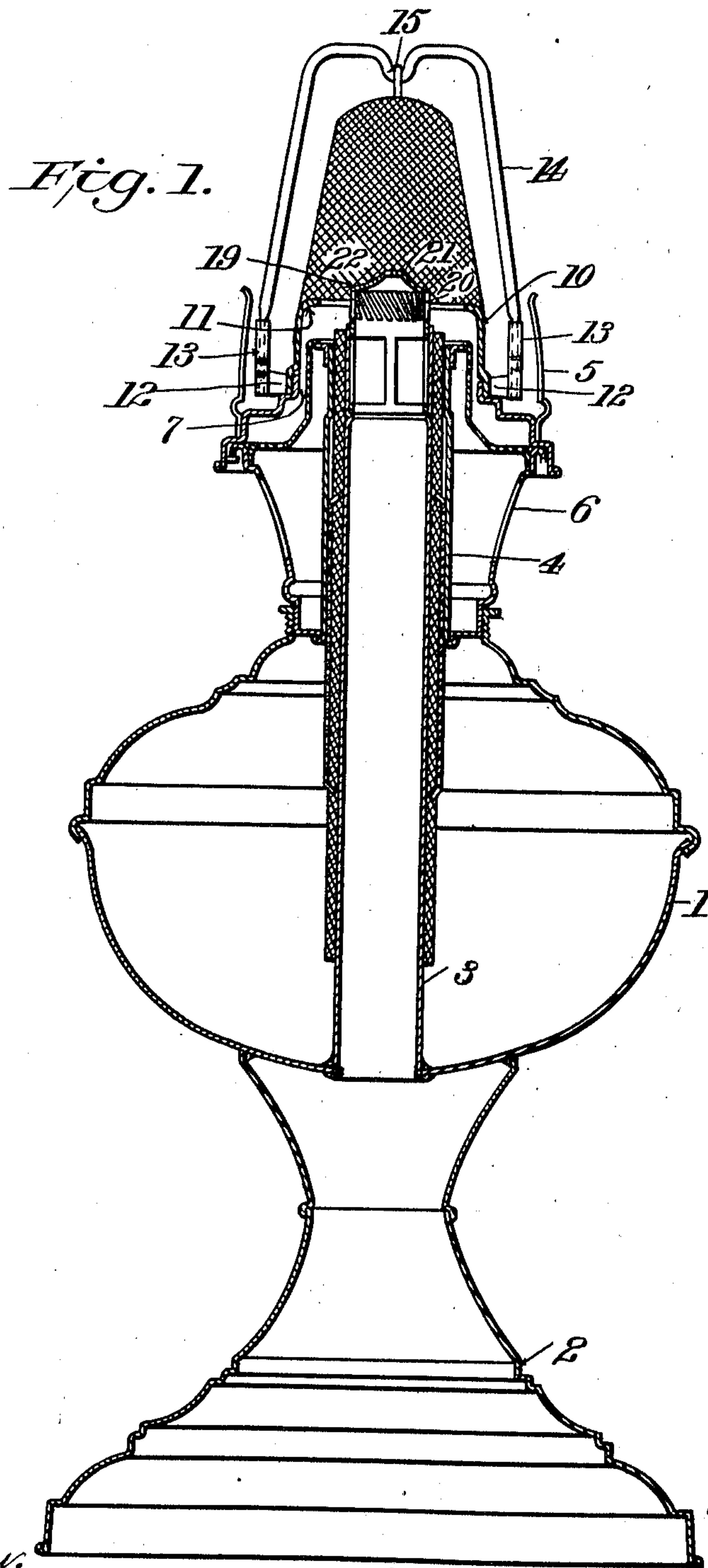


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 COMBINED MANTLE CAP AND BURNER CONE FOR INCANDESCENT VAPOR GAS LAMPS.
 APPLICATION FILED JULY 8, 1910.

988,902.

Patented Apr. 4, 1911.

2 SHEETS—SHEET 1.



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34

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Fig. 1.

