(No Model.) 2 Sheets—Sheet 1.

W. & L. W. GATES.

SAFETY GAS BURNER.

No. 569,868. Patented Oct. 20, 1896.

Fig. 1

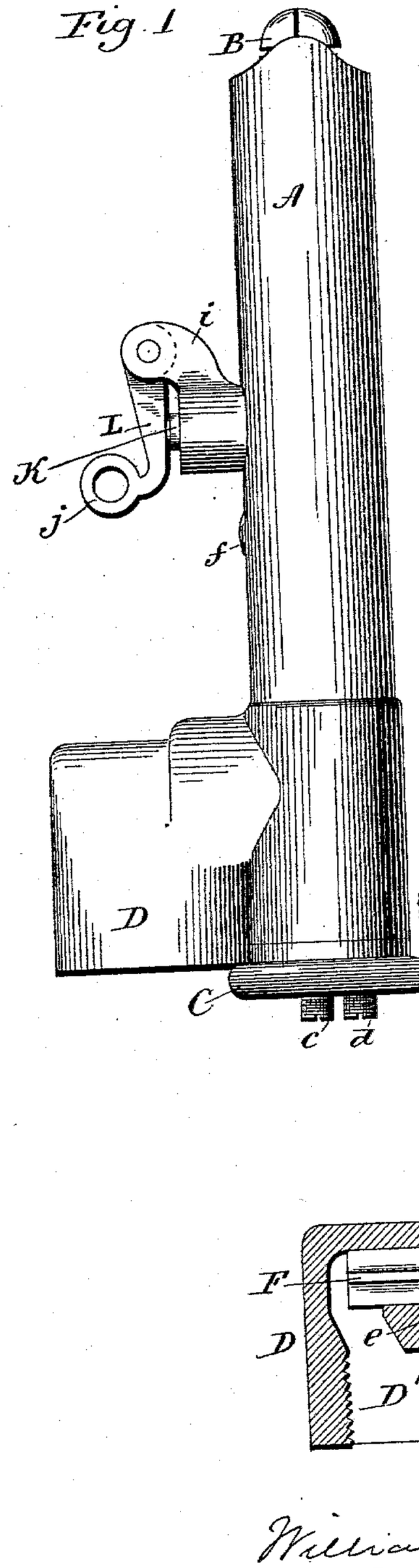

Fig. 2

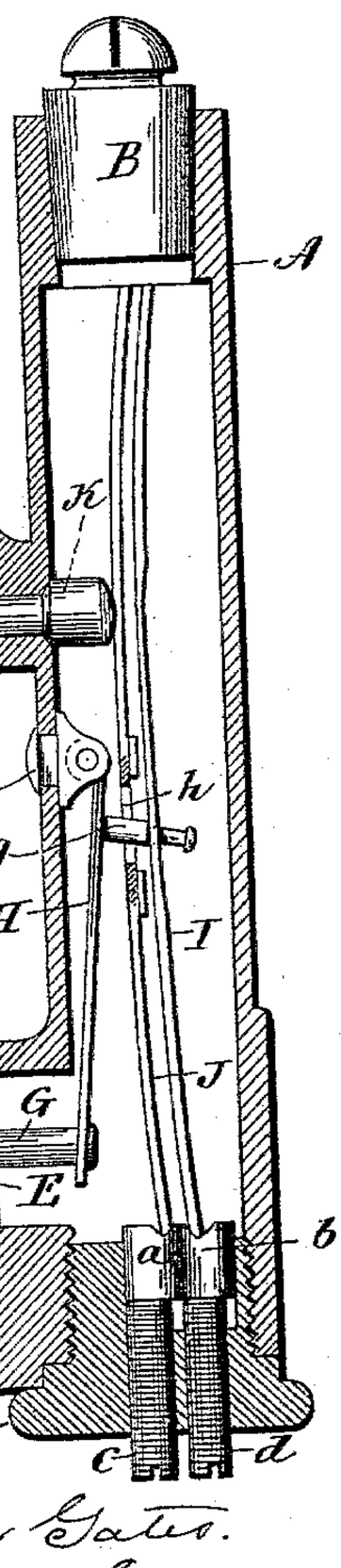

Fig 6

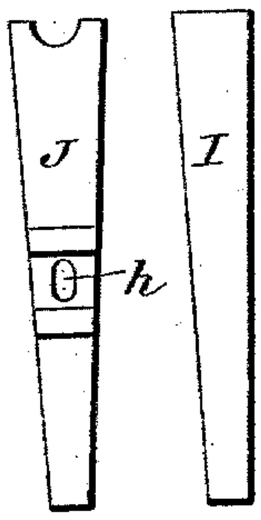

Fig. 7

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W. & L. W. GATES.

SAFETY GAS BURNER.

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Fig. 3.

