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RAIN PIPE TRAP

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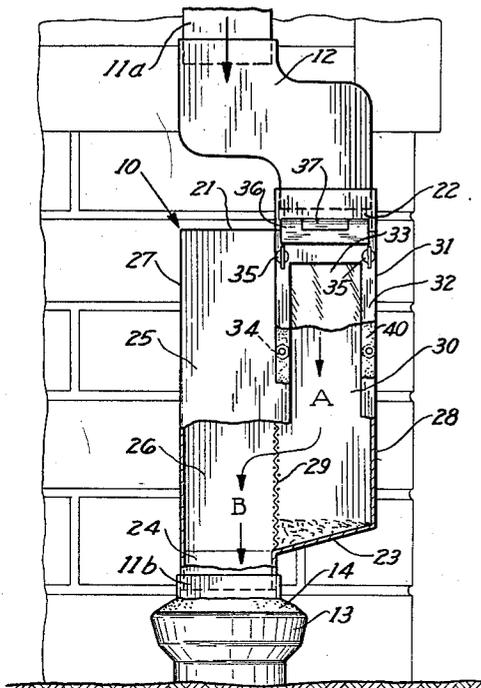


Fig. 1.

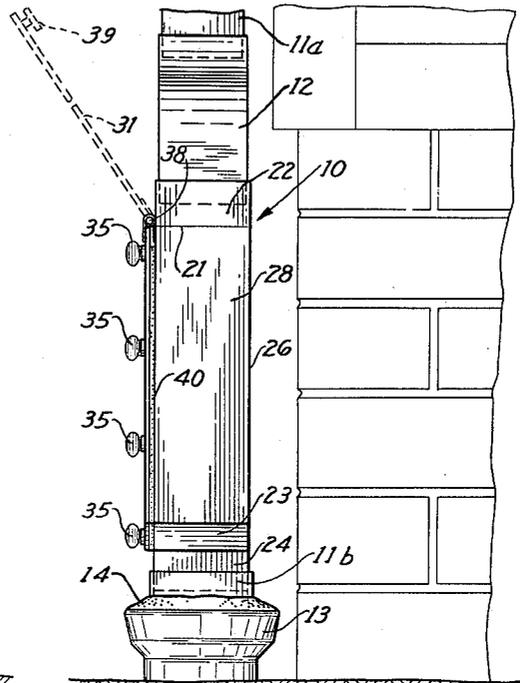


Fig. 2.

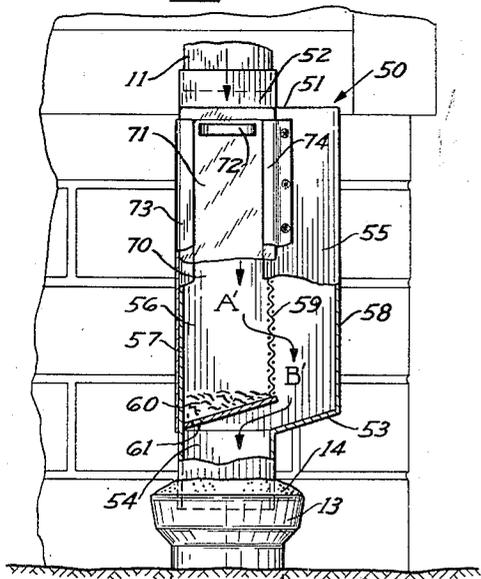


Fig. 3.

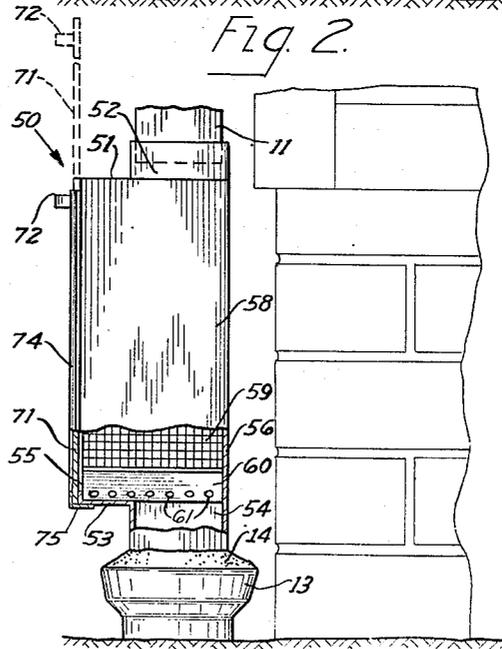


Fig. 4.

