No. 827,342.

PATENTED JULY 31, 1906.

L. T. ALTON.

INCANDESCENT GAS LAMP.

APPLICATION FILED FEB. 16, 1905.

Fig. 1.

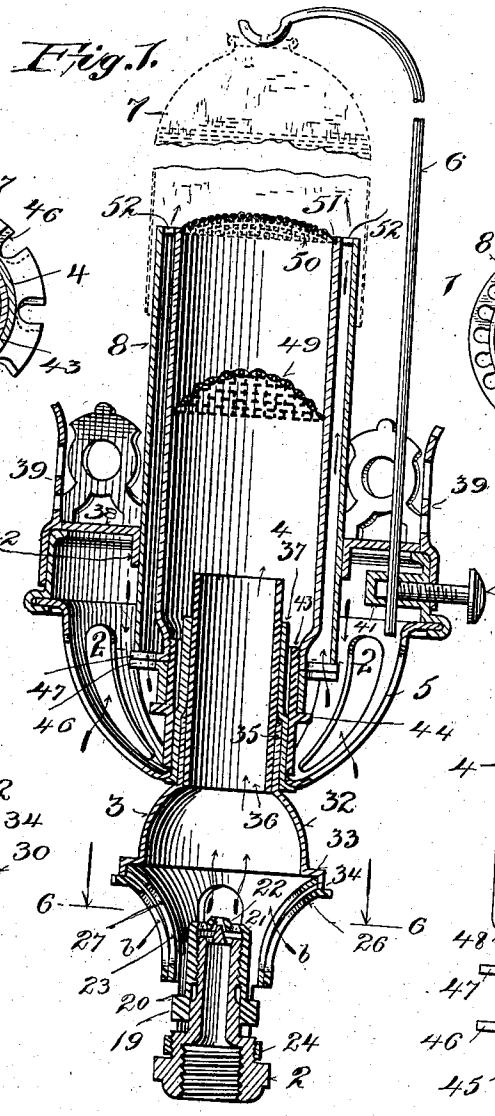


Fig. 2.

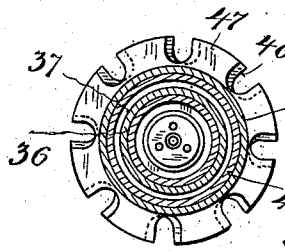


Fig. 3.

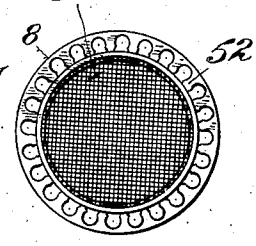


Fig. 4.

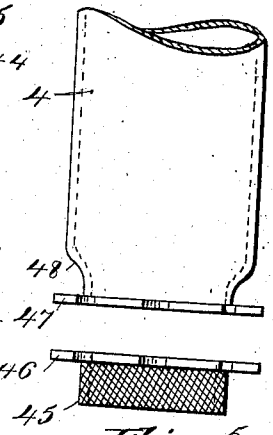


Fig. 5.

Fig. 7.

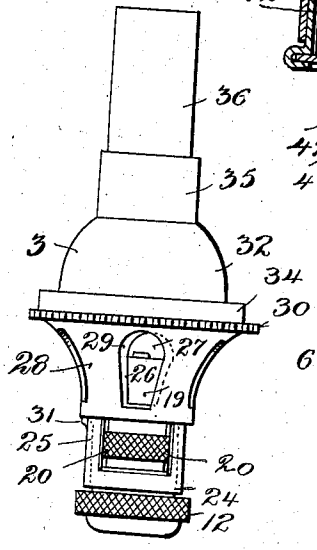


Fig. 8.

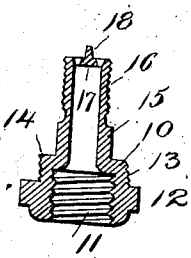
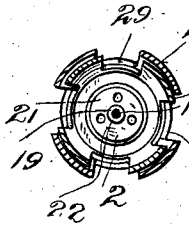


Fig. 6.



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By his Attorney
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UNITED STATES PATENT OFFICE.

LEE T. ALTON, OF NEW YORK, N. Y.

INCANDESCENT GAS-LAMP.

