

W. A. COOK.  
GAS BURNER.

APPLICATION FILED AUG. 8, 1903.

NO MODEL.

Fig. 1.

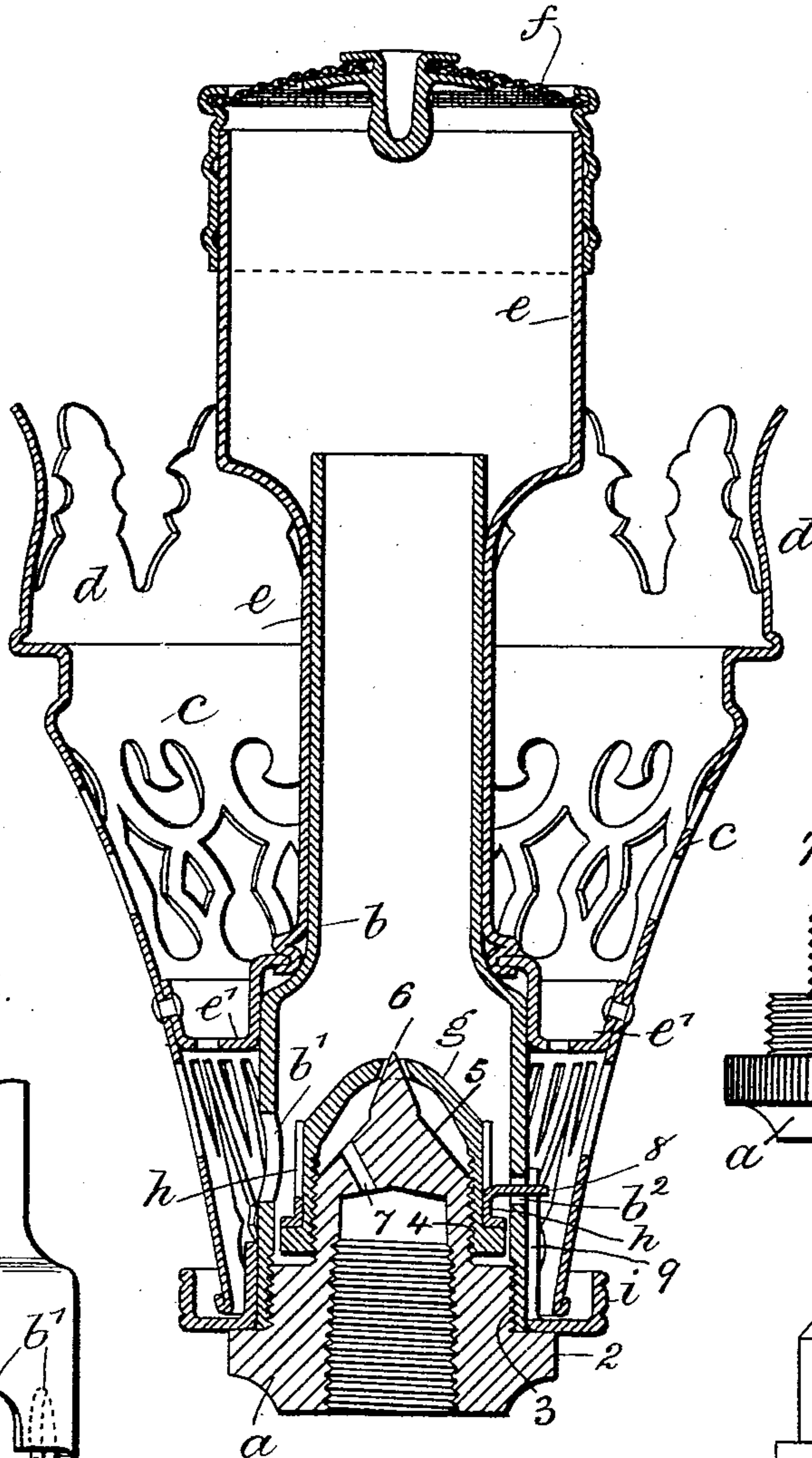


Fig. 2.