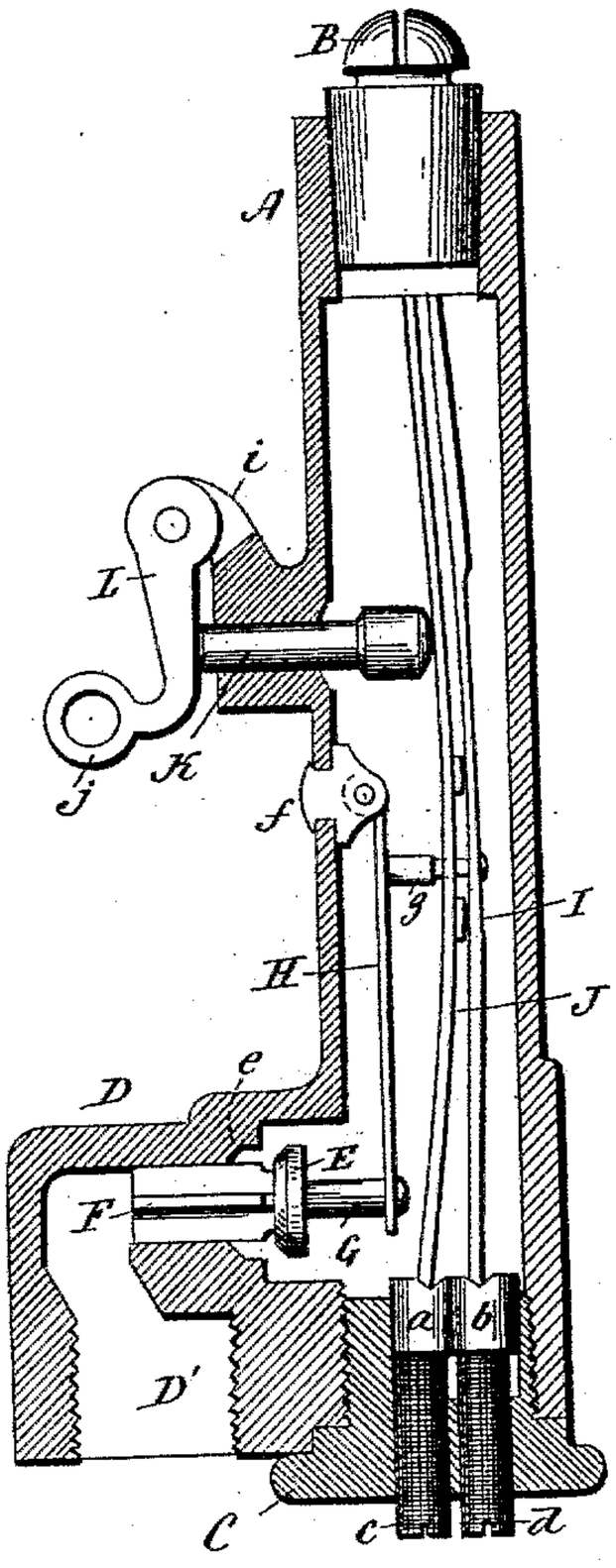


Fig. 4

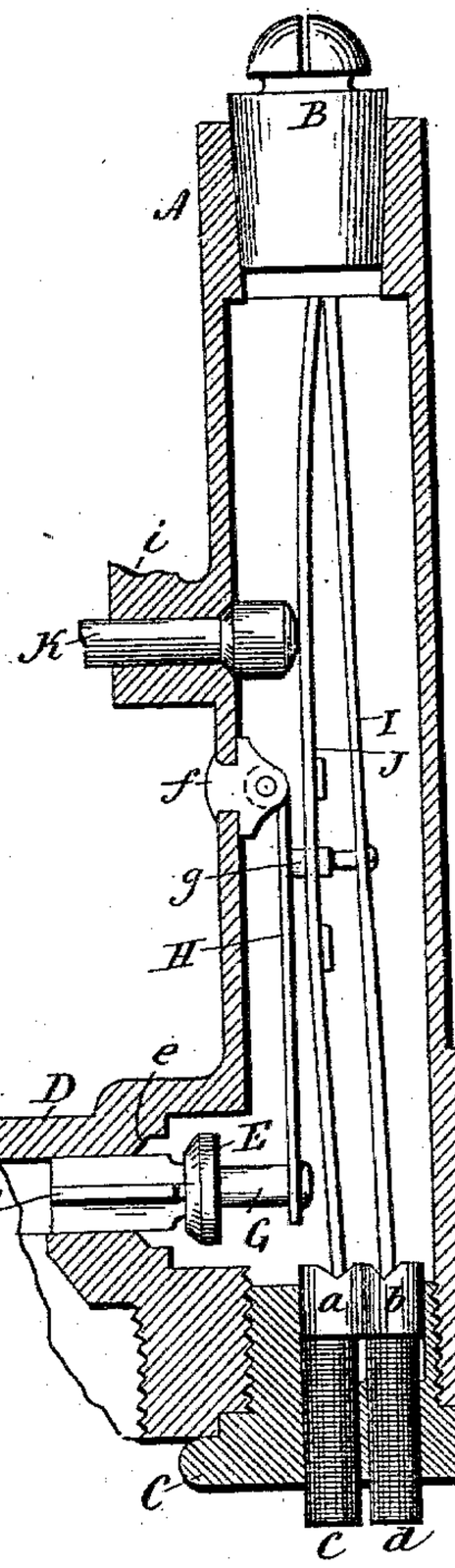


