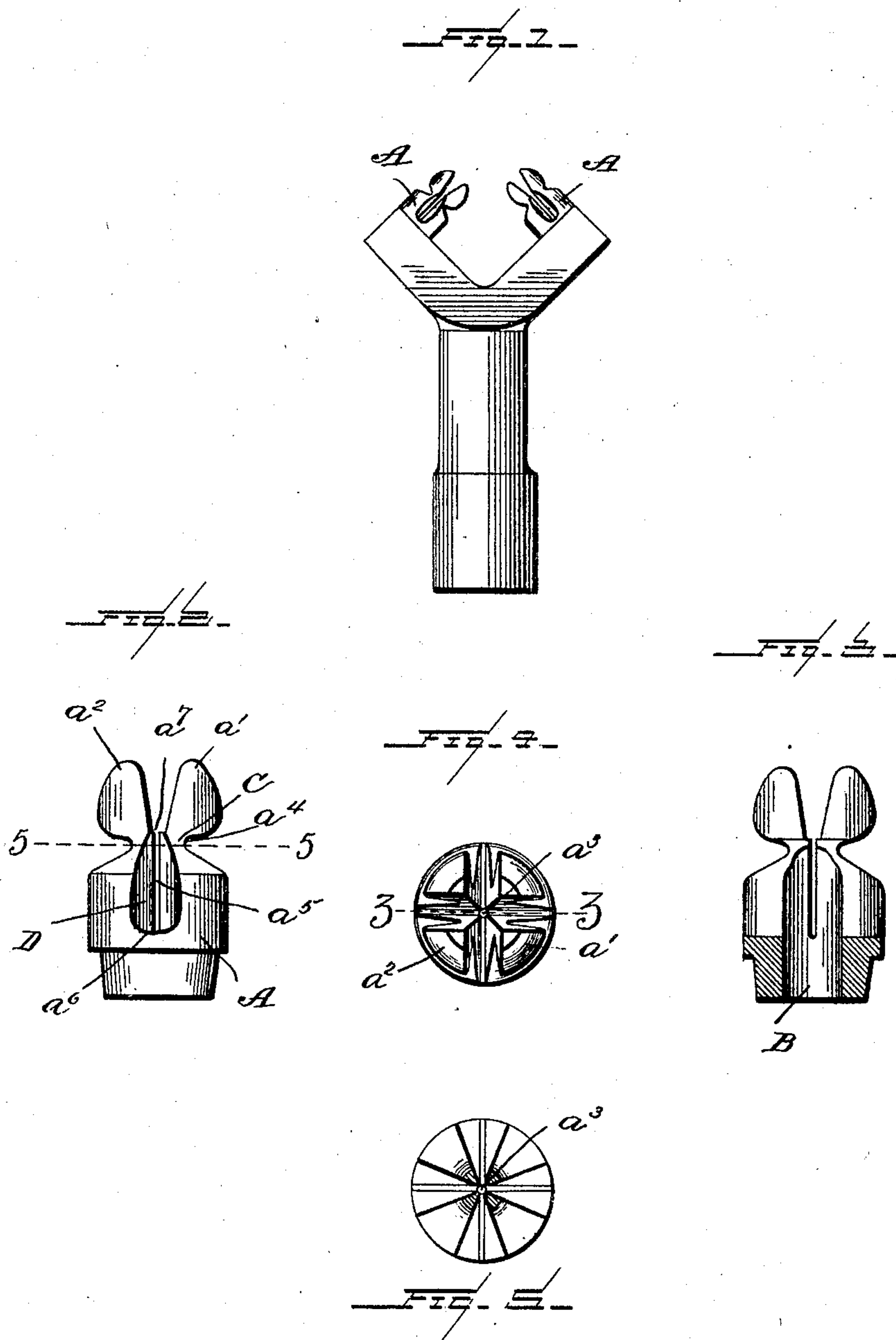


No. 795,826.

PATENTED AUG. 1, 1905.

E. J. DOLAN & M. J. TRACY.  
METHOD OF BURNING ACETYLENE GAS.  
APPLICATION FILED MAY 2, 1905.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## METHOD OF BURNING ACETYLENE GAS.

No. 795,826.

Specification of Letters Patent.

Patented Aug. 1, 1905.

Application filed May 2, 1905. Serial No. 258,548.

*To all whom it may concern:*

Be it known that we, EDWARD J. DOLAN and MICHAEL J. TRACY, citizens of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Methods of Burning Acetylene Gas; and we 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 new and useful improvements in methods of burning acetylene gas; and the object sought is to raise the temperature of the burner-tip to a non-corrosive temperature by mixing without surrounding the gas with air before combustion.

