April 1, 1969 K. C. BORST ET AL 3,436,197

ESCAPED GAS VENTING APPARATUS

Filed Sept. 13, 1967 Sheet 1 of 2

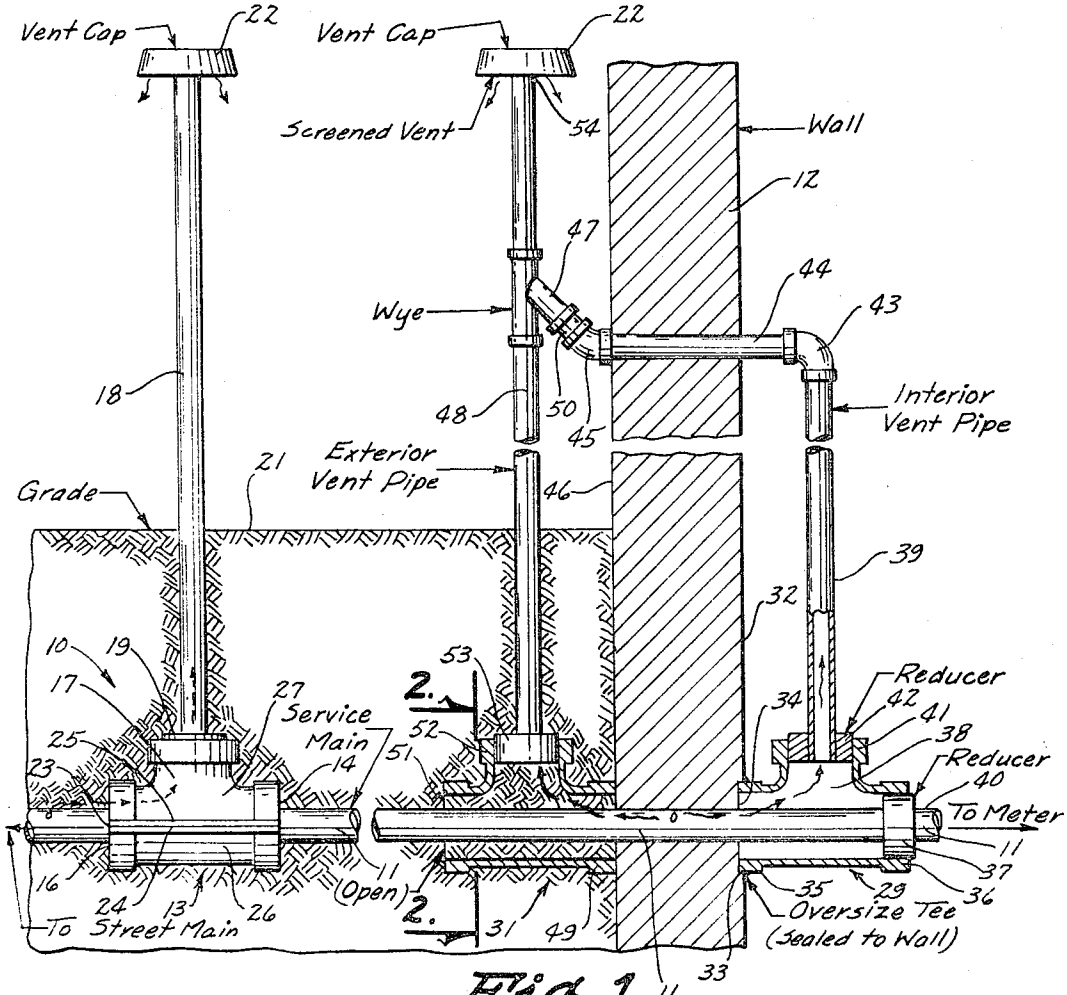


Fig. 1

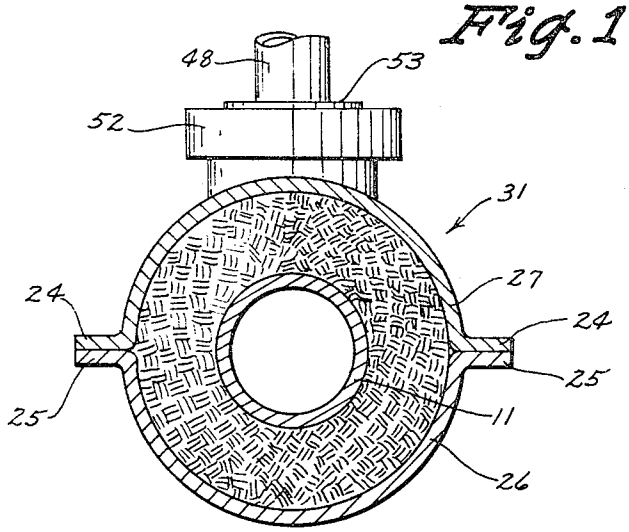


Fig. 2

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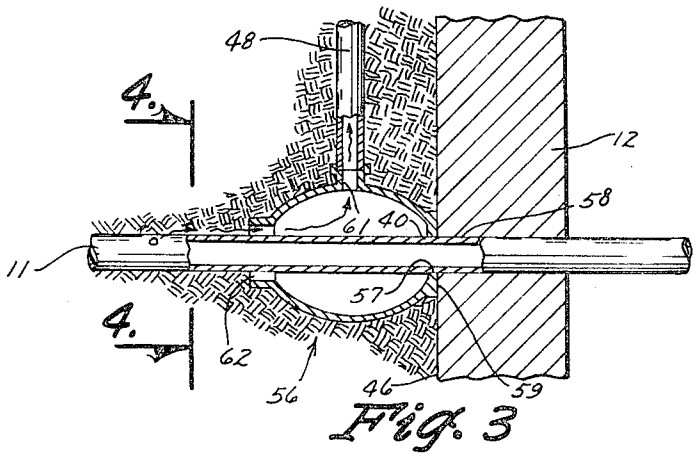


Fig. 3

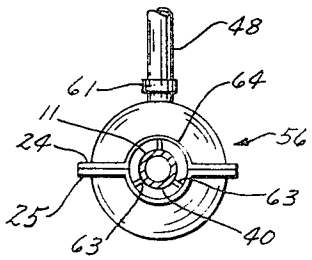


Fig. 4

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ESCAPED GAS VENTING APPARATUS

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U.S. Cl. 48—192 7 Claims

ABSTRACT OF THE DISCLOSURE

This invention relates generally to apparatus for venting escaping gas, and particularly to a combination of two traps for a gas line between a building and a gas service main, one trap attached exteriorly and adjacent to the building foundation wall; another trap attached interiorly to the wall and sealed off from the atmosphere interior of the wall; each trap interconnected by vents exposed to the atmosphere, thereby permitting the trapped gas to escape.

BACKGROUND OF THE INVENTION

The field of this art includes a number of devices attached to gas lines to trap escaping gas moving along a service main outside of a building; however, the field has been void of any device which will entrap such gas within a building.

It is a well known fact that one time or another a conventional gas service main will develop a leak, and that frequently the leak will develop in that portion of pipe traversing a building foundation wall. The leaking gas follows a path of least resistance and will usually move along the gas line and away from a high pressure area such as a street gas main. The line of least resistance at the foundation wall is the place where the service main traverses the foundation, and this is especially true in those cases where the pipe, foundation, or seal is older or faulty, and either has begun to deteriorate. The escaping gas will accumulate wherever possible, as within the building, forming with air an explosive compound needing only a spark or the like to cause an explosion normally resulting in fire.

This invention alleviates this danger by doubly entrapping the leaking gas moving along the service main, first exteriorly before it enters the building in addition to secondly trapping any gas either escaping the exterior trap or caused by leakage within the foundation portion of the pipe, then venting the gas safely to the atmosphere.

SUMMARY OF THE INVENTION

It is an object of this invention to provide a safety device capable of entrapping gas leaking from a service gas main and venting it to the atmosphere.

It is another object of this invention to provide a gas trap which is adaptable to placement within a building which will effectively entrap and remove any leaking gas traversing a foundation wall.

It is yet another object of this invention to provide a gas trap which will entrap leaking gas before it enters a building.

Still another object of this invention is to provide a combination gas trap which will entrap escaping gas both within and without a building and which necessitates the use of only one exteriorly exposed vent.

It is yet another object of this invention to provide a safety combination gas trap capable of attaining the above designated objectives which is simple, economical, and effective.

