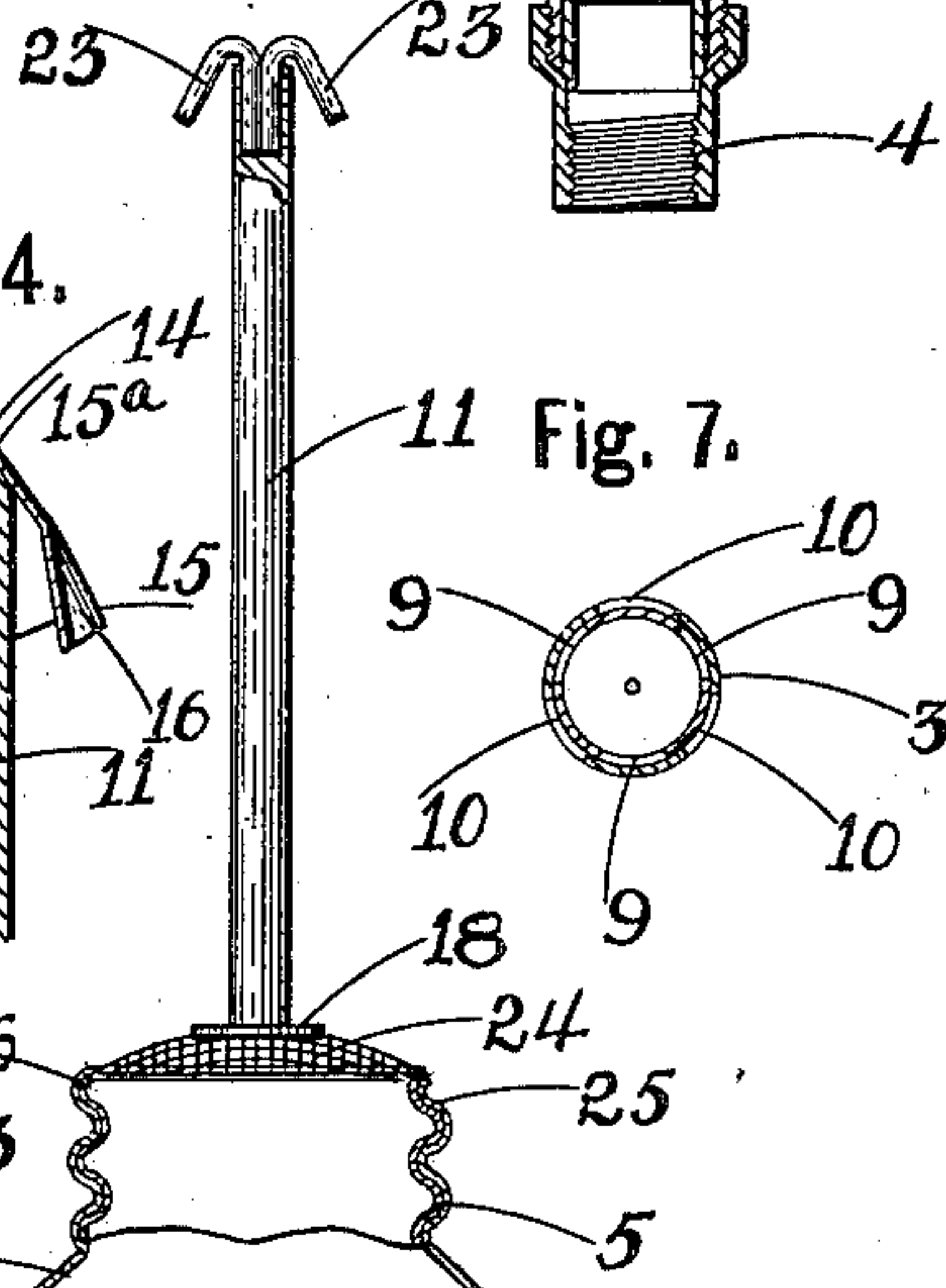
