Dec. 18, 1928. 1,695,583

S. GOLDBERG ET AL

LIQUID RECEPTACLE

Filed Oct. 17, 1927 3 Sheets-Sheet 1

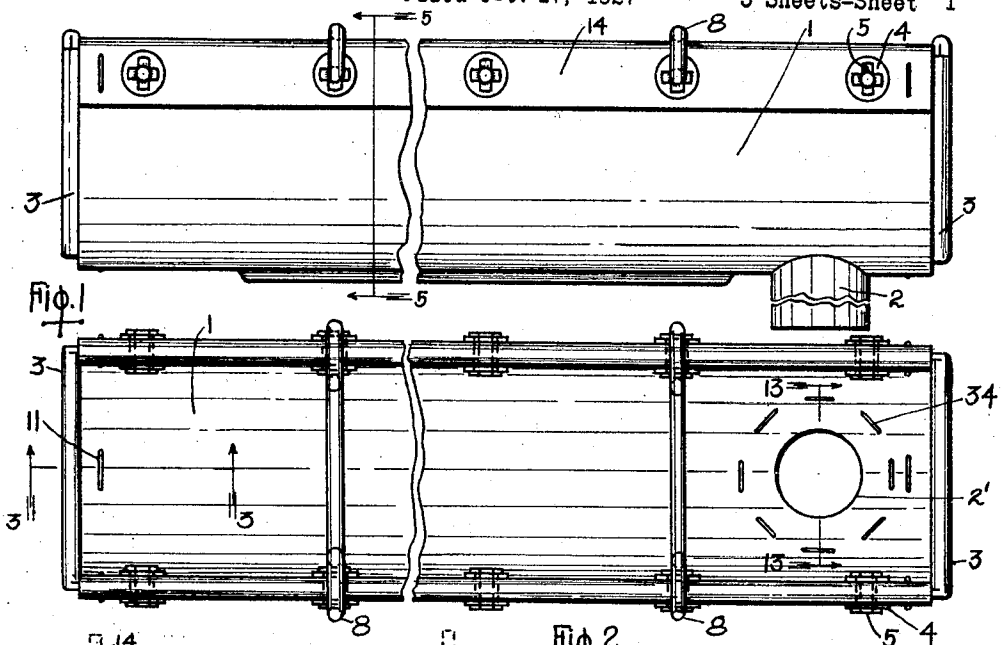


Fig. 1

Fig. 2

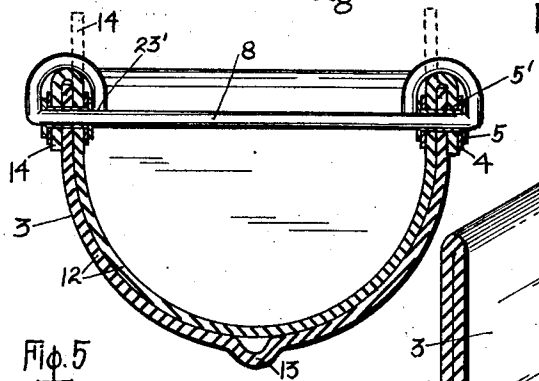


Fig. 5

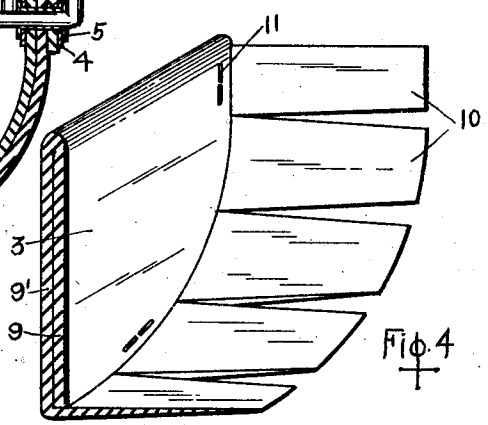


Fig. 4

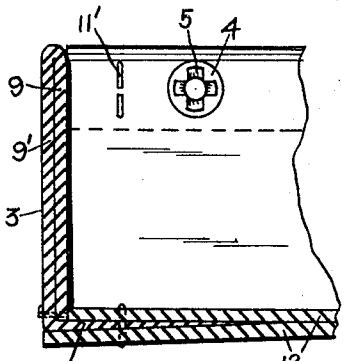


Fig. 3

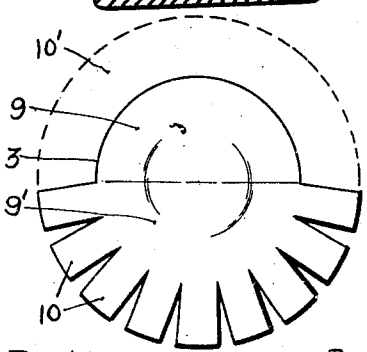


Fig. 4a

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LIQUID RECEPTACLE

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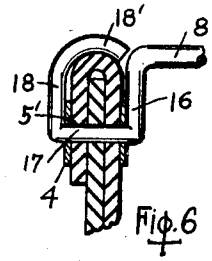


