S. SYAKAS.

AUTOMATIC GAS SHUT-OFF VALVE.

APPLICATION FILED MAR. 27, 1916.

1,186,147. Patented June 6, 1916.

Fig. 1.

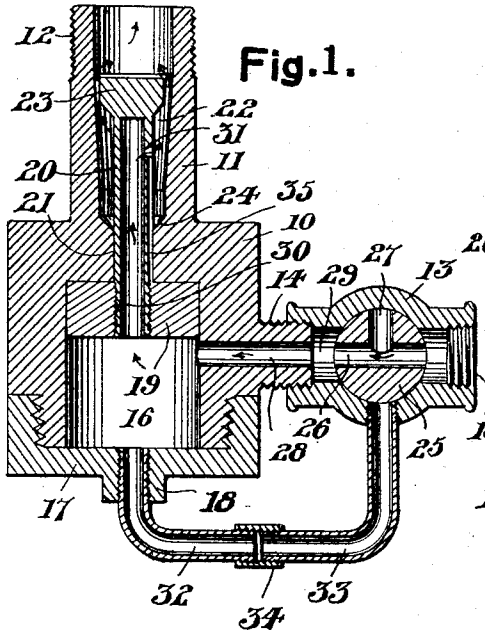


Fig. 2.

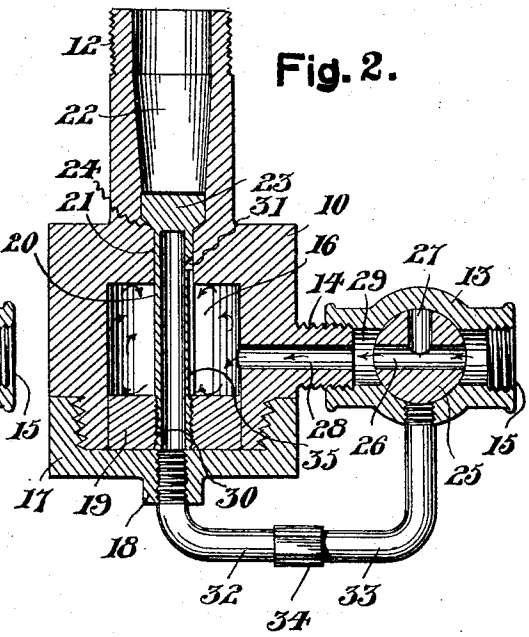
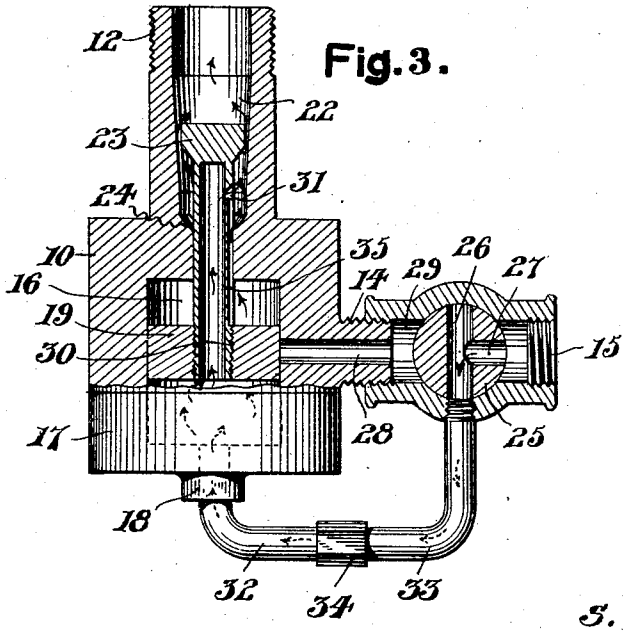


Fig. 3.



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AUTOMATIC GAS-SHUT-OFF VALVE.

1,186,147. Specification of Letters Patent. Patented June 6, 1916.

Application filed March 27, 1916. Serial No. 86,975.

