

(No Model.)

A. P. JACOB.  
GAS BURNER.

No. 406,584.

Patented July 9, 1889.

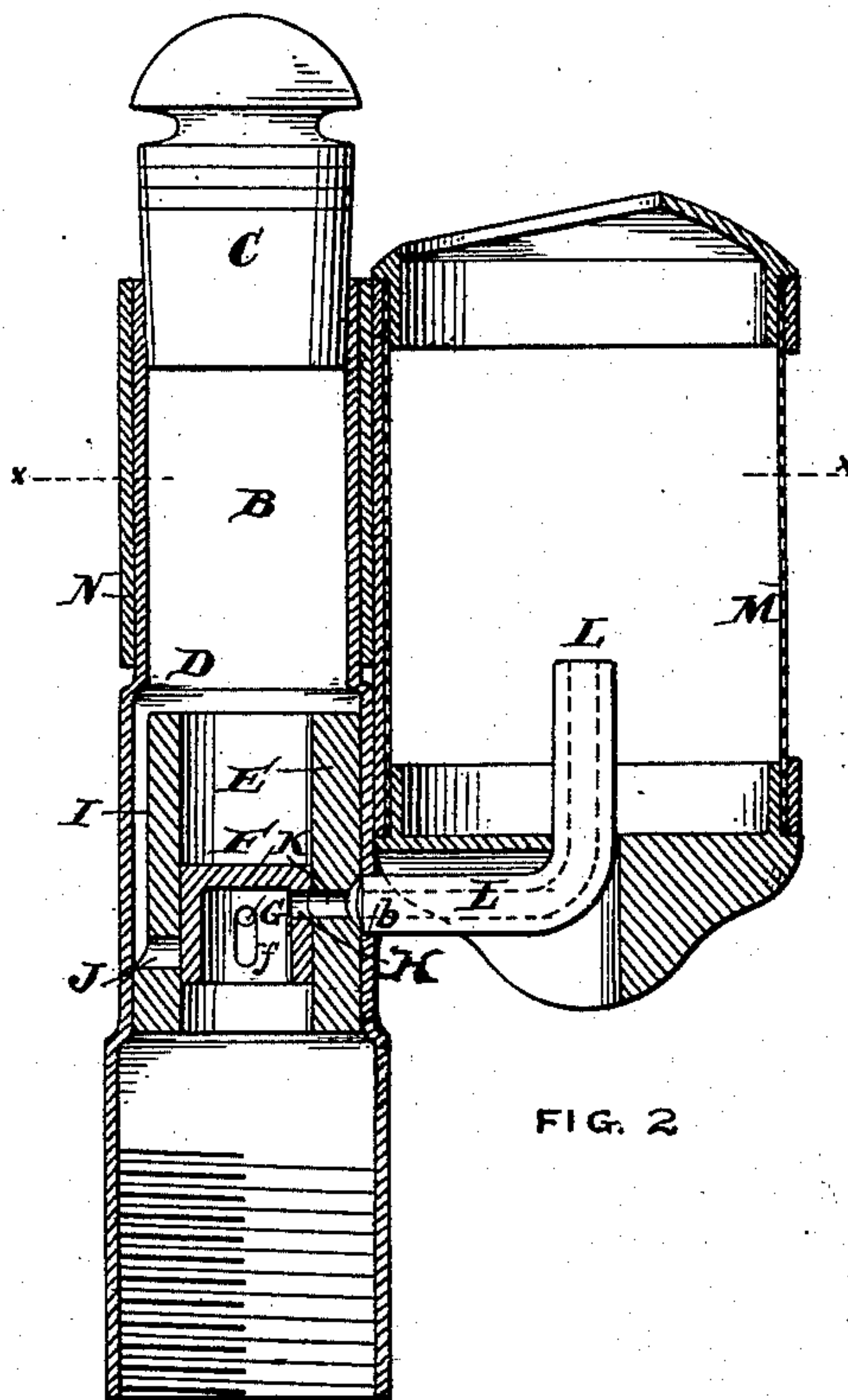
