

No. 640,698.

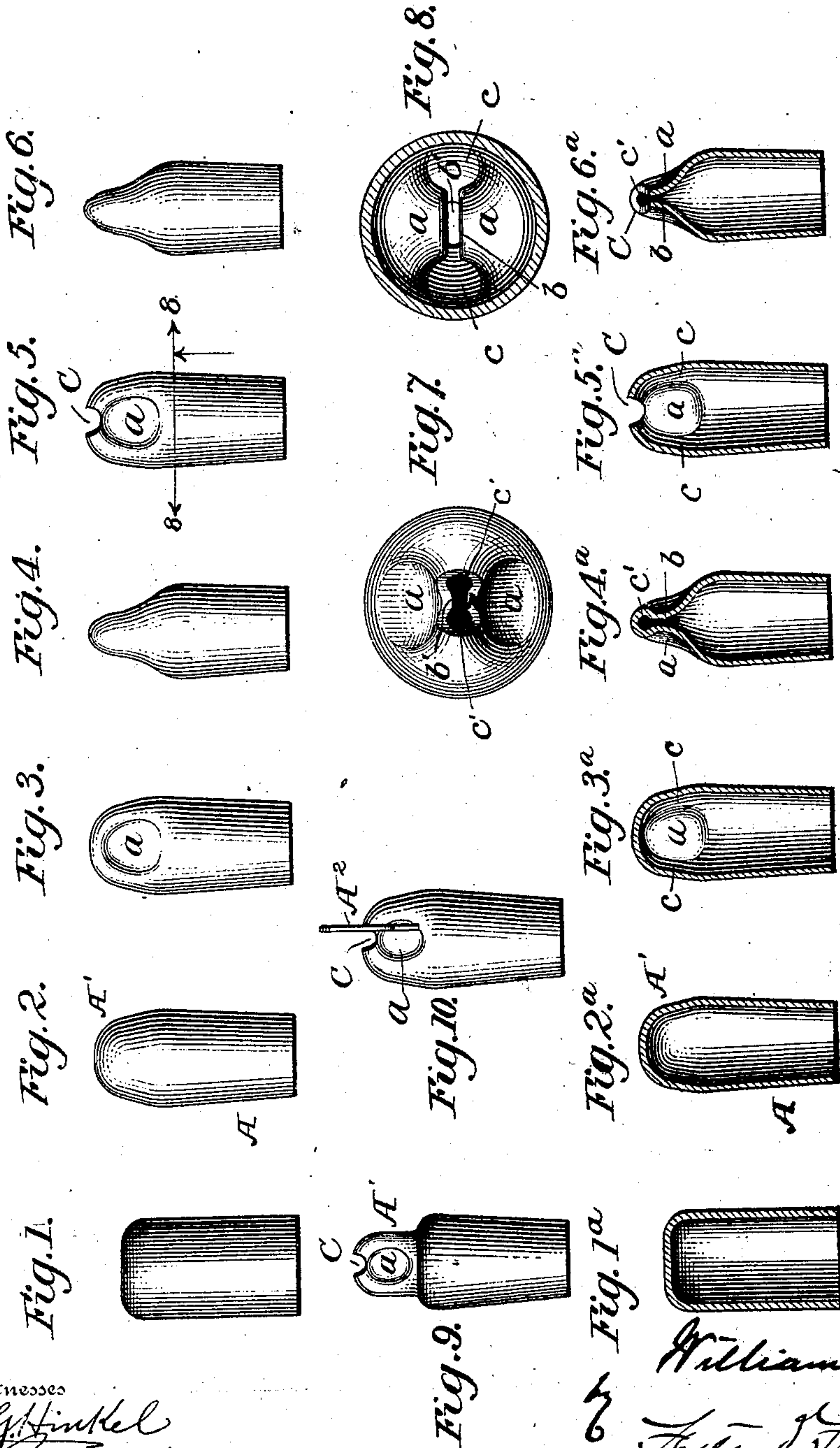
Patented Jan. 2, 1900.

W. H. PORTER.

GAS TIP.

(Application filed Feb. 15, 1898.)

(No Model.)



Witnesses

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# UNITED STATES PATENT OFFICE.

WILLIAM H. PORTER, OF NEW YORK, N. Y.

## GAS-TIP.

SPECIFICATION forming part of Letters Patent No. 640,698, dated January 2, 1900.

