

No. 654,682.

Patented July 31, 1900.

H. E. SHAFFER.

GAS BURNER.

(Application filed Apr. 26, 1900.)

(No Model.)

Fig. 1.

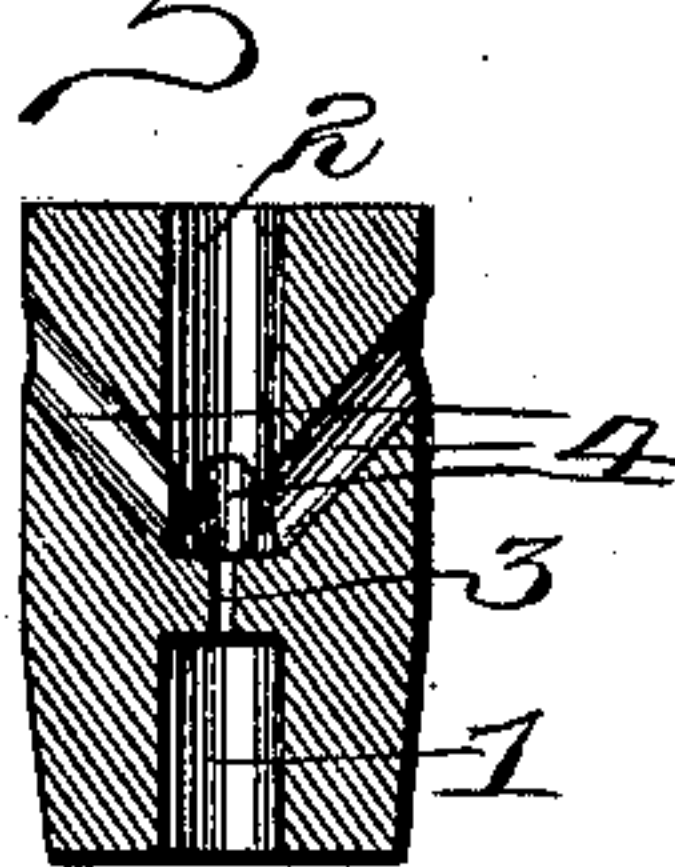
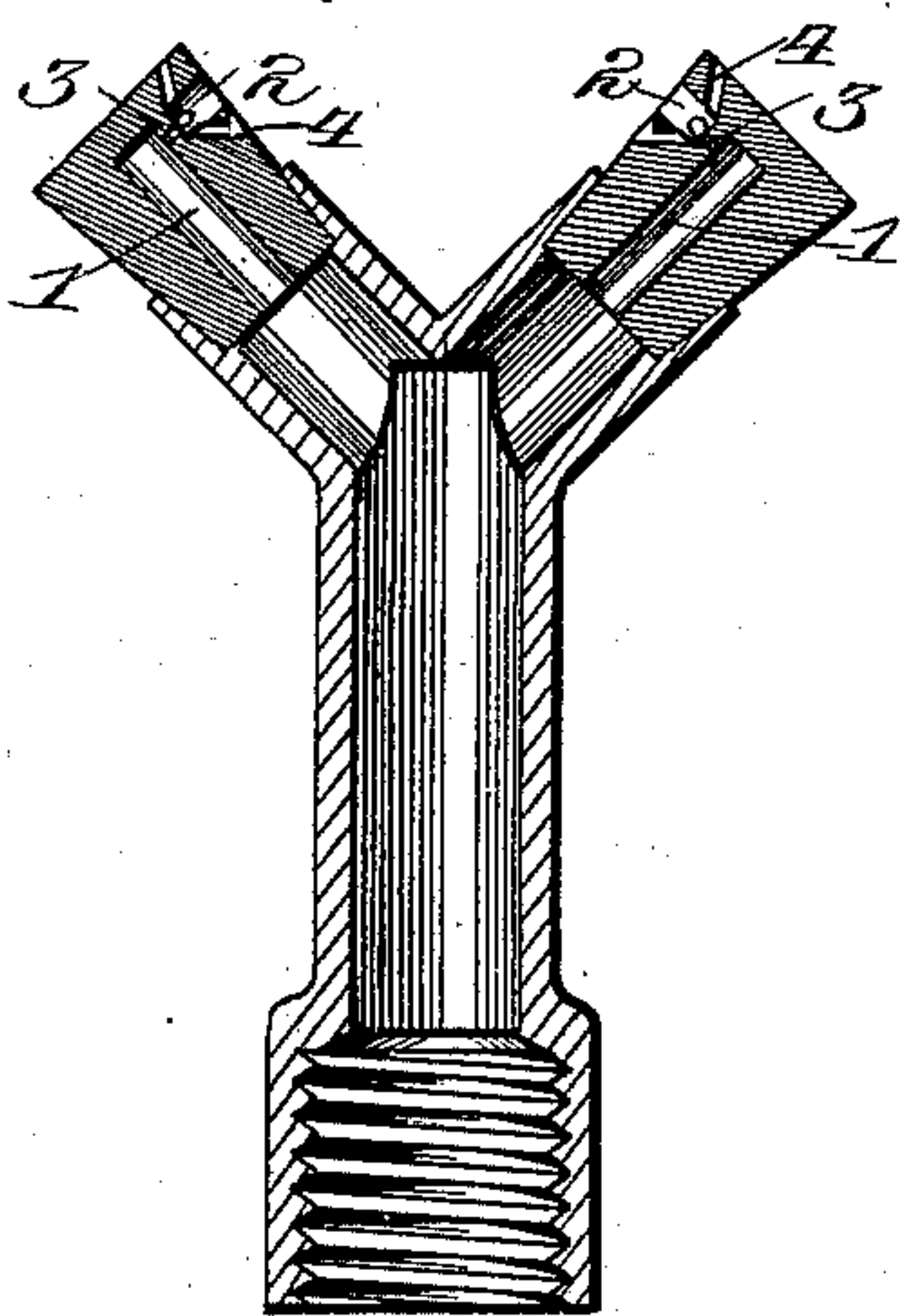