No. 827,342. Specification of Letters Patent. Patented July 31, 1906.

Application filed February 16, 1905. Serial No. 245,813.

To all whom it may concern:

Be it known that I, LEE T. ALTON, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, county of Kings, and State of New York, have invented a new and useful Improvement in Incandescent Gas-Lamps, of which the following is a specification.

The object of my invention is to provide an article of this class which will produce light more efficiently—that is, for a given consumption of gas it will produce more light or heat than any other burner known to me which receives the same amount of gas. This object has been accomplished after numerous experiments by providing a check and air-mixing chamber of a peculiar form, and also by providing an additional air-chamber which surrounds the mixing-chamber and permits the supply of pure air—that is, air free from gas—to be directed against the inside of the mantle in predetermined quantities, whereby a more complete combustion is had, and a larger mantle may be heated either to incandescence, if the mantle is to be used for lighting purposes, or to a lower degree of temperature if the burner is desired for heating purposes only.

For a more particular description of my invention reference is to be had to the accompanying drawings, which illustrate as an example the preferred manner of embodying my invention, and in which—

Figure 1 is a longitudinal sectional view of my improved burner in its operative position and surmounted by a mantle. Fig. 2 is a sectional view taken on the line 2 2 of Fig. 1 looking in the direction of the arrows. Fig. 3 is a plan view of the mixing-chamber and its surrounding air-chamber. Fig. 4 is a detailed view showing the lower portion of the mixing-chamber. Fig. 5 shows the damper which regulates the amount of air that flows into the air-chamber which is external to the mixing-chamber. Fig. 6 is a sectional view taken on the line 6 6 of Fig. 1 looking in the direction of the arrows. Fig. 7 is a side elevation of the Bunsen-tube air-inlet chamber and check, and Fig. 8 is a longitudinal section of a portion of the check which is adapted to be fixed to a gas-pipe.

Throughout the various views of the drawings, similar reference characters designate similar parts.

The lamp 1 comprises a check 2, surmounted by the Bunsen tube 3, which in turn is surmounted by the mixing-chamber 4 and gallery 5. A wire 6 extends from the gallery and supports the mantle 7 in the usual way, and surrounding the mixing-chamber 4 and extending into the mantle 7 is the tube 8, which is preferably made concentric with the mixing-chamber 4, so that a chamber is formed between the walls of the chamber 4 and the tube 8.

The check 2 comprises the fixed portion 10, which is screw-threaded at 11, where it is adapted to be secured to a gas-pipe and provided with a knurled flange 12. Above this flange 12 the part 10 is screw-threaded at 13 for a purpose which will appear below. These threads 13 terminate in a shoulder 14, where the part 10 is reduced to form an elongated neck 15, which is screw-threaded near its upper extremity, as shown in 16, and provided with a perforated top 17, which is surmounted by a small cone 18. The cap 19, which surmounts the part 10, is provided with a flange 20, which is preferably knurled, and this cap is screw-threaded to the part 16 and surmounted by a perforated part 21, a portion 22 of said top 21 being shaped like the frustum of a cone, so as to fit the projection 18, the cap and part 10 forming between them a needle-valve, which may be more or less open to regulate the flow of gas by simply turning the knurled collar 20.

The Bunsen tube 3 is provided with an air-admission chamber 23 at its lower extremity. This chamber 23 is screw-threaded at the collar 24 to the threads 13 on the part 10, and extending from the collar 24 are the standards 25, which are united at their upper ends and then flared upwardly and outwardly at 26 to form a portion of the walls of the air-inlet chamber 23. These walls are perforated, as shown at 27, and the check preferably extends about two-thirds the length of these openings. Surrounding the curved portion 26 is a damper or shutter 28, which has perforations 29, adapted to register with the openings 27 or to partially close them, as may be desired. This is accomplished by turning the knurled flange 30 at the upper extremity of this shutter 28. A lug or lugs 31, preferably integral with and bent from the uprights 25, secure this shutter in place, as is evident in Fig. 7. The lower portion 26 of the air-inlet chamber 23 is surmounted by the dome-shaped upper portion 32, which is connected to the part 23 by means of a flange 33 and collar 34, as is apparent in Fig. 1. In prac-

tice the parts 32 and 33 of the air-inlet chamber may or may not be pressed together at the volition of the manufacturer, the brazed structure for most purposes being preferred. The dome 32 is surmounted by a short tube 35, which extends upwardly and which retains and holds a short tube 36, which may be made as long or short as desired, although to secure the best results all parts should be made in the proportions indicated in Fig. 1. As is obvious, the tube 36 may be screw-threaded in the part 35 or brazed therein or held in any other suitable way, as desired.

