

R. H. COWDREY.
SAFETY CUT-OFF.
APPLICATION FILED OCT. 9, 1906.

904,497.

Patented Nov. 17, 1908.

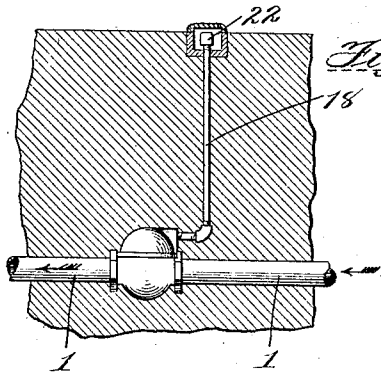


Fig. 1.

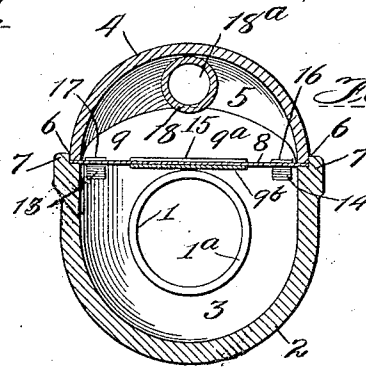


Fig. 3.

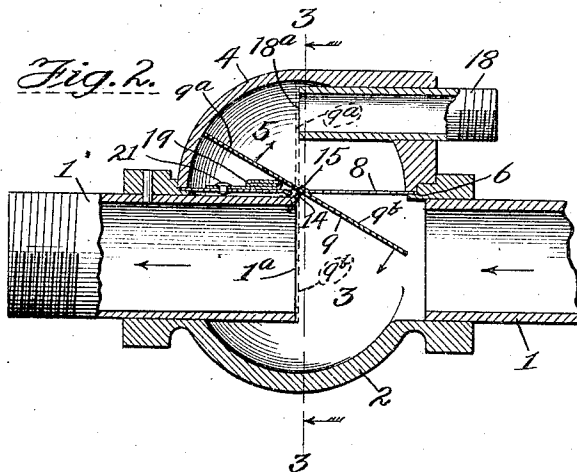


Fig. 2.

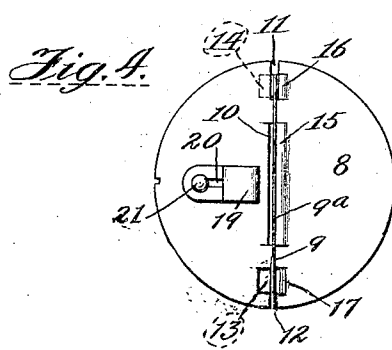


Fig. 4.

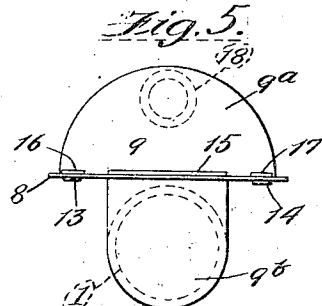


Fig. 5.

Witnesses:

Geo. D. Perry
A. J. Sprinkle

Inventor:

R. H. Cowdrey
by *Brown & Asby* Attorneys

UNITED STATES PATENT OFFICE.

ROBERT H. COWDREY, OF CHICAGO, ILLINOIS.

SAFETY CUT-OFF.

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To all whom it may concern:

Be it known that I, ROBERT H. COWDREY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Safety Cut-Offs, of which the following is a full, clear, and exact specification.

My invention relates to improvements in safety checks or cut-offs to be used on gas pipes or gas inlet tubes and its primary object is to provide an improved form of safety device or cut off to be used on gas supply pipes and which is adapted to automatically stop or check the flow of gas or other fluids passing therethrough when such flow has become abnormal, as for example, when house pipes are broken or melted during a fire or from other causes.

It is desirable in a device of this character that it shall not only be automatic in its operation, thus serving to stop or check the flow of gas or other fluid therethrough in case of accidents, but it should also be so constructed that it may be operated to check the flow of gas or fluid at the will of an operator when normal conditions obtain; and a further object of the invention is to provide an improved means by which an operator may cause the supply passing therethrough to be cut off at will.

