

(No Model.)

J. F. STRONG & J. H. J. HAINES.

AUTOMATIC SAFETY GAS BURNER.

No. 343,282.

Patented June 8, 1886.

Fig. 2.

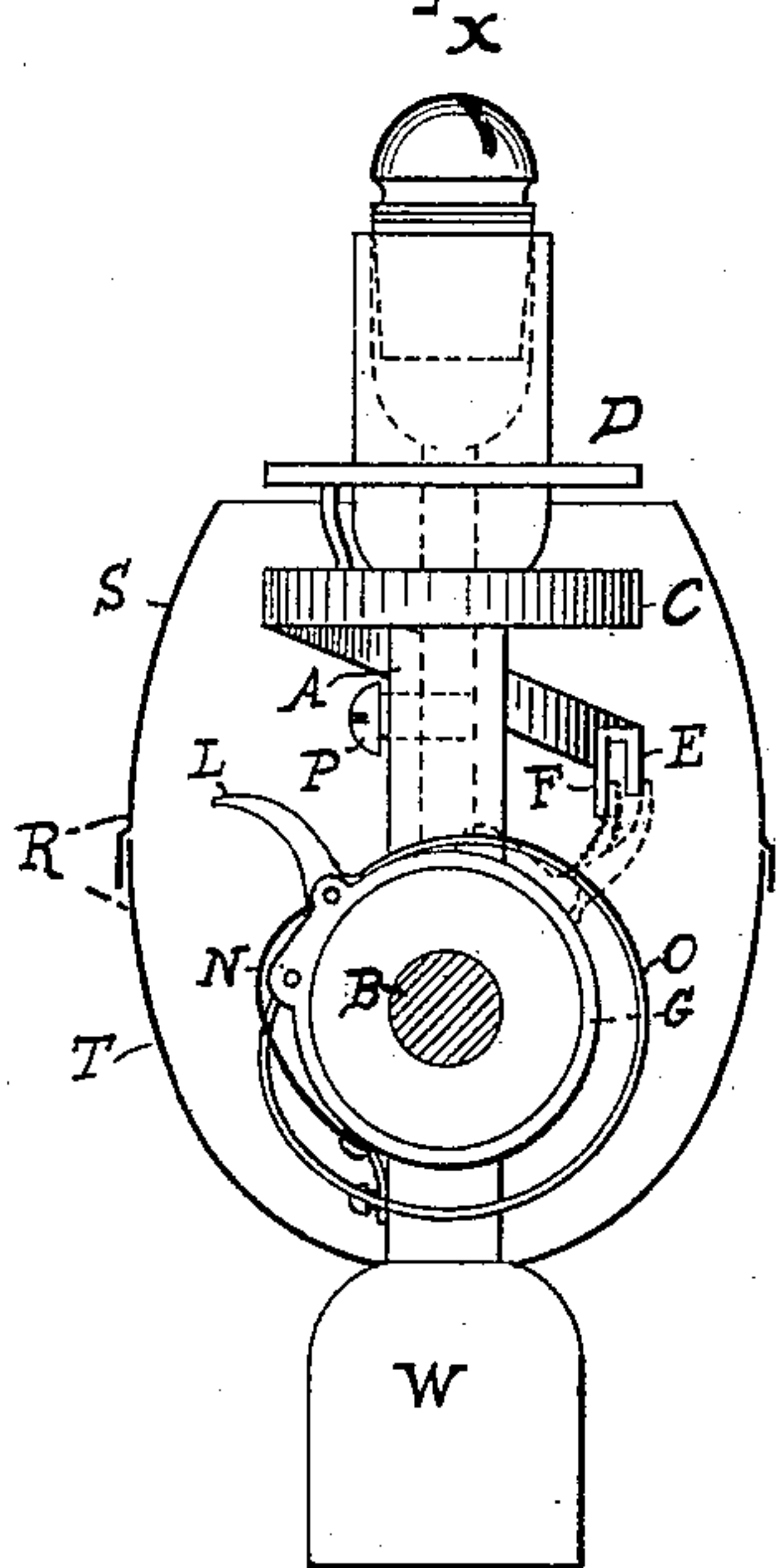


Fig. 3.

