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E. J. DOLAN & M. J. TRACY.
ACETYLENE GAS BURNER TIP.

APPLICATION FILED APR. 22, 1907.

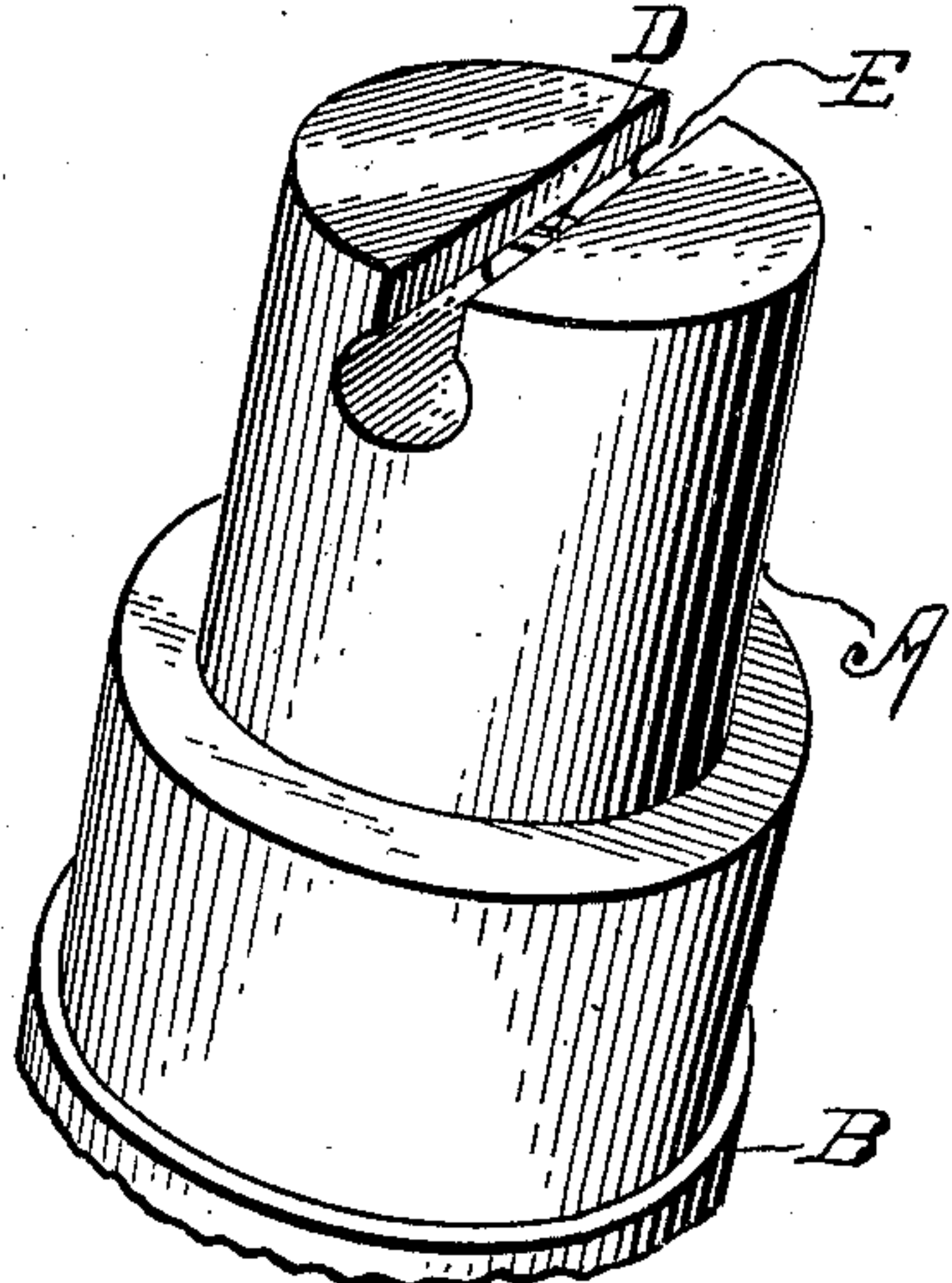


Fig. 1.

