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H. W. YERRINGTON.

SAFETY GAS BURNER.

APPLICATION FILED NOV. 17, 1902.

NO MODEL.

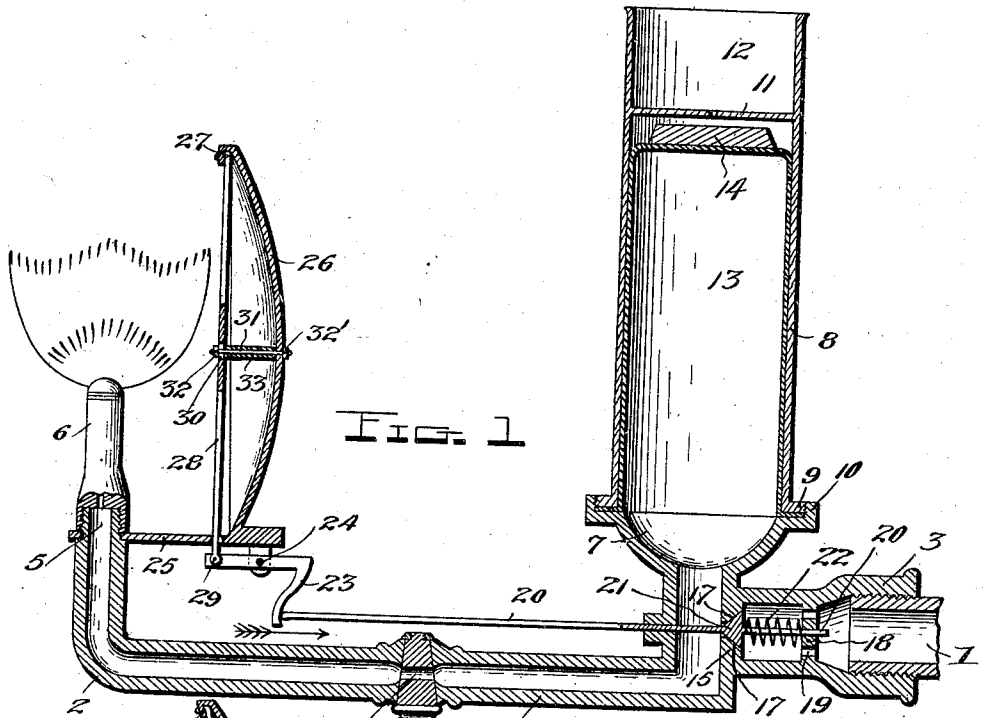

Fig. 1

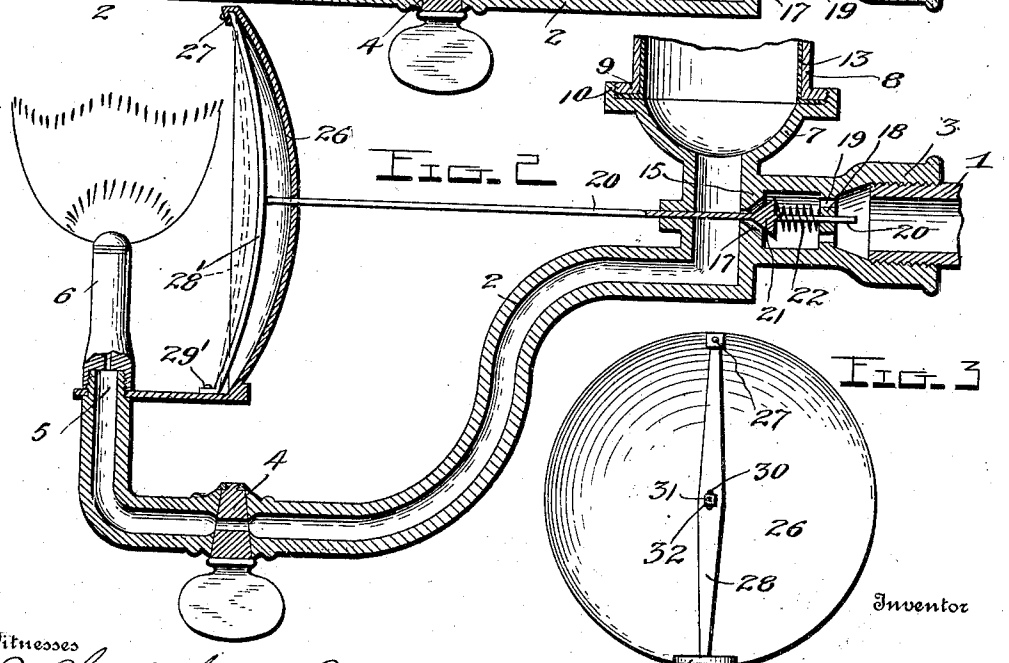

Fig. 2

Fig. 3

Witnesses

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HENRY W. YERRINGTON, OF OCEANIC, NEW JERSEY.

SAFETY GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 726,490, dated April 28, 1903.

Application filed November 17, 1902. Serial No. 131,775. (No model.)

To all whom it may concern:

Be it known that I, HENRY W. YERRINGTON, a citizen of the United States, residing at Oceanic, in the county of Monmouth and State of New Jersey, have invented certain new and useful Improvements in Safety Gas-Burners; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to automatic safety gas-burners of that type in which a valve controlled by a thermostat governs the supply of gas to the burner and is automatically closed when the gas ceases to burn.

The object of the invention is to provide a burner of this kind which will maintain the valve in the gas-pipe open so long as the gas is being consumed by ignition and which will automatically cut off the supply of gas whenever the flame has been blown out or extinguished by accident or otherwise and the gas ceases to burn, so as to prevent escape of unconsumed gas and the deleterious consequences ensuing therefrom.

With this and other objects in view the invention consists of certain novel features of construction, combination, and arrangement of parts, as will be more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a vertical longitudinal section of the gas-burner embodying my invention. Fig. 2 is a similar view showing a modification in the mounting of the thermostat, and Fig. 3 is a front view of the reflector and thermostat.

