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Patented May 14, 1901.

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AUTOMATIC SAFETY GAS VALVE.

(Application filed Oct. 20, 1900.)

(No Model.)

Fig. 1.

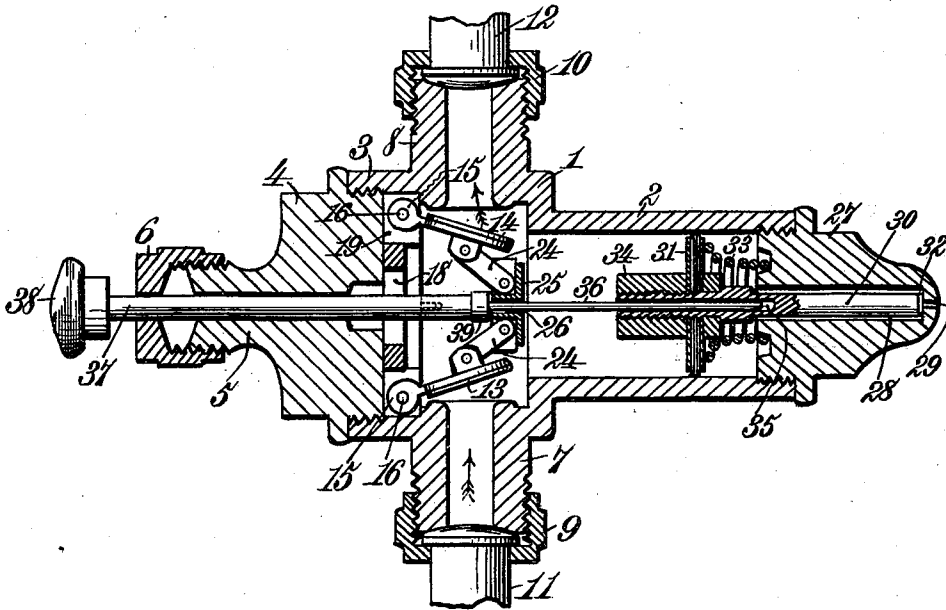


Fig. 2.

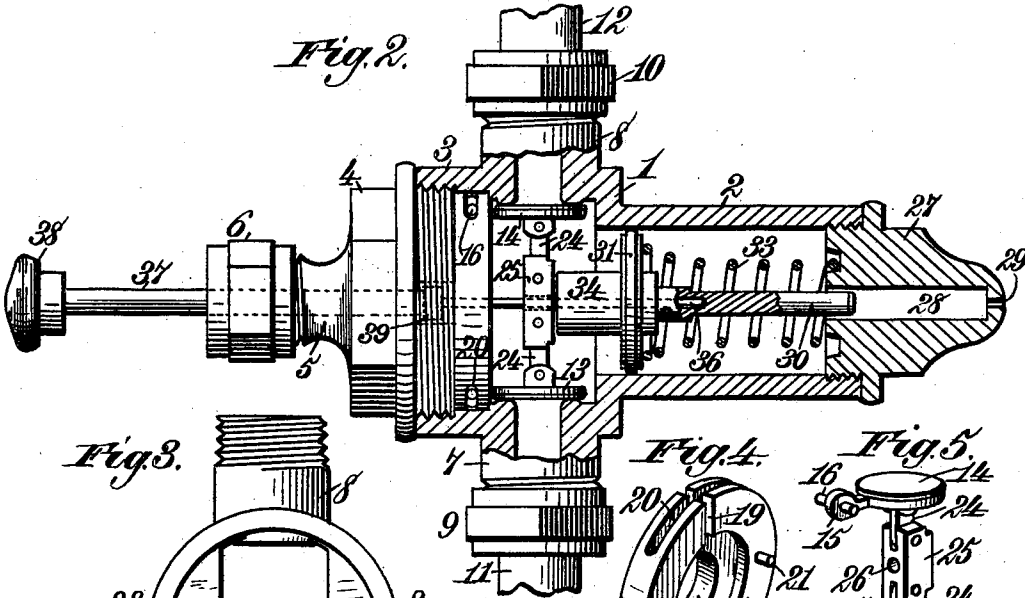


Fig. 3.