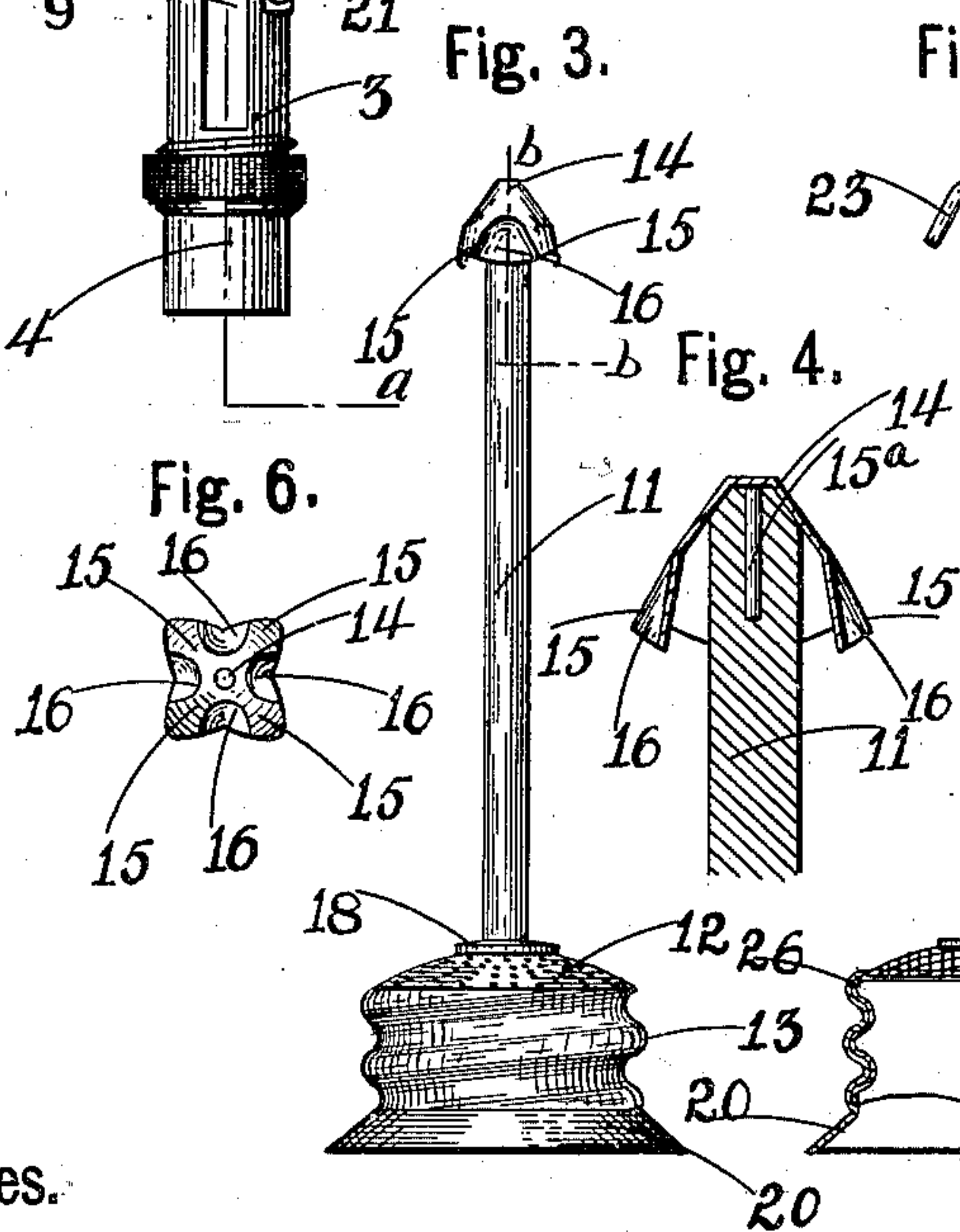
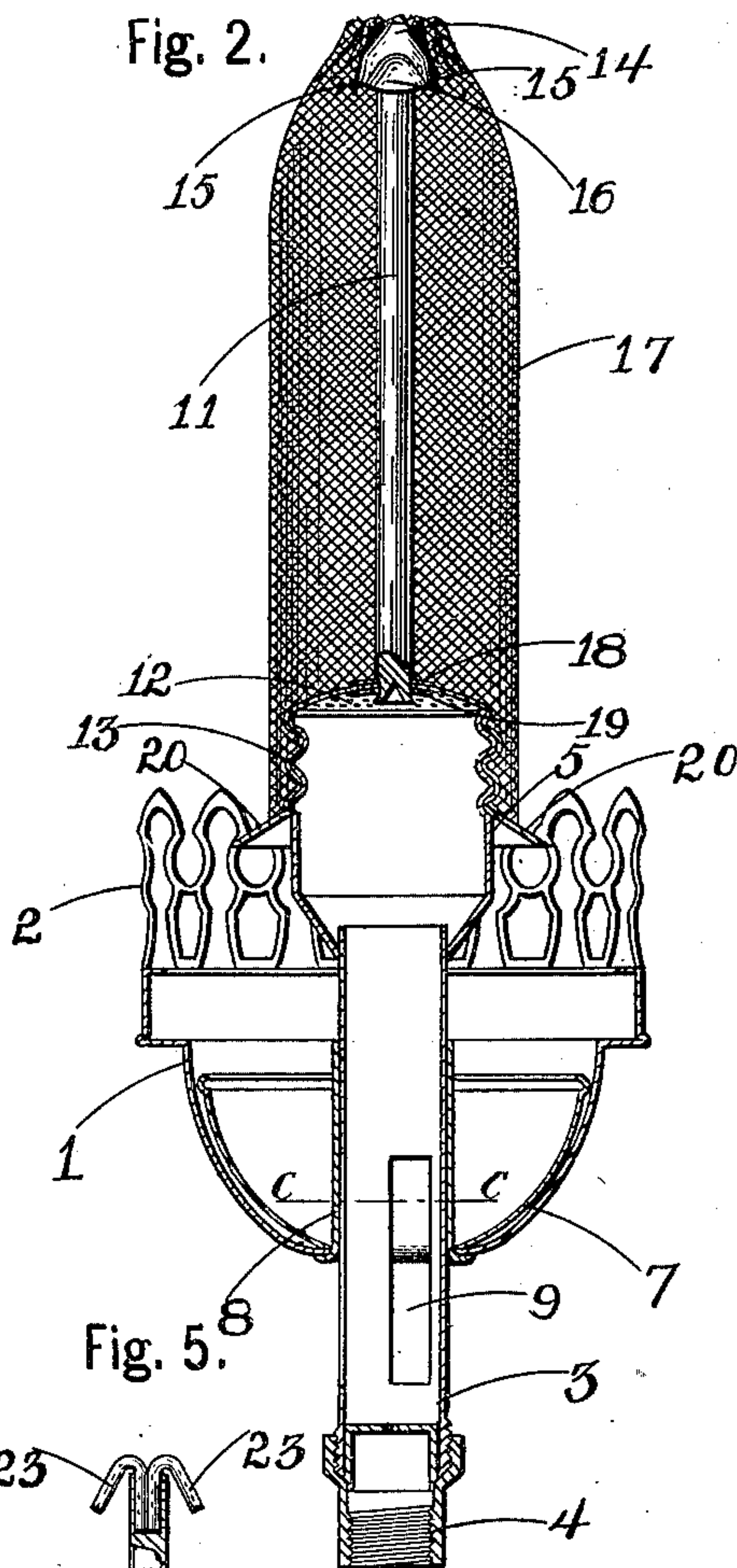
