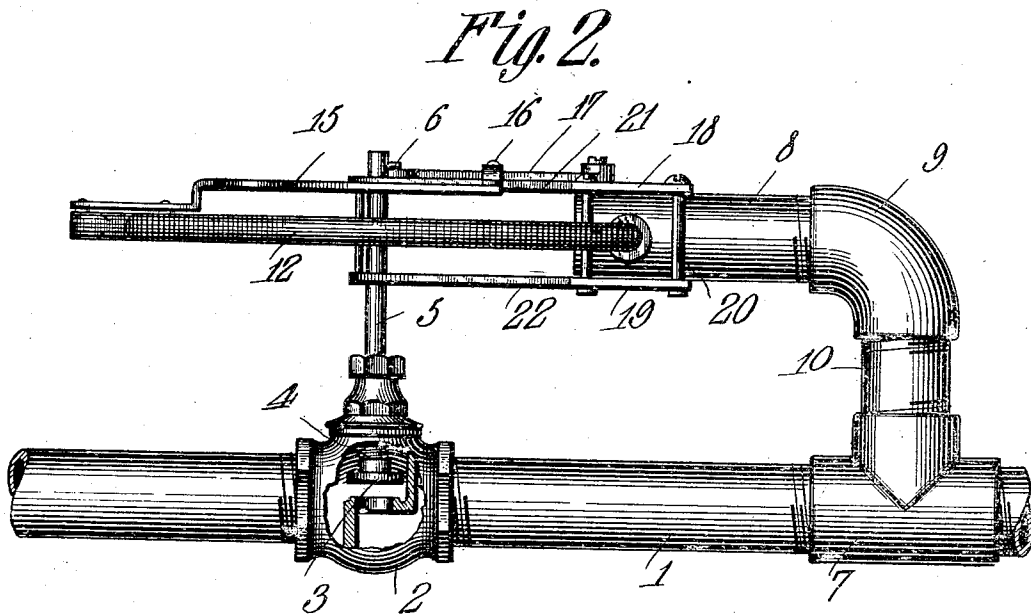
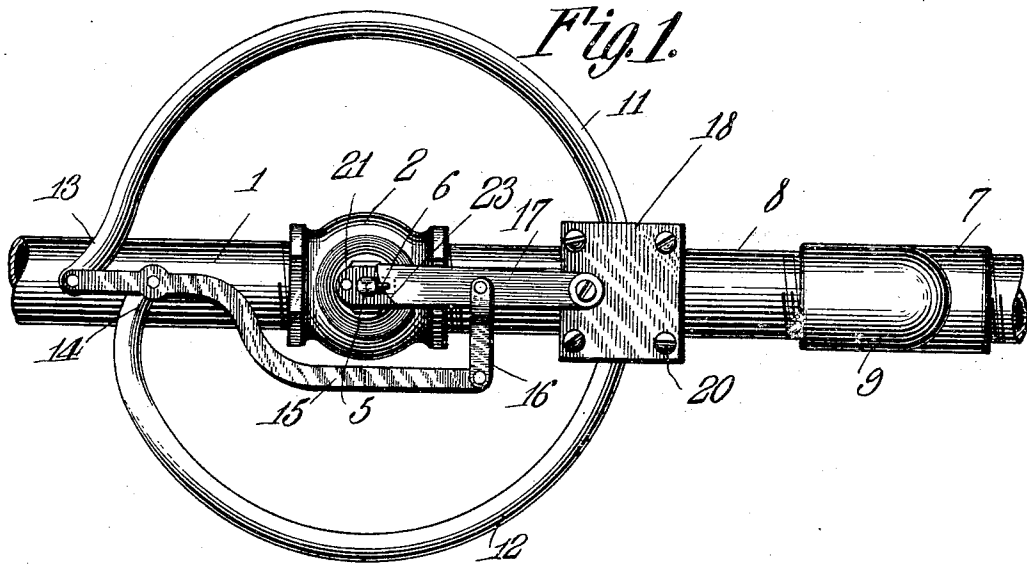


R. F. AINSWORTH.
 AUTOMATIC GAS CUT-OFF.
 APPLICATION FILED MAR. 29, 1909.

935,725.

Patented Oct. 5, 1909.



Witnesses
[Signature]
F. J. Chapman

Inventor
Robert F. Ainsworth
 By *C. Snow & Co.*
 Attorneys

UNITED STATES PATENT OFFICE.

ROBERT F. AINSWORTH, OF ANDOVER, OHIO.

AUTOMATIC GAS CUT-OFF.

935,725.

Specification of Letters Patent.

Patented Oct. 5, 1909.

Application filed March 29, 1909. Serial No. 486,524.

To all whom it may concern:

Be it known that I, ROBERT F. AINSWORTH, a citizen of the United States, residing at Andover, in the county of Ashtabula and State of Ohio, have invented a new and useful Automatic Gas Cut-Off, of which the following is a specification.

This invention has reference to improvements in automatic gas cut-offs and is designed to positively arrest the flow of gas from the mains to the point of consumption so that in the event of a drop in gas pressure sufficient to cause lights to go out the flow of gas to such lights will be stopped and when the pressure is again restored there will be no danger of the gas escaping through the still open valves.

In accordance with the present invention the device is installed in the gas pipe leading from the main into a house or other place where the gas is being used so that the entire building is cut off from the gas main in the event of a sufficient drop in pressure and will not be again restored except by a manipulation requiring the presence of an attendant or operator to reset the device.

The invention will be best understood from a consideration of the following detail description taken in connection with the accompanying drawings, forming a part of this specification, in which drawings,

Figure 1 is a plan view of the improved gas cut-off. Fig. 2 is a side elevation of the same with parts shown in section.

