No. 640,887. Patented Jan. 9, 1900.

E. J. DOLAN.

ACETYLENE GAS BURNER.

(Application filed Jan. 10, 1899. Renewed Sept. 16, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

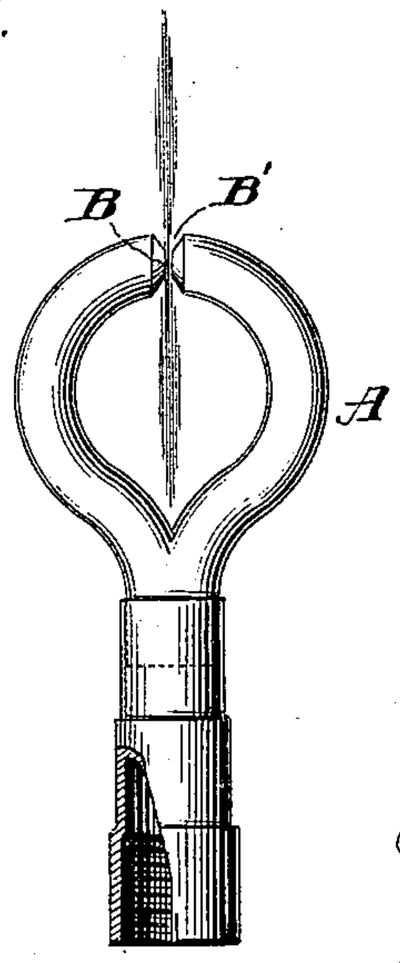


Fig. 2.

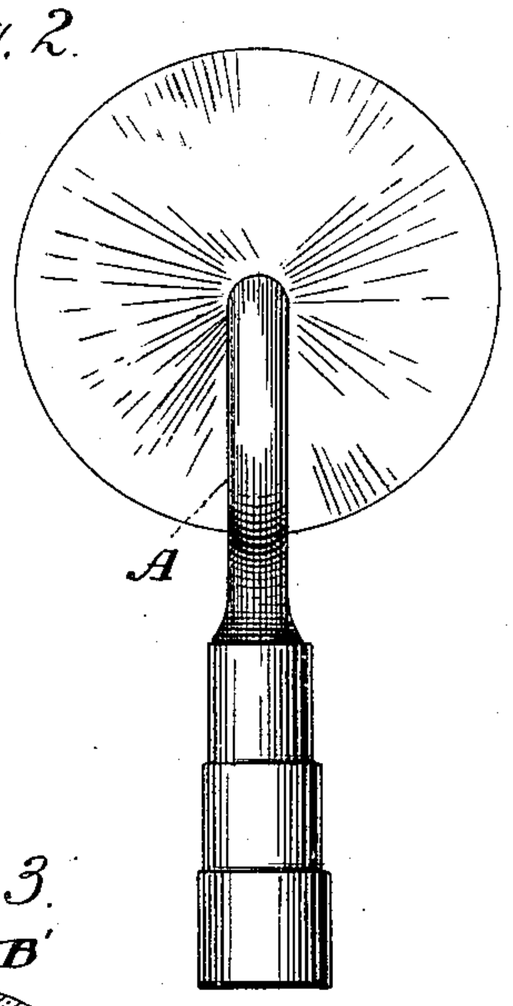


Fig. 3.

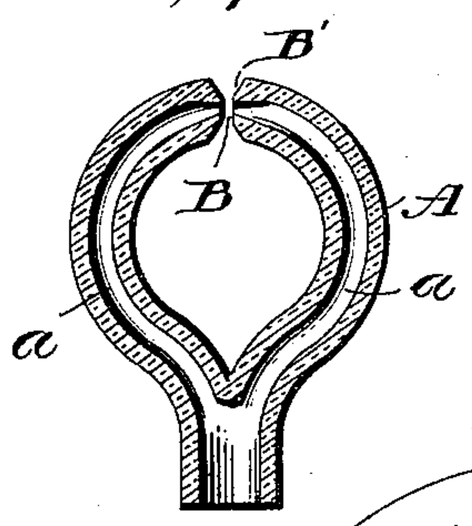


Fig. 4.