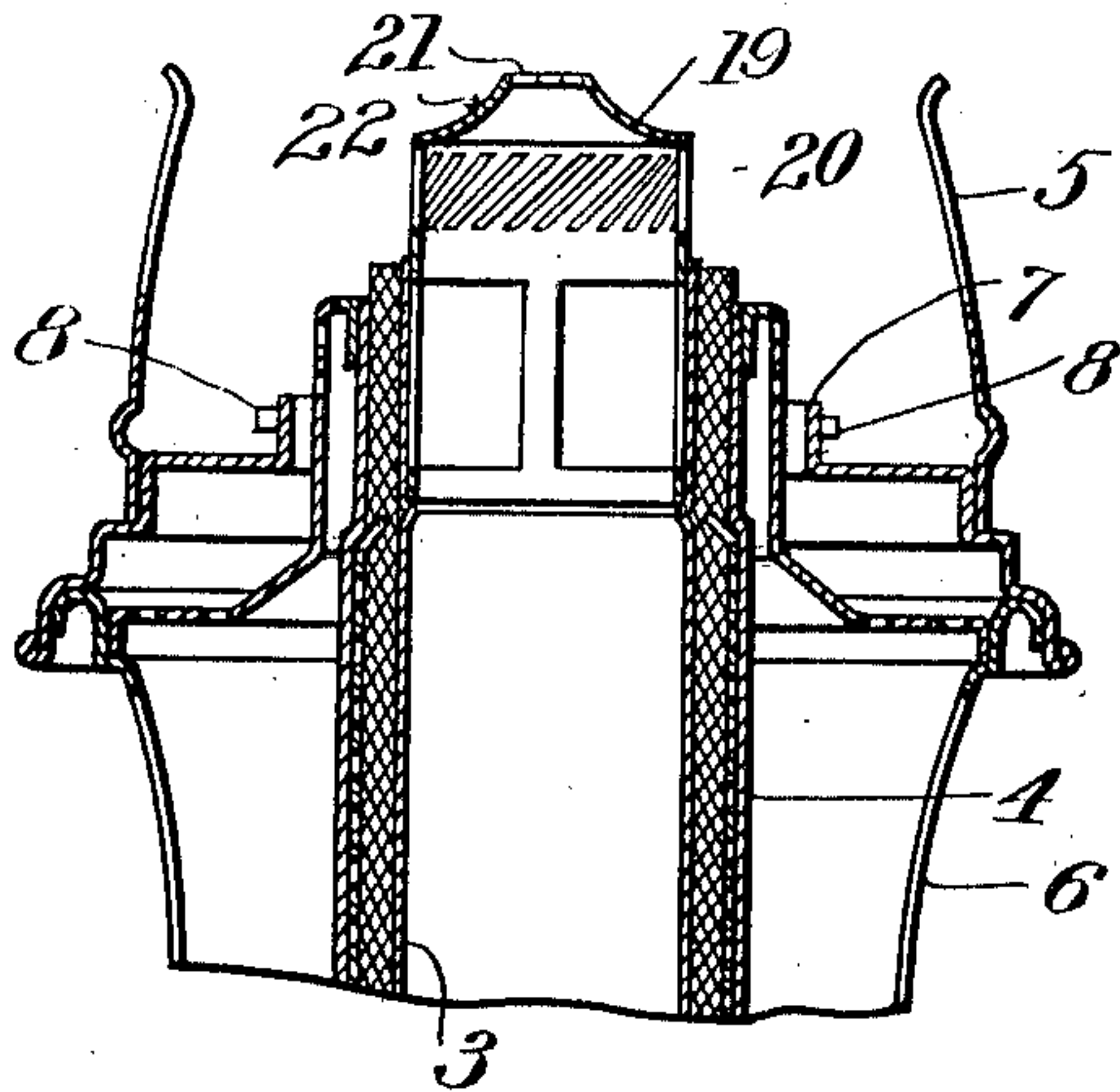


Fig. 4.