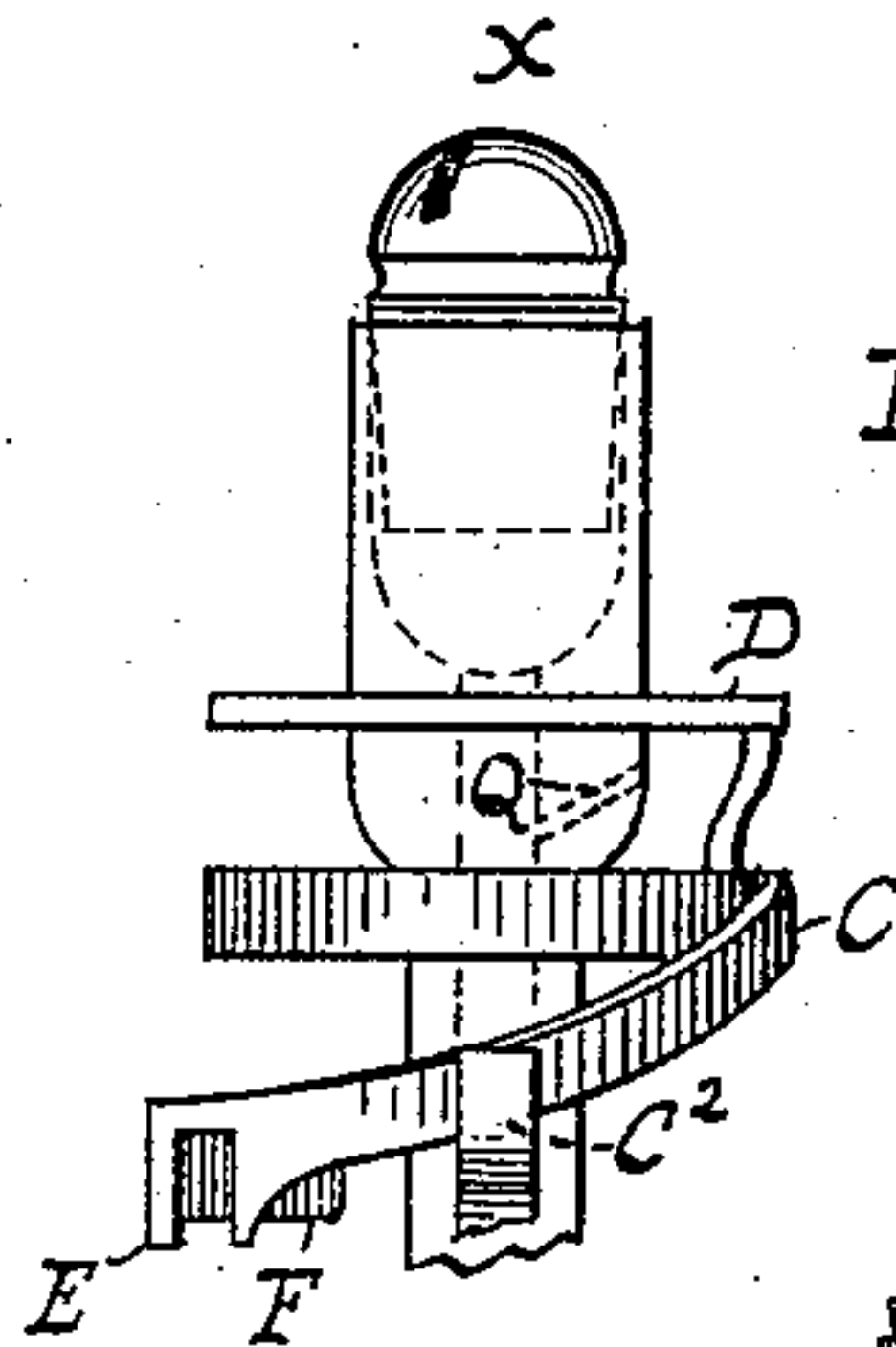


Fig. 1.