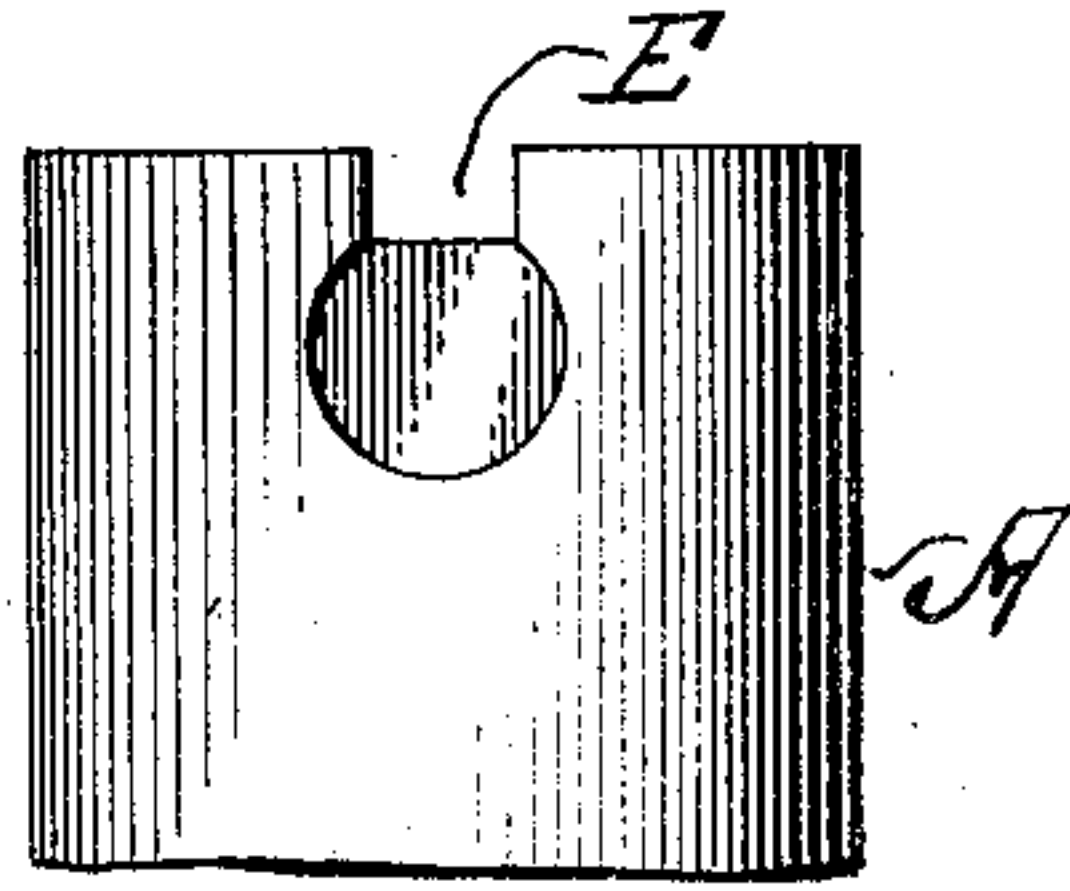


Fig. 2.