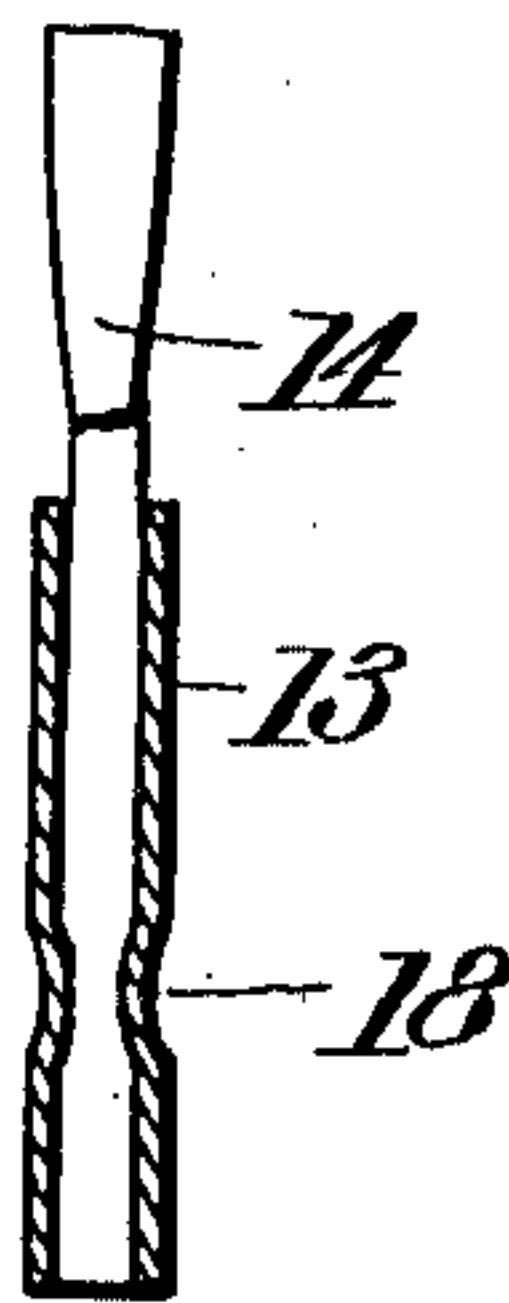


Fig. 3.

