C. L. HOLT.

AUTOMATIC SHUT-OFF FOR GAS PIPES.

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1,284,682. Patented Nov. 12, 1918.

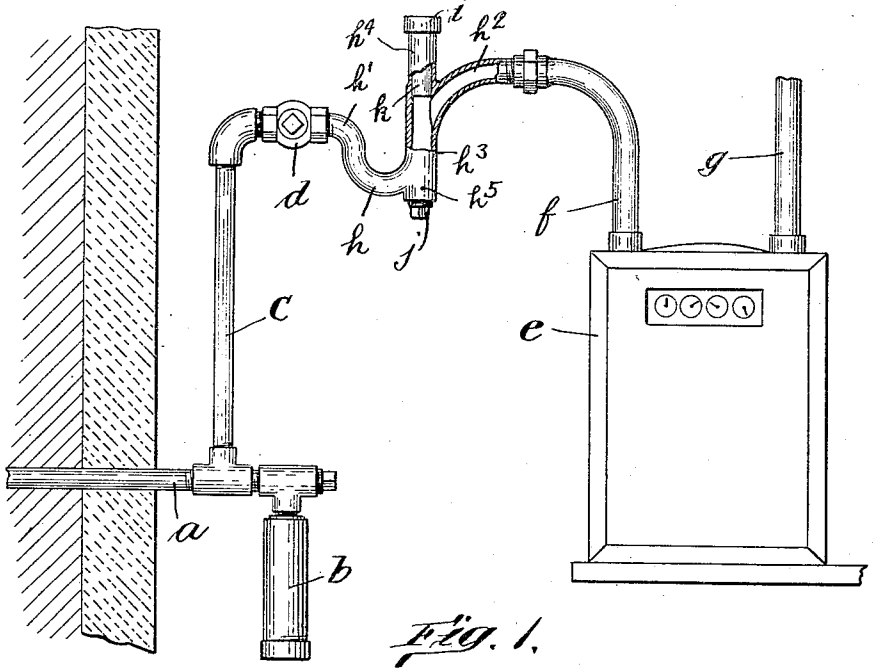

Fig. 1.

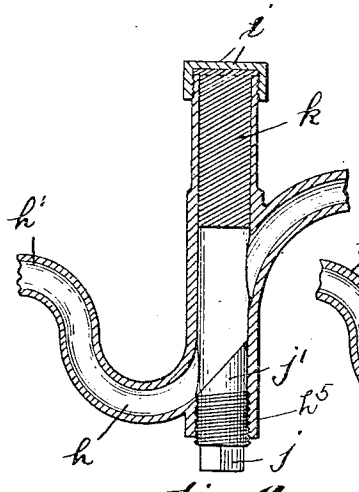

Fig. 2.

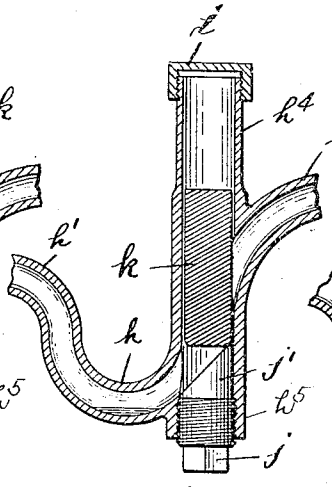

Fig. 3.

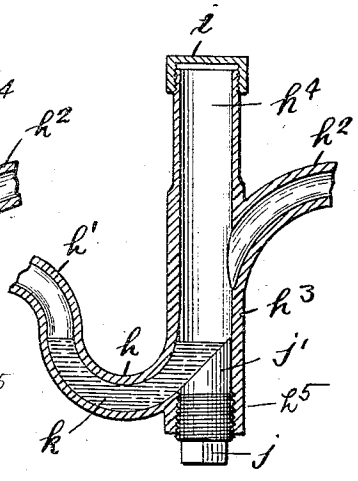

Fig. 4.

