A. BUCKHAM.

Gas Burner.

No. 123,327. Patented Feb. 6, 1872.

Figure 1,

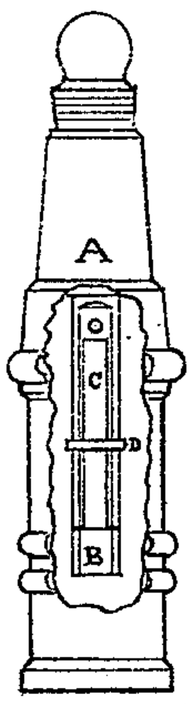

Figure 2,

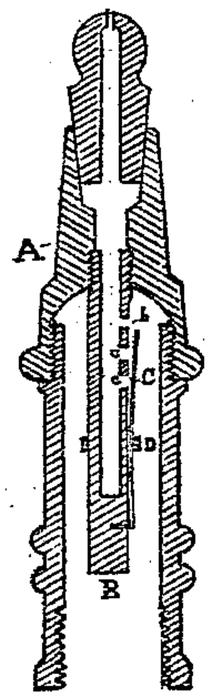

Figure 3, Figure 4, Figure 5,

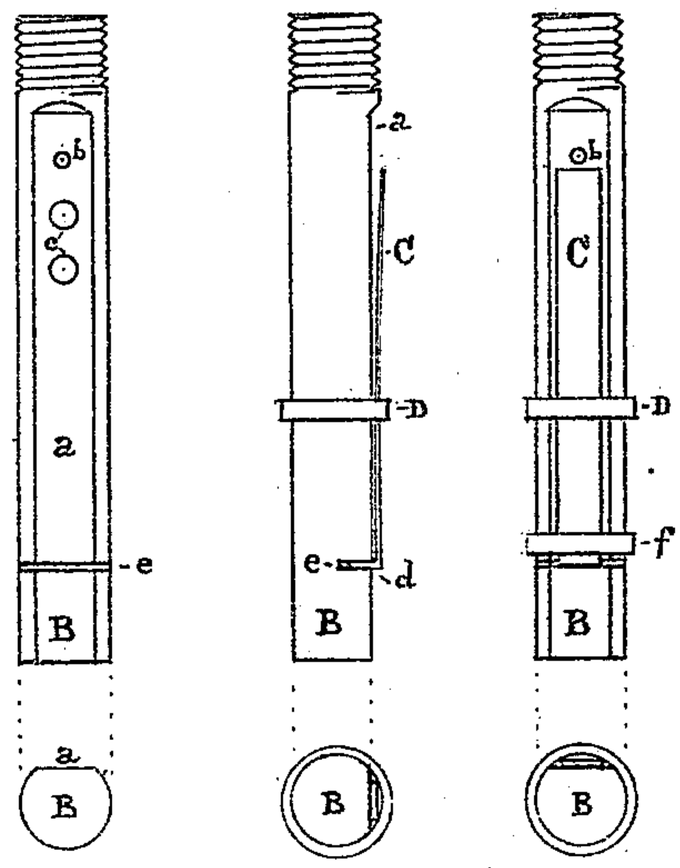

Figure 6,

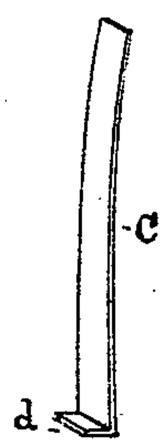

Figure 7,

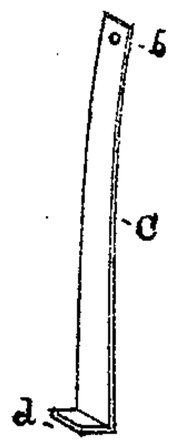

Figure 8,

Witnesses,
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123,327

UNITED STATES PATENT OFFICE.

ANDREW BUCKHAM, OF DELHI, NEW YORK.

IMPROVEMENT IN GAS-BURNERS.

Specification forming part of Letters Patent No. 123,327, dated February 6, 1872.

SPECIFICATION.

To all whom it may concern:

Be it known that I, ANDREW BUCKHAM, of the town of Delhi, in the county of Delaware and State of New York, have invented certain new and useful Improvements in "Gas-Burners," of which the following is a specification:

Nature and Objects of my Invention.

The first part of my invention relates to the employment in a gas-burner of a spring-valve for the purpose of regulating the discharge of the gas at the burner for combustion, under varying pressure of the gas in the supply-pipe, in such a manner that the spring-valve will close or open more or less according as the pressure of the gas in the supply-pipe is increased or diminished, thereby preventing unnecessary waste of the gas and flaring or blowing of the flame under a high pressure, yet permitting the escape or discharge of sufficient gas to supply and maintain a steady flame under ordinary low pressure. The second part of my invention relates to the employment of a valve-tube, acting in combination with said spring-valve in such a manner as to render the action of said spring-valve more uniform and certain, its shape also permitting an easy adjustment of the spring-valve by means of the adjusting ring sliding upon it. The third part of my invention relates to the employment, in combination with said spring-valve and valve-tube, of a regulating or adjusting ring, whereby the spring-valve can be easily adjusted or set nearer to or further from the escape-openings or apertures, in the valve-seat of the valve-tube, on purpose thereby to regulate more perfectly the action of the spring-valve in controlling or regulating the quantity of gas passing through the openings in the valve-seat under varying pressures.

Description of the Accompanying Drawing.