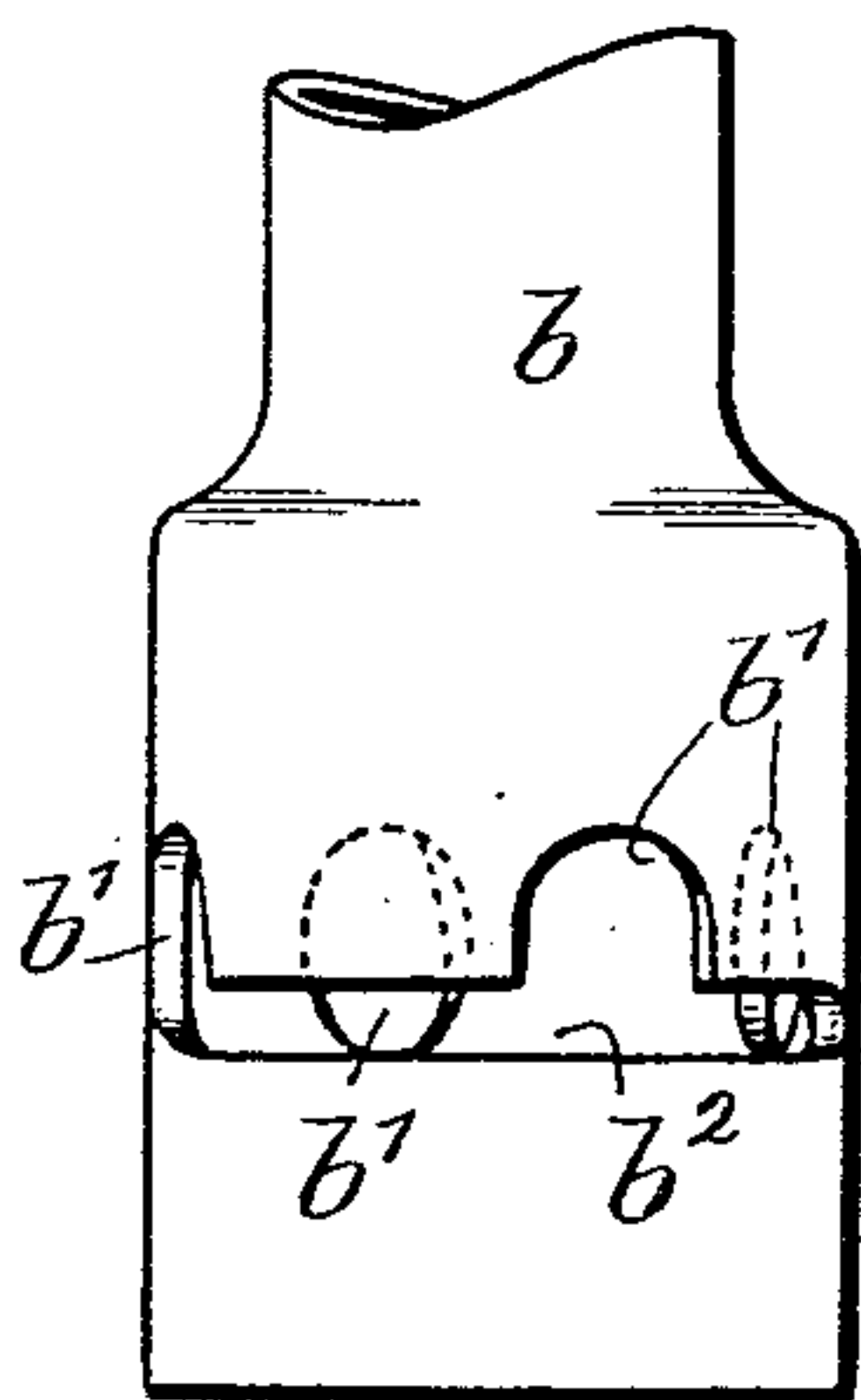


Fig. 3.