Both the tubes 35 and 36 are surrounded by another tube 37, to which is secured the gallery 5. This gallery extends upwardly in the usual manner and is surmounted by the disk 38 and chimney-retaining fingers 39. It is also provided with the usual support for the mantle-wire 6, which includes the set-screw 40 and the casing 41 therefor, as well as the necessary perforations therethrough and through the disk 38. With the exception of the disk 38 this construction of gallery is old, so that a more detailed description is believed to be unnecessary. The disk 38 differs from the ordinary disks on galleries in that except for the center bore and the perforation for the passage of the wire 6 it is imperforate and does not extend to the mixing-chamber 4, but terminates at the tube 8 and is provided with a downwardly-extending flange 42, which rests snug against the tube 8 and preferably forms therewith an air-tight joint, the purposes of which will appear below.

Surrounding the tube 37 and snugly fitting against its lower portion is another tube 43, which is provided with an integral flange 44 and is screw-threaded at its upper end to receive the mixing-chamber 4, as shown in Fig. 1. A collar 45 rests on the flange 44, and this collar 45 is suitably knurled and provided with radially-extending teeth 46, which run at right angles to the knurled portion. These teeth have openings between them which are adapted to register with corresponding openings formed by teeth 47, which extend from the lower edge of the mixing-chamber 4, and above these teeth 47 the mixing-chamber 4 is slightly enlarged, as shown at 48, and then extends in a cylindrical form to its upper extremity.

The interior of the mixing-chamber 4 is preferably provided with one or more gauzes 49, and its upper extremity is provided with a gauze 50, which is preferably set in a small annular recess 51, so as not to interfere with the smooth exterior surface of the chamber 4. The gauzes 49 may be omitted entirely, if desired, but if omitted the burner loses some of its efficiency. The tube 8 rests on the projections 47 and extends up therefrom through the flange-opening in the disk 38 to the plane of the upper end of the chamber 4, where the tube 8 is provided with a top 52, which is perforated, so as to break up the air which passes through the tube 8 into a plurality of small streams. The mantle 7, as described above, is mounted in the usual way, as indicated in Fig. 1, and surmounts the burner and surrounds the upper extremity of the tube 8.

From the foregoing the operation of my improved burner will be evident. Gas passes into the check, as indicated by the arrow *a* at the bottom of Fig. 1, and at the upper extremity of this check it is somewhat mixed with air which passes as indicated by the arrows *b*, as well as through the openings in the lower end of the check. As the gas issues through a number of small perforations it is finely divided, and as its pressure is reduced it readily expands against the wall of the air-inlet chamber, and as it rises it comes in contact with the lower edge of the tube 36, against which it is forced by the contraction of the dome 32, and the mixture is made more complete. The mixing-chamber 4, together with the screens or gauzes 49 and 50, makes this mixture as complete as possible, and when it issues from the gauze 50 the mixture may be burned in the usual way with more than the ordinary efficiency. However, I have found after exhaustive experiments that by incasing the mixing chamber 4 in the tube 8 an air-inlet chamber is formed between them, so that pure or unmixed air issues in a finely-divided state through the perforated top 52 at the upper extremity of this tube, and the air from this chamber further unites with the flame at the top of the gauze 50 and produces a very complete combustion through the mantle 7, which readily heats it to incandescence. The amount of air best suited to produce this combustion is regulated by turning the knurled collar 45, and by turning the damper 28 and cap 19 the air and gas mixture in the mixing-chamber 4 may also be varied, so that by trial and adjustment the best results may be obtained. By experiment I have found that a large mantle may be heated to incandescence in this way with the same amount of gas that is required for a smaller mantle that would fit the mixing-chamber 4.