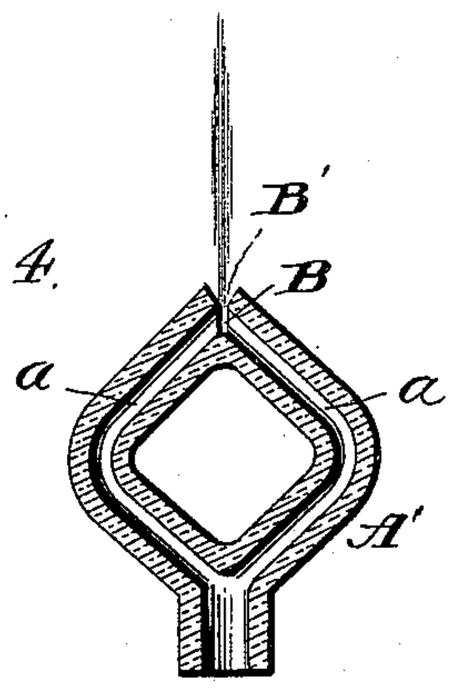
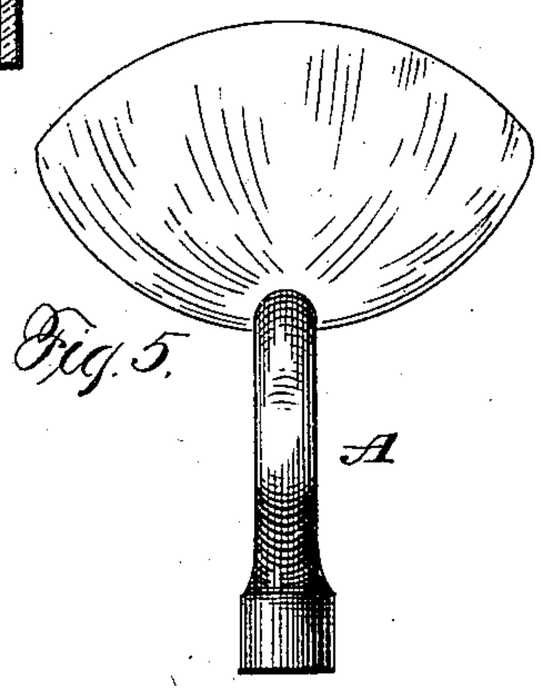


Fig. 5.



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No. 640,887. Patented Jan. 9, 1900.

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ACETYLENE GAS TIP.

(Application filed Jan. 10, 1899. Renewed Sept. 16, 1899.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 6.

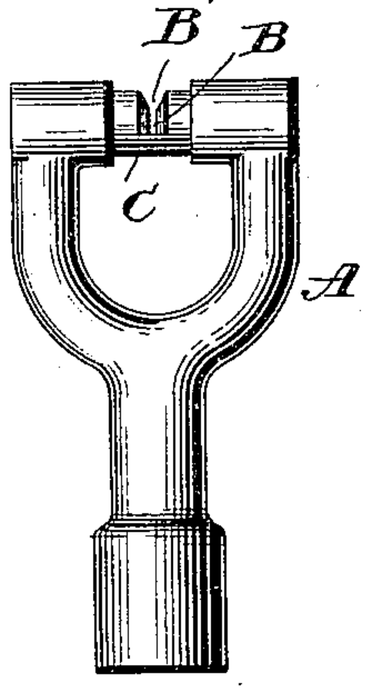

Fig. 7.