Referring now more particularly to the drawings, the numeral 1 represents a gas-supply pipe, and 2 a burner pipe or bracket having a coupling portion 3 for connection with said pipe, a controlling-valve 4, adapted to be manipulated by hand to let on or cut off the flow of gas, an upwardly-extending outer end 5, threaded to receive the burner proper, 6, and an upwardly-projecting bowl-shaped extension 7, located at the point of junction of the coupling 3 and body of the pipe 2, as shown. This extension 7 forms the base of a gas-reservoir consisting of a tubular casing 8, provided at its lower end with a threaded flange 9 to engage a corresponding flange 10 on the bowl or extension 7 and closed at a point below its upper end by a partition 11, the space above which forms a chamber or receptacle 12, which may be used as a match holder or receptacle, if desired. A flexible gas bag or diaphragm 13 is arranged within the tube 8 and is clamped at its lower edge between the flanges 9 and 10 and is closed at its upper end and provided with an attached weight 14, which compresses the bag to force the gas contained therein under pressure to the burner.

The coupling portion 3 of the burner is separated from the body of the pipe 2 by a partition 15, in which is formed a port or valve seat 17, and in rear of this partition 15 is a second partition 18, provided with perforations 19 for the passage of gas therethrough from the pipe 1. A valve-stem 20 is slidably mounted in said partition 18 and in the vertical portion of the pipe 2 below the bowl 7 and is provided with a valve 21, adapted to close against said seat 17, and a coiled spring 22 surrounds said stem between partitions 15 and 18 and serves to press the valve 21 against its seat The outer end of the valve-stem contacts with, but is free from engagement with, one arm of a bell-crank lever 23, the opposite arm of which is pivoted, as at 24, to a bracket or support 25, clamped upon the burner-pipe by the burner 6, the construction being such that when the pivoted or horizontal arm of the bell-crank lever is tilted downward the vertical arm thereof will move upwardly and rearwardly, and in so doing will force the valve-stem 20 backward and move the valve 17 away from its seat against the tension of the spring 22, and so that when the pressure is removed from said pivoted arm the spring 22 will restore the valve to its normal position or close it against its seat.