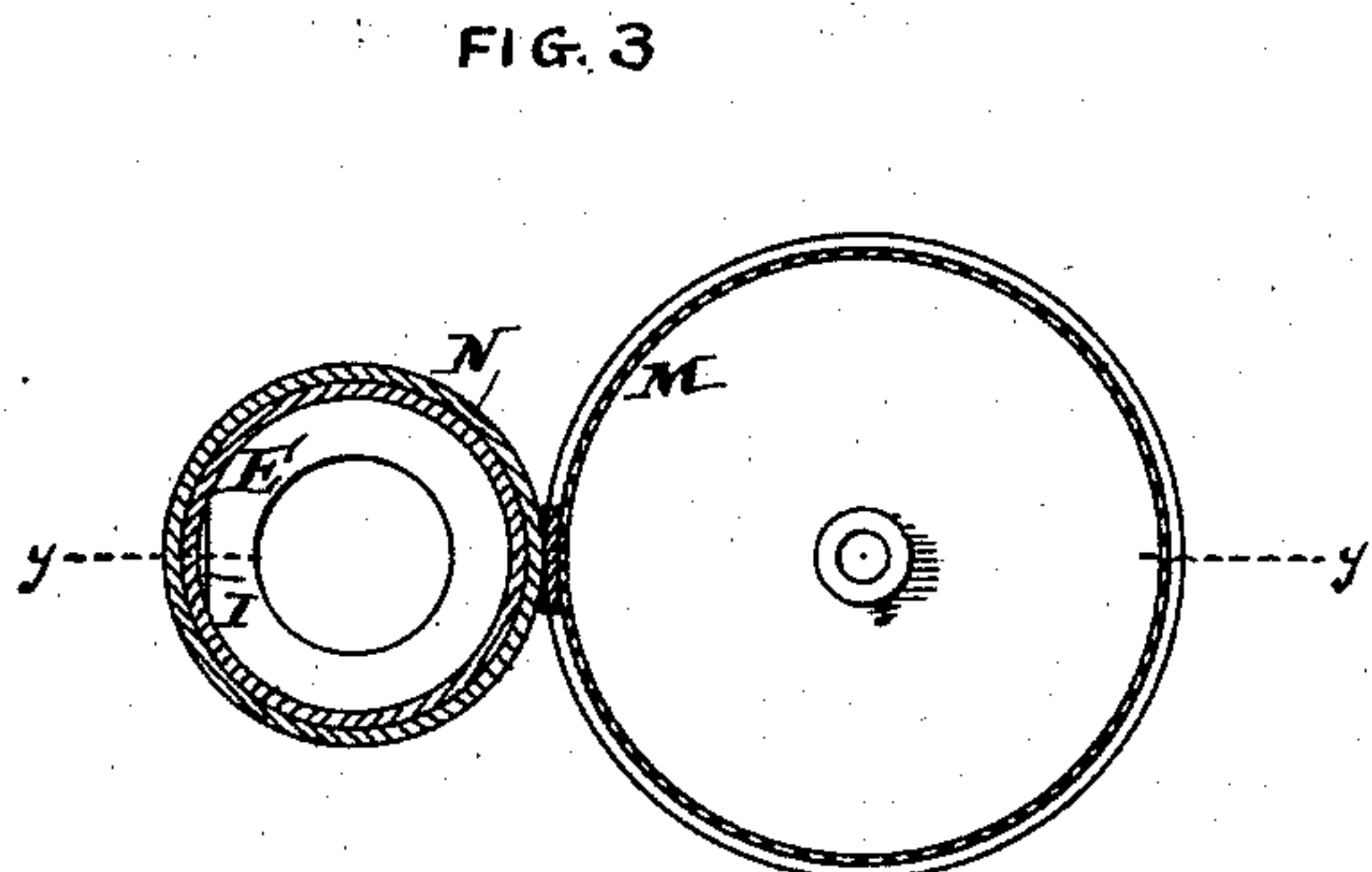
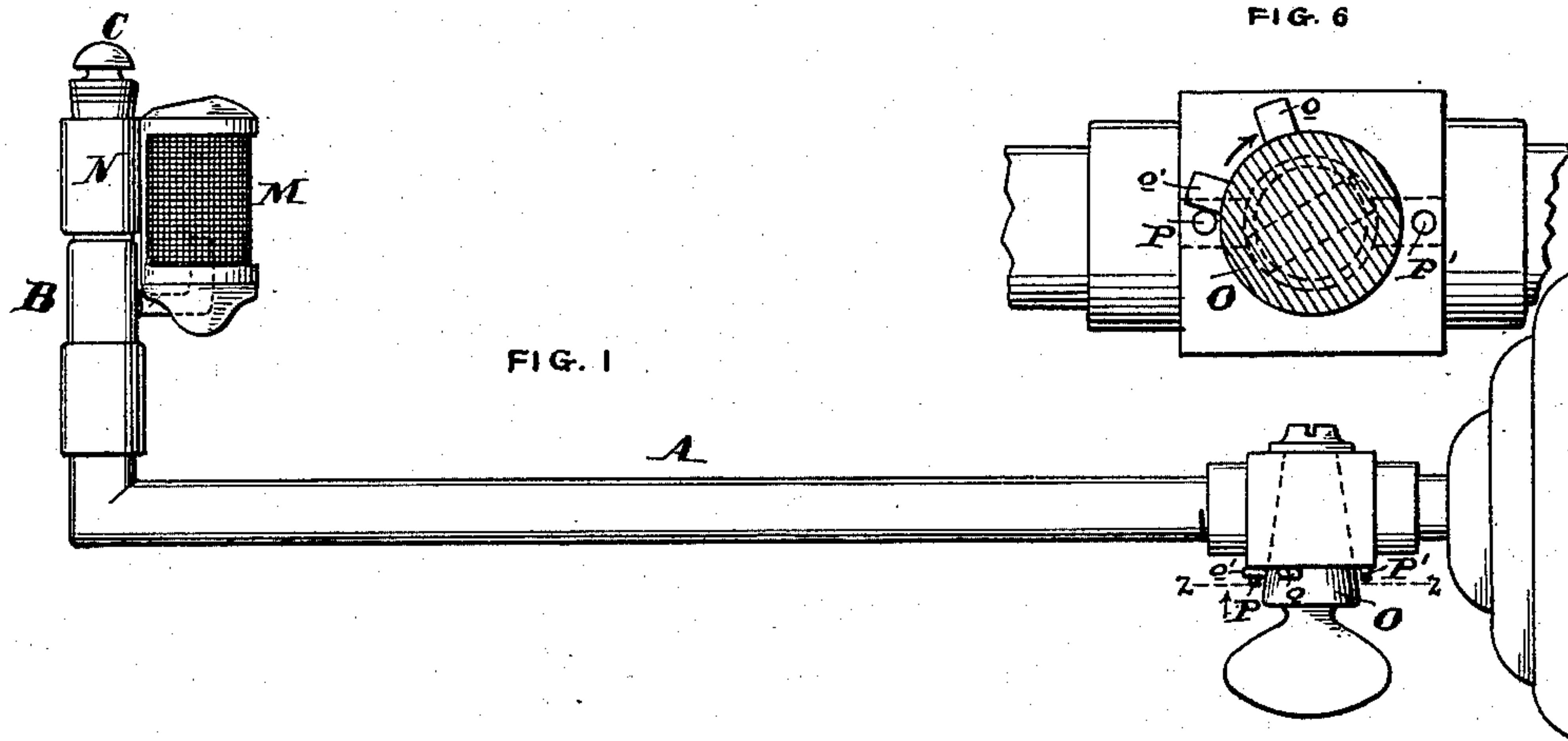