Fig. 5

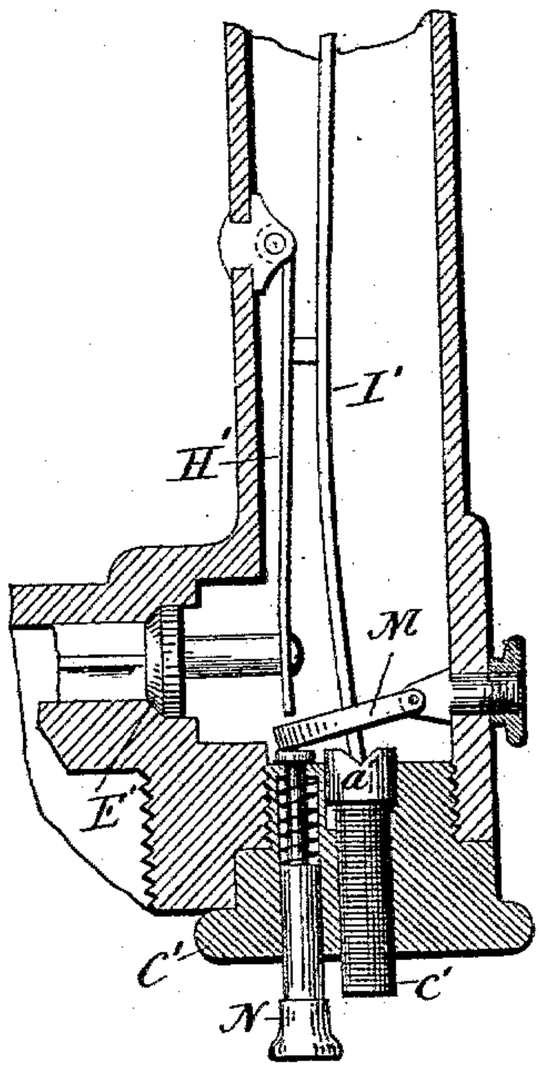
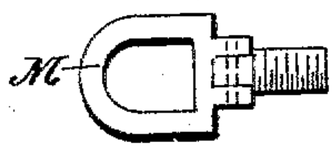


