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W. S. STAPLEY.
GAS CUT-OFF FOR BUNSEN TUBES.
APPLICATION FILED MAY 25, 1905.

Fig. 1.

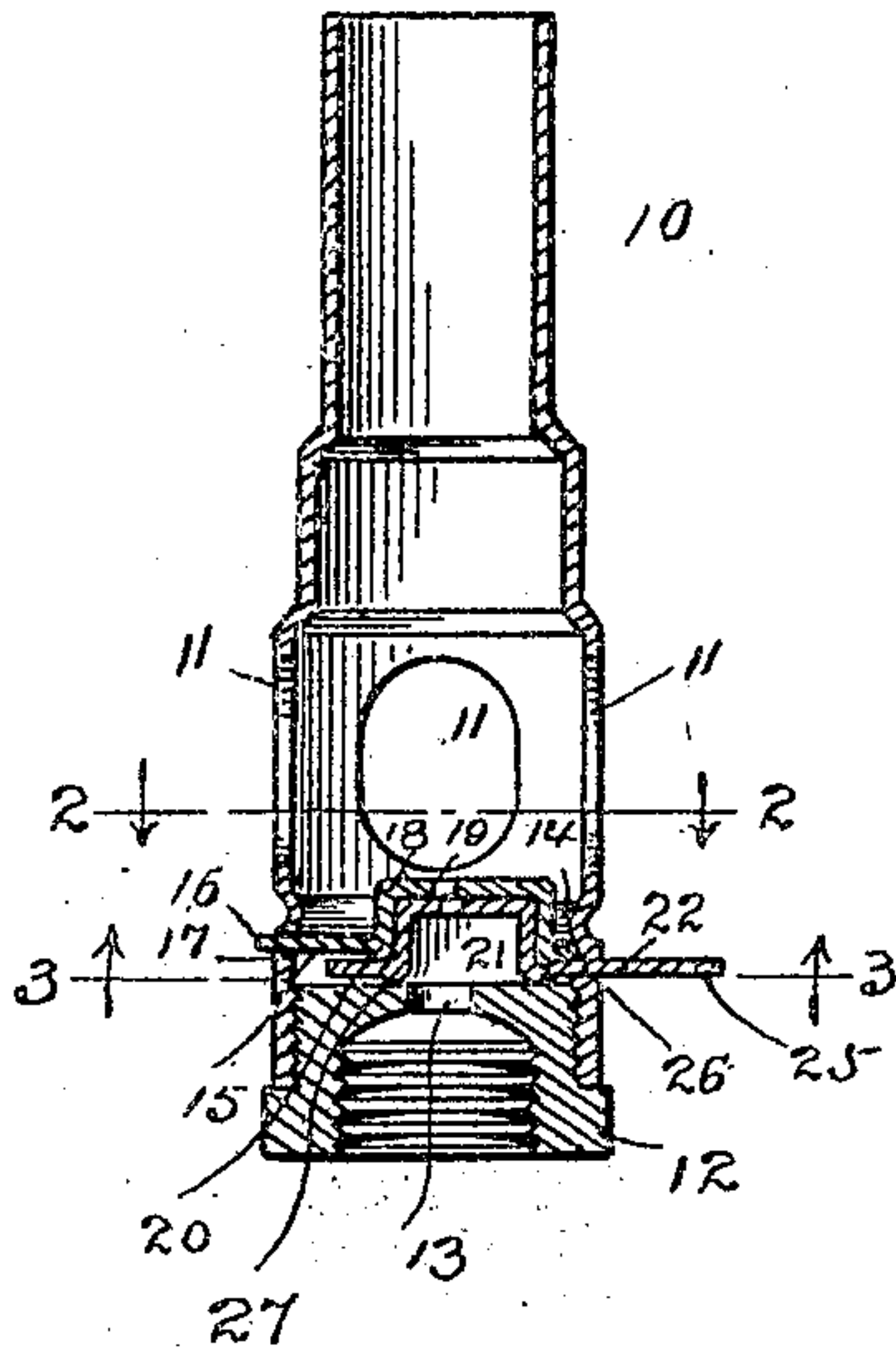


Fig. 2.