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RAIN PIPE TRAP

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3 Claims. (Cl. 210-90)

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This invention relates to a trap or strainer for the downspout of a building, to the manner of its use in the water-removal system of which the downspout forms part, and to the combination of elements making up such system, including the gutter, the downspout, the strainer associated with the downspout, the crock into which the downspout discharges, and the drain to which the crock is connected.

In systems in which no strainer is employed, leaves, twigs, insects and other debris caught by the gutter pass through the downspout into the crock and thence into the drain, which is usually some four to six feet below ground level adjacent the wall of the basement or underneath the basement floor. In such circumstances, the debris passing from the downspout into the drain tends to accumulate below the crock, sometimes creating an obstruction in the drain sufficient to bring about complete stoppage of flow. When this occurs, overflow from the system falls on the siding of the building, basement walls become water-logged, and dampness, rotting and the odor of decaying organic matter are prevalent throughout the year.

Correction of this state of affairs usually requires expensive excavation, sometimes accompanied by the necessity of breaking through the wall or floor of the basement to reach the point in the drain at which the obstruction has formed. Removal of the obstruction may afford only temporary relief for the reason that the condition which brought about its formation can and usually does recur. To remedy this condition may require a reduction in the density of the trees in the locality, with attendant loss of trees desired for shade.

It is an object of the present invention to provide a strainer of a kind that may be inserted in such a system to obviate these difficulties. Another object of the invention is to provide a strainer, that, when so inserted in the system, will serve to collect the leaves, twigs and other debris at a point from which they may conveniently be removed before they have had an opportunity to pass below ground level. Another object of the invention is to provide a strainer which permits observation of the amount of accumulated debris and its ready removal through a lateral opening and an associated closure extending from a point near the top to a point near the bottom of the strainer. Still another object of the invention is to provide a strainer in which rain water cannot accumulate to freeze in winter with consequent damage to the strainer.

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Other objects and advantages of the invention will be detailed in or apparent from the description which follows, taken with the accompanying drawing. In such drawing, Figure 1 represents a front elevation, with parts broken away, of a strainer constituting the preferred embodiment of the invention. Figure 2 represents a corresponding end elevation as seen from the right in Figure 1. Figures 3 and 4 are like views of a modified form of strainer coming within the purview of the invention.

In the embodiment of the invention shown in Figures 1 and 2, strainer 10 is inserted in the system between an upper part 11a and a lower part 11b of a downspout of rectangular cross-section, the downspout being connected at its upper end to a gutter (not shown). Between upper portion 11a of the downspout and strainer 10 is a double elbow 12, likewise of rectangular cross-section. The upper end of such elbow receives the lower end of portion 11a of the downspout. The opposite end thereof is received in a correspondingly shaped rectangular inlet collar on strainer 10. At its lower end, strainer 10 has a similarly shaped outlet collar which extends into lower portion 11b of the downspout. The latter is received in a round crock 13 and held in position therein by cement 14. Below crock 13 is a drain (not shown) passing alongside or under the house with which the system is used.

Strainer 10 takes the form of a casing having an oblong cross-section which, in practice, may conveniently measure about 6 inches on its long sides and about 2½ inches on its short sides. The strainer proper, not including the inlet and outlet collars previously mentioned, may conveniently measure about 10 inches from top to bottom. It consists, among other things, of a horizontal top wall 21 having therewith associated rectangular inlet collar 22; a bottom wall 23, which may be horizontal but is shown in the drawing as inclined, with which is associated rectangular outlet collar 24; and side walls made up of a front wall 25, a rear wall 26 and end walls 27 and 28. Inlet and outlet collars 22 and 24 measure 3 inches across front and back and 2½ inches along their sides, so that their aggregate areas equal that of the cross-section of strainer 10. They constitute prolongations or extensions of the side walls of the strainer.

