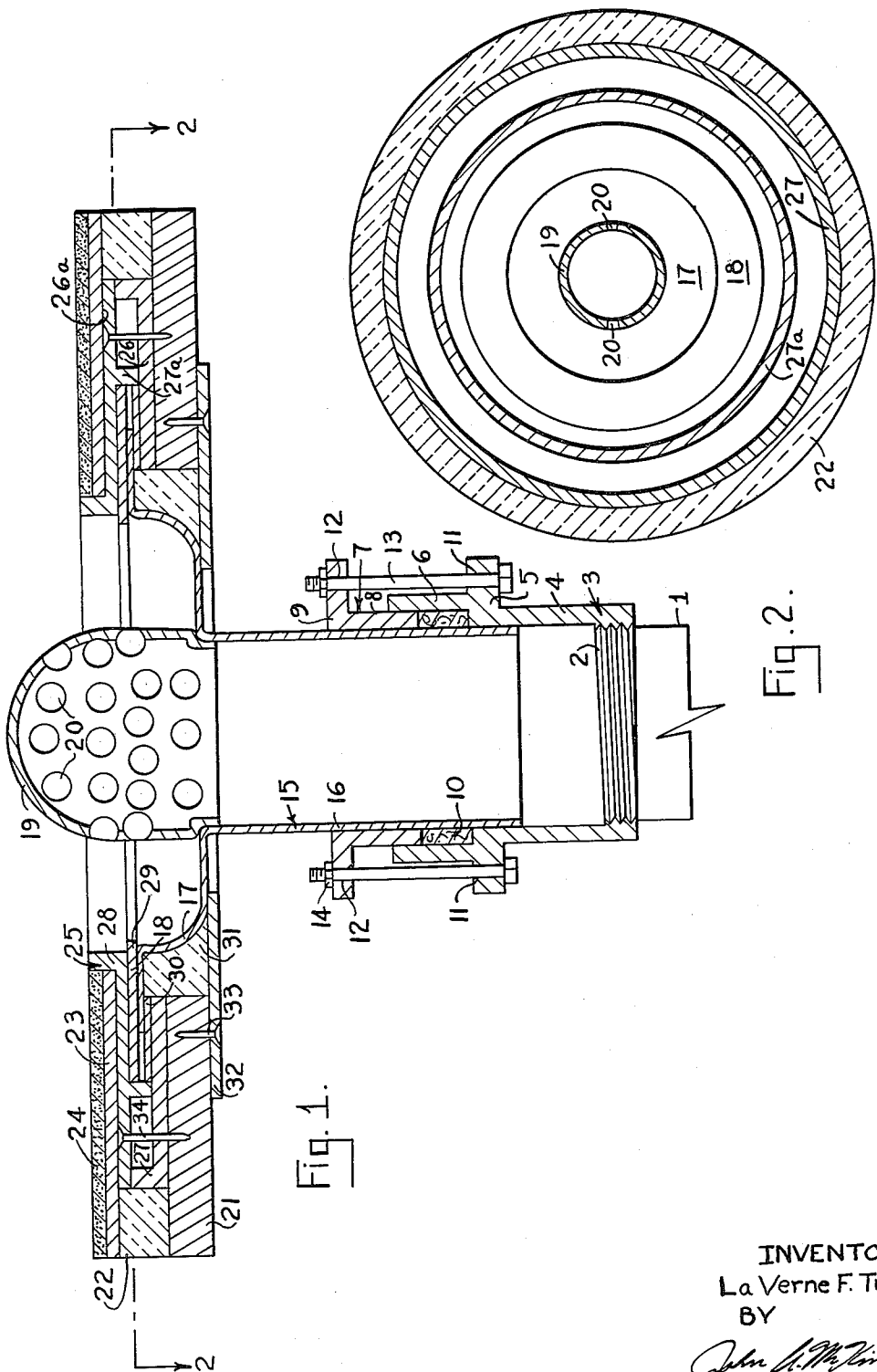


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DRAIN OR VENT PIPE CONSTRUCTION HAVING MEANS TO ALLOW
LATERAL AND LONGITUDINAL EXPANSION
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DRAIN OR VENT PIPE CONSTRUCTION HAVING MEANS TO ALLOW LATERAL AND LONGITUDINAL EXPANSION

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1 Claim. (Cl. 285—42)

This invention relates to drain or vent pipe constructions; more specifically, it relates to vent or drain pipes having means provided therein to compensate for longitudinal and lateral expansion of the piping system or movements of the wall member, through which the pipe protrudes, due to load deflections.

