O. C. MUSSER.

BURNER.

APPLICATION FILED FEB. 4, 1909.

954,125. Patented Apr. 5, 1910.

Fig. 1.

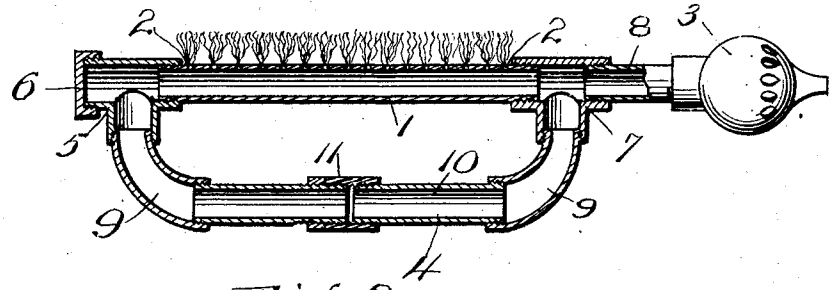


Fig. 2.

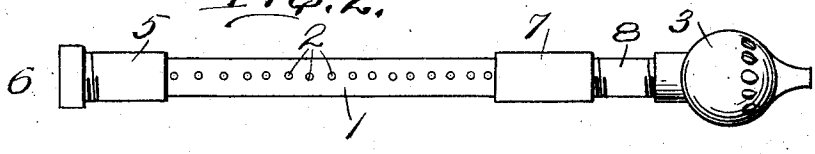


Fig. 3.

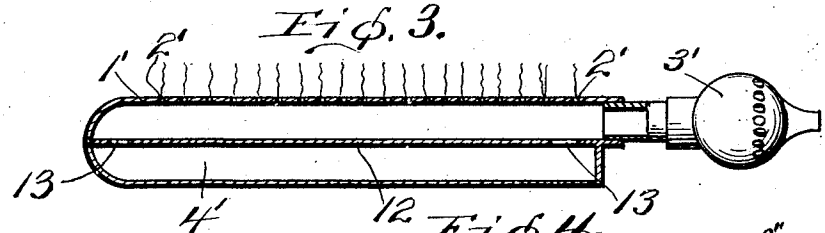


Fig. 4.

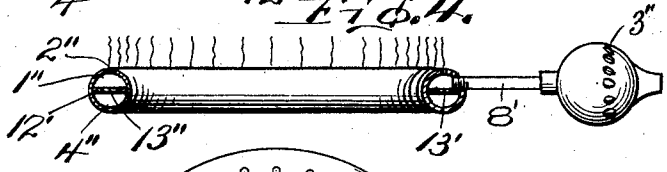
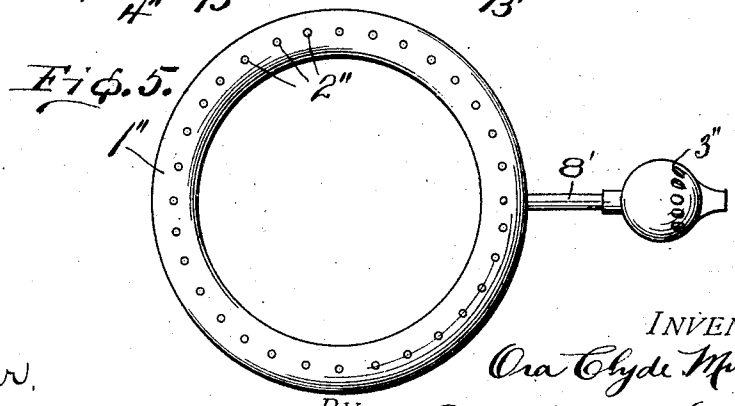


Fig. 5.



WITNESSES:

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BURNER.

954,125. Specification of Letters Patent. Patented Apr. 5, 1910.

Application filed February 4, 1909. Serial No. 476,107.

To all whom it may concern:

Be it known that I, ORA CLYDE MUSSER, a citizen of the United States, residing at Oil City, in the county of Venango and State of Pennsylvania, have invented certain new and useful Improvements in Burners; and I do hereby 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.

This invention relates to improvements in fluid fuel burners, and the primary object in view is the distribution and equalizing of the fluid fuel relative to the points of combustion such as to give a maximum efficiency.

With this and further objects in view as will in part become obvious and in part be hereinafter specified, the invention comprises certain novel constructions, combinations and arrangements of parts as will be hereinafter set forth and claimed.

In the accompanying drawing,—Figure 1 is a longitudinal, vertical section through a burner embodying the features of the present invention, the mixer being seen in elevation. Fig. 2 is a top plan view thereof. Fig. 3 is a view similar to Fig. 1 of a slightly modified form of the invention. Fig. 4 is a similar view of a further modification. Fig. 5 is a top plan of the structure seen in Fig. 4.