A foraminous inner wall 29, preferably of ¼", ⅜" or ½" mesh screen, divides the casing into two vertical compartments. One, inlet compartment A, has substantially the same cross-sectional area as inlet collar 22; the other, outlet

compartiment B, has substantially the same cross-sectional area as outlet collar 24. Although the two compartments have the same areas and extend in parallelism from the top to the bottom of the casing, the inclination of bottom wall 23 in the portion of the casing underlying inlet compartment A serves to reduce somewhat the cubic content of the inlet compartment as compared to that of outlet compartment B. The inclination from the horizontal is from 10 to 20 degrees, preferably about 15 degrees; so that the inclined angle between the foraminous wall 29 and the inclined portion of bottom wall 23 is about 75 degrees.

In the portion of front wall 25 adjoining inlet compartment A is an opening 30 which, as seen from the front of the casing, is substantially co-extensive with the inlet compartment, such opening being provided for the purpose of permitting ready access to inlet compartment A for the removal of leaves, twigs and other debris that accumulates at the bottom of the inlet compartment near the base of foraminous wall 29. Opening 30 is normally closed by a hinged closure 31 consisting of a frame 32 in which is received a transparent glass or plastic panel 33. Closure 31 is held in place on front wall 25 of the casing by inserting and screwing in place winged fasteners 35 of the nature of screw-threaded bolts that project into and are received by nuts 34 that are soldered, brazed or otherwise fastened in place, immediately adjoining opening 30 therein, inside front wall 25 of strainer 10.

As indicated in Figure 2, upon removal of fasteners 35, closure 31 may be swung about a horizontal axis to an elevated position, thus permitting ready access to the debris accumulated at the bottom of inlet compartment A. Closure 31 pivots on a hinge consisting of a saddle 36 which is soldered, brazed or otherwise affixed to frame 32, a circular or semi-circular retainer 37 which is similarly affixed to inlet collar 32, and a pin 38 extending through retainer 37 and projecting on both sides thereof into the aligned portions of saddle 36. A knob 39 may be provided, if desired, at or near the end of closure 31.

With this arrangement, it is possible to observe from a distance whether the debris that has accumulated is present in an amount making its removal necessary or desirable. If removal is indicated, it becomes a simple matter to unscrew fasteners 35, swing closure 31 to an elevated position, and remove the debris. Thereupon, closure 31 may be returned to its original position, after which fasteners 35 may be screwed in place to hold the closure in the desired position. If desired, a rubber or cork gasket 40 may be included to provide a tight joint between front wall 25 and closure 31, such gasket having openings through which fasteners 35 can pass.

In the modification shown in Figures 3 and 4, a strainer 50 of somewhat different construction is inserted between downspout 11 and crock 13, the inlet collar at the upper portions of the strainer receiving the downspout and the outlet collar at the lower portion thereof projecting into the crock. By virtue of the fact that the inlet collar and the outlet collar are located in alignment with each other, it becomes unnecessary to employ an elbow in conjunction with the strainer. In the interests of simplicity of construction, the outlet collar on strainer 50 of Figures 3 and 4 is about twice as long as the outlet collar on strainer 10 in the embodiment of the invention shown in Figures 1 and 2, thus permitting the insertion of

the outlet collar directly into crock 13 without requiring use of an additional piece of downspout comparable to lower portion 11b of Figures 1 and 2. Crock 13 discharges into drain 15 as indicated in dotted lines.

Strainer 50 consists of a horizontal top wall 51 in which is formed inlet collar 52; an underlying bottom wall 53 in which is formed outlet collar 54; and front wall 55, rear wall 56 and side walls 57 and 58. Collars 52 and 54 in part constitute prolongations of rear wall 56 and left side wall 57. Inlet collar 52 projects upward to receive downspout 11a; outlet collar 54 projects downward into crock 13. Preferably, but not necessarily, bottom wall 53 is inclined about 15° from the horizontal in the manner shown in Figure 3.

Conveniently, strainer 50 is nearly square in cross-section, measuring for example, about 4¼ inches across the front and back thereof and about 4 inches along either side. The overall length, not including inlet and outlet collars, may conveniently be about 10 inches. The collars measure about 3 inches across the front and 2½ inches as seen from the side. They are located in alignment toward the left rear of strainer 50.