Secured to the bracket or support 25 in rear of the burner is a heat-retaining shield and reflector 26, and secured at its upper end to said reflector, as at 27, is a thermostatic expansion bar 28, which projects at its lower end down through the bracket 25 and is pivoted, as at 29, to the forward end of the horizontal arm of the bell-crank lever 23. This rod in its expansive and contractive movements actuates the bell-crank lever to force the valve-stem 20 rearwardly to open the

valve 21 against the tension of the spring 22 and to allow said stem to be returned to its normal position by the action of the spring to close the valve. In order to prevent warping of the thermostatic bar while allowing it to have ample freedom of movement in contracting and expanding, I provide said bar with a short longitudinal slot 30, through which projects a rod or pin 31, which also extends through the reflector 26 and is threaded at its ends for the reception of clamping-screws 32 32′. On this rod between the thermostatic bar and reflector is a sleeve 33, which holds the parts properly spaced apart and in conjunction with nuts 32 32′ prevents the bar from becoming warped or bent under the action of the heat from the burner 6.

In operation the gas-reservoir 8 is primarily filled with gas by closing the cock 4 and pushing rearwardly on the stem 20 to open the valve 21, whereupon gas from the supply-pipe 1 will flow into said reservoir and distend the flexible gas-bag 13 and move the closed end or diaphragm portion thereof, together with the weight 14, up against the partition 11. The stem 20 is then released and the valve 24 is closed against its seat by the spring 22, and after this has been done the cock 4 is again opened to allow gas to pass to the burner. The escaping gas may then be ignited and the flame therefrom will heat the bar 28 and expand the same, and by such expansion the bell-crank lever 23 is tilted to force back the valve-stem 20 and open the valve 21, thus allowing gas from the supply-pipe to flow freely from the burner. Should the flame be extinguished, however, from any cause—as, for instance, by being blown out by the occupant of the room or by a draft of air—the bar 28 will contract, and in so doing will move the bell-crank lever 23 in the reverse direction, allowing the spring 22 to close the valve 21 and cut off the supply of gas to the burner, thus preventing any unconsumed gas from flowing into the room or apartment in which the burner is located. Each time the burner is extinguished, accidentally or in any other way than by turning off the cock 4, it becomes necessary to again fill the gas-reservoir 8 with a supply of gas to last until the heat from the flame of the burner expands the bar 28 and automatically opens the valve 17, and this is accomplished, as heretofore stated, by closing the cock 4 and pushing upon the stem 20 by hand to open the valve 21, whereupon gas will flow into the reservoir and distend or expand the gas-bag. Afterward the cock 4 is opened to allow gas to pass to the burner for use. It will be understood, of course, that the weight 14 is forced upward by the confined gas-pressure entering the gas-reservoir, and when the cock 4 is opened drops by gravity, thereby collapsing the gas-bag and forcing the gas out for use under proper pressure.

From the foregoing description it will be seen that by means of my invention the escape of any dangerous quantity of gas into a room or apartment cannot possibly occur, as the gas will be positively and automatically cut off, even in the event that the cock 4 should be left open whenever the jet of flame is extinguished in any way.