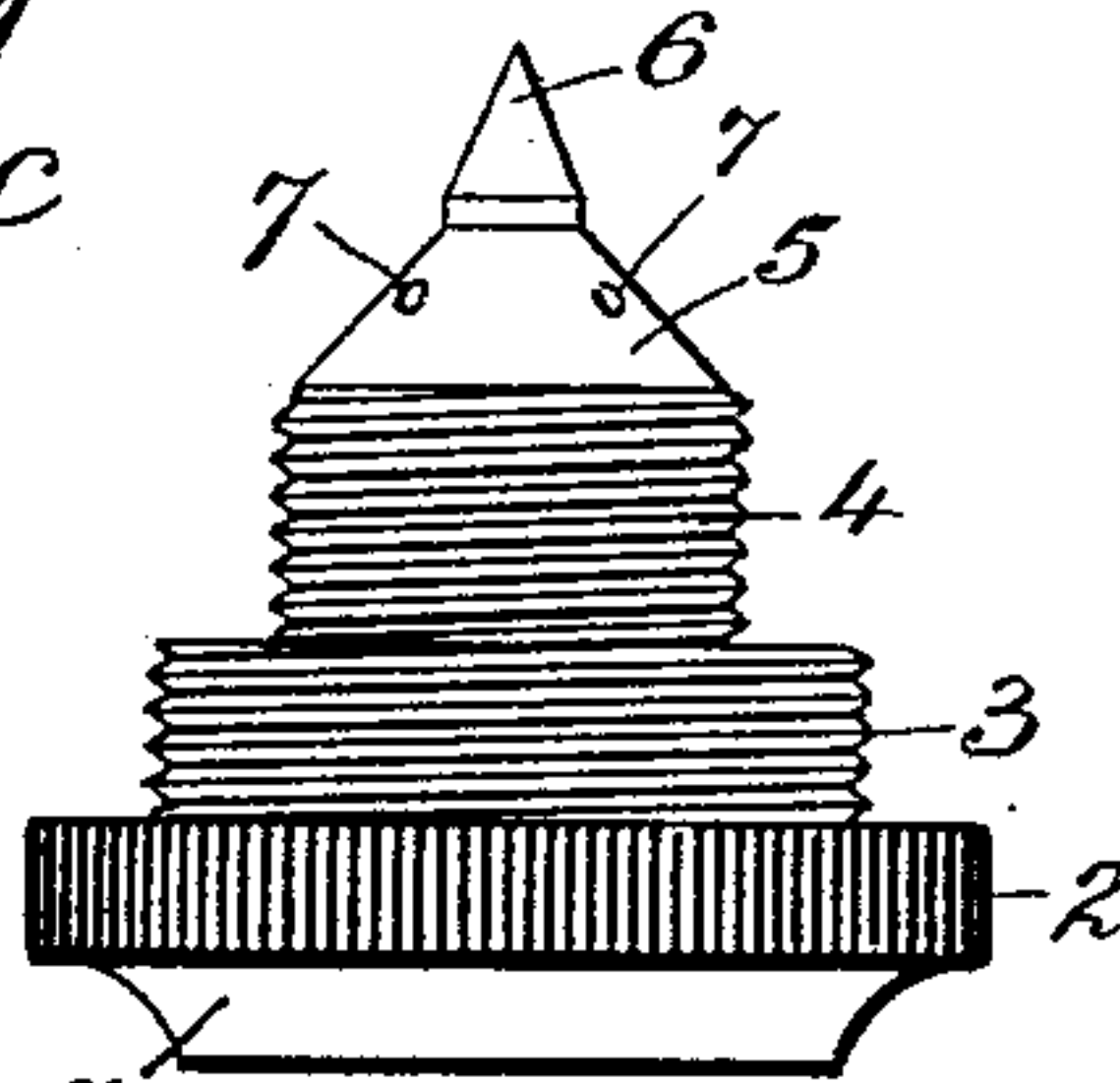


Fig. 4.

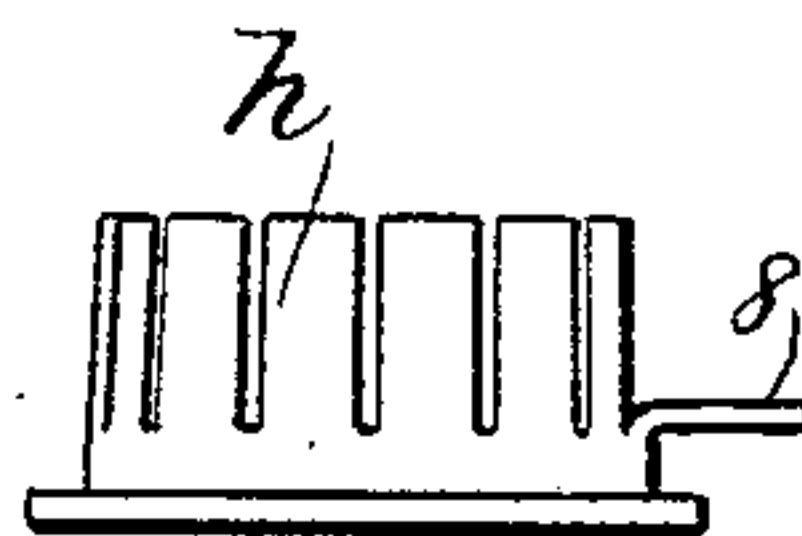
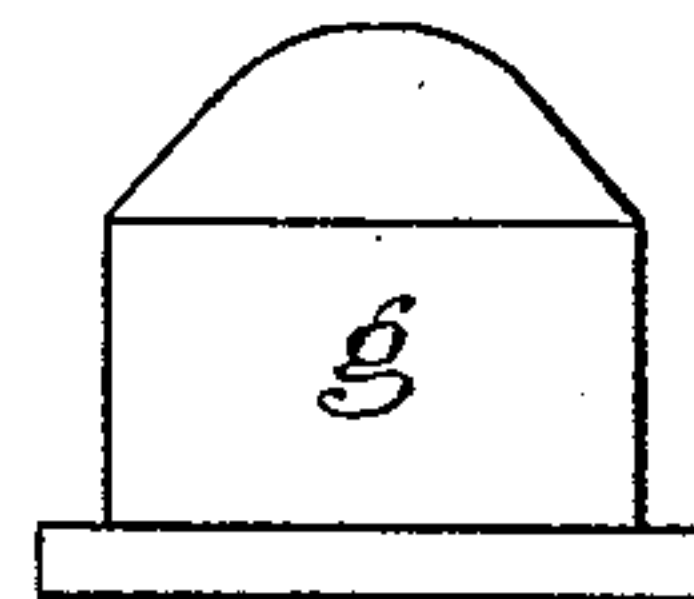