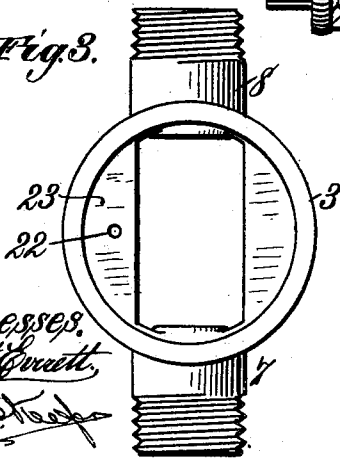


Fig. 4.

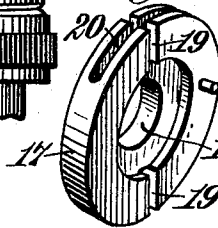
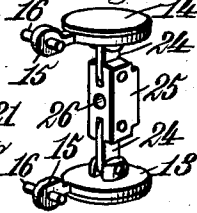


Fig. 5.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC SAFETY GAS-VALVE.

SPECIFICATION forming part of Letters Patent No. 674,289, dated May 14, 1901.

Application filed October 20, 1900. Serial No. 33,779. (No model.)

To all whom it may concern:

Be it known that we, JAMES M. WESCOTT, residing at Hornellsville, and CHARLES B. SMITH, residing at Prattsburg, in the county of Steuben and State of New York, citizens of the United States, have invented new and useful Improvements in Automatic Safety Gas-Valves, of which the following is a specification.

Our invention relates to an improved automatic safety gas-valve especially adapted for use in connection with pipes for conducting natural gas to a burner or burners and in which the several parts of the valve are so constructed and arranged as to automatically shut off the passage or passages leading to the burner when from any cause the pressure of gas is decreased below the normal average or when an accident or break occurs in the main or supply-pipe, the automatic closing of the valve being provided to prevent any escape of the gas at that time in case the stop-cock at the burner has been left open.

The principal object of the invention is to provide a valve for the inlet to the valve-casing and another for the outlet from said casing and to connect said valves by toggle mechanism to be actuated by a piston for closing both of said valves when the gas in the valve-casing falls below normal pressure.

Another object of the invention is the provision of means for indicating that the said valves have been closed by a fall of pressure in the valve-casing and to permit resetting of said valves or opening of the same from the outside of the valve-casing, so that a flow of gas to the burner or burners is resumed.

The invention consists in certain novel features in the construction, combination, and arrangement of the several parts in our improved safety gas-valve, as will be hereinafter more fully set forth.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 represents a central longitudinal section of our improved safety gas-valve, showing the valves open. Fig. 2 is a part-sectional elevation of the same, showing the valves closed. Fig. 3 is an end elevation with the plug at one end of the valve-casing removed. Fig. 4 is a perspective of a ring or

annular plate to which the valves are pivoted. Fig. 5 is a perspective of the toggle-connected valves detached.

Referring to the drawings for details of construction, the reference-numeral 1 designates a substantially cylindrical valve-casing having one end provided with a tubular or cylindrical extension 2, which may be of reduced diameter as compared with the main body of said valve-casing. The other end of said valve-casing has a somewhat extended portion 3, which is internally screw-threaded for reception of a centrally-perforated screw-plug 4, having a reduced and externally-screw-threaded extension or neck 5 for engagement of a centrally-perforated screw-cap 6, Figs. 1 and 2.

On opposite sides and intermediate the valve-casing extensions 2 and 3 the main portion or body 1 of the valve-casing is constructed with a tubular inlet-nozzle 7 and a tubular outlet-nozzle 8, both the nozzles 7 and 8 being externally screw-threaded for engagement, respectively, with screw-threaded couplings 9 and 10, through which the valve-casing obtains a union or connection with a gas-supply pipe 11 on one end and on the other end with a delivery-pipe 12 for conducting gas to a burner or burners.

