

(No Model)

F. P. BARNEY.
SELF CLOSING GAS BURNER.

No. 585,902.

Patented July 6, 1897.

Fig. 1.

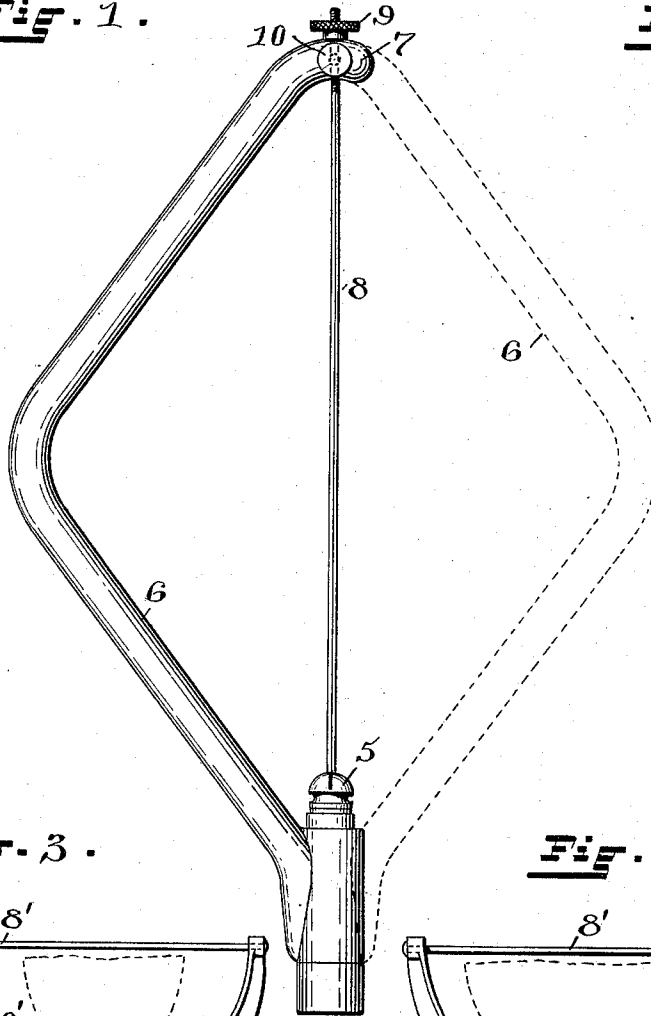


Fig. 2.

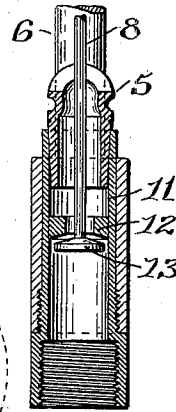


Fig. 3.

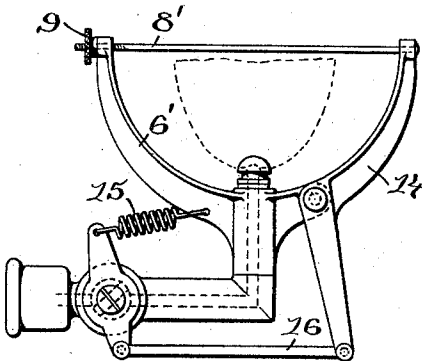
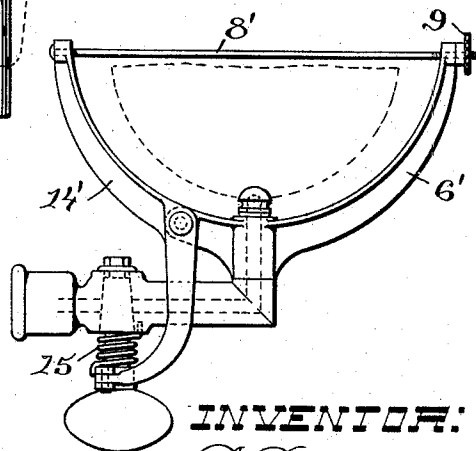


Fig. 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

FRANK P. BARNEY, OF CHARTLEY, MASSACHUSETTS.

SELF-CLOSING GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 585,902, dated July 6, 1897.

Application filed February 25, 1897. Serial No. 625,011. (No model.)

To all whom it may concern:

Be it known that I, FRANK P. BARNEY, of Chartley, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Self-Closing Gas-Burners; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

This invention has reference to improvements in fixtures for burning illuminating-gas; and it consists in the peculiar and novel construction whereby on the extinguishing of the flame the gas will be automatically shut off, as will be more fully described hereinafter.

In the use of coal-gas for lighting purposes the extinguishing of a light without the careful closing of the gas-supply to the burner is a constant and alarming cause of danger. Many gas-fixtures exist in which the valve has not the proper stops. Such cocks or valves are liable to be turned so as to extinguish the light and turned enough farther to permit the gas to escape. Many lives are annually lost by asphyxiation from illuminating-gas and often attributed to self-destruction when the fault was with the gas-fixtures. Pure coal-gas, formerly used, by its offensive odor gave at least notice of its escape; but natural gas and the modern water-gas while more deadly give no warning of their presence.

The object of this invention is to prevent the possibility of the escape of gas from a burner after the light has been extinguished.

