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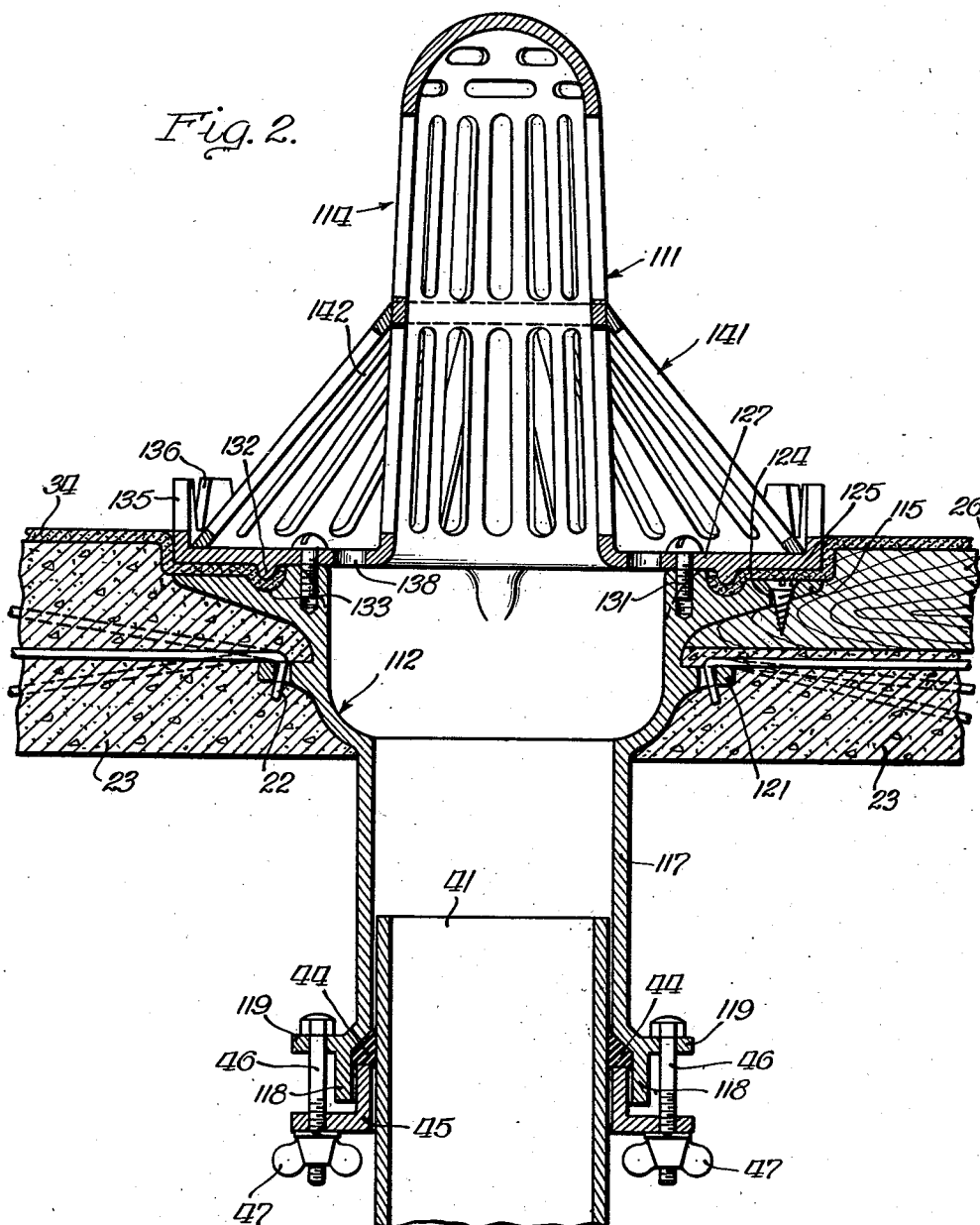
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ROOF DRAIN

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ROOF DRAIN

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2 Claims. (Cl. 182—31)

This invention relates in general to drainage devices, and more particularly to an improved type of roof drain.

A principal object of the invention is the provision of a simplified roof drain which is adapted for use with any desired type of roof construction, and is completely leak-proof throughout.

Another important object of the invention is the provision of a roof drain which results in very material savings in time, labor and materials in its installation.

A further important object of the invention is the provision in a roof drain of novel means for rigidly securing the same to the roof, which also functions to prevent cracking and breaking away of the concrete adjacent to and surrounding the drain, when used in connection with a concrete slab type of roof construction.

