Feb. 8, 1927. 1,617,156

R. R. HARDWAY

AUTOMATIC GAS CUT-OFF

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Fig. 1.

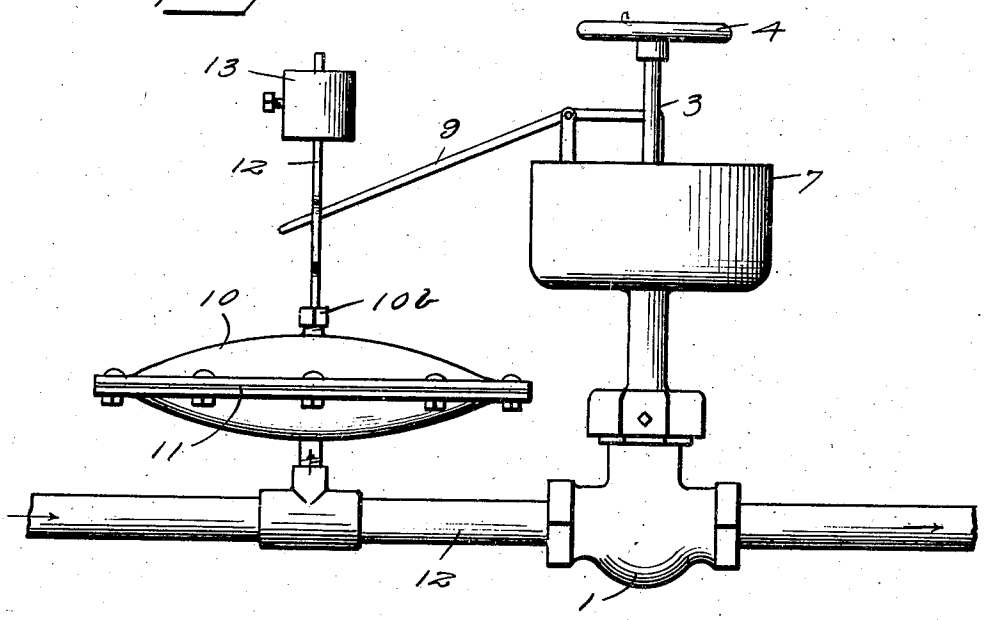
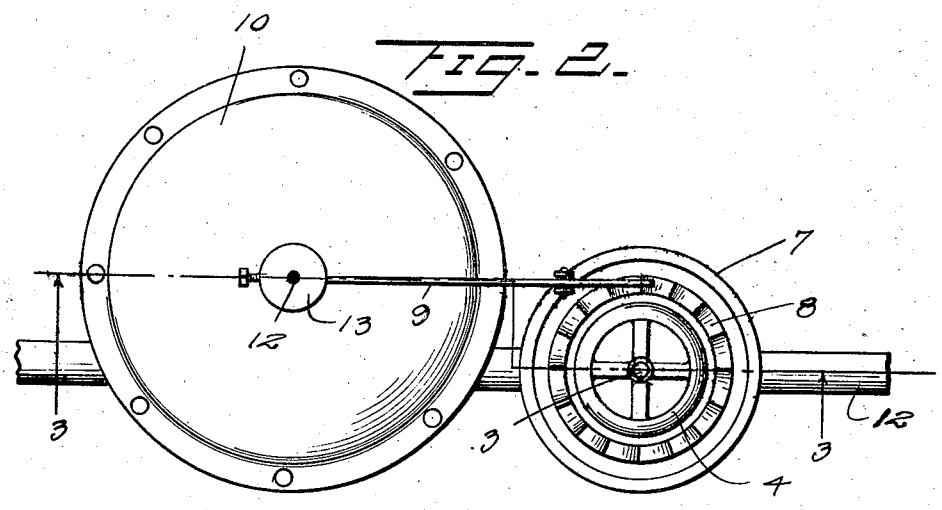


Fig. 2.



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Fig. 3.