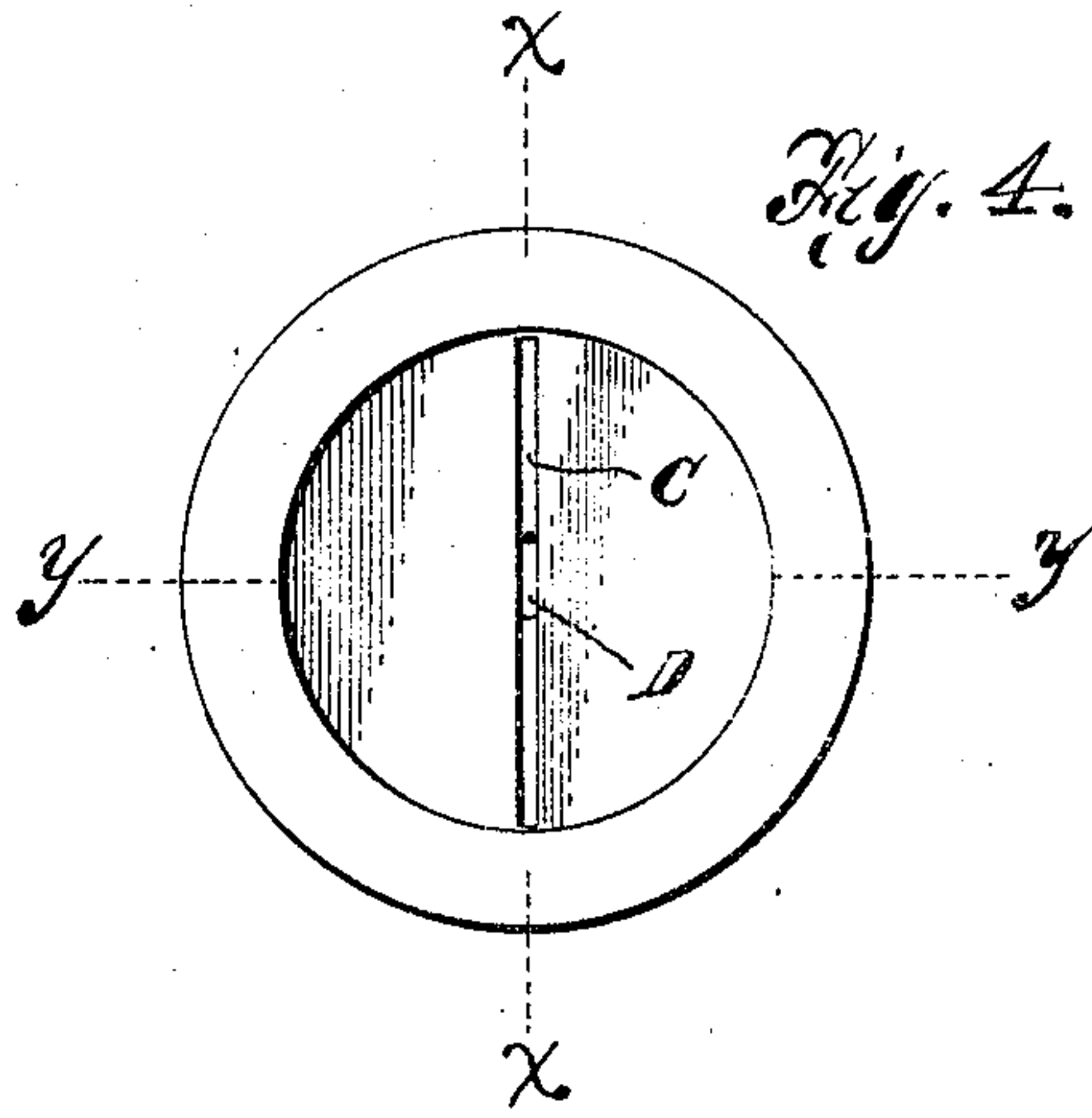


Fig. 4.