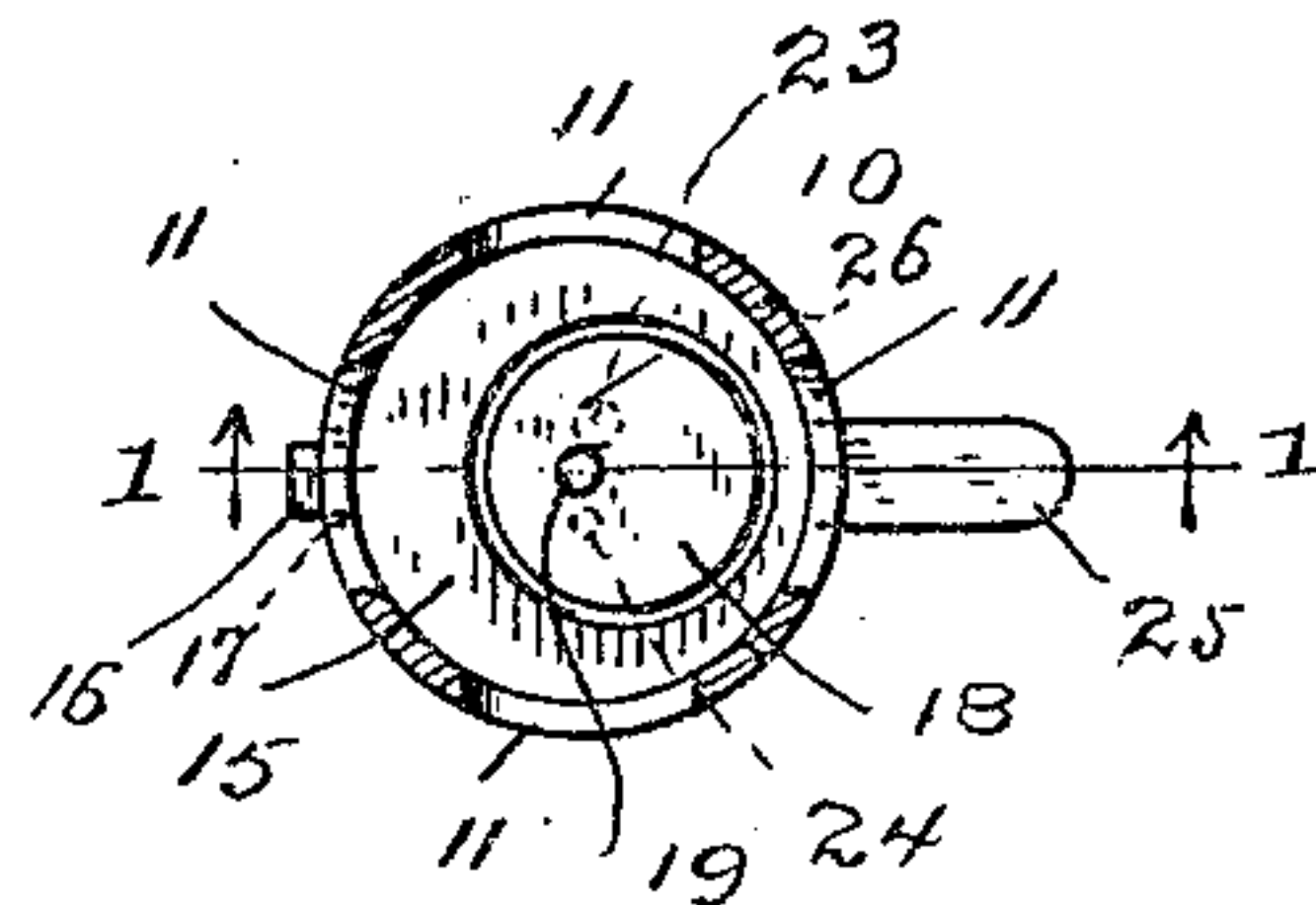


Fig. 3.