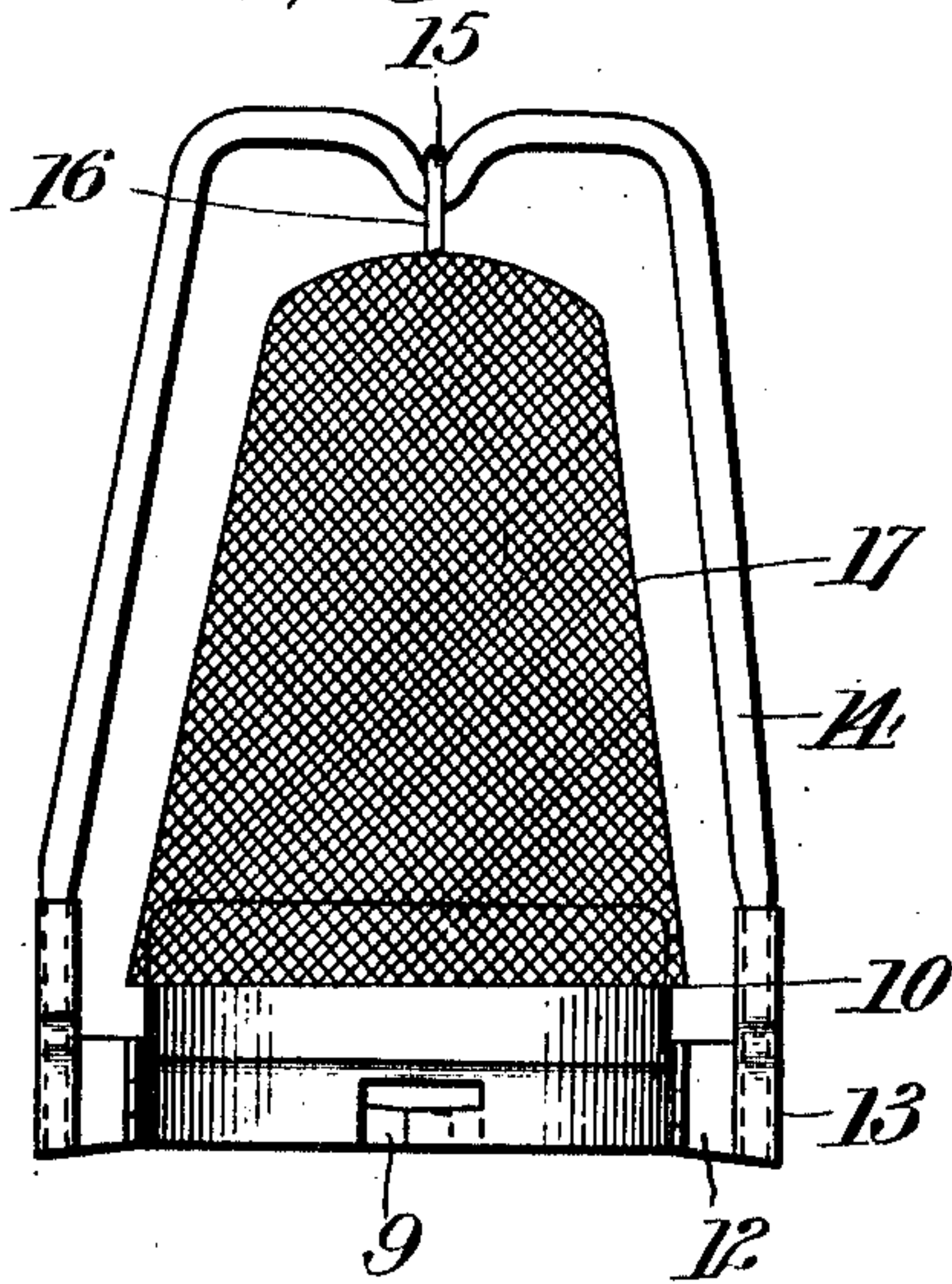
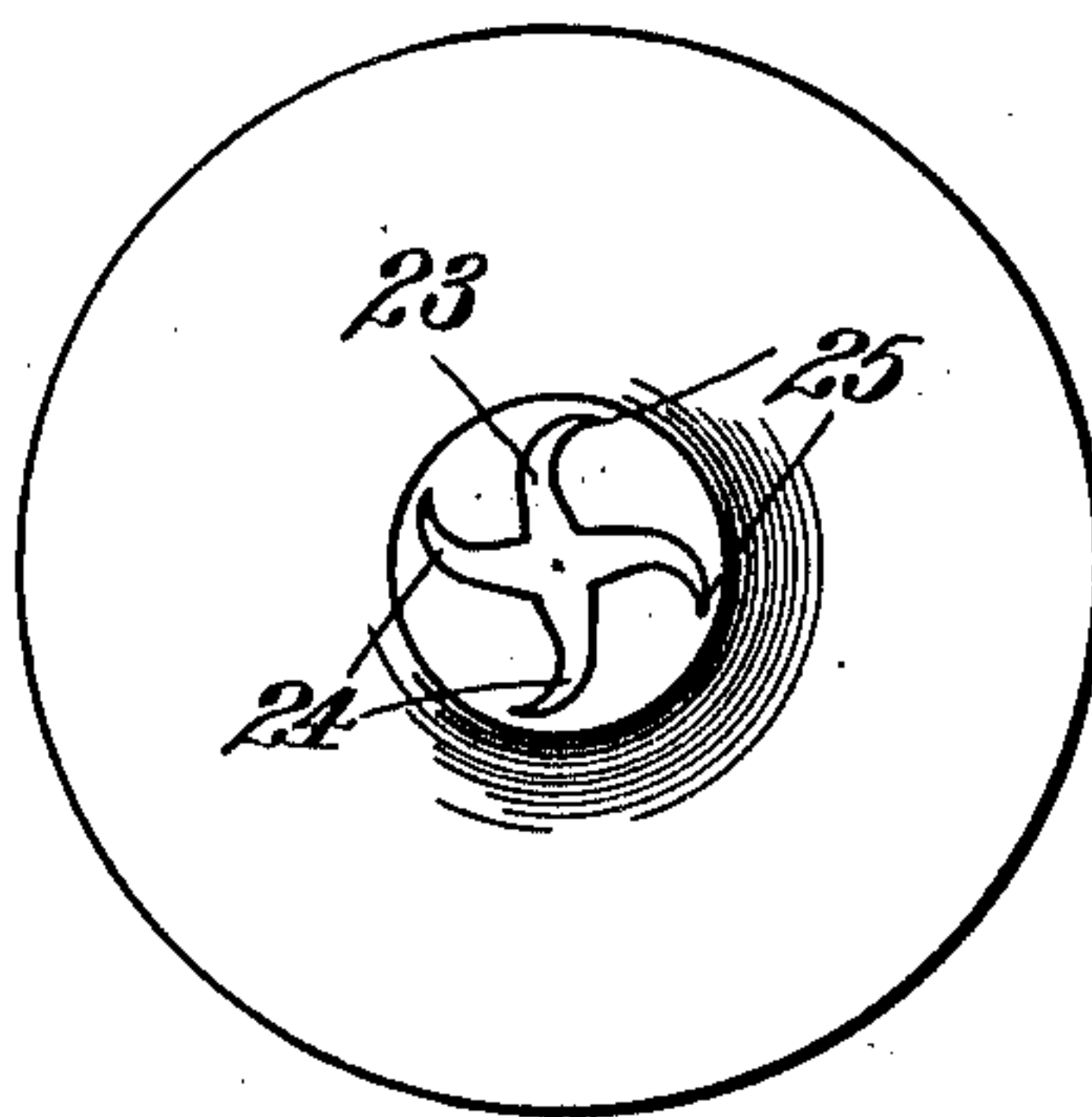