These objects, and other features and advantages of this invention will become readily apparent upon reference to the following description when taken in conjunction with the following drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary side elevational view showing in assembled relation with a gas service main a single gas trap positioned away from an exterior foundation wall, and a combination trap positioned adjacent each side of the wall;

FIG. 2 is an enlarged cross-sectional view as taken along the lines 2—2 of FIG. 1, and showing the relationship of the gas service main to the trap;

FIG. 3 is a fragmentary side elevational view similar to FIG. 1, showing a modification of the invention wherein the trap casing is oval in shape; and

FIG. 4 is a front elevational view as taken along the lines 4—4 in FIG. 3 and shows spacing lugs positioning the trap casing around the gas pipe.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings and particularly FIG. 1, a single gas trap and vent is indicated generally at **10**, and is shown in assembled relation with a conventional gas service main **11** located between a building exterior foundation wall **12**, and a street main (not shown). The service main **11** is made of metal piping generally one and one-quarter to one and one-half inches in diameter. The service main **11** generally follows a horizontal plane and intersects the vertical foundation wall **12** at a right angle.

Encircling the gas service main **11** is a circular casing **13** of rigid plastic or similar material. The casing **13** is substantially larger in diameter than the gas service main **11**, as best illustrated in FIG. 2. It is seen that the casing **13** is disposed concentrically about the main **11**, spaced radially therefrom. The casing **13** is comprised of two half-sections **26** and **27**, attached by epoxy or like material inserted between pairs of flanges **24** and **25** projecting from the sides of the upper section **27** and the lower section **26** of the casing **13**. The flanges are disposed normally horizontally and extend parallel to the longitudinal axis of the casing **13**.

The inside of the casing **13** forms a cavity within which dirt, or in some cases stones, gravel or the like may be placed about the main **11** to aid in trapping the gas. The opposite ends **14** and **16** of the casing **13** are open to the surrounding dirt encompassing the trap **13** and the service main **11**, thereby allowing free passage of any gas following the route of the gas line **11** to come within the cavity formed within the casing **13**. The casing cavity is enlarged by the provision of an annular flange **17** formed on the upper side of the casing **13**, and open to the interior thereof.

To position the casing **13** around the stationary gas service main **11**, the unattached lower section **26** of the casing **13** is slid under the main **11**. Epoxy or like material is then spread across the entire length of the upper surface of the flange **25**, and the upper section **27** of the casing **13** is placed on top of the lower section **26** with the flanges **24** and **25** properly aligned. Temporary clamps (not shown) may be used for the flanges until the sections **26** and **27** are securely attached. The temporary clamps may be left on or removed as desired.

A vertical vent pipe **18** connects the casing **13** at the vertical flange **17**. As the vent pipe **18** is substantially smaller than the orifice of the flange **17**, a conventional reducer **19** is necessary to seal the opening of the flange **17** from entry of any surrounding dirt. The vent pipe **18** protrudes above the ground grade **21** to a predetermined distance, based upon the normal snowfall for the locality, and is capped to the atmosphere by a conventional vent cap **22**. The vent cap prevents such items as

dirt, rain, and snow from entering the vent **18** while permitting gas trapped in the casing **13** to escape to the atmosphere (see the left hand arrows in FIG. 1).

Referring to the right side of FIG. 1, placement of a pair of casings **29** and **31** in a unique combination relative to the exterior foundation wall **12** is illustrated. It should be remembered that both casings **29** and **31** are identical to casing **13** unless described differently hereinafter.

The inside casing **29** encircles the entering service main **11** prior to the main's **11** juncture with the meter (not shown). An open lateral end **34** of the casing **29** is set in and embedded in the interior surface **32** of the wall **12** and is sealed thereto with epoxy or like material. The opposite end **36** is sealed from the interior atmosphere of the building by a conventional reducer **37** fitted within the orifice of the lateral end **36** and contiguous to the exterior wall **40** of the service main **11** at that point.

A vertical vent pipe **39** is connected and sealed to the vertical annular flange **41** of the casing **29** with a reducer **42** as hereinbefore described. The vent pipe **39** extends to a right angle elbow **43**, the length of the vent **39** being determined by the ground grade **21** exterior the wall **12**. A horizontal vent pipe **44** connects the elbow **43** and traverses the wall **12** to the exterior thereof. A forty-five degree angle elbow **45** is connected to the exposed end of the vent **44** and a short length of pipe **50** connects the entire vent **39**, **43**, **44**, **45** to a Y **47** extending from the vertical vent **48** for the outside casing **28** as hereinafter described.