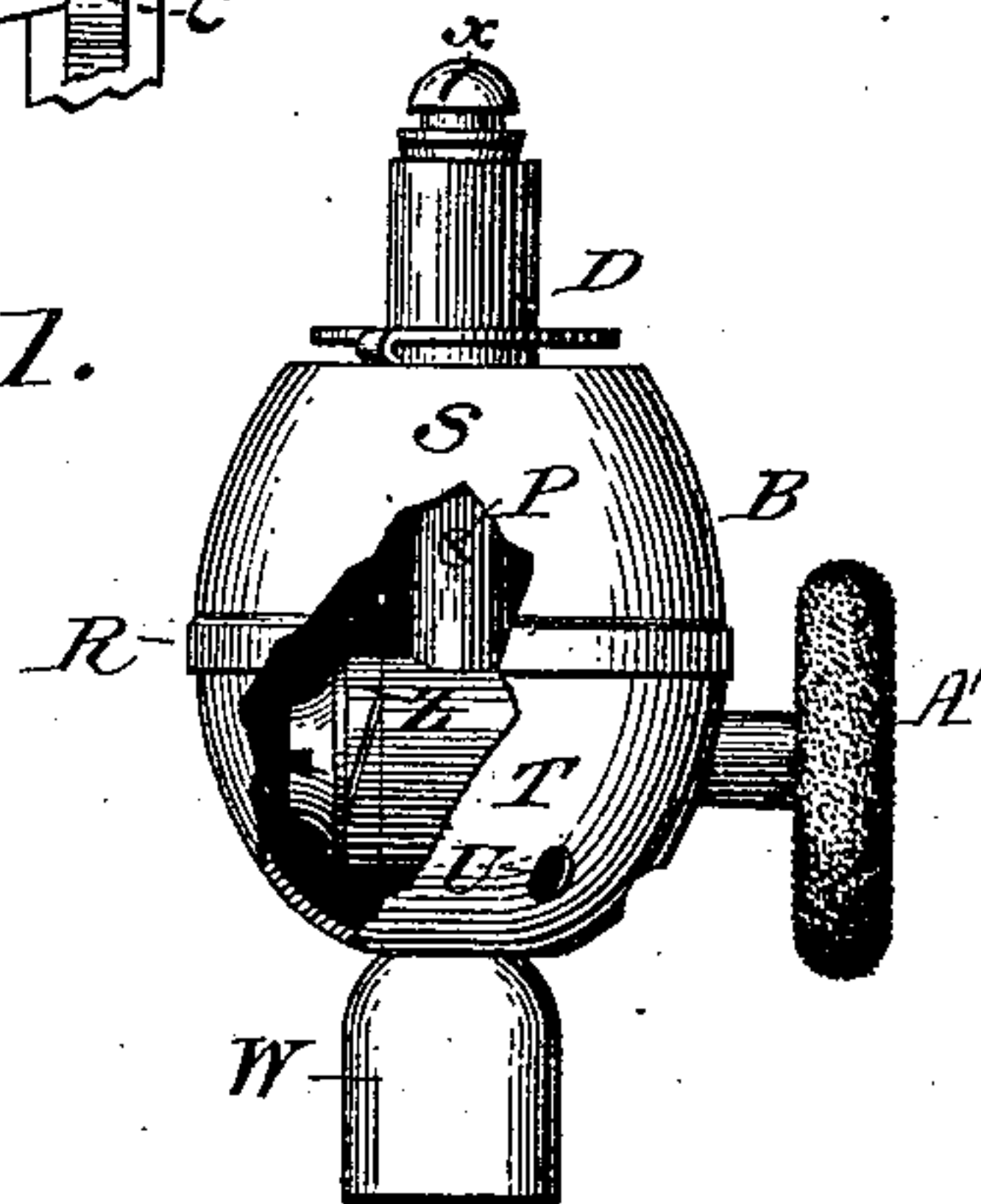


Fig. 7.