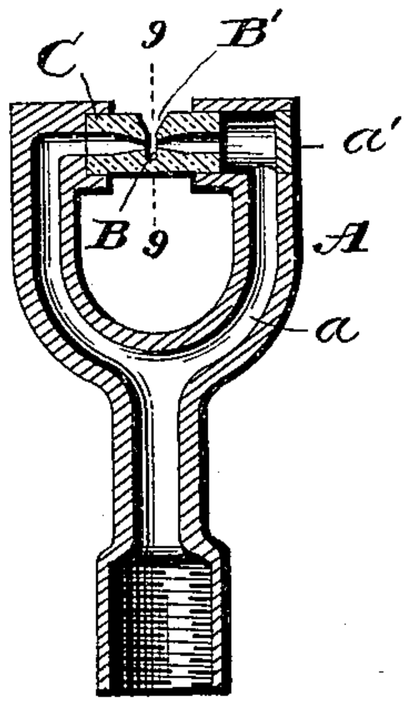

Fig. 8.

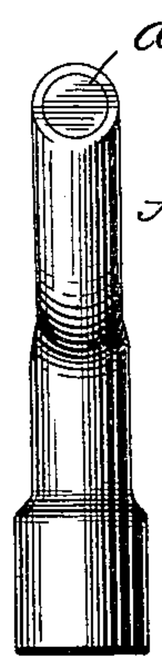

Fig. 9.

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UNITED STATES PATENT OFFICE.

EDWARD J. DOLAN, OF PHILADELPHIA, PENNSYLVANIA.

ACETYLENE-GAS BURNER.

SPECIFICATION forming part of Letters Patent No. 640,887, dated January 9, 1900.

Application filed January 10, 1899. Renewed September 16, 1899. Serial No. 730,770. (No model.)

To all whom it may concern:

Be it known that I, EDWARD J. DOLAN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Acetylene-Gas Burners; and I do 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 the letters of reference marked thereon, which form a part of this specification.

This invention relates to certain new and useful improvements in burners which are especially designed for burning acetylene gas and other gases which are rich in hydrocarbons. It is well known that in burning gases of this character a burner must be provided having an outlet which is considerably contracted, and that the gas must be supplied under a sufficient degree of pressure to project it into the atmosphere in order that a sufficient quantity of oxygen may be mixed with the gas in order to insure its burning without giving off smoke.

A special object of my invention relates to the peculiar construction of the burner, whereby a flat and smokeless flame may be secured under varying degrees of gas-pressure. Heretofore gas-burners of the type commonly designated as "duplex" burners have been provided. In this class of burners two distinct jets of gas have been projected at an angle toward one another, the design being to produce a flat flame by the impingement of the two jets thus projected. This form of burner has been found to be objectionable by reason of the fact that it has been found difficult to at all times insure the perfect alinement of the gas-jets, which is necessary to secure a uniform flame, and for the further reason that in that class of burners as heretofore constructed no provision has been made for adapting the burners for use under varying degrees of gas-pressure.

The essential object of my present invention is to provide a gas-burner having hollow, curved, or angular arms bending out from the base support or pillar, the upper ends of said arms being bent into sufficiently close contact to form a contracted opening, as will hereinafter be more fully described, from which opening the gas will be projected into the atmosphere in a very thin flame, either in circular form or in the form of an arc of a circle, the flame being absolutely smokeless.

To these ends and to such others as the invention may pertain the same consists in the peculiar construction and in the novel combination, arrangement, and adaptation of parts, all as will be more fully hereinafter described, shown in the accompanying drawings, and then specifically defined in the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this application, like letters of reference indicating the same parts throughout the several views, and in which drawings—

Figure 1 is a side view of a burner constructed in accordance with my invention. Fig. 2 is an edge view of the same. Fig. 3 is a central vertical section through the burner. Fig. 4 is a central vertical section through a modified form of the burner. Fig. 5 is an edge view of the form of burner shown in Fig. 4. Fig. 6 is a perspective view of another modified form of the burner. Fig. 7 is a central vertical section. Fig. 8 is an edge view of the same, and Fig. 9 is a section upon the line 9 9 of Fig. 7.

