(No Model.)

# C. M. KIRKPATRICK.

## AUTOMATIC CUT-OFF FOR GAS.

No. 395,334. Patented Jan. 1, 1889.

Fig: 1.

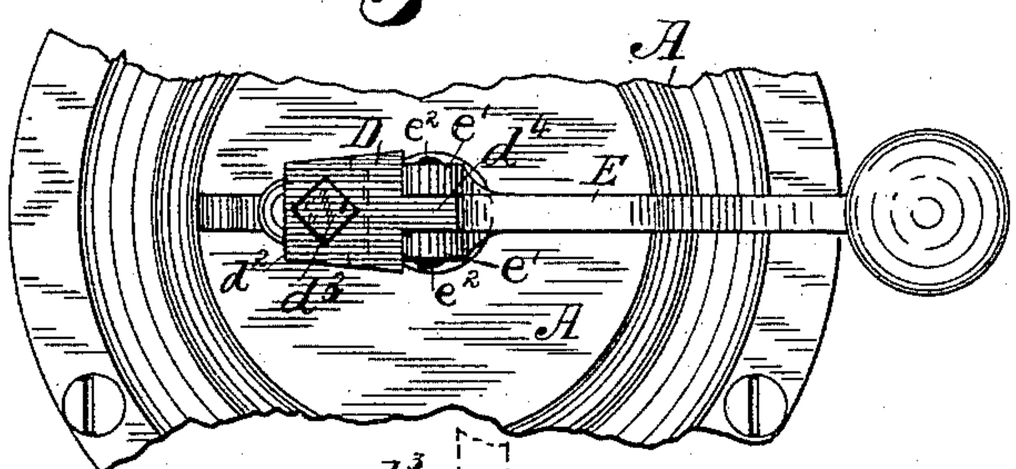



Fig: 2.