One of the common forms for venting the plumbing system of a building or to provide for drainage of a flat or low pitched roof of the building is the provision of a stack which extends through the roof to the exterior. In this way, the internal pipe system is vented, in the case of a vent pipe, by allowing the gases, vapors, etc., to pass through the vent pipe to the exterior; in the case of a drainage system, the roof is pitched slightly towards the drain pipe and the water is allowed to flow into a well adjacent the pipe and thence into the pipe and the drainage sewers. The defects in these systems are that no provision is made for the continual longitudinal and lateral expansion of the piping system, and no provision is usually made for the deflections of the roof due to a changing load, as, for example, a snow load.

An object of this invention therefore is to provide a novel type of internal roof drain or vent pipe which provides for expansion of the piping system in both a lateral and longitudinal direction.

Another object of this invention is to provide a novel internal roof drain or vent pipe system wherein compensation is provided in the piping system for deflections of the roof due to changing loads on the roof.

Still another object of this invention is the provision of a drain or vent pipe for a plumbing system in a building and with novel means of support for that section of the pipe adjacent the roof.

In brief, the invention comprises an extension on a drain pipe or vent pipe in a building plumbing system whereby the extension is resiliently supported by the roof. Provision is made for longitudinal or vertical expansion of the extension and main pipe and for the lateral expansion of the extension and pipe. The arrangement provided also allows deflections of the roof due to changing loads to occur without creating stresses in the roof adjacent the connections between the extension and the roof.

These and other objects will be readily apparent from the following more detailed description and the attached drawings wherein:

FIG. 1 is a cross-sectional view of a roof and the upper portion of a drain pipe or a venting system adjacent the roof; and

FIG. 2 is a plan view of the system along section lines 2—2 of FIG. 1.

Referring to the figures, a drain pipe 1 extends vertically from within the building structure (not shown). For the sake of simplicity pipe 1 will hereinafter be described as a drain pipe; however, it is to be understood that the pipe 1 may be either a drain pipe or a vent pipe as the surrounding constructions for the two are basically the same. In addition, the drain pipe or vent pipe is described as extending through a roof of a building; it is to be understood, however, that the pipe may extend through other wall structures. For example, the drain pipe may be attached to a building structure so that it will drain the floor of such a structure. Consequently,

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although only a roof deck is specifically described and illustrated for the sake of clarity and simplicity, other similar basic structures may be provided with a piping system according to the principles of this invention.

The upper lip of the pipe 1 is externally threaded at 2 and has secured thereto a coupling or fitting 3 which supports, in part, the drain pipe extension 15. Fitting 3 comprises a tubular extension 4 having at its upper portion a flange 5; a second extension 6 extends upwardly from the first extension 4 and flange 5 and is staggered slightly on the flange in order to receive internally the mating section 7 of the fitting. Tubular portion 8 of this latter section 7 is encircled by the tubular extension 6 and has a flange 9 extending transversely from its upper edge; a gasket gland is placed between one of the edges of tubular portion 8 and flange 11 to seal the joint between the mating halves of the fitting. The gland is compressed and the joint between the two portions of the fitting is secured by a plurality of bolts 13 passed through ports 11, 12 of the flanges 5, 9, which bolts are tightened by nuts 14. During tightening, gland 10 is compressed and extends inwardly thereby sealing the small gap between extension 15 and the fitting. The gland is of the asbestos graphite type so that any expansion in the vertical direction of the drain pipe 1 or the extension 15 allows relative sliding movement in a vertical direction between the extension 15 on the one hand and the fitting 3, including elements 4, 7, and 10, on the other hand, and hence between the extension 15 and the pipe 1, while still maintaining a proper seal between the two.

