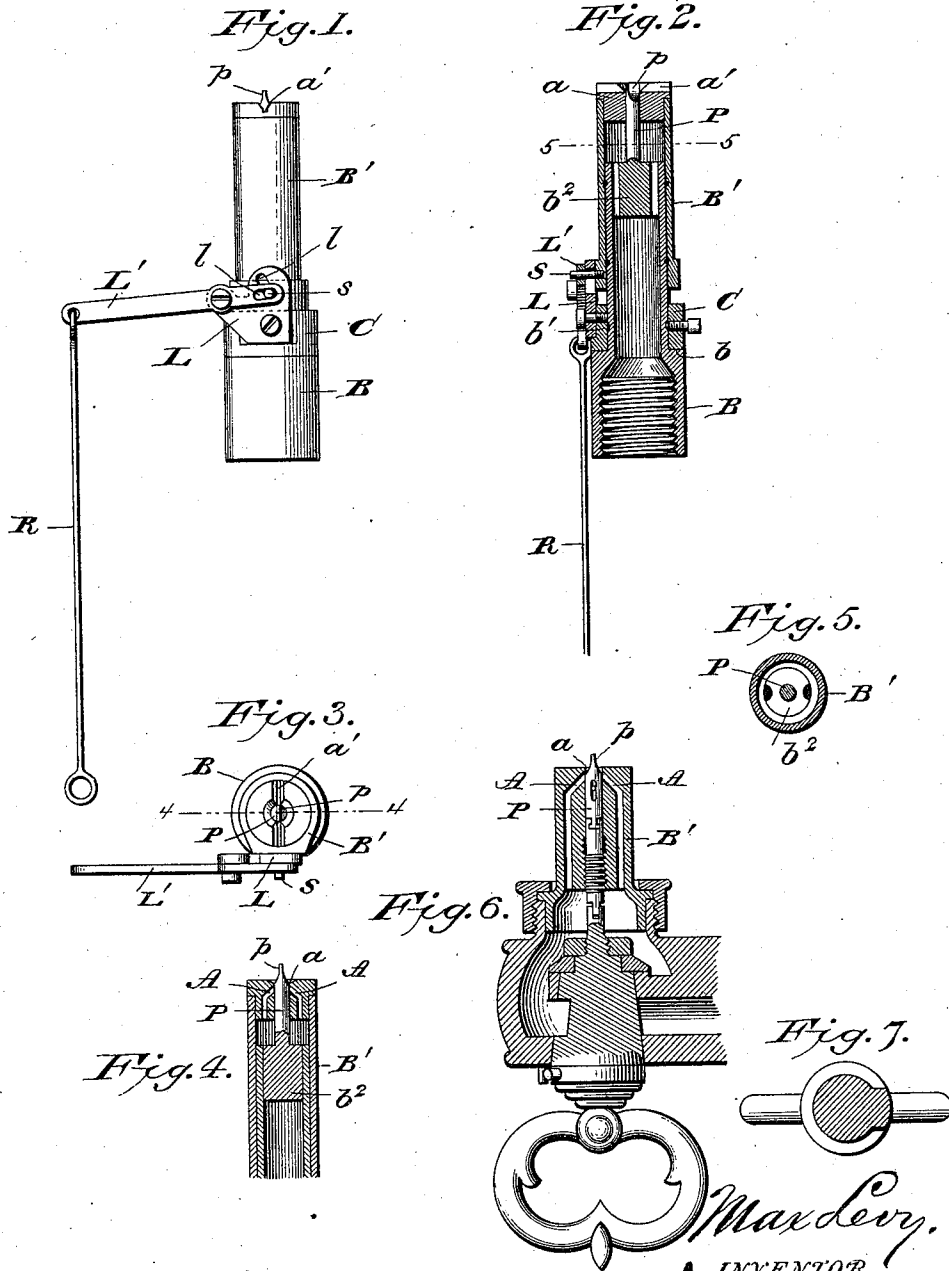


(No Model.)

M. LEVY.
GAS BURNER FOR ACETYLENE.

No. 576,682.

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GAS-BURNER FOR ACETYLENE.

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To all whom it may concern:

Be it known that I, MAX LEVY, a citizen of the United States of America, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Gas-Burners for Acetylene; and I 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in gas-burners, and appertains more especially to the means of supplying illuminating-gas for combustion, and it is designed more particularly for use with such hydrocarbons as are exceptionally rich in carbon, and which consequently require relatively more rapid union with oxygen in order that no carbon may escape unconsumed.

Acetylene is a particular example of a gas extremely rich in carbon, and when this gas is consumed under ordinary conditions it gives off a material quantity of unconsumed carbon in the form of smoke, and if with any of the burners in current use the supply of gas be reduced at the cock in order to reduce the size of the flame the diminution of pressure resulting causes the gas to flow from the aperture of the burner so slowly that the "suction power" of the more rapid flow is lost and the union with the oxygen does not take place so rapidly, and most profuse smoking follows. Further, it is well known that the thickness of the flame is a matter of material importance in attaining the best results from illuminating-gas, and that for gas which is poor in carbon the flame should be relatively thick, and thinner in proportion as the gas is richer in carbon.