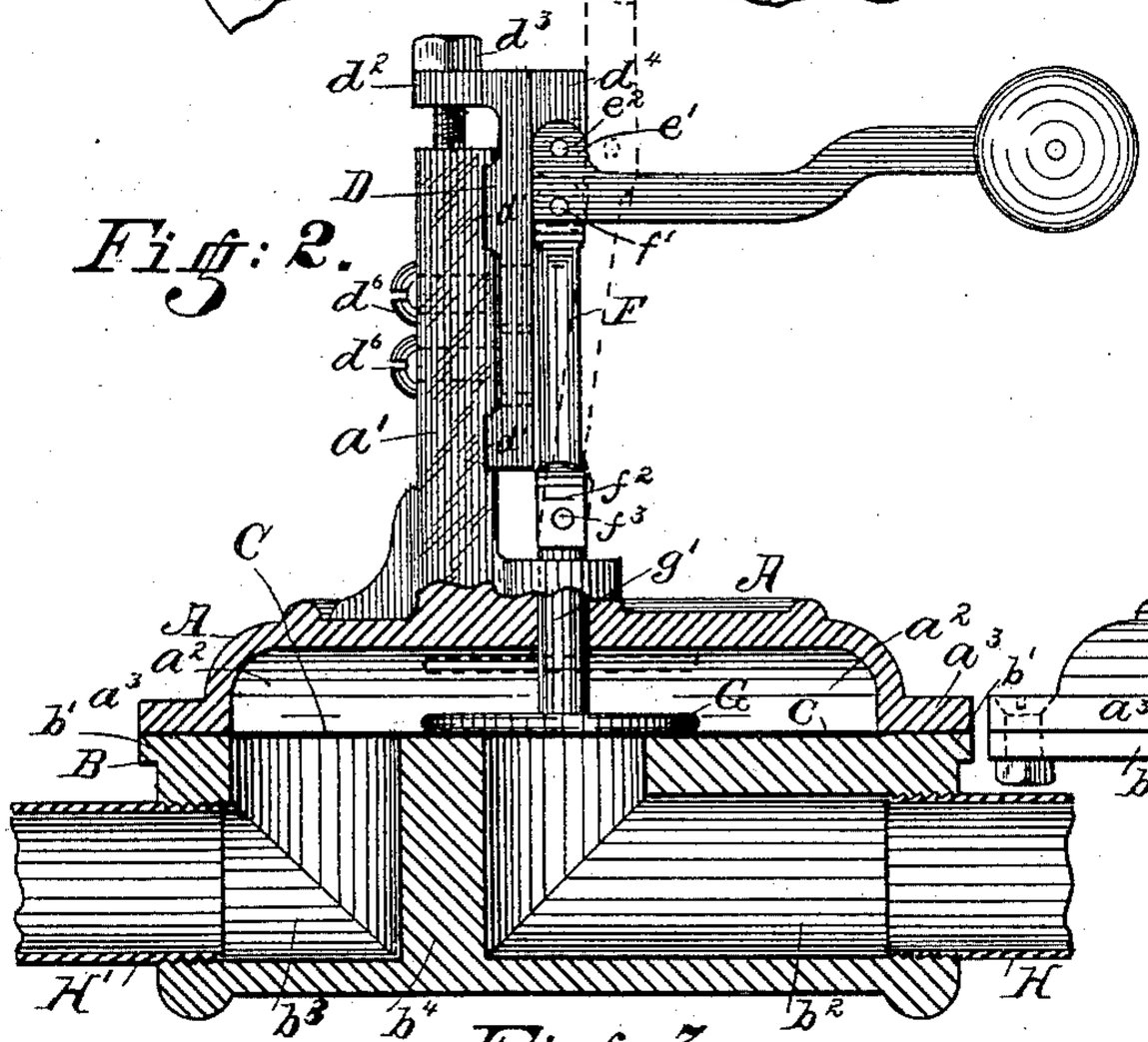



Fig: 3.