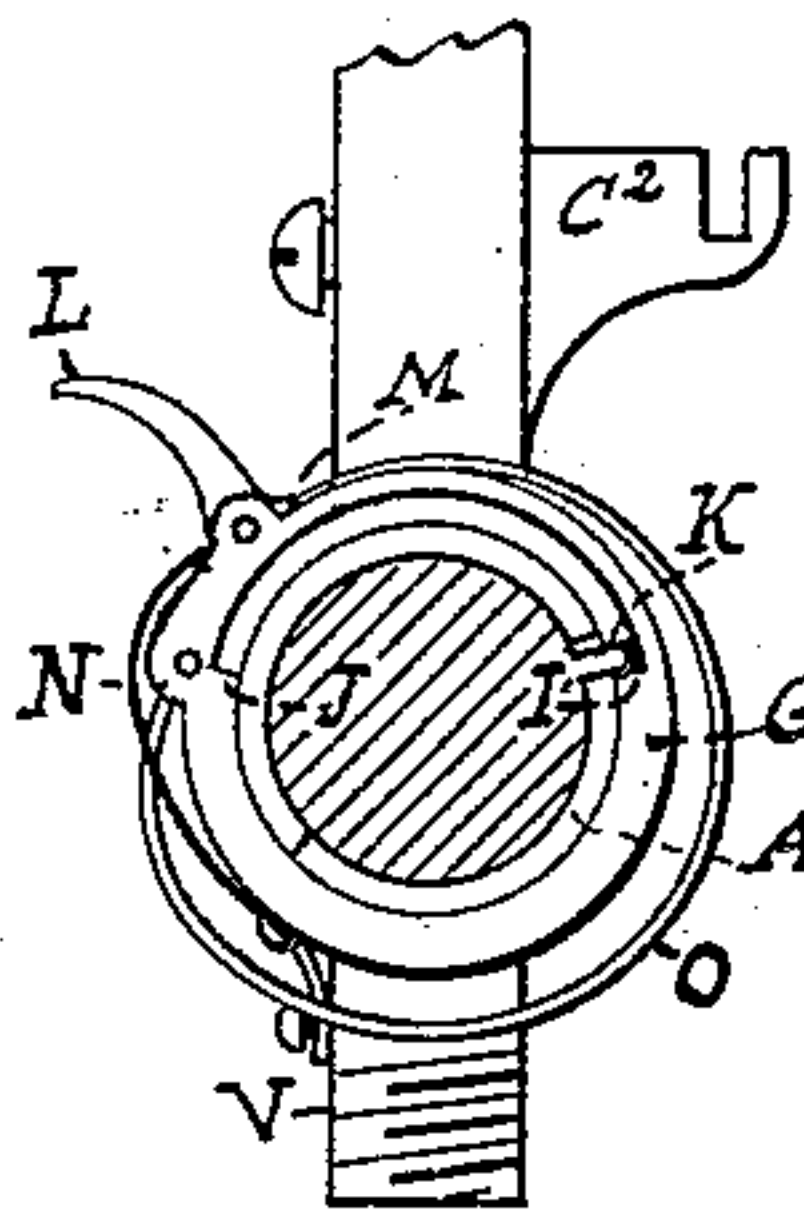


Fig. 8.