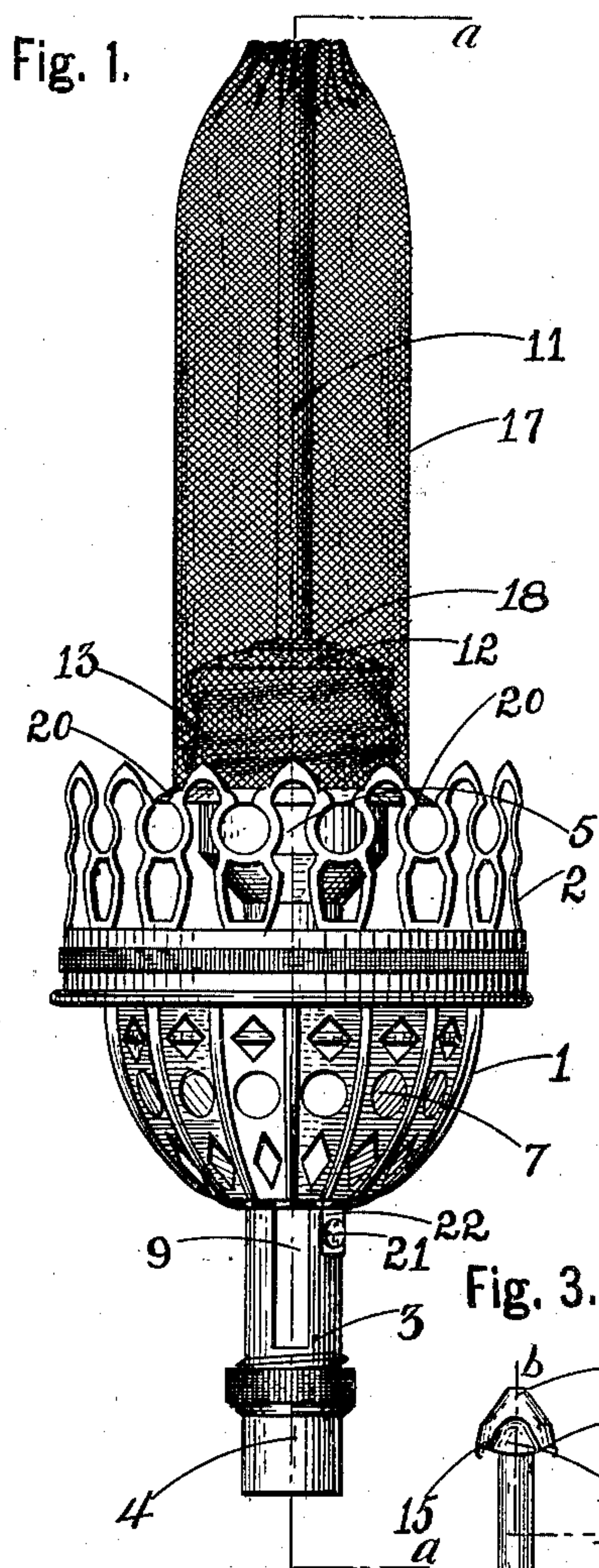