Fig. 5.



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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.

COMBINED MANTLE-CAP AND BURNER-CONE FOR INCANDESCENT VAPOR GAS-LAMPS.

988,902.

Specification of Letters Patent.

Patented Apr. 4, 1911.

Application filed July 8, 1910. Serial No. 570,986.

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 Combined Mantle-Caps and Burner-Cones 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 a combined mantle cap and burner cone for incandescent vapor gas lamps of the blue flame wick type.

My improved mantle cap is especially adapted for use on the Argand type of lamp which employs a tubular wick and has a central air passage extending up through the wick. The incandescent lamp of this type, as now constructed, also comprises a perforated body supporting a chimney gallery having a burner cone made as an integral part thereof. Said burner cone is spaced away from the outside of the wick, and air is fed up through it from the perforated body. A perforated air distributor or gasifier is arranged in the upper end of the passage extending through the wick. The pure carbon vapor, which is given off by the wick, is mixed with the opposing currents of air issuing from the gasifier and rising through the cone to form the proper mixture to give the desired blue flame which produces the heat necessary to make the glow in the mantle. The proper mixture is from six to eight per cent. of the pure carbon vapor with from ninety-four to ninety-two per cent. of air. The mixing is promoted, of course, by the draft created by the chimney, but this mixing takes place within the very small space, or annular chamber, in the upper portion of the cone and extending from the horizontal plane of the top of the wick to the inwardly turned flange at the upper edge of said cone. As the mixing of the vapor and air, essential to maintaining the proper combustion, is confined to this limited space at the top, by the flange on the cone, the importance of the cone, especially the upper portion and flange thereof, will be immediately appreciated. In the first place, it may be noted that the cone embodies the principal air adjustments and is the principal wearing part of the

small individual gas-making machine with which each lamp is provided. Consequently, the cone needs to be renewed more frequently than any other part of the burner. The essential uniform shape of the flange on the cone may be changed sooner or later, and from one cause or another. This may be due to a knock, or a defect in material, etc., in the course of manufacture, but is more frequently the result of the intense heat to which it is subjected. As the flame should be parallel to the mantle, and as near thereto as possible without actually touching it, which often destroys a mantle, the importance of having a flange of proper form in order to secure the greatest illuminating power to the mantle and to preserve the same will be fully appreciated.

When the flange on the permanent cone, of a lamp of a construction heretofore used, is warped by the heat or its shape is changed from any mechanical cause, such as an accidental knock in filling the lamp, adjusting a new mantle thereto, or in any other way, the whole lamp immediately becomes defective and will not give a satisfactory light, irrespective of whether an old or new mantle is used thereon. The reason for this is that as soon as any portion of the flange of the cone is raised above or lowered below its proper and normal position, it will cause the flame to shoot out against the side of the mantle instead of maintaining said flame in parallel position thereto. It will be understood that the adjustment of the flange of the cone partially governs the form of the flame by the counter-balancing of the air currents which radiate from the distributor and which flow up through the cone. The air coming from the cone must have sufficient force to throw the flame out near to the surface of the mantle, but the adjustment must be such that the flame will not shoot out too far and thereby come in contact with the mantle, in which event the mantle is usually destroyed. A defective cone may destroy several mantles in succession without producing good light and without the user knowing the cause thereof.

