

(No Model.)

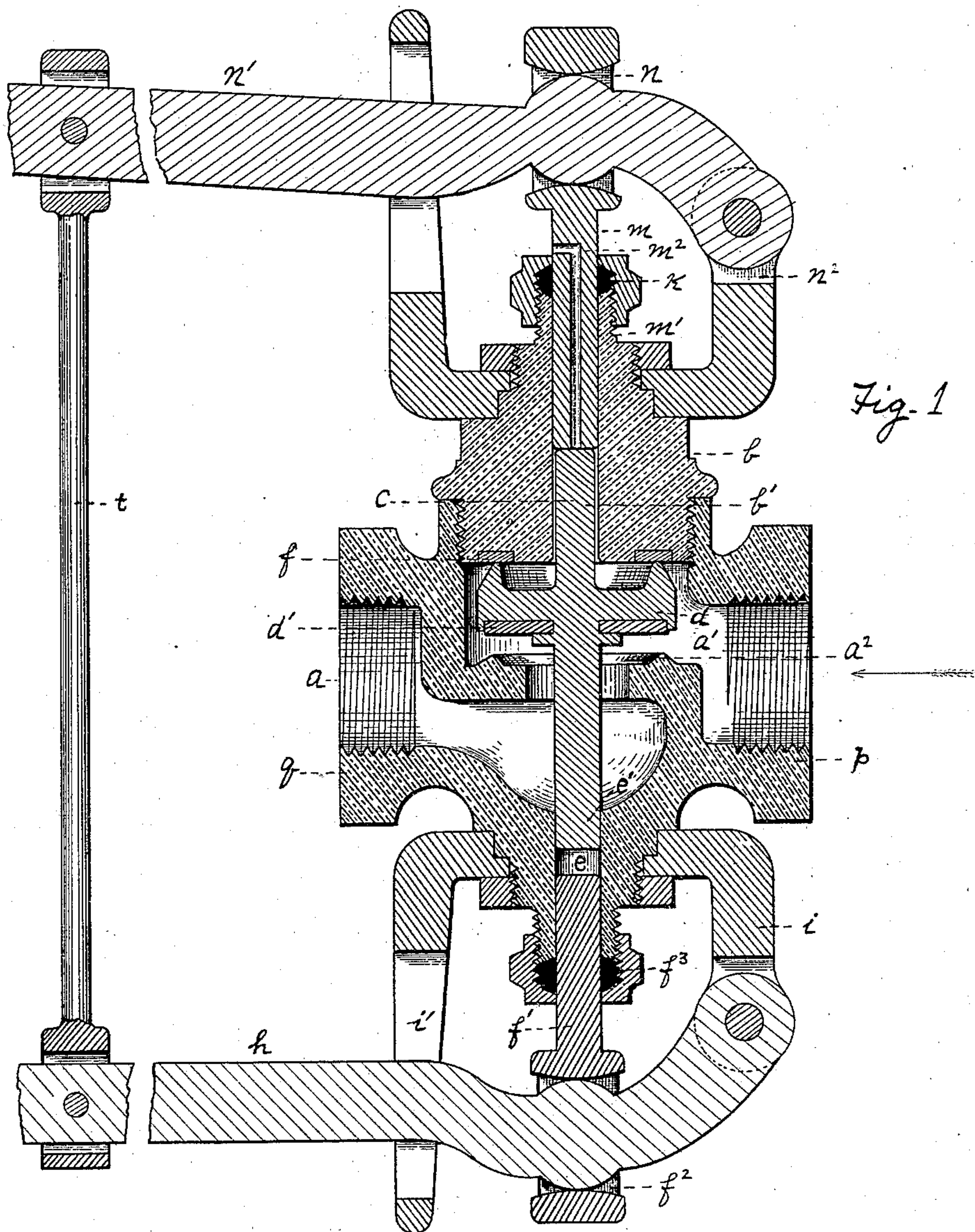
2 Sheets—Sheet 1.

W. S. JARBOE.

SAFETY VALVE.

No. 312,724.

Patented Feb. 24, 1885.



Witnesses.

