(No Model.)

C. H. KEENEY.

SELF CLOSING CUT-OFF FOR GAS BURNERS.

No. 491,943. Patented Feb. 14, 1893.

Fig. 1.

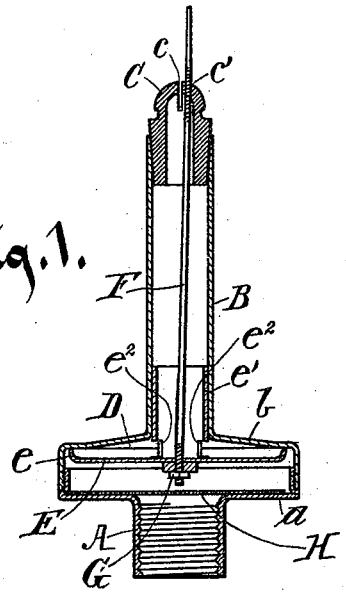


Fig. 2.

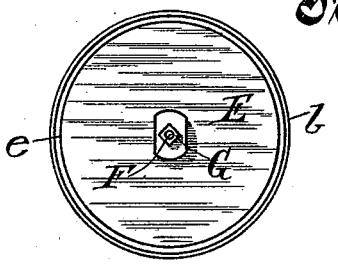
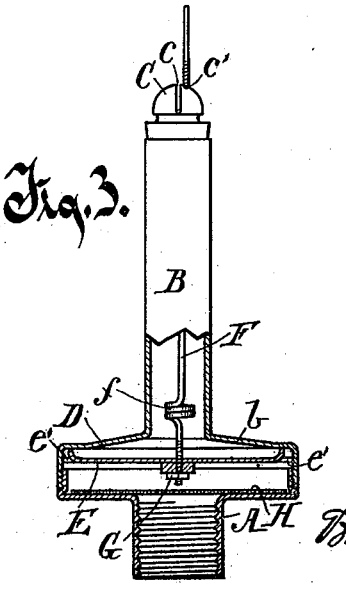


Fig. 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

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SELF-CLOSING CUT-OFF FOR GAS-BURNERS.

SPECIFICATION forming part of Letters Patent No. 491,943, dated February 14, 1893.

Application filed January 19, 1892. Serial No. 418,547. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. KEENEY, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in Self-Closing Cut-Offs for Gas-Burners, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

My invention has relation to improvements in gas burners where the flow of gas through the burner is automatically shut off, and prevented from escaping when the flame is extinguished, the devices being especially intended and adapted for shutting off the flow of gas through a burner when, by accident or otherwise, the flame of the gas has been extinguished, thus preventing the flow of unconsumed gas into the room where the burner is located.

In the drawings, Figure 1, is a vertical sectional view. Fig. 2, is an inverted plan view of Fig. 1, with the base removed, and Fig. 3, is a view, partly in section, of a slightly modified construction.

Like letters of reference refer to like parts in all the views.

Referring to the drawings, the letter A indicates the base of a gas burner, B its shell or body connected thereto by means of screw threads, and C the tip provided with the usual slit or apertures, *c*, for the escape of gas, and also, to one side thereof, with a second screw threaded aperture *c'*. It will be noticed that the base, A, and the lower end of the shell or body, B, are each provided with right angular flanges, *a b*, respectively, said flanges having threads which form the screw threaded connection between the two parts, and serve as means for disconnecting the same, whereby the interior mechanism may be properly inserted in place, or removed as desired. These registering right-angular flanges form an annular valve-chamber, D, in which an annular disk-valve, E, has vertical play. Said valve, at its circular edge or circumference, is upturned slightly, as indicated at *e;* and also in Fig. 1 is shown as formed or provided with an upwardly extending guiding tube *e'*, which slides freely in the shell or body B, below which it is provided at diametrically opposite points with ports or openings, e^2, or with a series of such openings arranged annularly. The tube has the function of accurately guiding the valve, and securing for the same a true movement in a vertical path. I do not wish to be understood as confining myself to a complete tubular guiding stem for effecting this purpose, as it is obvious that a series of arms or projections extending from the valve up into the shell or body will accomplish the same purpose.

The valve is composed of any desired metal best adapted to accomplish the purpose, the essential feature, however, in the construction shown in Figs. 1 and 2 being that it should be of thin metal so as to yield or spring readily when pressure or force is applied thereto. That is to say, I employ what I term a "flexible" valve.

The letter F indicates an expansible and contractible rod having its upper end screw threaded and passing through the threaded aperture, *c'*, of the tip thus forming a rigid connection therewith, and having its lower end also screw-threaded and passing through a threaded central aperture of the valve, the under surface of the valve at this point being somewhat thickened to form a boss, whereby a greater surface is afforded for the threads, and also a projection presented for turning the valve, and thereby adjusting the same from the lower end. A jam nut, G, takes upon the end of the rod and bears against the boss. It will thus be seen that the rod also has a rigid connection at its lower end with the valve.

The construction shown in Fig. 3 is similar in all essential respects to that shown in the other figures. The rod, F, however, instead of being straight throughout its entire length is provided near its lower end with coils *f*. The guide, *e'*, is also somewhat different. Instead of extending a tube or arms up vertically from the valve into the shell or body, I merely provide lugs, *e'*, extending out horizontally from the valve and acting against the inner surface of the vertical wall of the right angular flange formed upon the shell or body.