Frequent attempts have been made to compensate for the variation of the quality of illuminating-gas by means of burners with apertures adjustable to different sizes, but, so far as I am aware, none of these devices are practically applicable to the case of a gas like acetylene, in which the proportion of carbon is very great. If the usual slit burner is employed, the slit must be made excessively nar-

row, so as to produce the thin flame, and such slits clog with the smallest particle of dust, and even the minute inequalities in an apparently smooth-face slit will produce great irregularities in the flame, and these irregularities will be increased if it be attempted to reduce the size of the flame without at the same time reducing the pressure.

The burner which has been most successful in connection with acetylene is the so-called "fish-tail" burner, in which the gas is supplied through two small apertures opposite each other, and the flame is spread out at right angles to the straight line between these holes or apertures as a resultant of the forces of the two opposing jets, and with such a burner it is possible to obtain a very small flame of symmetrical form. It is to this form of burner that my improvements apply; and my said improvements consist, first, in the means for supplying a thin symmetrical flame, or, in other words, a symmetrical flame of larger area, with a given amount or flow of gas; second, in supplying means for controlling or altering at will the shape or form of the flame; third, in supplying means for altering at will the size of the supplying-apertures, thus altering the size of the flame without altering the initial pressure at which the gas is expelled, thereby retaining the same suction for a flame of any size with the same burner.

My invention further consists in the construction and combination of the parts, as will be hereinafter fully set forth.

In order to carry out my invention, I use, primarily, a burner similar in construction to an ordinary fish-tail burner, but with various alterations and attachments added for accomplishing the results in view.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation of a gas-burner constructed in accordance with my invention, the same embodying instrumentalities for varying the outlet-openings for the gas, as well as means for varying the shape of the flame without reducing the pressure at the burner. Fig. 2 is a vertical sectional view. Fig. 3 is a plan view looking down upon the top of the burner. Fig. 4 is a vertical sectional view on the line 4 4 of Fig. 3. Fig. 5 is a horizontal sectional view on the line 5 5 of Fig. 2. Fig. 6 is a sec-

tional view of a modification in which the plug or cut-off for varying the size of the apertures for the escape of the gas out of the burner is operated by a turning-plug or cock of the fixture, and Fig. 7 is a sectional view of the cock and parts adjacent thereto.

B and B' designate the two parts of the gas-burner, one part being movable with respect to the other. The upper part of the burner has a tip with converging apertures or gas-passages A A, between which is a central opening *a*, enlarged or countersunk at its upper end, and across the upper end of the tip is a recess or groove *a'*, which intersects the central opening *a*. Within the central opening *a* is positioned a plug P, which reduces the size of said opening and acts to close the passages A A, as hereinafter set forth.

It will be noted that the two small apertures A A are analogous to such as are used in fish-tail burners, and they lead into the opening *a*. It will also be noted that said passages are at angles with the transverse recess or groove *a'* in the burner-tip.

The part B', which carries the tip, is movable with respect to the other part of the burner, or it may be the fixed part of the burner, as shown in Fig. 6.

In the preferred form of construction the sleeve or part B' fits snugly over the hollow pillar or part B, the pillar having threads for attaching the same to the ordinary gas-fixture, and it is also provided with an annular shoulder *b*, above which is an annular groove or recess *b'* for the purpose hereinafter set forth. Within the pillar B, at the upper part of the same, is a suitable bridge or block *b''*, the sides of which are cut away, as shown in Fig. 5, to provide gas-passages, and centrally this bridge or block carries an upwardly-projecting plug P, opposite sides of the upper end of said plug being beveled and slightly concave, and in some instances it may be slightly twisted, an essential feature of the plug being that the end is reduced substantially flat or wedge-shaped to provide the tongue *p*.

C designates a collar which is placed over the pillar B, above the shoulder *b'* thereon, and this collar has attached thereto or formed integral therewith a lever-support L, which, as illustrated, comprises a plate upon which the lever L' is fulcrumed, said plate having an upright portion in which is formed an inclined slot *l*. The short end of the lever L' is also provided with a slot *l'*, and the other end carries an operating-rod R. The lower end of the sleeve B' is provided with an outwardly-projecting stud or pin *s*, which passes through the slots in the lever and lever-support.

When the parts of the burner are assembled as shown in the drawings, by moving the lever L' the sleeve will be raised and lowered and the position of the tip with respect to the plug will be changed, and when the sleeve is lowered to its fullest extent the plug will en-

tirely cut off or close the escape-apertures in the tip, and as the sleeve is raised the gas will be allowed to pass out of said apertures in a quantity which is fixed by the relative position of the tip to the plug. As the sleeve is moved upward it will rotate or turn upon the pillar by reason of the inclined slot, thus changing the position of the beveled sides of the end of the plug with respect to the passages A A.