Application filed February 15, 1898. Serial No. 670,400. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM H. PORTER, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Gas-Tips, of which the following is a specification.

My invention relates to gas tips or burners, and has for its object to provide an exceedingly simple, cheap, and effective burner; and to these ends it consists in the various features of construction, substantially as hereinafter more particularly set forth.

In the accompanying drawings, Figures 1 to 6 are side views showing different stages of making the tip. Figs. 1<sup>a</sup> to 6<sup>a</sup> are vertical sections of the corresponding figures. Fig. 7 is a top plan view of the tip. Fig. 8 is a sectional view on the line 8-8, Fig. 5, looking upward; and Figs. 9 and 10 are side views of modified forms of tips.

All the views are enlarged beyond the actual size for purposes of clearness of illustration.

One of the objects of my present invention is to provide a practicable tip or burner made from metal, and while of course my improved tip may be made in various ways, so long as it embodies substantially the same features of construction, I prefer to make it from a thimble of metal in substantially the manner illustrated and described hereinafter, and while various materials may be used in its construction it is preferred to make it from aluminium or some similar non-corrosive material which will not be deleteriously affected by the gas and elements to which it is exposed.

Heretofore it has generally been the practice to provide tips or burners with two classes of openings for the passage of the gas, one in the form of a slot extending transversely across the top of the tip to a greater or less extent and the other in the form of two holes, usually set opposite to each other; and one of the objects of my present invention is to provide an improved form of opening for the gas which is neither a simple slot nor two holes, but which may be said to comprise in a general way a combination of these two forms in that there are practically two holes connected by an intermediate slot, or, otherwise expressed, a continuous transverse slot having enlargements at its ends, which en-

largements are arranged at any desired angle to the intermediate slot and preferably extend above the same. This opening also is preferably formed out of a right line—that is, the holes or enlarged portions are arranged opposite to each other at a greater or less angle and extend above the connecting transverse slot. Again, the tip is formed so that the opposed openings or enlarged ends of the slot are in communication with what may be termed “conveying-channels,” extending from the chamber or body of the tip, and these channels communicate with this chamber, being what may be termed “open” channels, with their ends or openings facing each other.

In making the burner in the manner illustrated in the drawings I take a thimble of metal substantially of the contour shown in Figs. 1 and 1<sup>a</sup> and by suitable instruments first draw or otherwise form it into the configuration illustrated in Figs. 2 and 2<sup>a</sup>, giving it a tapered body portion A and a dome-like portion A'. It is then by suitable instruments or tools indented or compressed at the sides, as at the points *a*, so that it has the appearance substantially of that shown in Figs. 3, 4, 3<sup>a</sup>, and 4<sup>a</sup>, Fig. 3 showing one side in elevation and Fig. 4 another side at ninety degrees from Fig. 3, and Figs. 3<sup>a</sup> and 4<sup>a</sup> showing cross-sections of the corresponding figures. It will be seen that the indented portions *a* are brought quite close to each other, so as to form a passage *b* between them, and the outer portions form channels *c*, which communicate with the passage *b*. The thimble as thus formed is then notched or slotted at its upper portion, as at C, Fig. 5, and this forms the completed tip, which is shown in another elevation at Fig. 6, and right-angled cross-sections of which are shown in Figs. 5<sup>a</sup> and 6<sup>a</sup>.

In Fig. 7 I have shown on a larger scale a plan view of the tip or burner, more clearly showing the opening comprising the transverse slotted portion *b'*, which is an opening of the passage *b* of Fig. 4<sup>a</sup>, and the enlarged ends *c'* of the slot, which are, in fact, portions of the channels *c*, so that the opening includes the passage *b* and the terminals of the channels *c*.

Fig. 8 (which is an upward view on the cross-section line 8-8, Fig. 5) more clearly shows



the internal construction and arrangement of the metal forming the openings and showing how the channels *c* are in communication with the body portion *A* of the burner.

3 In Fig. 9 I have illustrated a similar form of tip, except that the dome portion *A'* is reduced in size with relation to the body portion, but otherwise it has the same general characteristics, while in Fig. 10 I have shown  
10 the addition of a partition or plate *A<sup>2</sup>* inserted into the tip, so as to close the opening into one of the channels *c*, and forms what may be termed a "semitip," in that the gas  
15 flows through only one of the enlarged portions of the slot and is projected against the face of the partition, the other enlarged portion of the slot being stopped or closed by the partition, so that no gas will escape therefrom.

