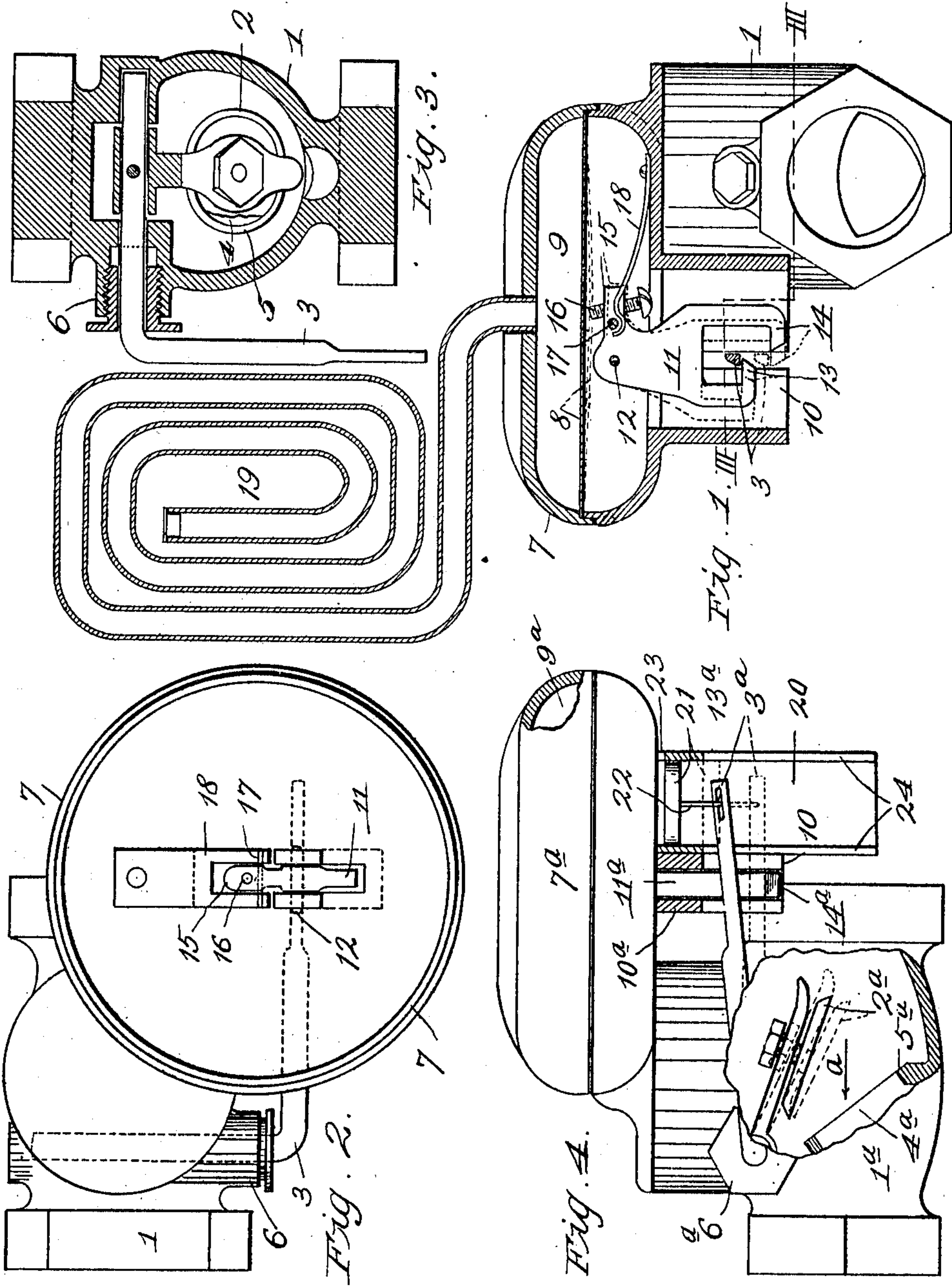


J. C. SMITH.
 AUTOMATIC OUT-OFF VALVE.
 APPLICATION FILED AUG. 18, 1908.

969,911.

Patented Sept. 13, 1910.



WITNESSES:
M. Cox.
F. E. Oakley.

INVENTOR
J. C. Smith,
 BY *F. G. Fischer*
 ATTORNEY

UNITED STATES PATENT OFFICE.

JESSE C. SMITH, OF KANSAS CITY, MISSOURI.

AUTOMATIC CUT-OFF VALVE.

969,911.

Specification of Letters Patent. Patented Sept. 13, 1910.

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To all whom it may concern:

Be it known that I, JESSE C. SMITH, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Automatic Cut-off Valves, of which the following is a specification.

This invention relates to automatic cut-off valves; and my object is to provide a simple and efficient valve of this character which will automatically cut off the flow of gas from a supply-pipe should the pressure therein be materially reduced or the supply of gas be temporarily cut off.

With the above object in view the invention may be said to reside in the novel combination and arrangement of parts hereinafter described, illustrated in the accompanying drawing, and particularly pointed out in the claims, it being understood that changes in form and minor details of construction may be resorted to without departing from the spirit or scope of the invention.

Referring now to the accompanying drawing which illustrates the invention: Figure 1 represents an end elevation of the device partly in section. Fig. 2 is a plan view of the device with a portion of the housing, employed in carrying out the invention, removed. Fig. 3 is an irregular section of the valve when closed on line III—III of Fig. 1. Fig. 4 is a side elevation of a modified form of the device partly broken away to show the interior thereof.

In carrying out the invention, I employ a valve consisting of a casing 1, a plug 2 arranged therein, and a stem 3 to which the plug is fixed. Casing 1 is provided with a port 4 surrounded by a plug-seat 5, which is inclined so that when plug 2 is seated thereon it will be reliably held in a closed position by the pressure of the fluid acting thereon. Stem 3 extends outward through one side of the casing, which is provided with a stuffing-box 6 to prevent leakage of fluid around the valve-stem.