Fig. 6.

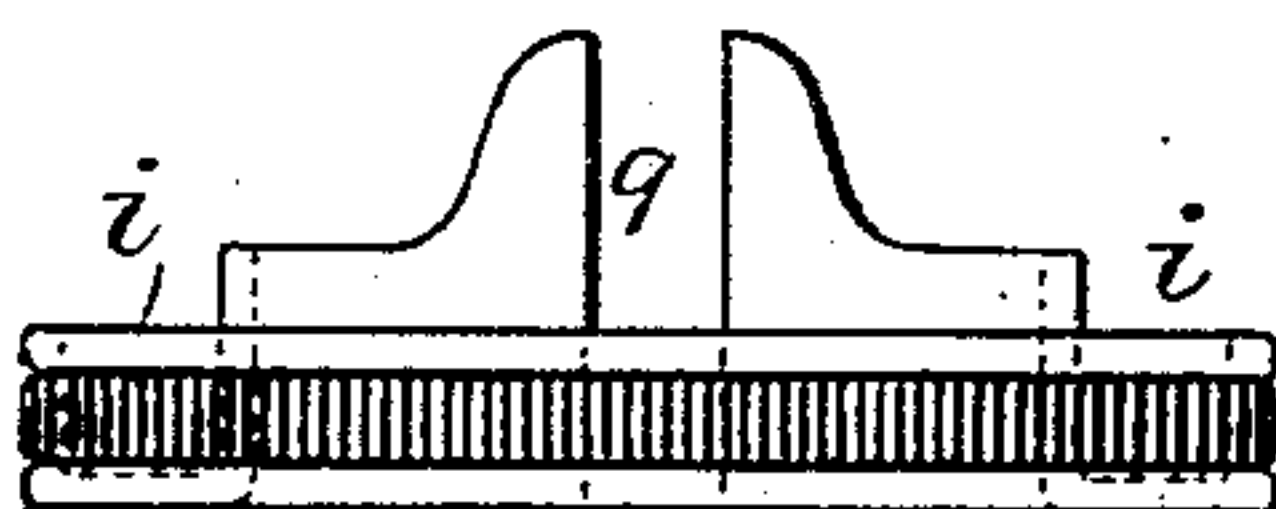


Fig. 7.

