

No. 676,958.

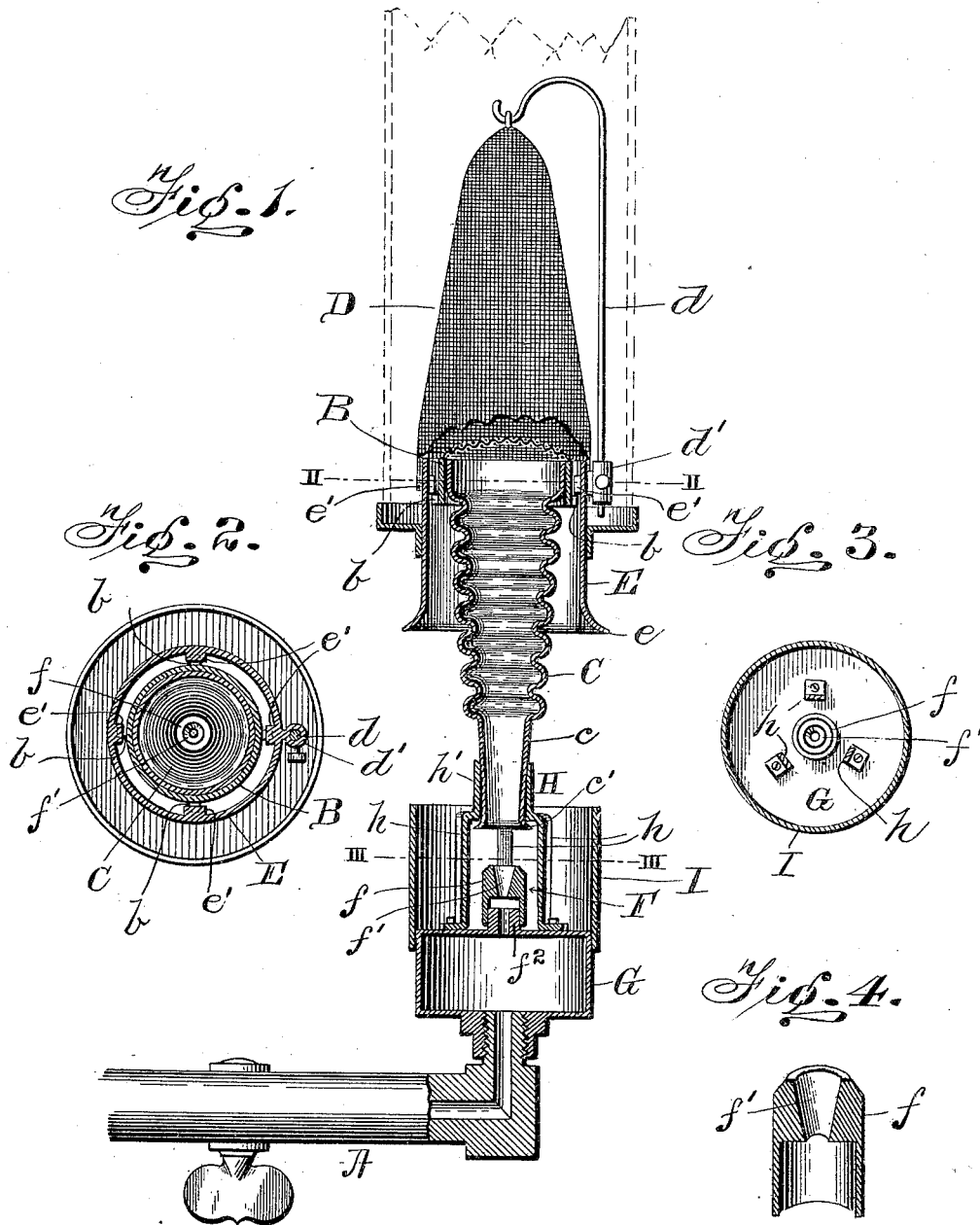
Patented June 25, 1901.

W. H. & R. W. MILLER.

LAMP.

(Application filed Aug. 18, 1900.,

(No Model.)