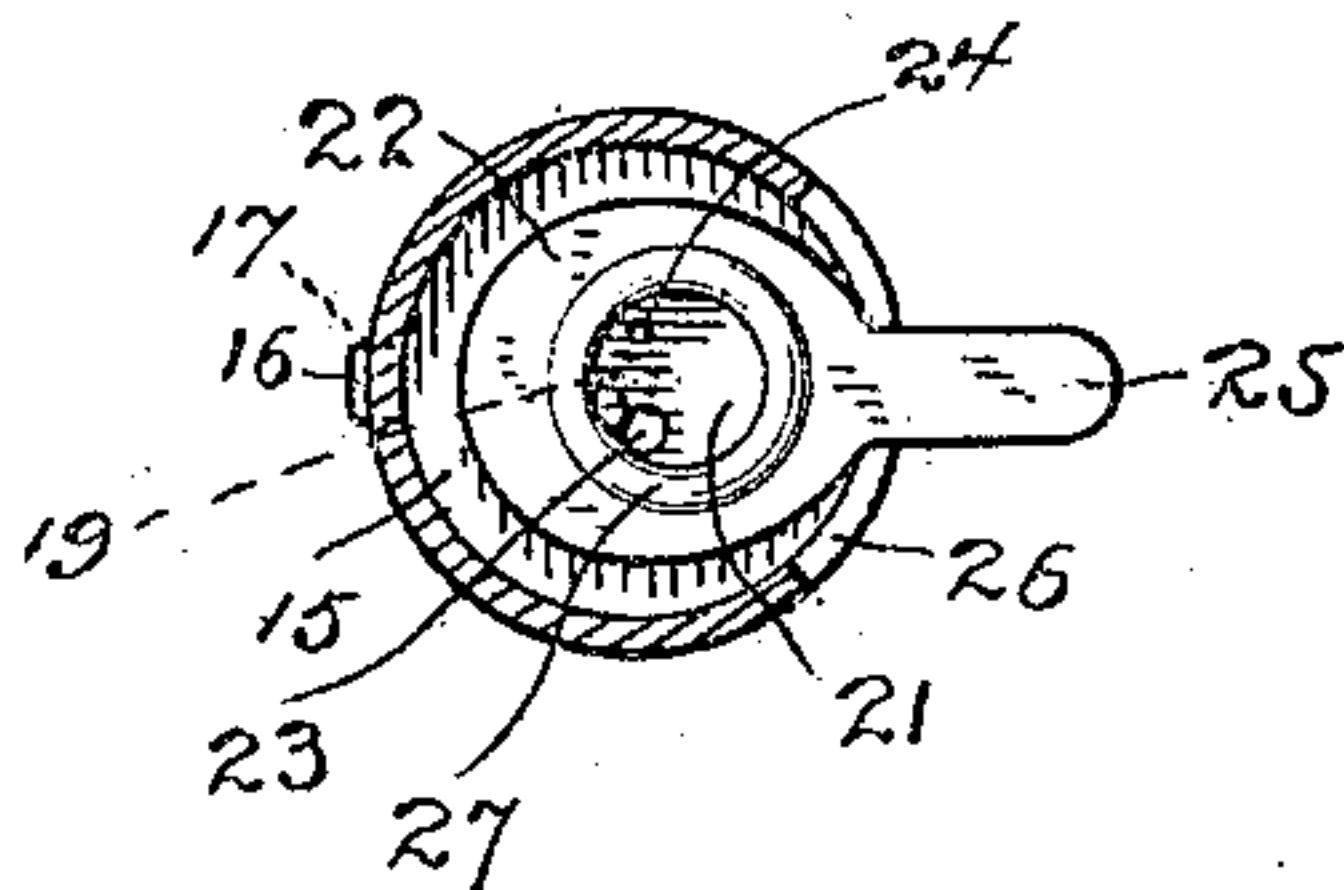