**C. H. FRYE.**  
**GAS BURNER.**

(Application filed Nov. 11, 1899.)

(No Model.)



**Witnesses.**

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# UNITED STATES PATENT OFFICE.

CHARLES H. FRYE, OF BUFFALO, NEW YORK, ASSIGNOR TO HIMSELF  
AND ARTHUR E. JEWELL, OF SAME PLACE.

## GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 663,831, dated December 11, 1900.

Application filed November 11, 1899. Serial No. 736,605. (No model.)

*To all whom it may concern:*

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

My invention relates to an improved illuminating-gas burner; and the object of the invention is to provide a cheap, simple, and easily-operated device of that character. The invention also relates to a novel form of central mantle-support, which is detachably secured to the burner.

For a full understanding of the merits and advantages of the invention reference is to be had to the accompanying drawings and the following description.

The invention is susceptible to various changes in the form, proportion, and minor details of construction without departing from the principle or sacrificing any of the advantages thereof, and to a full disclosure of the invention an adaptation thereof is shown in the accompanying drawings, in which—

Figure 1 is a side elevation of my improved burner. Fig. 2 is a section on or about line *a a*, Fig. 1. Fig. 3 is a detached side elevation of my preferred adaptation of mantle-support. Fig. 4 is an enlarged fragmentary section of the mantle-support on line *b b*, Fig. 3. Fig. 5 is a modification, partly in section, of the mantle-support. Fig. 6 is a detached top view of one of the top caps. Fig. 7 is a section on or about line *c c*, Fig. 2.

In referring to the drawings in detail like numerals designate like parts.

The burner-body is formed of the usual exterior perforated frame 1, having the top portion 2 formed to receive a chimney and its bottom provided with a vertical central opening, through which the tube 3, connected to the gas-supply pipe by the connecting-screw tube 4, is passed. To the upper end of the tube 3 is rigidly attached an enlarged tubular shell 5, forming an air and gas mixing chamber 6, and the exterior of the upper portion of the shell is screw-threaded. A cup 7, having a central aperture, through which the tube 3 passes, is arranged within the outer perforated frame, and a tube 8, of slightly

larger circumference than the tube 3, extends vertically upward from the bottom of the frame 1, the lower end of said tube 8 being rigidly fastened to the circular edge of the cup 7, surrounding the central opening. These tubes 3 and 8 are each provided with a series of longitudinal openings 9 and 10, and the burner-body is adapted to rotate and slide up and down on the tube 3, being limited in its downward movement by striking the top edge of the tube 4 and its upward movement by striking the lower end of the shell 5.