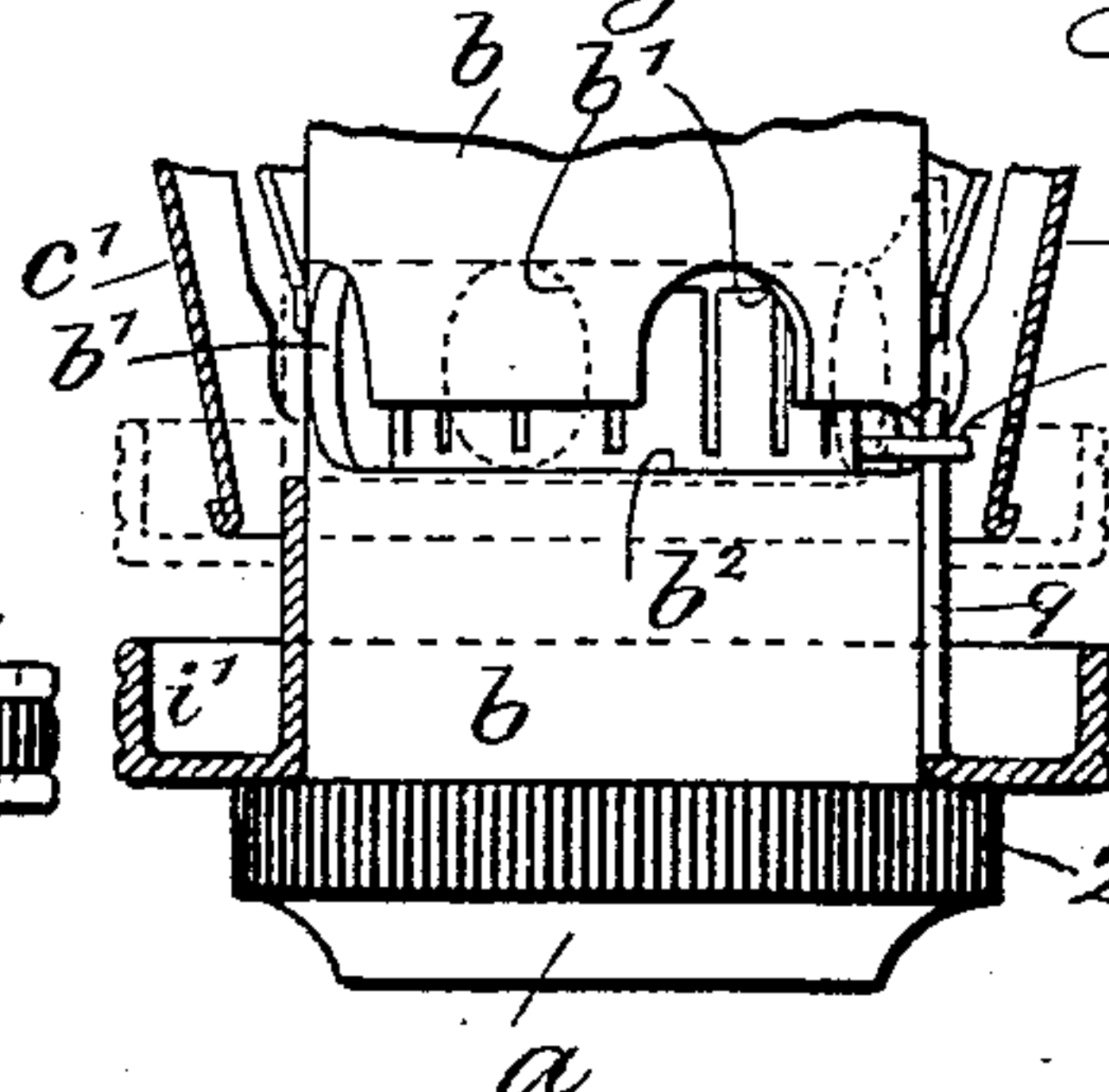


Fig. 5.

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Witnesses  
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J. Stair



# UNITED STATES PATENT OFFICE.

WILLIAM A. COOK, OF NEW YORK, N. Y., ASSIGNOR TO MANHATTAN BRASS COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

## GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 745,790, dated December 1, 1903.

Application filed August 8, 1903. Serial No. 168,705. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM A. COOK, a citizen of the United States, residing at the borough of Brooklyn, in the county of Kings, city and State of New York, have invented an Improvement in Gas-Burners, of which the following is a specification.

My invention relates to Bunsen gas-burners especially adapted for use with incandescent mantles, and particularly to the construction of convenient and readily-assembled parts for regulating the flow of gas and which do not require any special manipulation or adjustment or indication therefor, as has heretofore been usual with devices of this kind.

In my improvement I employ a revoluble thimble providing for and controlling the entrance of gas, a collar surrounding the same and frictionally held thereto in an adjustable relation and having a part by which the collar and thimble are turned together, a Bunsen tube receiving these parts and through a slot in which the aforesaid part of the collar projects, and a regulating-collar independently supported and movable and adapted by its rotation to move the aforesaid collar and thimble to regulate the flow of gas. These parts are placed and operated without moving the Bunsen tube or chimney-support and air-distributor. This regulating-collar may also be of such form as to be adapted for employment to the air-entrance apertures of the burner in lighting the gas to overcome the tendency to the usual light explosion that is injurious to the mantle, the collar thereafter dropping by gravity to establish the desired relation of parts for the air and gas flame.

In the drawings, Figure 1 is a vertical section and partial elevation representing my improvements. Fig. 2 is an elevation of the lower portion of the Bunsen tube. Fig. 3 is an elevation of the cap to screw upon the end of the gas-pipe. Fig. 4 is an elevation of the thimble fitting around the upper end of the cap. Fig. 5 is an elevation of the collar fitting over the thimble. Fig. 6 is an elevation of the regulating-collar, and Fig. 7 is an elevation and vertical section illustrating a form of my invention.

