

No. 658,340.

Patented Sept. 25, 1900.

M. CAHILL.  
BURNER.

(Application filed May 29, 1899.)

(No Model.)

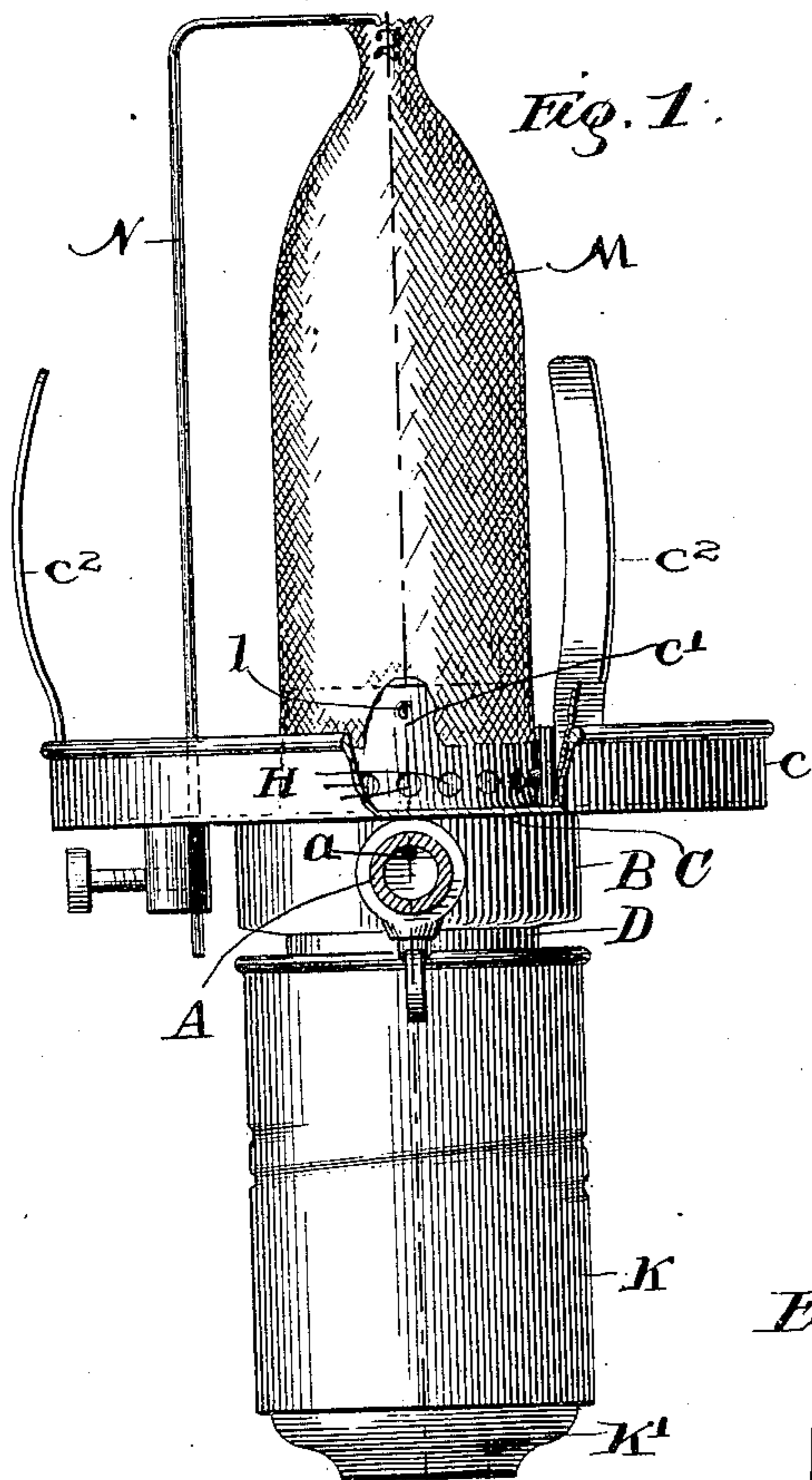


Fig. 2.

