

C. H. SMITH.
BURNER FOR INCANDESCENT VAPOR GAS LAMPS.
APPLICATION FILED JULY 8, 1910.

987,022.

Patented Mar. 14, 1911.

2 SHEETS—SHEET 1.

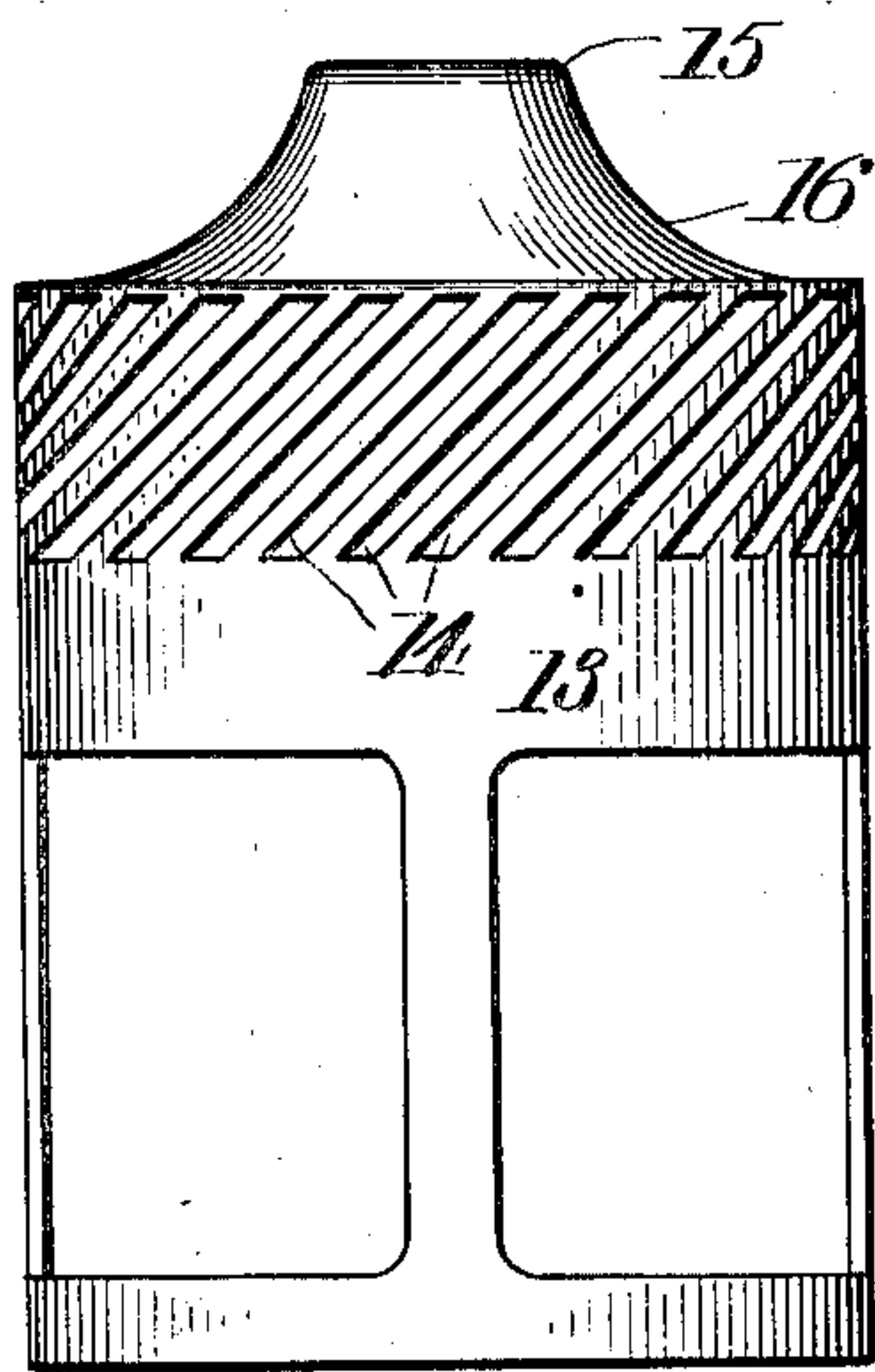


Fig. 4.