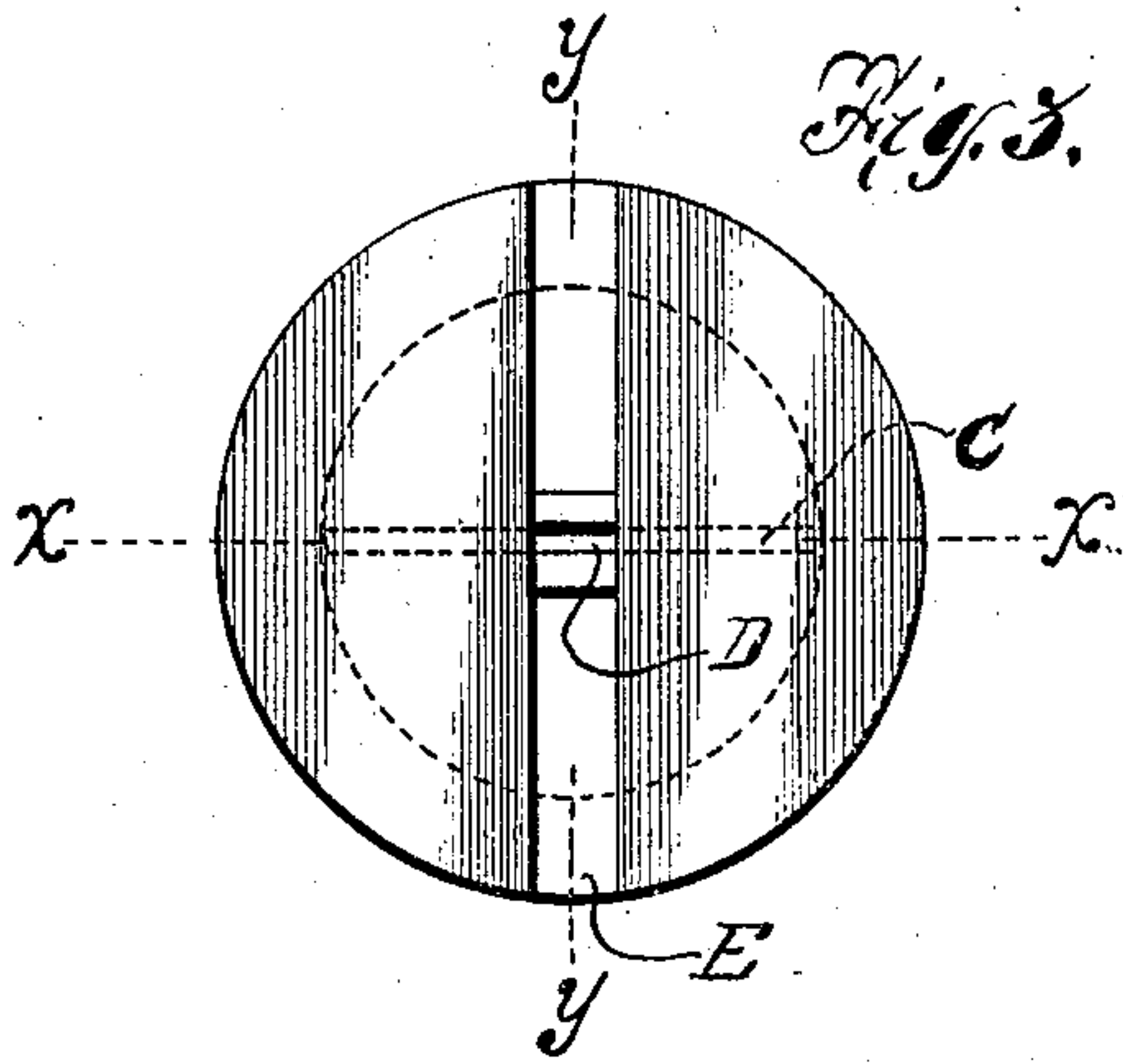


Fig. 3.