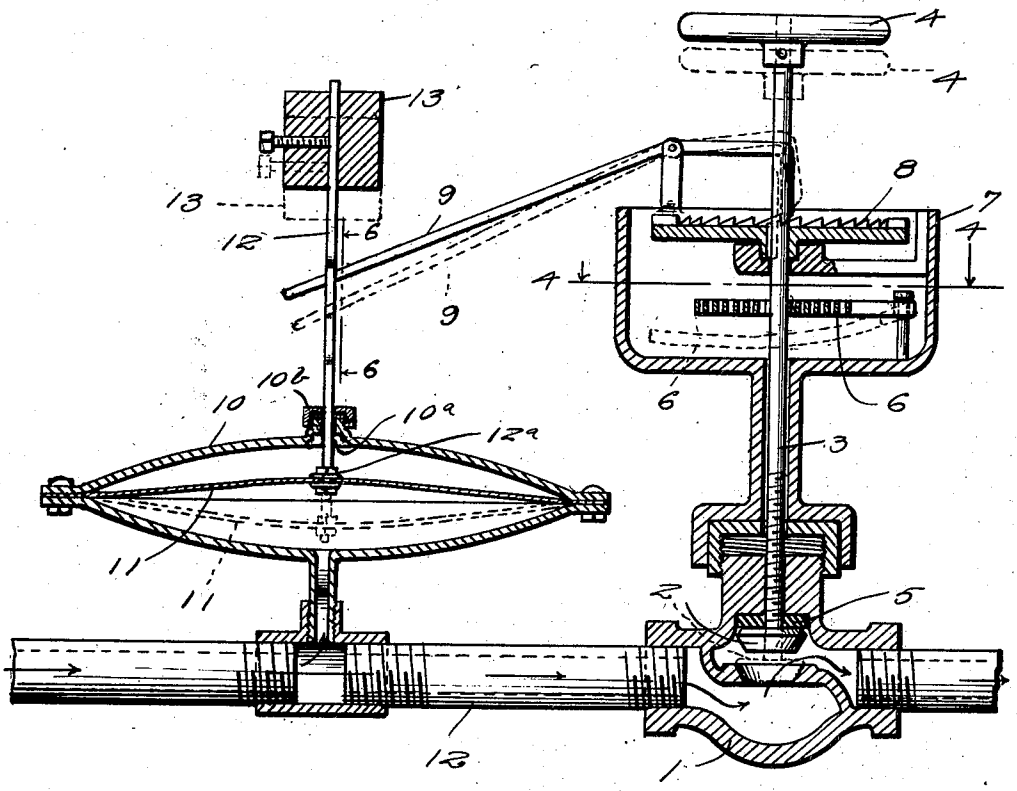


Fig. 4.

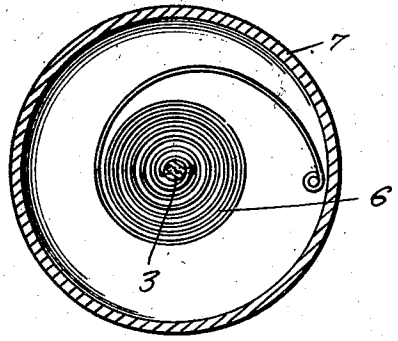


Fig. 5.

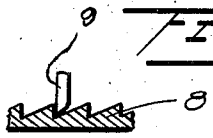
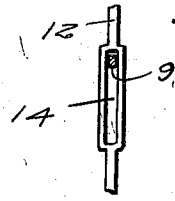


Fig. 6.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC GAS CUT-OFF.

Application filed September 20, 1923. Serial No. 663,856.

When the outlet of a gas service is open and the gas issuing therefrom is consumed, there is no danger of the room or other place in which said outlet is located becoming filled with gas and causing asphyxiation or explosion. However, should the supply of gas be temporarily suspended from any cause, the flame is extinguished and when the supply is reestablished, the gas escaping at the open outlet is not consumed and fills the room or other place in which the outlet is located, thereby becoming a source of danger and liable to cause asphyxiation or explosion and fire.

The present invention provides means whereby the gas outlet is automatically closed when the supply of gas is temporarily suspended, so that when the supply is reestablished the gas cannot escape because of the closed outlet.

Other objects and advantages will be apparent and suggest themselves as the nature of the invention is understood.