Referring to the drawing by numerals, 1 indicates a burner tube or casing formed with a series of discharge apertures 2, the said tube being adapted to be supplied with gaseous or fluid fuel from any ordinary air mixer 3 supplied from any suitable source of supply. Communicating with the opposite ends of the tube 1 is a by-pass 4 adapted to allow inter-communication of the fuel from the opposite ends of the tube 1. Obviously, the tube and by-pass may be constructed in any desired manner, as by being formed integral as indicated in Fig. 3 and hereinafter mentioned, or by being constructed of the ordinary mercantile pipe connections, as indicated in Fig. 1. When the burner is constructed as seen in Fig 1, the tube 1 is connected at one end with a T-connection 5 having that end immediately opposite the tube 1 closed by a cap 6 or an L-connection might be substituted for the T-connection, and necessity for the employment of the cap obviated. The opposite end of the tube 1 is connected to the T-connection 7, the immediately opposite opening of which receives the nipple 8 with which the mixer 3 is connected. Into the depending portion of each of the T-connections 5 and 7 is threaded the nipple end of a nipple-L 9 to the opposite end of each of which is connected a nipple 10 engaged and connected together by an ordinary union 11.

As above intimated, the burner may be constructed by simply being cast or otherwise formed integral, as indicated in Fig. 3, in which 1′ is a tube supplied with fluid fuel from an ordinary mixer 3′. The tube 1′ is formed with the burner apertures 2′. Formed integral with the tube 1′ is a by-pass 4′ which is divided from the tube 1′ by the partition wall 12, the by-pass 4′ communicating at each end with the tube 1′ by apertures 13, 13, formed in the wall 12.

While the above described structures are illustrated as being provided merely with a straight tube burner, it is obvious that the tube may be circular in form as shown in Figs. 4 and 5, in which 1″ indicates the burner tube having the usual apertures 2″, said tube being formed integral with the by-pass 4″, the tube and by-pass being separated by the horizontal annular partition 42′. A fuel supply pipe 8′ communicates from the usual mixer 3″ with the tube 1″ and, contiguous to the point of communication thereof, the partition 12′ is provided with an aperture 13′. At a diametrically opposite point from aperture 13′ an aperture 13″ is formed in partition 12′, so that the action of the fuel supplied to burner 1″ will be the same as that supplied to the straight burner.

From carefully conducted experiments and tests, I have concluded that the correct theory of operation of my present improved burner is as follows: The gas entering the intake end of the burner tube passes throughout the length of the tube and at the same time a portion of the gas settles down through the by-pass and equalizes the gas pressure at all points along the burner tube. I have found by tests that the provision of a mixer and supply tube at each end of the burner tube results in defective, or imperfect, or uneven combustion, whereas in the

use of the present improved burner with its by-pass I am able to maintain a constant flame so even throughout as to present the appearance of a practically solid mass having a flat top. Furthermore, by the use of the present improved burner, when the supply of gas is turned off, the flames are extinguished at the ends of the burner tube first, and then gradually become extinguished toward the center approaching from both ends at approximately equal rates, so that at any time after the cutting off of the fuel supply, the number of extinguished flames at one end of the burner tube will substantially agree with the number at the other end thereof. Hence, I am enabled to secure by the present improved arrangement substantially perfect combustion, and almost exact evenness in heat distribution, and in the amount of flame produced at all points. This I find to be true both of the straight tubular burner and the annular burner, so that I desire it to be understood that the present invention is comprehensive of burners of various shapes so long as the equalizing by-pass is employed.

What I claim is,—

1. In a burner, the combination with a burner tube having a discharge opening, and means for supplying fluid fuel to said tube, of a by-pass affording communication between a point of said tube contiguous to the point of supply and a point of said tube farthermost from said point of supply, said by-pass being disposed substantially at the opposite side of the burner from the burner opening, and the fuel supply means being disposed between said opening and said opposite side.

2. In a burner, the combination of a burner casing having a burner discharge opening and an intake for fuel, of a by-pass communicating with spaced points of said casing at the opposite side thereof from the burner discharge opening, said fuel intake being disposed in a plane between said discharge opening and said opposite side.

3. In a burner, the combination with a burner casing having a discharge opening, of a by-pass communicating with the casing at spaced points, said spaced points being also spaced from the burner discharge opening, and the burner casing having a fuel intake independent of the by-pass and disposed for directing fuel between the burner discharge opening and the points of communication of said by-pass.

4. In a burner, the combination with a burner casing having a burner discharge opening, of a by-pass communicating with the burner casing at spaced points, said points being also spaced from the burner discharge opening, and said burner casing having a fuel intake independent of and spaced from the by-pass.

5. In a burner, an inclosure, a partition dividing the inclosure into independent passages, the partition being apertured at spaced points affording communication between the passages, the outer wall of one of the passages being apertured for providing a burner discharge, and a fuel intake for the passage-way having the burner discharge, said intake being disposed between the partition and the burner discharge.

6. In a burner, the combination with a burner tube having a burner discharge opening and fluid fuel supply means for the burner tube arranged on substantially the same horizontal plane with said tube, of a by-pass beneath the plane of the tube and fuel supply means and communicating with spaced points of the tube, said by-pass being disposed at that side of the burner tube remote from the burner discharge opening.

7. In a burner, a tubular member having burner openings, means for supplying fluid fuel thereto, and a passage way beneath the tubular member and communicating therewith at spaced points, the fuel supply means being arranged to discharge into the tubular member across and above the points of communication therewith of the passage way.

8. In a burner the combination with a burner tube having a burner discharge opening and fluid fuel supply means for said burner tube arranged in substantially the same horizontal plane therewith, of a by-pass communicating with the tube at spaced points, said points of communication of the by-pass with the burner tube being spaced from the burner discharge opening and disposed at the opposite side of the fuel supply means from said burner discharge.

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

ORA CLYDE MUSSER.

Witnesses:

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THOMAS T. HASOCK.