(No Model.)

G. RUSSELL.

GAS SUPPLY PIPE.

No. 337,350. Patented Mar. 2, 1886.

Fig. 1

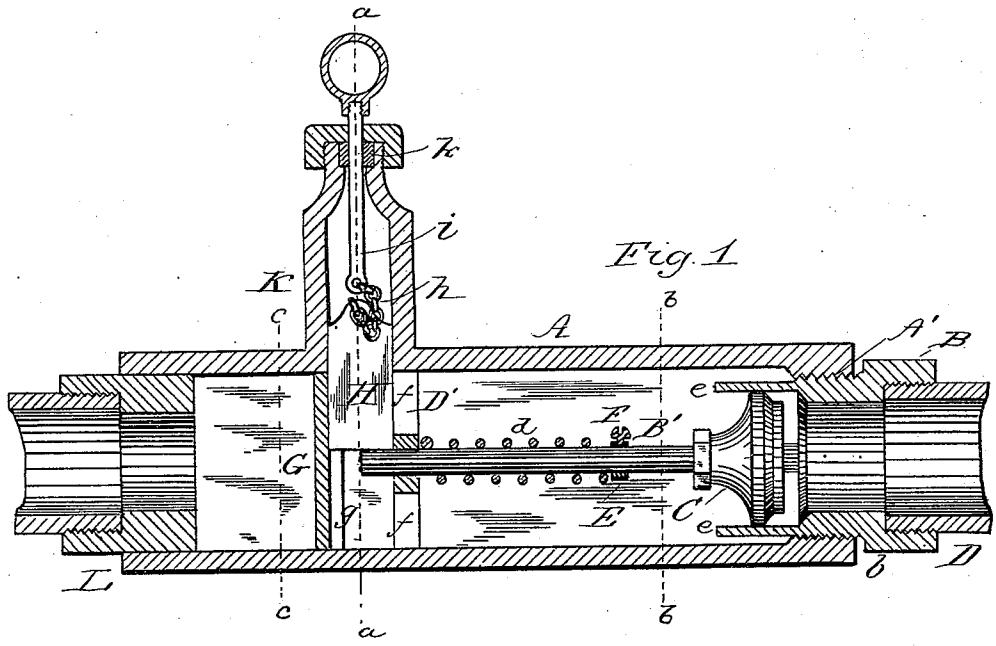


Fig 2

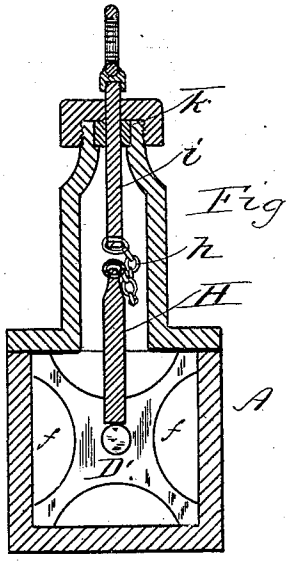


Fig. 3

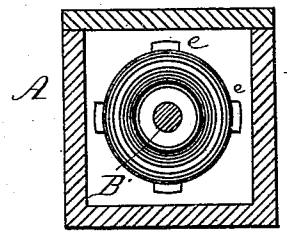
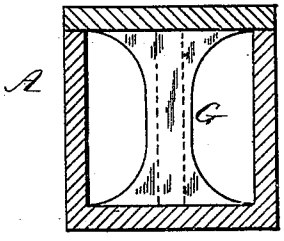


Fig 4



Witnesses.
Alva. A Moore
A. N. Connolly

Inventor
Geo. Russell
by Connolly Bro
Attys

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

GEORGE RUSSELL, OF McKEESPORT, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO ENOCH H. LEIZURE, OF SAME PLACE.

GAS-SUPPLY PIPE.

SPECIFICATION forming part of Letters Patent No. 337,350, dated March 2, 1886.

Application filed January 11, 1886. Serial No. 188,175. (No model.)

To all whom it may concern:

Be it known that I, GEORGE RUSSELL, a citizen of the United States, residing at McKeesport, in the State of Pennsylvania, have invented certain new and useful Improvements in Cut-Off Valves for Gas-Supply Pipes; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, which form part of this specification.

This invention has relation to automatic cut-off valves for the service-pipes employed in supplying gas from mains to the points of consumption, and has for its object the provision of a novel construction of cut-off valve or check-valve which may be applied to the service-pipes of a natural-gas supply, and which will be effective and reliable in its operations and of such simple construction that it will not be liable to get out of order.

One of the principal dangers to be apprehended from the use of natural gas as fuel is the decrease of pressure or the total cessation of the flow of gas in and through the service-pipes. When this occurs, the flame is extinguished, and when the gas again begins to flow it escapes without being consumed, and, filling the apartment into which it escapes, is in constant danger of accidental ignition and explosion. This ignition and explosion frequently take place where the flow of gas ceases for a short time and starts again before the furnace or grate or other place where it is burned becomes cooled.

My invention contemplates the provision of a cut-off valve interposed in the service or supply pipe and so constructed that when the flow of gas is at too low a pressure to feed the flame or when the flow entirely ceases the gas-inlet to the valve chamber or box will be automatically closed and locked in a closed position, so that when the pressure increases, or, in case of a total stoppage, begins to flow again, its supply to the point of combustion will be prevented until the locking mechanism is manually released, and proper precautions taken to prevent disastrous results.