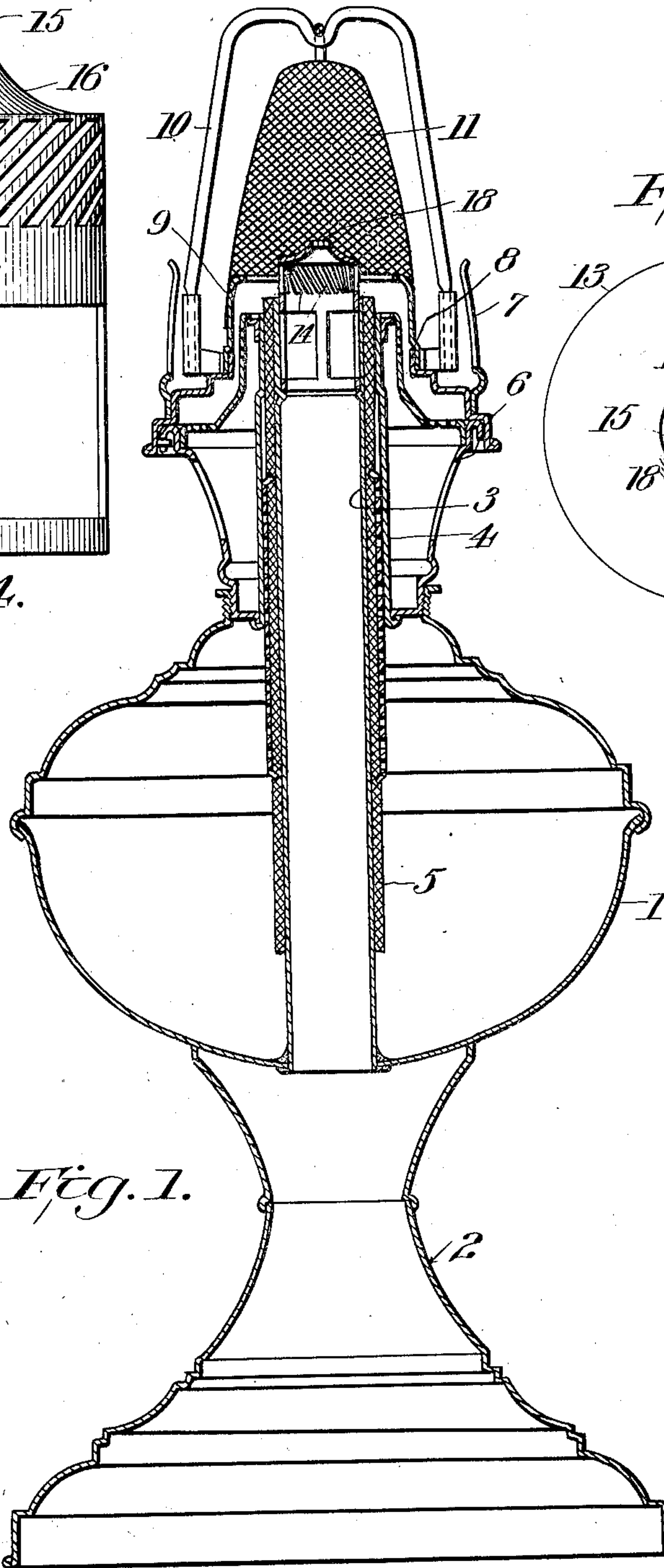
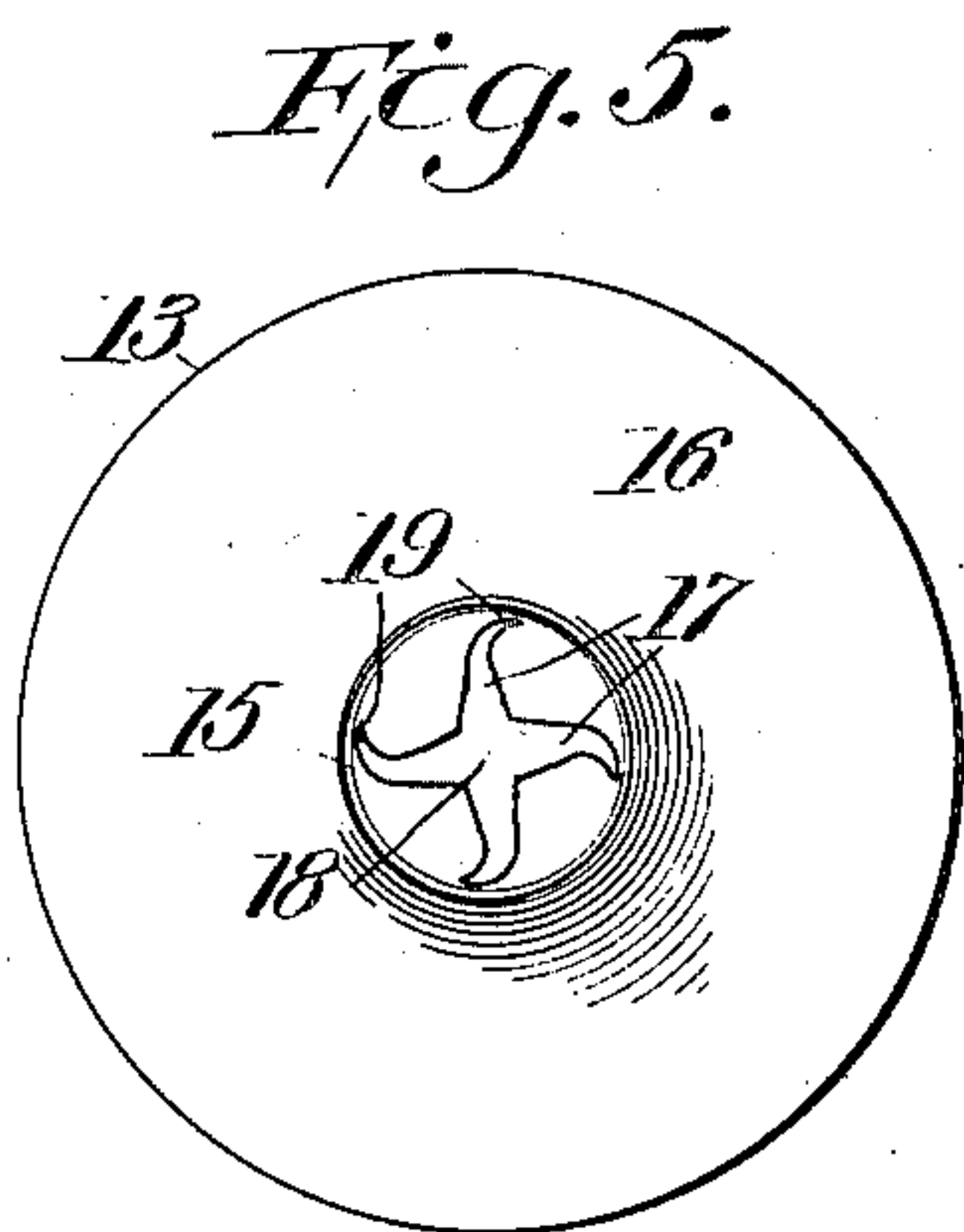