The inlet-nozzle 7 and the outlet-nozzle 8 are controlled, respectively, by valves 13 and 14, arranged within the main body 1 of the valve-casing. Each valve 13 and 14 is provided on one edge with a partly-circular lug 15, arranged at right angles to the valve-disks, as shown in Figs. 1 and 5, and these lugs 15 are provided on their opposite sides with pintles 16, through which the respective valves are hinged within the valve-casing.

There is arranged in one end of the main valve-body 1 a ring or annular plate 17, Figs. 1, 2, and 4. This plate 17 has a central perforation 18, and its rim or body portion is provided at opposite points with radial slots 19 for receiving the lugs 15 of the two hinged valves. In the periphery of this annular plate 17 there are provided grooves or kerfs 20, that intersect the slots 19 at right angles, and in these grooves 20 are received the pintles 16 on the lugs 15 of the two hinged valves. One side of the ring or annular plate 17 has

projecting therefrom a pin or dowel 21, Fig. 5, to enter a recess 22, Fig. 3, in a shouldered or internal web portion 23 of the central or body portion of the valve-casing. By means of the pin 21 and recess 22 the ring or annular plate 17 is prevented from turning, and thus the valves 13 and 14 are maintained in the required position for controlling the inlet and outlet nozzles of the valve-casing. The construction and arrangement of the slots 19 and grooves 20 of this annular plate 17 are such as to permit a sufficient play of the valves 13 and 14 to insure accurate seating of said valves when closed.

The inner face of each valve 13 and 14 has pivotally connected therewith one end of a toggle-link 24, and the other end of each toggle-link is pivotally connected with a slide-block 25, Figs. 1, 2, and 5, having a central perforation 26 in line with the longitudinal axis of the valve-casing.

The outer end of the valve-casing extension 2 is closed by a screw-plug 27, Figs. 1 and 2, in which there is a central longitudinal bore 28, terminating in a vent-opening 29 at the outer end of said screw-plug. The bore 28 of the screw-plug 27 receives one end portion of the stem 30 of a piston 31, that is arranged to operate in the reduced cylindrical portion or extension 2 of the valve-casing. A packing 32 on the outer end of the piston-stem 30 will insure closing the vent 29 when the piston is in its outermost position. The inner face or end of the screw-plug 27 is constructed to provide a bearing for one end of a spiral spring 33, the other end of which bears against one face of the piston-head. On its other face the piston-head 31 carries a somewhat elongated hub portion 34, through which the slide-block 25 is actuated for closing the valves 13 and 14 when the pressure of gas within the valve-casing falls below the pressure to which the spring 33 may have been adjusted. The passage of gas to the burner or burners will thus be automatically cut off whenever the gas falls below normal, as by any accident to the gas-main or service-pipe or any serious interruption to the flow of gas, so that should the gas cock or valve at the burner have been left open there will be no escape of gas at that point when the normal flow of gas is resumed.

The inner end portion of the piston-stem 30 is constructed with an axial recess or bore 35, Fig. 1, to receive an elongated and circumferentially-reduced portion or extension 36 of a rod 37, having a knob or head 38 on its other end outside the valve-casing. On this rod 37 there is formed a collar 39, which is so located as to be capable of being brought into bearing contact with one face of the slide-block 25 opposite that face of said block against which the hub portion of the piston is designed to act.