By twisting the tongue *p* as hereinbefore mentioned the shape of the flame can be changed by altering the direction at which the tongue crosses the space between the two apertures, thus spreading the gas more or less.

In Figs. 6 and 7, which illustrate the modification of my invention, the plug is moved vertically by the turning of the stop-cock, to which said plug is suitably connected, and in this instance the plug is held against rotation by means of a pin which passes through a slot therein. The rotary part of the plug is threaded, so that it will be raised and lowered as the cock is turned to the right or left, and the vertical movement between the supply-cock and plug is provided for by having one of the parts recessed and the other provided with a pin which engages said recess. The gas-passage in the stop-cock extends around the major portion of the same, as shown in Fig. 7, so as to provide for a large range of adjustment of the plug without reducing the pressure or flow of the gas out of the burner.

In practice if the supply of gas be reduced by covering a portion of the passages A A with the plug and retaining the same initial pressure at the burner the flame will be thinner as it becomes smaller, so that approximately one-half the amount of gas will yield a flame about two-thirds the area, but more attenuated, while with the ordinary burner the flame becomes thicker as it is reduced in size, and this improvement is conducive to the efficiency of the illuminant as well as to the more rapid and perfect union with the oxygen of the air.

The collar carrying the lever may be turned upon the pillar to adjust or change the shape of the flame, the shape of the flame being governed by the relative position of the beveled end of the plug with respect to the escape-passages.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a gas-burner, the combination, of the tip having a central opening and gas passages or orifices which converge toward and communicate therewith, together with a plug located in said central opening and adapted to open and close the gas-orifices, one of the parts being movable vertically and rotatably with respect to the other.

2. In a gas-burner, the combination, of the tip having a central opening and escape-passages leading thereto, and a plug located in

the central opening to project beyond the tip and adapted to open and close the gas-orifices, the upper end of the plug being beveled and one of the parts movable with respect to the other both vertically and rotatably, substantially as set forth.

3. The combination with a gas-burner, of the tip having a central opening and converging passages leading thereto, and a plug located in the central opening to project beyond the tip and having a flattened and twisted upper end to present curved surfaces against which the gas impinges, for the purpose set forth.

4. In a gas-burner, the combination, of the tip having a central opening countersunk at its upper end and converging passages leading to said central openings; together with a plug having a flattened upper end, said plug being positioned in the central opening of the tip to project beyond the same and adapted to open and close the converging passages, one of the parts being movable vertically and rotatably with respect to the other, for the purpose set forth.

5. In combination with a gas-burner having a tip with a central opening and converging passages leading thereto, of a vertically and rotatably movable plug the upper end of which is beveled on opposite sides, the plug being positioned within the central opening to project beyond the tip so that the gas which escapes through the passages will impinge against the beveled sides of the plug.

6. In a gas-burner, the combination, of a pillar or support carrying a plug or cut-off, and a sleeve mounted upon the pillar and having a tip with a central opening and gas-passages leading thereto, the plug or cut-off being located in the central opening of the tip, one of the parts being movable vertically and rotatably with respect to the other, substantially as shown and for the purpose set forth.

7. In a gas-burner, the combination with a fixed part carrying a plug or cut-off, of a lever fulcrumed thereto, a movable section or sleeve having a tip with a central opening and converging gas-passages, the lever engaging the movable part so that the movement of said lever will cause the movable part to be elevated and depressed, for the purpose of operating the cut-off which is located in the central opening of the tip.

8. The combination with a burner having

one part movable vertically and rotatably with respect to the other and embodying a burner-tip through which passes a plug having a flattened end that projects beyond said tip, the tip having apertures which lead to the opening in which the plug is located, and means for moving one part with respect to the other so that the plug may entirely close the escape-apertures in the tip.

9. In combination with a gas-burner constructed substantially as shown, of the tip having a central opening and converging gas-passages located therein, and a plug or cut-off located in the central opening and projecting beyond the tip, together with means for turning one of the parts with respect to the other as said parts are moved vertically one upon the other.

10. The combination with a gas-burner, of the tip having a central opening and apertures for the gas leading thereto; a plug or cut-off located in the central opening and provided with a flattened and twisted upper end which projects beyond the tip, one of the parts being adjustable and rotatable with respect to the other for varying the size of the escape-apertures and the character of the flame, substantially as described.

11. A gas-burner having a tip with a central opening, converging passages leading to said opening, and a transverse groove in the tip intersecting the central opening, of a plug or cut-off the upper end of which is flattened to provide two surfaces against which the gas impinges, the plug projecting beyond the tip and one of the parts being movable vertically and rotatably with respect to the other.

12. In a gas-burner for the purpose set forth, the combination, of the hollow pillar or post carrying in its upper end a bridge or block provided centrally with a plug, a collar mounted on the pillar and provided with a lever-support having a slot which is inclined relative to the longitudinal center of the burner; a lever mounted on the support and having a slot; together with a movable section carrying a tip and having a projecting pin which engages the slots in the lever and its support, substantially as shown.

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

MAX LEVY.

Witnesses:

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HORACE S. BEALL.