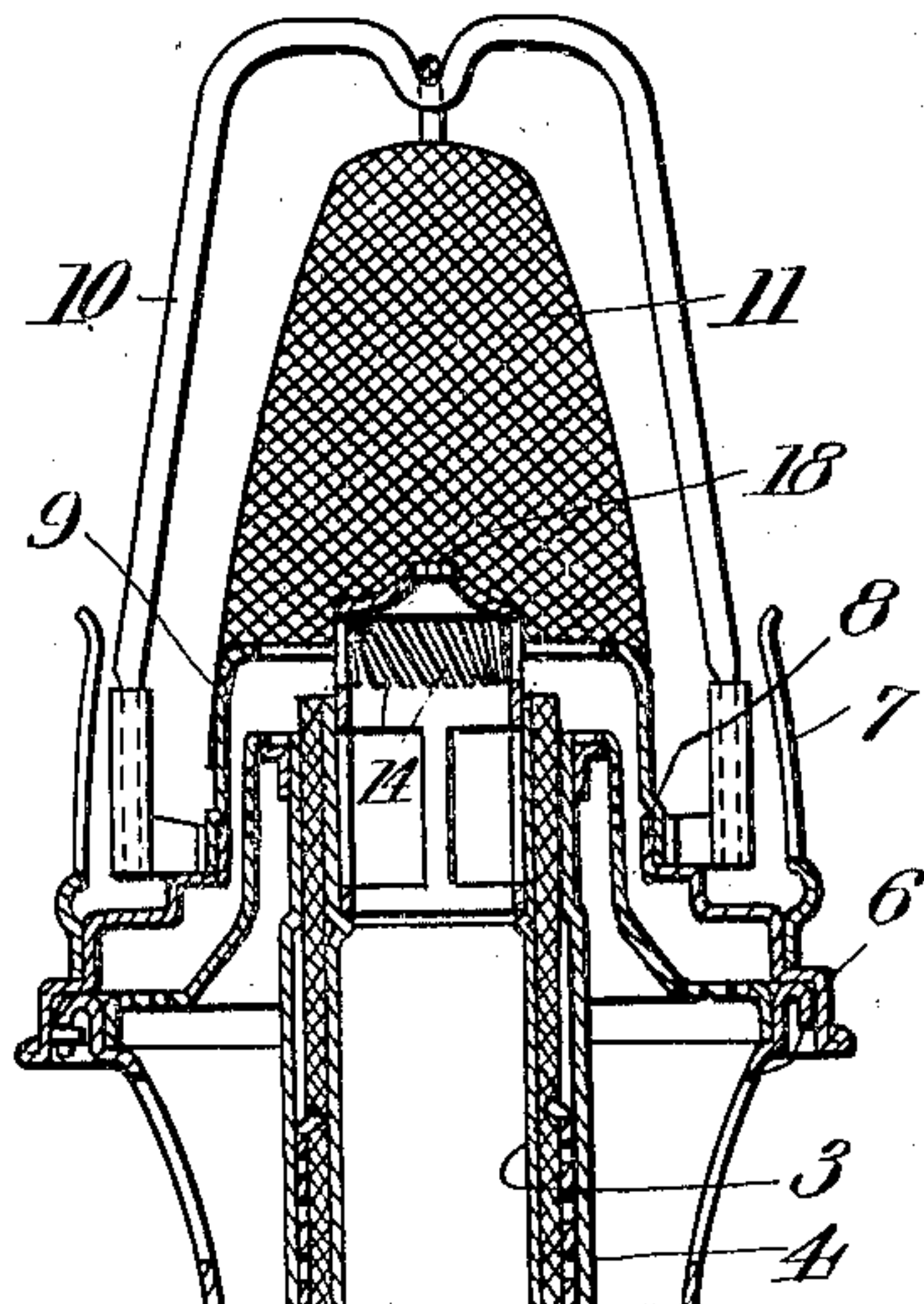