The preferred adaptation of the mantle-support is shown in Fig. 1, in which a vertical rod 11 has its lower end passed through and rigidly secured in a central aperture in the perforated top 12 of the screw-cap 13, which screws upon the screw-threaded upper end of the shell 5. The top end of the rod is provided with a central vertical depression, and a cap 14, formed as shown in Figs. 3 and 4, is provided with a vertical standard 15<sup>a</sup>, which extends downward from the interior and is adapted to seat in the depression in the top of the rod 11. This cap 14 is bell-shaped to conform to the interior of the reduced top of the mantle, and thus support the mantle more firmly and securely and with less liability to breakage. In order to provide draft-openings between the cap and the interior of the mantle, the cap is preferably of an irregular corrugated form, consisting of alternate shoulders 15 and depressions 16, so that when the mantle 17 is arranged in place it is supported upon the shoulders 15 and the cap touches the same at points only, the depression 16 forming outlet-openings between the interior of the mantle and the cap for the products of combustion, the shoulders, owing to the bell-shaped formation of the cap, extending vertically in a nearly similar direction with the inner surface of the reduced top of the mantle, and thus coming in contact with more of the surface of the interior of the reduced top and supporting the mantle more firmly and securely than a disk-shaped structure, as before stated.

The rod 11 is secured to the cap 13 by passing its lower end, which is slightly reduced in circumference, (see Fig. 2,) through the central aperture therein, an upper washer 18



having been previously placed upon the rod against the shoulder at the upper termination of the reduced lower end, placing a lower washer 19 upon the end of the rod beneath the top surface of the cap, and rigidly securing the interposed portion of the cap-top between the two washers by swelling or enlarging the exterior lower end of the rod in any well-known manner. The lower part 20 of the screw-cap 13 is flared or flanged outwardly to form a support for the bottom edge of the mantle and also serves to close the intervening space between the lower portion of the mantle and the cap, thereby preventing the entrance of a cold-air draft directly upon the consuming gas. By this means the mantle is supported both at its top and bottom and is less liable to be broken by a sudden jar.

The amount of air admitted is regulated by the adjustment of the burner-body upon the tube 3, the mantle and its support remaining perfectly stationary during said adjustment, and it is so arranged that a mixture of cold air and partially-heated air can be admitted in any proportion, the cold air being admitted below the burner-body and the partially-heated air within said body. The cold air can be shut off entirely by moving the burner-body down, so that it rests upon the top edge of the screw-tube 4, and the partially-heated air can be entirely shut off by moving the burner-body upward until the top of the tube 8 abuts against the bottom of the shell 5, and the entire air-supply can be closed off by partially turning the burner-body, so that the slots in the tube 3 will be closed by the portions of the metal wall of the surrounding tube 8, between the slots of said tube 8.

The burner-body is held in any position to which it may be adjusted by the thumb-screw 21, mounted in the portion 22, projecting downwardly from the burner-body.

In the modified form shown in Fig. 5 two rods 23, having their upper ends bent at an oblique angle, are employed in lieu of the cap 14 and are seated in the depression in the top end of the rod in substantially the same manner, with their bent ends arranged opposite to each other and arranged so that they will extend nearly parallel with the interior of the reduced top of the mantle. The perforated top of the screw-cap is dispensed with, and in lieu thereof a separate independent interwoven wire-gauze 24 is employed, which is secured to the lower end of the rod in substantially the same manner employed in the preferred construction.

In securing the modified form of mantle-support in place the circular edge of the separate wire-gauze 24 is arranged firmly against the inwardly-extending flange 26 of the untopped cap portion 25, and the cap portion is then screwed firmly upon the upper portion of the shell 5, thereby rigidly holding the gauze in place, with its outer edge firmly interposed between the flange 26 and the top edge of the shell 5.

In the preferred construction the air and gas mixing chamber can be enlarged by partially unscrewing the screw-cap 13.

By mounting the mantle-support rigidly upon the gas-tube I am enabled to adjust the burner-body vertically without disturbing or moving the support or mantle or appreciably shaking or vibrating the mantle, as the mantle-support is not attached to or supported from the burner-body and is entirely independent of said burner-body. This is a great advantage, as the mantles are frail and brittle and easily broken. With the ordinary bent-wire exterior support, which has to be attached to the burner, the burner-body, the support, and the mantle would all receive the same movement when the burner was vertically adjusted and the mantle would necessarily be more or less shaken.

I claim as my invention—

1. An improved gas-burner comprising a slotted tube rigidly attached to a gas supply pipe, a burner-body mounted on said slotted tube and having vertical adjustment thereon, a mantle-support rigidly mounted on said slotted tube and a mantle supported by said support; the burner-body being adapted to be vertically adjusted without disturbing or moving the mantle-support or mantle.