J. A. Burns.
J. K. Smith

Inventor

Walter S. Jarboe
by Bakenell & Kerr
his Attorneys

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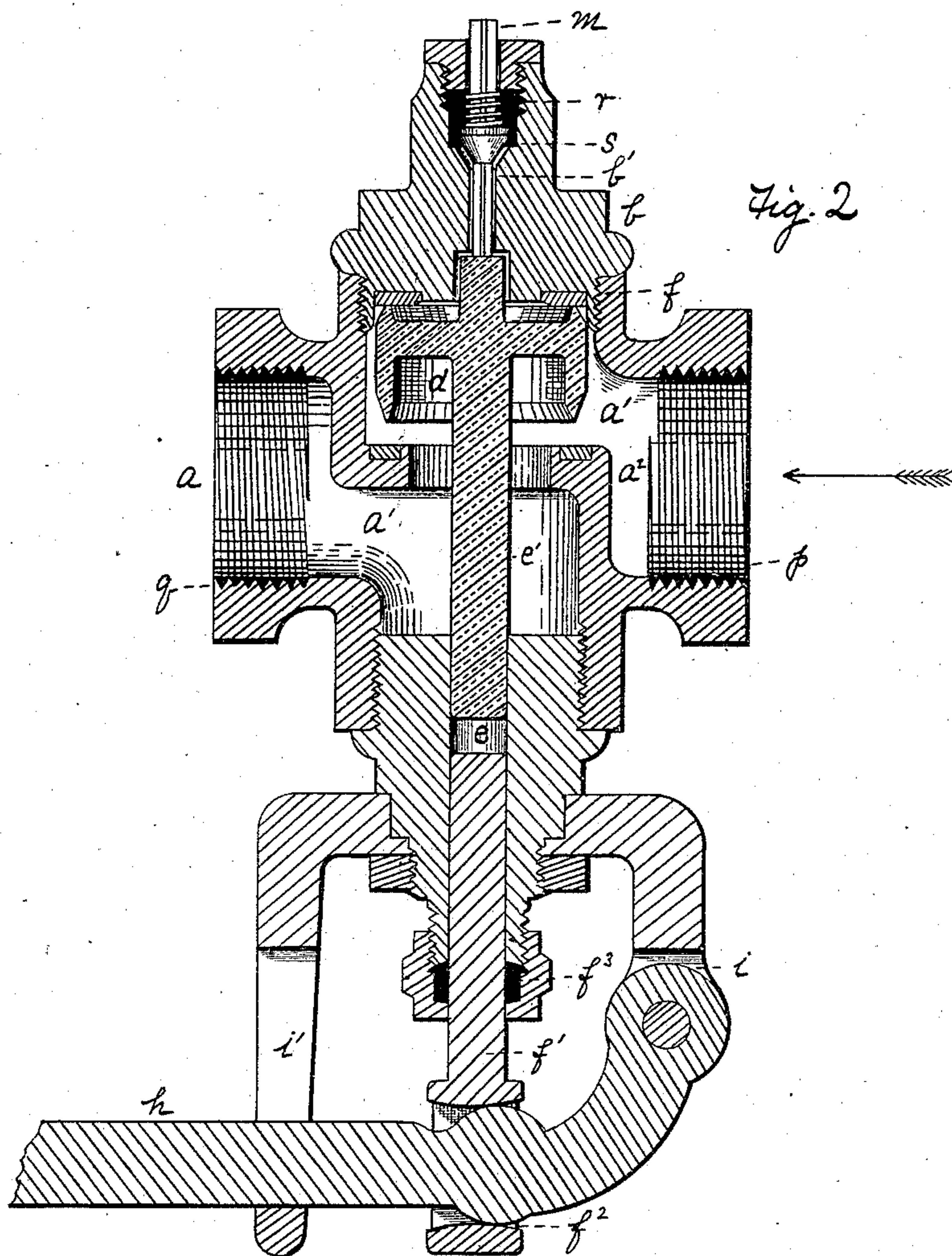
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UNITED STATES PATENT OFFICE.

WALTER S. JARBOE, OF ALLEGHENY CITY, ASSIGNOR TO BAILEY, FARRELL
& CO., OF PITTSBURG, PENNSYLVANIA.