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UNITED STATES PATENT OFFICE.

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AUTOMATIC SHUT-OFF FOR GAS-PIPES.

1,284,682. Specification of Letters Patent. Patented Nov. 12, 1918.

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To all whom it may concern:

Be it known that I, CHARLES L. HOLT, a citizen of the United States, and a resident of Lawrence, county of Essex, and State of Massachusetts, have invented an Improvement in Automatic Shut-Offs for Gas-Pipes, of which the following is a specification.

It is a well known fact that, when fires occur in the cellars or basements of buildings, where gas meters are usually located, the lead pipe connections to the meters frequently become melted, or the soldered joints of the meters open, so that the gas escapes and adds fuel to the flame to such an extent that the difficulty of extinguishing the fire is greatly increased. Frequently there is considerable delay in shutting off the gas from the street, so that, even if the fire is extinguished, the gas continues to escape, with the result that serious explosions sometimes occur, when the gas becomes ignited. Also, it sometimes happens that the metal of the joints, or connections, melt before the fire reaches the immediate vicinity of the gas meter, so that the gas escapes for some time before it is ignited, and consequently the explosion, when it finally occurs, is particularly disastrous.

The object of my invention is to provide a simple and effective means for automatically closing the gas supply to a gas meter and its lead pipe connections, when either comes under the influence of heat of a sufficiently high degree to endanger the melting of said connections or of the soldered joints of the meter, so that the escape of gas would be permitted.

I accomplish this object by providing within the usual iron pipe, which leads from the street main to the meter connections, and closely adjacent the latter, a quantity of readily fusible metal, so arranged that, when it comes under the influence of a certain degree of heat, it will become fluid and seal the gas inlet, and thus prevent the escape of gas, in case the meter, or its connections should be destroyed.

A preferable embodiment of my invention is shown in the accompanying drawings, in which:—

Figure 1 is a side elevation of a typical gas inlet, to a building, embodying my invention.

Figs. 2, 3, and 4, are detail sectional view of the special fitting which I employ, showing different stages of the operation.

In Fig. 1, a common piping arrangement to a gas meter is illustrated, *a* indicating the street pipe which passes through the cellar wall, to the end of which the usual drip chamber *b* is connected, and from which the riser *c* extends, and in which the usual inside shut-off *d*, for the building, is arranged, these parts all being of iron, or metal which fuses only at high temperature. A meter *e*, having a lead pipe inlet connection *f*, and a similar outlet connection *g*, leading to the piping of the building, is also indicated.

Ordinarily the shut-off *d* is connected directly to the lead pipe *f*, but, according to my invention, I interpose therebetween, a special form of fitting having therein a trap *h*, of somewhat similar construction to an ordinary plumber's S-trap, but reversely arranged, that is, the inlet leg *h'* thereof, which corresponds in construction, to the outlet leg of the trap in a drain pipe, is connected to the shut-off *d*, while the inclined branch h^2, which communicates with the other, or discharge leg, is connected to the lead pipe connection of the meter. The pipe, forming the discharge leg of the trap, is disposed vertically to provide a vertical tubular portion h^3, below the point of connection of the branch h^2, and is extended vertically to provide a vertical tubular chamber h^4, above said point of connection, the upper end of said chamber being made gas-tight with an ordinary screw cap *i*. A short branch h^5 is also provided which leads from the under side portion of the discharge leg of the trap in line with the vertical portion h^3, and a plug *j* is arranged therein to close the same, said plug preferably having an extension *j'*, with an inclined end, so that the interior of the trap is substantially continuous.