The above constitutes a complete description of the construction of my invention. Its operation will now be explained. In the drawings, the valve is shown as against its seat, consequently shutting off the flow of gas. When it is desired to light the gas, it is only necessary to hold the match to the slit for a few seconds. Under the action of the heat, the rod, F, soon begins to expand, and necessarily forces the valve downwardly away from its seat, and thus a clear passage for the free flow of the gas to the tip is afforded. While the gas continues to burn, of course, the valve will be held open by the expansion of the rod. Upon the flame being extinguished, however, the loss of heat and change of temperature thereby produced will, in a few seconds, cause the rod to contract and again draw the valve back to its seat thus closing the passage for the gas. If desired, of course, an ordinary gas cock may be used in connection with my invention.

The merits of a device constructed in accordance with the foregoing description, it is thought will be readily appreciated by any person skilled in the art. It will be seen that the rod, F, not only acts by expansion to open the valve, but furthermore upon the extinguishment of the flame, the subsequent contraction thereof serves to close the valve against further escape of gas, thus dispensing entirely with the necessity of employing springs, or equivalent means, for effecting this purpose.

Attention is also directed to another very important feature of my invention, which is attained in the device shown in Figs. 1 and 2 primarily by reason of the employment of the flexible valve, and in Fig. 3, primarily by the employment of a rod provided in its length with a series of coils.

Practical experiments have demonstrated the fact that the shell or body is also affected somewhat by the action of the heat, so that while the rod, F, is expanded very quickly, and sufficiently to force the valve clear of its seat, said shell or bracket is also elongated or lengthened to some extent. The moment the flame is extinguished, the rod being of small area, and being surrounded by the gas which has now lost much of its heat, cools more readily than the surrounding shell or body, which retains its heat longer. This cooling immediately causes the rod to contract and seat the valve carried thereby. It is apparent, however, that when this occurs the shell or body has not yet contracted sufficiently to assume its normal position, and the consequence is that considerable strain is experienced, which it is necessary to provide against. To do this I merely construct a valve, as previously stated, of thin metal, as indicated in Figs. 1 and 2, which gives it a certain degree of flexibility, or, as indicated in Fig. 3, I provide the rod with a series of coils, *f*, which accomplish the same function, that is, holds the valve yieldingly to its seat. In this latter instance the valve may be either of thin metal or not as desired.

A further advantage possessed by my invention is that the entire device may be stamped out of metal instead of being cast, thereby saving time and labor in the manufacture of the invention, and greatly decreasing the cost thereof.

I have also shown the base of the burner as provided with an interior wire screen or gauze, H, which, in its application to my invention, serves the purpose of preventing the entrance of any solid particles which would have a tendency to clog the valve opening, and thereby prevent the closing of the valve.

It is to be noted that I provide very convenient means for adjusting the valve either from the top or bottom of the burner. In adjusting from the top, all that is necessary is simply to rotate the valve rod, the threads thereof turning in the threaded aperture *c'*. Said rod is, therefore, moved either up or down in accordance with the direction of rotation. As the valve is attached rigidly to the lower end of the stem or rod, of course it is likewise moved either up or down therewith. When it is desired to adjust the valve from the bottom, either the burner base may be removed in order to gain convenient access to the boss, or a tool may be inserted into the bore of the burner base, without the necessity of removing the latter, and said tool made to engage the boss and thus turn the valve.

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

1. In a self closing cut off for gas burners, the combination, with a valve, of a vertically acting expansible and contractible rod constructed by its expansion to effect the opening of said valve and by its contraction the closing thereof, substantially as set forth.

2. In a self closing cut off for gas burners, the combination of the burner proper, a valve located therein, and a vertically acting rod having rigid connections at opposite ends with the burner tip and with the valve, respectively, said rod adapted by expansion to open the valve, and by contraction to close the same, substantially as set forth.

3. In a self closing cut off for gas burners, the combination, of a gas burner provided with an interior valve seat, a valve located in said burner, and an expansible and contractible valve rod having connection with the valve and adapted to effect the opening and closing thereof and to allow for the excess of its contraction over that of the burner shell so as to properly seat the valve and hold the same yieldingly to its seat without undue strain, substantially as set forth.

4. In a self closing cut off for gas burners, the combination of a burner proper, provided with an interior valve seat, an expansible and contractible valve rod having rigid connection at its upper end with the burner tip, and

a flexible valve secured rigidly to the lower end of the valve rod, and adapted, through its flexibility, to allow for the excess of the contraction of the rod over that of the burner shell, substantially as set forth.

5. In a self closing cut off for gas burners, the combination, with a burner proper, of a valve located therein formed or provided with a projecting guide bearing and guided in the cylindrical inner wall of the burner tube, substantially as set forth.

6. In a self closing cut off for gas burners, the combination, of a valve casing having its upper end provided with a screw threaded aperture, a valve within the casing, a valve rod for operating the same, the upper end of said rod being threaded and passing through the threaded aperture of the burner to the exterior thereof, whereby the position of the valve may be regulated exteriorly of the upper end of the burner, substantially as set forth.

7. In a self closing cut off for gas burners, the combination of a valve casing, a valve therein provided with a screw threaded aperture, and a valve rod having a threaded end passing through the aperture, whereby the position of the valve may be regulated from the lower end of the burner, substantially as set forth.

8. In a self closing cut off for gas burners, the combination, of a valve casing the upper end thereof provided with a screw threaded aperture, a valve within the casing also provided with a screw threaded aperture, and a valve stem having its opposite ends threaded, and passing through the threaded apertures of the burner and valve, respectively, substantially as set forth.

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

CHARLES H. KEENEY.

Witnesses:
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