Figure 1 is a longitudinal elevation of a gas-burner embodying my invention, part of the burner being represented as broken away in order to show the position which the valve-tube, spring-valve, and adjusting-ring occupy in the burner. Fig. 2 is a longitudinal section of the same. Fig. 3, is a longitudinal elevation of the valve-tube, drawn on a larger scale on purpose to show more clearly the escape-openings or apertures in the valve-seat. Figs. 4 and 5 are longitudinal elevations, drawn on a larger scale, of the valve-tube, showing the spring-valve and adjusting-ring in proper position on the valve-tube. Fig. 6 is a perspective view of the spring-valve, drawn on a larger scale. Fig. 7 is perspective view of the spring-valve, drawn on a larger scale, showing the employment of an escape opening or aperture in the spring-valve. Fig. 8 is a perspective view of the adjusting-ring, drawn on a larger scale.

Like letters of reference indicate like parts.

General Description.

A is the burner, which, for convenience in adjusting the spring-valve, should be constructed in two parts, connected by means of a male and female screw, as shown in Fig. 2. B is the valve-tube, which may either be formed out of the upper part of the burner or constructed separately, and afterward screwed into the upper part of the burner, as shown in Fig. 2. This last method is more desirable on account of greater convenience in construction and repairs. The valve-tube B is entirely closed at its lower end, as shown in Fig. 2, and has a valve-seat, *a*, formed upon it by cutting away a portion of the circumference on one side, so as to form a flat surface extending from the screw-thread to the lower end, as shown in Fig. 3, for the spring-valve to rest upon and close against. The valve-tube B is also provided with apertures *b* and *c*, through which the gas must pass previous to its discharge for combustion, at the tip of the burner; the aperture *b* is formed in the valve-seat *a* in such a position that the spring-valve C, when shut, will not cover it. This aperture is made much smaller than would be required to supply a sufficient amount of gas for burning at the tip under a low pressure of the gas in the supply-pipe, being just barely sufficient in size to permit enough of gas to pass through it to form a steady flame at the tip of the burner, under the highest pressure usually attained by the gas in the supply-pipe. This aperture serves a double purpose, for, under a low pressure, it aids in permitting the discharge of the gas to the tip, and, by thus relieving the spring-valve from a part of the pressure which would otherwise be upon it, permits it the more

readily to open and allow the gas to discharge through the aperture *c;* while under a high pressure sufficiently powerful to close the spring-valve over the apertures *c* it permits enough of gas to discharge to support a steady flame at the tip of the burner. The aperture *b* could, of course, be placed in any part of the valve-tube; but the position above described is considered the best on account of causing the flow of gas to pass more directly over the spring-valve, and thereby act more quickly and directly upon it. The aperture *b* may also be placed in the end of the spring-valve C, as shown in Fig. 7, if desired. The apertures *c* should be sufficiently large to permit enough of gas to pass through under a low pressure to form a steady flame at the tip of the burner. C is the spring-valve, being, in fact, a flat spring acting as a valve; this spring-valve is placed and works upon the valve-seat *a* of the valve-tube B, in the position shown in Figs. 1, 2, 4, and 5. The lower end of the spring-valve should be bent over or formed at a right angle with its under side or face, as shown at *d*, Fig. 7, the projecting part or end *d* being placed in a slit or seat, *e*, made in the lower end of the valve-tube B on purpose to receive it, as shown in Figs. 3 and 4; by which method of attachment the spring-valve is prevented from slipping on the valve-seat, while the adjusting-ring D prevents it from getting out of place. If desired, an additional ring, *f*, similar to the adjusting-ring D, may be placed over the end of the spring-valve and valve-tube, as shown in Fig. 5, on purpose to hold the end of the spring-valve close down to the valve-seat. The above method of attachment permits of the spring-valve being easily detached from the valve-tube. The spring-valve C should be made to curve slightly lengthwise, and be placed upon the valve-seat with the hollow side of the curve up, so that the free point of the spring-valve will be a short distance away from the valve-seat *a*, as shown in Fig. 4. The spring-valve is thus slightly curved on purpose to shut off the discharge of the gas through the apertures *c* gradually, as the pressure of the gas in the supply-pipe increases, and open gradually as the pressure is diminished, and thus tend to maintain a steady flame at the tip of the burner. The strength of the spring-valve C must, of course, correspond with the maximum pressure usually attained by the gas in the supply-pipe and the area of the apertures *c*, so that when the pressure of the gas is at its maximum, or nearly so, the spring-valve will close shut over the apertures *c*, and thereby cut off the discharge of all the gas, except what passes through the relieving aperture *b*. D is the regulating or adjusting ring, which is made to fit and slide upon the outside of the valve-tube B, over and along the top of the spring-valve C; it is split on one side, as shown in Fig. 8, on purpose to accommodate itself to any slight inequalities of surface on the valve-tube, as also to grasp the valve-tube and remain where set. The use of this ring is to regulate or adjust the spring-valve with respect to its distance from the apertures in the valve-seat, so as to obtain the best results.

The above-described invention can be applied to any part of the supply-pipe in the same manner as in a burner, as it will operate and regulate the discharge of the gas equally as well in either an upright, horizontal, or inclined position; care only being taken that the closed end of the valve-tube is placed toward the supply end of the pipe.

Claims.

1. The spring-valve C, when constructed and operating, for the purpose of regulating the discharge of gas from the supply-pipe to the burner, substantially as described.

2. The valve-tube B, in combination with the spring-valve C, substantially as and for the purposes above specified.

3. The adjusting-ring D in combination with the valve-tube B and spring-valve C, substantially as and for the purposes specified.

ANDREW BUCKHAM.

Witnesses:
ARTHUR FRISBEE,
SOLOMON RICE.