Fig. 1.

Witnesses

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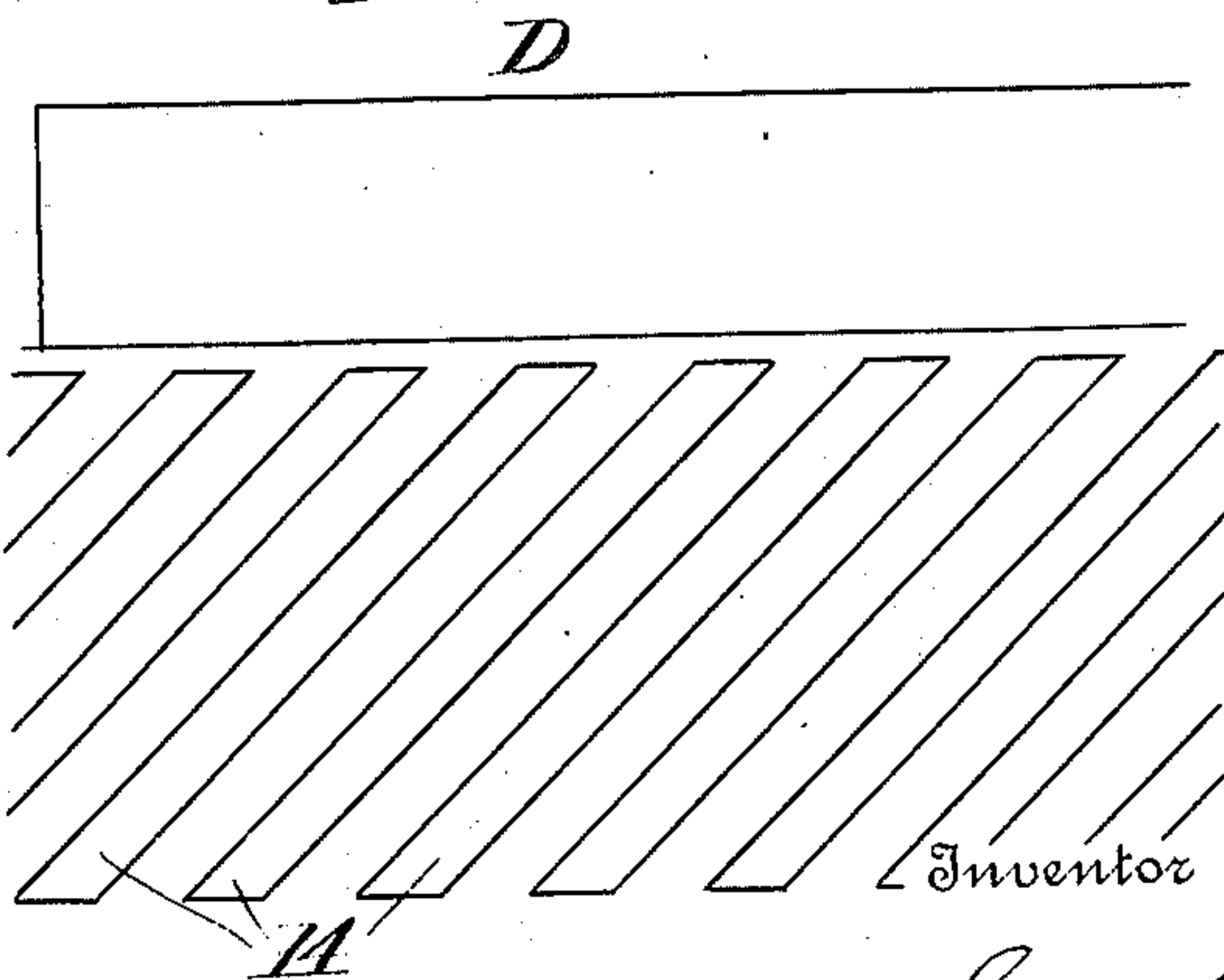