Fig. 2.



Witnesses
Walter B. Payne.
Willard Rich.

Inventor,
Henry E. Shaffer
by Daniel Church
his Attorneys.

UNITED STATES PATENT OFFICE.

HENRY E. SHAFFER, OF ROCHESTER, NEW YORK.

GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 654,682, dated July 31, 1900.

Application filed April 26, 1900. Serial No. 14,488. (No model.)

To all whom it may concern:

Be it known that I, HENRY E. SHAFFER, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Gas-Burners; 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 a part of this specification, and to the reference-numerals marked thereon.

My present invention relates to certain improvements in burners for gas rich in hydrocarbons—such, for instance, as acetylene gas—in which the air is mixed with the pure gas before being burned and in which air is directed in separate streams upon the minute orifice, where the pure gas first issues, in such manner as to keep this orifice clear and prevent the deposit of carbon thereon. To these and other ends it consists in providing the tip with air-inlet apertures arranged at an angle to the gas and air discharge passage of the burner less than a right angle and discharging below their inlet ends and directly upon the column of gas where it first issues into the discharge-passage, as will be hereinafter fully described.

In the drawings, Figure 1 is a sectional view of a burner-tip constructed in accordance with my invention; Fig. 2, a sectional view of another form of tip adapted particularly to be used after the manner described in my prior patent, No. 617,942, dated January 17, 1899.

Similar reference-numerals indicate similar parts.

The tips for burners shown in the accompanying drawings are adapted to be made from a single piece of refractory material, such as staetite, both forms being provided with a gas-passage 1, a discharge-passage 2, and extending between these a minute gas-aperture 3, arranged at the bottom of the discharge-passage 2 and discharging axially into the same.

4 indicates air-passages, two or more of which are preferably employed, formed in the walls of the tip at the sides of the discharge-passage 2 and extending at an angle less than a right angle relative to the axis of the same, having their inlet or outer ends above the level of the minute gas-aperture 3 and ar-

ranged to discharge the air descending or passing in directly upon the column of gas as it first issues from the aperture 3. This arrangement causes separate columns of air to strike the gas at the proper point to cause it to thoroughly mix with the gas promoting the combustion thereof and also causes such fresh air by the direct impingement at this point to keep the minute aperture clean and prevent the deposit of carbon, &c., which otherwise would clog said aperture and prevent the proper operation of the burner. The air is drawn into the air-channels by the gas under high pressure passing through the discharge-passage, and by the angular arrangement of these channels the air is directed downward directly upon the top or exit of the small gas-aperture, thereby preventing the more or less pure gas—that is, gas without having air mixed with it—from spreading at the sides of said aperture and remaining in contact with the heated burner, causing a deposit, as is the case when the air-channels enter the discharge-passage above the small gas-exit, forming a dead-gas pocket therein. When the air-channels enter the discharge-passage at right angles and in the plane of the gas-aperture, as in my prior patent referred to, this dead-gas space is materially reduced and the clogging of the burner is in a larger degree prevented. By the angular arrangement of the channels shown herein the entering air is caused to impinge more directly upon the gas-aperture to break up the column of gas, mix with it, and prevent the gas from coming in contact with the heated surface of the burner and at the same time affords a longer passage through the tip for cool air, which reduces the temperature of the tip. The air-passages 4 are preferably formed by passing a drill downwardly at an angle through the side walls of the tip, so that its center will coincide with the center of the minute gas-aperture, and, as stated, several passages could be employed, if desired. In the tip shown in Fig. 2 the same air and gas passages are shown; but the gas-passage in the body of the tip is arranged at an angle to the discharge-passage and is therefore capable of use in a burner having diverging arms into which the tips are placed, with the discharge-passages so arranged that

the streams of gas and air will converge to form a flat flame, as in my prior patent, No. 617,942, dated January 17, 1899.

I claim as my invention--

- 5 1. An acetylene-gas burner provided with a discharge-passage, a small gas-aperture leading axially therein, and an air-passage leading into the discharge-passage having its outer end higher relative to the gas-aperture
10 than its inner end, and discharging a stream of air upon the gas as it first issues into the discharge-passage.

2. An acetylene-gas burner provided with a discharge-passage, a small gas-aperture leading axially therein, and air-passages in 15 the walls around the discharge-passage having their outer ends higher relative to the gas-aperture than the inner ends and discharging streams of air upon the gas as it first issues into the discharge-passage.

HENRY E. SHAFFER.

Witnesses:

J. F. CHURCH,
G. A. RODA.