C. E. ARUNDEL.

ACETYLENE GAS BURNER TIP.

APPLICATION FILED AUG. 16, 1911.

1,035,137.

Patented Aug. 13, 1912.

Fig. 1.

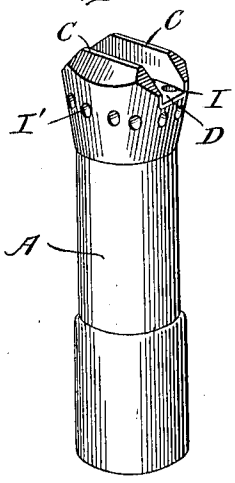


Fig. 2.

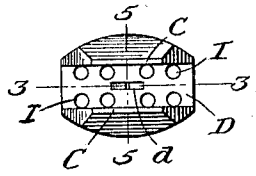


Fig. 4.

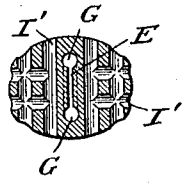


Fig. 3.

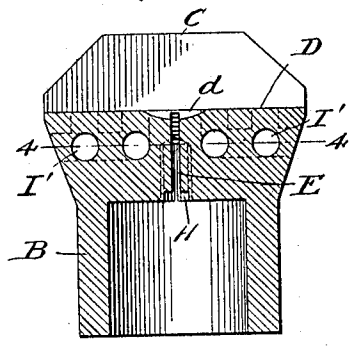


Fig. 5.

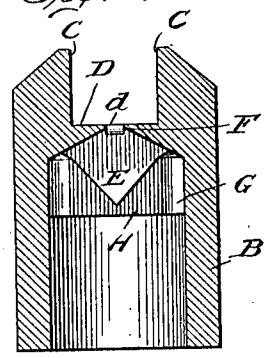


Fig. 6.

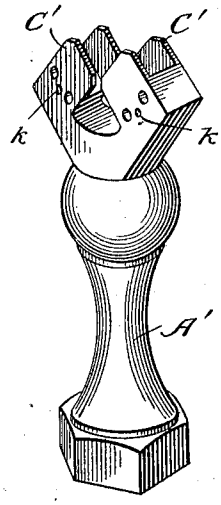


Fig. 7.

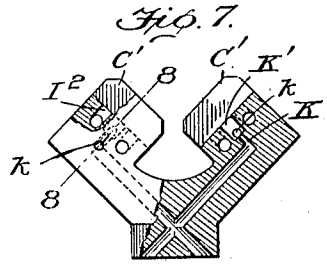


Fig. 8.

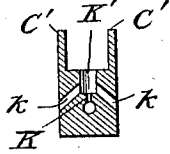
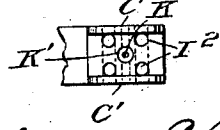


Fig. 9.



Witnesses

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ACETYLENE-GAS-BURNER TIP.

1,035,137. Specification of Letters Patent. Patented Aug. 13, 1912.

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To all whom it may concern:

Be it known that I, CLARENCE E. ARUNDEL, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Acetylene-Gas-Burner Tips; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, and to the figures and letters of reference marked thereon.

This invention relates to gas burner tips designed for burning acetylene gas, the objects of the invention being to provide a simple form of tip whereby the manufacture of the same is facilitated and a tip which will permit of the flame being turned down so as to reduce the consumption of gas to the minimum without carbonization of the walls of the gas orifice and adjacent portions of the tip.

Referring to the accompanying drawings,—Figure 1 is a perspective view of a preferred form of gas burner embodying the present improvements; Fig. 2 is a top plan view of the same; Fig. 3 is a section in the vertical plane indicated by the dotted line 3—3 of Fig. 2; Fig. 4 is a section in a horizontal plane indicated by the dotted line 4—4 of Fig. 3; and Fig. 5 is a section in a vertical plane indicated by the dotted line 5—5 of Fig. 2. Fig. 6 is a perspective view of a burner embodying certain feature of the present invention as applied to a double jet tip in which the jets impinge at a considerable distance from the orifices; Fig. 7 is an elevation partly in section of the form of tip illustrated in Fig. 6; Fig. 8 is a section in a plane indicated by the dotted line 8—8 of Fig. 7; and Fig. 9 is an elevation from a point of view in line with one of the jet orifices.

Like letters of reference in the several figures indicate the same parts.

The burner tip of the present invention embodies in its construction side walls which extend upwardly beyond the gas orifice with apertures for the free admission of air in proximity to the bases of said walls, the gas orifice itself being located centrally between the walls with a considerable space between the orifice and the bases of the walls, and in this sense the gas orifice may be said to be remote from the walls themselves.