To the attainment of these ends and the accomplishment of other new and useful objects, as will appear, the invention consists in the features of novelty in the construction, combination and arrangement of the various parts, hereinafter more fully described and claimed, and shown in the accompanying drawings illustrating an exemplification of this invention, and in which:—

Figure 1 is a view showing the device inserted in a gas supply pipe adapted to extend from the gas street main to the building. The supply pipe to which the device is attached is shown buried below the level of the street or the earth and the surrounding material is shown in section. The pipe or tube adapted to control the device under normal conditions is shown extending to the surface of the street or earth in order that the same may be readily accessible. Fig. 2 is a vertical sectional longitudinal view taken through the device in the general line of direction of the supply pipe to which it is shown attached in Fig. 1. The closed position of the cut off valve or gate is indicated

in this figure in dotted lines. Fig. 3 is a vertical sectional view on line 3—3, Fig. 2, viewed in the direction indicated by the arrows. Fig. 4 is a plan view of the diaphragm on which the swinging valve or gate is carried. The valve or gate is shown mounted thereon and extending at approximately right angles to the plane of the diaphragm when in its closed position. Fig. 5 is a view in side elevation of the diaphragm and valve or gate mounted thereon as shown in plan view, Fig. 4. This view illustrates folding member or valve in full side elevation.

1 designates a gas supply pipe through which the fluid is adapted to pass in the direction indicated by the arrows in Figs. 1 and 2.

2 is a housing or shell spherical in shape and provided with a spherical inner cavity 3.

4 is a covering adapted to cover shell or housing 2. This covering is also provided with an inner cavity 5 adapted to complete the general spherical shape of the inside of the housing when taken in connection with inner chamber 3 in member 2.

The ends of supply tubes or pipes 1 are tapped into housing 2 at almost diametrically opposed points in the walls thereof as illustrated. It is preferred that the end 1^a of pipe 1 be a short piece of pipe permanently inserted into housing or shell 2 in order that the inner end of this pipe may be accurately fitted for a purpose to be hereinafter described.

Shell 2 is provided with a grooved or recessed portion 6 and a flange 7 which extend entirely around its upper edge. These parts are fitted to take the lower circular edge of cover member 4. The recessed groove 6 is also adapted to furnish a support for the outer circumference of diaphragm 8. To diaphragm 8 the swinging door or gate 9 is attached, being pivotally mounted thereon. The attachment of door 9 to member 8 is accomplished by means of slots 10, 11 and 12 formed approximately in the same straight line coinciding with one of the diameters of the diaphragm (see Fig. 4). Door or gate 9 is preferably formed of thin sheet material and consists of an upper member 9^a semi-circular in form, and a lower or dependent member 9^b of somewhat decreased size (see Fig. 5) and adapted to be of sufficient size to conveniently cover the mouth of pipe 1^a. The upper member 9^a is provided with short dependent members

or tongues 13 and 14. Member 9 is mounted to swing on diaphragm 8 in order to be in position to close the mouth of tube 1^a when required and is held in position by inserting the depending member 9^b into slot 10 in diaphragm. The lower edge of semi-circular member 9^a extending beyond the limits of 9^b contacts with the upper surface of member 8 thus forming a support for member 9. At the same time tongues or lugs 13 and 14 enter slots 11 and 12 in order to retain 9 in position. Members 13 and 14 after being inserted in slots 11 and 12 may be bent at an angle to the plane of the surface of 9 thus permanently fixing the gate in position on member 8. In order that the gate 9 may be free to swing on its hinged support, slots 11 and 12 may be somewhat wider than the thickness of the material in the gate. Slot 10 is also made wider than the thickness of the material in the gate which admits of swinging motion of the gate. This increase in the width of slot 10 is also made to serve another purpose as hereinafter described. The material in diaphragm 8 on one side of slot 10 may be formed upwardly into a boss as indicated by 15. This same construction may be employed on the same side of slots 11 and 12 as indicated at 16 and 17. When member 9 is swung on member 8 into an approximately perpendicular position upwardly formed portions 15, 16 and 17 in conjunction with members 13 and 14 which are folded out of the plane of gate but on the opposite side, serve as a stop to prevent the further movement of parts in this direction with relation to each other.

