(No Model.)

H. J. BELL.

INCANDESCENT GAS LAMP.

No. 408,068. Patented July 30, 1889.

Fig. 1.

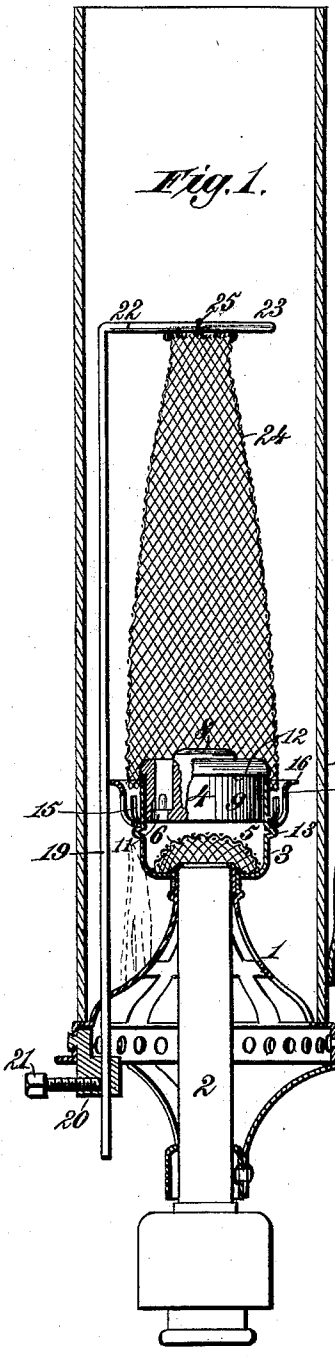


Fig. 2.

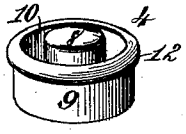


Fig. 3.

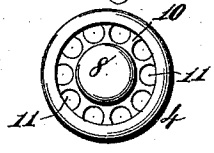


Fig. 4.

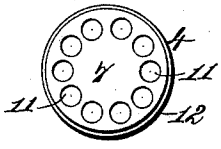


Fig. 5.

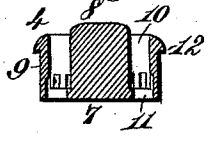
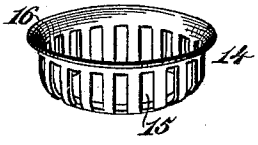


Fig. 6.

Fig. 7.



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UNITED STATES PATENT OFFICE.

HAROLD J. BELL, OF WOODBURY, NEW JERSEY, ASSIGNOR TO THE WELSBACH INCANDESCENT GAS LIGHT COMPANY, OF NEW JERSEY.

INCANDESCENT GAS-LAMP.

SPECIFICATION forming part of Letters Patent No. 408,068, dated July 30, 1889.

Application filed March 8, 1888. Serial No. 266,505. (No model.)

To all whom it may concern:

Be it known that I, HAROLD J. BELL, a citizen of the United States, residing at Woodbury, in the county of Gloucester and State of New Jersey, have invented new and useful Improvements in Incandescent Gas-Lamps, of which the following is a specification.

This invention relates to incandescent gas-lamps of the class employed in the Welsbach system of incandescent gas-lighting.

The invention consists in an improved burner-tip composed of lava, steatite, or other suitable refractory material and formed with a central cone, an outer rim or shell, and an annular series of gas-passages penetrating the base of the tip around the central cone and projecting somewhat into the outer rim or shell of said tip, the object being to concentrate or deflect the individual jets of flame toward the center of the burner-tip.

The invention also consists in the combination, with said burner-tip, of a perforated diaphragm in the form of a cone of wire-gauze placed below the tip and supported by the base of a cup that surmounts the top of the gallery, which cup also incloses and supports the burner-tip in such manner as to afford a chamber beneath the same, in which a thorough mixture of gas and air is effected at the point of ignition without liability of the gas being flashed back into the burner-tube by external air-currents. These and other peculiarities in the construction and combination of parts will be hereinafter more fully set forth.

In the annexed drawings, illustrating the invention, Figure 1 is a vertical section of an incandescent gas-lamp embodying my improvements, the burner-tip being shown in elevation. Fig. 2 is a perspective view of my improved burner-tip. Fig. 3 is a top view of the burner-tip. Fig. 4 is a bottom view of said tip. Fig. 5 is a sectional elevation of the burner-tip. Fig. 6 is a perspective view of the wire-gauze cone placed in the bottom of the cup that supports the burner-tip. Fig. 7 is a perspective view of the perforated cup-shaped mantle-protector.

The lamp-gallery 1 is supported on an atmospheric gas-burner tube 2 of any suitable construction. To the top of the gallery is secured, either rigidly or detachably, a cup 3 of sufficient depth and diameter to support a burner-tip 4 of greater diameter than the burner-tube and to afford a gas and air expanding chamber 5 beneath the burner-tip. In the gas and air expanding chamber 5, formed by the cup 3, is placed a perforated diaphragm, which is preferably in the form of a wire-gauze cone 6, that rests on the bottom of the cup and extends over the top of the burner-tube.

