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ROOF DRAIN EXTENSION

Filed Jan. 15, 1951

2 Sheets-Sheet 1

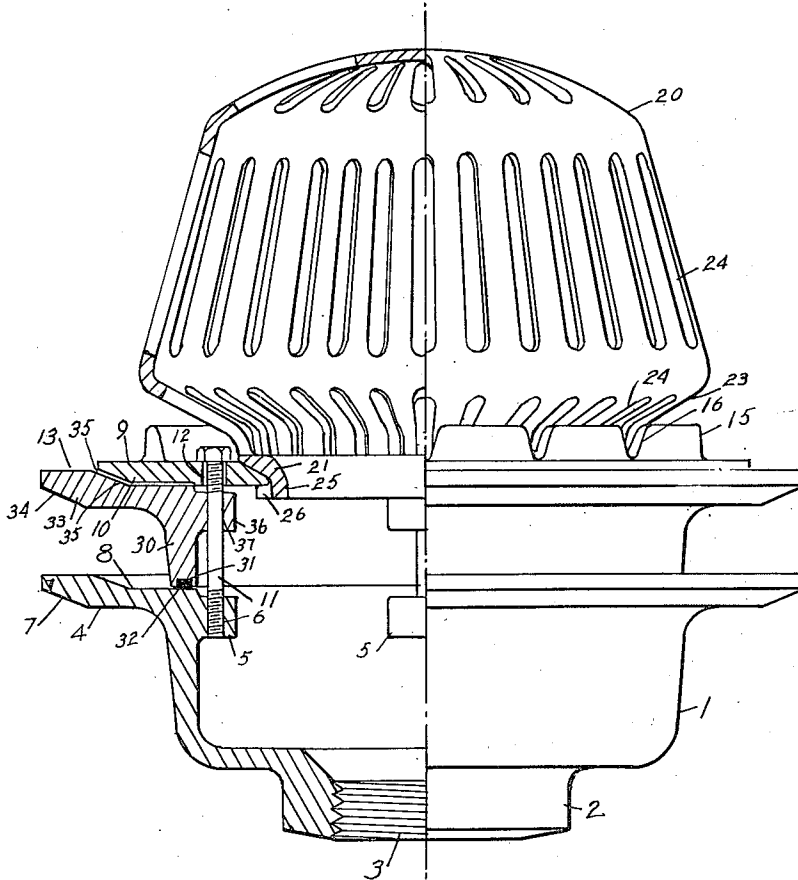


FIG. 1.

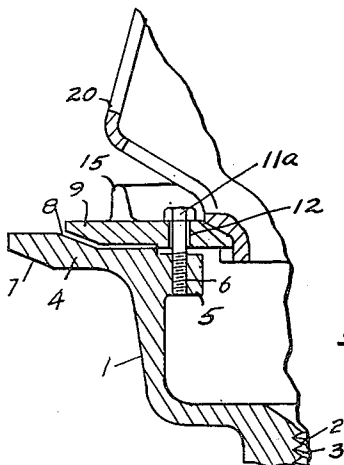


FIG. 3.

