

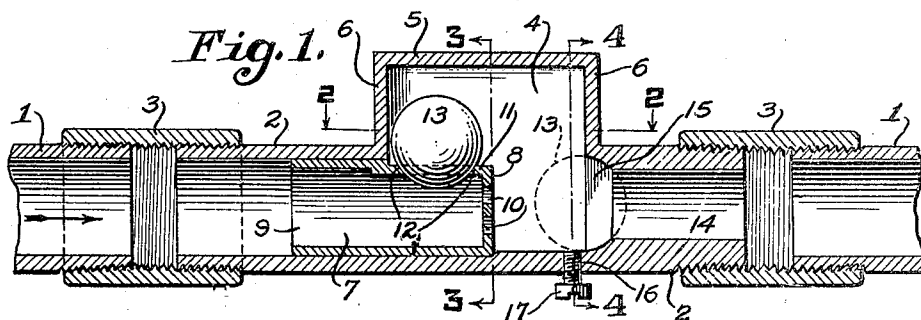
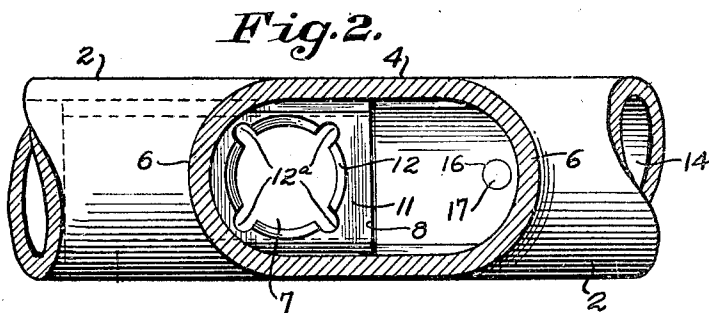
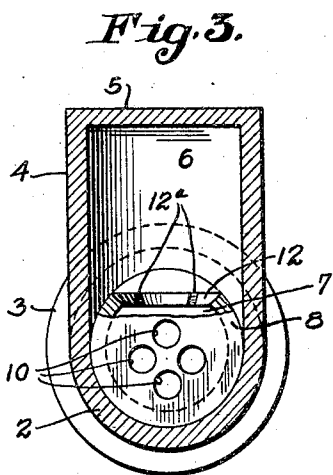
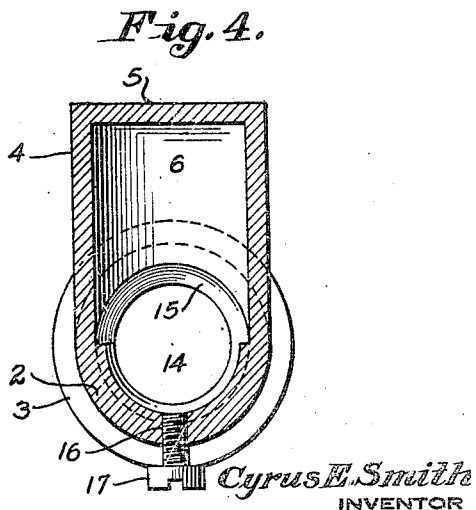
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C. E. SMITH

AUTOMATIC CUT-OFF

Filed June 18, 1923



WITNESSES

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AUTOMATIC CUT-OFF.

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To all whom it may concern:

Be it known that I, CYRUS E. SMITH, a citizen of the United States, residing at Fall River, in the county of Bristol and State of Massachusetts, have invented a new and useful Improvement in Automatic Cut-Offs, of which the following is a specification.

This invention relates to automatic cut offs.

The object is to provide a device for installation in a pipe line for gas or other fluids whereby, when an abnormal flow of the same passes through said pipe, the device automatically acts to cut off the flow.

Another object is to provide a cut off of this character which may be readily placed in position in the pipe line between the adjacent ends of two sections of pipe by the employment of a pair of ordinary pipe couplings, and which when properly set in position will permit the maximum amount of fluid to pass uninterruptedly, as when all the outlets or burners are being utilized, as in the case of gas, or will permit any one or more of the same to be used, but in the event of fire or any other accident where the pipe line may be broken or damaged, and the leakage of gas would prove disastrous, the automatic cut off functions through the excessive flow or pressure caused by such accident, and the escape of the gas through such leak is immediately stopped.