Extension 15 comprises a main tubular body portion 16 having at its upper end a transverse well 17. The latter, at its upper portion, has a transverse flange 18 extending into the body of the roof. A cap 19 having perforations or ports 20 therein is placed upon the upper internal lip of the tubular body 16 and screens the water flowing from the roof into the well 17 and pipe 1. In the event that pipe 1 is a vent pipe, cap 19 may be omitted if so desired. Extension 15 is supported in part by the tight seal between the fitting 3 and the extension 15 and also by a soft layer of insulation 31 supported from the roof deck by a plate 32, the latter being secured to the roof deck by securing means 33. Insulation 31 has one edge or face shaped to conform to the outer periphery of well 17 and flange 18, so that the extension 15 is supported in part by the mating of well 17 with the insulation and the mating of flange 18 with the insulation.

The roof deck comprises a base member 21 on which is super-imposed a layer of insulation 22; the roof is further built up by subsequent layers 23 of asphalt or bitumen in combination with roofing paper, and, if desired, a layer of gravel 24 may be placed thereupon. Adjacent the well 17, a gasket housing 25 is secured to the roof deck and abuts at one edge the insulation 22. The housing comprises a pair of annular plates 26 and 26a separated by spacers 27 and 27a; plate 26a has a vertical extension 25 which contains the built up section 23 and gravel 24, preventing these materials from eroding into the well 17 during water flow. Gasket 30 is mated with one of the faces of plate 26, and gasket 29 is mated with the opposing face of plate 26a; the thickness of the flange is such and the thicknesses of the gaskets are such that flange 18 may be slid between the two gaskets without difficulty but always maintaining a proper gasket seal, thereby preventing water from circumventing the flange and entering the insulation 31 or the base member 21. The gaskets 29, 30 are similarly of the asbestos graphite type, which permits such sliding movement between the gaskets while maintaining at all times a proper seal. For installation purposes, a spacer 27 may be secured to plate

26 and spacer 27a may be secured to plate 26a so that plate 26 and gasket 30 may be placed first upon the deck and superimposed by flange 18. Gasket 29 is thereafter placed upon the upper section of the flange and plate 21 is secured to the roof deck by securing means 34.

As described, extension 15 is resiliently supported by insulation 31, gasket seals 29, 30, and gland seal 10. During sideways movement of the extension, a certain amount of give or compression in the insulation 31 occurs and the flange slides between seals 29 and 30. During lateral expansion of the extension and pipe, flange 18 slides between the two gaskets 29 and 30 and compresses slightly the insulation 31; consequently, the entire upper section of the extension 15 may move outwardly due to expansion and this outward movement is absorbed by the insulation 31 and the sandwich type of gasket and flange construction. During movements or deflections of the adjacent areas of the roof deck due to heavy loads, as, for example, a snow load, the deck moves downwardly forcing the extension 15 downwardly further into the fitting 3. If, during the application of such a load, bending also occurs, the flange may slide toward one area of the housing between the gaskets 29, 30, and the well 17 compresses the adjacent area of the insulation 31.

Thus, it is seen that movement of the extension 15 and the main pipe 1 both in a vertical and in a lateral direction is compensated for preventing the creation of crack forming stresses in the adjacent portions of the roof;

likewise, the same apparatus compensates for movement or deflections of the roof relative to the piping system.

Having thus described my invention in rather full detail it will be understood that the details given are for the purpose of illustration, not restriction, and that variations within the spirit of the invention are intended to be included in the scope of the appended claim.

What I claim is:

A drain or vent pipe extension comprising a drain pipe, a tubular extension, means coupling the pipe and extension to each other, means in said coupling sealing said extension relative to the pipe and allowing for perpendicular expansion of either the pipe or the extension, a roof deck, a flange on the extension, said flange being spaced on its outer periphery from adjacent lateral portions of the roof deck, a gasket mated to each face of the flange allowing the flange to move laterally between the gaskets, and means to mount the gaskets and flange to the roof deck.

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