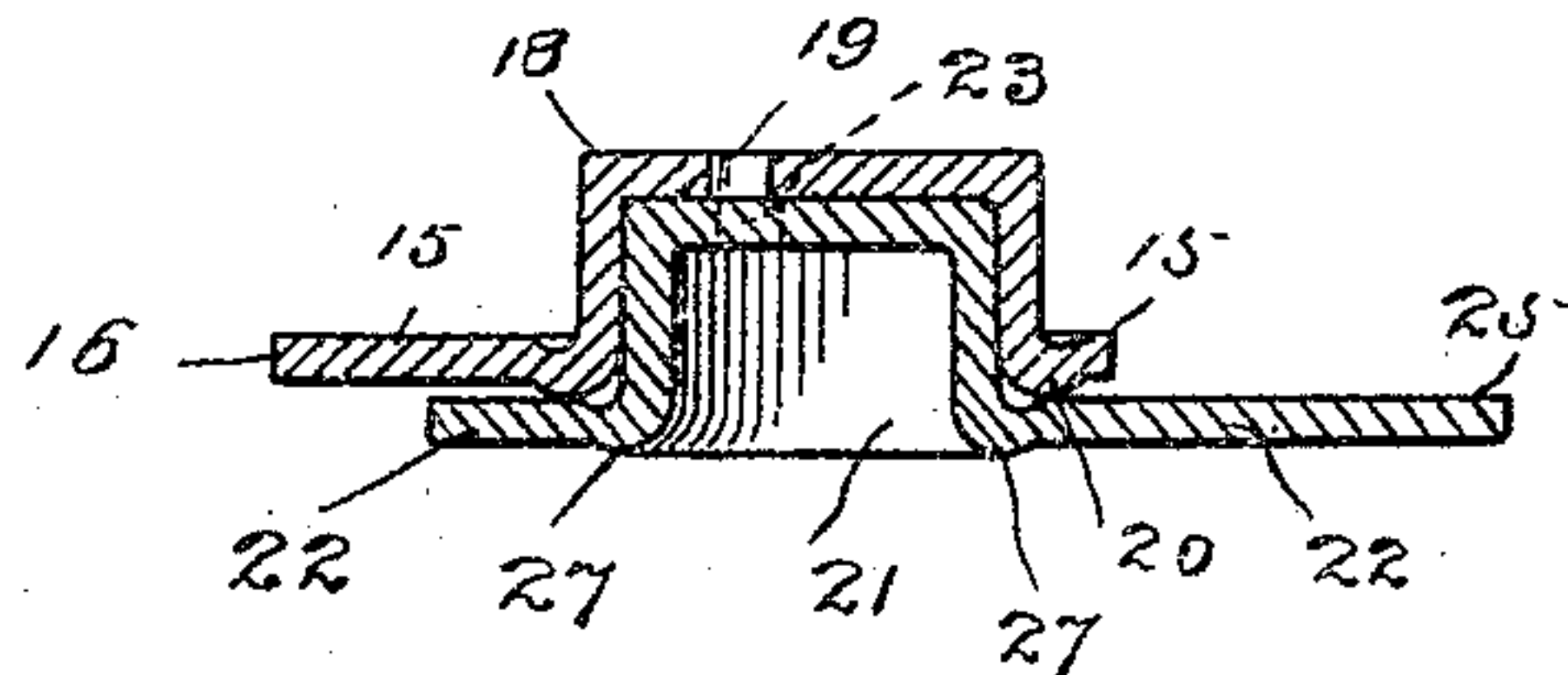