The burner-tip 4, composed of lava, steatite, or other refractory material, consists of a base 7, from which rises a solid or imperforate central cone 8 and an outer rim or shell 9, the intervening space forming a continuous annular flame-passage 10, that communicates with the interior of the cup 3 through an annular series of gas passages or perforations 11, which penetrate the base of the burner-tip and project partially into its outer rim or shell, the annular flame-passage 10 being above said gas-passages. On the outer surface of this rim or shell, near the top, is a shoulder 12, by which the burner-tip is supported on the upper edge of the cup 3 and prevented from coming in contact with the wire-gauze cone 6, that is placed in said cup.

The gas and air supplied through the atmospheric-gas burner-tube 2 are afforded ample room for expansion in the chamber 5, and by passage through the wire-gauze cone 6 the gas and air are finely divided and become thoroughly intermixed in the chamber 5 immediately beneath the annular flame-passage of the burner-tip. By thus affording a space for the expansion and thorough mixture of the gas and air at the point of ignition all liability of the gas being flashed back into the burner-tube by external currents of air is effectually prevented. It will also be seen that as the gas-passages 11 project somewhat into the outer shell or rim 9, as shown in Fig. 5, the flame will be thereby deflected inward and concentrated around the central cone of the burner-tip.

On the outer surface of the cup 3, at or near its center, is an annular bead or shoulder 13, for supporting a perforated cup-shaped protector 14, that is adapted to receive and protect the lower edge of the fragile mantle without obstructing the access of air or inter-

fering with the lighting of the mantle by a match or otherwise. This protector may be made of metal or of suitable refractory material. As shown, it is formed with an annular series of elongated perforations or slots 15, for access of air-currents to pass up on the outer surface of the mantle, and above these perforations the protector has a flaring rim 16, that more effectually protects the lower edge of the mantle.

The gallery 1 is provided with spring-holders 17, for securing a glass chimney 18, which is preferably straight or perfectly cylindrical throughout its entire length. Within the chimney is placed a vertical rod 19, that is adjustably supported in a lug 20 on the gallery by means of a set-screw 21, so that the rod can be raised or lowered, as desired. This rod is straight throughout its length except at its upper ends, where it is formed with a horizontal offset 22 and supporting-ring 23, from which the mantle 24 is suspended by platinum wires 25, as usual.

A straight chimney 18 and straight mantle-supporting rod 19 are preferable, on account of enabling the use of a larger mantle than ordinary, with consequent increase in illuminating effect. By this construction also the rod can be located at a greater distance from the burner and incandescent mantle, thereby avoiding any tendency to overheating and consequent warping of the rod, as well as any liability of contact between the rod and mantle, which would result in damaging the fragile structure of the mantle. A perfectly-straight chimney devoid of contractions prevents a concentration of heat on any one point of the mantle-surface, facilitates a more equable distribution of heat throughout the mantle, with consequent improvement of its incandescing effect, and in connection with the herein-described burner promotes a more thorough combustion of gas and an increase in the efficiency of the illumination.

A further advantage derived from the straight chimney and the straight wire is that the cracking of the mantle, which sometimes ensues when the wire is close to the mantle, as is the case where it is a bent wire, is prevented, this cracking when the wire is close being caused by the fact that the wire's absorption of heat causes the expansion and contraction of the mantle along the line of the wire to differ from that over the rest of its surface.

A further advantage of the burner-tip described herein in connection with the straight chimney is that the mixture of air and gas is kept below the explosive point by the reunion of the individual jets at the surface of the tip under a very low pressure, whereby the explosion on lighting from the top of the chimney is avoided.

I would have it understood that I do not broadly claim in an incandescent gas-lamp a protecting-cup adapted to receive and protect the lower end of a fragile mantle, nor the combination of the burner, the incandescent mantle suspended above the burner and having its lower edge below the burner-outlet, and the protecting-cup below and surrounding the lower edge of said mantle, as such is not my invention.

What I claim is—

1. In an incandescent gas-lamp, a burner-tip comprising a central cone, an outer rim or shell, an intervening annular flame-passage, and an annular series of gas-passages that perforate the base of the burner-tip around the central cone and below the annular flame-passage, said gas-passages being extended partly into the outer rim or shell, whereby the flame is deflected toward the center of the burner-tip, substantially as described.

2. In an incandescent gas-lamp, the combination, with a burner-tube, of a gallery supported on said tube, a cup at the upper end of said tube and gallery, and a burner-tip supported in said cup and provided with an annular flame-passage and with an annular series of gas-passages leading into said flame-passage, substantially as described.

3. In an incandescent gas-lamp, the combination, with a burner-tube and a gallery supported thereon, of a cup at the upper end of said gallery, a wire-gauze cone placed in said cup, and a burner-tip supported in said cup above the inclosed wire-gauze cone and provided with an annular flame-passage and with an annular series of gas-passages leading into said flame-passage, substantially as described.

4. In an incandescent gas-lamp, the combination, with an atmospheric gas-burner tube, of a gas and air expansion chamber at the upper end of said tube, a perforated diaphragm located in said chamber, and a burner-tip supported in said chamber above the perforated diaphragm, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

HAROLD J. BELL.

Witnesses:
LEWIS STARR,
WALDRON SHAPLEIGH.