My invention consists in the novel construction, combination, and arrangement of parts, as hereinafter described, and having special reference to the employment of a valve chamber or box, a longitudinally-moving cut-off valve, provided with an adjustable spring and a gravity block or catch adapted to lock the valve in a closed position, said gravity-block being provided with means for its manual operation, all as hereinafter described.

Referring to the accompanying drawings, Figure 1 is a central longitudinal section of the valve-chamber and appurtenances; Fig. 2, a transverse section on the line *a a* of Fig. 1; Fig. 3, a transverse section on the line *b b* of Fig. 1, and Fig. 4, a transverse section on the line *c c* of Fig. 1.

In said drawings, A designates the valve-chest, which consists of an oblong metallic casing of any suitable length and width or of approximately the capacity of the service-pipe to which it is to be attached. At one end of said box or chest is formed an internally-threaded opening, A′, adapted to receive a correspondingly-threaded metallic bushing or sleeve, B, which, at its inner end, is shaped so as to produce a seat for the cut-off valve C, while at its outer end it is enlarged and internally threaded to serve as a connection for the service-pipe D, which is screwed thereinto. The bushing B may be formed with an octagonal, square, or other shaped collar, *b*, for the application of a wrench or tongs by which the bushing is screwed into place or removed.

The valve C consists of a conical head or disk attached to a horizontal stem, B′, which at its inner end passes through and plays in an opening formed in a partition, D, fitted within the valve-chest A. Upon said stem is arranged a spiral spring, which abuts at one end against the partition D′, while its other end abuts against a collar, E, secured to the stem by means of a set-screw, F. The tendency of this spring is to keep the valve closed against its seat, and it will keep the valve so closed when there is no pressure from the gas upon the face of the valve or when the pressure is less than that of the spring. The tension of the latter is regulated

by means of the collar and set-screw, so that the valve may be adjusted to close against any pressure of gas less than a given pressure or less than that required for the purposes of consumption.

For the purpose of guiding the valve in its movements and causing it to play in a perfectly true line without binding or grinding, the bushing B is provided with inwardly-projecting rods or fingers *e e*, which embrace the valve and maintain it in proper working position. These rods may be either formed integral with the bushing or they may be inserted in sockets formed in the inner end thereof.

The partition D′ is of skeleton shape or formed with openings at its edges, as shown at *f f*, for the passage of the gas. The aggregate capacity of these openings should be equal to the area of the service-pipe, so as to form no obstruction to the free passage of the gas when the valve is open. At a short distance from and in front or forward of the partition D′ is arranged a partition or standard, G, formed with a channel or with guides *g g* for the reception of a gravity lock or catch, H, which is adapted to move or play in the space between the two partitions in a vertical plane, the channel or guides formed on the partition G serving to hold said block or catch in position and to guide it in its movements.

As will be seen, the valve-stem projects a short distance beyond the partition D when the valve is open; hence, when the block H is raised, the valve-stem projects under the lower end of said block and holds it in an elevated position, the upper portion of the block being within a box or tube formed upon or attached to the valve-casing. A cord or chain, *h*, connects the upper part of the block with a rod, *i*, which passes through a stuffing-box, *k*, which closes the upper end of the box or tube K. The block or catch as arranged is free to drop when the valve closes under a decrease or cessation of pressure, and when dropped constitutes an obstruction or stop, which will prevent the valve from again opening when the gas begins to flow or exert pressure against the valve. The block is allowed to drop automatically, being held in its upraised position only by the valve-stem. It will thus operate effectively as an expedient to cut off the flow of gas under such conditions as necessitate the use of a cut-off which will prevent the valve from reopening until the cut-off devices are operated manually.

When it is desired to reopen the valve, the rod *i* is drawn upward and is followed by the block, which is raised through the medium of the chain or cord *h*. As soon as the block is high enough to allow the valve-stem to pass under it, the rod *i* is lowered, the chain or cord then becoming slack, so as to impose no strain upon the block, but allow it perfect freedom of motion and liberty to drop, when the valve again closes.

The partition G is open at its sides to allow the free passage of the gas through the valve-chest to the outlet end, in which is secured a bushing or connecting-sleeve, L, for the attachment of that portion of the service-pipe leading directly to the point of consumption.

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

1. A cut-off for gas-supply pipes, comprising a valve-chest, a stem-valve arranged to move lengthwise thereof, an adjusting or closing spring attached to the valve-stem, and a gravity block or catch constructed and arranged substantially as described, whereby, when the valve is closed, it cannot be opened by the pressure of the gas.

2. In a cut-off device for gas-supply pipes, the combination, with the valve chest and a longitudinally-moving stem-valve adapted to open and close the inlet to said chest, of the partitions D G, and the vertically-sliding block or catch H, rod *i*, and connection *k*, substantially as described.

3. In a cut-off device for gas-supply pipes, the combination, with the valve-chest A and the longitudinally-moving valve adapted to open and close the inlet to said chest, of the sliding block H, the box or tube K, the rod *i*, connection *k*, and the open partitions D G, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 8th day of January, A. D. 1886.

GEORGE RUSSELL.

Witnesses:

THOS. A. CONNOLLY,

JOHN F. ATCHESON.