Referring now to the outside casing device **31** (FIG. 1), it encircles the main **11** prior to its traversing through the wall **12**. An open inner end **49** is adjacent to the exterior surface **46** of the wall **12** and sealed thereto. The opposite end **51** is open in the direction of the street gas main (not shown) to permit any gas following the pipe **11** to become entrapped within the cavity formed within the casing **31**. Though the frontal area preceding the opening **51** may be encompassed with fill, the fill will not pack so tight as to detour the gas flow into the trap **31**.

A vertical vent pipe **48** is connected and sealed to the vertical flange **52** of the casing **31** by the use of a reducer **53**. The vertical vent **48** provides not only an escape for the trapped gas, but serves also to stabilize the vertical position of the casing **31**. The vent pipe **48** protrudes above ground grade **21** and interconnects a Y-juncture **47**. The Y **47** serves to connect the interior and exterior casings **29** and **31**, thus necessitating the use of only one vent opening **54** to the atmosphere. The vertical vent pipe **48** extends beyond the Y **47** and connects a vent cap **22** as hereinbefore described.

The exterior T-tube **31** (FIG. 1) may be substituted by an oval shaped trap **56** (FIG. 3) of like material as the casing **31** and encircling the gas main **11** in substantially the same manner as the casing **31**. However, the posterior wall **57** of the oval trap **56** extends to the exterior surface **40** of the main **11** and is sealed thereto. The abutting back portion **59** is contiguous to the outer surface **46** of the wall **12** and attached thereto. A vertical vent pipe **48** connects the upper annular flange **61** of the cavity and thereby vents the trap **56**. The casing end **62** nearest the street main (not shown) is formed with a plurality of spacing lugs **63** (FIG. 4) extending from the rim **64** of the opening **62** to the outer diameter **40** of the main **11**. These lugs **63**, of any rigid material, center the oval trap **56** about the main **11** and act as a screen to withhold dirt and roots from entering the trap **56**.

In operation, leaking gas will naturally flow away from a high pressure area, such as a street main and will follow the path of least resistance, that being the unpacked ground surrounding a service main **11**. The gas will flow into the exterior trap **31** or **56**, and meet the sealed-back portion of the trap **57** (FIG. 3) or the wall surface **46** (FIG. 1). There it will collect to escape the trap **31** or **56** up the vent pipe **48**, that being the path of least resistance, and to the atmosphere. Likewise, any gas escaping through a leak in the main **11** at its most vulnerable portion, that being where it traverses the wall **12**, will naturally follow the main **11** into the building and will be entrapped in the interior trap **29**. There it will take the route of least resistance out the provided vent **39** and to the atmosphere.

Although the preferred embodiment and a modification thereof have been shown and described hereinbefore, it is to be remembered that various other alternative constructions can be made thereto without departing from the true spirit and scope of the invention as defined in the appended claims.

We claim:

1. Escaped gas venting apparatus for a gas line extending through a foundation wall comprising:

first gas entrapment means forming a chamber open at both ends above the line at a location between the gas main and the foundation wall;

second gas entrapment means forming a chamber above the line at a location on the interior side of the foundation wall, said second means set partially into the foundation wall at one end, said end being open to the foundation wall and with the opposite end sealed off from the atmosphere; and

conduit means connected in an air tight manner to said first and second means and communicating said chambers to the atmosphere.

2. Apparatus as defined in claim **1**, and wherein each of said gas entrapment means includes a casing having an annular flange formed in its normally upper side, which flange defines an opening open to the respective chamber therebelow, and each flange being connected to said conduit means.

3. Apparatus as defined in claim **2**, and wherein each casing is cylindrical and encircles the gas line in a radially spaced, concentric manner.

4. Apparatus as defined in claim **3**, and wherein each casing comprises a pair of half-sections having mating flanges disposed normally horizontally to either side of the line.

5. Apparatus as defined in claim **4**, and wherein said conduit means comprises an exterior vent pipe connected at its lower end to said annular flange of said first means casing and at its upper end to a vent cap, and an interior vent pipe connected at its lower end to said second means casing annular flange, extended through the foundation wall and fluid connected to said exterior pipe intermediate said upper and lower ends thereof.

6. Apparatus as defined in claim **2**, and wherein either casing has a cylindrical, oval shape in longitudinal cross section with the inner diameter at the longitudinal center thereof greater than the inner diameter of said ends thereof.

7. Apparatus as defined in claim **6**, and wherein either end of said oval casing has a plurality of spacing lugs extended radially inwardly for engagement with the gas line whereby to maintain the said either end concentrically spaced from the gas line.

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