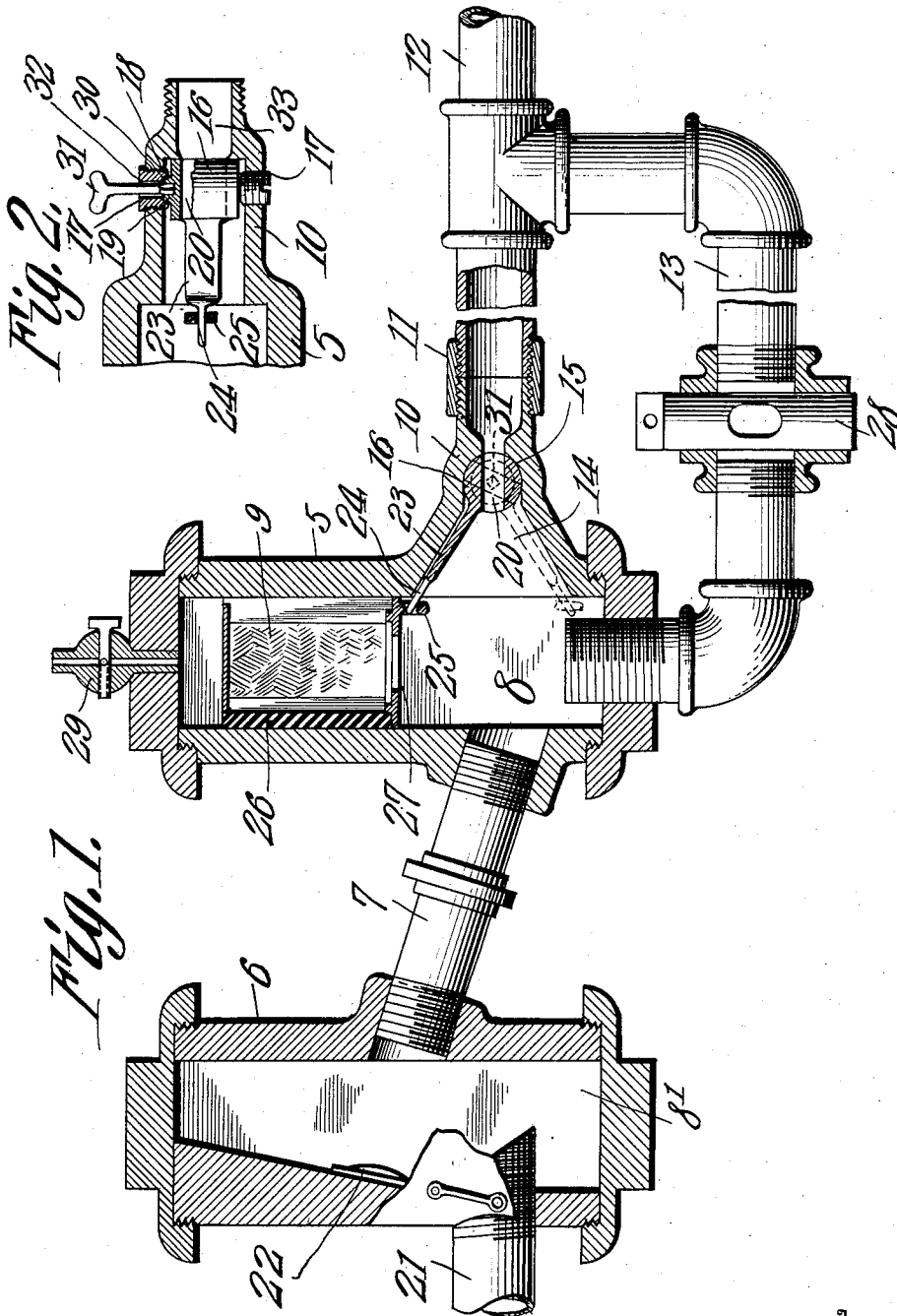


M. F. NICHOLS.
 AUTOMATIC GAS CUT-OFF AND SAFETY DEVICE.
 APPLICATION FILED JAN. 14, 1909.

934,339.

Patented Sept. 14, 1909.



Witnesses

E. J. [Signature]
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UNITED STATES PATENT OFFICE.

MARCUS FREDRICK NICHOLS, OF OSWAYO, PENNSYLVANIA.

AUTOMATIC GAS-CUT-OFF AND SAFETY DEVICE.

934,339.