*a* represents the cap interiorly threaded

and adapted to screw upon the threaded end of a gas-pipe. This cap is provided at its lower end with a knurled rib 2, above the same and of smaller diameter with an exteriorly-threaded part 3, above this and of still smaller diameter with an exteriorly-threaded part 4, above which rises a conical center 5, terminating in a needle-point 6, and the conical center is perforated with holes 7 for the escape of gas coming directly from the gas-pipe.

The Bunsen tube *b* is provided near its lower end with holes *b'* for the entrance of air and with a slot *b<sup>2</sup>*, that intersects two of these holes. The Bunsen tube is provided with a shoulder connecting the portions thereof of varying diameters, and this Bunsen tube screws upon the threaded part 3 of the cap *a*, so that the lower end comes closely adjacent to the knurled rib 2. A central tube *e* is adapted to surround the portion of the Bunsen tube *b* of smallest diameter, and the collar *e'* is connected to the lower portion of said central tube, and these parts rest upon and are supported by the shoulder of the Bunsen tube. The central tube *e* is also of varying diameters—that is to say, its upper end, which rises above the Bunsen tube *b*, is of larger diameter than the lower portion, and it in turn is adapted to receive and support the gauze cap *f*.

The air-distributor *c* and the chimney-holder *d* rising therefrom are connected to and supported by the collar *e'* and its connection with the central tube *e*, and the lower free edge of the air-distributor is appreciably distant from the knurled rib 2 of the cap *a*.

I provide a thimble *g* with a central aperture for the needle-point 6 of the cap *a*. This thimble *g* is adapted to screw upon the threaded part 4 of the cap, and the aperture therein is tapering to correspond to the taper of the needle-point 6, and when the thimble is screwed down tightly to place the aperture therein is completely closed by the needle-point, so that gas that would pass through the holes 7 of the cap is held within the thimble and cannot escape until the thimble is turned to open up the aperture and permit the gas to escape in the annular openings produced around the needle-point 6. This thimble is made with



a flanged base, and I provide a slitted collar *h*. (See Figs. 1 and 5.) This slitted collar is preferably formed by taking a tube-section and turning a flange thereon and slitting the same in line with the imaginary axis of the tube-section, so as to produce a number of arms or tongues. This collar is of such diameter as to fit snugly over the thimble *g*, and the series of arms thereof may be slightly bent toward the center, so as to produce such a gripping friction of the collar upon the thimble that it is substantially impossible to rotate the one with reference to the other without great force. One of the arms 8 of the collar is bent outwardly, as shown in Figs. 1 and 4, and when the collar is in place upon the cap *a* this outwardly-bent arm 8 passes through the slot *b*<sup>2</sup> of the Bunsen tube and appreciably beyond the surface of said Bunsen tube, but still within the lower portion of the air-distributor *c*.

I provide a regulating-collar *i*. (Shown in elevation, Fig. 6, and in section, Fig. 1.) This has a knurled periphery to be grasped by the fingers. It approximates a U form in cross-section, so that the vertical part thereof surrounds the Bunsen tube *b*. The horizontal portion lies upon the knurled rib 2 of the cap *a* and comes appreciably below the lower edge of the air-distributor *c* and the knurled portion outside of the said air-distributor. The inner portion of said collar is made with rising projections, between which is a slot 9, and when in position, as shown in Fig. 1, the outwardly-extending arm 8 passes within this slot 9, and it will be apparent that when this collar *i* is rotated by the fingers it will in turn simultaneously rotate the slitted collar *h* and thimble *g*. The slot *b*<sup>2</sup> of the Bunsen tube in its length limits the amount of rotation which may be imparted by the collar *i* to the slitted collar *h* and thimble *g*. The parts are to be so assembled with reference to Fig. 2 that when the arm 8 is at the left-hand side of the slot *b*<sup>2</sup> the aperture of the thimble *g* is closed completely by the needle-point 6, and when so turned that the arm 8 is at the right-hand end of the slot *b*<sup>2</sup> the thimble has been raised sufficient to establish an annular opening around the needle-point that will permit an ample escape of gas for the purposes of the burner. As between these points of extreme movement the burner is regulated by the turning of the collar *i* and slitted collar *h* and thimble *g* through the medium of the arm 8, it being possible in this regulation to produce anything between a full light and a light so small as to be barely distinguishable. In fact, it may be so small that the gas and air burning are confined entirely to the upper spread portion of the central tube *e* adjacent to the gauze cap *f*, and which light may be termed a "pilot-light."