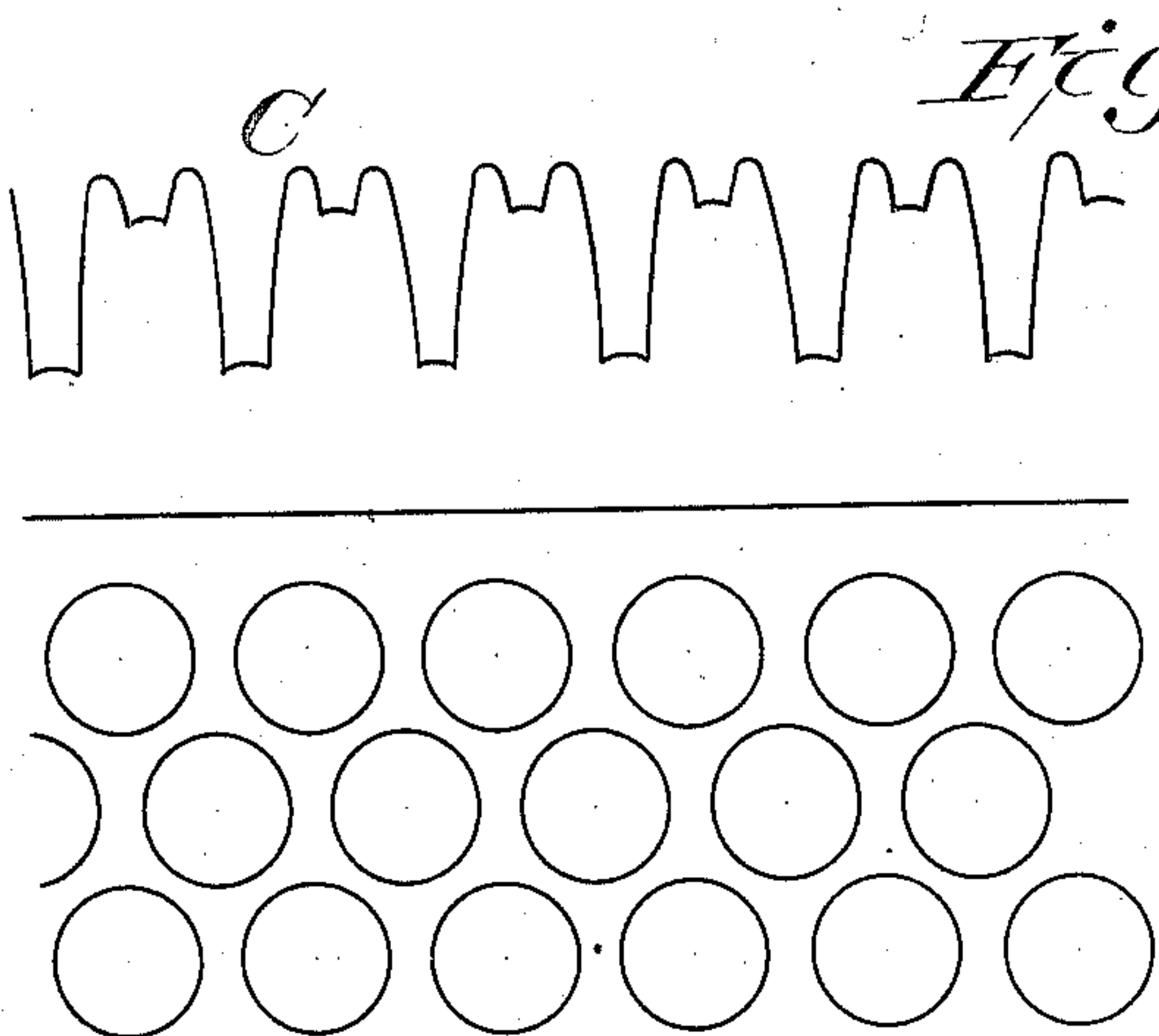
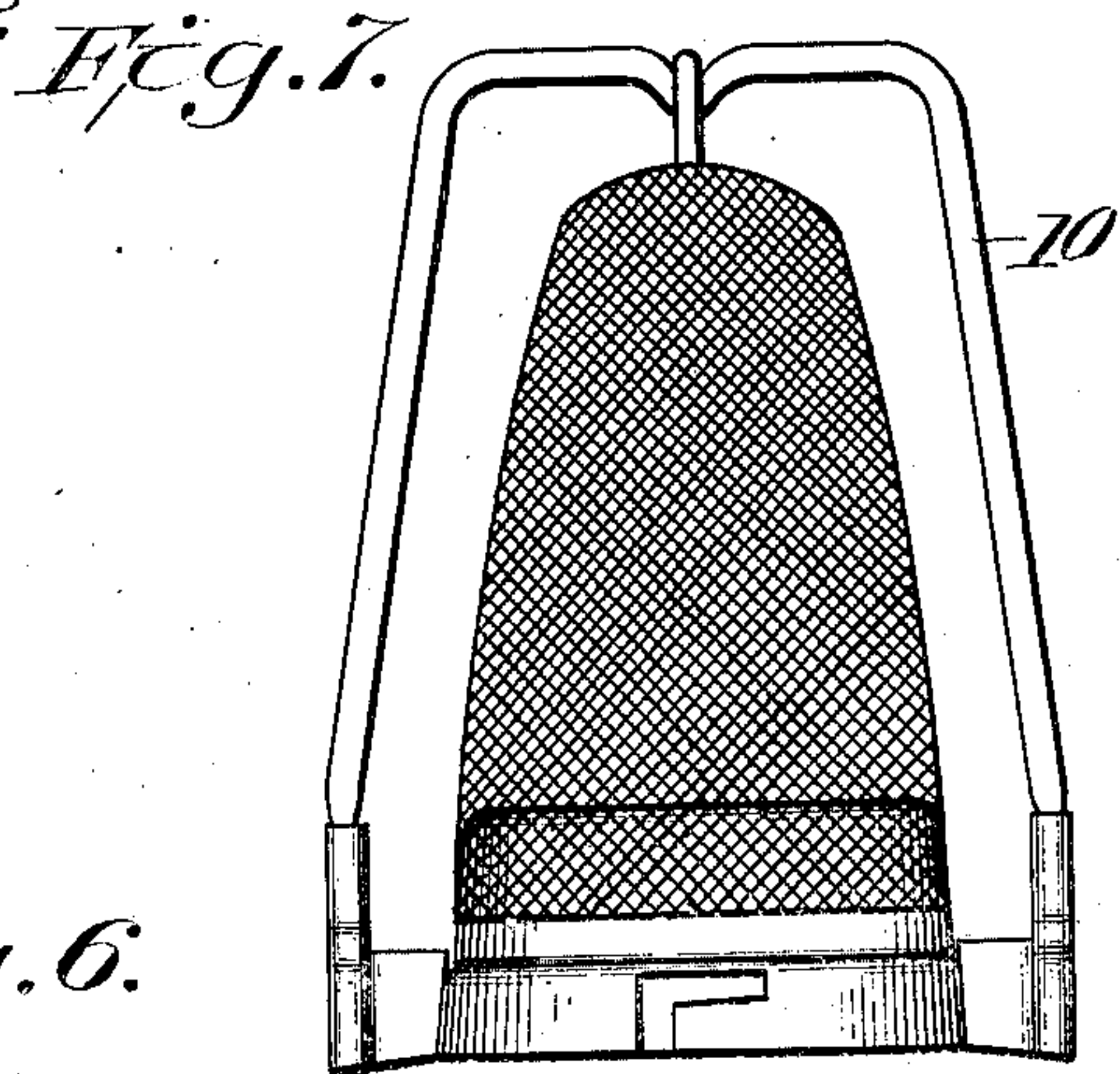
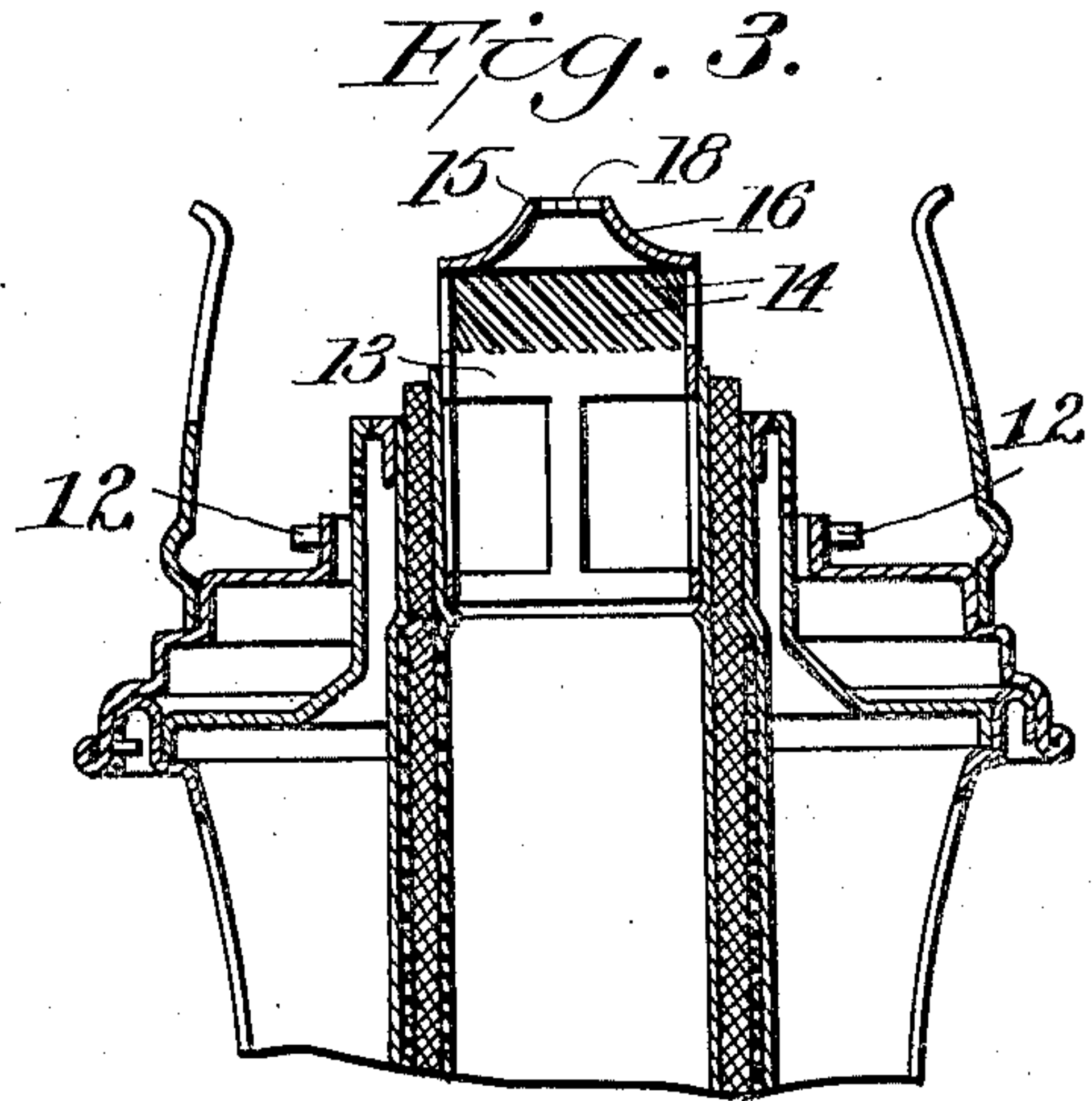