In the construction shown in Fig. 2 the thermostatic bar 28′ is not only fixed at its upper end to the reflector, but is fixed at its lower end, as indicated at 29′, to the bracket 25, and being thus mounted is not adapted to expand and contract longitudinally, but when heated bows rearwardly, as indicated in said figure, and thereby pushes upon the stem 20 to open the valve 21, and upon the bar becoming cooled it resumes a substantially straight or vertical position and permits the said valve to be closed against its seat by the spring 22. In this embodiment of the invention the outer end of the stem 20 slides in the opening in the reflector 26 and simply contacts with the thermostatic bar, but is not connected therewith, so that said stem may be freely operated by hand to open the valve 22 when occasion requires the filling of the reservoir 8 with gas.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention. For instance, I may employ a weighted or spring-actuated piston or any other equivalent of the weighted diaphragm and also substitute equivalent devices for any of the other parts.

One important and desirable feature of my invention is that it is not necessary to manipulate the valve 21 to admit gas to the reservoir 8 for feeding gas to the burner until said valve is automatically opened by the thermostat under any condition in which the burner is properly extinguished by closing the cock 4, as the thermostat will remain expanded a sufficient time after the closure of said cock and the extinguishment of the flame to hold the valve 21 open until sufficient gas passes the port 17 to replenish said reservoir, thus enabling the burner to be immediately ignited upon opening cock 4.

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

1. In an automatic gas cut-off for burners, the combination of a burner-pipe carrying a burner and provided with a closing-cock and a valve-seat, of a sliding valve-stem, carrying an automatic cut-off valve adapted to close against said seat, a spring for automatically closing said valve, a gas-reservoir in communication with the pipe through a passage between the cock and valve, a thermostat, and

a connection between the thermostat and the valve-stem for moving the latter in one direction to open the automatic valve, said connection leaving the stem free for adjustment by hand so that the automatic valve may be opened to allow gas to pass to the gas-reservoir, substantially as described.

2. In an automatic cut-off for gas-burners, the combination with a burner-pipe provided with a burner, a cock for cutting off the supply of gas thereto, and a valve-seat, of a valve adapted to close against said seat, a sliding stem connected to said valve, a spring acting on the valve to normally hold it closed, a gas-reservoir in communication with the gas-pipe between the cock and the automatic valve and provided with means for forcing gas therefrom under pressure, a thermostat supported in juxtaposition to the burner, and a connection between the thermostat and valve-stem for operating the latter, said connection allowing an independent movement of the stem for admitting gas to the reservoir, substantially as described.

3. In an automatic gas cut-off for burners and in combination with a burner-pipe, a thermostat, and a feed-valve actuated thereby, a gas-reservoir in communication with said pipe and provided with a flexible bag or diaphragm to receive gas, and a weight for collapsing said diaphragm to expel gas under pressure.

4. In a device of the character described, a support, a reflector carried thereby, a thermostatic bar connected at one end to the reflector and longitudinally expansible and contractible, and a connection between said bar and reflector to prevent curvature or warping of said bar, substantially as described.

5. In an automatic gas cut-off for burners, a burner-pipe carrying a burner and provided with an inlet-port and a closing-cock between the port and burner, a gas-reservoir in communication with the pipe between said port and closing-cock, said gas-reservoir having a force-feed device, a self-closing valve controlling said port, a thermostat, and a stem connected to the valve and operated by the thermostat, said stem being so connected with the thermostat that it may be operated independently thereof to open said valve, substantially as described.

6. In an automatic gas cut-off for burners and in combination with a burner-pipe, an automatic cut-off mechanism including a thermostat and a feed-valve controlled thereby, and a reservoir for holding a charge of gas to supply the burner until the heat from the latter operates the thermostat to open the feed-valve, substantially as described.

7. In an automatic gas cut-off for burners and in combination with a burner-pipe, an automatic cut-off mechanism including a thermostat and a feed-valve controlled thereby, a reservoir for holding a charge of gas to supply the burner until the heat from the latter operates the thermostat to open the feed-valve, and means for forcing the gas under pressure from said reservoir, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HENRY W. YERRINGTON.

Witnesses:
JAS. ENRIGHT, Jr.,
JOHN L. HUBBARD.