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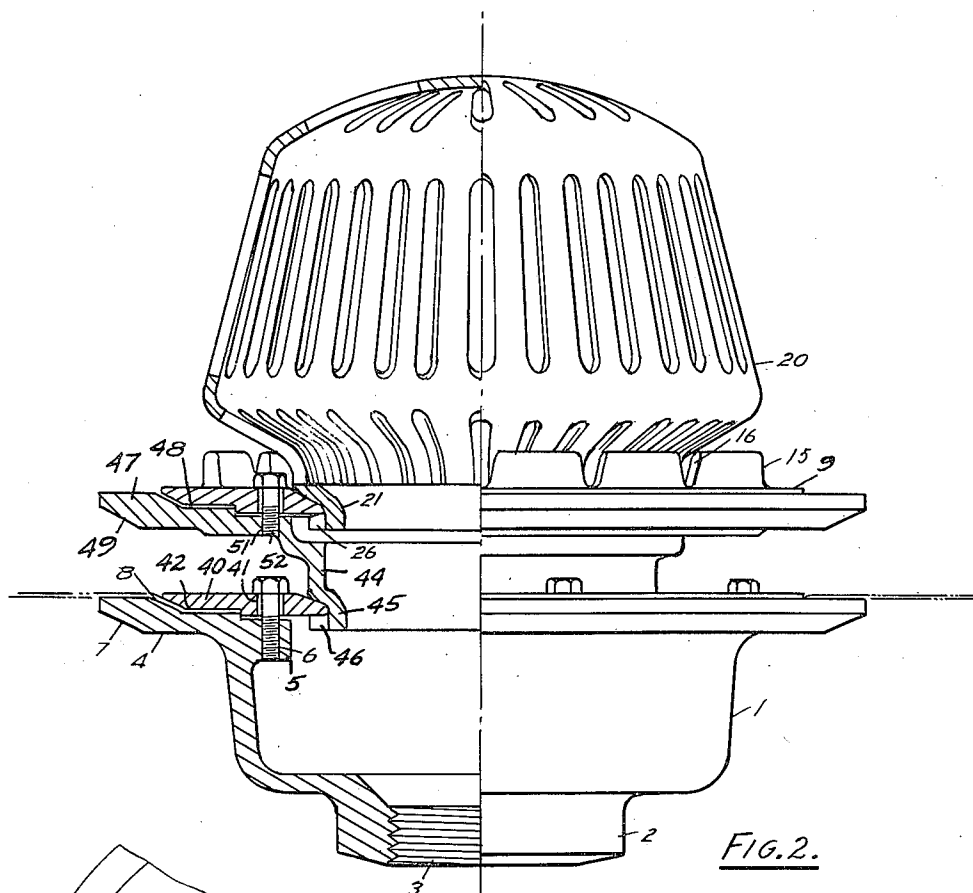


FIG. 2.

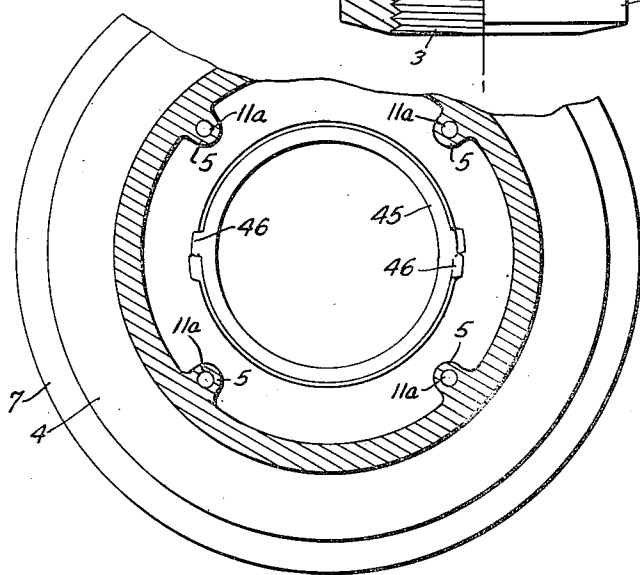


FIG. 4

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1

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ROOF DRAIN EXTENSION

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3 Claims. (Cl. 182—31)

This invention relates generally to roof drains and more particularly to roof drain extensions for extending the height of a roof drain level with a raised roof without disturbing the original installation.

In most large buildings, a base roof portion is placed on the building in its initial building stage. Additional roofing material is added to the roof at some later stage in the construction of the building. In some instances, an aperture is left in the roof for drainage and a roof drain is later installed therein. This is unsatisfactory in that workmen below are subjected to the flow of water through the openings. In other instances, conventional roof drains are installed in the base roof portion with the height of the drain coincidental with the height of the roof so that water will drain therefrom or with the height of the drain at a level coincidental with the projected raised roof level. The first mentioned installation makes it necessary to slope the sides of the drain aperture when additional insulation and/or roofing material is placed on the base portion of the roof, thus leaving a pocket above the drain to catch leaves, dirt, etc., thereby clogging the drain. In the second mentioned installation, the water gathers on the roof to the height of the drain so that workmen must work in several inches of water until the roof is completed. No suitable means has heretofore been provided to raise the level of a roof drain to accommodate different roof levels.

It is, accordingly, an object of my invention to overcome the above and other defects in present roof drains and it is more particularly an object of my invention to provide a roof drain extension for raising the level of a roof drain which is simple in construction, economical in cost, economical in manufacture, and efficient in operation.