Fig. 6

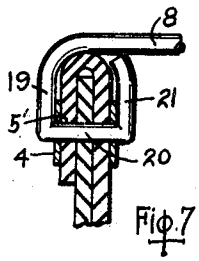


Fig. 7

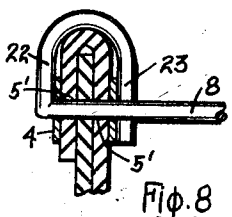


Fig. 8

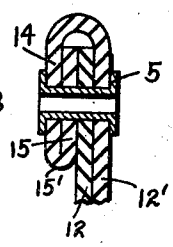


Fig. 11

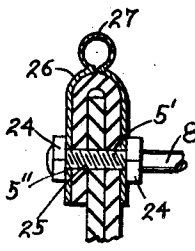


Fig. 9

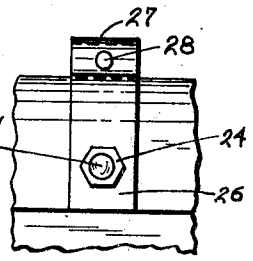


Fig. 10

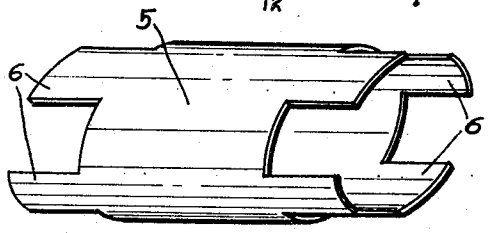


Fig. 12

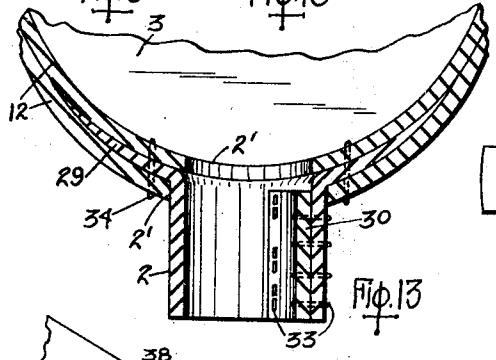


Fig. 13