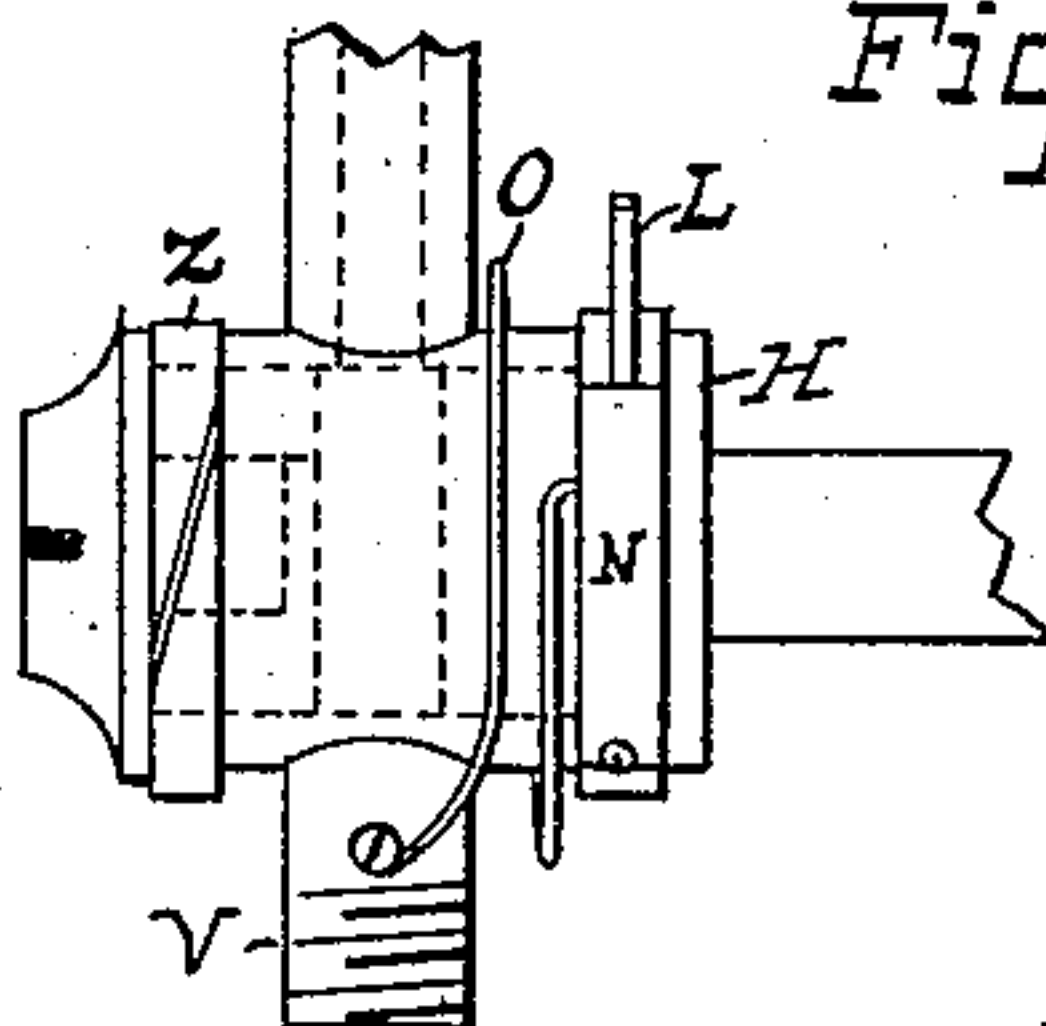


Fig. 6.

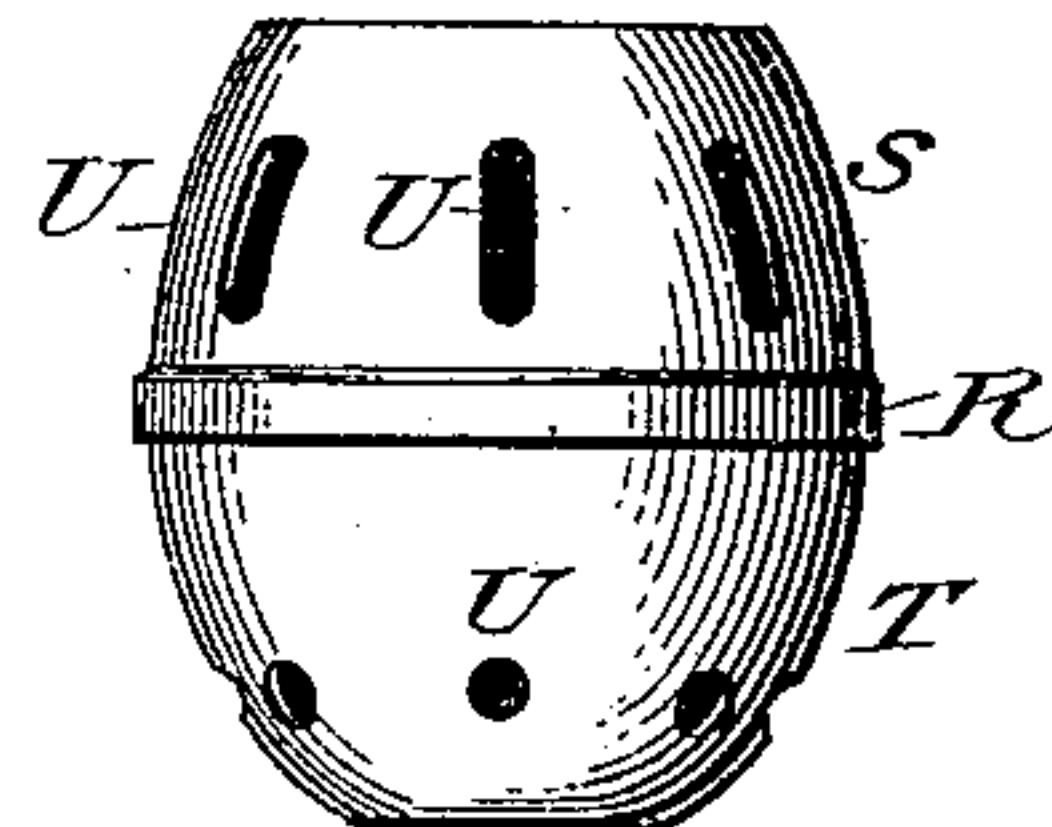


Fig. 5.