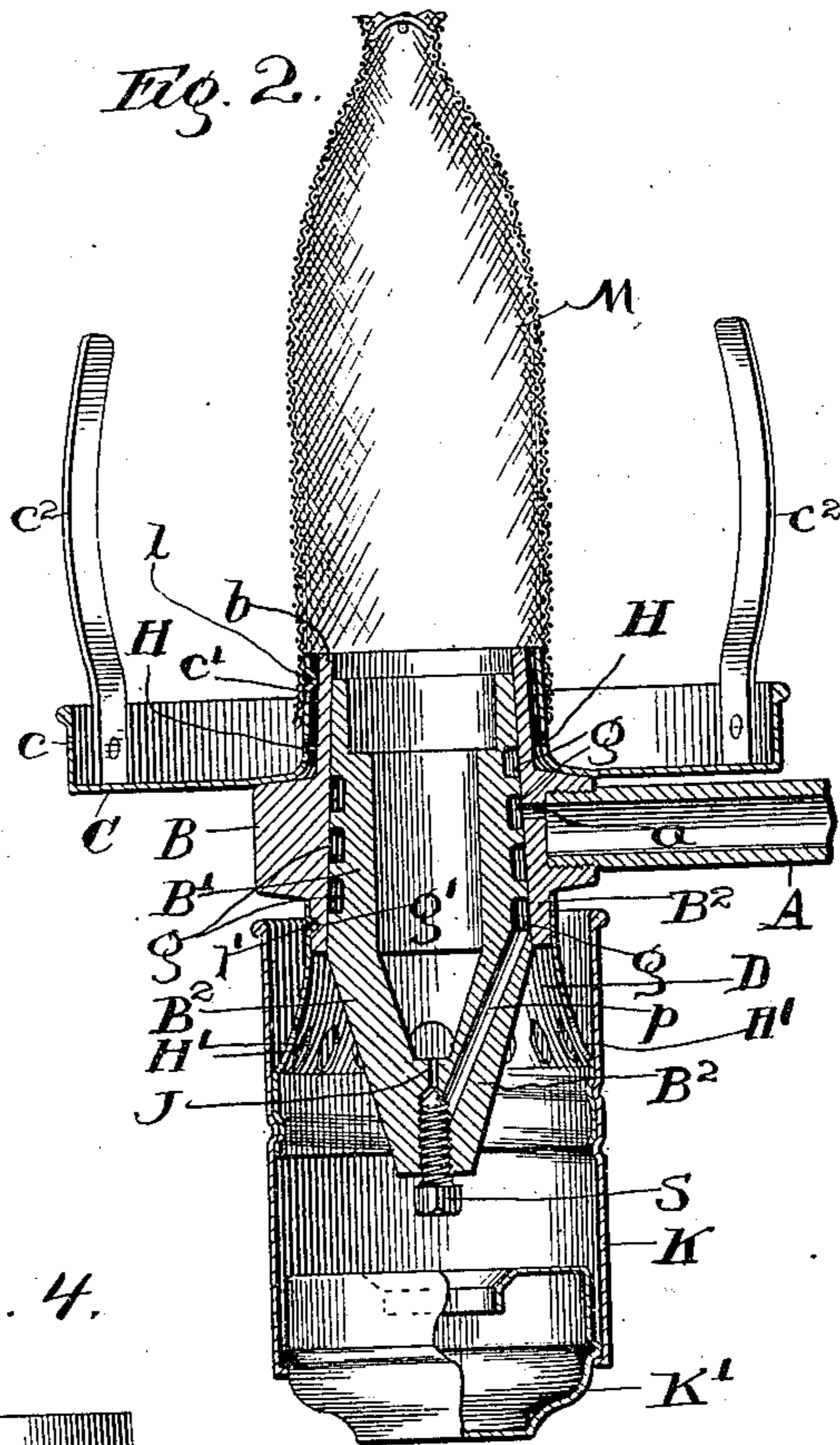


Fig. 4.

