No. 767,958. PATENTED AUG. 16, 1904.

F. W. RATH.

GAS BURNER.

APPLICATION FILED DEC. 15, 1903.

NO MODEL.

Fig. 1.

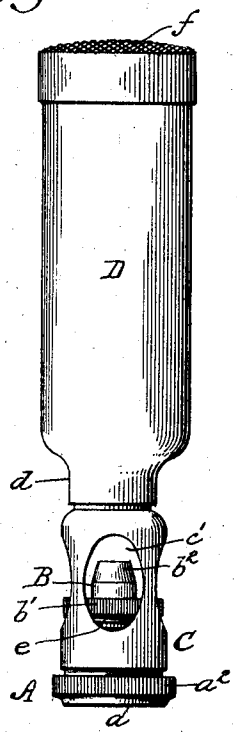


Fig. 2.

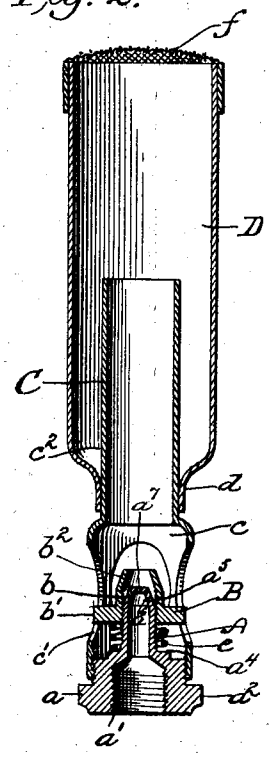


Fig. 3.

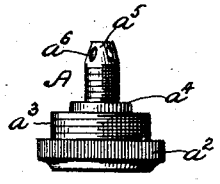
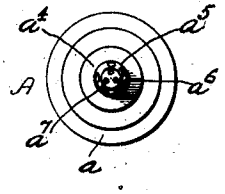


Fig. 4.



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UNITED STATES PATENT OFFICE.

FRANK W. RATH, OF PATERSON, NEW JERSEY.

GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 767,958, dated August 16, 1904.

Application filed December 15, 1903. Serial No. 185,236. (No model.)

To all whom it may concern:

Be it known that I, FRANK W. RATH, a citizen of the United States, residing at Paterson, in the county of Passaic and State of New Jersey, have invented new and useful Improvements in Gas-Burners, of which the following is a specification.

This invention relates to burners, and has particular application to a certain novel and improved gas-burner designed especially for use in connection with incandescent lights.

In the present instance I have in view the provision of an improved burner of the type referred to through the medium of which the flow of gas to the mixing-chamber of the burner may be regulated and controlled in such manner that with a minimum consumption of gas a light of increased candle-power will be obtained when compared with the burners now generally in use.

Still a further object of my invention is to provide the gas-nozzle with a plurality of gas-passages in the nature of perforations or bores so constructed and arranged that the gas may be admitted to the mixing-chamber without the jets of gas issuing from the nozzle, forming what is commonly known as a "cross-flame." In connection with this improved nozzle I contemplate employing a peculiarly-constructed regulating-cap by which the volume of gas issuing from the nozzle may be regulated to a nicety. I also intend to employ, in connection with a mixing-tube, an outer tube or jacket through which the mixing-tube extends for a considerable distance, this correlation of the jacket and the mixing-tube enabling a clear steady light of great power and incandescence to be had when the burner is provided with an ordinary incandescent mantle.

With the above-recited objects and others of a similar nature in view my invention consists in the construction, combination, and arrangement of parts, as is described in the specification, delineated in the accompanying drawings, and set forth in the appended claims.

In the drawings like parts are designated by corresponding characters in all the figures.

Figure 1 is a side elevation of a gas-burner embodying my improvements. Fig. 2 is a vertical central longitudinal section thereof. Fig. 3 is a detail view of the gas-nozzle with the cap removed, and Fig. 4 is a plan view of the nozzle shown by Fig. 3.

In the accompanying drawings for the sake of convenience and a clear understanding of my invention I have designated the gas-nozzle as a whole by the letter A, the regulating-cap for the nozzle by B, while the gas and air mixing chamber or tube is indicated at C and the jacket or outer tube is shown at D.

Referring to the drawings in detail, it will be seen that the nozzle A comprises a base portion a, having a threaded socket a', said base portion having extending circumferentially thereof a milled flange a^2, while the portion immediately above said milled flange is provided with a male screw-thread a^3. Extending upwardly from the base portion is the nozzle proper, A, which is of less diameter than the base portion and forms therewith a shoulder a^4. The nozzle is of tubular form and at its upper end portion terminates in the frusto-conical part a^5, which is closed except where such frusto-conical part is provided with a plurality of gas passages or bores.

Referring particularly to Figs. 3 and 4, it will be seen the inclined wall of the frusto-conical part is formed with a plurality of elongated vertically-disposed apertures a^6, communicating with the interior of the nozzle, while the flattened top of the frusto-conical part is provided with a plurality of relatively small openings a^7, the same also having communication with the interior of the nozzle. The nozzle A is threaded externally below the frusto-conical part to screw into the threaded wall b of the cap B.