To all whom it may concern:

Be it known that I, STEPHEN SYAKAS, a citizen of the United States of America, residing at Massena, in the county of St. Lawrence and State of New York, have invented certain new and useful Improvements in Automatic Gas-Shut-Off Valves, of which the following is a specification.

This invention relates to new and useful improvements in automatic gas shut-off valves.

The primary object of the invention is to provide an apparatus readily inserted in any gas supply line between the supply pipe and the gas consuming apparatus adapted for closing the gas passage automatically whenever the gas pressure falls below a predetermined point or is entirely shut off.

A further object of the invention is the provision of a safety appliance for employment with gas supply apparatus, especially those utilizing natural gas or other gas where the pressure in the mains is subject to fluctuations and interruptions, the apparatus being designed for automatically closing the gas supply pipe and preventing a discharge of the gas until the appliance is manually reset.

A still further object is to provide a device for preventing injury by reason of escaping gas after a burner has been extinguished by reason of a drop in the pressure or a suspension in the supply of the gas, the device automatically closing the supply pipe under such circumstances.

With these general objects in view and others that will appear as the nature of the invention is better understood, the same consists in the novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings and then claimed.

In the drawing forming a part of this application and in which like designating characters refer to corresponding parts throughout the several views: Figure 1 is a central longitudinal sectional view through the device in its operative open position. Fig. 2 is a similar view thereof partly in elevation in its inoperative closed position, and Fig. 3 is a view similar to Fig. 2, the device being illustrated in the operation of resetting the same.

It will be understood that the present automatic shut-off for the gas supply may be positioned at any point in the supply pipe and the same consists broadly of a cylindrical valve casing 10 having a front head 11 projecting therefrom with a threaded terminal nipple portion 12 adapted to be connected to the gas consuming apparatus such as the burner connecting pipes of a building, a casing 13 of a three-way gas cock being attached to a threaded boss 14 of the casing 10 and arranged with a supply connection 15 for attachment to the gas supply or inlet pipe (not shown) of the system.

The valve casing 10 is provided with a central chamber 16 therein arranged with a closure cap or cylindrical back head 17 screw-threaded upon the casing and having a threaded boss 18 axially projecting therefrom. A piston 19 is tightly fitted for reciprocating within the chamber 16 and has a piston rod or valve stem 20 slidably arranged through a bore 21 connecting the chamber 16 with an axially arranged valve chamber 22 in the front head 11 of the valve casing. A valve 23 is attached to the end of the valve stem 20 opposite the aforementioned piston 19, the said valve adapted to close upon an annular seat 24 at the inner end of the valve chamber 22 when the piston is at the outer end of the piston chamber 16 in substantial contact with the closure head 17. A turn plug 25 is positioned in the casing 13 having a transverse main port 26 and a lateral auxiliary port 27, while a passage 28 is arranged through the casing 10 and boss 14 communicating with the piston chamber 16 and the chamber 29 within the cock casing 13.

With the elements in their normal position, as illustrated in Fig. 1 of the drawing, the gas is supplied through the inlet 15 of the casing 13, the plug 25 being positioned with the port 26 thereof in communication with the passage 28 and whereby the gas enters the piston chamber 16 and by reason of the gas pressure maintains the said piston at the inner end of the chamber 16 and with the valve 23 unseated and positioned outwardly of the valve chamber 22. The gas then normally passes out through the axial bore 30 of the piston rod 20, through a side port 31 in the said rod and thence outwardly past the valve 23 to the outlet nipple 12 and thence through the serv-

ice apparatus, such as the gas burners, not shown.

In the event of an interruption in the gas supply at the casing inlet 16 or a reduction in the gas pressure, the piston 19 will lower by reason of its own weight incident to the reduced fluid pressure in the chamber 16 until the elements assume their relations illustrated in Fig. 2 of the drawings with the valve 23 closed upon its seat 24, thus preventing any further outlet of the gas through the nipple 12.

Upon a renewal of the gas supply entering through the inlet 15, port 26, chamber 29 and passage 28, the gas will enter the chamber 16 above the piston 19 and the pressure of the gas will more firmly seat the valve 23 preventing any exit of the gas through the nipple 12, as illustrated in Fig. 2 of the drawing. It will thus be evident that any burners that may have been extinguished when the gas was shut off by the lowering of the piston 19 cannot now be in a position for gas to escape therethrough and being unlighted cause injury to persons and property.