The cover member 4 is provided with pipe or tube 18 which is supported in its surface and preferably enters the inner surface 5 at a point as near the top of the cover as possible but which will permit this pipe to lie approximately parallel with the intake and outlet pipe 1 of the device. It will be noted that the interior end 18^a of pipe 18 and the interior end of pipe 1^a lie in approximately the same plane so that the closing of gate 9 over the opening in 1 operates to bring the opposite end of the gate in contact with the opening in the other pipe. It is preferable that the device be inserted in the supply pipe running from the gas main to the house before the supply pipe enters the house, or immediately after the pipe enters the foundation wall of the house and before it connects with the meter. The reason for this lies in the fact that pipe and joinings immediately adjacent to gas meters ordinarily contain much material that is liable to fuse or break during a fire.

As indicated by the direction of the arrows in illustrations the gas enters the device through supply pipe 1 and finds its way out through pipe by entering the opening at 1^a.

Door or gate 9 normally rests in position illustrated in Fig. 2 in which the upper member 9^a is in contact with the stop 19. This stop is adjustable by means of slot 20 and is retained in position on member 8 by suitable pin or rivet 21. The upper member 9^a of the gate contains more material and therefore is heavier than the lower member 9^b and consequently the superior weight of said upper member 9^a constitutes a means which has a tendency to hold the gate in the position indicated in Fig. 2 by reason of gravity. It will be seen, however, that the ease with which the gate is operated by the flow of the fluid through the device would depend upon the angle that the gate 9 takes when normally at rest and as the rate of flow of gas differs very materially in different localities and when different styles of meters are used, the adjusting member 19 just described, is provided. This adjustment is ordinarily used only at the time the device is installed. As the gas passes through the device under normal conditions it will be seen that the gate or door 9 will not be affected, when, however, an abnormal flow of the fluid takes place at the discharge side of the device the gate 9 will be closed over the end of outlet pipe 1^a and will be retained in closed position by reason of the incoming pressure of the gas. When, however, the leak or abnormal flow in outlet pipe is stopped the door or gate will automatically resume its normal position. This will be due to the restoration of the pressure on outlet side of the gate which will ordinarily soon be accomplished by reason of the tendency for a slight leakage of gas to occur between member 9^b and the outlet tube 1^a even when the gate is closed.

In order that the gate or door 9 may be operated under normal conditions at the will of an operator, that is, when pipes on outlet side are intact, or so nearly intact that the flow of the gas is not sufficient to operate the door, the tube or pipe 18 is extended to an accessible point (see Fig. 1) and the close-fitting cap 22 is inserted over the end of the tube. This cap may be of metal or other convenient material and in order to be operative quickly in emergency it may be constructed of glass in order to be readily broken, thus avoiding the necessity for unscrewing the metal cap. It will be noted that the inner surface 5 of cover 4 is spherical in shape, conforming to the circumference or outer edge of 9^a. When cap 22 is in position on tube 18 gate 9 is not affected by reason of the escape of gas through this outlet. When cap 22 is removed, however, the gas entering the device from the inlet side finds its way through slot 10 in diaphragm 8 previously referred to, and thus accumulates between the diaphragm 8 and member 9^a. Pressure exerted in this manner as the

gas tends to escape through the open tube 18 carries 9^a into contact with the end 18^a of tube 18. This same movement closes the lower member of the gate 9^b. It will be seen that the pressure of gas through the inlet tube will continue to be exerted on member 9^a, thus causing outlet tube 1^a to remain closed until the end of outlet 18 is again sealed.

10 In order that the invention might be fully understood, the details of an embodiment thereof have been thus specifically described, but

What I claim is:

15 1. In a device of the character described, the combination of a casing having an inlet and an outlet, a movable gate or door in said casing, said gate or door being pivotally mounted and adapted to rest normally within the path of flow of gas passing through said housing and normally presenting one of its surfaces in an inclined plane to the direction of flow of gas through said casing, and means adapted to hold said gate or door in position to be unaffected by and to permit a normal flow of gas through said casing.