Another object of the invention is to automatically turn on the gas by the lighting of the same and automatically shut off the gas when the light is extinguished.

For the purpose of illustrating my invention I have selected and have shown in the drawings two distinct forms of devices for carrying my invention into practice. In one of these the valve is inclosed in the burner-tube. It is opened by the power exerted when a rod is heated and closed when the rod is cooled. In the other form the stress of a cold wire holds the valve closed and the expansion of the wire when heated permits the valve to be opened automatically by a spring.

As far as I know I am the first to use a rod or wire exposed to the flame, which on cooling automatically closes the gas-supply to a burner. I do not, therefore, wish to confine myself to the particular details of construction I have selected to illustrate my invention.

Figure 1 is a side view showing a burner, a frame extending above the burner, and a rod adjustably secured to the upper part of the frame and extending into the burner. Fig. 2 is a vertical sectional view of the burner, showing the valve operated by the vertical rod. Fig. 3 is a side view of a gas-fixture having a wire extending across the flame, the expansion of which permits the opening of the cock or valve and the contraction of which closes the valve. Fig. 4 is a side view of a modified gas-fixture operating on the same principle as the fixture shown in Fig. 3.

Similar numerals of reference indicate corresponding parts in all the figures.

In the drawings, 5 indicates the gas-burner; 6, a bracket, the base of which is secured to the burner, or it may be secured to the fixture supporting the burner. The bracket 6 may have one arm, as is shown in solid lines in Fig. 1, or it may have two, as is indicated in broken lines, so as to give to the bracket 6 an approximately diamond-shaped form. At the apex 7 the rod 8, having the upper end screw-threaded, is provided with the adjusting thumb-nut 9 and a clamping-screw 10. In the tube 11, which supports the burner 5, the valve-seat 12 is formed, and on the lower end of the rod 8 the valve-disk 13 is secured.

The operation of this burner is as follows: The rod 8, which extends through a hole in the center of the burner, is adjusted by the thumb-nut 9 to hold the valve-disk 13 to the valve-seat 12, so as to prevent any gas passing to the burner. When so adjusted, the rod is firmly clamped by the clamp-screw 10. By holding a taper or a match against the lower part of the rod 8 near the burner the rod quickly expands, the valve is partially opened, the gas ignited, and as the rod expands the flame burns bright. When now the gas is turned off to extinguish the flame or the flame is otherwise extinguished while the gas is turned on, the rush of gas and the

absence of the heat of the flame cause the rod to cool quickly and contract, thereby closing the valve 13 and preventing the escape of gas.

In practice I find that the closing of the valve is almost instantaneous, and that the difference between the high temperature of the flame and the normal temperature of a room is so great that on extinguishing the flame the rod contracts instantly.

In the devices shown in Figs. 3 and 4 the wires 8' do not by the force of expansion caused by heat open the valve; but by the force exerted on the cooling and contraction of the wires they close the valves automatically when the light is extinguished.

In Fig. 3 the bracket 6' extends from one side of the burner. The lever 14 is pivotally supported on a short bracket on the other side of the burner. The wire 8' is secured to the upper end of the lever 14 and is adjustably secured to the upper end of the bracket 6'. The wire 8' extends horizontally over the flame.

The valves used in the devices shown in Figs. 3 and 4 are the usual petcocks used in gas-fixtures, they being opened or closed by partially turning the same.

The valve in Fig. 3 is provided with a two-armed lever. One of the arms is connected by means of the coiled spring 15 with the bracket 6' and the other arm with the lower end of the lever 14 by the rod 16.

In Fig. 4 the lower end of the lever 14' is connected with an arm projecting from the stem of the petcock, and the spiral torsional spring 15' surrounds the stem of the petcock. One end of the spring is secured in the fixture and the other end bears on the arm to which the lower end of the lever 14' is secured.

The operation of the gas-fixtures shown in Figs. 3 and 4 is as follows: When the gas is

to be lighted, a taper or match is held under the wire 8'. The wire, exposed to the heat of the flame, quickly expands and releases the strain on the lever 14 or 14'. The spring 15 or 15' takes up the slack and partially turns the petcock, allowing the gas to escape, which is ignited and by its heat increases the expansion of the wire 8'. When now the flame is extinguished in any way, the wire 8' quickly cools, contracts, and draws the upper end of the lever 14 or 14' toward the upper end of the bracket 6' and operates the lever to turn the petcock against the tension of the spring 15 or 15', thereby shutting off the gas and preventing the possibility of the escape of gas from an unlighted burner and the possibility of asphyxiation or death from escaping gas, whether coal-gas, natural gas, or the practically inodorous water-gas.

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

In a gas-fixture, the combination with the gas-supply tube 11, the valve-seat 12, the burner 5 secured to the gas-supply tube, the bracket 6 extending from the gas-supply tube upward to a point above the center of the burner, of the wire rod 8, the adjusting-nut 9 for regulating the tension on the wire rod, the clamping-screw 10, and the valve-disk 13 secured to the lower end of the wire rod 8, whereby the longitudinal expansion of the wire rod by heat opens the gas-supply and the contraction of the wire rod by cooling closes the gas-supply, as described.

In witness whereof I have hereunto set my hand.

FRANK P. BARNEY.

Witnesses:

M. F. BLIGH,

JOSEPH A. MILLER, Jr.