Another object of the invention is the provision of a roof drain incorporating a readily accessible expansion joint connection with the drainage pipe therefrom as a part of the drain proper.

A further object of the invention is the provision in a drain employing a main strainer unit, of auxiliary means for preventing clogging and blocking thereof by foreign matter carried to the drain, such auxiliary strainer means preferably comprising a readily removable, slotted collar member surrounding the main strainer unit.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, when taken in connection with the accompanying drawings, discloses preferred embodiments thereof.

In the drawings,

Figure 1 is a vertical sectional view through a roof structure and a drain therefor embodying the features of the invention; and

Figure 2 is a similar view of a modified drain.

Referring more particularly to Fig. 1, reference numeral 11 indicates in general a roof drain embodying the features of the instant invention which comprises a main body portion 12, a clamping ring 13, and a removable dome-shaped strainer 14. The main body portion 12 is in the shape of a bowl having an outwardly extending, horizontally disposed flange 15 at its upper end, with an inwardly extending, annular flange 16 disposed intermediate the ends of the bowl portion and formed integrally therewith. The lower end of the main body portion 12 comprises a downwardly extending tube 17 terminating at its lower end in an enlarged flange portion 18, and

and having a circumferential, horizontally disposed flange 19 formed adjacent such enlarged end portion, for a purpose to be later more fully described.

The main body portion 12 is adapted to be disposed in a suitable aperture provided in any desired type of roof construction, such as concrete slab, metal deck, wood sheathing, or tile, marble block, cement or terrazzo finish. To this end, the body portion 12 is provided with dual retaining means for securing the same to the roof structure, comprising the upper circumferential flange 15, and a plurality of hollow lugs or eyelets 21 formed integrally with and disposed adjacent the lower end of the bowl portion thereof. The eyelets 21 are spaced circumferentially around the main body portion 12 and are adapted to be engaged by a plurality of wires 22 which are preferably connected to the usual reinforcing means employed in a concrete slab 23, when such a roof structure is being used. The top flange 15 is provided with a plurality of spaced apertures 24 to accommodate screws 25 which are adapted to rigidly secure the main body portion 13 to the wood sheathing 26, if the latter is employed in the roof construction. In Fig. 1, both fastening means 22 and 25 are disclosed for the purpose of illustrating the optional methods by which the main body portion 12 of the roof drain may be secured to a roof of any particular type of construction.

In installing the roof drain 11, it is the usual practice to first position the main body portion 12 in its selected location prior to the completion of the roof structure, especially where a concrete slab construction is employed, and then complete the installation of the drain after all other construction work has been finished. The instant drain particularly lends itself to such installation, since the lower end 17 of the main body portion 13 extends sufficiently below the roof proper to clear any type of ceiling which may be subsequently applied thereto. This is an extremely important advantage of the instant construction, because it permits the person installing the same to do the job, without interference, at any time which may be convenient to him.

After completion of the roof construction, the clamping ring 13 may be secured to the main body portion 12 of the roof drain 11 in the following manner. The clamping ring 13 comprises an inwardly extending, annular flange 27 at the lower end, a main body portion 28 having a slope the same as that of the upper por-

tion of the main body 12, and a horizontal, circumferentially disposed flange 29 at the upper end. The lower flange 27 is provided with a plurality of spaced apertures to accommodate clamping bolts 31, which are adapted to be screwed into suitable tapped apertures provided in the inwardly extending flange 16 of the main body portion 12. The upper flange 29 is provided with a downwardly extending, annular flange 32 spaced inwardly from the outer edge thereof which is substantially V-shaped in cross section. The upper flange 15 of the main body portion 12 is provided with a companion groove or recess 33 disposed in vertical alignment with the flange 32. The roofing felt, paper, waterproofing membrane, or the like, 34 which is employed in the roof construction is adapted to extend downwardly between the upper end of the main body portion 12 and the clamping ring 13. Tightening of the bolts 31 will result in the flange 32 of the clamping ring 13 forcing this roofing material 34 into the groove 33, thus functioning to provide a completely leak-proof and air-tight joint between the main body portion 12 and the clamping ring 13. Without the flange 32 and groove 33, leakage would result, in time, between the main body portion 12 and the clamping ring 13 solely from vibrations of the roof structure. The flange 32 and groove 33 are so shaped and dimensioned that the roofing material 34 will not be punctured or perforated thereby regardless of the characteristics of the material used. The clamping ring 13 is also provided with an upwardly extending flange 35 adjacent its outer edge having spaced notches 36 therein to permit drainage from the upper surface of the roof structure downwardly over the clamping ring 13, while acting as a stop or barrier for any gravel or slag which may be used on the surface of the roof.