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UNITED STATES PATENT OFFICE.

WILLIAM H. MILLER AND ROBERT W. MILLER, OF HENRY CLAY, DELAWARE.

LAMP.

SPECIFICATION forming part of Letters Patent No. 676,958, dated June 25, 1901.

Application filed August 18, 1900. Serial No. 27,301. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM H. MILLER and ROBERT W. MILLER, citizens of the United States, residing at Henry Clay, in the county of Newcastle and State of Delaware, have invented certain new and useful Improvements in Lamps; and we 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.

This invention relates to improvements in lamps, and more particularly to incandescent lamps or burners.

15 The principal object of our invention is to provide simple and efficient means for burning illuminating or generated gases or vapors and effecting a complete and thorough intermingling of the gas or vapor with air before it reaches the burner and to cause the intermingled air and gas to gradually expand and its pressure to be reduced as it approaches the burner, so as to effect a more complete combustion and produce a brilliant light with
20 less consumption of fuel and less smoke and soot than with devices of this same general character as heretofore constructed.

Other objects are to provide simple and effective means for maintaining a constant
30 equal pressure of the gas at the outlet therefor irrespective of variations of pressure in the supply-pipes and also to provide effective means for drawing air into the mixing-chamber with the gas and to provide means for regulating the flame other than by the usual
35 regulating-cock in the gas-pipe.

The invention will first be hereinafter more particularly described with reference to the accompanying drawings, which form a part
40 of this specification, and then pointed out in the claims at the end of the description.

In said drawings, in which like parts in the different views are designated by similar letters of reference, Figure 1 is a vertical sectional elevation of an apparatus embodying
45 our invention. Figs. 2 and 3 are sections taken on lines II II and III III, respectively, of Fig. 1; and Fig. 4 is an enlarged detail perspective view, in vertical section, of the
50 nipple constituting the jet-orifice.

The apparatus herein shown is represented

in the drawings as fitted to a gas-supply pipe A and comprises a burner B, mounted on a mixing-chamber C, with suitable connections between the mixing-chamber and gas-supply
55 pipe and also provision for supplying said mixing-chamber with air. The burner may be of any suitable construction and preferably has mounted thereon a mantle D of the Welsbach type, supported by a rod *d*, the
60 lower end of which may be fitted in a socket *d'*, attached to the burner-casing E or other suitable support. Between the burner and the gas and air supply is placed the mixing-chamber C, which consists, preferably, of a
65 tubular body tapering toward its bottom or inlet end and interiorly ribbed or corrugated, so as to provide an interrupted or uneven surface or a series of what may be termed
70 "riffles," which are adapted to facilitate the breaking up and commingling of the particles of gas and air by causing the outer particles of the upwardly-moving column to move alternately inward and outward into and out
75 of the cavities between adjacent ribs or projections under the pressure of successive layers and to roll or turn over, thereby thoroughly intermingling the gas and air. In the use of the words "corrugated" or "riffled"
80 in the appended claims with respect to the air and gas mixing chamber we desire it to be understood that such words are intended to include an interiorly-riffled surface whether the riffles are formed by ribs or corrugations or
85 in any equivalent manner. The conical form of the mixer also permits a gradual expansion or spreading out of the inwardly-moving column as it approaches the burner and a gradual reduction of pressure, thus effecting a
90 thorough and complete intermingling of the gas and air for feeding the burner. In the apparatus herein shown the mixing-chamber is provided with a tubular inlet end *c*, having an
95 outwardly-projecting flange *c'* at its lower end for a purpose to be hereinafter described. The lower interior corrugations or ribs on the body of the chamber preferably project inwardly no farther than the interior periphery or bore of said tubular end *c*, so as not to check the momentum of the upwardly-moving
100 column of gas and air nor impede the progress of the mixing already commenced

as the gas and air enter the mixing-chamber. In some instances, however, where mixing-chambers of different constructions are employed it may be desirable to have said interior ribs project farther within the chamber.