This device is exceedingly simple, there are no parts to get out of order, the parts are

easily assembled, and are efficient in their operation.

It is frequently desirable to be able to close off the air-openings of the burner at the moment of lighting the gas, because with the ignition of the mixture of gas and air a slight explosion frequently takes place on lighting the burner, and this is detrimental to the integrity of the mantle. In the form of my invention Fig. 7 I aim to overcome this difficulty with the devices of my invention as hereinbefore described by providing a space between the lower edge of the air-distributor *c*' and the knurled rib 2, so that the regulating-collar *i*' may be moved vertically and longitudinally of the Bunsen tube *b*. The sleeve portion of the collar *i*', surrounding the tube *b*, is in the modification made deep and so as to extend up to the lower edges of the air openings or holes *b*', and the space between the lower edge of the air-distributor *c*' and the upper surface of the horizontal portion of the regulating-collar *i*' is sufficient to permit said collar when raised by hand at the time of lighting the burner to cover over all the air-openings and prevent the Bunsen function thereof and so that only the gas is lighted at the start, after which the said collar drops by gravity the moment same is released, and thus opens up the air-apertures and establishes the Bunsen function of the air and gas flame without explosion or other demonstration. In this construction the slot 9 is also the full depth of the sleeve portion of the collar, as in Fig. 6.

I claim as my invention—

1. The combination with a cap for the end of the gas-pipe carrying a needle-point at its extreme upper end, a Bunsen tube secured to the said cap and a chimney-holder and air-distributor supported thereby, of coacting adjustable devices operating within and without said Bunsen tube for regulating the supply of gas and movable independent of the aforesaid parts of the burner.

2. The combination with a cap for the end of the gas-pipe carrying a needle-point at its extreme upper end, a Bunsen tube, chimney-holder and air-distributor supported thereby, of a thimble having a central aperture and revoluble for regulating the escape of gas, a device frictionally connected to said thimble and adjustable in its relation thereto, and a revoluble device independent of said thimble and of the parts of the burner, and coacting therewith for effecting the rotation of said thimble by the means of the device frictionally held thereto.

3. The combination with a cap for the end of the gas-pipe carrying a needle-point at its extreme upper end, a Bunsen tube, chimney-holder and air-distributor supported thereby, of a thimble adapted to screw on the end of the said cap, revoluble in its relation to the cap and having a central aperture coacting with the needle-point for regulating the admission



of gas to the burner, a collar surrounding and frictionally held to said thimble and having a part projecting through a slot in the Bunsen tube, a regulating-collar surrounding the Bunsen tube and moving over a surface of the cap and having a slotted part engaging the projecting part of the collar for simultaneously moving the collar and the thimble to regulate the supply of gas to the burner.

4. In a gas-burner, the combination of a Bunsen tube having openings for air and a slot horizontally placed, a cap adapted to screw on the end of the gas-pipe and to which the said Bunsen tube is connected, said cap terminating in a needle-point, a thimble surrounding the upper part of the cap, revoluble thereon and having a central aperture receiving the said needle-point, a collar *h* slitted in line with the imaginary axis thereof so as to produce a series of arms, one of which is bent out into a horizontal position and said collar adapted to fit snugly over said thimble and to be held frictionally thereto so that the collar and thimble are adapted to rotate together, and a revoluble device adapted to surround the Bunsen tube, to be operated by hand, and having a part engaging the arm of the slitted collar.

5. In a gas-burner, the combination of a Bunsen tube having openings for air, and a slot horizontally placed, a cap adapted to screw on the end of the gas-pipe and to which the said Bunsen tube is connected, said cap terminating in a needle-point, a thimble surrounding the upper part of the cap, revoluble thereon, and having a central aperture receiving the said needle-point, a collar *h* slitted in line with the imaginary axis thereof so as to produce a series of arms, one of which is bent out into a horizontal position, and said collar adapted to fit snugly over said thimble and to be held frictionally thereto so that the collar and thimble are adapted to rotate together, a regulating-collar of substantially U shape in cross-section having a knurled outer portion to be engaged by the hand, an inner vertical portion to surround the Bunsen tube, a horizontal portion to rest upon the cap for the rotation thereof, and projections of the inner portion spaced apart to produce a slot 9 adapted to receive the arm of the slitted collar for the simultaneous rotation of the collar and thimble.