Referring to the drawings there is shown a pipe 1 which may be taken as a pipe leading from a source of gas supply such as a street main into a building to be protected by the device of the present invention. In this pipe there is included a valve 2 which may be in the form of a globe valve with the valve head 3 under the normal control of a spring 4 tending to seat said valve automatically. The valve head 3 is carried by a valve stem 5 rising for a distance above the valve and near its free end carrying a laterally projecting pin 6 or other suitable stop device for the purpose.

Included in the pipe 1 at a point a short distance from the valve 2 is a tee 7 and connected to this tee is another pipe 8 through a suitable elbow 9 and nipple 10 so that the pipe 8 is parallel with the pipe 1. The outer end of the pipe 8 is closed, and branched off from opposite sides of the pipe 8 are two

small pipes 11 and 12 so bent as to normally form a substantially complete circle. These pipes are made of thin light material capable of holding gas against leakage and at the same time yielding to the gas pressure after the plan of the ordinary Bourdon tubes. The construction is such that the gas pressure tends to straighten these tubes 10 and 11 and when the gas pressure is relieved these tubes will tend to assume their normal curved positions. The free ends of the tubes, that is those ends remote from the gas pipe 8 are closed, the end of the tube 11 being curved slightly away from the pipe 8 while the end of the tube 12 is curved slightly toward the pipe 8, these two curved ends being shown at 13 and 14 respectively. The end 13 of the tube 11 is pivotally connected to an arm 15 at one end of the latter and the end 14 of the tube 12 is connected to the same arm 15 at a point somewhat removed from the end to which the tube 11 is connected. The other end of the arm 15, that is the end remote from its connection with the tubes 11 and 12 is connected by a link 16 to a lever 17 pivoted on a plate 18 made fast to the free end of the pipe 8. The plate 18 may be secured in place on the pipe 8 by a matching plate 19 and bolts 20. The plates 18 and 19 are each provided with an extension 21 and 22 respectively in parallel relation and at their outer ends being perforated for the passage of the valve stem 5, these extensions 21 and 22 serving as guides for said valve stem 5. The extension 21 also serves as a support for the lever 17 the free end of which latter is rounded as indicated at 23 and is adapted to engage under the pin 6 and so hold the valve head 3 in the open position.

When gas pressure is established in the tubes or pipes 11 and 12 these tubes tend to straighten out and since they are connected to the arm 15 at different distances from the pivot point of the latter as defined by the link 16, the end of the arm connected to the link 16 will be drawn in a direction to move the lever 17 under and in the path of the pin 6 on the valve stem 5, the said valve stem being considered as in the elevated position with the valve head 3 away from its seat and the spring 4 compressed. The length of the lever 17 and the shape of the end 23 may be such that the lever will ultimately engage the valve stem and so be locked thereby from further movement under the action of the tubes 11 and 12.

Suppose that the gas pressure in the pipe 1 should drop, from any cause, to such an extent as to practically cut off the supply of gas from the burners and the lights at the burners should go out. If then the gas pressure be renewed the gas will freely flow through the open burners and so become a source of danger and this becomes particularly so if all the burners do not go out but some do and others still remain lighted. With the structure of the present invention installed in the supply pipe 1 there is no interference with the flow of gas so long as the pressure is maintained. If however the pressure should drop to a dangerous degree then the tubes 11 and 12 will tend to move to their normal positions, or in other words will tend to curl up to an extent sufficient to move the arm 15 in a direction which will cause the lever 17 to pass from under the pin 6 when the spring 4 will seat the valve head 3 on its seat and thus close communication through the pipe 1. When the valve is seated after the release of the pin 6 from engagement with the lever 17 a restoration of the pressure will be immaterial since the pin has dropped out of the position it first occupied so that the lever 17 may no longer engage under said pin. In order to restore the pressure of gas it is necessary that an operator visit the place where the cut-off is established and then lift the valve stem 5 against the action of the spring 4 until the lever 17 may again pass beneath the pin 6 and so hold the valve against the action of the spring 4. By properly proportioning the tubes 11 and 12 and the lever 17 there may be a considerable range in the pressure of the gas without causing the closure of the valve head 3 so that fluctuation in the gas pressure insufficient to cause the lights to go out will not operatively affect the cut-off.

What is claimed is:—

1. An automatic gas cut-off comprising a

valve having a normal tendency to move to the closed position, a detent for holding the valve in the open position, two oppositely acting members directly responsive to gas pressure, and a positive connection common to both of said members and extending therefrom to the detent.

2. An automatic gas cut-off comprising a spring actuated valve having a normal tendency toward the closed position, means for holding the valve in the open position against its normal tendency, oppositely acting members directly responsive to gas pressure and connected to the pressure side of the service pipe, and a positive connection between both of said members and to the means for holding the valve in the open position.

3. An automatic gas cut-off comprising a valve included in the gas service pipe and having a normal tendency to close, a branch pipe on the pressure side of the service pipe, oppositely acting Bourdon tubes connected to the branch pipe, a detent lever acting on the valve to hold it in the open position, and positive connections between the Bourdon tubes and the detent lever.

4. An automatic gas cut-off comprising a suitable valve having a normal tendency to close, a detent lever for holding the valve in the open position, oppositely acting Bourdon tubes connected to the service pipe on the pressure side of the valve, and an arm connected to the lever at one end and at the other end to the free ends of the Bourdon tubes at different distances from the first named end of the arm.

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

ROBERT F. AINSWORTH.

Witnesses:

W. H. BROWN,
C. W. WOOD.