20 Other modifications of this general type of tip have been made; but it is not necessary to describe the same in order to enable the general principles of my invention to be understood.

25 It will be seen that when the tip is in use in the ordinary way the gas enters the chamber or body portion *A* and passes up the converging portions of the channels *c* and through the passage *b* between the compressed walls *a* until it reaches the gas-opening, where there are, in effect, two streams of  
30 gas opposing each other from the two faces *c'* of the notched portion *C*, and these, as seen in the drawings, are at an angle to each other, and at the same time there is a more direct  
35 path for the gas through the passage *b*, forming the contracted or slotted portion *b'* of the opening, and the result is that the flame is in a vertical plane between the two faces *c'*  
40 of the tip and which flame is almost round in shape, giving a most satisfactory and perfect light, which is not liable to flicker and is steady and almost entirely luminous, there being but a small portion near the opening  
45 which is non-luminous.

No regulator or distributing-diaphragm or other device is necessary in connection with the tip in order to produce the most satisfactory results.

50 It will further be seen that all the operations are exceedingly simple and can be readily and easily carried out with great uniformity by suitable tools, not necessary to be described, and that the tip is homogeneous  
55 in character and readily made from a single thimble or similar shaped piece, which can be formed in the usual way from an ordinary blank of metal with little waste.

60 While I prefer to make the burner integral, the portions shown in section, Fig. 4<sup>a</sup> and 5<sup>a</sup>, may be struck up and formed in any desired manner and afterward cemented or welded or otherwise joined to form a complete burner, although from my present experience in man-  
65 ufacture I am in favor of making the burner from a single piece.

While I prefer the form of gas-opening described and illustrated, it is evident that other forms may be used in connection with other features of my invention, and the form of  
70 gas-opening may be used in burners embodying other features of construction, without departing from the spirit of my invention. Furthermore, while my invention is primarily  
75 intended for a gas-burner I have used the various features for other purposes—such, for instance, as nozzles for liquids or vapors—and do not limit myself to any particular use.

What I claim is—

1. A gas tip or burner, the opening of which  
80 is in the form of a concave slot enlarged at the ends, substantially as described.

2. A gas tip or burner, the opening of which is in the form of a slot enlarged at the ends, the enlarged portions being above the central  
85 portion, substantially as described.

3. A gas tip or burner, the opening of which is in the form of a concave slot with enlarged ends, the enlarged ends being at an angle to the central portion of the slot, substantially  
90 as described.

4. A gas tip or burner, having a notched portion at its end, the opposite faces of the notched portion having enlarged openings connected by a contracted slot, substantially  
95 as described.

5. A gas tip or burner, having a chamber communicating with two channels throughout their length, the channels terminating in opposed openings, substantially as described.  
100

6. A gas tip or burner, having two opposed openings forming a continuation of an intermediate narrow slot and communicating with an inner chamber having two channels connecting with said openings, substantially as  
105 described.

7. A gas tip or burner, consisting of a thimble with side indentures and a gas-opening between said indentures, substantially as described.  
110

8. A gas tip or burner, consisting of a thimble with side indentures, and a notched portion, the gas opening being formed in the notched portion, substantially as described.  
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9. A gas tip or burner, consisting of a thimble with side indentures, and a notched portion, the gas-opening being in the form of a slot enlarged at the ends and being located in the notched portion, substantially as described.  
120

10. A gas tip or burner, consisting of a metallic thimble having indented walls *a*, and a notched end forming a slot with enlarged ends, substantially as described.

In testimony whereof I have signed my  
125 name to this specification in the presence of two subscribing witnesses.

WILLIAM H. PORTER.

Witnesses:

W. CLARENCE DUVAL,  
F. L. FREEMAN.



It is hereby certified that Letters Patent No. 640,698, granted January 2, 1900, upon the application of William H. Porter, of New York, N. Y., for an improvement in "Gas-Tips," were erroneously issued to said Porter as owner of said invention; whereas said Letters Patent should have been issued to *the Air-Lighter Company, of New York*, said company being owner of the entire interest, as shown by the record of assignments in this office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 9th day of January A. D., 1900.

[SEAL.]

THOS. RYAN,  
*First Assistant Secretary of the Interior.*

Countersigned:

C. H. DUELL,  
*Commissioner of Patents.*