Fig. 4.



WITNESSES:

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GAS CUT-OFF FOR BUNSEN TUBES.

No. 799,579.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM S. STAPLEY, a citizen of the United States, residing at Bridgeport, county of Fairfield, State of Connecticut, have invented a new and useful Gas Cut-Off for Bunsen Tubes, of which the following is a specification.

This invention has for its object to produce a gas cut-off for Bunsen tubes which shall consist of two parts only, that may be struck out and formed from sheet metal at trifling expense, which will regulate the pressure as required, but will only affect the pressure at the point of delivery, and which will be perfectly gas-tight at all times.

It is of course well understood that the efficiency of a Bunsen burner depends rather upon the pressure at which gas is delivered than on the quantity of gas and that the main pressure varies greatly even under the best conditions, so that in mantle-burners as ordinarily constructed the quantity of gas that passes to the burner is very irregular and at times much greater than can be consumed. The result is a deposit of carbon upon the mantle, which quickly impairs the incandescence of the mantle and not infrequently entirely ruins it. The present invention enables the user to regulate with the greatest ease the pressure at the burner in accordance with the pressure of the main, and thus prevent the deposit of carbon upon the mantle, at the same time giving the best possible result in incandescence of the mantle and effecting a great saving in the consumption of gas.

With these and other objects in view I have devised the novel gas cut-off which I will now describe, referring to the accompanying drawings, forming a part of this specification, and using reference characters to indicate the several parts.

Figure 1 is a longitudinal section, on an enlarged scale, of a Bunsen tube and base, illustrating the application thereto of my novel cut-off; Fig. 2, a transverse section on the line 2 2 in Fig. 1 looking down; Fig. 3, a transverse section on the line 3 3 in Fig. 1 looking up; and Fig. 4 is a detail sectional view, on a still larger scale, of the cut-off on the line 1 1 in Fig. 2.

10 denotes a Bunsen tube having the usual air-openings 11, and 12 the base, having an opening 13 for the passage of gas. The base

and tube are provided with corresponding external and internal screw-threads, by which they are secured together.

14 denotes an internal circumferential rib below the air-openings, and 15 a disk which rests against the rib and is shown as provided with a radial lug 16, which engages an opening 17 in the tube and holds the disk against rotation, but leaves it readily removable by detaching the tube from the base. This disk is provided with an eccentrically-placed inverted outer cup 18, and the bottom of the cup is provided with a gas-opening 19, which is concentric both with the Bunsen tube and with gas-opening 13 in the base. Upon the under side of the disk and surrounding the base of the cup is a rib 20.

21 denotes an inner cup carried by a plate 22, which fits closely within outer cup 18, the outer face of cup 21 resting closely against the bottom of cup 18. The bottom of cup 21 is provided with a relatively large gas-opening 23 and a relatively small gas-opening 24, either of which is adapted to be placed partly or wholly in alinement with gas-opening 19 in cup 18 by oscillation of the plate, which is provided with a finger-piece 25, extending through a slot 26 in the Bunsen tube just above the base. By placing the inner and outer cups eccentric to the Bunsen tube and the base and providing the outer cup with a gas-opening concentric with the Bunsen tube and base and the inner cup with a gas opening or openings adapted to be placed in alinement therewith when the inner cup is oscillated I insure a central straight delivery of the gas to the Bunsen tube at all times. This prevents spiral movement of the current of gas and its being thrown against the side of the tube, thus effecting a true mixture of gas and air in the tube and perfect combustion at all times. This feature of construction is of especial importance when the gas-pressure is low, as it wholly prevents waving, fluttering, and rising and falling of the flame. Upon the under side of plate 22 and surrounding the base of the cup is a rib 27, which engages the base closely and prevents the passage of gas outward around the cup. Rib 20 upon disk 15 engages the top of plate 22 and makes a gas-seal between said plates, effectually preventing the passage of gas and also permitting sufficient spring of the disk to compen-

sate for slight variations in the parts, it being practically impossible in the manufacture of such parts to prevent slight variations, as a thousandth of an inch, more or less. I find
 5 in practice that the ribs upon the plate and disk make perfect gas-seals between the base and the plate and between the plate and the disk, the spring of the disk amply compensating for the slight but inevitable variations
 10 in the parts.