While any ordinary style of chimney or globe may be used with my burner, as above described, I prefer that the type of chimney with holes on a level with the mantle should be employed, as this chimney with this burner appears to give the best satisfaction.

While the burner as described above obtains the best results, it is obvious that all its features need not be utilized on the same burner. For example, the mixing-chamber and its inclosed tube may be used with any other form of check and air-inlet chamber than the one shown. Therefore I do not regard my invention as limited to the precise combination herein shown and described, but regard it as broad enough to cover all

at its top, a mixing-tube extending through the closed top of the gallery, a tubular member encircling the Bunsen tube and sustaining the mixing-tube, a jacket inclosing the mixing-tube and extending through the top of the gallery to form an air-passage from the gallery to the upper part of the mixing-tube, and an annular air-shutter encircling said tubular member and commanding the said lower end of the jacket.

14. A gas-burner having a Bunsen tube, a gallery surrounding it, the gallery having an opening in its lower portion and having a closed top located above the top of the Bunsen tube, a mixing-chamber extending from the Bunsen tube through the closed top of the gallery, and means forming an air-passage outside of the mixing-chamber from the interior of the gallery to the upper part of the mixing tube or chamber.

15. A gas-burner having a Bunsen tube, a gallery surrounding it, the gallery having an opening in its lower portion and having a closed top located above the top of the Bunsen tube, a mixing-chamber extending from the Bunsen tube through the closed top of the gallery, means forming an air-passage outside of the mixing-chamber from the interior of the gallery to the upper part of the mixing tube or chamber, and an air-shutter for regulating the air movement through said passage.

16. A gas-burner having a Bunsen tube, a tubular member surrounding it, a gallery sustained by said tubular member, the gallery being open at its lower portion and closed at its top, a tubular member surrounding the first-named tubular member, a mixing tube or chamber sustained on the second tubular member, said chamber extending through the closed top of the gallery, and a jacket inclosing the mixing-tube and spaced therefrom, the jacket entending from the interior of the gallery to the upper part of the mixing-tube and forming a passage, for the purpose specified.

17. A gas-burner having a Bunsen tube, a tubular member surrounding it, a gallery sustained by said tubular member, the gallery being open at its lower portion and closed at its top, a tubular member surrounding the first-named tubular member, a mixing tube or chamber sustained on the second tubular member, said chamber extending through the closed top of the gallary, a jacket inclosing the mixing-tube and spaced therefrom, the jacket extending from the interior of the gallery to the upper part of the mixing-tube and forming a passage, for the purpose specified, and an annular air-shutter loosely fitting around the second tubular member and controlling the air movement through the jacket.

18. A gas-burner having a Bunsen tube formed in two sections fitted together, a tubular member encircling the Bunsen tube adjacent to the joint between the sections, a gallery sustained by the tubular member, the gallery being closed at the top and open at the lower portion, a second tubular member encircling the first tubular member, a mixing-tube sustained by the second tubular member and extending through the top of the gallery, a jacket encircling the mixing-tube, for the purpose specified, and an annular air-shutter loosely encircling the second-named tubular member and controlling the air movement through the jacket.

19. A gas-burner having a Bunsen tube, a mixing-chamber rising from the same, an air-jacket surrounding the mixing-chamber and spaced therefrom, for the purpose specified, and a gallery mounted on the Bunsen tube, the gallery inclosing the Bunsen tube and the lower part of the mixing-chamber and jacket, and having a closed top and open lower portion.

20. A gas-burner having a Bunsen tube, a mixing-chamber rising from the same, an air-jacket surrounding the mixing-chamber and spaced therefrom, for the purpose specified, a gallery mounted on the Bunsen tube, the gallery inclosing the Bunsen tube and the lower part of the mixing-chamber and jacket, and having a closed top and open lower portion, and a means at the lower end of the jacket and within the gallery for regulating the air movement through said jacket.

Signed this 15th day of February, 1905.

LEE T. ALTON.

Witnesses:

GUSTAVE I. ARONAW,

CHARLES G. HENSLEY.

structures which come within the scope of the annexed claims.

Having thus described my invention, what I claim is—

1. In an incandescent gas-burner or similar device, a Bunsen tube, a gallery resting thereon, and supported thereby, an air-tight disk forming a partition on the upper portion of said gallery, a tube surrounding the mixing-chamber and resting against said partition whereby air may be admitted directly under the mantle and outside of the combustible mixture of air and gas.