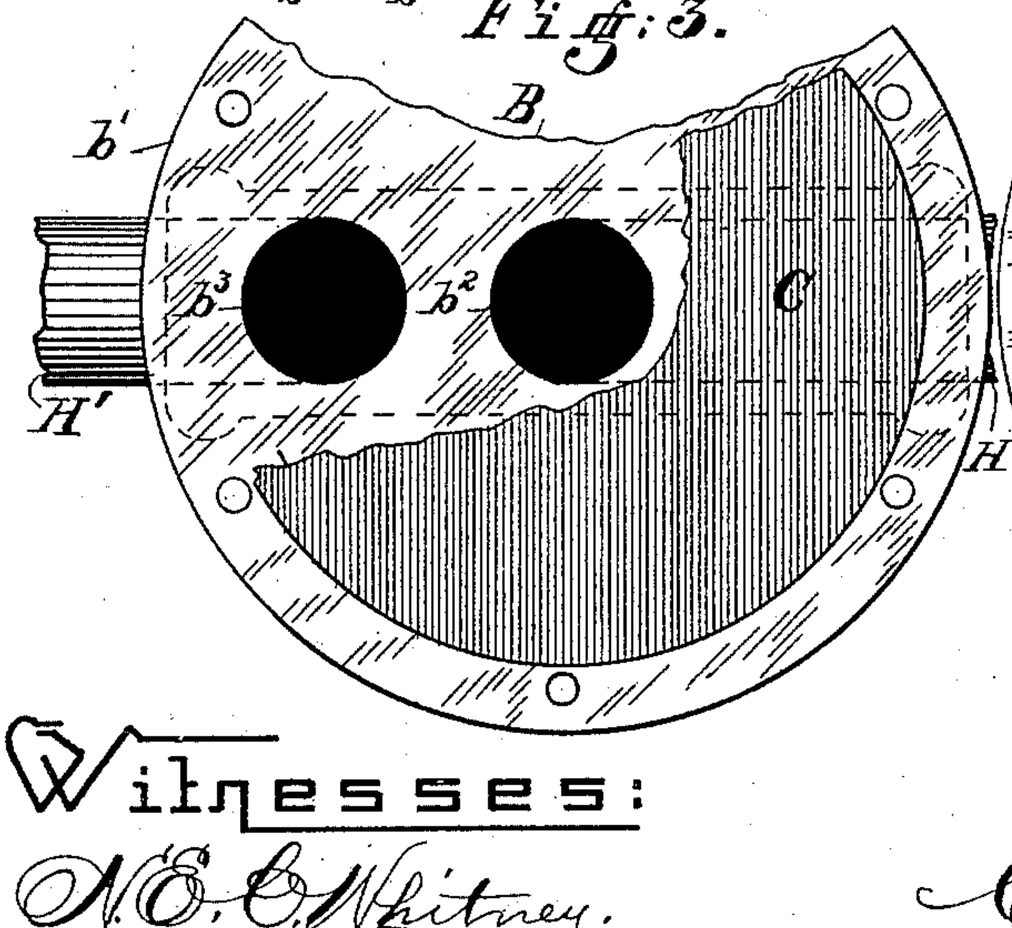



Fig: 4.

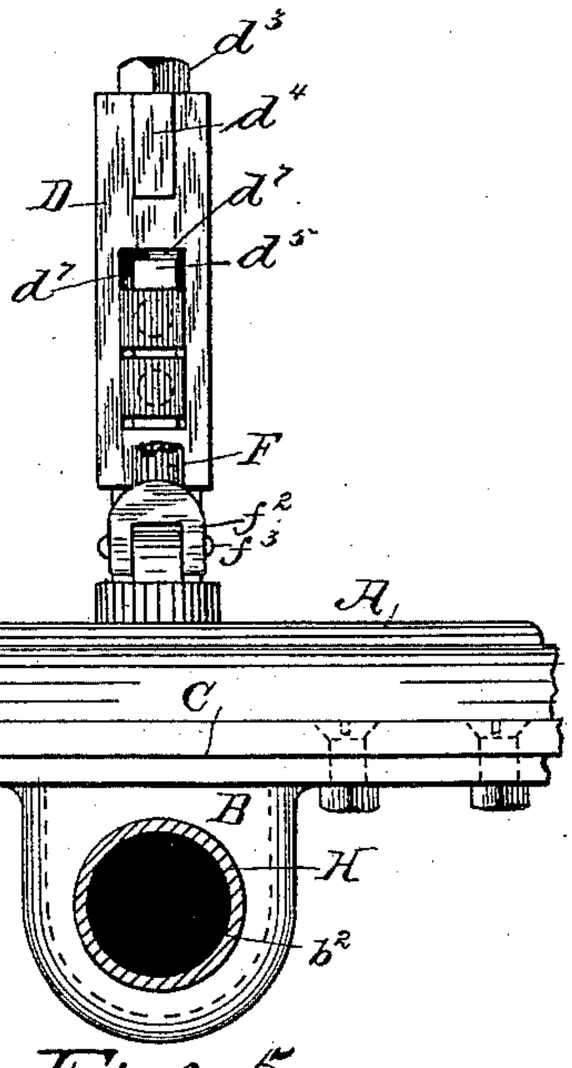
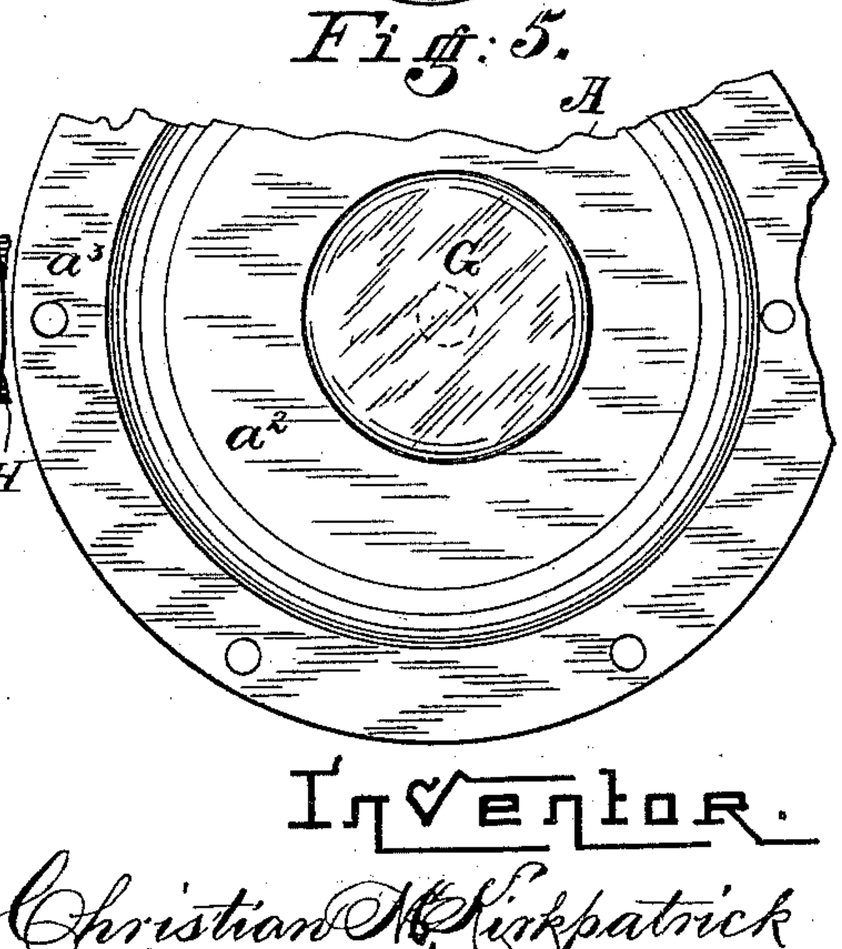