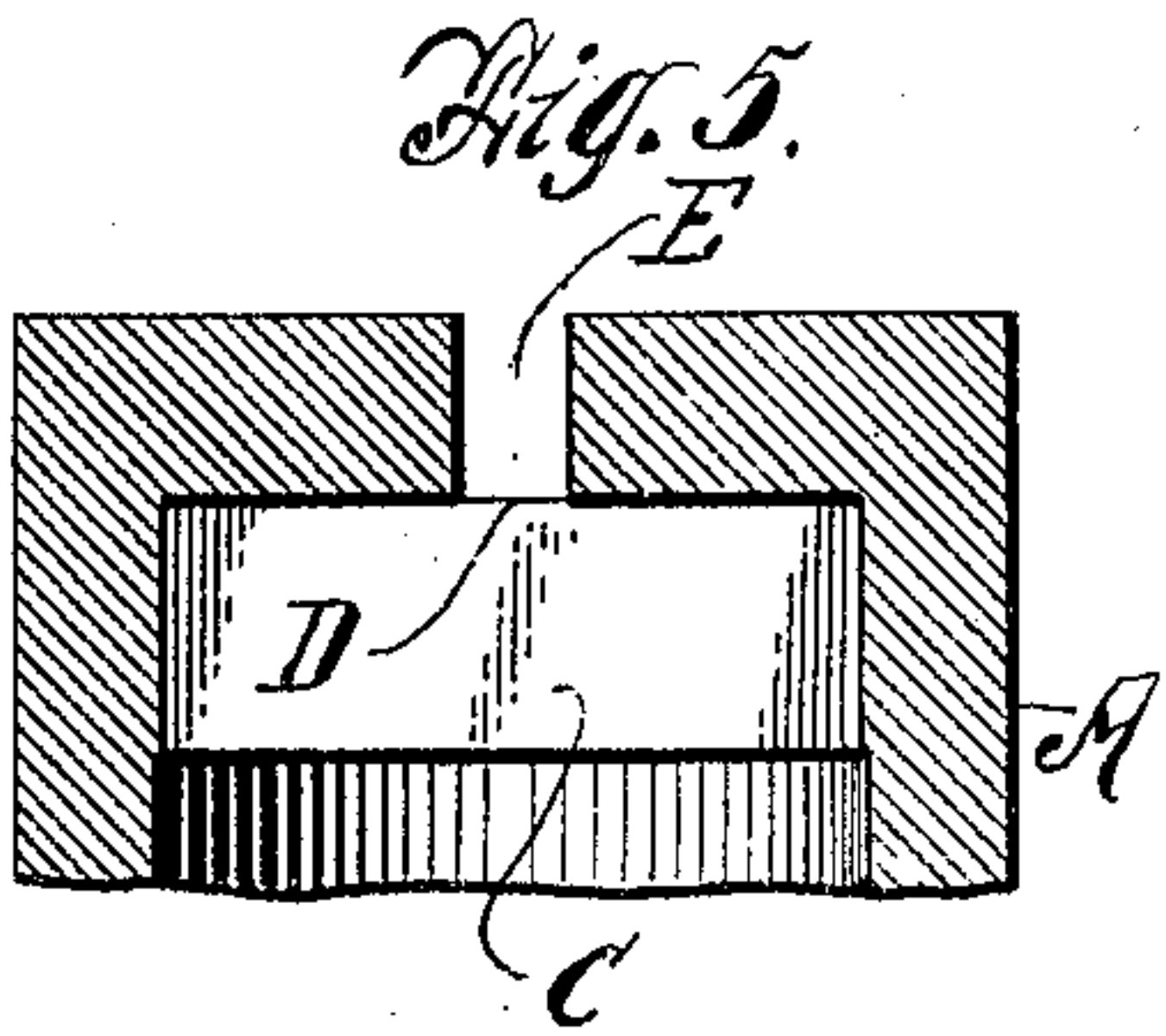


Fig. 5.