Another object of my invention is to provide an extension for a roof drain whereby a roof drain may be installed permanently in an initial roof installation and the level thereof raised at a later date.

Other objects of my invention will become evident from the following detailed description, taken in conjunction with the accompanying drawings, in which:

Fig. 1 is a side elevational view cut away at the vertical center line thereof of my novel roof drain;

Fig. 2 is a side elevational view of a modified form of my novel roof drain cut away at the vertical center line thereof for better installation;

Fig. 3 is a fragmentary sectional view of the roof drain shown in Fig. 1 without the extension thereon; and

Fig. 4 is a cross sectional view taken on line 4—4 of Fig. 2.

In a roof drain, it is desirable to increase the flow of fluid through the drain line extending therefrom. To do this, it is necessary to minimize the entrainment of air with the water which seriously impedes the flow of water through the drain and in the drain line. The flow rate of a fluid varies directly with the square root of the hydraulic head available. My novel drain extension

2

greatly increases the hydraulic head. By having a deep body due to my novel extension and a comparatively deep reservoir, the air is permitted to vent and it is therefore not entrained with the water. A greater length of time is given for the air to vent and a lower lineal velocity through the body results which permits a maximum separation of the air from the water before it enters the drain line.

Referring now to the drawings, I show in Figs. 1 and 3 a cylindrically shaped drain cup 1 terminating in a centrally disposed outlet 2 threaded at 3 for connection to suitable piping. The drain cup 1 has an outwardly directed flange 4 on the upper end thereof and inwardly directed ears 5 with vertically extending threaded apertures 6. The bottom of the flange 4 is tapered at 7 and is adapted to engage a roof for support thereby. The top of the flange 4 has an offset portion 8 for nesting a flashing clamp or clamping ring 9 which has a bottom portion 10 corresponding to the offset portion 8 on the flange 4 of the drain cup 1. The clamping ring 9 is initially secured to the flange 4 by screw bolts 11a which extend through apertures 12 in the clamping ring 9 and threadably engage the threaded apertures 6 in the ears 5 as shown in Fig. 3. Conventional insulation and/or roofing paper may be initially clamped between the clamping ring 9 and the offset grooved portion 8 of the flange 4 of the drain cup 1. The under side 10 of the clamping ring 9 and the offset portion 8 of the flange 4 are so designed that the upper side of the clamping ring 9 is substantially merged with the upper surface on the initial base portion of the roof. A guard ring 15 extends upwardly from the clamping ring 9 to form a barrier to gravel and other heavy particles. Circumferentially spaced V-slots 16 are formed in the upper side of the ring 15 to permit the flow of water therethrough.

A dome strainer 20 has a supporting ring 21 formed integral with the bottom portion thereof. The strainer 20 is so designed that the lower portion 23 thereof flares outwardly and upwardly and the spaced, radially extending slots 24 therein extend downwardly to substantially the same horizontal plane as that of the level of the roof, thereby permitting a drainage of water from the roof. The outer portion of the lower end 23 of the strainer 20 is spaced from the upper side of the ring 15 a predetermined distance, thereby providing an annular opening to prevent debris from passing into the pocket formed by the ring 15.

The inner portion 25 of the supporting ring 21 is rounded so as to prevent a sudden contraction of the water, thereby greatly decreasing the entrance loss in pressure due to the sudden contraction of the water as in conventional drains.

The supporting ring 21 of the strainer 20 has lugs 26 extending radially outwardly therefrom which engage slots (not shown) on the inner edge of the clamping ring 9, the lugs 26 and the slots in the clamping ring 9 forming a bayonet joint by means of which the strainer 20 may be detachably secured to the clamping ring 9. The clamping ring 9 may be removed by removing the bolts 11a and an extension member 30 as shown in Fig. 1 may be disposed on the upper face of the flange 4 of the reservoir 1. A groove 31 is formed in the bottom edge thereof for carrying a suitable packing 32. The upper end of the extension member 30 is flanged outwardly to form a flange 33. The flange 33 has a tapered portion 34 adapted to engage a roof for support thereby. The tapered portion 34 is similar to the tapered portion 7 on the flange 4 of the drain cup 1. The flange 33 also has an annular offset grooved portion 35 the same as the grooved portion 8 on the flange 4 of the drain cup 1 and corresponding to the lower portion 10 of the clamp-

3

ing ring 9. The clamping ring 9 is adapted to secure conventional insulation and roofing paper to the top 13 and the offset portion 35 of the flange 33 of the extension member 30. The extension member 30 has inwardly extending lugs 36 with vertically extending apertures 37 for receiving bolts 11 which threadably engage the threaded apertures 6 in the inwardly directed lugs 5 of the drain cup 1. It will be evident upon inspection that the inwardly directed lugs 36, the annular offset grooved portion 35, the tapered portion 34, and the flange 33 are all of the same configuration as the corresponding elements 5, 8, 7, and 4 of the drain cup 1. The strainer 20 is attached to the clamping ring 9 as has heretofore been described.