Specification of Letters Patent. Patented Sept. 14, 1909.

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To all whom it may concern:

Be it known that I, MARCUS FREDRICK NICHOLS, a citizen of the United States, residing at Oswayo, in the county of Potter and State of Pennsylvania, have invented a new and useful Automatic Gas-Cut-Off and Safety Device, of which the following is a specification.

This invention relates to automatic cut off valves of that general class shown and described in United States Letters Patent issued to me on the 8th day of December 1908, under Serial No. 906152.

The object of the invention is generally to improve and simplify the construction of the cut off and to provide means for automatically closing the controlling valve of the supply pipe in case the fluid pressure falls below a predetermined point.

Further objects and advantages will appear in the following description, it being understood that various changes in form, proportions and minor details of construction may be resorted to within the scope of the appended claims.

In the accompanying drawings forming a part of this specification:—Figure 1 is a longitudinal sectional view of an automatic cut off constructed in accordance with my invention, a portion of the device being shown in elevation. Fig. 2 is a longitudinal sectional view of the turning plug or valve of the main supply pipe.

Similar numerals of reference indicate corresponding parts in all of the figures of the drawings.

The present invention is in the nature of an attachment to my automatic valve before referred to and illustrated in Fig. 1 of the drawings in which 5 and 6 designate the casings connected by an inclined pipe 7 and provided with interior chambers 8 and 8' in one of which is slidably mounted an expansible valve 9. One wall of the casing 5 is provided with a lateral extension 10 which is connected through the medium of a coupling 11 with a main supply pipe 12, there being a by-pass 13 arranged beneath the extension 10 and forming a source of communication between the main supply pipe 12 and the interior of the chamber 8, as shown. The side walls of the extension 10 at the juncture of the latter with the casing 5 are inclined laterally to produce a substantially tri-angular shaped chamber 14, the interior walls of the chamber 14 at the apex

of the latter being curved or ground to form a valve-seat 15 for the reception of a turning plug or valve 16. Threaded in the opposite walls of the extension 10 at the valve-seat 15 are pins 17 having cone-shaped bearings 18 formed in their inner ends for the reception of correspondingly shaped trunnions 19 formed on the opposite ends of the valve 16, thereby to permit free turning movement of said valve. The turning plug or valve 16 is provided with a single port 20 which, when in open position, permits the passage of gas from the supply pipe 12 into the chamber 8 and thence through the pipe 7 and chamber 8' to the service pipe 21, the entrance of the gas to the service pipe being controlled by a flap valve 22 similar in construction to the flap valve shown in my former patent above referred to.

Secured to or formed integral with the valve 16 is a laterally extending arm 23, the free end of which is reduced to form a finger 24 which enters an eye or loop 25 depending from the bottom of the expansible valve 9, this valve 9 being closed on three sides thereof by the expansible walls 26 and open at its bottom, as indicated at 27, to permit the entrance of gas under pressure to the interior of said valve. An auxiliary valve 28 is also preferably arranged in the by-pass 13 for controlling the flow of gas through said by-pass to the chamber 8. Thus it will be seen that with the several parts in the full line position shown in Fig. 1 of the drawings, should the supply of gas be accidentally cut off or the pressure reduced or partially reduced, the valve 9 will drop by gravity and in doing so actuate the turning plug or valve 16 to automatically cut off the flow of gas through the supply pipe and casings 5 and 6 to the service pipe. In order to re-set the valve, the turning plug 28 is moved to open position, thus allowing the gas from the supply pipe to flow through the by-pass into the chamber 8 where it enters the valve 9 through the open end thereof and elevates the same, the pet cock 29 being previously opened to exhaust the air in the chamber above the valve 9 so as to permit the latter to be moved to open or elevated position. In its upward movement the valve 9 will tilt or oscillate the arm 25 and again move the valve 16 to open position so as to permit the flow of gas from the supply pipe to the service pipe, in the manner before stated.

In some cases it has been found desirable to provide means for manually operating the valve or turning plug 16 and in order to effect this result one of the trunnions 19 is formed with a squared socket 30 adapted to receive the correspondingly squared terminal of an operating handle or key 31, which latter passes through an opening 32 in the adjacent bearing pin 17, as best shown in Fig. 2 of the drawings.

Attention is here called to the fact that the inclined walls of the chamber 14 by engagement with the arm 23 serves to limit the turning movement of the plug or valve 16, while the contracted portion 33 of the extension 10 prevents the admission of gas into the chamber 14 when the valve is in closed position.