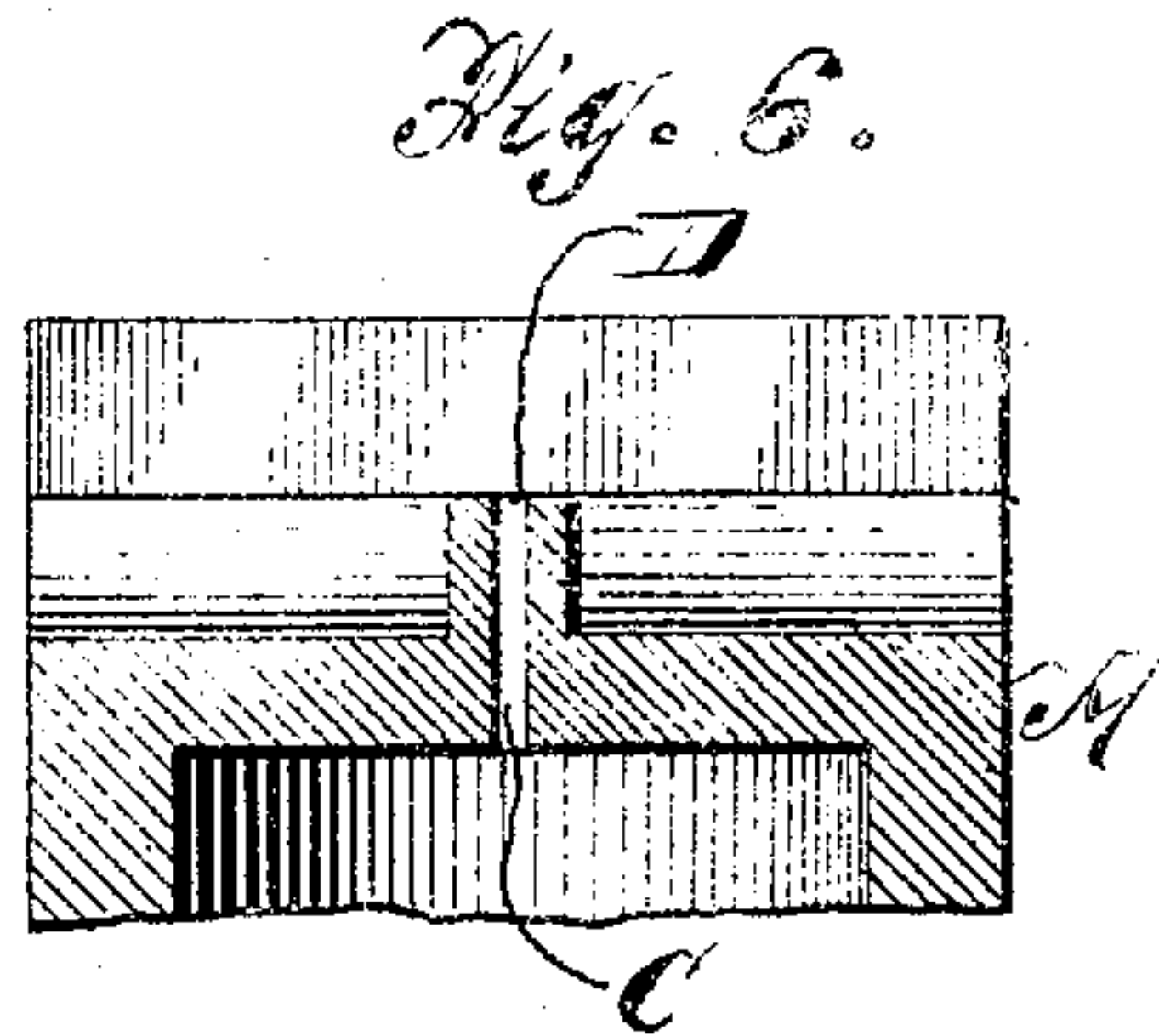


Fig. 6.

Witnesses
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UNITED STATES PATENT OFFICE.

EDWARD J. DOLAN AND MICHAEL J. TRACY, OF PHILADELPHIA, PENNSYLVANIA.

ACETYLENE-GAS-BURNER TIP.

No. 862,315.

Specification of Letters Patent.

Patented Aug. 6, 1907.

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To all whom it may concern.

Be it known that we, EDWARD J. DOLAN and MICHAEL J. TRACY, both citizens of the United States, and residents of the city and county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Acetylene-Gas-Burner Tips, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of a tip constructed in accordance with our invention, and secured to a pillar. Fig. 2 is a side elevation of the upper portion of said tip. Fig. 3 is an enlarged top plan view of Fig. 2, interior parts being indicated by dotted lines. Fig. 4 is an enlarged bottom plan view showing interior construction. Fig. 5 is an enlarged vertical section of Fig. 2 upon a line at right angles to the cleft, and Fig. 6 is a like view taken at right angles to the line upon which Fig. 5 is taken.

The object of our present invention is to produce a tip which, from a single exit, will produce, from acetylene gas, a flat, as distinguished from a cylindrical, flame and without undesired deposits. We attain this object by means of the construction shown in the drawings and hereinafter described, it being understood that relative proportions and shape of parts may be varied considerably without departing from our invention.