It is the usual practice at present to make the cone in one piece with the chimney gallery, the raising of the cone being obtained by suitable dies which also form the horizontal portion and downwardly extending flange on the outer edge of the gallery.

Thin metal is generally used for making the gallery and cone, not only because it is easier to work and is cheaper, but also because thick metal carries more inductive heat down into the lamp, whereas it is essential that this heat be reduced to a minimum. For these reasons, thin metal, which is generally employed, is often incapable of withstanding the wear and heat to which the cone is necessarily subjected; hence, the flange of the cone may soon get out of shape, with the fatal results hereinbefore explained. This accounts for the major part of the troubles experienced by users of this style of lamp.

Another important consideration in the use of a burner having a permanent mixing cone is that it requires a separate cap for the mantle which means an extra thickness of metal around the cone and necessarily increases the inductive heat imparted to the lamp. When my invention is used, this extra thickness of metal is eliminated and the heat reduced by reason of my combining the mantle cap and burner cone in one and the same piece.

It is the object of my invention to provide for renewing the cone of the burner each time a new mantle is required. By so doing, I get rid of the probable cause of the destruction of the old mantle, which is generally unknown to the user, when said old mantle is discarded, and begin the use of a new mantle with a true cone fresh from the dies.

Another object is to provide for the proper mounting and adjustment of each mantle with respect to the burner cone without leaving this adjustment to be made by the user. It should be understood that there is a wide difference in the shapes of mantles, even when they are made to the same pattern. In other words, any two given mantles of the same size may differ materially as to their vertical axes or median lines. In making my combined mantle caps and burner cones, the support for each mantle is permanently adjusted by a skilled workman to exactly conform to its cone before the combined mantle, mantle support and cone leaves the factory. The consumer, when he purchases one of my mantles which is confined on one of my combined mantle caps and burner cones, not only renews the most vital part of the burner, namely the cone, but also secures a mantle which is already accurately adjusted to proper relative position with respect to the burner and chimney. It is also a fact that the altitude of the place where the lamp is used affects the mixture of air and vapor by causing a greater or smaller proportion of air to be mixed with the vapor. In order to meet these conditions, I propose to vary the diameter and height of the cone of my combined mantle cap and burner cone,

which constitutes the retort or mixing chamber as well as the air adjustments. With my invention, which provides a new mixing cone with every mantle, I can easily make the cones to suit each locality in which the mantles are to be used, by either expanding or contracting the upper portion of the cone laterally and vertically. The importance of this will be at once appreciated by those familiar with the use of these lamps.

My invention consists in the novel combination of a mantle cap and burner cone for the type of lamp described. By mantle cap, I mean a support for a mantle to which the latter is confined so that the substitution of a new mantle necessitates the use of a new support or cap. When my invention is used, the substitution of a new burner cone is also furnished with each new mantle, but without any additional expense above the cost of the ordinary mounted mantle now in use.

The invention also consists of the features of construction and combinations of parts hereinafter described and specified in the claims.

In the accompanying drawings: Figure 1 is a central vertical section of a lamp equipped with one of my combined mantle caps and burner cones. Fig. 2 is an enlarged central vertical section of the upper portion of the burner, with the combined mantle cap and burner cone removed. Fig. 3 is an enlarged detailed view of the combined mantle cap and burner cone. Fig. 4 is an enlarged vertical sectional view of one of the ears on the cone, showing how the ends of the mantle supporting wire or bail are secured to the ears after said bail has been properly adjusted, and Fig. 5 is a top plan view of the gasifier or air distributor on an enlarged scale.