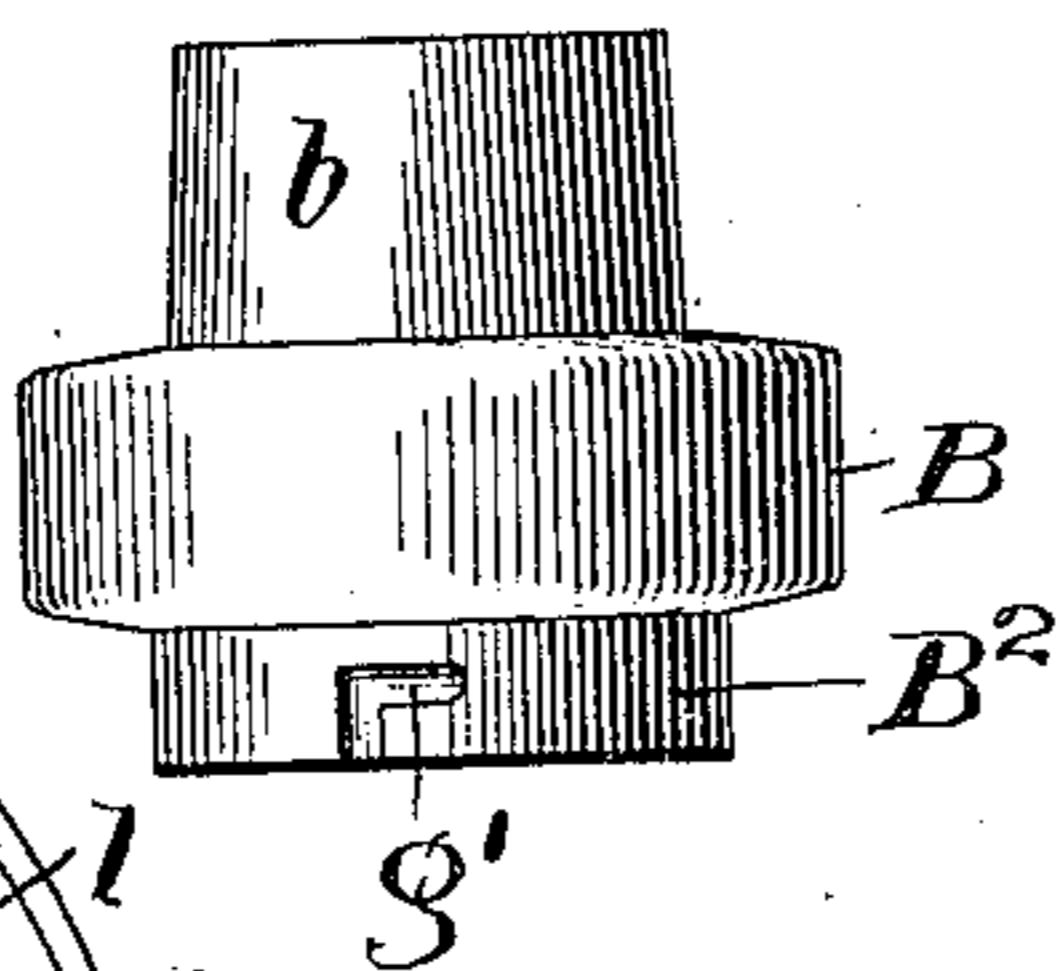


Fig. 3.