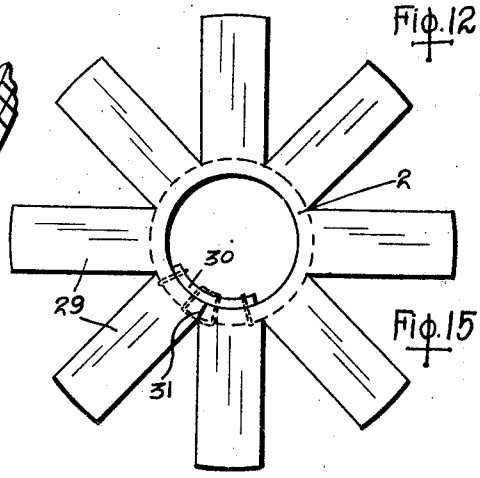


Fig. 15

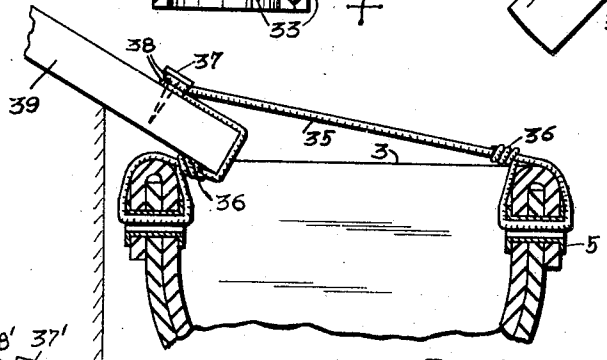


Fig. 16

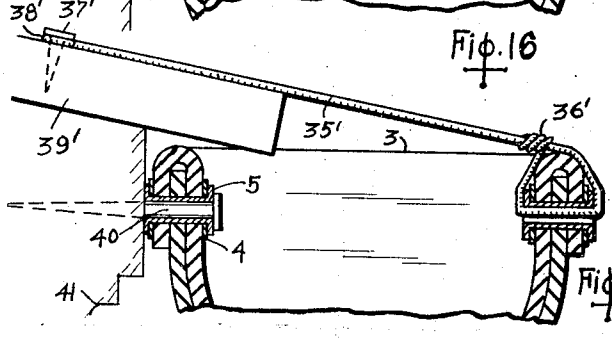


Fig. 17

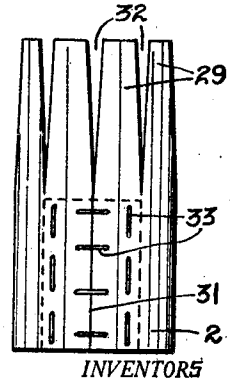


Fig. 14

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LIQUID RECEPTACLE

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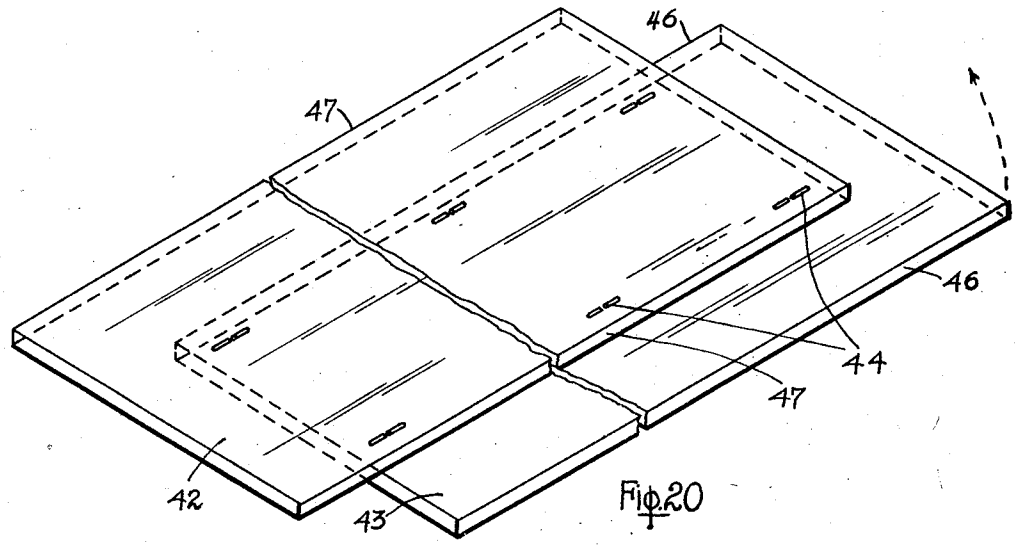