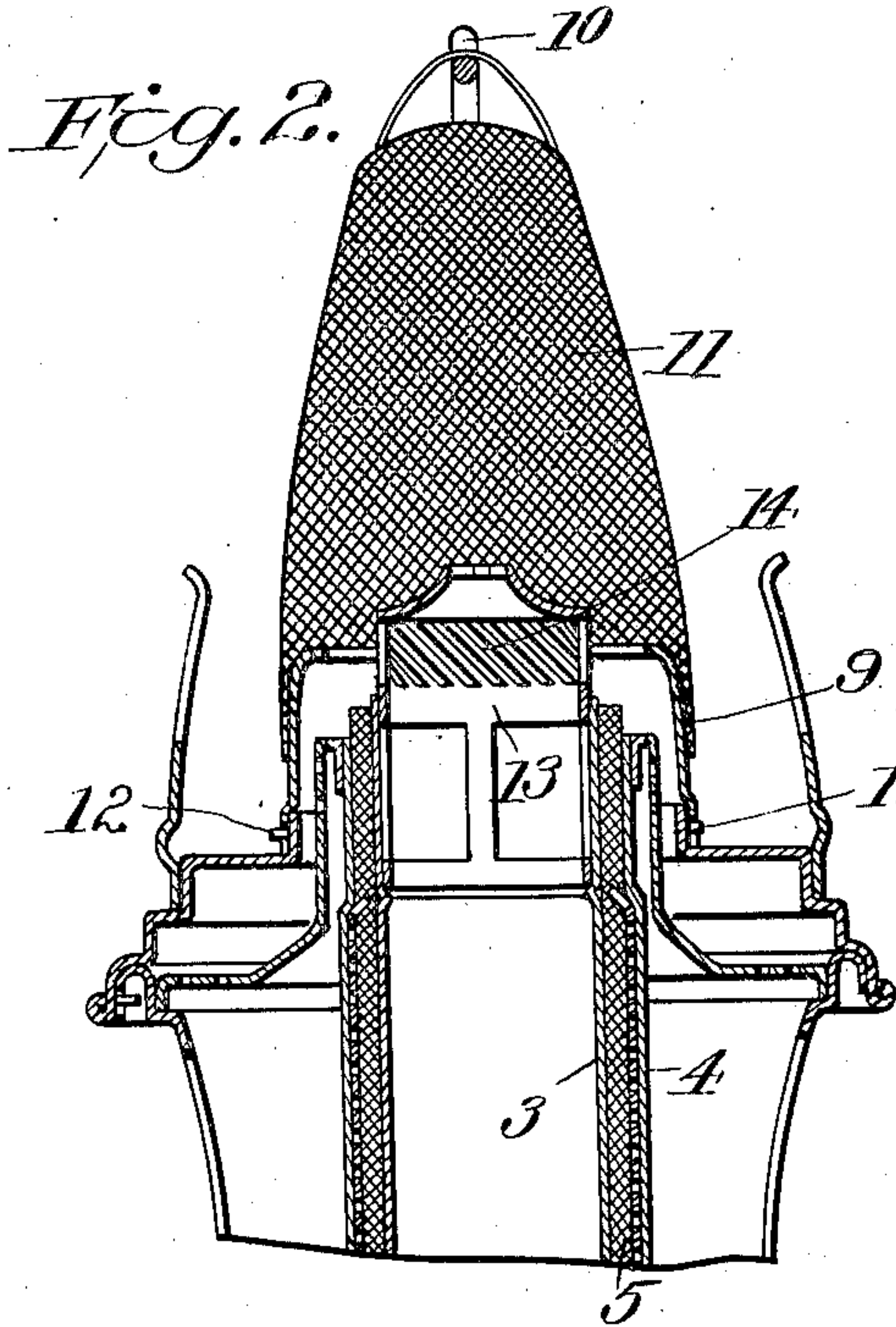
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