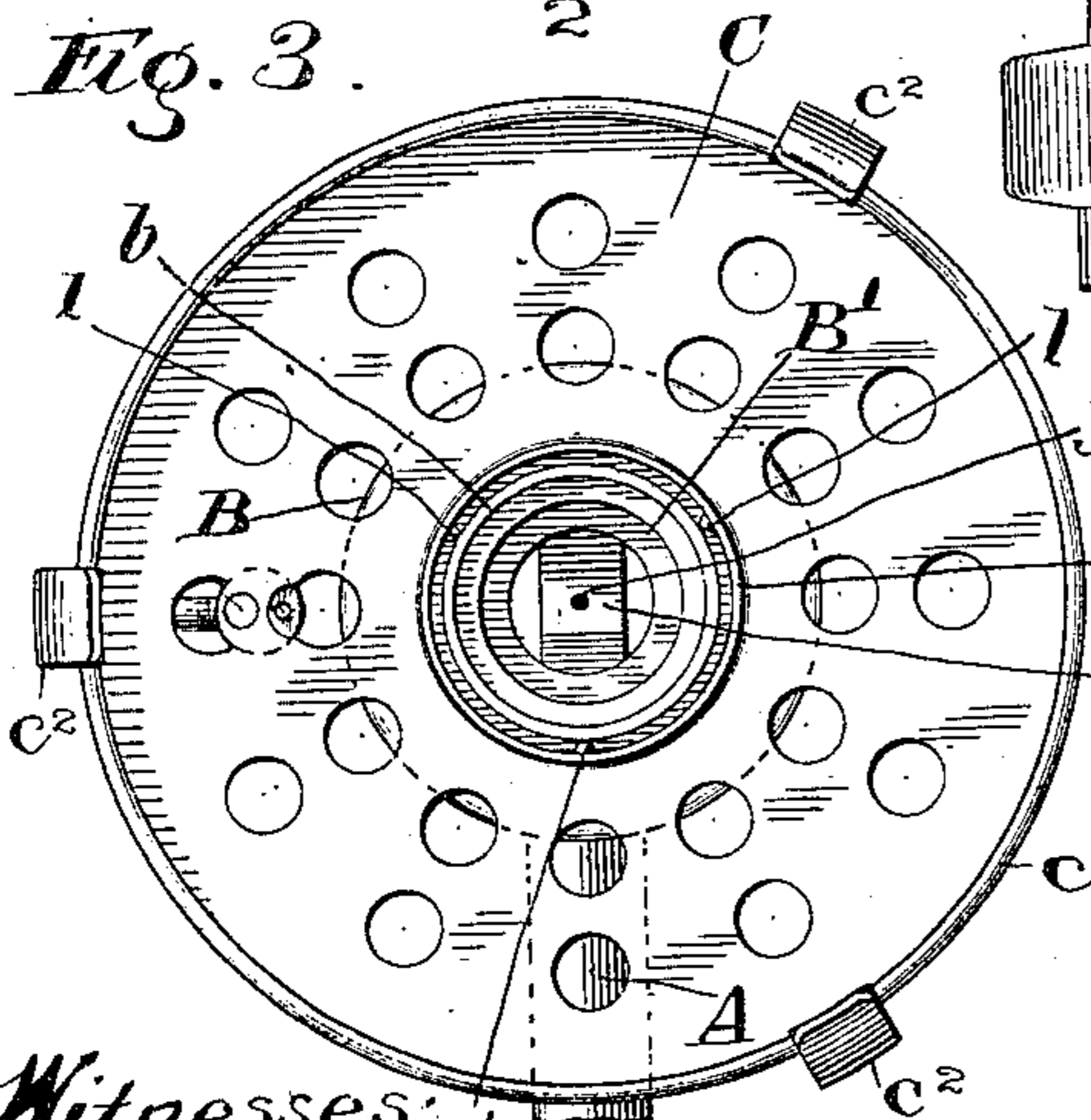


Fig. 5.