Fig. 20

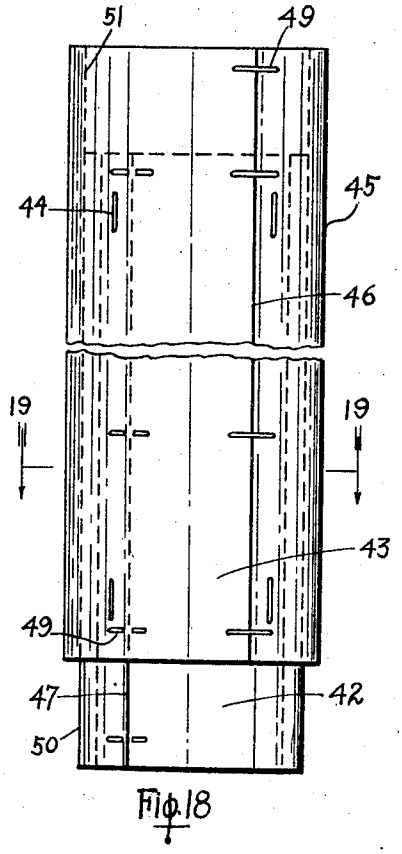


Fig. 18

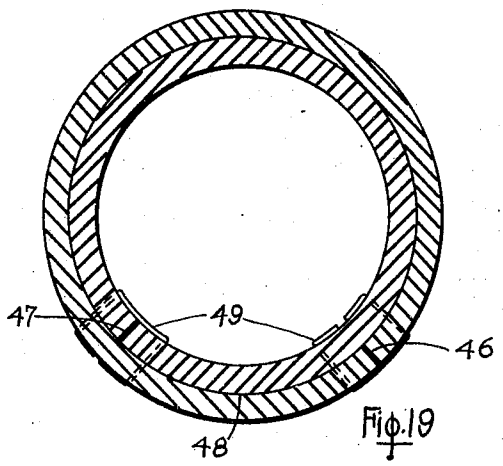


Fig. 19

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Patented Dec. 18, 1928. 1,695,583

UNITED STATES PATENT OFFICE.

SAMUEL GOLDBERG AND VICTOR GOLDBERG, OF BALTIMORE, MARYLAND; SAID VICTOR GOLDBERG ASSIGNOR TO SAID SAMUEL GOLDBERG.

LIQUID RECEPTACLE.

Application filed October 17, 1927. Serial No. 226,706.

This invention relates to a conduit and more particularly, to an improved drainage system adapted to be positioned adjacent the edge of a roof.

Heretofore, the drainage systems employed for drawing off the water from the roof of a building structure has been made of ordinary sheet metal or tin conduits which are expensive and easily corroded by the action of the water and the elements. In addition, difficulty has been experienced in attaching the metal conduit in place and this work therefore, can only be done by specially skilled mechanics such as roofers, tinsmiths or plumbers. The cost therefore, has been considerably increased by reason of the highly skilled type of labor necessary in this work.

The ordinary tin conduit heretofore employed, must always be kept in a good state of repair in order to function properly and this can also only be done by the skilled mechanics referred to above. Furthermore, the life of any ordinary conduit or trough is relatively short, requiring frequent replacement, due to its inability to withstand the actions of the elements.

Attempts have been made heretofore to overcome some of the disadvantages of the tin conduit by coating the tin with impregnated paper material, although it has never been recognized heretofore, to what extent the tin may be replaced.

We have discovered that waterproof, flexible, non-metallic materials such as paper, impregnated or coated with an impervious substance, when properly formed in layers can be much better adapted to a drainage system by reason of its flexibility and ease of attachment, while at the same time it has a considerably longer life than the metallic trough, and can be built at a much lower cost. An example of such a substance is tar paper or roofing paper, waterproof or rubberized fabric or rubber.

This invention has for an object to provide a drainage system which will be simple in construction, cheap to manufacture and efficient in operation.

A further object of this invention is to provide a drainage system made entirely of non-metallic or non-corrosive material, impervious to water, light in weight, durable and sufficiently strong to resist the elements.

A still further object is to provide a non-metallic conduit capable of being readily attached to the edge of a roof by any inexperienced person without any special tools, capable of being easily repaired without removal from its place of attachment, and capable of continuing in use without any attention whatsoever.

It is well known that the ordinary sheet metal or tin conduits or troughs in use at the present time are expensive, easily corroded by the action of water and the elements, and difficult to attach, thereby necessitating the employment of roofers, tinsmiths or plumbers, and involving the use of special tools. The ordinary tin conduits or troughs must always be kept in a good state of repair in order to function properly, further necessitating the employment of the above mentioned artisans. Furthermore, the life of any ordinary tin conduit or trough is relatively short, requiring frequent replacement due to its inability to withstand the action of the elements. The non-metallic conduit or trough as contemplated, obviates the disadvantages of the ordinary conduits in use for the above stated reasons.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that the changes in the precise embodiment of the invention herein disclosed, may be made within the scope of what is claimed, without departing from the spirit of the invention.

The drawings illustrate our invention as embodied in a house drainage system.

Referring to the drawings:—

Figure 1 illustrates a side elevation of the eaves-trough.

Figure 2 is a plan view of the trough shown in Figure 1.

Figure 3 is a section on line 3—3 of Figure 2.

Figure 4 is a perspective view partly in section of one of the backs.

Figure 4ª is a plan view of one of the backs before being folded.

Figure 5 is a transverse section of the trough taken on line 5—5 of Figure 1.

Figures 6, 7 and 8 are modifications partly in section showing various means of securing the transverse rods to the longitudinal edges of the trough.

Figure 9 is another modification partly in section showing an attaching means for the trough secured in place by a transverse rod.