Our tip A is composed preferably of lava, steatite, or other suitable material. It may be secured to the pillar B connected with the gas pipe or other source of supply in the usual manner. The tip contains intermediate the gas inlet and gas exit a chamber C essentially of elongated cross section, said cross section being preferably parallelogrammic in form (Fig. 4) and its interior having preferably the shape of a parallelepiped, the said chamber having in all cases, when the tip is in upright operative position, a central major horizontal axis on the line $x-x$ and its central minor horizontal axis on the line $y-y$, at right angles thereto (see Figs. 3 and 4). The chamber C leads directly into the single gas exit D of the tip which is also essentially of elongated shape, preferably parallelogrammic, (Figs. 3 and 4) and having also, in all cases, a central major horizontal axis parallel with the central major horizontal axis of said chamber and its central minor horizontal axis at right angles thereto and parallel with the central minor horizontal axis of said chamber, (see Figs. 3 and 4), the centers of all of said axes being therefore in the same vertical line which is rectangularly disposed to each of said axes. The said exit may be conveniently formed by cutting downwards, from the top of the tip, a central cleft E disposed at right angles to the major axis of said chamber until the latter is opened by said cleft, said opening being carried slightly below the roof of the chamber, if desired. The said major axes of the chamber and of the exit are

mutually parallel and the centers of said axes also lie in the same vertical line which is rectangularly disposed to all of the said axes enumerated, and it is essential that said major horizontal axis of the chamber shall be longer than said major horizontal axis of the exit. The said minor axes of the chamber and of the exit are also mutually parallel and the centers of said minor axes lie in a line at right angles to each of said axes, and it is preferable that said minor axes be of equal length, though the chamber may be a little wider than the exit, without preventing operation.

The operation of those portions of our tip heretofore described is as follows;—the gas, under pressure, passes into the chamber from the gas supply pipe, and thence through the exit. The aforesaid relative shapes, proportions and dispositions of the chamber and the exit result in gas being directed through the exit into the atmosphere in angularly opposed convergent directions to a point where the impingement of the opposing streams against each other imparts to the gas rising therefrom the form of an extremely thin sheet in a plane, disposed at right angles to the major axis of the exit, which sheet in burning produces the desired flat flame. Where acetylene, or other gases rich in hydrocarbon are used, it is important to seat the base of said flame at a distance from said exit. Any convenient, or well known, means may be employed for this; but we prefer our device shown in the drawings, which consists in imparting to the tip, outside of the exit, a cleft F extending completely across the tip as shown, freely open at top and both ends to the atmosphere, and, preferably, carried below the exit on both sides thereof. This cleft is to accommodate the flat sheet of gas, disposed at right angles to the exit D and is concentric therewith and the chamber C. The sides of the cleft rise preferably at each end of the exit, and the height of the cleft above the exit and its remaining dimensions should be such as to insure the seating of the flame at the top of the cleft and prevent the flame from "popping" down to the gas exit D, thus avoiding injurious deposits of combustion.

We are aware that flat flames have been produced by impinging against each other two oppositely directed streams of gas, but this has hitherto required two substantially distinct gas exits with the resulting difficulty of securing, and maintaining, required alinement. Our tip obviates such difficulty, and dispenses with parts, by its said construction, which produces the desired flat flame from gas delivered through a single exit, from a single chamber, both novelly shaped and disposed as aforesaid, so as to secure said result.

The much greater diffusing surface presented by our attenuated sheet of gas, as compared with a cylindrical jet of equal volume, and the vortices imparted by the spreading of the stream from the exit in the presence of unlimited access of air afforded by the cleft insure a thorough admixture of the gas with air, this admixture

filling the cleft above the gas exit whereby deposits of combustion are also prevented. The cleft also permits the gas to be burned under small pressure, as when turned low, and any deposits thereby made will be burned off when normal pressure is restored, as when the gas is again turned on full.