While the drawings illustrate an embodiment of the invention it is to be understood that in adapting the same to meet different conditions and requirements, various changes in the form, proportion and minor details of construction may be resorted to without departing from the nature of the invention.

Referring to the accompanying drawings forming a part of the application:

Figure 1 is a side view showing the invention applied,

Figure 2 is a top plan view,

Figure 3 is a vertical longitudinal section on the line 3—3 of Figure 2,

Figure 4 is a horizontal section on the line 4—4 of Figure 3,

Figure 5 is a fragmentary view of the detent mechanism, and

Figure 6 is a sectional detail on the line 6—6 of Figure 3.

Corresponding and like parts are referred to in the following description and designated in the several views of the drawings by like reference characters.

The numeral 1 designates the casing of a globe valve of ordinary construction and 2 is the valve for controlling the flow through the casing. The stem 3 of the valve is threaded in the casing in the usual way and its outer end is provided with a hand wheel 4 or analogous part for opening and closing the valve as required. A washer 5 is fitted upon the inner end of the valve stem 3 and insures a tight joint when the valve is unseated to preclude any escape of gas. A coil spring 6 coacts with the valve stem 3 to normally hold the valve 2 seated. The inner end of the spring 6 is attached to the valve stem and its outer end is attached to a housing 7 which is of cup-shape. A toothed wheel 8 is fast to the valve stem 3 so as to turn therewith and a detent 9 coacts therewith to normally hold the valve in open position. The detent 9 is pivoted intermediate its ends to the housing 7 and its active end cooperates with the teeth of the element 8.

A pressure regulator is provided to automatically trip the detent 9 in the event of the pressure of gas being temporarily suspended, thereby releasing the valve which is automatically closed by means of the spring 6. The pressure regulator comprises a sectional casing 10 and a diaphragm 11 clamped between the sections of the casing. The lower portion of the casing is in communication with the service pipe 12 and under normal conditions the pressure of gas acts upon the diaphragm 11 to admit of the detent 9 engaging the toothed wheel 8 so as to hold the valve open in the required adjusted position. However, should the pressure of gas momentarily decrease from any cause, the diaphragm 11 will become depressed with the result that the detent 9 will be tripped and release the valve which will automatically close by the action of the spring 6. A slotted stem 12 operates through the upper section of the casing 10 and is connected to the diaphragm 11 and is provided at its upper end with a weight 13. The outer end of the detent 9 passes through the slot 14 of the stem 12 and under normal conditions, the stem 12 is held elevated and the detent 9 is free to engage the teeth of the element 8. Upon opening the valve 2, the spring 6 is tensioned and the valve 2 is held in the required adjusted position by means of the detent 9 and toothed wheel 8. Should the pressure of gas materially decrease, the stem 12 will lower and trip the detent 9 and release the valve 2 which will automatically close by the action of the spring 6, thereby closing the outlet and preventing any escape of gas even though the supply temporarily reduced or suspended should be reestablished. It will thus be un-

derstood that the valve must be positively operated when it is required to again open the outlet. The upper section of the casing is provided with a recess 10^a in its inner side to receive the upper nut of a pair of nuts 12^a applied to the stem 12 for securing the diaphragm thereto. This arrangement admits of the diaphragm lying close against the inner side of the upper section of the casing 10 when at the limit of its upward movement thereby preventing injury thereto. A stuffing box 10^b maintains a close joint between the stem 12 and the casing 10.

What is claimed is:

In an automatic gas cut-off, a rotatable and slidable cut-off valve having an operating stem, a casing through which said stem passes enlarged at its free end to provide a housing, said casing at its other end having means for attachment thereof to a valve casing, a helical spring secured to said stem and to the housing and located within the latter, said spring normally urging closing rotation of the valve, a toothed wheel secured to said stem within the housing having ratchet teeth on its upper surface, a rigid elongated detent extending across the top of and pivoted to the upper edge of the housing adapted at one end to engage said toothed wheel and hold the valve stem against rotation, and means controlled by gas passing through the valve directly engaging said detent at the other end to release the detent from engagement with the toothed wheel.

In testimony whereof I affix my signature.

ROY R. HARDWAY.