CHARLES HAZOR SMITH, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE MANTLE LAMP COMPANY OF AMERICA, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

BURNER FOR INCANDESCENT VAPOR GAS-LAMPS.

987,022.

Specification of Letters Patent.

Patented Mar. 14, 1911.

Application filed July 8, 1910. Serial No. 570,987.

To all whom it may concern:

Be it known that I, CHARLES HAZOR SMITH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Burners for Incandescent Vapor Gas-Lamps; 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.

My invention relates to burners for incandescent vapor gas lamps.

My burner is applicable to the ordinary Argand lamp which comprises essentially a bowl for holding the combustible fluid, a tubular wick, having an air inlet passage extending up through it, an air distributor or gasifier arranged at the upper end of said passage and above the wick, and a mixing cone or retort arranged around the outside of the upper end of the wick and having a separate air supply from the outside of the lamp, the opposing currents of air furnished by the interior passage and the cone being mixed with the pure carbon vapor from the flame in the upper portion of the cone and producing a proper mixture for giving the desired glow within the incandescent mantle supported above said cone. It has been found that the proper percentage for this mixture of air and carbon vapor is from six to eight per cent. of the vapor and from ninety-four to ninety-two per cent. of air.

I have discovered that in order to produce the best results, that is, obtain the highest candle power, it is necessary to not only maintain the proper mixture of vapor and air but also to provide for an even distribution of this mixture as nearly as possible throughout the full height or length of the mantle.

The object of the present invention is to obtain this result, namely form and maintain in the mantle a flame which extends substantially throughout the height thereof and effects a complete combustion of the gas so that there will be no smoke produced in the upper part of the mantle.

To this end, my invention consists particularly in the peculiar and novel construction of the air distributor or gasifier which will be hereinafter fully described.

The invention also consists in the combi-

nations of parts specified in the accompanying claims.

In the accompanying drawings: Figure 1 is a central vertical section of a lamp equipped with my improved air distributor and also provided with a novel construction of combined mantle cap and burner cone. Fig. 2 is a partial central section, on an enlarged scale, of the upper portion of the burner including the chimney gallery, the mixing cone, mantle, and air distributor. Fig. 3 is a similar view with the mixing cone and mantle removed. Fig. 4 is a detailed view of the air distributor in side elevation, on an enlarged scale. Fig. 5 is an end view of the air distributor on an enlarged scale. Fig. 6 is a diagrammatic view illustrating the difference in contour of the flame produced with one of the old forms of perforated air distributors as compared with that produced by my improved air distributor; and Fig. 7 is a detailed view of the combined mantle cap and burner cone.

The old form of air distributor or gasifier, now generally in use in this class of lamps, has a flat imperforate top and a plurality of rows of staggered perforations in its vertical wall. As illustrated in Fig. 6, there are usually three of these rows, the perforations A in the top and bottom rows being arranged in vertical alinement with one another, while the perforations B in the intermediate row are placed half way between the vertical planes of the perforations in the other rows which are adjacent thereto on either side. The consequence is that the flow of air rising from this form of distributor is irregular and produces the jagged flame, shown in this figure at C.