Fig: 5.




Witnesses:

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# UNITED STATES PATENT OFFICE.

CHRISTIAN M. KIRKPATRICK, OF INDIANAPOLIS, INDIANA, ASSIGNOR OF ONE-HALF TO JOSEPH M. TAYLOR, OF SAME PLACE.

## AUTOMATIC CUT-OFF FOR GAS.

SPECIFICATION forming part of Letters Patent No. 395,334, dated January 1, 1889.

Application filed October 8, 1888. Serial No. 287,547. (No model.)

*To all whom it may concern:*

Be it known that I, CHRISTIAN M. KIRKPATRICK, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Automatic Cut-Offs for Gas; and I do hereby 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.

This invention relates to improvements in automatic cut-offs for gas-supply pipes, the object of the invention being, primarily, to provide a gas cut-off to be connected with the supply-pipe that will be cheap, simple, and durable, and which will operate automatically to cut off communication between the main and supply pipes when the pressure in the main pipes ceases or the gas is turned off for any purpose and retain the same in a cut-off condition or normally closed until opened by hand or outside agencies.

The object of cutting off communication between the main or street pipes and the pipes which supply the house or premises and retaining the communication normally cut off, as is well known, is to prevent the escape of gas through the supply or house pipes when the pressure is turned on in the main pipes until communication is opened between the main and supply pipes.

Another object of the invention is to so construct and arrange the parts of the automatic cut-off that the valve, after being set or raised to admit gas to the supply-pipes, will be retained in an elevated or "open" position by the pressure of gas until the pressure ceases, when it will automatically descend and cut off communication between the inlet and outlet ports or the main and supply pipes and become practically "locked" against movement until raised or opened by hand, the pressure of gas upon the valve when seated having no elevating influence thereon, the arrangement of the parts of the cut-off being such that it is necessary to wholly or partially raise the valve before the pressure of gas will assist to raise or sustain it in an unseated position, as hereinafter described.

With these objects in view my invention consists in the special construction and combination of the several parts of the gas cut-off, substantially as hereinafter described, and set forth in the claims.