FIG. 4

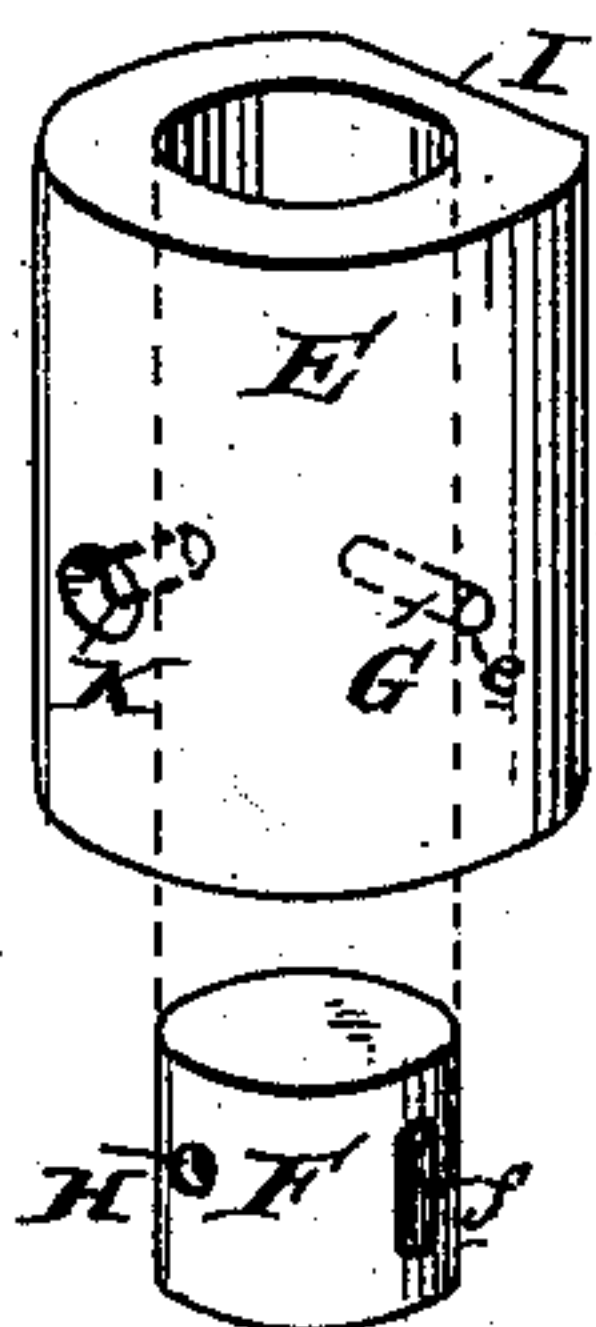


FIG. 5

Witnesses:  
*Henry Dwyer*  
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Inventor:  
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By *his atty*  
*[Signature]*



# UNITED STATES PATENT OFFICE.

ALFRED P. JACOB, OF PHILADELPHIA, PENNSYLVANIA.

## GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 406,584, dated July 9, 1889.

Application filed August 13, 1888. Serial No. 282,524. (No model.)

*To all whom it may concern:*

Be it known that I, ALFRED P. JACOB, of the city and county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Gas-Burners, of which the following is a specification.

My invention relates to gas-burners; and it consists of certain improvements, which are fully set forth in the following specification, and shown in the drawings which accompany it.

It is often very desirable at night, particularly in halls and the sick-room, to have a gas-burner so arranged that the full jet of gas can be instantly turned on and automatically lighted without the use of matches or other independent means of igniting. When the gas is merely turned down low, it is in constant danger of being blown out by any slight draft, and unless it is turned down so low that this is possible the room is not darkened. Many attempts have been made to accomplish this end, which have, as a rule, heretofore necessitated the operation of some mechanical means to ignite the gas after it has been turned on. These mechanical means are more or less objectionable and cumbersome and prone to get out of order.

