

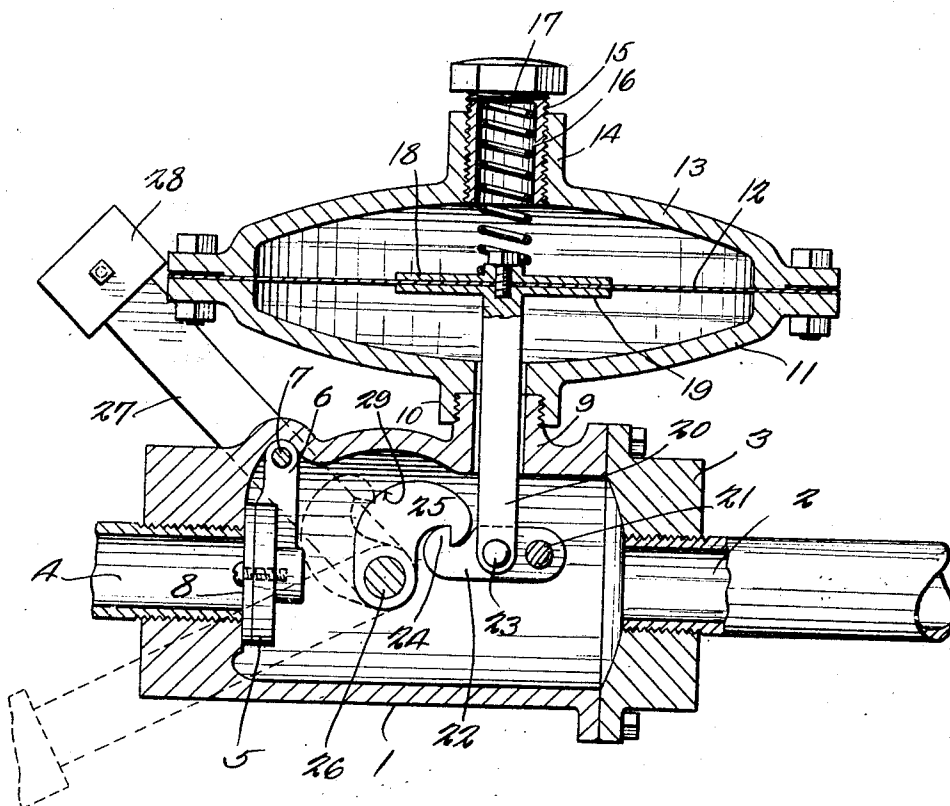
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AUTOMATIC CUT-OFF

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UNITED STATES PATENT OFFICE.

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AUTOMATIC CUT-OFF.

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This invention relates to an automatic cut-off designed primarily for use in connection with gas, steam and water systems although the same may be utilized wherever liquids or gases of any kind are to be controlled automatically. It is an object of the invention to provide a simple, compact and efficient device which will operate to close automatically whenever the fluid controlled thereby falls below a predetermined pressure.

A further object is to provide an automatic cut-off device which will not be affected by corrosion or other deterioration because remaining inactive for a long time but, on the contrary, is always ready for instant action whenever the desired pressure fails.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawing, which is a section through a valve having the present improvements combined therewith, the preferred form of the invention has been shown.

Referring to the drawing by characters of reference 1 designates a valve casing having an outlet pipe 2 opening into one end thereof, said end being preferably formed of a head 3 detachably connected to the casing 1. An inlet 4 is provided in the casing and is adapted to be closed by a valve 5 suspended by an arm 6 from a pivot pin 7. This arm may be provided with a face 8 of any suitable material adapted to bear against the seat of the valve so as to seal the inlet.

A tubular nipple 9 is extended from the casing and is detachably engaged by a recessed boss 10 extending downwardly from the center of the lower portion 11 of a diaphragm casing. A diaphragm 12 is claimed, at its margin, between said lower portion 11 and the upper portion 13 of the diaphragm casing. Said upper portion has a tubular extension 14 at the center thereof in which is

mounted an adjusting screw 15 having a bore 16 extending thereinto from its inner end. A spring 17 is seated in this bore and thrusts downwardly upon the middle portion of the diaphragm 12. To this middle portion are connected disks 18 and 19 engaging opposed surfaces of the diaphragm, the lower disk 19 being provided with a stem 20 which projects through the boss 10 and the nipple 9, there being sufficient clearance around the stem to permit gas to flow freely from the interior of the casing 1 into the lower portion of the diaphragm casing.

A cross pin 21 is arranged within the casing 1 and pivotally mounted thereon is a short latch lever 22, there being a pivotal connection 23 between the lower end of the stem 20 and an intermediate portion of the latch lever. This latch lever has a head 24 adapted to engage a hook 25 mounted for rotation with a transverse pin 26 suitably journaled in the wall of the casing 1. To one end of this pin is attached a lever 27 having a weight 28 thereon, this lever and weight being located outside of the casing. The hook 25 is not only designed to engage and be retained by the head 24 as shown by full lines in the drawing but the back of the hook is rounded as shown to constitute a cam 29 for thrusting against the arm 6 and holding the valve tight against its seat when the weighted lever 27 is released.

It is designed that the diaphragm 12 with its spring 17 be adjusted so as to be thrust away from normal position by gas under a predetermined pressure, this gas being admitted to the portion 11 of the diaphragm casing from the casing 1 through the nipple 9 and the boss 10. At this time the head 24 engages the hook 25 so that the same cannot swing around the longitudinal axis of the pin 26. Consequently the weighted arm 27 will be supported in raised position away from the valve 5 so that said valve can swing open freely under the pressure of the fluid being controlled.

It will be apparent that under normal conditions, with the valve 5 open and the lever 27 supported in raised position as shown by full lines, the fluid can flow from the inlet 4

into the casing 1 and thence outwardly through the outlet 2, a portion of the fluid passing into the casing of the diaphragm so as to press against the diaphragm and hold it out of normal position with spring 17 slightly under compression. The amount of compression of this spring will be controlled by the adjustment of the screw 15. As long as the pressure remains at or above a predetermined amount there will be no change in the operation of parts. When, however, the pressure falls below the predetermined amount the diaphragm 12 will shift slightly toward the casing 1 to cause stem 20 to thrust against the latch lever 22. This lever will thus be swung away from the hook 25 and release it so that weighted arm 27 will swing downwardly to the position indicated by broken lines in the drawing. During this downward movement of the lever 27 the cam edge 29 of the hook will thrust against the arm 6 and force the valve 5 to its closed position, thereby shutting off the supply of fluid to the casing 1.

It will be obvious, of course, that the apparatus can be reset by raising arm 27 and holding it in such position until normal pressure has been restored whereupon the arm 27 can be released and will remain supported by the interengaging latch head 24 and hook 25.

What is claimed is:

An automatic cut-off in the form of a self contained unit including a casing having an inlet and an outlet, a valve swingably mounted in the casing, a pivot above the valve for supporting it normally by gravity in position across the inlet, a cam pivotally mounted in said casing, a latch in said casing, a second casing communicating with the first named casing, a diaphragm in said second casing, an operative connection between the diaphragm and the latch, said diaphragm, when subjected to pressure from within the first named casing, constituting means for holding the latch in engagement with the cam thereby to maintain the cam away from the valve and permit free swinging movement of the valve about its pivot away from the outlet, and a combined weighted lever and resetting handle outside of the casing and connected to the cam for automatically shifting said cam when released from the latch to move the cam against the valve, close the valve, and maintain the valve in closed position.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

GEORGE WILLIAM FRANZHEIM.