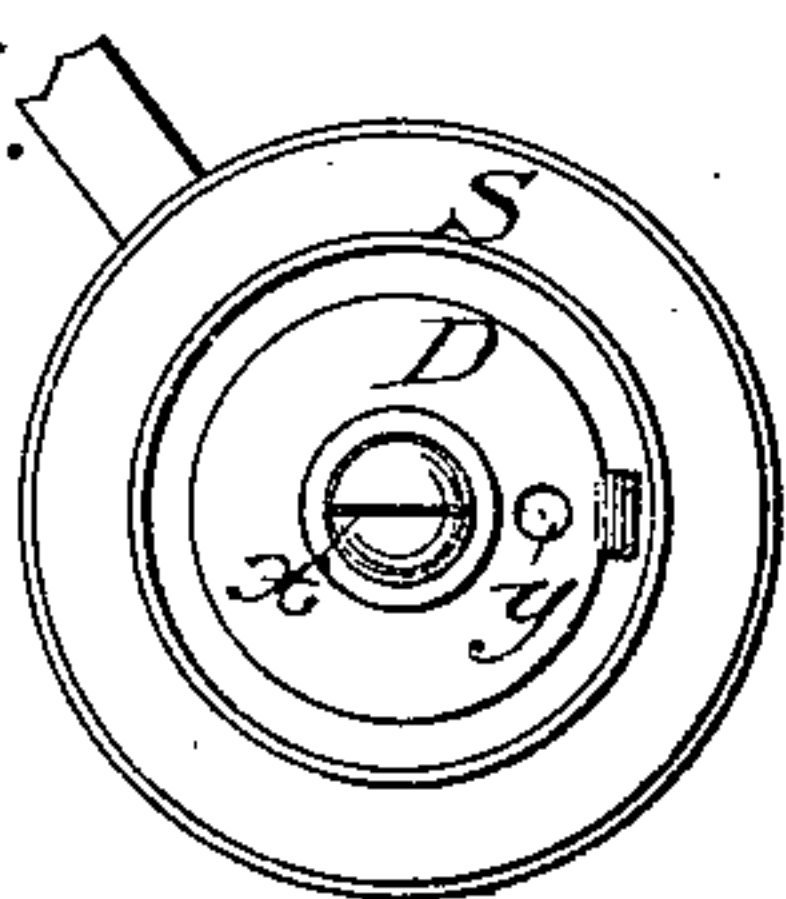


Fig. 4.



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# UNITED STATES PATENT OFFICE.

JAMES F. STRONG AND JOHN H. J. HAINES, OF FLUSHING, NEW YORK.

## AUTOMATIC SAFETY GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 343,282, dated June 8, 1886.

Application filed May 2, 1885. Serial No. 164,173. (No model.)

*To all whom it may concern:*

Be it known that we, JAMES F. STRONG and JOHN H. J. HAINES, both of Flushing, in the county of Queens and State of New York, have  
5 invented certain new and useful Improvements in Automatic Safety Gas-Burners, of which the following is a specification.

Our invention relates to the improvements in gas-burners whereby the escape of gas is  
10 automatically stopped if the flame is extinguished.

In the drawings, Figure 1 is a view of our invention with part of the jacket broken away to show the spring-washer and regulating-  
15 screw. Fig. 2 is a view of the same, partly in section, taken at right angles to Fig. 1. Fig. 3 is a detailed view of the upper part of the jet and of the expanding-spring. Fig. 4 is a detailed view of the end of the expanding-  
20 spring, showing the compound lips, taken from the side opposite to that shown in Fig. 3. Fig. 5 is a plan view from the above of the gas-nipple, expanding-spring-plate, and jacket. Fig. 6 is a detailed view of the jacket. Fig.  
25 7 is a detailed view of the cut-off collar and arm. Fig. 8 is a detailed view of the cock and cut-off mechanism, taken at right angles to Fig. 7.