Referring more particularly to the drawings, 1 designates the liquid fuel-holding bowl or reservoir which is supported on a pedestal 2. The inner wick tube, 3, extends down through the reservoir, as usual, and the outer wick tube, 4, is arranged concentrically of the inner tube and terminates a little below the top of the latter. The chimney balcony, 5, is supported on the perforated body, 6, and, instead of the ordinary burner cone, is provided with a vertical annular flange, 7, spaced away from the outer wick tube and terminating below the upper end thereof. Said flange is, preferably, provided with projecting pins, 8, which engage angular slots, 9, opening on the lower edge of the cone, 10, of the combined mantle cap and burner cone. It will be understood, however, that any other suitable fastening means may be employed for securing the cone to the flange 7. Said cone, 10, is preferably made of brass and formed by dies which make its inwardly turned flange, 11, perfectly true. To diametrically opposite faces of the cone,

there are secured projecting ears, 12, each having an upright tubular portion, 13, into which the extremities of the looped wire mantle support, 14, are fitted. Said mantle support has a notch, 15, in the center of its upper horizontal portion to retain the suspension loop, 16, of the mantle, 17. It will be observed that the mantle is confined to the support when the latter is secured to the cone, so that the whole device, including the cone, is in reality the mantle mounting or cap.

When a mantle is mounted on the wire support at the factory, and the extremities of said support are inserted in the tubular portions, 13, the side portions of the support or bail are adjusted vertically until the mantle is properly centered over the cone. When the proper adjustment of the mantle is secured, the extremities of the bail are rigidly clamped in place by depressing a portion of each of the tubes, 13, into each of said extremities, as illustrated at 18 in Fig. 4. Any other suitable means for permanently attaching the extremities of the bail to the cone after said cone and bail, the latter having the mantle hung thereon, have been properly adjusted, may, however, be employed instead of the means I have just described.

While any suitable construction of gasifier, or air distributor, may be used in connection with my combined mantle cap and burner cone, I prefer to use the one illustrated in the accompanying drawings. This air distributor, 19, has a series of parallel oblique slots, 20, in its vertical annular wall. Said slots are preferably arranged at an angle of about forty-five degrees. They impart a swirling motion to the air discharged through them which promotes the mixture thereof with the gas. The central portion, 21, of the top of the gasifier is raised so that the top, as a whole, assumes the general form of a truncated cone. The sides of the cone, however, are concave, as at 22, to produce a vacuum above the oblique slots, 20, which draws the gas inwardly and downwardly toward the center thereby aiding combustion and tending to make the flame mount higher in the mantle. The raised portion, 21, is provided with an auxiliary or secondary air inlet opening, 23, which furnishes air to the burning gas above the vacuum formed around the concave portion of the top of the gasifier. Said opening, 23, has radial slots, 24, which extend in the same direction as the slots, 20, and, therefore, contribute to the swirling motion of the gas. Said slots, 24, are preferably ta-

pered, their extremities being pointed, as at 25, in order to gradually limit the volume of air emitted by said slots as they extend farther away from the central opening 23. The purpose of this construction is to shoot the air, from said secondary opening and its tributary slots, as far up into the mantle, as possible, whereby oxygen is furnished to the burning gases in the upper end of the mantle to effect complete combustion.

I claim:

1. As an article of manufacture, a combined mantle cap and burner cone, for incandescent vapor gas lamps of the blue flame wick type, comprising a mixing cone, a looped wire mantle support having its extremities permanently secured to said cone, and a mantle permanently secured on said support.

2. As an article of manufacture, a combined mantle cap and burner cone, for incandescent vapor gas lamps of the blue flame type, comprising a mixing cone, a looped wire mantle support having its extremities permanently secured to said cone, a mantle permanently secured on said support, and means for locking the cone upon a burner.

3. The combination, with the body of an incandescent vapor gas burner and a tubular wick, of a chimney gallery supported thereon, an air distributor and gasifier arranged within the upper end of the wick and having slots in its vertical annular wall, and a combined mantle cap and mixing cone detachably mounted on the chimney gallery, the upper edge of said cone being arranged in a horizontal plane which cuts the slots in said air distributor intermediately of their extremities.

4. The combination, with the body of an incandescent vapor gas burner and a tubular wick, of a chimney gallery supported thereon and having a vertical annular flange arranged concentrically thereof and spaced away from the wick, an air distributor and gasifier arranged within the upper end of the wick and having slots in its vertical annular wall, and a combined mantle cap and mixing cone detachably secured to said flange, the upper edge of said cone being arranged in a horizontal plane which cuts the slots in said air distributor intermediately of their extremities.

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

CHARLES HAZOR SMITH.

Witnesses:

A. M. PARKINS,

GEO. A. HUTCHINSON.