Reference now being had to the details of the drawings by letter, A represents the base support or pillar of the burner, from the upper portion of which rise the curved or angular arms A′, the free ends of which are brought into close contact, being separated by an exceedingly narrow slot B, the width of which, in order to insure at all times a uniform and smokeless flame, must not exceed fourteen ($\frac{14}{1000}$) one-thousandths of an inch. The ends of the arms A′, which are thus brought into close contact to form the slot B, are beveled outwardly from the slot to form a wide space B′, intervening between the slot and the outer periphery of the arms A′. The thickness of the walls of the slot I have found must be less than thirty ($\frac{30}{1000}$) one-thousandths of an inch in order to produce a uniform and at all times smokeless flame, regardless of the degrees of gas-pres-

sure. The essential object of providing the beveled or cut-away space B′ intervening between the outer edges of the gas-slot and the periphery of the arms A′ is to secure a seating of the flame at a distance somewhat remote from the slot proper, as owing to the fact that the slot is so exceedingly narrow it would be liable to obstruction by carbonization produced at the seat of the flame. This I find is obviated entirely by seating the flame at a point somewhat remote from the slot proper. In the drawings I have shown the slot as much wider in proportion to the size of the burner than the dimensions which I have specified, this being done for the purpose of better illustrating the construction of the burner.

In Figs. 1, 2, and 3 of the drawings I have shown a construction of burner in which the slot consists of an exceedingly-contracted space between the tips of the arms forming the burner, and the beveled space B′ in this construction extends entirely around the outer ends of the arms thus brought into close relationship. It will be at once seen that by this construction of burner a flat circular flame, such as is indicated in Fig. 2 of the drawings, will be produced.

In the construction of burner shown in Figs. 4 and 5 it will be observed that the two arms A′ are united at their upper ends, thus forming a solid burner having gas-passages *a*, which unite at a slot B, the diameter of the said slot being the same as that described in connection with the burner in Fig. 1. This slot, however, is of a form adapted to project a blaze, the outer periphery of which will be in the form of an arc of a circle, as indicated in Fig. 5.

The burner shown in Figs. 6, 7, and 8 is a modified form of the burner, the principle involved in the construction of which modification is the same as that embraced in the burners shown in the other figures of the drawings, this particular form of burner being designed to produce a flat flame similar to the flame produced by the burner shown in Fig. 4, the difference in the burners consisting, essentially, in the provision which is had for removing or replacing the lava tip, which in this case is shown as formed in a separate piece, which is placed in the burner by removing a plug *a′*, which plug is afterward reseated when the burner-tip has been secured in place.

From the foregoing description of the construction of my burner the operation of the same will be readily understood. It will be seen that instead of producing a flat and smokeless flame by the impingement of two inclined gas-jets, as has heretofore been proposed by the use of the duplex burner, I produce the flame by forcing the gas through an exceedingly-contracted slot and seating the flame at a distance somewhat remote from the slot.

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

1. A gas-burner comprising a base portion or pillar and two curved or angular arms extending therefrom with their free ends approaching each other and having gas-passages communicating with a contracted slot and an enlarged flame-seat extending therefrom, as set forth.

2. A gas-burner of the character described consisting of a base portion or pillar and two curved or angular arms connected therewith and having gas-passages opening at their upper ends into opposite sides of a contracted slot, the ends of the said arms being inclined outwardly from the outer edge of the slot to produce a flame-seat separated from the entrance to the slot, substantially as specified.

3. In a gas-burner of the character described, a base portion or pillar and two arms extending therefrom and having their free ends approaching each other and having gas-passages which open into and communicate with a contracted slot and a surrounding inclined flame-seat beyond the said slot substantially as and for the purpose specified.

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

EDWARD J. DOLAN.

Witnesses:
ARTHUR E. NITZSCHE,
E. V. SUDELL.