Similar letters of reference designate similar parts in all the drawings.

A is the body of the gas jet or burner, having therein the rotary cock B.

C is a coiled expanding-spring terminating at one end in the plate or ring D, which passes  
35 around and is firmly attached to the upper end of the burner A, and which has at its other end the compound lips E F. This spring is made of two metals which expand unequally under the application of heat, the  
40 metal which has the greatest expansion being placed upon the outside of the coil, in the usual manner.

C<sup>2</sup> is a lug or other suitable projection on the body of the burner having a notch or opening for the spring C to rest in, through which  
45 the spring can slide as it expands and contracts, while at the same time it has lateral and vertical support.

G is a collar or ring placed loosely upon a  
50 shoulder on the valve-box, and held in position by the flange H on the stem of the cock B, and having the recess or cut-away portion

I J. The shoulder of the valve-box is also recessed from I to J, to allow the pin K to travel therein, and to arrest the rotation of the cock  
55 B at those points.

K is a pin or projection on the shank of the cock B, which travels in the recess J I of the ring G, so that the cock B may rotate within the ring G a distance equal to that from  
60 I to J.

L is an arm pivoted upon the ring G, having the toe M, to prevent its flying too far forward and being pressed forward by the  
65 spring M.

O is a coiled spring, one end of which is attached to the body of the burner and the other end to the ring G, so as to rotate the latter, as hereinafter described.

P is a screw projecting through into the  
70 channel of the burner, for the purpose of regulating the flow of gas therein, if desired.

Q is a fine hole from the channel of the burner to the outside thereof, through which a very small jet of gas may escape for the purpose of  
75 operating the expanding-spring, as hereinafter more fully described.

R is the jacket of the burner, which we prefer to make in two parts, S T. U U U are apertures through said jacket for the purpose  
80 of ventilation, &c. We find it most convenient to first apply the portion T of the jacket around the portion V of the burner, and then to screw up against it the portion W, which holds it firmly in place. The portion S can then be  
85 placed on from above and fitted upon the portion T, and sealed or soldered thereto, if desired.

The operation of our invention is as follows: The cock being closed, the ring G and  
90 attachments will be in the position shown by the solid lines in Fig. 2, and to open the cock it will be necessary to turn it from left to right, in which movement the pin K, bearing at I against the collar G, will carry the latter  
95 around until the arm L buckles and passes under the lip E of the spring C, and assumes the position shown by the broken line in Fig. 2. If the cock be released before the arm L has passed the lip E, the spring O will rotate the  
100 collar G, carrying with it the cock B and closing the same; but when the arm L is in the position shown by the broken lines in Fig. 2, it will keep the collar G from rotating, the



cock will be open, and the gas may be lighted at the nipple X. When this is done, a very small jet of gas will escape through the hole Q, and at once become lighted from the main jet, and, burning under and against the plate D, and up through the hole Y therein, will heat the plate D and spring C, and expand the latter. This upward course of the small jet from Q is facilitated by the upward inclination of the channel Q; but we do not confine ourselves to the particular angle or position of the channel Q, for it may be given any angle or position in which the flame from it will reach or heat the plate D or the spring C, or both, and it is even practicable to dispense with the channel Q and jet therefrom, and derive the heat necessary to operate the spring C directly from the main jet at X, by any suitable means; neither is the hole Y essential to the operation of our device. Should the jet from Q be extinguished by any means while the jet at X continues to burn, it will readily relight itself from X, and, being a very fine jet, any draft which will extinguish the flame at X will readily reach it through the apertures U U and the opening between the plate D and the top of the jacket R, and extinguish it also. The gas being turned on and lighted, the heat from the jet at Q will expand the spring C, so that the lip E will slide past and from under the arm L, when the arm L will be thrown into the position shown by the dotted lines in Fig. 2, in which position it will remain so long as the gas-jet continues to burn and keep the spring C expanded. When the arm L passes from the lip E to lip F, if the cock is fully open at the time it will have an effect of slightly turning the cock B, and to allow for this play without interfering with the flow of the gas we make the hole through the cock B slightly larger in diameter than the channel of the burner, (see Fig. 8,) and to prevent the cock B from being "bounced" or thrown too far around by this change of position of the arm L we make use of the spring-washer Z, to keep the cock B snug. The screw P is used to adjust the flow of gas through the burner, when desired, to prevent the flame from being too strong or being driven against the plate D or spring C, so as to burn or injure the same. When the arm L is held back by the lips of the spring C, the cock B may be rotated from I to J, and opened or closed at will; but whenever the flame is extinguished from any cause, and the spring C cools and contracts, (which is facilitated by ventilation through the apertures U U U,) the arm L will be released by the lip F, and the collar G will be rotated by the spring O, and catching the pin K by I, will rotate and close the cock B, if it is at all open at that time; or if the cock B be closed at that time will hold it closed.