Extending transversely from front to rear of casing 50 is a foraminous inner wall 59, preferably of ¼", ⅜" or ½" mesh screen, which at its lower end is soldered to and supported by baffle 60 having therein a series of ports 61. Baffle 60 is inclined from the horizontal by approximately 15 degrees, so that the included angle between foraminous inner wall 59 and baffle 60 is approximately 165 degrees. Inner wall 59 serves to divide the strainer 50 into two compartments, an inlet compartment A' which measures 3 inches across the front and 4 inches in depth and an outlet compartment B' which measures 1¼ inches across the front and 4 inches in depth. Outlet compartment B' extends under baffle 60 as shown in Figure 3.

In the portion of front wall 55 which adjoins inlet compartment A' is an opening 70 extending from a point near the top to a point near the bottom of strainer 50. Such opening permits access to debris accumulating on baffle 60. It is closed by a slide 71 having a semi-circular grasping portion 72 formed near the upper part thereof. Both slide 71 and grasping portion 72 may be of glass or molded of transparent plastic such as methyl methacrylate resin. Slide 71 is held in place by lateral guide members 73 and 74, which are soldered, brazed or otherwise affixed to the casing, and a bottom retainer 75 which, with guides 73 and 74, forms a frame around three sides of slide 71. As shown in dotted lines in Figure 4, slide 71 may be lifted to provide access to the interior of strainer 50.

The materials of which the strainer is formed may vary widely, although sheet metal such as galvanized sheet steel is preferably used for the strainer proper. Steel, copper or bronze wire fabric is preferably used for the foraminous inner wall which separates the inlet compartment from the outlet compartment in each of the two embodiments of the invention shown in the drawing. Other materials, including stainless steel, Monel metal, aluminum alloys and even synthetic resins, may be used throughout. However, the preferred process of fabrication is to make use of steel parts, spot-weld them to form a unit, and then galvanize the entire unit by a dipping process. Such a unit may be made up at small cost, yet will have a long useful life.

It is apparent that numerous changes may be

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made in the invention without departing from the spirit thereof as defined in the appended claims. Thus closure 31 in the embodiment shown in Figures 1 and 2 may, if desired, be located in end wall 28 rather than in front wall 25; similarly, it need not necessarily take the form of hinged closure but may, if desired, take the form of a slide closure or a closure of any other desired sort. In the embodiment shown in Figures 3 and 4, a hinged closure may be used, such closure being located in front wall 55 where slide 71 appears, or, if desired, in side wall 57. Other changes will suggest themselves to those skilled in the art.

In use, a strainer so made up is inserted in and becomes part of the system for removing rain water from a building. Rain water will pass through the foraminous inner wall of the strainer without accumulating in substantial quantity at the base of the inlet compartment: thus there is no body of water which in cold weather can freeze to do damage to the strainer or its parts. Leaves, twigs, insects and other debris passing into the downspout will accumulate at the bottom of the inlet compartment until such time as their removal is effected. Immediate and easy access may be had to the inlet compartment, from which may be removed, from time to time, such debris as has accumulated. The latter is prevented from passing into the crock and drain therewith associated and, in consequence, from creating a stoppage below the ground line with attendant flooding of the system and development of dampness, rotting and the odors of decaying organic matter in the building or its basement.

It is intended that the patent shall cover, by suitable expression in the appended claims, whatever features of patentable novelty reside in the invention.

I claim:

1. A downspout trap comprising an elongated box-like casing having top, bottom and side portions, the body of said casing between the top and bottom portions thereof being of generally

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rectangular cross-section; means at the top portion of the casing forming an inlet; means at the bottom portion of the casing forming an outlet; an elongated inlet compartment extending vertically of the casing beneath said inlet and an elongated outlet compartment extending vertically of the casing above said outlet, said inlet and outlet compartments extending in parallel relation from the top portion to the bottom portion of the casing; a common wall comprising an elongated screen separating the inlet and outlet compartments from each other, said common wall extending vertically from the means forming the inlet at the top portion of the casing to the means forming the outlet at the bottom portion of the casing and extending laterally across the casing between opposed side portions; means at the base of the common wall forming a transverse baffle at the bottom of the inlet compartment on which incoming debris can accumulate pending its removal from the casing; and, formed in the side portion of the casing, a full-length closure providing access to the inlet compartment for the removal of debris accumulating on the transverse baffle at the base of the common wall.

2. A downspout trap as in claim 1 in which the means forming the inlet and the means forming the outlet are in alignment with each other.

3. A downspout trap as in claim 1 in which the means forming the inlet and the means forming the outlet are out of alignment with each other.

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