



# UNITED STATES PATENT OFFICE.

ELLIS T. JONES, OF HOBOKEN, NEW JERSEY.

## GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 607,049, dated July 12, 1898.

Application filed July 28, 1897. Serial No. 646,161. (No model.)

*To all whom it may concern:*

Be it known that I, ELLIS T. JONES, a citizen of the United States, residing in Hoboken, in the county of Hudson and State of New Jersey, have invented a certain new and useful Improvement in Gas-Burners, of which the following is a specification.

The invention relates to that class of burners in which light is produced by heating a refractory mantle to incandescence. As usually constructed and applied such burners require the removal of the ordinary gas jet or burner and are secured upon the gas-pipe in place of the latter. They are also equipped with a special gas-cock additional to the one ordinarily found on the pipe.

The object of my invention is to supply a burner of the above-mentioned type which may be applied upon the ordinary burner without necessitating its removal or any special preparation to receive it. I also propose to employ the usual gas-cock, which, by means of a specially-designed attachment easily applied and removed, will condition it to serve successfully in controlling the supply of gas.

The invention consists, essentially, of a mixing chamber or tube having an opening at the lower end shaped to conform to the usual gas-burner, fitting snugly thereon and supporting the mantle and other portions in the upright position. Air-inlets are provided, controlled by a peculiarly-constructed cut-off arranged to insure intimate mingling of the air and gas, and at the upper end is the chimney-supporting gallery and means for carrying the mantle, whereby its liability to fracture is greatly reduced. In the most complete form the lower end of the mixing-chamber is surrounded by an outwardly-flared skirt, affording a reliable base upon which the burner may stand when not in use.

The invention also consists in certain details of construction and arrangements of parts to be specifically described.

The accompanying drawings form a part of this specification and represent what I consider the best means of carrying out the invention.

Figure 1 is a side elevation of the burner and adjacent parts in position for use. Fig. 2 is a vertical section through the burner alone. Fig. 3 is a side view of the mantle-

support, and Fig. 4 is a top view of the same. Fig. 5 is a side view of the air-inlet cut-off detached. Figs. 6 and 7 are respectively a side elevation and plan view of the gas-cock attachment alone. Fig. 8 is a side elevation showing a modified form of mantle-support.

Similar letters of reference indicate like parts in all the figures.

A is the arm of any ordinary gas-fixture, having the usual burner or jet B and gas-cock C.

D is a tube having the plug D' partially closing the lower end and bored and smoothly finished axially to form the opening  $d$ , which may be tapered, as shown, to match closely to the corresponding surface of the burner B. At about the level reached by the tip of the latter is provided a series of rectangular orifices or air-inlets  $d'$ , controlled by the partial rotation of a sleeve E, the latter formed by making a series of longitudinal cuts or slits in a short tube, extending from the lower edge nearly but not quite to the upper edge. Each alternate tongue E' thus produced is sprung inward to insure strong frictional contact with the outer face of the mixing chamber or tube D and the others E<sup>2</sup> bent outward and curved downward, as shown, to form deflecting-plates, directing the incoming currents of air toward the center of the mixing-chamber, and thus inducing a rapid and intimate mixing of the air with the current of gas passing upward in the tube. The sleeve is applied upon the tube in such manner that the openings  $d'$  in the latter will register with the tongues E' and be closed thereby when the sleeve is rotated sufficiently.

The tongues E' are preferably narrower than the air-inlets, so as to allow a small quantity of air to enter under all conditions, and they extend a little below the openings in order to rest against the unperforated portion of the tube and not spring into the openings. The sleeve is held at the proper height and is operated by a radial arm E<sup>3</sup>, extending from one of the tongues E<sup>2</sup> through a circumferential slot  $h$  in the casing H, inclosing the lower portion of the mixing-chamber. The upper edge of the casing is flanged outwardly to form the gallery H' and carries a horizontal open-work platform H<sup>2</sup>, through which the upper end of the tube D extends.

H<sup>3</sup> H<sup>3</sup> are arms receiving and supporting the chimney N, and H<sup>4</sup> H<sup>4</sup> are vertical rods set in the platform and gallery and reaching upward within the chimney to hold it against displacement, as usual.

F is a cap fitted upon the upper protruding end of the tube D. It consists of a lower ring F' and an upper ring F<sup>2</sup>, joined by a cylinder of mica or other non-conductor, serving to prevent the transmission of heat downward to the mixing-chamber and its connections. A conical diaphragm G of foraminated metal or wire-gauze within the cylinder F<sup>3</sup> is secured to the lower ring F', and a similar but stronger and coarser diaphragm G' covers the upper end of the cap at the point of combustion. The diaphragm G supports a centrally-arranged rod or wire I, seated therein, extending through and guided by the diaphragm G'. It carries at its upper end an umbrella-shaped piece or button I', of perforated metal or wire-gauze, adapted to support the refractory mantle M resting thereon and inclosing the wire I and upper portion of the cap F. This means of suspending the mantle is of special importance in this portable or alternative form of burner, in which the delicate and easily-fractured mantle is subjected to more than the ordinary amount of vibration and strain due to removing and replacing the burner. The mantle supported on the button I' conforming to its general interior shape insures several points of contact, thus distributing the slight strains, and with the inclosed cap F tends to hold the mantle lightly but firmly against any considerable lateral movement which, though comparatively small, would be sufficient to fracture the loop by which such mantles are usually suspended.