It is the object of my invention to accomplish the automatic lighting of a full jet of gas by the mere turning of the valve, without any other devices, to be operated by the hand. This is done by means of a valve in the burner, which is automatically operated by the pressure of the gas emerging in the pipe to the burner. The gas issuing from the tip of the burner is instantly ignited by a small auxiliary flame arranged in comparatively close proximity to the tip of the burner. When the gas is lighted, this auxiliary flame is preferably extinguished; but when the gas is again turned out the automatic valve in the burner operates to cause the auxiliary flame to be once more ignited and ready to operate again to ignite the gas when it is again turned on.

The details of my invention will be more fully understood from the description of the drawings, in which—

Figure 1 is a side elevation of my improved gas-burner. Fig. 2 is a sectional view of the same through the line *yy* of Fig. 3. Fig. 3 is a cross-sectional view through the line *xx* of

Fig. 2. Figs. 4 and 5 are perspective views of the automatic valve removed from the burner, and Fig. 6 is a sectional view through the line *zz* of Fig. 1.

A is the gas-pipe, and B the gas-burner, having the tip C, through which the gas emerges. Within the burner B is placed a valve-chest D, consisting of a cylindrical metal piece E, adapted to closely fit the inner part of the burner and to be held firmly therein, but capable of being pushed out, when desired, for repairs. Within this cylindrical piece E is a valve F, with its open part downward. This valve F is provided with a longitudinal slot *f*, and through a hole *e* in the side of the cylinder E a pin G is inserted, to hold it within the cylinder and prevent it from turning. The slot *f* will allow the valve to rise and fall.

H is a hole or passage-way in one side of the valve F. One side of the cylinder E is partially cut away to form a passage-way between the cylinder E and the inner surface of the burner B, and opening into this passage-way is a hole or orifice J through the cylinder. On the opposite part of the cylinder E is a hole K. The valve F is so supported on the pin G that normally the hole H is opposite and coincides with the hole K of the cylinder. The burner B also has an opening *b* at a similar point, so that there is normally a passage-way through the valve F, cylinder E, and burner B, as shown in Fig. 2.

L is a small tube or auxiliary burner into which this passage-way opens.

M is a cylindrical screen having a collar N, by which it is attached to the burner B. This screen M is open at the bottom to receive the tube or auxiliary burner L, and has an opening at the top, which is almost on a level with the tip C of the burner. I prefer to construct this screen of fine wire-gauze with a metal top and bottom, and to have it open at the top only toward the side near the burner-tip C; but the details of this screen are not essential to my invention. Its only function is to protect the flame against drafts and allow of a sufficient supply of air, and when protection of that flame is not necessary the screen may be entirely dispensed with.

Normally the valve F is suspended on the pin G within the cylinder E, and there is a



passage-way on one side through the valve, cylinder, and burner into the small auxiliary burner L, and the edge of the valve on the other side extends over and covers up the opening J through the cylinder into the passage-way I, leading to the main burner. When, however, the gas is turned on full, the pressure of the gas against the valve F is increased, and by this pressure the valve is raised, closing the passage-way on the one side to the auxiliary burner L and opening that on the other through J and I to the main burner. These two passage-ways should be so located with reference to each other that the closing of the one is almost simultaneous with the opening of the other, or so regulated that the gas has commenced to escape through the tip C before the auxiliary burner L is extinguished, and vice versa. Then the escaping gas coming in contact with that small flame is instantly ignited and the auxiliary jet is extinguished.