2. In an incandescent gas-lamp or similar device, a mixing-chamber surrounded by a concentric tube, a gallery secured to said mixing-chamber and having its upper end closed by a disk which bears against said concentric tube, and an air-shutter at the base of said concentric tube.

3. A gas-burner having a tubular check with an opening in its upper end, an orificed cap adjustable on the upper portion of the check to regulate the area of the opening therein, a collar embracing the check below said cap and sustained by the check, standards rising from the collar and spaced from each other to expose the lower part of the cap whereby to facilitate the adjustment thereof, and a Bunsen tube mounted on and sustained by the standards, the lower part of said tube directly adjacent to the standards flaring outward and having an air-inlet opening therein.

4. A gas-burner having a tubular check with an opening in its upper end, an orificed cap adjustable on the upper portion of the check to regulate the area of the opening therein, a collar embracing the check below said cap and sustained by the check, standards rising from the collar and spaced from each other to expose the lower part of the cap whereby to facilitate the adjustment thereof, a Bunsen tube mounted on and sustained by the standards, the lower part of said tube directly adjacent to the standards flaring outward and having an air-inlet opening therein, the standards extending essentially parallel to the check from the collar to the Bunsen tube, and an air-shutter encircling the orificed part of the Bunsen tube and adjustable thereon, one of the standards having a lip bearing under the air-shutter to sustain it.

5. A gas-burner having a Bunsen tube, a tubular member encircling it, a gallery sustained by said tubular member, a second tubular member encircling the first tubular member, and a mixing-chamber sustained by the second tubular member.

6. A gas-burner having a Bunsen tube formed in two sections fitted together, a tubular member encircling the Bunsen tube at the joint between its sections, a gallery sustained by said tubular member, a second tubular member encircling the first member, and a mixing-chamber sustained by the second tubular member.

7. A gas-burner having a Bunsen tube, a mixing tube or chamber into which the Bunsen tube discharges, a jacket encircling the mixing-tube and forming an air-passage outside of the mixing-tube to the upper portion thereof, and an annular air-shutter for regulating the opening at the lower end of the jacket, said air-shutter encircling and being mounted to turn concentrically to the Bunsen tube.

8. A gas-burner having a Bunsen tube, a mixing tube or chamber into which the Bunsen tube discharges, a tubular member encircling the Bunsen tube and sustaining the mixing-tube, a jacket encircling the mixing-tube and forming an air-passage outside of the same to its upper end, and an annular shutter arranged at the lower end of the jacket and loosely encircling the said tubular member, for the purpose specified.

9. A gas-burner having a Bunsen tube, a gallery surrounding the same, the gallery being closed at the top and having an opening at its lower portion, a mixing-tube extending from the Bunsen tube upward, and means forming an air-passage extending from the interior of the gallery below the said closed top thereof upward outside of the mixing-tube to the upper part of the same.

10. A gas-burner having a Bunsen tube, a gallery surrounding the same, the gallery being closed at the top and open at its lower portion, a mixing-chamber extending from the Bunsen tube upward, and an air-jacket outside of the mixing-chamber and open at its lower end, said mixing-chamber and jacket extending downward and below said closed top of the gallery.

11. A gas-burner having a Bunsen tube, a gallery surrounding the same, the gallery being closed at the top and open at its lower portion, a mixing-chamber extending from the Bunsen tube upward, an air-jacket surrounding the mixing-chamber and forming an air-passage outside of the mixing-tube, said jacket extending across the top of the gallery, and an annular shutter located within the gallery at the lower end of the said jacket to vary the air movement through it.

12. A gas-burner having a Bunsen tube, a mixing-chamber extending from the same, a jacket surrounding the mixing-tube and forming an air-passage outside of the tube from the lower to the upper portion thereof, and an annular air-shutter operating at the lower end of the jacket to command the air movement through the same, the air-shutter having a collar joined thereto and concentrically surrounding the Bunsen tube, facilitating the adjustment of the air-shutter.

13. A gas-burner having a Bunsen tube, a gallery open at its lower portion and closed