Our method consists, further, in projecting a stream of gas through a minute duct in a tip, into which duct lead radiating slots, through which air passes and comes in contact with portions of the stream of gas, while sections of the wall of the duct intermediate the slots form frictional surfaces which agitate the stream of gas, while certain portions of the latter are in contact with the atmosphere.

We have found from experimenting that decomposition will not form upon the gas-tip of the burner if the latter is heated beyond the decomposing-point. Ordinarily this cannot be done on account of the heat being conducted to the body portion of the tip, and it is our aim to maintain the heat at the upper portion of the tip with a reduced neck portion immediately below the combustion-point, whereby a small amount of heat will be conducted to the lower or top portion of the tip, whereby gas passing through the body portion of the tip may be kept comparatively cool.

In burners commonly used the stream of gas is surrounded or enveloped by air and burned at the extreme point of the tip, the object being to keep the top of the tip as cool as possible, which differentiates from the present invention, as it is not our purpose to surround the gas with air, but to mix it with air before combustion takes place, which is accomplished by providing slots of a width equal to the diameter of the gas-duct, and

through which air is allowed to contact with portions of the stream of gas only. In order to raise the temperature of the combustion-point and its vicinity to the required degree to prevent corroding deposits, we cause the combustion to take place at the top or end of the narrow radial slots and in contact with slotted extensions of the tip, the amount of flame contact being regulated by the length of said slotted extensions.

We have illustrated in the accompanying drawings an apparatus whereby the various steps of our method may be carried out, and in which similar letters of reference indicate like parts in the views, in which—

Figure 1 is a side elevation showing two of our improved burner-tips mounted in a suitable pillar and so positioned that the flames will impinge one against the other to produce a flame of high illuminating power. Fig. 2 is a side elevation of our improved tip. Fig. 3 is a sectional view longitudinally through the same. Fig. 4 is a top plan view of the burner. Fig. 5 is a sectional view taken on line 5 5 of Fig. 2.

Reference now being had to the details of the drawings by letter, A designates a tip, which is made of any suitable material, preferably steatite, and is provided with the usual chamber B, from which a minute central duct  $a^5$  extends, through which gas passes to the combustion end of the tip, and said tip has a constricted neck portion C, which reduces to a minimum the conducting-surface intermediate the lower or body portion of the tip and the upper or combustion end. D designates a series of radial slots which are formed longitudinally in the tip and have slanting walls on the marginal edges thereof, said slots opening into said duct  $a^6$  and the marginal edges  $a^3$  intermediate the slots forming the longitudinal strips or sections of the walls of the slot. The upper portion of the tip has radial slots formed therein, as shown clearly in the drawings, and affording a large surface to the burning gas, whereby the extensions  $a^1$  and  $a^2$ , where the ignition takes place, are raised to a non-corrosive temperature.

In the operation of our burner it will be noted that as the gas is projected through the duct  $a^6$  it will contact with marginal edges  $a^3$  of the tip intermediate the slots, thereby forming a certain amount of friction which will agitate and mix the gas with the atmosphere,



and the moment after the mixture passes the constricted neck portion C of the tip it becomes ignited at the point  $a^7$ , and owing to the high degree of temperature of the ignition-point and the immediate surroundings, consisting of the outwardly-flanged extensions  $a$  and  $a^2$  of the burner tip, all of the component parts of the gas will be consumed without leaving any deposit which would be likely to clog the burner.

While we have shown and described a particular form of apparatus whereby the steps of our method may be carried out, it will be understood that various modifications of burner-tip may be employed for carrying out the process.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A method of burning acetylene gas, which consists in projecting a stream of gas through a minute duct, and causing the atmosphere to contact with portions only of the circumference of the stream of gas, and the intermediate portions of the gas in contact with the

solid portions of the wall of the duct, as set forth.

2. A method of burning acetylene gas, which consists in projecting a stream of gas through a duct, and exposing portions of the circumference of the stream to the atmosphere, and maintaining the flame at a high temperature at its base.

3. A burner-tip provided with a central minute duct and surrounding walls having intercepting-slots, each of substantially equal diameter to said duct intermediate of the solid portions abutting said duct.

4. A burner-tip provided with a contracted neck portion intermediate of the top and bottom thereof, and a minute duct extended through said contracted neck and terminating below the separated upper edges of said tip.

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

EDWARD J. DOLAN.  
MICHAEL J. TRACY.

Witnesses:

E. R. McCLEESE,  
FREDK. C. EBERHARDT.