In carrying out the purpose of my invention, the chamber h^4 is filled with a load of metal *k*, the fusing point of which is substantially lower than that of lead or ordinary solder, the filling operation being performed by removing the plug *j* and inverting the fitting and then pouring the metal *k*, while in molten condition, through the plug opening, so that the chamber h^4 is filled up to the point at which the branch h^2 leads therefrom, as shown in Fig. 2. The metal is then permitted to solidify while the fitting is in inverted position, so that it will become attached to the walls of the chamber into which it has been poured. The cap *i* is so formed that it does not bear on the upper

end of the tubular chamber h^4, when screwed tightly onto the end of said chamber, so that a space is provided therebetween into which the metal will flow, and thus form a supporting flange when cold. While the interior of the walls of the chamber will ordinarily be sufficiently rough to provide a suitable anchorage for sustaining the metal in the chamber, the supporting flange which is thus provided, prevents all possibility of displacement of the metal so long as it is at ordinary temperatures.

When the fitting is in position between the shut-off and the meter, as already described, the gas will, ordinarily, flow through the same to the meter, as through any other part of the pipe system, and if the trap should, in time, become filled with moisture of condensation, it may be emptied by removing the plug j. The drip-chamber b, will, however, prevent substantial accumulation of moisture in the trap h.

Under these conditions, if the fitting is subjected to excessive heat, the heat will be conducted through the walls of the chamber h^4 to the metal k, so that the portion of said metal next the walls of the chamber h^4, (which walls are preferably made thinner than the walls of the other portions of the fitting,) will become melted, so that the main portion of the metal will no longer be supported by its engagement with said wall, and consequently it will slide down past the point where the branch h^2 leads from the vertical portion of fitting, as indicated in Fig. 3, and, if the gas is then escaping into the building, its flow will be, to a large extent, cut off thereby. If, however, the heating of the fitting is continued, the metal k will soon become entirely melted and run down into the trap h, as indicated in Fig. 4. The volume of the space provided in the chamber h^4 is made to correspond to the volume of liquid required to seal the trap h to a depth suitable for the purpose, so that, when the metal fuses, the trap will be sealed to a suitable depth. As the ordinary service pressure of gas is seldom more than, and is usually less than the pressure of 6 inches of water, a seal to the depth of an inch in the trap h, provided by the molten metal, which has approximately the same specific gravity as mercury, will be amply sufficient to prevent the passage of gas through the trap. In practice therefore, the length of the legs of the trap and the quantity of fusible metal provided will be sufficient to form a seal of approximately this depth, but, in any event, the seal formed by the metal will be of sufficient depth to prevent all possibility of escape of gas through the trap, after the metal has been fused, under all conditions. As metal having a fusing point which is much lower than that of lead, or ordinary solder, is employed, it follows that the gas supply will, ordinarily, be shut off by the fusing of the metal k before the lead connections, or the solder of the meter becomes fused, so that all escape of gas, in case of fire, will be prevented.

It will be apparent that, under ordinary conditions, the fitting embodying my invention will act as a mere conduit for the supply of gas to the meter, and that there are no parts which are liable to become displaced in handling, before it is set up, or while it is being set up, and that the device will operate to shut off the gas just as effectively after a period of indefinite length, as when first installed. The arrangement is also of such simple and inexpensive construction that it may be installed at small expense, whether the meter has previously been installed or not.

I employ metal, as the fusible material for sealing the trap, in preference to paraffin, hard grease, or the like, not only on account of its greater specific gravity, which enables the employment of a comparatively shallow seal, but also because it will not either evaporate or burn to a substantial extent, although subjected to abnormal heat for a considerable period of time.

While other effective forms of my invention may be produced, without departing from the spirit and scope of my invention, the form herein before described is the most desirable form of which I am, at present, aware.

I claim:—

A gas-inlet fitting consisting of a liquid trap of the S-type, the outlet leg thereof having a chamber extending beyond the outlet connection, to form an approximately straight, tubular chamber, closed at its outer end, a filling opening leading to the under side of said outlet leg in line with said chamber, a removable plug for closing said opening, and a mass of readily fusible material in said chamber beyond said outlet connection, adapted, when heated above normal, to flow into said trap, to seal the same against the flow of gas therethrough.

In testimony whereof, I have signed my name to this specification.

CHARLES L. HOLT.

Witness:

L. H. HARRIMAN.