Where a roof is to be installed in two stages, the drain cup 1 is permanently installed in the base portion of the roof with the upper surface of the flange 4 substantially level with the base portion of the roof. Insulating and roofing paper is usually clamped to the flange 4 by the clamping ring 9 secured by screw bolts 11a to the drain cup 1. The water passing through the slots 24 in the strainer 20 is directed through the inner side of the supporting ring 21 by the tapered lower portion 23 of the strainer 20, thereby minimizing the entrance loss in pressure. When further insulating and roofing material is placed on the base portion of the roof and the level thereof is raised several inches, the clamping ring 9 is removed by removing the bolts 11a. My novel extension member 30 is then disposed on the face of the flange 4 of the drain cup 1 as shown in Fig. 1. Insulating and roofing paper is then clamped between the lower portion 10 of the clamping ring 9 and the offset grooved portion 35 of the flange 33 of the extension member 30 at the desired raised level. The clamping ring 9 is then secured by screw bolts 11 threadably engaging the threaded apertures 6 in the lugs 5 of the drain cup 1. The addition of the extension member 30 provides a deep reservoir for water whereby a high head of water forms therein and, inasmuch as the water passing through the slots in the strainer 20 must pass a substantial distance through the strainer 20, extension member 30, and drain cup 1 to the discharge outlet 2, substantially all of the air is vented from the water. Furthermore, because of the great distance that the water must travel through the drain cup 1 and extension member 30 and strainer 20, the lineal velocity thereof is lowered to permit a maximum separation of air from the water. Thus the high hydraulic head provided by my novel drain and the substantial elimination of entrained air in the water increase the flow approximately twice the amount of that of the best designed drains now on the market.

In Fig. 2, I show another embodiment of a roof drain extension in combination with a reservoir and strainer identical with the reservoir and strainer shown in Figs. 1 and 3. The drain cup 1 with the outwardly extending flange 4, outlet 2, annular groove 8 in the flange 4, and tapered portion 7 is exactly the same as the drain cup 1 in Fig. 1. The clamping ring 9 with the offset under portion and apertures 12 is the same as the clamping ring shown in Figs. 1 and 3. The guard ring 15 with circumferentially spaced V-shaped slots 16 is the same as on the clamping ring 9 in Figs. 1 and 3. The dome strainer 20 with the supporting ring 21 on the bottom thereof has lugs 26 extending radially outwardly therefrom which engage slots (not shown) on the inner edge of the clamping ring 9, the lugs 26 and slots on the clamping ring forming a bayonet joint by means of which the strainer 20 may be secured to the clamping ring 9. In Fig. 3, I show the initial installation of the drain shown in Fig. 2 wherein bolts 11a secure the clamping ring 9 to the flange 4 by threadable engagement with the threaded apertures 6 in the lugs 5 of the drain cup 1. In other words, in the initial installation of my novel modified roof drain shown in Fig. 2, it is exactly the