A by-pass pipe formed of two sections 32 and 33 attached together by a coupling or union 34 provide a passage between the boss 18 of the piston head 17 and the casing 13 of the three-way cock so that the chamber 16 is in communication with the chamber 29. For reëstablishing fluid communication between the inlet 15 and outlet 12, the plug 25 is given a quarter turn so as to connect the auxiliary port 27 thereof with the casing inlet 15 and the main port 26 with the by-pass pipe, as illustrated in Fig. 3 of the drawing. In this position, it will be seen that the gas which has regained its full pressure passes through the plug 25, the by-pass pipe 33—32 entering the chamber 16 beneath the piston 19, forcing the piston upwardly returning the same to its operative station as shown in Fig. 1 with the valve 23 unseated from its seat 24 and the device in its operative open arrangement. Any fluid trapped within the chamber 16 above the piston 19 during the operation of the device is allowed to escape during the re-opening of the valve 23 by means of a longitudinal exteriorly arranged side groove 35 in the piston rod 21 allowing such fluid to pass from the chamber 16 to the valve chamber 22, all as fully illustrated in Fig. 3 of the drawing. While the communication will thus be established through the by-pass pipe, it is only necessary to employ such pipe for an instant during the return of the piston 19 to its normal valve unseating arrangement and whereupon the plug 25 is returned for directly connecting the port 26 with the piston passage 28 and closing the by-pass pipe 33, the device being then operatively arranged for performing the functions for which it is designed as hereinbefore specifically set forth.

The device is easy and inexpensive to manufacture, all the parts thereof being readily assembled and disconnected when desired, the device being serviceable as a safety or precautionary means against injury by escaping gas as well as for effecting a saving of the gas supply.

While the form of the invention herein shown and described is what is believed to be the preferable embodiment thereof, it is nevertheless to be understood that minor changes may be made in the form, proportion and details of construction without departing from the spirit and scope of the invention as hereinafter claimed.

What I claim as new is:—

1. An automatic gas control apparatus comprising a casing having a piston chamber therein, a head extending from the said casing and having a valve chamber therein provided with a valve seat, the said casing having an axial bore communicating with the said piston chamber and the said valve chamber centrally of the said seat, a weighted piston within said piston valve, a tubular piston rod axially secured through the said piston slidably arranged within the said bore and having a side outlet port, a closure valve upon the outer end of the said rod arranged upon the said seat when the piston is in its lowered position, the said casing provided with a fluid inlet passage, a three-way cock casing in communication with the said inlet passage and having a supply connection, a turn plug in the said casing having main and auxiliary ports, a closure head for said piston chamber screw-threaded upon the first named casing and a by-pass pipe connecting the said piston chamber with the interior of said cock casing.

2. A safety valve cut-off comprising a casing having a piston chamber and a valve chamber therein and a communicating bore between the said chambers, a piston within the said piston chamber, a valve within the said valve chamber, a tubular connecting member having a side port therethrough attached to the said piston and valve and slidably arranged within the said bore, the said connecting member having a longitudinal side groove terminating adjacent the piston at its lower end and adjacent the said port at its upper end, a valve casing communicating with the piston chamber, a by-pass pipe between the lower end of the piston chamber and the said valve casing, and a three-way ported turn plug within the said valve casing.

3. An automatic gas shut-off apparatus comprising a piston casing having a piston chamber therein, an axial bore through one side thereof and inlet passages arranged in planes perpendicular to each other in two

of the other sides thereof, one of the said passages being in axial alinement with the said bore, a weight closing piston within the said chamber, a tubular rod slidably arranged within the said bore attached to the said piston and having an outlet port adjacent its free end, a piston controlled cut off valve on the outer end of the said rod, and a three-way gas cock attached to the said casing in communication with the said inlet passages and having a fluid supply connection.

In testimony whereof I affix my signature.

STEPHEN SYAKAS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."