2. An improved gas-burner comprising a slotted tube rigidly attached to a gas-supply pipe, a burner-body mounted on said slotted tube and having vertical adjustment thereon, a central mantle-support rigidly mounted on said slotted tube, and a mantle mounted on said support; the support and mantle being independent of and not affected by the vertical adjustment of the burner-body.

3. An improved gas-burner comprising a slotted tube rigidly attached to a gas-supply pipe, a tubular enlargement at the top of said tube having an open top, a cap detachably placed upon the tubular enlargement and having a perforated top closing the top of the tubular enlargement and forming a mixing-chamber, a vertical rod having its lower end centrally mounted in the perforated top of said cap, a mantle mounted upon and encircling said rod, and a burner-body mounted on the slotted tube and adapted to be rotated to close or partially close the slots, and to be adjusted vertically on said tube to regulate the admission of air from within or without the burner-body, as set forth.

4. An improved gas-burner, comprising a slotted tube rigidly attached to the gas-supply pipe, a tubular enlargement at the top of said tube having an open top, a cap detachably placed upon the tubular enlargement and having a perforated top closing the top of the tubular enlargement and forming a mixing-chamber, a vertical rod having its lower end centrally mounted in the perforated top of said cap, a mantle mounted upon and encircling said rod, a burner-body mounted on the slotted tube and adapted to be rotated to close or partially close the slots, and



to be adjusted vertically on said tube to regulate the admittance of air from within or without the burner-body, and means for locking said burner-body in its rotatable and vertical adjustment, as set forth.

5 5. An improved gas-burner, comprising a slotted tube rigidly attached to a gas-supply pipe, a tubular enlargement at the top of said tube having an open top, a cap detachably placed upon the tubular enlargement and having a perforated top closing the top of the tubular enlargement and forming a mixing-chamber, a vertical rod having its lower end centrally mounted in the perforated top of said cap, a mantle mounted upon and encircling said rod, a burner-body mounted on the slotted tube and adapted to be rotated to close or partially close the slots and to be adjusted vertically on said tube to regulate the admittance of air within or without the burner-body, an extension projecting from the burner-body and a thumb-screw in said extension adapted to screw against the slotted tube to lock the burner-body in its adjusted position, as set forth.

6. In a gas-burner, the combination with a gas-conducting tube having a top tubular enlargement provided with an open mouth forming a mixing-chamber, and a mantle, of a support for said mantle centrally located in the mantle and extending throughout its length with its upper end against the reduced top of the mantle, a perforated bottom cap detachably fitted over the open mouth of the mixing-chamber, having a central opening through which the lower end of the support extends, as set forth.

7. In a gas-burner, the combination with the gas-conducting tube having a top tubular enlargement provided with an open mouth forming a mixing-chamber, and a mantle, of a support for said mantle centrally located in the mantle and extending throughout its length having an enlarged top cap fitting against the interior of the reduced top of the mantle and a perforated bottom part attached to the lower end of said mantle-support and having an annular flange detachably fitting over the open mouth of the mixing-chamber, as set forth.

8. In a gas-burner, the combination with the gas-conducting tube and an enlarged air and gas mixing compartment connected to the top of said tube and having a top open mouth, of a central mantle-support, a bottom cap attached to the lower end of said mantle-support and provided with a plurality of perforations or openings in its top and an annular flange detachably fitted over the open mouth of the mixing-compartment, and a mantle mounted upon and encircling said mantle-support, as set forth.

9. In a gas-burner, the combination with the gas-conducting tube having an upper mixing-chamber provided with a screw-threaded top, of a central mantle-support having a perforated screw-threaded bottom cap screwing on the screw-threaded top of the mixing-chamber and provided with a flanged lower edge and a bell-shaped top cap, and a mantle mounted upon and encircling said support with its bottom supported upon the flange and its top supported upon the bell-shaped top cap.

10. In a gas-burner, the combination with a gas-conducting tube having a top tubular enlargement provided with an open mouth forming a mixing-chamber, and a mantle, of a support for said mantle centrally located in the mantle, and extending throughout its length with its upper end against the reduced top of the mantle, a perforated bottom cap detachably fitted over the open mouth of the mixing-chamber having a central opening through which the lower end of the support extends, and washers on said support on each side of the central opening for fastening the support to the cap, as set forth.

11. In a gas-burner, the combination of the gas-conducting tube, an enlarged gas and air mixing device at the top of said tube having an open mouth and exteriorly screw-threaded, a mantle, a mantle-support centrally within the mantle and having a perforated screw-cap at its lower end adjustably screwed upon said mixing device.

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Witnesses:

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