5 The inlet-opening of the mixing-chamber is connected with a jet-orifice *F* in communication with the gas-pipe *A* or other source of gas or vapor supply, preferably through a

10 reservoir or pressure-equalizing chamber *G*, though the latter may be omitted when the pressure is not too great. The gas passes from the supply-pipe *A* into this chamber *G*, where it acts as a cushion to overcome excess

15 or fluctuations of pressure in said pipe *A*, and thus is an equal pressure of gas always maintained at the point of outlet or exit thereof. The jet-orifice may consist of a nipple *f*, having an exit-opening *f'* of inverted-conical

20 form and of appreciable length to give suitable slant thereto and sleeved over an apertured nipple or boss on the gas-pipe *A* or interposed equalizing-chamber, such boss in this instance being shown on the said chamber and marked

25 *f''* in the drawings. Through this single jet-orifice the gas is forced under pressure, rising into and hugging the walls of the mixing tube or chamber and rolling over and mingling with the air in said chamber, the air entering from

30 below the inlet to said mixing-tube and being drawn in and forced up through the tube by the current of gas issuing from the jet-orifice. The inverted-conical form of the exit from the gas-jet has the effect of causing the gas

35 to issue therefrom into the inlet end of the mixing-chamber in a funnel-like or tubular form, uplifting the superimposed column of air in said chamber and causing additional air to be sucked or drawn into said chamber,

40 and thereby insuring a full supply of air for commingling with the injected gas. To provide for the admission of the air at the lower end of the mixing-tube, the latter may be supported above the jet-orifice *f* by a tripod or

45 spider *II*, having its legs *h* connected to the supply-pipe or interposed equalizing-chamber *G* and having a sleeve or socket *h'* at the upper end thereof, into which the tubular inlet end *c* of the mixing-tube is fitted. Said

50 tubular inlet end *c* is preferably adapted to slide up or down in said sleeve or socket *h'* of the tripod, the outwardly-projecting flange *c'* on the lower end of the tube before mentioned serving to prevent the mixing-chamber from

55 being lifted too high and detached from the tripod or support, and by lowering or raising said mixing-chamber, so as to bring its inlet end nearer to or farther from the jet-orifice, the amount of air entering the chamber may

60 be varied as desired and the flame thereby regulated otherwise than by changing the amount of gas-supply. As a shield or protection to the gas-jet to protect the same against outside drafts a surrounding casing

65 or body *I* may be employed in the form of a sleeve or cylinder fitting around the gas-jet and supported on the pressure-equalizing chamber or on the gas-supply pipe when the jet-orifice is attached directly to said pipe.

For supplying air to the burner or flame 70 externally of the mixing-chamber and independently of the combined gas and air supply to said chamber the upper portion of the mixing-chamber may be surrounded by a tubular casing *E*, hereinbefore mentioned, to 75 within a suitable distance from the highest point of the burner, preferably substantially on a plane with the top thereof, and the lower portion of said casing may be flaring or spread outwardly, as shown at *e*, to facilitate the entrance of the air, thus affording a full supply of air externally of the mixing-chamber independently of the mixed air and gas supply for supporting combustion. The burner-casing may be interiorly provided with lugs 80 *e'*, adapted to rest on lugs *b* on the burner-frame, so as to support the casing without impeding the entrance of air to the burner.

Under some conditions it may be desirable to employ a gauze covering or shield across 90 the lower open end of the casing *E* and also across the open top of the surrounding casing *I*, so as to prevent any violent current of air from interfering with the flame and with the current of gas issuing from the jet-orifice, 95 respectively.

The device thus constructed is adapted to effect a very thorough and complete commingling of gas and air for feeding the burner, which in turn is supplied with additional air 100 from without the mixing-chamber, and thus a more complete combustion is effected.