Figure 1 represents in plan view a gas cut-off constructed in accordance with my invention, a portion only being shown; Fig. 2, a central vertical section of the same partially in side elevation; Fig. 3, a plan view of the lower part of the main casing, showing the valve-seat and inlet and outlet openings and flexible diaphragm, a portion being broken away; Fig. 4, a front elevation of the gas-cut-off looking toward the inlet-opening, parts being broken away; Fig. 5, an under side view of the upper part of the main casing, showing the valve.

The casing of my improved cut-off for natural-gas pipes is preferably constructed of cast-iron and in two pieces, A B, the upper part, A, being cast, preferably, in the shape of a concaved disk with an upwardly-projecting standard, $a'$, cast integral therewith, the concavity forming a chamber, $a^2$, in which the valve operates, as hereinafter described. This upper part, A, has an annular horizontal flange, $a^3$, at its lower edge to rest upon an annular horizontal flange, $b'$, at the upper edge of the lower part, B. This lower part, B, has formed in it at opposite sides an L-shaped inlet and L-shaped outlet port, $b^2$ $b^3$, respectively, which ports extend horizontally from the right and left sides of the lower part, B, and vertically to the upper edge, the two ports being divided by the vertical wall $b^4$, said ports communicating with the chamber $a^2$, the one, $b^2$, being extended to the center, or approximately so, of the said chamber, and the one, $b^3$, to nearly the edge of said chamber, as clearly shown in Figs. 2 and 3.

Secured between the flanges of the upper and lower parts of the casing and extending around the entire area of the chamber $a^2$ is a flexible diaphragm, C, which will be preferably made of soft rubber of the shape of the contour of chamber $a^2$, and will normally cover the inlet and outlet ports $b^2$ $b^3$, or so long as it is desired to cut off communication between said ports. The two parts A B of the

casing are secured together at their flanges with the outer edge of the diaphragm between them by bolts and nuts, screw-bolts, or otherwise, as desired.

Adjustably secured to the standard $a'$ by bolts or equivalents is a metal sliding carriage, D, having ears $d'$ to engage the sides of the standard $a'$ and guide and hold it in its movement and in adjusted position, said carriage having a lateral projection or flange, $d^2$, at its extreme upper end, through which a tap-bolt, $d^3$, is extended and screwed into the upper end of the standard $a'$, which tap-bolt regulates the vertical adjustment of the carriage D. This carriage has also a central longitudinal projecting ear, $d^4$, at its opposite or front face, as shown clearly in Figs. 1 and 2, which ear $d^4$ is engaged between the two ears $e'$ upon the end of a weighted lever, E, which ears $e'$ project substantially at right angles to the length of the lever-arm E, the object of which will be hereinafter explained. This carriage D will preferably have a central longitudinal transverse slot, $d^5$, cut through it or formed therein, through which the shanks of bolts $d^6$ extend, said bolts extending through the standard $a'$ and secured thereto by nuts. The slot $d^5$ will also be rabbeted, as at $d^7$, to receive the head of the bolt, as shown in Fig. 4.

The weighted lever E is pivoted to the projecting ear $d^4$ by a pin or equivalent, $e^2$, which extends through the ears $e'$, which ears project at right angles from the inner end of the weighted lever, as shown, and engage at each side of the ear $d^4$ of the carriage.

Pivoted to the bifurcated end of the weighted lever E, on a line with and just below the point at which the lever is pivoted to the carriage, as shown at $f'$, is a pitman, F, which is bifurcated at its lower end, as shown at $f^2$, and is pivoted at $f^3$ to the upper end of the stem $g'$ of a disk-valve, G, which stem extends through a vertical hole in the center of the upper part, A, of the casing, and being adapted to be positively raised by lifting the lever E, and after being raised held in an elevated position by the pressure of gas at the lower face and allowed to automatically descend when the gas-pressure is cut off or ceases.