Fig. 8



Witnesses.
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By their Attys Earle Seymour

UNITED STATES PATENT OFFICE.

WILLIAM GATES, OF WOODBRIDGE, AND LOUIS WILLIAM GATES, OF WEST HAVEN, CONNECTICUT, ASSIGNORS OF ONE-THIRD TO GEORGE H. SMITH, OF NEW HAVEN, CONNECTICUT.

SAFETY GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 569,868, dated October 20, 1896.

Application filed March 18, 1896. Serial No. 583,692. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM GATES, of Woodbridge, and LOUIS WILLIAM GATES, of West Haven, in the county of New Haven and State of Connecticut, have invented a new Safety Gas-Burner; and we do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a side view of our improved burner; Fig. 2, a sectional view of the same in the closed position; Fig. 3, a sectional view in the open position and before the shell is expanded; Fig. 4, a similar view with the shell expanded; Fig. 5, a modified form of temporary releasing device; Fig. 6, a plan view of the lever-spring; Fig. 7, a plan view of one form of releasing device; Fig. 8, a plan view of a modified form of releasing device.

This invention relates to an improvement in gas-burners, the object being the combination, with a burner, of a valve which may be operated to cut off the supply of gas in case the flame be accidentally extinguished; and the invention consists in utilizing the expansion of the shell of the burner to operate the springs and levers to open the valve, and as more fully hereinafter described, and particularly recited in the claims.

The burner consists of a shell A, partially closed at its upper end to receive an ordinary lava tip B and closed at its lower end by a screw-plug C. Offsetting from the lower end of the shell is an internally-threaded arm D for adjustment to ordinary fixtures. In the upper end of the plug C are two vertically-movable seats *a b*, which may be adjusted by screws *c d*, which project beyond the lower end of the plug C. In the inlet-passage D′, which extends through the offsetting-arm D into the chamber, a valve-seat *e* is formed to receive a valve E, which is formed at one end with a stem F, whereby it is horizontally guided, and at its opposite end with an arm G, projecting into the shell A. Pivoted to a lug *f*, which is secured to the inside of the shell, is a valve-lever H, which depends downward therefrom into the path of movement of the arm G of the valve, to which it is preferably connected. From the face of this lever, and just below its pivot, projects a finger *g*. Mounted in the shell and having a bearing in the seat *b* at one end and against the upper end of the shell at the other end is a lever-spring I, which normally stands bowed toward the valve side of the case, as shown in Fig. 2, and to this spring the finger *g* is preferably connected. Also mounted in the shell and seated in the bearing *a* at one end and against the upper end of the shell at the other end is a releasing-spring J, which is formed with a clearance-opening *h* for the finger *g*, which extends through it, the said spring I and releasing device J being placed under tension by the screws *c d*. Also mounted in the case and above the point where the valve-lever H is pivoted is a plunger K, adapted to be forced into the shell against the releasing device J by an L-shaped lever L, mounted in a bearing *i* on one side of the shell.