The strainer 14 is a hollow dome-shaped device having a plurality of apertures therein to provide the desired drainage area, and is formed with a horizontally disposed flange 37 at its lower end. The flange 37 is provided with suitable weep holes 38, and is sufficiently smaller in diameter than the inner diameter of the lower flange 27 of the clamping ring 13 to permit ready removability of the strainer 14. The removable dome-shaped strainer 14 normally rests upon the inward extending flange 16 of the main body portion 12, as shown in the drawings. The drainage area provided by the apertures in the strainer 14 is preferably greater than the outlet area of the lower tubular portion 17 of the main body portion 12. The mounting of the strainer 14 as above described enables it to be removed at any time for the purpose of cleaning out any sediment which may accumulate between it and the exposed surface of the clamping ring 13, without necessitating removal of the latter or disturbance of the leak-proof connection between the clamping ring and the main body portion 12.

The upper end of a suitable drainage pipe 41 is adapted to be slidably disposed within the tubular lower end 17 of the main body portion 12, and the pipe may be provided at its lower end with a threaded portion 42 for connection to the usual drainage line 43. If desired, the latter connection may be calked or otherwise secured, in lieu of such threaded connection, to provide a leak-proof joint. A gasket 44 of any desired material is interposed between the enlarged flange portion 18 of the tube 17 and the

drainage pipe 41, and is held in position by a gland ring or sleeve 45. The sleeve 45 is secured to the flange 19 provided upon the tube 17 by bolts 46, extending through suitable apertures therein, and wing nuts 47. The members 18, 19 and 44 to 47 thus constitute an expansion joint which permits relative movement between the tube 17 and the drainage pipe 41, while providing a leak-proof joint therebetween.

As will be readily understood, the above described roof drain 11 is adapted for use with any desired type of roof construction. The retaining means 21, 22 are of particular importance where the drain is to be associated with a concrete slab roof. This is for the reasons that the main body portion 12 of the drain may be positioned in the desired location prior to the pouring of the slab 23, and the wires 22 which are connected to the usual reinforcing means employed with the slab will effectively prevent breaking away of the slab from the drain. A tight connection between the concrete slab and the drain is thus assured, and the usual difficulty of cracking and breaking away of the slab adjacent to the drain is entirely eliminated. In fact, such retaining means is of particular advantage where the drain 11 is to be used as a floor drain, or in any other suitable location.

The fact that only the main body portion 12 of the drain 11 need be placed in position prior to complete construction of the roof and any ceiling which may be provided on the under surface thereof is of material importance, because it enables the person installing the drain to do so at any desired time without interference by those doing other types of work on the building. The extension of the lower tubular portion 17 of the main body portion 12 of the drain well below the lower surface of any ceiling which may be applied to the under surface of the roof not only facilitates such installation of the drain, but also eliminates the necessity of working close to the roof in connecting the drainage pipe 41 thereto. Such connection is also greatly facilitated by the particular type of expansion joint provided, which enables connection thereof entirely from below the joint. The flange 32 and groove 33 insure a completely leak-proof arrangement, regardless of any subsequent vibrations of the building, or the like, and the clamping ring 13 eliminates the necessity of using metal flashing of any kind. It will thus be seen that the instant roof drain 11 provides material savings in material, as well as in time and labor, in its installation.

In Fig. 2, a modified construction of the drain is illustrated which is indicated generally by reference numeral 111 and, like the drain 11 hereinbefore described, is adapted to be mounted in any suitable type of roof, floor or other construction. The drain 111 comprises a main body portion 112, a dome-shaped strainer 114 and an auxiliary strainer 141. The main body portion 112 is shaped somewhat similarly to the body portion 12 of the drain 11, terminating at its upper end in a horizontally disposed flange 115 and at its lower end in a downwardly extending tube 117. The tubular portion 117 is provided at its lower end with an enlarged flanged portion 118 and a circumferential, horizontally disposed flange 119 formed adjacent thereto.