A considerable degree of heat will sometimes be produced in the parts of the burner, and if the key A' is in close proximity to the cock and other parts, as shown in the draw-

ings, we find it preferable to make it of rubber or some other non-conducting material.

By means of our construction we obtain a burner wherein the channel for the flow of the gas is controlled only by a single rotary cock, which cock, when turned so as to open said gas-channel, will set the automatic cut-off actuating mechanism, and will then, as long as the gas-jet burns, be free, so that it can be rotated without interfering with said cut-off mechanism to wholly or partly open or close said gas-channel, but will be automatically rotated, so as to close said gas-channel when the flame of the gas-jet is extinguished.

Having thus described our invention, what we claim, and desire to secure by Letters Patent of the United States, is—

1. The combination of the burner A and its governing-cock, a collar surrounding the cock and engaging therewith, a spring connected to said collar and burner for moving the collar in one direction, a detent pivoted to the collar, and an expansion-spring composed of brass and steel attached to the burner, the said burner being provided with the channel Q, opening near said expansion-spring and its connections, substantially as described.

2. In an automatic safety gas-burner, the burner A, an expansive spiral spring, C, composed of brass and steel or their equivalents and secured at its upper end to the burner A, and adapted at its lower end to engage with the arm L, the cock B, provided with the pin K, the springs N O, arm L, collar G, engaging at two points on its interior with the cock B, substantially as and for the purposes set forth.

3. A body, A, cock B, provided with the pin K and flange H, or their equivalents, collar G, having the recess portion I J, the arm L and springs N O, and expanding spiral spring C, composed of brass and steel or their equivalents, combined and operating substantially as set forth.

4. A body, A, cock B, provided with the flange H and pin K, or their equivalents, collar G having the recess I J, arm L, and springs N O, and expanding spiral spring C, composed of brass and steel or their equivalents, the spring-washer Z, and the screw in the end of the cock B, to hold said washer in place, substantially as set forth.

5. In an automatic safety gas-burner, the burner A, provided with the lug C', an expansive spiral spring, C, composed of brass and steel or their equivalents and secured at its upper end to the burner A, and adapted at its lower end to engage with the arm L, the cock B, provided with the pin K, springs N O, arm L, collar G, engaging at two points on its interior with the cock B, substantially as set forth.

6. In an automatic safety gas-burner, the combination of the burner A, provided with the channel Q, plate D, the expanding-spring C, composed of brass and steel or their equivalents, and provided with the lips E F, the



cock B, collar G, provided with the recess I J, arm L, and springs N O, substantially as and for the purposes set forth.

7. An automatic safety gas-burner having  
5 the body A, provided with the channel Q, the plate D, provided with the hole Y, the spring C, composed of brass and steel or their equivalents, provided with the lips E F, the cock B,  
10 provided with flange H and pin K, or their equivalents, the spring-washer Z, the collar G, having the recess I J, arm L, and spring N, and spring O, substantially as and for the purpose set forth.

8. An automatic safety gas-burner having  
15 the body A, provided with the channel Q and

lugs C', the plate D, provided with the hole Y, the spring C, composed of brass and steel or their equivalents, and provided with the lips E F, the cock B, provided with the flange H and pin K, or their equivalents, the spring- 20 washer Z, the collar G, having the recess I J, arm L, and spring N, the spring O, jacket R, and key A', formed of rubber or similar non-conducting material, substantially as set forth.

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Witnesses:

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