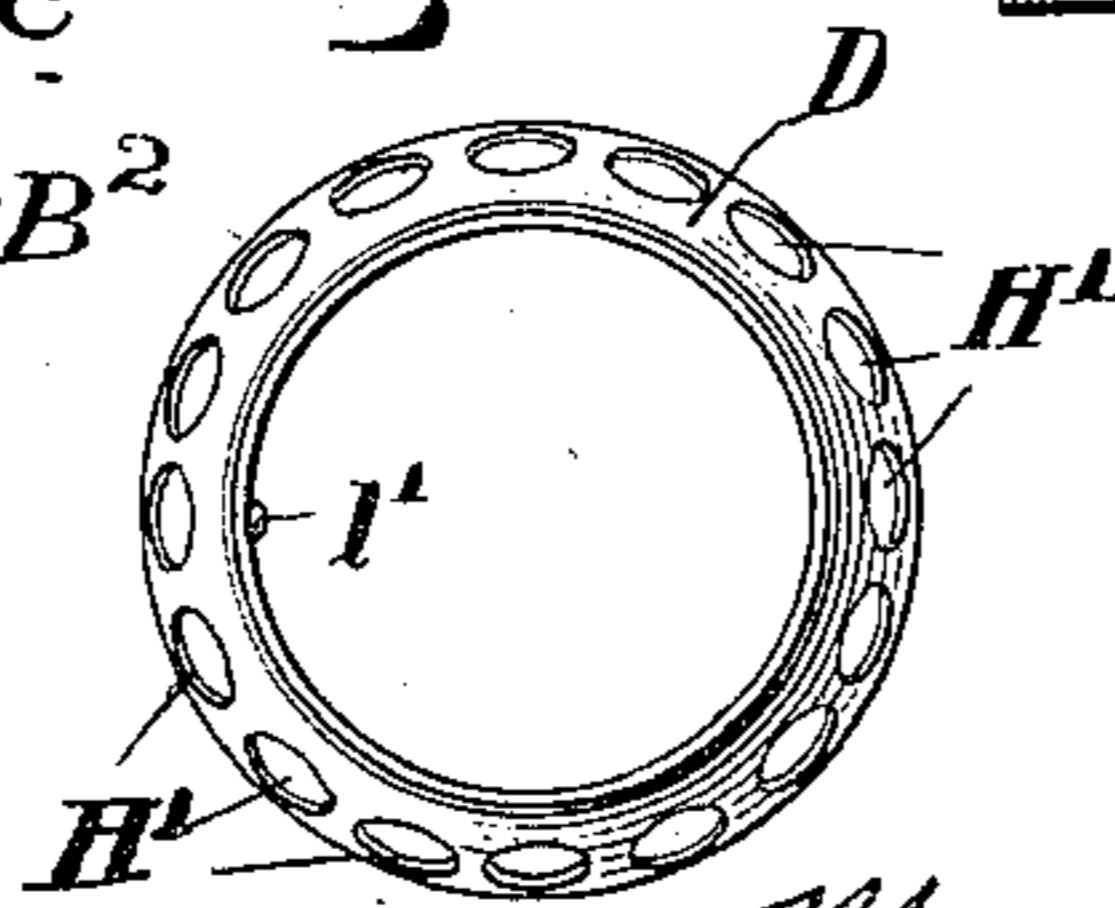
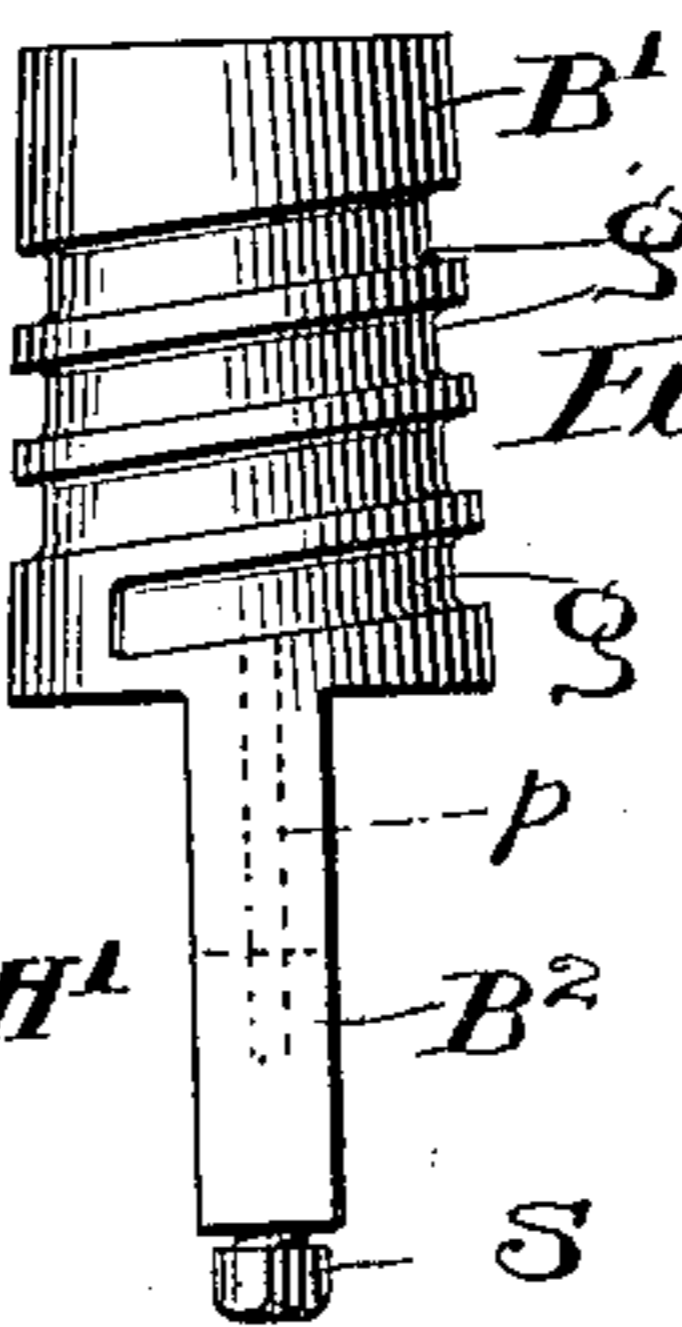