By reference to Fig. 2 it will be seen that in the normal or closed position of the valve G all the pivotal points $e^2$, $f'$, and $f^3$ are in a direct vertical plane, and that the inner face of the bifurcated end of the lever E abuts against the outer face of the carriage D, thus forming a dead-lock as against any pressure exerted upon the under face of the valve when seated. By means of the set screw or bolt $d^3$ the carriage with its pivoted pitman and valve may be adjusted so that normally the valve will press tightly against the upper face of the flexible diaphragm directly over the inlet-port, which hermetically closes this port and cuts off communication between it and the outlet-port and connected supply-pipes.

In operation, the cut-off apparatus having been connected with the inlet-pipe H, which communicates with the main pipe and with the outlet-pipe H', which supplies the house, and the gas is turned on, the lever E will be raised by hand, which will bring the parts in the position shown in dotted lines, which leaves the inlet and outlet ports in communication, the pressure of gas against the under side of the flexible diaphragm retaining the valve in a raised position until the gas is cut off in the main or inlet pipes or ceases, when the valve will automatically drop and press the flexible diaphragm tightly against the face of the inlet-port and cut off communication between said port and the outlet-port. The upper part, A, of the casing is re-enforced or provided with a boss, in which the valve-stem is journaled.

On account of the simplicity of my cut-off, any person of ordinary skill can apply the same to the gas-pipes, take it apart, make repairs, if necessary, and adjust it accurately without difficulty.

I am aware that a gas cut-off has been made in which the pivoted lever acted as a cam upon the valve-rod, but had no fixed or positive connection therewith; but in such construction the valve could not be lifted by the lever itself, but was dependent upon a pressure from beneath it to elevate it, and, as is well known, valves of this description, where they seat upon a flexible diaphragm, will occasionally stick, and therefore it is desirable to so arrange the parts that the valve may be lifted independent of the assistance of gas-pressure, and I therefore do not desire to claim such a construction.

I claim—

1. In a gas cut-off, the two-part casing having the vertical standard and having the inlet and outlet ports $b^2$ $b^3$ normally covered by a flexible diaphragm, and a disk-valve to press the diaphragm closely over the inlet-opening, a valve-operating mechanism therefor, consisting of a weighted lever, a pitman pivoted thereto and to the valve-stem in such manner that when the valve is closed and the lever on a horizontal plane the pivotal points will be exactly aligned vertically, and the carriage D, connected to the weighted lever by pivot $e^2$ and adjustably connected to the standard $a'$ by the bolt $d^3$, all substantially as shown and described.

2. An adjusting device for the valve mechanism of gas cut-offs, consisting of the carriage D, to which one element of the valve mechanism is pivoted, adjustably secured to a portion of the casing by a tap-bolt, $d^3$, substantially as shown and described.

3. In a gas cut-off, the standard $a'$, having a bolt-hole in its upper end, in combination with the carriage D, having the rearward projection $d^2$, and having ears $d'$ to engage the

standard, a bolt extending through the projection $d^2$ into the standard $a'$, by means of which the carriage may be adjusted vertically, and a valve mechanism connected to said carriage, substantially as described.

4. A gas cut-off having a valve and valve-operating mechanism, consisting of a valve-stem, a weighted lever, and a connecting rod or pitman so pivoted together that when the valve is depressed the pivotal points are in a line directly central with relation to the movement of the valve, substantially as and for the purpose set forth.

5. In a gas cut-off, the standard $a'$, cast integral with the casing, the carriage D, having the transverse longitudinal opening $d^5$ therethrough, the bolts $d^6$, extending through said opening and through the standard and securing the carriage to the standard, the adjusting-bolt $d^3$, and the valve-operating mechanism, all combined and arranged substantially as shown and described.

6. In a gas cut-off, the carriage D, adjustably secured to a standard of the casing, in combination with the weighted lever E, having the right-angle projection at its inner end, where it is pivoted to the carriage, and a valve-operating pitman pivoted to the inner end of the lever E in a line with but remote from the point at which the lever is pivoted to the carriage, all substantially as shown, and for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

CHRISTIAN M. KIRKPATRICK.

Witnesses:

A. F. HOOTON,

JOSEPH A. MINTURN.