What we claim as new and desire to secure by Letters Patent is the following, viz:—

1. An acetylene gas burner tip comprising a single elongated gas exit and a gas chamber of elongated cross section leading directly into said exit the central major axis of said chamber being longer than and parallel with the central major axis of said exit, the centers of said axes being in a line rectangular thereto, and means for seating the flame at a point from said exit.
2. An acetylene gas burner tip comprising a single elongated gas exit and a gas chamber of elongated cross section leading directly into said exit the central major axis of said chamber being longer than and parallel with the central major axis of said exit, the central minor axes of said exit and chamber being parallel and of equal length, the centers of all said axes being in a line rectangular thereto, and means for seating the flame at a point removed from said exit.
3. An acetylene gas burner tip comprising a single elongated gas exit and a gas chamber of parallelogrammic cross-section leading directly into said exit the central major axis of said chamber being longer than and parallel with the central major axis of said exit, the centers of said axes being in a line rectangular thereto, and means for seating the flame at a point removed from said exit.
4. An acetylene gas burner tip comprising a single elongated gas exit and a gas chamber of parallelogrammic cross section leading directly into said exit the central major axis of said chamber being longer than and parallel with the central major axis of the said exit, the central minor axes of said exit and chamber being parallel and of equal length, the centers of all said axes being in a line rectangular thereto, and means for seating the flame at a point removed from said exit.
5. An acetylene gas burner tip comprising a single elongated gas exit and a gas chamber of elongated cross section leading directly into said exit the central major axis of said chamber being longer than and parallel with the central major axis of said exit, the centers of said axes being in a line rectangular thereto, and outside of said gas exit and leading therefrom an open cleft extending at right angles to said axes completely across the tip.
6. An acetylene gas burner tip comprising a single elongated gas exit and a gas chamber of elongated cross section leading directly into said exit the central major axis of said chamber being longer than and parallel with the central major axis of said exit, the central minor axes of said exit and chamber being parallel and of equal length, the centers of all said axes being in a line rectangular thereto, and outside of said gas exit and leading therefrom an open cleft extending at right angles to said major axes completely across said tip.
7. An acetylene gas burner tip comprising a single elongated gas exit and a gas chamber of parallelogrammic cross section leading directly into said exit the central

major axis of said chamber being longer than and parallel with the central major axis of said exit, the centers of said axes being in a line rectangular thereto, and outside of said gas exit and leading therefrom an open cleft extending at right angles to said axes completely across said tip.

8. An acetylene gas burner tip comprising a single elongated gas exit and a gas chamber of parallelogrammic cross section leading directly into said exit the central major axis of said chamber being longer than and parallel with the central major axis of said exit, the central minor axes of said exit and chamber being parallel and of equal length, the centers of all said axes being in a line rectangular thereto, and outside of said gas exit and leading therefrom an open cleft extending at right angles to said major axes completely across said tip.

9. An acetylene gas burner tip comprising a single elongated gas exit and a gas chamber of elongated cross section leading directly into said exit the central major axis of said chamber being longer than and parallel with the central major axis of said exit, the centers of said axes being in a line rectangular thereto, and outside of said gas exit and leading therefrom an open cleft extending at right angles to said axes completely across said tip and also below said exit on both sides thereof.

10. An acetylene gas burner tip comprising a single elongated gas exit and a gas chamber of elongated cross section leading directly into said exit the central major axis of said chamber being longer than and parallel with the central major axis of said exit, the central minor axes of said exit and chamber being parallel and of equal length, the centers of all said axes being in a line rectangular thereto, and outside of said gas exit and leading therefrom an open cleft extending at right angles to said major axes completely across said tip and also below said exit on both sides thereof.

11. An acetylene gas burner tip comprising a single elongated gas exit and a gas chamber of parallelogrammic cross section leading directly into said exit the central major axis of said chamber being longer than and parallel with the central major axis of said exit, the centers of said axes being in a line rectangular thereto, and outside of said gas exit and leading therefrom an open cleft extending at right angles to said axes completely across said tip and also below said exit on both sides thereof.

12. An acetylene gas burner tip comprising a single elongated gas exit and a gas chamber of parallelogrammic cross section leading directly into said exit the central major axis of said chamber being longer than and parallel with the central major axis of said exit, the central minor axes of said exit and chamber being parallel and of equal length, the centers of all said axes being in a line rectangular thereto, and outside of said gas exit and leading therefrom an open cleft extending at right angles to said major axes completely across said tip and also below said exit on both sides thereof.

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

EDWARD J. DOLAN.
MICHAEL J. TRACY.

Witnesses:

HANS WENIGER,
KATIE A. DOLAN.