Fig. 6.



Witnesses:  
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Inventor:  
Mortimer Cahill  
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# UNITED STATES PATENT OFFICE

MORTIMER CAHILL, OF CHICAGO, ILLINOIS.

## BURNER.

SPECIFICATION forming part of Letters Patent No. 658,340, dated September 25, 1900.

Application filed May 29, 1899. Serial No. 718,649. (No model.)

*To all whom it may concern:*

Be it known that I, MORTIMER CAHILL, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Burners, of which the following is a specification.

My invention relates to improvements in burners adapted for the generation and consumption of hydrocarbon gases, the object of the invention being to secure practically perfect combustion of the gases and consequent development of the maximum of heat from their combustion.

The invention is fully described and explained in this specification and shown in the accompanying drawings, of which—

Figure 1 is an elevation of a burner embodying my improvements. Fig. 2 is a central longitudinal section through the line 2 2 in Fig. 1, the view being in the direction indicated by the arrow at the lower end of said line 2 2. Fig. 3 is a top plan of the burner, the mantle and its support being removed. Fig. 4 is a side elevation of the shell of the converter. Fig. 5 is a top plan of the perforated skirt attached to and dependent from the shell, and Fig. 6 is an elevation of the plug or inner member of the converter.

In the views, A is the end portion of a tube communicating with a source of liquid-hydrocarbon supply, and B the outer portion or shell of a converter adapted to change the liquid hydrocarbon into gas, the inner surface of the shell B being preferably smooth and tapering slightly inward and upward. Within this shell is the plug or inner portion B' of the converter, this element being a hollow cone having an external taper fitting in the shell B and a continuous and preferably spiral groove *g*, adapted to receive liquid hydrocarbon from the pipe A through a small opening *a* in the shell B. The lower end of the groove *g* communicates, by means of a passage *p*, with a jet-opening J, formed in a yoke B<sup>2</sup>, dependent from the plug B', the jet-opening being opened and closed by means of a screw-valve S in the lower end of the yoke. When the generator is in operation, the gas formed in the spiral groove *g* is forced downward through the passage *p* to the opening J and forms a flame, which passes up-

ward through the central hollow in the tubular plug B'.

The shell B of the generator is formed with an upwardly-extending neck *b*, and outside of this neck and encircling it is a collar *c'*, formed integral with a perforated circular sheet-metal plate C, having an annular flange *c* at its outer edge and a series of arms *c*<sup>2</sup>, adapted to form lateral supports for a chimney resting upon the plate C. The neck *c'* forms the support for the lower end of the mantle M of the ordinary type in use in incandescent vapor-lamps, the neck being encircled by the lower end of the mantle. I have found in the practical use of lamps of this general class that it is desirable to supply a certain amount of air entering the space within the mantle at a point or points above the generator, and I have also observed that after the mantle has been in use for a short time it shrinks so that its lower end becomes absolutely tight upon the neck within it, and thus prevents the passage of air upward between the mantle itself and the metal neck on which it is mounted. For this reason I have found it expedient to provide an air-space within the collar upon which the mantle is directly mounted, and it will be seen that there is such space between the collar *c'* and the neck *b* of the shell of the generator. The proper relation between the collar *c'* and neck *b* may be maintained in any simple manner—as, for instance, by forming on the inner face of the collar *c'* a series of inwardly-punched lugs *l*, adapted to hold the collar concentric with the neck, and thus to maintain an equal air-space throughout the circle of the parts. The collar *c'* is formed with a series of holes H below the edge of the mantle, and it is evident that air may enter these holes and pass upward in the space between the collar *c'* and the neck *b*, thus becoming heated before it reaches the combustion-chamber within the mantle.