It is apparent that the valve F must in practice be made sufficiently light in weight to be instantly operated by the pressure of the gas, and while this pressure continues of sufficient strength (which of course depends on the amount of gas turned on by the main valve) the valve will be held up and the gas will continue to flow to the burner B. When, however, the main valve is partially closed, so that the pressure of gas is sufficiently diminished, the valve F will fall, thereby closing the passage-way to the burner B just after opening that to the auxiliary burner L, and the gas escaping from said auxiliary burner will be ignited by the flame from the main burner B, which will then be extinguished. Of course if the main valve is totally closed and the entire supply of gas shut off both burners will be extinguished, and to prevent this happening accidentally I provide the main valve-cock O with two projections or pins *o o'*, or one long one in place of two, as is usual, having their operating edges arranged a short distance apart, so that on turning the cock in one direction the pin *o'* will come in contact with the projection P on the gas pipe or fixture, and thereby supply sufficient gas to the small auxiliary burner L without operating the valve. If, however, it is desired to completely shut off the supply of gas, the cock O is turned in the opposite direction until the pin *o* comes in contact with the projection P', which closes the valve in the usual or present manner.

It will be seen that by my invention the gas may always be kept ignited at the auxiliary burner L, and that upon simply opening the main or supply valve the gas automatically operates the valve F in the burner and a full jet of gas is ignited at the main burner B. The screen M, as above stated, protects the little auxiliary flame and prevents it from being extinguished by the drafts in the room, and at the same time readily supplies all the air needed.

The minor details here shown may manifestly be varied in a number of ways without in the least departing from the principles of my invention.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a main gas-burner with an auxiliary burner opening therefrom, a short inverted-cup-shaped valve loosely held entirely within said main burner and free to move vertically therein, and passages to the main and auxiliary burners controlled by said valve, so that when the one is opened the other is closed.

2. The combination of a main gas-burner with an auxiliary burner opening therefrom, a cylindrical chest held in said main burner and provided with passages leading, respectively, to the main and auxiliary burners, and a sliding valve loosely supported in said cylindrical chest normally open to the passage leading to the auxiliary burner and closed to that leading to the main burner.

3. The combination of a main gas-burner with an auxiliary burner opening therefrom, a removable cylindrical chest held in said main burner and provided with passages leading, respectively, to the main and auxiliary burners, and a sliding valve loosely supported in said cylindrical chest normally open to the passage leading to the auxiliary burner and closed to that leading to the main burner.

4. A gas-burner consisting of a main burner, in combination with an auxiliary burner opening therefrom, and a valve operated by the pressure of the gas, consisting of a vertically-movable inverted cup, and a cylindrical piece within which said cup is supported and upon the sides of which it is guided, located within the main burner, and provided with openings, respectively, to said main and auxiliary burners, said openings to the main burner being normally closed and the opening to the auxiliary burner being normally open.

5. A gas-burner consisting of a main burner, in combination with an auxiliary burner opening therefrom and a valve operated by the pressure of the gas, consisting of a vertically-movable inverted cup, and a cylindrical piece within which said cup is supported and upon the sides of which it is guided, provided with passages substantially in opposite sides opening, respectively, into the main burner and into the auxiliary burner located within the main burner, the former of said passages being normally closed and the latter normally open when the supply is increased.

6. In a gas-burner, the combination of the main burner B, auxiliary burner L, opening thereinto, cylinder E, held in said burner, having a passage-way K on the one side to said auxiliary burner, and passage-ways I J on the other to said main burner, valve F, provided with opening H, normally opposite to passage-way K into the auxiliary burner loosely se-



cured in said cylinder E, but free to rise therein to close the passage-way into the auxiliary burner and to open that into the main burner.

5 7. In a gas-burner, the combination of the main burner B, auxiliary burner L, opening thereinto, cylinder E, held in said burner having a passage-way K on the one side to said auxiliary burner and passage-ways I J on the  
10 other to said main burner, valve F, provided with opening H, normally opposite to passage-

way K into the auxiliary burner, loosely secured, by means of slot *f* and pin G, on said cylinder E, but free to rise therein to close the passage-way into the auxiliary burner 15 and to open that into the main burner.

In testimony of which invention I hereunto set my hand.

ALFRED P. JACOB.

Witnesses:

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ERNEST HOWARD HUNTER.