A final object is to provide an automatic cut off which, when the broken pipe line is restored to a working condition, may be reset or placed in its normal position for permitting the proper amount of gas to flow for serving all the outlets or burners, without the necessity for dismantling the line or disconnecting the device therefrom for the purpose.

A full and complete understanding of the invention may be obtained from a consideration of the following detailed description, taken in connection with the accompanying drawing forming a part of this specification; it being understood that while the drawing shows a practical form of the invention, the latter is not to be confined to strict conformity with the showing thereof, but may be changed or modified, so long as such changes or modifications mark no material departure from the salient fea-

tures of the invention, as specifically pointed out in the appended claims.

In the drawing, in which similar reference characters designate corresponding parts throughout the several figures:—

Figure 1 is a longitudinal sectional view through a portion of a pipe line having the improved device in connection therewith.

Figure 2 is a horizontal sectional view taken on the line 2—2 of Figure 1.

Figure 3 is a vertical section taken on the line 3—3 of Figure 1.

Figure 4 is a similar view taken on the line 4—4 of Figure 1.

Referring to the drawing there is shown the adjacent ends of two pipe sections 1—1 forming part of an ordinary pipe line adapted to convey gas or other fluid, between which is located the body 2 of the automatic cut-off, the same comprising a tubular casing of the same diameter as the aforesaid pipe sections and open from end to end, said ends being externally threaded for the reception of ordinary couplings 3 which connect the device to the ends of the pipe sections.

The body member 2 is provided with an upstanding turret or housing 4, forming an enlarged chamber, preferably formed integrally therewith, closed at its upper end by a flat top plate 5, the said housing being of the same width as the diameter of the body member and substantially twice as long as the width thereof, the ends 6 of the housing being rounded in semi-circular form as shown in Figure 2 of the drawing, and the long interior side walls thereof merging into the sides of the bore through the said body member.

Inserted into one end of the body member is a tubular ball valve support 7 consisting of a length of tubing having an external diameter to be driven into the body and tightly fitting the same so as to have no rotary or longitudinal movement therein. The ball support is located with substantially half its length extending into the lower portion of the housing, the inner end being closed by an integral wall 8, while the outer end of the same is open, as at 9, to provide for the free entrance of the gas or other fluid being conducted by the pipe line.

The inner end wall 8 is provided with a plurality of perforations 10 to admit of the

passage of the fluid in a more or less restricted manner, as when the normal flow of the same is passing while any or all of the lights or outlets are being used along the pipe line, and the upper face of the ball support 7 is flattened, as at 11, where extending into the housing, said flattened face having an opening 12 therethrough in communication with the interior of the tubular member 7.

The walls of the opening or seat 12 are rounded to conform to the diameter of the ball 13, which is formed of suitable non-corrosive metal and of a size to freely roll along the flattened face 11 and between the elongated, interior side walls of the housing, there being ample space between the end wall 8 of the tubular member 7 and the opposite end of the housing for the ball 13 to drop down and rest upon the bottom wall of the body member 2 of the automatic cut off, as shown in dotted lines, Figure 1. The bore or passageway 14 at this end of the body member 2 is somewhat smaller in diameter than the bore at the opposite end thereof, and the same is formed at its inner end into a ball seat 15 having its walls rounded to conform to the ball 13 which is adapted to fit therein.

The elevated ball seat 12 is provided around its periphery with a plurality of notches 12^a, as clearly shown in Figure 2, said notches serving to allow the gas or other fluid to pass through the same and into the housing, in addition to the apertures or perforations 10, when the ball is seated on said raised seat 12.

Substantially below the center of the ball, when the same is seated in the seat 15, there is a threaded perforation 16 formed in the bottom wall of the body member 2, and a screw 17 is fitted into this perforation 16 for the purpose of normally closing the same against the escape of gas or other fluid therethrough.

When the device is installed in the pipe line 1—that end of the body member 2 having the ball-valve support 7 located therein is positioned to receive the flow of the gas or other fluid, as indicated by the arrow in Figure 1 of the drawing, and the ball is located in the elevated seat 12. With any one or all of the gas burners or outlets in use, the pressure of the gas flow is taken care of by the combined outlets 10 and 12^a without disturbing the ball 13, a portion of the gas traversing the notches 12^a and finding outlet around the said ball and on through the bore 14 together with the gas that passes through the openings 10. If however the pipe line should be disrupted, broken or strained sufficiently to cause a leak at any place, and the full pressure of the fluid is allowed to pass through the pipe line, the ball is lifted thereby off its

seat 12, there being ample space between the top of the ball and the under face of the top plate 5 for the ball to roll over the end of the ball support 7 and into closing relation to the seat 15, when the flow of gas is immediately stopped.