In setting the parts of this safety-valve mechanism into operative position for permitting the flow of gas at a usual or an ordinary

pressure to the burner or burners it is only necessary to push inward the head 38 of the rod 37, as shown in Fig. 1, thereby bringing the collar 39 of said rod against the slide-block 25, so as to force the toggle-links 24 into an inclined position, thus opening the valves 13 and 14, which control the flow of gas through the valve-casing. When the valves are in the open position, (shown in Fig. 1,) the packing 32 on the end of the piston-stem 30 will close the vent 29 and prevent any escape of gas in that direction. The act of opening the valves 13 and 14 will at the same time compress the spring 33 in readiness for action in closing said valves when the normal pressure of gas within the valve-casing falls as a result of accident or otherwise. At this time the compressed spring 33 will expand, thereby forcing the piston 31 in an inward direction and causing its hub 34 to bear against the slide-block 25, consequently extending the toggle-links 24 and through them forcing the valves 13 and 14 to their seats. All flow of gas through the valve-casing is thus automatically cut off, and consequently there can be no escape of gas at a burner or burners should the accident be repaired or the flow of gas resumed before the valves 13 and 14 are reset. It will also be seen that the movement of the slide-block 25 in closing the valves 13 and 14 will cause said slide-block to bear against the collar 39 of the rod 37, thereby forcing outward the head 38 of said rod. The outwardly-extended position of the rod 37 as thus produced will at once indicate that the valves 13 and 14 are closed and that no flow of gas can be obtained at the burner without resetting said valves 13 and 14 by pushing said rod 37 inward, as already described.

The construction and arrangement of the several parts of the valve mechanism are such as to insure reliable automatic action for shutting off a flow of gas to a burner or burners when the pressure of gas falls below normal, as by accident or otherwise, and the position of the rod 37 and its head 38 will always indicate whether the valves 13 and 14 are open or closed.

What we claim as our invention is—

1. In an automatic safety gas-valve, the combination with the valve-casing and its inlet and outlet, of a pair of valves for controlling said inlet and outlet, a slide-block having toggle-link connections with said valves, means for moving said slide-block by hand to open said valves, and automatically-actuated mechanism for moving said slide-block in an opposite direction to close said valves on fall of gas-pressure below normal, substantially as described.

2. In an automatic safety gas-valve, the combination with the valve-casing and its inlet and outlet, of a pair of valves for controlling said inlet and outlet, a slide-block having toggle-link connections with said valves, a longitudinally-movable rod for moving said block in one direction to open said valves,

one end portion of said rod being extended outside the valve-casing and serving to indicate whether the valves are open or closed, and a spring-pressed piston for automatically moving said slide-block in the opposite direction to close said valves on fall of gas-pressure below normal, substantially as described.

3. In an automatic safety gas - valve, the combination with the valve-casing and its inlet and outlet, of a pair of hinged valves for controlling said inlet and outlet, a slide-block supported in the valve-casing between said valves and having a toggle-link connection with each, a longitudinally-movable rod for moving said slide-block in one direction to break extension of the toggles and thereby open said valves, and a spring-pressed piston for automatically moving said slide-block in the opposite direction to close said valves on fall of gas-pressure below normal, substantially as described.

4. In an automatic safety gas - valve, the combination with the valve-casing and its inlet and outlet, of a pair of hinged valves for controlling said inlet and outlet, an annular plate supported in the valve-casing and to which said valves are hinged, a slide-block supported in the valve-casing and having toggle-link connections with said valves, a longitudinally-movable rod projecting from the valve-casing, for moving said slide-block in one direction to open said valves, and a

spring-pressed piston for automatically moving said slide-block in the opposite direction to close said valves on fall of gas-pressure below normal, substantially as described.

5. In an automatic safety gas - valve, the combination with the valve-casing and its inlet and outlet, said valve-casing being further provided in its opposite ends with screw-plugs having axial perforations one of which constitutes a vent, of valves controlling the inlet and the outlet of said valve-casing, a slide-block supported in the valve-casing between said valves and having a toggle-link connection with each, a rod extended through the perforation of one of said plugs for moving said slide-block in one direction by hand from the outside of the valve-casing to set the valves in open position, and automatically-actuated mechanism mounted in the valve-casing to control the gas-vent and to close the valves at the inlet and outlet of the valve-casing on fall of gas-pressure below normal, substantially as described.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

JAMES M. WESCOTT.
CHARLES B. SMITH.

Witnesses:

F. B. KEEFER,
GEO. W. REA.