While it is preferred to use the attachment in the supply pipe it is obvious that the same may be arranged within the inclined pipe 7 or operatively connected with the valve 22 without departing from the spirit of the invention.

Having thus described the invention what is claimed is:—

1. In an automatic cut off, a casing having fluid inlet and discharge pipes, a by-pass forming a source of communication between one of said pipes and the interior of the casing, a hollow valve mounted for vertical movement within the casing above one end of the by-pass, an oscillating valve for controlling the flow of gas through the supply pipe, and a connection between said valves for automatically closing the supply pipe valve upon a reduction in the fluid pressure.

2. In an automatic cut off, a casing having fluid inlet and discharge pipes, a by-pass forming a source of communication between one of said pipes and the interior of the casing, means for controlling the flow of fluid through the by-pass, a hollow valve slidably mounted within the casing above one end of the by-pass, an auxiliary valve for controlling the passage of gas through the supply pipe to the casing, and an arm projecting from the auxiliary valve and actuated by engagement with the sliding valve to close said auxiliary valve upon a reduction in the fluid pressure.

3. In an automatic cut off, a casing having fluid inlet and discharge pipes, a by-pass forming a source of communication between one of said pipes and the interior of the casing, means for controlling the passage of fluid through the by-pass to the interior of the casing, an expansible valve slidably mounted within the casing, an auxiliary valve arranged in the supply pipe, said auxiliary valve being actuated by engagement with the expansible valve for automatically closing the auxiliary valve upon a reduction in the fluid pressure.

4. In an automatic cut off, a casing having fluid inlet and discharge pipes, a by-pass forming a source of communication between one of said pipes and the interior of the casing, means for controlling the passage of fluid through the by-pass, a valve slidably mounted within the casing and provided with a depending eye, an auxiliary valve connected in the supply pipe, and an arm extended laterally from the auxiliary valve and engaging the eye of the sliding valve for moving the auxiliary valve to closed position upon a reduction in the fluid pressure.

5. In an automatic cut off, a casing having fluid inlet and discharge pipes, a by-pass forming a source of communication between one of said pipes and the interior of the casing, means for controlling the passage of fluid through the by-pass, an expansible valve operating within the casing and provided with a depending eye, an auxiliary valve arranged in the supply pipe and provided with an arm having a reduced extension operating in the eye of the expansion valve.

6. In an automatic cut off, a casing having fluid inlet and discharge pipes and having one wall thereof expanded laterally at its juncture with the supply pipe to produce an interior chamber having a valve-seat formed therein, a by-pass forming a source of communication between the supply pipe and the interior of the casing, means for controlling the passage of fluid through the by-pass, a vertically movable valve operating within the casing, an oscillating auxiliary valve engaging the valve-seat, and an arm extending laterally from the auxiliary valve and actuated by engagement with the sliding valve to close said auxiliary valve upon a reduction in the fluid pressure.

7. In an automatic cut off, a casing having fluid inlet and discharge pipes, a by-pass forming a source of communication between the supply pipe and the interior of the casing, a main valve operating within the casing, an auxiliary valve arranged within the supply pipe and operatively connected with the main valve, pins threaded in the supply pipe and having cone shaped bearings formed therein, and trunnions formed on the opposite ends of the auxiliary valve for engagement with the cone shaped bearings of the pins.

8. In an automatic cut off, a casing having fluid inlet and discharge pipes, a by-pass forming a source of communication between the supply pipe and the interior of the casing, a main valve operating within the casing, pins threaded in the supply pipe and provided with cone shaped bearings, one of said pins being formed with a longitudinal passage, an auxiliary valve having oppositely disposed trunnions engaging the bearings in the pins and provided with an arm

operatively connected with the main valve, and a handle extending through the opening in said threaded pin and engaging the valve for operating the latter manually.

- 5 9. In an automatic cut off, a casing having fluid inlet and discharge pipes, a by-pass forming a source of communication between the supply pipe and the interior of the casing, a hollow main valve arranged within
10 the casing and having an opening therein forming a source of communication between the interior of the valve and said by-pass, an

auxiliary valve for controlling the supply of fluid through the supply pipe into said casing, and an arm projecting laterally from the auxiliary valve and operatively connected with the main valve. 15

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

MARCUS FREDRICK NICHOLS.

Witnesses:

H. R. EASTON,
C. A. EWELL.