6. In a gas-burner, a cap adapted to screw upon the threaded end of a gas-pipe, having a knurled rib 2, an adjacent threaded part 3 of smaller diameter than the knurled rib, an adjacent and rising exteriorly-threaded part 4 of smaller diameter, a conical center rising from the last-named threaded portion and having holes for the escape of gas, and said conical portion terminating in a needle-point 6, a Bunsen tube interiorly threaded at its lower end and adapted to screw upon the threaded portion 3 of the cap and having holes for the entrance of air and a horizontal slitted portion intersecting two or more of the

holes, a regulating-collar *i* adapted to surround the lower end of the Bunsen tube, to rest upon the shoulder produced between the knurled rib 2 and the threaded portion 3 and to be independently revolved thereon, a thimble *g* interiorly threaded and adapted to screw upon the threaded portion 4 of the cap and having a central aperture at its upper portion receiving the needle-point 6 and adapted in its rotation to close the aperture therein or to open the same for the escape of gas, a slitted collar *h* having a part thereof projecting at right angles to the collar surrounding the thimble, frictionally held thereto and adjustable circumferentially in relation to the said thimble, the horizontal portion thereof adapted to pass through the slot of the Bunsen tube and into the slot 9 of the regulating-collar to be operated thereby for the simultaneous rotation of said slitted collar and thimble to regulate the supply of gas.

7. The combination with a cap for the end of the gas-pipe carrying a needle-point at its extreme upper end, a Bunsen tube, chimney-holder and air-distributor supported thereby, of independent coacting adjustable devices for regulating the supply of gas, movable independent of the aforesaid parts of the burner, and means whereby one of the coacting adjustable devices may be raised to cover over the air-apertures when lighting the burner and to fall by gravity when released to establish the Bunsen function of the burner.

8. The combination with a cap for the end of the gas-pipe carrying a needle-point at its extreme upper end, a Bunsen tube, chimney-holder and air-distributor supported thereby, of a thimble having a central aperture and revoluble for regulating the escape of gas, a device frictionally connected to said thimble and adjustable in its relation thereto, and a revoluble device independent of said thimble and of the parts of the burner and coacting therewith for effecting the rotation of said thimble by the means of the device frictionally held thereto, and means, whereby the latter device may be raised to momentarily cover over the air-apertures when lighting the burner and to fall by gravity when released to establish the Bunsen function of the burner.

9. The combination with a cap for the end of the gas-pipe carrying a needle-point at its extreme upper end, a Bunsen tube, chimney-holder and air-distributor supported thereby, of a thimble adapted to screw on the end of the said cap, revoluble in its relation to the cap and having a central aperture coacting with the needle-point for regulating the admission of gas to the burner, a collar surrounding and frictionally held to said thimble and having a part projecting through a slot in the Bunsen tube, a regulating-collar surrounding the Bunsen tube and moving over a surface of the cap and having a slotted part engaging the projecting part of the collar for simultaneously moving the collar and the thimble to regulate the supply of gas to the



burner, and said collar adapted, because of the position of the lower edge of the air-distributor, for a longitudinal or rising-and-falling movement on the Bunsen tube to momentarily cover over the air-apertures when lighting the burner and to fall by gravity when released to establish the Bunsen function of the burner.

10. The combination with a cap for the end of the gas-pipe carrying a needle-point at its extreme upper end, a Bunsen tube, chimney-holder and air-distributor, of a thimble having a central aperture and revoluble for regulating the supply of gas, a revoluble device hand-actuated and independent of said thimble and surrounding the Bunsen tube, and a device coacting with and intermediate of the thimble and revoluble device whereby the thimble is operated and the supply of gas regulated.

11. The combination with a cap for the end of the gas-pipe carrying a needle-point at its extreme upper end, a Bunsen tube, chimney-holder and air-distributor, of a thimble having a central aperture and revoluble for regulating the supply of gas, a device surround-

ing the base of the Bunsen tube and hand-operated along the same to regulate or close off the air-supply and also revoluble thereon, and a device coacting with and intermediate of the same and the thimble, whereby the thimble is operated and the supply of gas regulated.

12. The combination with a cap for the end of the gas-pipe carrying a needle-point at its extreme upper end, a Bunsen tube, chimney-holder and air-distributor, of a thimble having a central aperture and revoluble for regulating the supply of gas, a deep regulating-collar *i'* having a slot 9 and surrounding the base of the Bunsen tube and hand-operated along the same to regulate or close off the air-supply and also revoluble thereon, and a device coacting with and intermediate of said hand-operated device and the thimble whereby the thimble is operated and the supply of gas regulated.

Signed by me this 5th day of August, 1903.  
WM. A. COOK.

Witnesses:

GEO. T. PINCKNEY,  
BERTHA M. ALLEN.