In the closed position, as shown in Fig. 2, the spring I is bowed toward the valve side of the shell, and, bearing against the end of the finger *g*, forces the valve-lever H outward and the valve E to its seat, and so as to cut off the flow of gas. When it is desired to light the gas, the plunger K is forced inward by the lever L, which may be operated by the finger or by cords depending from a ring *j* in the end thereof, which movement forces the releasing-spring J inward, which in turn bears against the lever-spring, also forcing that inward to the position shown in Fig. 3, which movement of the spring draws the valve-lever H outward and hence opens the valve. This position of the releasing and lever springs will be maintained by the contracted condition of the shell. The flow of gas is thus admitted and may be ignited at the tip B. Preferably the upper end of the shell will curve upward on opposite sides of the burner, as shown in Fig. 1, which causes it to soon become heated, and when the shell is so heated it expands, and consequently releases the tension of the releasing device and lever-spring, which return to a nearly vertical position, as shown in Fig. 4, and

which position still allows a free flow of gas through the shell.

Should the flame become extinguished, the shell will gradually cool and hence contract, again placing the releasing device and lever-spring under tension, which causes them to return to the closed position, as shown in Fig. 2, thereby returning the valve E to its seat and cutting off the flow of gas. In order to insure the positive return of the lever-spring to its closed position, a portion of one side will be cut away to reduce its central portion, and so that when tension is applied it will naturally spring in the desired direction. Instead of arranging the releasing device vertically in the shell, as before described, it may be arranged at the lower end and consist of a loop M, pivoted to the shell opposite the valve, through which loop the lever-spring will extend into a seat a', which is vertically adjustable by a screw c', as before described. Extending through the plug C', and parallel with the screw c', is a spring-pin N, the upper end of which stands beneath the outer edge of the loop M. When the lever-spring I' is bowed to bear against the valve-lever H', the valve E' is in the closed position. To open the valve, the pin N is raised, which forces the loop M over the lower end of the valve-lever H', which draws it toward the lever-spring I' and opens the valve E'. As the shell becomes heated and expands the tension of the spring I' is reduced, which permits the loop M to drop downward to its normal position and releases the lever H', but, as stated, the power of the spring I' being relieved, it will not act to close the valve. When, however, the shell contracts, the spring I' will again come under tension and force the valve-lever H outward and close the valve.

It will thus be seen that the burner acts automatically to cut off the supply of gas when the flame becomes extinguished without turning off the supply. Hence the danger of escaping gas is entirely avoided.

We are aware that valves operated by the expansion and contraction of the shells have been employed, and do not, therefore, wish to be understood as claiming, broadly, such as our invention; but

What we do claim is—

1. In a gas-burner the combination with a metallic shell and inlet-port thereof, a valve seated in said inlet, a valve-lever mounted in said shell and extending into the path of movement of said valve, a lever-spring mounted in the shell between its ends adapted to be placed under endwise tension by the contraction thereof, and adapted when under pressure to close said valve and means for temporarily moving the said valve-lever to open the valve, substantially as described.

2. In a gas-burner the combination with a shell and inlet-port thereof, a valve seated in said port, a valve-lever mounted within the shell and extending into the path of movement of the valve, a lever-spring mounted between the ends of the shell and adapted to be normally held under tension by the contraction thereof, a releasing device also mounted in the shell and means for moving said releasing device to operate said spring, substantially as described.

3. In a gas-burner the combination with a shell and inlet-port thereof of a valve seated in said port and formed with a stem projecting into said shell, a valve-lever pivoted in said shell and extending into engagement with said valve, a lever-spring mounted between the ends of the shell, a releasing device also mounted between the ends of the shell and means for adjusting the tension of the said lever-spring and releasing device and a plunger extending through one side of the shell, whereby said releasing device may be forced inward, substantially as described.

4. In a gas-burner, the combination with a shell, of a valve, and a valve-spring located within the said shell, adapted to be placed under endwise tension by the contraction thereof, and coacting with the valve to open and close the same, substantially as described.

5. In a gas-burner, the combination with a shell, of a valve, a valve-lever connected with the valve, and a valve-spring located within the shell, adapted to be placed under endwise tension by the contraction thereof, and coacting with the lever to operate the valve, substantially as described.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

WILLIAM GATES.
LOUIS WILLIAM GATES.

Witnesses:
FRED. C. EARLE,
JESSIE S. ALLING.