The main body portion 112 is adapted to be disposed in a suitable aperture provided in any desired type of construction in the same manner as has previously been described relative to the

drain 11. To this end, the main body portion 112 is provided with dual retaining means for securing the same to the supporting structure, comprising the upper circumferential flange 115, and an intermediate flange providing outwardly extending lugs or eyelets 121. The eyelets 121 are adapted to be engaged by a plurality of wires 22 which are preferably connected to the usual reinforcing means employed in the concrete slab 23, when the drain is mounted in such a structure. The top flange 115 is provided with a plurality of circumferentially spaced apertures 124 to accommodate screws 125 which are adapted to rigidly secure the main body portion 112 to the wood sheathing 26, if the latter is employed in the supporting structure. In Fig. 2, the supporting structure at the left side of the drain 111 is shown as comprising a concrete slab 23, whereas that at the right side of the drain is shown as comprising not only the slab 23, but also the wood sheathing 26. From the previous description herein, it will be readily understood that the drain 111 is adapted to be installed in the same manner as the drain 11.

The modified drain 111 does not incorporate a clamping ring similar to the ring 13 of the drain 11, nor is the main strainer 114 loosely mounted upon the main body portion 112, as is the strainer 14 of the drain 11. Rather, the strainer 114 is provided with a substantially horizontal flange 127 at its lower end which rests upon and is secured to the upper flange 115 of the main body portion 112 by suitable screws 131 which are threaded into tapped apertures provided in the flange 115. This flange 127 of the dome-shaped strainer 114 also performs the function of the clamping ring 13 of the drain 11 of insuring a leak-proof connection with the main body portion 112. This function is accomplished by a downwardly extending annular flange 132 provided on the under surface of the flange 127 and a companion groove or recess 133 disposed in vertical alinement with the flange 132 in the upper surface of the flange 115 of the main body portion 112. This arrangement is similar to the flange 32 and recess 33 of the drain 11. The roofing felt, paper, water-proofing membrane, or the like, 34 which is employed in the supporting construction is adapted to be disposed between the flanges 115 and 127 and the flange 132 and recess 133. Consequently, securing of the dome-shaped main strainer to the main body portion 112 by means of the screws 131 will result in the flange 132 forcing the roofing material 34 into the groove 133, thus functioning to provide a completely leak-proof and air-tight joint between the main body portion 112 and the flange 127 of the strainer 114.

The flange 127 of the strainer 114 also performs another function of the clamping ring 13 of the strainer 11, i. e., that of acting as a stop or barrier for any gravel or slag which may be used on the upper surface of the supporting structure. To this end, the flange 127 terminates at its periphery in an upwardly extending flange

135 having spaced notches 136 therein. In other respects, the dome-shaped strainer 114 is similar to the strainer 14 of the drain 11. The strainer 114 is also provided in its lower flange 127 with suitable weep holes 138, similar to the weep holes 38 of the strainer 14.

The tubular lower end 117 of the drain 111 is adapted to be connected to the drainage pipe 41 in exactly the same manner as the tubular lower end of the drain 11, the flanges 118 and 119 cooperating with the sleeve 45, bolts 46 and wing nuts 47 to provide an expansion joint which permits relative movement between the tube 117 and the drainage pipe 41 while providing a leak-proof joint therebetween.

The drain 114 incorporates an additional feature not provided in the drain 14. This comprises the auxiliary strainer 141 which is in the shape of an inverted, flared ring adapted to engage the outer periphery of the dome-shaped portion of the main strainer 114 at its upper end and the junction between the flanges 127 and 135 of the strainer at its lower end. The auxiliary strainer 141 is thus removably mounted upon the main strainer 114, and is provided with a plurality of circumferentially spaced slots 142. The auxiliary strainer 141 thus functions to prevent clogging of the main strainer 114 by any foreign matter which may be carried to the drain, and is adapted to be readily removed to facilitate cleaning of the drain and removing of such foreign matter. The advantage of this construction is that even during cleaning of the drain 114, no foreign matter will be permitted to enter the main portion 112 thereof.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the forms hereinbefore described being merely preferred embodiments thereof.

I claim:

1. A drain, comprising a main body portion adapted to extend through a supporting structure, a main strainer member rigidly secured to said body portion, and an auxiliary strainer member surrounding and removably mounted upon the lower portion of said main strainer member.

2. A roof drain, comprising a main body portion, a main strainer member rigidly secured to said body portion and having a dome portion extending upwardly therefrom and a bottom horizontal flange terminating in an upstanding gravel stop ring, and an auxiliary strainer member in the form of a flared ring adapted to slidably engage the outer surface of said dome portion at its upper edge and the inner surface of said gravel stop ring at its lower edge to prevent clogging of said main strainer by any foreign matter carried to the drain.

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