranged so that it engages the periphery of the burner at the outside of the downwardly-turned part *u* of the flange *r*, and thus all the gas is directed upward on the inside of the mantle and the latter is given high incandescence from the base to the top thereof. The mantle is supported by a mantle rod or support *q* in any ordinary manner.

I am aware that various modifications from my construction thus positively described may be made or employed without departing from the scope or spirit of my invention, and consequently I do not wish to be understood

as limiting myself by the positive expressions employed.

Having thus described the invention, what I claim as new is—

1. The improved burner herein described, comprising a mixing-chamber having at its top a preheater, which lies over the open end of said chamber, and at its bottom is perforated to permit the passage upward of the ignited mixture of gas and air along the outside of said preheater, between said preheater and the mantle, and a mantle disposed around said preheater, substantially as set forth.

2. The improved burner herein described, comprising a mixing-chamber open at the top, a preheater arranged over the open top and extending downward at the sides of the said mixing-chamber, a down-passage for the gas being formed between the sides of said chamber and the sides of the said preheater, which passage opens outward at the lower end thereof, and a mantle arranged around the outside of the preheater and forming a chamber or passage with said preheater, through which chamber the ignited gas from the open end of the down-passage may flow upward and heat the wall of said passage, substantially as set forth.

3. The improved burner, comprising a valve, a mixing-chamber receiving the gas from the valve and perforated to receive atmospheric air, a sleeve arranged around said mixing-chamber, a preheater supported at the top of said sleeve and supporting a mantle-support, a down-passage being formed between the side walls of the preheater and the mixing-chamber, said side walls being perforated at their bottoms and permitting an outflow of gaseous mixture against the mantle, and said mantle carried by the said mantle-support and extending down around said preheater, substantially as set forth.

4. The improved burner comprising a mixing-chamber, a cap-like preheater arranged over and around the upper end of said mixing-chamber and forming a down-passage for the gaseous mixture from the mixing-chamber, and a mantle arranged outside of and around said preheater and forming with the sides of the preheater an up-passage for the ignited mixture, the flame of which will lie immediately against the outside of the wall of the down-passage, substantially as set forth.

5. The improved burner, comprising the valve for regulating the flow of gas, a mixing-chamber having perforations *k*, a flaring sleeve secured to the outside of the mixing-chamber, a cap arranged over said mixing-chamber, and at its bottom having a perforated flange turned down over the top of said sleeve, a mantle-supporting rod carried by said cap, and a mantle, all arranged and combined substantially as set forth.

6. In a burner, the combination with the tubular mixing-chamber, of a sleeve attached



5 to said mixing-chamber, a cap arranged over said mixing-chamber and having a deflector inside thereof, said cap having a perforated flange at its bottom turned to fit over said sleeve and a mantle-supporting rod and its mantle, all arranged and operating, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 26th day of April, 1902.

LEONARD JOHN REINHARDT.

Witnesses:

CHARLES H. PELL,  
C. B. PITNEY.