4

same for both the drain shown in Fig. 1 and the drain shown in Fig. 2. When the level of the roof is raised, the clamping ring 9 shown in Fig. 3 is first removed by removing the bolts 11a and a clamping ring 40 having circumferentially spaced apertures 41 and an offset under side 42 corresponding to the grooved offset top portion 8 of the flange 4 of the drain cup 1 is secured to the top of the flange 4 by the screw bolts 11a as shown in Fig. 2. The clamping ring 9 could be used instead of the ring 40 but I prefer to use the more economical ring 40. An annular extension 44 has a supporting ring 45 with radially outwardly extending lugs 46 the same as the supporting ring 21 on the dome strainer 20. The lugs 46 engage slots (not shown) on the inner edge of the clamping ring 40, the lugs 46 and slots on the clamping ring 40 forming a bayonet joint by means of which the annular extension 44 may be detachably secured to the clamping ring 40. The extension 44 has an outwardly flanged portion 47 with the upper side thereof having a stepped offset portion 48 corresponding to the offset under side 10 of the clamping ring 9 and the flanged portion 47 has a tapered portion 49 adapted to engage a roof for support, thereby. The flanged portion 47 has circumferentially spaced threaded apertures 51 for threadably engaging screw bolts which secure the clamping ring 9 on the flanged portion 47 of the extension 44 with insulating and roofing paper therebetween. The dome strainer 20 is secured to the clamping ring 9 by the bayonet joint connection between the lugs 26, thereon and the slots in the inner side of the clamping ring 9 as has been heretofore described.

It will be evident upon inspection that the modified extension performs the same function as the extension shown in Fig. 1 in that it provides a much higher hydraulic head and it gives all of the other advantages given by the extension shown in Fig. 1.

It will be evident from the foregoing description that I have provided a novel extension for a roof drain which permits a roof drain to be permanently installed on a roof in the first stage of construction thereof where it is constructed in different stages, which adds to the maximum flow capacity and the hydraulic head of the drain, which minimizes the entrainment of air with the water passing to the drain line through the drain when the extension is attached thereto, and in which the construction and assembly is very simple and economical.

Various changes may be made in the specific embodiment of my invention without departing from the spirit thereof or from the scope of the appended claims.

What I claim is:

1. A roof drain having means thereon to conform to varying raised levels of a roof comprising a drain cup having a flanged portion with an annular groove in the upper side thereof, the upper side of said flanged portion being disposed in substantially flush relation with a first level of a roof, an extension on said drain cup disposed on said drain cup flanged portion, means to secure said extension to the upper side of said flanged portion, said extension comprising a generally cylindrical portion having a flanged portion attached to the upper outer periphery similar to the flanged portion of said drain cup and disposed above said drain cup flanged portion a substantial distance, a flashing clamp disposed on said extension flanged portion, fastening members securing said flashing clamp to said extension flanged portion, said flashing clamp securing a sheet of roofing material to said extension flanged portion at another level of a roof above said drain cup flanged portion, and a strainer secured to said flashing clamp.

2. A roof drain having means thereto to conform to varying raised levels of a roof comprising a drain cup having a flanged portion with an annular groove in the upper side thereof, the upper side of said flanged portion being disposed in substantially flush relation with a first level of a roof, an extension on said drain cup disposed

5

on said drain cup flanged portion, means to secure said extension to the upper side of said flanged portion, said extension comprising a generally cylindrical portion having a flanged portion attached to the upper outer periphery similar to the flanged portion of said drain cup and disposed above said drain cup flanged portion a substantial distance, a flashing clamp disposed on said extension flanged portion, fastening members securing said flashing clamp to said extension flanged portion, said flashing clamp securing a sheet of roofing material to said extension flanged portion at another level of a roof above said drain cup flanged portion, and a strainer secured to said flashing clamp, said means to secure said extension to the upper side of said drain cup flanged portion comprising a flashing ring resting on an annular grooved portion of said drain cup flanged portion and attached thereto, said flashing ring having locking means thereon locking said extension to said flashing ring.

3. A roof drain having means thereon to conform to varying raised levels of a roof comprising a drain cup having a flanged portion with an annular groove in the upper side thereof, the upper side of said flanged portion being disposed in substantially flush relation with a first level of a roof, an extension on said drain cup disposed on said drain cup flanged portion, means to secure said extension to the upper side of said flanged portion, said extension comprising a generally cylindrical portion having a flanged portion attached to the upper outer periphery similar to the flanged portion of said drain cup and disposed above said drain cup flanged portion a sub-

6

stantial distance, a flashing clamp disposed on said extension flanged portion, fastening members securing said flashing clamp to said extension flanged portion, said flashing clamp securing a sheet of roofing material to said extension flanged portion at another level of a roof above said drain cup flanged portion, and a strainer secured to said flashing clamp, said means to secure said extension to said drain cup flanged portion comprising the lower end of said extension resting on said drain cup flanged portion on the grooved portion thereof, and bolt means engaging said extension and said drain cup whereby said extension is held in place on said drain cup flanged portion.

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