J is a narrow ring encircling the plug of the gas-cock C, held in the desired position by the clamping-screw J<sup>2</sup> and having the projection J' lying within the offset c between the stop-pin C' and shoulder c'. Its function is to limit the motion of the plug in one direction and prevent turning beyond the point determined by experiment at which the flow of gas is just right to produce the best results. The plug may be turned in the opposite direction, as usual, until the pin strikes the shoulder at that end of its motion and the supply is completely shut off.

The inner diaphragm G besides serving as a seat for the mantle-support I also performs the function of a "flash-back" in preventing the flame at the upper diaphragm following the current of gas and air back to the mixing-chamber and not only interfering with the light, but endangering the burner by reason of the heat thus produced.

The casing H approaches close to the tube D on one line only. It expands in both directions therefrom, upward to form the gallery H' and downward in the flared skirt. The latter is cut squarely on a plane coincident with or a little below the plug D' to offer a

considerable base upon which the burner may stand when not in use upon the burner B. The upper portion of the casing is freely perforated, as shown, to supply air to the exterior of the mantle and interior of the chimney.

A serious objection to the domestic use of this type of burner has been its liability to derangement in the hands of incompetent servants and others. Such occurrence when the burner was a permanent fixture necessarily left the apartment unlighted. By the use of my invention it is only necessary under such conditions to remove the whole and light the ordinary burner, while the other may be set aside to be repaired at leisure.

The improved burner is simple in construction, and therefore not expensive to manufacture. It is easily applied and removed, and parties desiring the increased illumination and saving in gas afforded by its use are the more willing to accept it for the reason that if it prove for any reason unsatisfactory it may be instantly taken away and the ordinary burner will be ready for service as usual.

Modifications may be made without departing from the principle of the invention or sacrificing its advantages.

Other means for controlling the air-inlets may be employed instead of the cut-off shown. The ring J applied to the gas-cock may be omitted and other means for suspending the mantle may be adopted. Fig. 8 shows a construction in which the button I' is provided with a loop I<sup>2</sup> of wire, by which the mantle may be suspended from a hook I<sup>3</sup> on a bent rod I<sup>4</sup> exterior to the mantle instead of supporting it from the interior. I prefer the latter construction.

I claim—

1. In a burner of the character herein set forth, the burner-tube having an opening at the lower end adapted to match closely to and support the burner upon an ordinary gas jet or burner, in combination with the latter and means as the flaring casing or skirt serving as a base to support the burner in an upright position when not in use on said gas-jet, all substantially as herein specified.

2. In a burner of the character herein set forth, the burner-tube having a series of air-inlet openings, in combination with a rotatable sleeve mounted thereon, consisting of a series of tongues bent inwardly to grasp said tube and register with said openings, and an alternating series bent outwardly to serve as deflecting-plates for the air-currents flowing toward said openings, all substantially as herein specified.

3. The burner-tube D receiving gas and air, in combination with the cap F having the rings F', F<sup>2</sup> and non-conducting cylinder F<sup>3</sup>, the lower diaphragm G and upper diaphragm G' the rod I and button I' adapted to support the mantle M, the said lower diaphragm serving as a seat for said rod and also to prevent the flame extending to the interior of said tube, all substantially as herein specified.

4. The burner-tube D having the air-inlet openings  $d'$ , in combination with the sleeve E and its series of inwardly-bent tongues  $E'$  narrower than said openings and adapted to register therewith, an alternating series of tongues  $E^2$  bent outwardly and curved downwardly to deflect air-currents entering said openings toward the center of said tube, the operating-arm  $E^3$ , and casing H having the slot  $h$  receiving said arm, all substantially as herein specified.

5. In a burner of the character herein set forth, the burner-tube D having the opening  $d$  adapted to match closely to and support the burner upon an ordinary gas-jet B, and having the air-inlet openings  $d'$ , in combination with said gas-jet and its controlling-cock C, and with the sleeve E, tongues  $E'$ ,  $E^2$  and

arm  $E^3$  controlling said air-inlets, and the adjustable ring J and its projection  $J'$  attached to and limiting the motion of said gas-cock, all substantially as herein specified.

6. The tube D, casing H, sleeve E and tongues  $E'$ ,  $E^2$  and arm  $E^3$ , cap F, rod I and button  $I'$ , in combination with the gas-jet B, cock C, and ring J and its adjusting-screw  $J^2$  and projection  $J'$  serving with said cock, all substantially as herein specified.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

ELLIS T. JONES.

Witnesses:

ROBT. CONNOR,  
CHARLES R. SEARLE.