The gas-opening 19 in cup 18 is the point of supply to the Bunsen tube. The cutting off and regulation of the pressure is effected by oscillation of the inner cup by means of
 15 the finger-piece. When the inner cup is oscillated to a position that will place gas-openings 23 and 24 in the inner cup on opposite sides of gas-opening 19 in the outer cup, the supply of gas will be wholly cut off. By
 20 moving the finger-piece in one direction the relatively small gas-opening 24 in the inner cup will be moved partly or wholly into alinement with gas-opening 19, and by moving the finger-piece in the opposite direction the
 25 relatively large gas-opening 23 in the inner cup will be moved partly or wholly into alinement with the gas-opening 19 in the outer cup. I thus provide for a regulation of pressure adapted to any possible variation in the
 30 main pressure and giving the best possible results in incandescence of a mantle.

Having thus described my invention, I claim—

1. A gas cut-off comprising a disk having
 35 an eccentrically-placed inverted cup with a gas-opening and an oscillating plate carrying a cup provided with a gas-opening and fitting closely within said other cup.

2. A gas cut-off comprising a disk having
 40 an eccentrically-placed inverted outer cup with a gas-opening and an inner cup adapted to oscillate within the outer cup and having a relatively large and a relatively small gas-opening, either of which is adapted to be
 45 placed wholly or partly in alinement with the opening in the outer cup.

3. A gas cut-off comprising a disk having an eccentrically-placed inverted outer cup with a gas-opening and a rib surrounding the
 50 base of the cup, and a plate which is engaged by the rib and carries an inner cup adapted to oscillate within the outer cup and provided with relatively large and small gas-openings adapted to register with the opening in the
 55 outer cup.

4. In a device of the character described the combination with a Bunsen tube and a base, of a disk having an eccentrically-placed inverted outer cup with a gas-opening and an
 60 inner cup adapted to oscillate within the outer cup and having relatively large and small gas-openings either of which is adapted to be placed

either partly or wholly in alinement with the opening in the outer cup.

5. In a device of the character described 65 the combination with a Bunsen tube and a base having a gas-opening, of a disk having an eccentrically-placed inverted outer cup with a gas-opening concentric with the tube and a rib surrounding the base of the cup, 70 an inner cup adapted to oscillate within the outer cup and having relatively large and small gas-openings, and a plate by which the inner cup is carried and which is engaged by the rib and is provided with a rib surrounding the 75 cup which engages the base.

6. In a device of the character described the combination with a Bunsen tube having an internal rib and a base which is engaged by the tube, of a disk engaging the rib, means 80 for retaining said disk against rotation, an eccentrically-placed inverted outer cup carried by said disk and provided with a gas-opening, concentric with the tube, an inner cup adapted to oscillate within the outer cup and having 85 relatively large and small gas-openings and a plate by which the inner cup is carried and which is provided with a finger-piece.

7. In a device of the character described the combination with a Bunsen tube having 90 an internal rib, below the rib an opening and opposite to said opening a slot and a base which is engaged by the tube, of a disk engaging the rib and having a lug engaging the opening by which the disk is held against ro- 95 tation, an eccentrically-placed inverted outer cup provided with a gas-opening which is carried by the disk, an inner cup adapted to oscillate within the outer cup and having relatively large and small gas-openings, and a 100 plate by which the inner cup is carried and which is provided with a finger-piece extending through the slot in the tube.

8. In a device of the character described the combination with a Bunsen tube and a 105 base, of a disk having an eccentrically-placed outer cup with a gas-opening and a rib on its under side surrounding the cup, an oscillating plate which is engaged by the rib and has on its under side a rib engaging the base, said 110 ribs making gas-seals between the plates and the base and an inner cup carried by the plate which lies closely within the outer cup and is provided with relatively large and small gas-openings either of which is adapted to partly 115 or wholly register with the gas-opening in the outer cup.

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

WILLIAM S. STAPLEY.

Witnesses:

GEORGE E. SOMERS,
 GEORGE W. BALDWIN.