Figure 10 is an elevation of the modification shown in Figure 9.

Figure 11 is a still further modification illustrating the manner of securing the longitudinal edges of the layers comprising the trough to each other.

Figure 12 is a perspective view of one of the metallic eyelets.

Figure 13 is a section on line 13—13 of Figure 2 showing the manner of securing the discharge nipple to the trough.

Figure 14 is an elevation of the nipple.

Figure 15 is a plan view of the nipple with the flaps bent at an angle to the vertical axis of the nipple.

Figures 16 and 17 show various ways of attaching the trough to the edge of a roof or cornice.

Figure 18 illustrates an elevation of one of the units comprising the downspout.

Figure 19 is a transverse section on line 19—19 of Figure 18.

Figure 20 is a perspective view of the arrangement of the layers comprising one of the units of the downspout.

Referring to the drawings in detail, 1 indicates the conduit, channel or eaves-trough made up of one or more longitudinal layers 12, (Figure 5) intimately secured to each other at their contacting surfaces. The layers 12 may be of any waterproof flexible non-metallic material, such as paper impregnated or coated with an impervious material, as for example, tar or roofing paper; water proofed or rubberized fabric, or rubber. The channels as contemplated are preferably made of tar or roofing paper. The layers 12, except for a narrow portion at their ends, are cemented together at their contacting surfaces and are transversely bent into a U-shaped trough, though it is obvious that the conduit may be of any desired cross section, the inner layer 12 being preferably made wider than the outer layers for a purpose to be hereinafter described.

The open ends of the trough are closed by backs 3, Figures 1 and 2, the construction of which is clearly shown in Figures 4 and 4a. A circular piece of the prepared material 10′ (Figure 4a) is divided into two semi-circular upper and lower portions 9 and 9′ respectively, the larger and lower portion 9′ having formed at its edge, flaps 10, said upper portion 9 being folded over into contacting engagement with the lower portion 9′ (Figure 4) and securely held thereto through the medium of the clips 11. The portions 9 and 9′ are also preferably cemented together in a manner to be described in detail hereinafter. The flaps 10 are bent at right angles to the plane of the portion 9′, and abut the periphery or edge of the portion 9. The backs are secured to the transverse end of the conduit by inserting the flaps 10 between the uncemented portions of the layers 12, Figure 3, so that the inner layer abuts the portion 9, the outer layer 12 being preferably made a trifle longer so that its transverse edge is in alignment with the surface of the portion 9′. To permanently attach the backs 3 to the layers 12, clips 11′ are provided. The uncemented portions of the layers 12 and the flaps 10 are cemented together.

The inner layer 12 has portions 14 extending beyond the longitudinal edges of the outer layer 12, as shown by the dotted lines, (see Figure 5) said portions 14 being folded over into contacting engagement with the outer surface of the outer layer 12, and securely cemented thereto, as clearly shown in Figures 1 and 5. Metallic eyelets 5 of the type shown in Figure 12, having projections 6 formed thereon are inserted into apertures 5′ provided at regular intervals along the longitudinal ends of the trough for a purpose to be hereinafter described. The projections 6 are bent back into contacting engagement with the inner surface of the trough and the portion 14, as shown in Figure 11. If desirable washers may be inserted between the bent over projections 16 and the surfaces of the trough coincident with the apertures 5′, as shown in Figure 5. Rods or stays 8 made of stiff wire are inserted into certain of the eyelets 5, the ends of the said rods being bent upwardly and around the edge of the trough as shown in Figure 5. The rods 8 function to retain the trough in shape by supporting the walls against lateral pressure and to lend it a certain amount of stiffness. The rods 8 and eyelets 5 are alternately arranged as shown in Figure 2, though it is obvious that other arrangements of the rods and eyes may be resorted to if found desirable. To prevent buckling of the trough, a bead or corrugation 13, (Figure 5) may be provided on the outer layer 12 along its longitudinal center. If desirable, a plurality of such corrugations may be formed or all the layers may be corrugated.