2. In a device of the character described, the combination of a casing, inlet and outlet orifices in said casing, a movable door or gate in said casing adapted to rest normally within the path of flow of gas through said casing and presenting one of its surfaces in an inclined plane to the direction of movement of gas through said casing, and means adapted to hold said door or gate normally in position to be unaffected by and to permit the flow of gas into said outlet orifice when the supply of gas passing through said casing is normal, said means being adapted to be overcome by the action of an abnormal current of gas through said casing and to permit of the closing of said door or gate on said outlet orifice.

3. In a device of the character described, the combination of a casing, of inlet and outlet orifices therefor, a movable door or gate mounted adjacent to said outlet orifice, a support for said door or gate and adjustable means adapted to limit the movement of said door or gate in relation to said supporting member.

4. In a device of the character described, the combination of a casing, a wall or partition in contact with the inner wall of said casing and adapted to divide the interior of said casing into two compartments, inlet and outlet orifices communicating with one of said compartments, a movable door or gate mounted on said wall or partition, said door or gate adapted to lie within the path of flow of gas between said inlet and outlet orifices, and presenting one of its surfaces at an angle to the path of flow of gas between said inlet and said outlet orifices, means adapted

to hold said door or gate in open position during the flow of gas between said inlet and said outlet orifices under normal conditions, said means being adapted to be overcome by the force of the current of gas exerted when an abnormal flow of gas takes place between said inlet and said outlet orifices, thus permitting the closing of said door or gate.

5. In a device of the character described, the combination of a casing, a wall or partition in contact with the inner walls of said casing and adapted to divide the interior of said casing into two compartments, main inlet and outlet orifices communicating with one of said compartments, an auxiliary outlet leading from the other compartment of said casing, said outlet normally adapted to be closed on the exterior of said casing, a door or gate mounted on said wall or partition having wings or members extending into each of said compartments, said door being adapted to close simultaneously the main outlet orifice and the said auxiliary outlet, and means adapted to retain said door or gate normally in position to permit the passage of gas through said main inlet and outlet orifices.

6. In a device of the character described, the combination of a casing, a wall or partition adapted to divide the interior of said casing into a main compartment and an auxiliary compartment, main inlet and outlet orifices in walls of said main compartment, an auxiliary outlet orifice in the walls of said auxiliary compartment, a movable door or gate mounted on said wall or partition and adapted to close simultaneously said main outlet orifice and said auxiliary outlet orifice, said door or gate being provided with an auxiliary wing extending into said auxiliary compartment, and means for permitting the entry of gas through said wall or partition from said main compartment on the side of the said auxiliary wing of said gate remote from the side thereof adapted to close said auxiliary outlet orifice.

7. In a device of the character described, the combination of a casing, a wall or partition contacting with the inner walls of said casing and adapted to divide the interior thereof into two closed compartments, a longitudinal slot in said wall or partition, a door or gate mounted in said slot, a laterally extending member or wing integral with said door member adapted to rest against the surface of said wall or partition adjacent to said slot, and a lug or member formed integral with said door or gate adapted to be folded at an angle to the plane thereof on the opposite side of said wall or partition from said laterally extending member or wing.

8. In a device of the character described, the combination of a casing, a movable door

or gate in said casing, said door or gate being provided with controlling means adapted to normally hold it in open position and against the pressure of the gas to permit a given or normal flow of gas through said casing, said means being incapable of resisting an abnormal or unusual flow of gas through said casing and operating to permit the closing of said door or gate, and means to vary the normal position of the door or gate for adjusting said controlling means.

9. In a device of the character described, the combination of a casing, a movable door or gate in said casing, controlling means for said door or gate adapted to hold it in open position to permit a given or normal flow of gas through said casing, and means operative from the exterior of said casing adapted to cause a current or flow of gas to be directed against said controlling means thereby operating to cause the normal flow of gas to close said door or gate.

10. In a device of the character described, the combination of a casing, a wall or partition adapted to divide the interior of said casing into a main compartment and an auxiliary compartment, the walls of said main compartment being provided with an inlet and an outlet orifice, said auxiliary compartment being provided with an auxiliary outlet orifice, means on the exterior of said casing adapted to control said auxiliary outlet orifice and a door or gate mounted on said wall or partition having wings or members extending into each of said compartments.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 5th day of October A.D. 1906.

ROBERT H. COWDREY.

Witnesses:

J. H. JOCHUM, Jr.,
A. L. SPRINKLE.