Referring particularly to Figs. 1 to 5 the usual metal pillar is indicated by the letter A and the base or flange of the tip which enters and seats in said pillar A is indicated by the letter B. Above the base or flange B the body of the tip preferably, but not necessarily, flares outwardly to a somewhat larger diameter than said flange, and its upper portion is formed with substantially parallel side walls C having between their bases a floor D, which may, if desired, be substantially flat, as shown in the drawings, and at substantially right angles to the longitudinal axis of the burner. Centrally, in the floor D a depression *d* is formed, said depression extending longitudinally of the floor and substantially parallel with the side walls C. Within the body of the tip there is formed a narrow transversely elongated gas chamber E which, at its upper portion, intersects and opens into the depression *d*, thereby forming the gas exit orifice. The form or shape of said orifice is of importance in the preferred type of burner illustrated in Figs. 1 to 5, and it will be noted particularly from Figs. 3 and 5 that the orifice is very narrow and of a length corresponding to the width of the depression, plus the portion of the side walls of the depression lying below the upper edges of the ends of the orifice. In other words, the orifice itself extends up on each side of the depression as well as across the bottom of the depression, whereby the edge portions of the issuing jet of gas are directed toward each other so as to impinge and spread or splay longitudinally of the depression and parallel with the side walls C. This construction is best illustrated in Fig. 5, wherein it will be seen that the ends of the aperture open through the side walls of the depression at F, the whole orifice corresponding in shape to the ends and base of a parallelepiped with the base below the ends. In the formation of the tip with the narrow transversely enlongated gas chamber E it is preferred to drill in at each end of the chamber to form circular openings G and to then cut away the material, of which the tip is formed, between the said openings G to form the narrow transversely elongated gas chamber E and passages leading thereto which are of somewhat greater width and capacity as indicated at H. The narrow elongated gas chamber is of a greater

vertical height in the longitudinal axis of the burner tip than at its edges, whereby the gas is allowed to enter said chamber with greater freedom near its upper portion and whereby the currents thus set up will tend to impinge more strongly at the exit orifice. In addition to the gas orifice the floor D is provided with air supply orifices I which communicate with air passages I′, Figs. 3 and 4, formed by drilling into the body of the tip below the floor D and at each side of the transversely elongated gas chamber E. The air orifices I extend directly upwardly through the floor D and substantially parallel with the side walls C. They are located in proximity to the bases of said side walls and the inner air orifices are also in proximity to the gas supply orifice and between said gas supply orifice and the side walls C. They are preferably arranged on each side of the plane in which the jet of gas spreads or is splayed by the impingement of the edges of the issuing stream of gas.

In the modification illustrated in Figs. 6 to 9, inclusive, the metal pillar is indicated by the reference letter A′ and the side walls extending above the air and gas orifices by the reference letter C′. The gas orifices in this form of burner conform substantially to well known burners now in common use; that is to say, the gas is supplied through minute openings K to the bottom of somewhat larger chambers K′ opening out through the floor of the arm of the burner, said chamber K′ being supplied with air through lateral openings *k*. Arranged around the orifice formed by the chamber K′ and in proximity to the bases of the side wall C′ are the air inlet orifices I^2. The arrangement is best illustrated in Fig. 9 where it will be seen that the air orifices I^2 are disposed on opposite sides of the gas orifice K′ and in position to supply air between the issuing jet of gas and the side walls C′.

With a burner constructed as above described carbon does not deposit on the tip and the supply of gas may be reduced until there is but a tiny flame immediately over the gas orifice, which flame will be blue indicating complete combustion. Even when turned down as just indicated there is no deposit of carbon in or around the orifice, and hence the burner may be turned down and left lighted for an indefinite period without impairing its efficiency.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is:

1. An acetylene burner tip having oppositely disposed parallel side walls and a floor intermediate and at substantially right angles to said side walls, said floor having a central orifice remote from the side walls forming the gas exit, and air ducts below said floor having exit orifices in the floor on opposite sides of the gas exit and in proximity to the side walls.

2. An acetylene burner tip having oppositely disposed side walls and a floor intermediate said walls, said floor having a central orifice elongated transversely of, but remote from the side walls forming the gas exit, and air ducts and orifices for supplying air between the gas exit and side walls.

3. An acetylene burner tip having oppositely disposed side walls and a floor intermediate said walls, said floor having a central orifice elongated transversely of but remote from the side walls, and a depression parallel with the side walls and intersecting the said orifice, whereby the edges of the issuing stream of gas will be caused to impinge upon each other and splay longitudinally of the depression and parallel with the side walls.

4. An acetylene burner tip having a gas chamber of elongated cross section, a floor provided with a central depression in its face elongated transversely of the chamber, and a gas orifice leading from the chamber and having its exit opening extending across the bottom and up the sides of said depression at diametrically opposite points, whereby the edge portions of the issuing stream of gas are directed toward each other and by impingement are caused to spread longitudinally of the depression.

5. An acetylene burner tip having an internal gas chamber terminating in a single gas exit orifice substantially conforming in shape to the ends and base of a parallelepiped with the base below the ends and open to the gas chamber both at the bottom and ends, whereby the edge portions of the issuing stream of gas are directed toward each other and by impingement caused to splay transversely of the orifice.

6. An acetylene burner tip having upwardly extending side walls with openings for the free admission of air between said walls in proximity to their bases, an internal gas chamber and an orifice from said chamber located centrally between but remote from the bases of the walls, said orifice being elongated transversely of the walls, and the ends of the orifice being higher than the center whereby the edges of the issuing stream of gas are caused to impinge and splay transversely of the orifice.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."