While the construction shown in the drawings is cheap and simple, it is evident that the collar *c'* and neck *b* may, if desired, be made in a single piece, an annular groove being turned out to form the air-space and this groove being reached by holes in the position occupied by the holes H H, as shown in the drawings. Other constructions having the

same effect will readily occur to any skilled mechanic, and I desire, therefore, not to limit the invention in this regard to the form shown in the drawings.

5 The shell B is formed with a downwardly-extending neck B<sup>2</sup>, on which is mounted a downwardly-extending skirt D, preferably of sheet metal and flaring outward and downward from the neck B<sup>2</sup>. This skirt may be  
10 held in place on the neck B<sup>2</sup> by friction alone or by means of one or more lugs l', punched inward in the upper end of the skirt and adapted to enter a corresponding groove g' in the neck B<sup>2</sup>, as shown in Fig. 4. The skirt  
15 D is formed near its lower end with a series of holes H', adapted to permit the passage of air inward to the lower end of the space within the plug B' of the generator, and below these holes the skirt terminates in a  
20 cylindrical portion, which receives a cylindrical shell K, held in place either by friction or by means of coacting screw-threads formed in the sheet metal, as clearly indicated in Figs. 1 and 2. Within the lower end  
25 of the shell K is a cup K', adapted to be dropped into the shell through its upper end before the shell is mounted on the skirt D, this cup being adapted to close the lower end of the shell K and also to serve as a reservoir  
30 for receiving alcohol in initiating the conversion of the liquid hydrocarbon into gas. The shell K may be vertically adjusted either by pushing it up and down or by means of the screw-thread shown in the drawings. The  
35 object of this adjustment is to increase or decrease the space between the upper end of the shell K and the large central portion of the shell B of the converter, which lies immediately above the open upper end of the shell  
40 K, and by means of this adjustment the amount of air reaching the openings H' on its way to the burner may be increased and decreased as desired, and may thus be so regulated as to secure practically perfect  
45 combustion. It is evident that this same result may be reached through the use of various modifications of the particular mechanisms described herein, and I desire, therefore, not to limit the invention as to this  
50 feature of the mechanism to the specific constructions shown and described.

I claim as new and desire to secure by Letters Patent—

1. In a burner of the class described, the combination with a tubular converter having  
55 its upper portion diminished to form a neck and an annular shoulder at the base of the same, of a sleeve encircling said neck, having lateral perforations near its base, and forming the outer wall of an annular air-space  
60 about the neck, means for holding the sleeve concentric with the neck, a mantle fitting over the sleeve above said perforations, and means for supporting the mantle from above.

2. In a burner of the class described, the  
65 combination with a tubular converter having its upper portion diminished to form a neck and an annular shoulder at the base of the same of a concentric mantle-receiving sleeve encircling said neck to form the outer wall of  
70 an air-space about the same and provided with lateral perforations below the mantle thereon, an annular chimney-supporting plate resting upon said shoulder extending outward from the base of the sleeve, below said  
75 perforations, and a support secured to the plate for holding the upper end of the mantle.

3. In a burner of the class described, the combination with a tubular converter having  
80 its lower portion diminished to form a neck and a shoulder at the upper end of the same, of a shell, closed below, inclosing the lower part of the converter and an annular space about the same, said shell being arranged for adjustment toward and away from said shoulder  
85 to vary the amount of air admitted to the inclosed parts, and means for holding said shell concentric with said neck.

4. In a burner of the class described, the combination with a tubular converter having  
90 its lower portion diminished to form a neck and an annular shoulder about the upper end of the same, of a perforated annular skirt mounted upon said neck, and a shell closed below, fitting around said skirt, and arranged  
95 for adjustment toward and away from said shoulder to vary the amount of air admitted between the shoulder and the edge of the shell.

In witness whereof I have hereunto set my  
100 hand, at Chicago, in the county of Cook and State of Illinois, this 26th day of May, 1899.

MORTIMER CAHILL.

Witnesses:

CHAS. O. SHERVEY,  
S. BLISS.