Figures 6, 7, and 8 show various modifications of the manner in which the rods 8 may be secured to the edges of the trough. In Figure 6, the rod 8 is bent vertically downward as at 16, then bent horizontally as at 17, then vertically upward as at 18 and around the edge of the trough as at 18′. In Figure 7, the rod 8 as in Figure 6, is in alignment with the edges of the trough and is bent vertically upward as at 21. In Figure 8, the rod 8, as in Figure 5, is in alignment with the apertures 5′ that receive the eyelets 5 and is bent vertically upward as at 22 and around the edge of the trough and vertically downward as at 23. In Figure 5 the end of the rod 8 abuts the upper side of the rod as at 23′, whereas in Figure 8, the end of the rod 8 extends below

the horizontal portion of said rod. It will be noted that the bent over end portions of the rods 8, Figures 5, 6, 7, and 8, rigidly secure said rods to the trough without any additional fastening means, will prevent any movement of the rod and as is readily apparent, are easily attached in place. Figures 6, 7, and 8 show the rods passing through the apertures 5′, the eyelets 5 being dispensed with. It is preferred however, that the washers 4 be retained.

Figures 9 and 10 show another modification for securing the rod 8′ to the trough with an attaching means for the trough additionally secured thereto. The rod 8′ is threaded at its ends 25. U-shaped strips 26 of non-corrosive metal having an eye 27 formed at its closed end parallel with the longitudinal edge of the trough, and having apertures 5″ formed opposite each other, are placed over the edge of the trough so that the apertures 5′ and 5″ register with each other. The threaded ends 25 are inserted into the apertures 5′ and 5″, the nuts 24 tightly clamping the strip 27 to the edge of the trough. A transverse aperture 28 is formed in the eye 27, serving with the eye 27 as a means for attaching the trough in place.

Figure 11 shows a modification for forming the longitudinal ends of the walls of the trough. The outer layer 12′ is made considerably wider than the inner layer 12, shown in Figure 5. The portion 15 is folded over into contacting engagement with the portion 14, forming a rounded edge 15′; both portions 14 and 15 being in turn folded over so that the portion 15 contacts the upper end of the outer layer 12, the contacting surfaces of the layers and portions being cemented together. The eye 5 is provided as described above, minus the washers 4, though it is to be understood that the washers 4 may be employed in the manner shown in Figure 5, if so desired.

Figures 13, 14 and 15 illustrate the manner of constructing the discharge nipple and the method of attaching it to the trough. The nipple 2 of tar-paper, is made cylindrical in form, being retained in shape by the strip 30, placed over the abutting edges 31, and cemented to the inner surface of said nipple. Clips 33 serve to additionally secure the strip 30 to the nipple 2. The upper portion of the nipple is formed into flaps 29 by cutting away the portions 32. The bottom of the trough has formed therein registering circular openings 2′, in each of the layers 12. Before the layers 12 are cemented to each other the nipple 2 is inserted through the opening 2′ in the lowermost layer 12 and the flaps 29 bent at an angle to the vertical center of the nipple 2, so as to contact the inner surface of the layer 12. The upper or inner layer is then placed over the flaps 29 so that the opening 2′ registers with the opening of the nipple 2. The layers 12 and the flaps 29 are cemented together and are additionally secured to each other through the medium of clips 34, Figure 2. While the nipple is usually placed adjacent one end of the trough, it is obvious that it may be placed any where along the length of said trough if deemed desirable.

Figures 16 and 17 illustrate two methods of attaching the trough to the eaves of a building. In Figure 16, the trough is hung in place by means of the wires 35. One end of each of the wires 35 are looped as at 38 and secured to the roof 39 by means of the nail 37. The other ends of the wires 35 are passed through the eyelets 5 and twisted over themselves as clearly shown at 36. It is apparent that in the type of hanger 26 shown in Figures 9 and 10, the ends of the wire could be passed through the eye 27, thus securing the conduit in place. In Figure 17, the side of the trough adjacent the wall or cornice 41 is secured thereto by a nail 40 inserted through the eyelet 5. The outer side of the trough is secured to the roof 39′ by a wire 35′, one end being looped as at 38′ and secured to the roof by the nail 37′, the other end being passed through the eyelet 5 and twisted over itself as at 36′. The above method of hanging the trough illustrates the ease of attaching the same without the aid of special tools.