Instead of the staggered perforations in the vertical wall of the gasifier, I provide my device with parallel inclined slots, indicated at 14 in Fig. 6, which are arranged, preferably, at an angle of about forty-five degrees. This arrangement of slots emits a uniform volume of air at every vertical line around the distributor with the result that the flame D is perfectly regular and even, as illustrated in this figure. Not only do these oblique slots insure an even flow of the mixture of air and vapor but they also cause said mixture to swirl in the mixing chamber thereby effecting a more complete mixture, promoting combustion.

In addition to the slots in the vertical wall

of the air distributor, I provide an opening in the center of the top thereof through which secondary air is discharged, thereby supplying the oxygen necessary to maintain the flame in the extreme upper end of the mantle. I have found that when the old style of gasifier, having an imperforate top, is used, the flame will not extend very high because all the oxygen is soon consumed, the consequence being that the flame would only partially fill a mantle.

I provide the central opening in the top of my gasifier with radial, preferably curved, extensions or slots which are tapered, or become narrower, as they extend outwardly from the central openings. The extremity of each of these slots is preferably pointed. The curvature of the slots is in the direction of the incline of the slots in the vertical wall of the gasifier. Consequently, the air discharged through said opening in the top will swirl in the same direction as that which is emitted from the slots in the side, whereby a thorough combustion is effected in the upper, as well as the lower, portion of the mantle. The object in tapering the radial slots, which extend from the central opening in the top of the gasifier, is to limit the discharge of air from the extremities of said slot, which are, of course, located nearer the vertical annular wall of the gasifier, to thin streams, the main volume of air being discharged near the center of the top where it will mount higher in the mantle before it will come in contact with the burning gas rising from the mixing chamber of the cone. For the same reason, the central portion of the top of the gasifier, in which said opening and tributary slots are formed, is raised above the plane of the rim thereof. The top of the gasifier is preferably formed into the general shape of a truncated cone, but the sides of the cone are made concave for the purpose of forming a vacuum between the rim at the base and the rim of the raised portion. A vacuum is caused here by the complete consumption of the oxygen in the gas which is formed in the mixing chamber of the cone, by the flame in the lower part of the mantle. The result of this vacuum is a more perfect combustion of the gas at this point by reason of said gas being drawn inwardly and downwardly toward the center and thereby thoroughly mixed.

Referring more particularly to the drawings, 1 designates the bowl or receptacle for the liquid fuel, 2 the pedestal on which said bowl is mounted, 3 and 4 the inner and outer wick tubes, and 5 the tubular wick. Any suitable or common form of perforated burner body 6 may be employed having a detachable gallery 7. The latter has a short vertical flange 8 arranged concentrically within the same and spaced away from the upper end of the outer wick tube. On said

flange 8 is removably mounted my combined mantle cap and burner cone 9 which has permanently secured thereto a looped mantle support 10 on which the mantle 11 is confined. The combined mantle cap and burner cone is preferably secured rigidly in place on the flange 7 by means of pins or projections 12 extending from the latter into engagement with angular slots opening on the lower edge of said cap.

The oblique slots, in the vertical annular wall of the air distributor or gasifier 13, are designated 14, the raised central portion of the top of said gasifier as 15, and the concave sides of the truncated cone-shaped top thereof as 16. The curved tributary slots of the central opening 17, in the part 15, are indicated at 18, and the tapered pointed extremity of said slots at 19, in Fig. 5.

I claim:

1. An air distributor and gasifier for incandescent vapor gas lamps having an opening in its top and curved tributary slots extending radially from said opening.
2. An air distributor and gasifier for incandescent vapor gas lamps having an opening in its top and curved tributary slots extending radially from said opening, said tributary slots being tapered outwardly.
3. An air distributor and gasifier for incandescent vapor gas lamps having a vertical annular wall, provided with oblique slots, and a top, the outer edge of said top terminating at the upper edge of said vertical annular wall and within the periphery of the same.
4. An air distributor and gasifier for incandescent vapor gas lamps having oblique slots in its vertical annular wall, a central opening in its top, and tributary slots radiating from said opening.
5. An air distributor and gasifier for incandescent vapor gas lamps having oblique slots in its vertical annular wall, a central opening in its top, and curved tributary slots radiating from said opening.
6. An air distributor and gasifier for incandescent vapor gas lamps having oblique slots in its vertical annular wall, a central opening in its top, and curved tributary slots radiating from said opening and extending in the same direction as said oblique slots in said annular wall.
7. An air distributor and gasifier for incandescent vapor gas lamps having oblique slots in its vertical annular wall, an opening in its top and tributary slots radiating from said opening, said tributary slots being tapered outwardly.
8. An air distributor and gasifier for incandescent vapor gas lamps having oblique slots in its vertical annular wall, a central opening in its top, and curved tributary slots radiating from said opening and extending in the same direction as said oblique

slots in said annular wall, said tributary slots being tapered outwardly for the purpose specified.

5 9. An air distributor and gasifier for incandescent vapor lamps having its top formed into the general shape of a truncated cone, openings in the vertical annular wall thereof, an opening in the raised central portion of the top, and tributary slots radiating from said opening in the top, the sides
10 of said truncated cone being imperforate for the purpose specified.

10. An air distributor and gasifier for incandescent vapor gas lamps having its top

formed into the general shape of a truncated cone, oblique slots in the vertical annular wall thereof, an opening in the raised central portion of the top, and curved tributary slots radiating from said opening and extending in the direction of said slots in the annular wall, all for the purposes specified.

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

CHARLES HAZOR SMITH.

Witnesses:

A. M. PARKINS,

GEO. A. HUTCHINSON.