After the pipe line is repaired, the ball 13 may be lifted and placed back on its normal elevated seat 12 by removing the screw 17 and introducing a piece of wire through the opening 16 for the purpose.

While the invention has been specifically described in connection with a pipe line for gas or other fluids it will be seen that the same may be used to equal advantage in connection with other uses.

From the foregoing it will be seen that a simple, cheaply manufactured and easily installed automatic cut-off for the control of fluids has been provided, which will permit of the normal flow of fluid without being actuated, and when the said flow reaches the abnormal stage, through accident to the pipe line or otherwise, the flow is immediately stopped, and that the device may be easily and quickly re-set or placed in normal position without dismantling the pipe line.

What is claimed is:

1. An automatic gas cut-off comprising a body having an inlet and an outlet, and an enlarged chamber between the inlet and outlet, a ball valve support within said body having an elevated ball seat in said chamber above the bottom thereof, a ball valve on said seat, and a second ball seat at the outlet of the body below the elevated ball seat, whereby abnormal pressure of fluid within the body will cause the ball valve to be forced from its elevated seat so as to occupy and close the seat at the outlet of the body and thereby stop the passage of fluid.

2. An automatic cut-off, comprising a body having an inlet and an outlet, and a housing forming an enlarged chamber between the inlet and outlet, a tubular ball valve support contained within the body and having an elevated ball seat within the chamber, the end of the tubular member within the chamber being perforated, a ball valve seated on the elevated ball seat, and a second ball seat at the outlet of the body, whereby abnormal pressure of fluid within the body will cause the ball valve to be forced from its elevated seat so as to occupy and close the seat at the outlet and thus stop the passage of fluid.

3. An automatic cut-off for pipe lines, comprising a tubular body member having an inlet and an outlet, a housing communicating with the top of the body member between the inlet and outlet, a tubular ball valve support fixed in the body member and extending within the housing, said ball valve support having an elevated ball seat and perforations at the end of the ball support below the seat, and a second ball seat for

closing the outlet of the body member, whereby abnormal pressure within the body member will force the ball valve from its elevated seat so as to occupy and close the ball seat at the outlet of said member.

4. An automatic gas cut-off comprising a body having an inlet and an outlet, and an enlarged chamber between the inlet and outlet, a ball valve support within said body having an elevated ball seat in said chamber above the bottom thereof, a ball valve on said seat, and a second ball seat at the outlet of the body below the elevated ball seat, whereby abnormal pressure of fluid within the body will cause the ball valve to be forced from its elevated seat so as to occupy and close the seat at the outlet of the body and thereby stop the passage of fluid, and an opening provided in the body member contiguous to the second ball seat, said opening being closed by a plug, so that upon removal of the plug, the ball valve may be manually shifted from its second seat onto its elevated seat.

5. An automatic cut-off for pipe lines comprising a tubular body member, a housing communicating with the top of the body member and intermediate the ends thereof, a tubular ball support fixed in the body member at the entrance end thereof and extending to an intermediate point within the lower portion of the housing and there provided with an end wall having perforations,

said support also having its inner end flattened and provided with a ball seat having peripheral notches, said housing having an internal ball seat formed at the inner end of the outlet bore or passage, and a ball normally resting in the first seat to allow the normal flow of fluid through the notches in addition to the perforations in the end wall, said ball being adapted to be forced off of said seat by excessive pressure of the fluid and rolled to the second seat to cut off the outlet.

6. An automatic cut-off for pipe lines, comprising a body having an inlet and an outlet and an enlarged chamber between the inlet and outlet, a ball support forming an elevated ball seat in said chamber, a ball valve supported on said seat, a second ball seat closing the outlet of the body and arranged below the elevated ball seat, and means for allowing the normal flow of fluid through the pipes while the ball valve is on the elevated ball seat, whereby any abnormal pressure or flow of fluid through the body will cause the ball valve to be forced from its elevated seat into closing relation to the second ball seat at the outlet of the body and thus stop the further passage of fluid.

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

CYRUS E. SMITH.