The regulating-cap B is provided at its lower portion with a circular milled flange b', and the upper portion of this cap, which is also of tubular conformation, is frusto-conical in form, as indicated at b^2, the top of said cap being open. By this construction and arrangement it will be observed that when the cap is rotated so as to be moved vertically up or down upon the nozzle the frusto-conical wall of the cap will be brought into such correlation with the frusto-conical wall of the nozzle that the flow of gas through the vertically-arranged elongated apertures a^6 will be regulated and controlled—that is to say, the adjustment of the cap regulates the area of

the ports in the nozzle. It will be noted, however, that in either of the several positions assumed by the cap when adjusted as described a limited volume of gas is free to pass from the nozzle through the vertical axial passages a^7 in the flat top wall of the nozzle.

When the burner is in service, a small volume of gas is supplied to the mixing-tube by the axial perforations a^7 of the nozzle; but to increase the supply of gas it is necessary to adjust the cap B and allow the gas to pass through the side passages a^6, as well as through the axial passages a^7.

In order to prevent any accidental displacement of the cap B upon the nozzle, I have provided a tension-spring e coiled about the nozzle and interposed between the milled flange b' and the base of such nozzle. The tension of the spring on the cap insures a positive engagement of the threads of the cap with those of the nozzle, thereby obviating a possibility of said cap being accidentally deranged.

The mixing-tube C is enlarged at its lower portion to produce the air-chamber c, air being admitted to such lower portion through the openings c'. The lower enlarged part of the tube is internally threaded to screw upon the male threaded portion a^3 of the nozzle-base, thus making provision for mounting the mixing-tube directly upon the base of the nozzle. The lower enlarged portion of the mixing-tube envelops the nozzle and the cap, and the milled edge of the cap is exposed through the openings in the bottom part of the tube, thus enabling access to be obtained easily to the cap for the proper adjustment thereof upon the nozzle. Projecting upward from the enlarged portion c is the tubular extension c^2, which forms the air and gas mixing chamber proper, the upper end of the tube being open for the unobstructed egress of the mixture of gas and air. Fitting over the tubular extension c^2 of the mixing-tube is the relatively large jacket or tube D, the lower part of which is reduced in diameter, as at d, the same having frictional engagement with the member c^2 of the mixing-tube C.

When the jacket D is mounted upon the mixing-tube C in the normal position, such as indicated by Fig. 2, it will be seen that the tubular member of the mixing-chamber projects into the jacket for a considerable distance, in the present instance approximately half the length of said jacket, this arrangement producing a burner capable of attaining a thorough mixing of the elements and insures that the light shall be of great brilliancy and candle-power. In addition to this the telescoping or jacketing of the member c^2 within the part D greatly reduces the length of the entire burner, thereby securing a compact and neat structure.

Surmounting the jacket D is a gauze cap f of any ordinary and well-known form.

It should be understood that the improved burner is used in connection with an incandescent mantle, (not shown,) the same being suspended over the gauze cap.

From the above description, taken in connection with the accompanying drawings, the operation of my improved burner will be readily apparent and the many advantages incident to the same will be manifest, so that it is unnecessary to dwell upon the same here in detail.

What I claim as new is—

1. As a new article of manufacture, a gas-burner provided with a gas-nozzle having a frusto-conical upper portion, said nozzle having in its upper surface a series of gas-pasages, and a plurality of approximately vertical passages arranged circumferentially of the side wall of the frusto-conical portion, a cap adjustable on the nozzle, a spring acting against the cap, a mixing-tube enveloping the cap and nozzle, and a jacket covering the mixing-tube.

2. As a new article of manufacture, a gas-burner provided with a nozzle having a frusto-conical upper portion, said frusto-conical portion having a plurality of approximately vertical passages, said nozzle also having a plurality of passages arranged in the flat top surface of the frusto-conical portion, an adjustable cap for regulating the area of the ports formed by the approximately vertical passages, and a mixing-tube.

3. As a new article of manufacture, a gas-burner provided with a shouldered nozzle having a frusto-conical upper portion containing a plurality of passages, a cap screwed on the nozzle, a spring seated on the shoulder of the nozzle and acting against the cap, and a mixing-tube enveloping the cap, nozzle and spring, and coöperating with the nozzle.

4. As a new article of manufacture, a gas-burner comprising a jacket, a gas-nozzle having an upper frusto-conical portion provided with a series of large passages and a plurality of relatively small passages, a mixing-tube supported by the nozzle and provided with air-inlets adjacent to the outlet from said nozzle, said tube projecting for the major portion of its length into the jacket, and means for regulating the volume of gas admitted by the nozzle to said tube.

5. A new article of manufacture a gas-burner comprising a gas-nozzle having a frusto-conical upper portion, said nozzle being provided with a plurality of relatively small gas-pasages in its upper extremity and with larger approximately vertical passages in its frusto-conical portion, a cap screwed on the nozzle and having a frusto-conical part disposed in coöperative relation to the corresponding part of the nozzle, and a mixing-tube.

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