Figures 18, 19 and 20 illustrate the method of constructing a downspout of tar paper, waterproofed or rubberized fabric or rubber. Two rectangular sections or layers of tar paper, 42 and 43, Figure 20, are arranged in overlapping engagement, the short and long side of one section overlapping the short and long side of the other. The sections 42 and 43 are cemented to each other and additionally secured to each other through the medium of clips 44. The layers are then turned up in the direction of the arrow to form the cylinder 45, Figure 18, the long sides 46 of the section 43, abutting each other, and the long sides 47 of the section 42, abutting each other (see Figures 18 and 19). The overlapping portions of the sections 42 and 43 are thus placed into contacting engagement with each other as at 48, (Figure 19) and are also cemented to each other. Clips 49 serve to additionally secure the sections to each other and to retain the cylinder in shape. Figure 18 shows a tubular unit comprising a downspout. It is obvious that to form a downspout of any considerable length a series of units as illustrated in Figure 18 would be necessary. One unit is attached to the other by inserting the projecting portion 50 of one unit into the recessed portion 51 of the succeeding unit. The downspout as thus formed presents a smooth exterior surface throughout its entire length, is very strong and easy to assemble.

The various layers of tar paper comprising

the trough and downspout may be intimately joined together throughout their entire contacting surfaces by heating the layers of tar paper to a predetermined temperature, thereby causing the substance or material with which the paper is impregnated or coated to become plastic. At the same time the layers are subjected to a uniform pressure through their entire length whereby the contacting surfaces of said layers are caused to adhere to each other through the medium of the above mentioned substance or material. The layers may also be secured together without the action of heat by merely cementing them together, the cement employed being any of the well known brands of tar or roofing cements known to the art. The layers incorporated in the trough, downspout, backs and nipple are cemented together under pressure so as to insure uniform adhesion. The layers are cemented together to increase the rigidity of the structure and to insure its waterproofness. In case it is desired to construct the conduits of rubberized fabric or rubber, the layers could be vulcanized together, in the manner well known in the art. The trough or downspout when constructed as described may be coated on its exterior and interior surfaces by a roofing paint or compound designed for use on tar or roofing paper to afford additional protection and increase the serviceability of the material from which it is constructed.

While the preferred embodiments of the invention have been shown and described in detail, it will be understood that we do not wish to be limited to the precise constructions set forth, since various changes in the form, proportion and arrangement of parts, and in the details of construction may be resorted to within the spirit and scope of the invention.

While the invention has been disclosed as applied to a drainage for drawing water off from a roof it is evident that the invention has application to any type of drainage system or for containers of water and liquids such as barrels.

Having thus described the invention what is claimed is:—

1. A conduit comprising layers of non-metallic material, backs of like non-metallic material formed with flaps secured to the open ends of said conduit, the flaps being inserted between the layers at the transverse ends thereof, said layers and flaps being intimately and securely joined together.

2. A trough shaped conduit comprising layers of non-metallic material, backs of like non-metallic material inserted between the transverse ends of said layers and abutting the same, and a nipple positively secured to said conduit.

3. A conduit comprising layers of non-metallic material having coincident openings formed therein, a discharge nipple attached to said layers and registering with said openings, the attached portion of the nipple being positioned below the topmost layer of the conduit, said nipple being formed of like non-metallic material having bent over portions at one end thereof forming flaps, said flaps being inserted between said layers at the periphery of said openings and securely attached thereto.

4. A conduit comprising layers of non-metallic material, backs at each end thereof having flaps formed along their lower edges, and a contacting bent-over portion; said flaps bent at an angle to the plane of said backs and in abutting relation with the peripheries of said bent over portions and inserted between the layers at the transverse ends thereof, the transverse edges of the inner layer abutting said bent over portions and the transverse edges of the outer layer in alignment with the outer surface of said backs, said layers and flaps being joined together and clips additionally securing said bent over portions to said backs and said flaps to said layers.

5. A conduit as claimed in claim 2, the inner walls of said conduit being free of projecting or raised surfaces, thereby offering a smooth and uninterrupted flow for the liquid therein.

6. A conduit comprising a plurality of layers of non-metallic material, the longitudinal edges of the inner layer being folded over the longitudinal edges of the outer layer, backs of like non-metallic material formed with flaps secured to the open ends of said conduit, said flaps being inserted between the layers at the transverse ends thereof, a nipple of like non-metallic material secured to said conduit, a plurality of cylindrical metallic fastening members spaced along the longitudinal edges of the conduit, said members being formed with a plurality of projections at each end thereof adapted to be bent back and securely clamp therebetween the plurality of layers and the folded over longitudinal edges of the inner layer, a plurality of stay members, the ends thereof passing through certain of said cylindrical fastening members and being bent upwardly and over the longitudinal edges of said conduit to securely fasten the same to said conduit.

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