7 designates a housing carried by casing 1 and provided with a diaphragm 8 which extends across the interior of the housing and forms an expansion chamber 9 in the upper portion thereof. The lower portion of housing 7 is provided with a slotted guide 10 through which the free end of stem 3 extends. Said stem is normally held in a raised position by a latch 11, pivotally se-

cured at its upper end to housing 7 by a pin 12, and provided at its lower end with two inwardly-extending arms 13 14, either of which is adapted to engage the stem 3.

The upper portion of latch 11 is provided with an arm 15 extending substantially at right angles thereto and provided with a screw 16 which is adjustable so that its upper terminal may be arranged in proper relation to the diaphragm. Arm 15 is also provided with a transverse pin 17, the ends of which project beyond the sides thereof and engage a spring 18, secured to the lower portion of housing 7, which holds the latch in such position that its arm 13 will intersect the slotted portion of guide 10 and support stem 3 in its raised position.

19 designates a hot-air coil closed at one end and communicating at its opposite end with chamber 9.

When the device is used in connection with a gas-stove or furnace, it is connected to the main supply-pipe in such manner that the gas will flow through the valve in the direction of arrow *a*. The valve may be connected to said supply-pipe any convenient distance from the furnace, but the coil 19 is arranged adjacent to the furnace-burner so that the air within said coil will become heated within a short time after the burner has been lighted. The valve is opened by hand to allow the passage of gas to the burner by raising its stem 3 until it is engaged by the upper surface of arm 13, which supports the stem until the air within the coil 19 becomes heated, expands into chamber 9, and depresses the diaphragm to the dotted position shown in Fig. 1. When this occurs the diaphragm contacts with screw 16 and depresses the same therewith, causing it to throw latch 11 to the position indicated by dotted lines, Fig. 1, and release arm 13 from stem 3 so that the latter may drop onto arm 14 which has been drawn across the slotted portion of guide 10 to intercept the downward movement of the stem. The stem remains supported by arm 14 so long as the gas flows to the furnace-burner and the latter remains lighted, but should the flame be blown out or the flow of gas there-to be temporarily interrupted, the air within coil 19 becomes cool and contracts, thereby allowing the diaphragm 8 to resume its normal position. When this occurs, spring 18 pressing upward on pin 17 throws the latch to the position shown in full lines,

Fig. 1, and thereby withdraws arm 15 from beneath stem 3, so the latter may descend and permit plug 2 to become seated. Further flow of gas to the burner is then prevented until the stem is again raised into engagement with arm 13.

In the modified form, Fig. 4, the construction is substantially the same as that in the preferred form, with the exception that arm 13 of latch 11 is removed, and a dash-pot 13^a is substituted therefor. Said device consists of a valve 1^a provided with a plug 2^a, secured to a stem 3^a extending outward from the valve through a stuffing-box 6^a. Valve 1^a has a port 4^a surrounded by an inclined seat 5^a to receive plug 2^a. 7^a designates a housing secured to the valve casing and provided with a slotted guide 10^a, through which the valve-stem extends. 11^a designates a latch mounted in housing 7^a and provided at its lower terminal with an arm 14^a adapted to intersect the slotted portion of guide 10^a and prevent stem 3^a from dropping therethrough until the supply of gas is cut off. The free end of stem 3^a extends into the dash-pot cylinder 20, and is connected to a piston-head 21 by a connecting-rod 22.

In practice the device is set in an operative position by raising stem 3^a, which is prevented from immediately dropping downward by the piston-head 21, which moves downward very slowly and permits the diaphragm in chamber 9^a to actuate latch 11^a and draw arm 14^a beneath the stem. Then should the flow of gas be interrupted the diaphragm will contract and allow latch 11^a to resume its normal position, thereby drawing arm 14^a from beneath the stem which drops rapidly and permits plug 2^a to become seated. The initial downward movement of the piston-head 21 is exceedingly slow by reason of the fact that air enters the top of cylinder 20 only through a small opening 23, but after the stem moves downward and rests upon arm 14^a, the piston-head passes beneath slots 24 in the cylinder and permits a free circulation of air above the piston-head, so that the latter will not retard the downward movement of the

valve-stem after arm 14^a has been withdrawn from beneath the same.

Having thus described my invention, what I claim is:—

1. An automatic cut-off valve, comprising, in combination, a valve having an oscillatory arm, a housing carried upon the valve casing, a diaphragm extending across the interior of said housing and forming an expansion chamber therein, and means adapted to engage said arm for holding said valve whereby upon automatic release from one position, said means automatically and simultaneously interposes itself in position to catch the valve in a second position, said holding means being adapted to be contacted by said diaphragm to operate said holding means.

2. An automatic cut-off valve, comprising, in combination, a valve having an oscillatory arm, a housing carried upon the valve casing, a diaphragm extending across the interior of said housing and forming an expansion chamber therein, and a device adapted to intercept said arm in its oscillations to hold the latter in one of a plurality of positions, said device consisting of arm supporting fingers, and a diaphragm contacting element.

3. An automatic cut-off valve, comprising, in combination, a valve having an oscillatory arm, a housing carried upon the valve casing, a diaphragm extending across the interior of said housing and forming an expansion chamber therein, and means adapted to engage said arm for holding said arm in one of a plurality of positions, said arm engaging means comprising a pivoted yoke having spaced fingers adapted to intercept said arm in succession, and an element in connection with said yoke for contacting said diaphragm.

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

JESSE C. SMITH.

Witnesses:

F. G. FISCHER,
M. Cox.