SAFETY-VALVE.

SPECIFICATION forming part of Letters Patent No. 312,724, dated February 24, 1885.

Application filed August 9, 1884. (No model.)

To all whom it may concern:

Be it known that I, WALTER S. JARBOE, of the city of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Safety-Valves; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical sectional view of my improved automatic valve, and Fig. 2 is a like view of a modification thereof.

Like letters of reference indicate like parts wherever they occur.

My invention relates particularly to natural gas, which differs in many respects from gas produced from coal and other fuel, among which differences are that it is without perceptible odor, is more penetrating, and is delivered from the well under high pressure, which often causes leaks in the supply-pipe, and the flow of gas from the well is also more or less intermittent. From these causes the flow through the supply-pipe is now and then interrupted, which causes the flame at the burner to die out, allowing the gas, which is not only noxious, but highly explosive when mingled with the atmosphere, to escape unperceived into the building where the gas is employed. Serious accidents have in this manner taken place; and to obviate this danger, and to prevent the escape of the gas in the manner described, is the object of my invention. To accomplish this end I employ a valve situate in the supply-pipe, which closes automatically whenever the pressure of the flow of gas in the pipe is interrupted to such an extent as to cause the flame at the burner to be extinguished, thereby shutting off the supply of gas, so as to prevent it passing to the burners when the pressure returns.

I will now describe my invention, so that others skilled in the art may employ the same.

In the drawings, *a* represents a globe-valve having a tubular plug, *b*, in the upper socket thereof, secured by screw-threads.

Extending into the cavity *b'* of the tube *b* is the valve-stem *c*, which fits loosely therein.

This stem *c* extends from the valve *d*, which has a cup-shaped upper surface, the rim of

which seats closely against an annular ring of packing, *f*, situate in a suitable recess or cavity in the bottom of the plug *b* when the valve is open, so as to prevent the gas from passing from the valve-chamber *a'* through the cavity *b'*.

Situate in a suitable recess in the bottom face of the valve *d* is an annular ring of packing, *d'*, which when the valve is closed rests on the seat *a''* in the chamber *a'*, which seat is beveled so as to form an angular ridge upon which the packing *d'* is seated when the valve is closed. It will be noticed that the diameter of the valve exceeds the diameter of the valve-seat.

In the bottom of the valve-chamber *a'* is a tubular opening, *e*, into which passes the valve-stem *e'*, extending from the lower face of the valve *d* downward.

Secured by suitable screw-threads to the lower portion of the casting *a*, forming the valve-chamber *a'*, is a stuffing-box, *f''*, through which a sliding rod, *f'*, extends upward into the cavity *e*.

In the lower end of the rod *f'* is a vertical slot, *f''*, through which a lever-arm, *h*, passes, one end of which lever is pivoted to the bracket *i*, which is secured to the outer face of the casting *a*, the lever *h* passing thence through the slot in the rod *f'*, and through a guide-slot, *i'*, formed in a second arm of the bracket *i*.

On the free end of the lever *h*, at the desired point, is placed a suitable weight secured to the lever, so as to be readily moved thereon nearer to or away from the fulcrum. This weight is not shown in the drawings.

Extending downward through a suitable stuffing-box, *k*, into the tubular cavity *b'*, above the valve-stem *c*, is a rod, *m*, having a tubular cavity, *m'*, extending longitudinally from the lower end of the rod to the point *m''*, where it branches horizontally and extends through the outer surface of the side of the rod.

In the upper end of the rod *m*, outside of the stuffing-box *k*, is a longitudinal slot, *n*, through which a lever-arm, *n'*, passes. This lever is pivoted to the bracket *n''*, which is similar to the bracket *i*, and is secured to the upper end of plug *b* in like manner. The two

levers h n' are connected by the vertical rod t , the levers being pivoted in longitudinal slots formed in the ends of the rod. It will be noticed that the space between the rod f' and the valve-stem e' in the cavity e is greater than the space between the lower face of the valve d and the valve-seat a^2 .