The form and shape and the general arrangement of parts may be varied in a number of ways without departing from the spirit 105 of our invention, and hence we do not desire to be limited to the exact construction and arrangement of parts shown and described, which is the best form we have thus far found adapted to produce the desired results. 110

Having thus fully described our invention, what we claim, and desire to secure by Letters Patent of the United States, is—

1. The combination with a burner of the character described, of a mixing-chamber 115 having means for the admission of air and gas, and provided interiorly with projections, and an unobstructed passage leading through said chamber to the burner, substantially as described. 120

2. The combination with a burner of the character described, of a mixing-chamber having inlet for the admission of air and gas, and provided interiorly with alternating projections and cavities, said projections leaving 125 an unobstructed passage through said chamber to the burner, substantially as described.

3. The combination with a burner of the character described, of a mixing-chamber having inlet for the admission of air and gas, 130 and formed circumferentially with horizontally-disposed corrugations, said corrugations

leaving an unobstructed central passage through said chamber to the burner, substantially as described.

4. The combination with a burner of the character described, of a mixing-chamber having inlet for the admission of air and gas and being of inverted-conical form with interior cavities and ribs, said ribs leaving an unobstructed passage through said chamber to the burner, substantially as described.

5. In an apparatus of the character described, the combination with the burner, and a mixing-chamber having gas and air inlet, said chamber being rifled on its inner surface and of inverted-conical form, of a nipple for admitting gas to said chamber having an outlet or orifice also of inverted-conical form, substantially as shown and for the purpose described.

6. The combination with a burner of the character described, of a mixing-chamber having inlet for the admission of air and gas, and having interior horizontally-disposed corrugations gradually increasing in circumference upwardly, said corrugations leaving an unobstructed passage through said chamber to the burner; substantially as described.

7. The combination with a burner of the character described, of a mixing-chamber having inlet for the admission of air and gas, and also having an interior undulating surface and enlarging toward the burner to permit a gradual expansion of the air and gas in its passage through the chamber to said burner, substantially as described.

8. The combination with a burner of the character described, of a mixing-chamber having inlet for the admission of air and gas, and corrugated interiorly, leaving an unobstructed passage through the chamber to the burner, and means for supporting said mixing-chamber above the usual outlet of a gas-supply pipe, substantially as described.

9. The combination with a burner of the character described, of an open support mounted over the outlet of the usual gas-supply pipe, the mixing-chamber held by said support, said chamber being corrugated interiorly and having an inlet for air and gas, and a shield surrounding said support, substantially as described.

10. The combination with a burner of the character described, of a mixing-chamber having inlet for the admission of air and gas, and also having an interior rifled surface and enlarging toward the burner, and means arranged to supply air to the flame independ-

ently of the supply of mixed air and gas passing to the burner through the mixing-chamber, substantially as described.

11. In an apparatus of the character described, the combination with the jet-orifice, of the mixing-chamber of inverted-conical form and having inlet for air and gas, said chamber being rifled on its inner surface, the burner, and the casing surrounding the upper portion of said mixing-chamber for supplying unmixed air to the burner independently of the supply of mixed air and gas through said chamber, substantially as described.

12. In an apparatus of the character described, the combination with the jet-orifice, of the pressure-equalizing chamber and superimposed air and gas mixing chamber of inverted-conical form, the burner, and the casing surrounding the upper portion of said mixing-chamber for supplying air to the burner externally of said chamber; substantially as described.

13. In an apparatus of the character described, the combination with the burner of an air and gas mixing chamber supported at a suitable distance from the gas-jet, so as to permit air to be drawn or sucked into said chamber by the current of gas issuing from said gas-jet, said chamber having an interiorly-rifled surface; substantially as described.

14. In an apparatus of the character described, the combination with the outlet of an ordinary gas-supply pipe, of the burner, a mixing-chamber having an inlet for air and gas, the said inlet being adjustable with relation to said gas-outlet so that the amount of air entering said chamber with the gas-current issuing from the gas-outlet may be regulated, substantially as described.

15. In an apparatus of the character described, the combination with the burner and gas-supply pipe having a support thereon provided with a sleeve at its upper end, of the interposed mixing-chamber having its tubular inlet end provided with an outward projection on its lower portion and slidably fitted in said sleeve of said support; substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM H. MILLER.
ROBERT W. MILLER.

Witnesses:

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WILBUR L. SASSE.