The operation of these devices is as follows: The gas-supply pipe being secured to the socket p of the valve and the service-pipe at the socket q , the valve is opened by raising the lever-arm h , thereby lifting the rod f' until the end thereof comes into contact with the lower end of the valve-stem e' and pushes it upward, thereby unseating the valve d from the lower seat, a^2 , and seating it against the upper seat, f . At the same time the lever-arm n' rises with the arm h , raising the rod m until the opening of the cavity m' is above the stuffing-box k , so that the gas contained in the upper part of the valve-chamber above the valve may pass around the valve-stem and through the cavity m' away from the valve. When the valve is opened in the manner described, the gas passes through the valve-chamber a' , below the valve d , and by its pressure keeps the valve closely seated against the seat f , resisting the force of the weight on the lever h pressing against the rod m , which bears on the end of the valve-stem e , the gas passing from the valve-chamber into the service-pipe. When, however, the pressure of the gas in the valve-chamber a' is reduced so low as to cease to supply gas to the burners, the force of the weight on the lever h , being exerted on the valve-stem e , closes the valve d . At the same time the rod m being lowered in the cavity b' , the opening m' is brought below the stuffing-box k , and the gas, being prevented from escaping from the valve-chamber, adds its pressure to the valve, keeping it closed until the valve is again lifted by the lever h . The purpose of the space between the end of the valve-stem e' and the rod f' is to enable the valve-stem to descend its full length without coming in contact with the rod f' . This valve, as I have described it, is adapted for use when the gas is fed into the service-pipe at high pressure. Where, however, the gas is fed at a low pressure, I prefer to employ the modification shown in Fig. 2, in which a light spring, r , is arranged around the rod m , which rod is provided with a conical valve, s , seating in the tubular cavity b' , and is without the cavity m' , the rod fitting loosely in the cavity b' . This spring should have a sufficient force to overcome the pressure of the gas on the end of the rod m , but not sufficiently strong to overcome the pressure of the gas on the valve d , which presents a much larger surface. It will also be noticed that the upper and lower faces of the valve d are cup-shaped, the packing being placed in annular recesses in both valve-seats. In this form of valve the purpose of the lever h is merely to open the valve in the manner already described, and when the valve has been opened it drops to its normal position,

(shown in the drawings,) the valve, however, being held open by the pressure of the gas on the lower side of the valve. When the valve is opened, the rod m and valve s are raised, allowing the gas to pass out of the upper portion of the valve-chamber, and the valve is held in this position by the pressure of the gas. When, however, the pressure is weakened or interrupted by a leak in the pipe or other cause, the valve is closed by the pressure of the spring r , and remains closed until the lever h is again raised.

I am aware that automatic extinguishers for shutting off the flow of gas by lessening the pressure in the main have been used before, and I therefore do not desire to claim the same broadly.

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

1. In an automatic safety-valve for shutting off the flow of gas, the combination of a valve-chamber and a puppet-valve, arranged, substantially as described, that the pressure of the gas shall be exerted to retain the valve away from the seat or port leading to the service-pipe when the valve is open, and shall retain the valve against the seat or port when the valve is shut, as and for the purpose specified.

2. In an automatic safety-valve for shutting off the flow of gas, the combination of a valve-chamber and a puppet-valve, arranged, substantially as described, that the pressure of the gas shall be exerted to retain the valve away from the seat or port leading to the service-pipe when the valve is open, and shall retain the valve against the seat or port when the valve is shut, a weight or spring for closing the valve when the pressure of gas is lessened, and a rod or lever for opening the valve by external pressure, substantially as and for the purposes specified.

3. In an automatic safety-valve for shutting off the flow of gas, the combination of a valve-chamber having a port leading to the service-pipe and an exit for confined gas, a double-seated valve arranged within the chamber, substantially as described, to open and close the exit when the port is opened, as and for the purpose specified.

4. In an automatic safety-valve for shutting off the flow of gas, the combination of a valve-chamber having a port leading to the service-pipe and an exit for confined gas, a double-seated valve arranged, substantially as described, to open and close the exit when the port is opened, and a valve for closing the exit when the port is shut, substantially as and for the purposes specified.

In testimony whereof I have hereunto set my hand.

WALTER S. JARBOE.

Witnesses:

JOS. H. JACOBS,

THOMAS W. BAKEWELL.