May 19, 1931. R. D. SIMPSON 1,805,852

LIQUID DISTRIBUTOR

Filed March 21, 1929

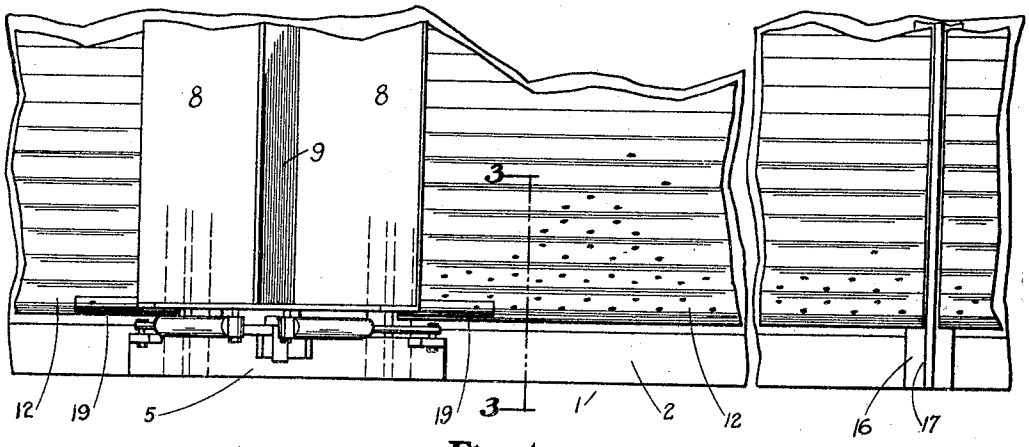


Fig. 1

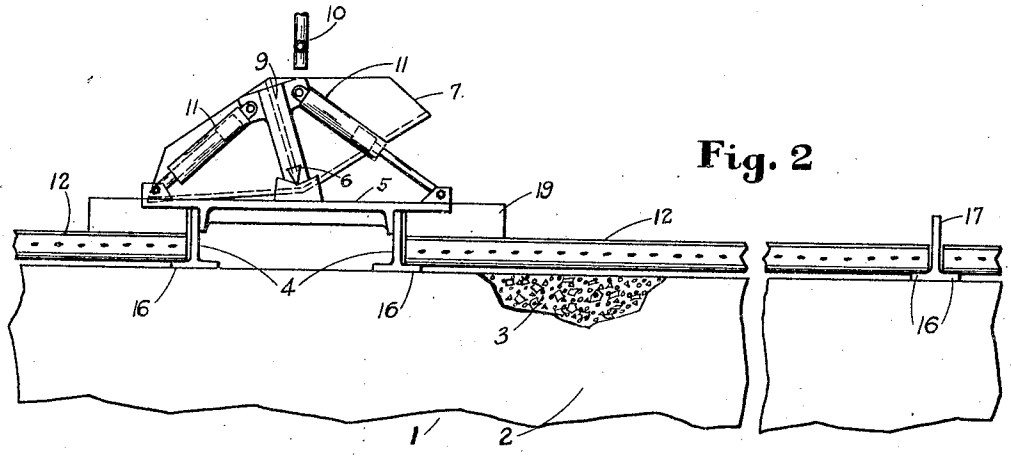
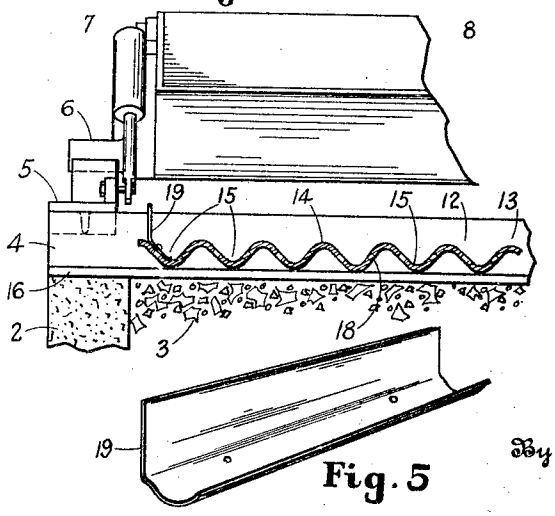


Fig. 2

Fig. 3



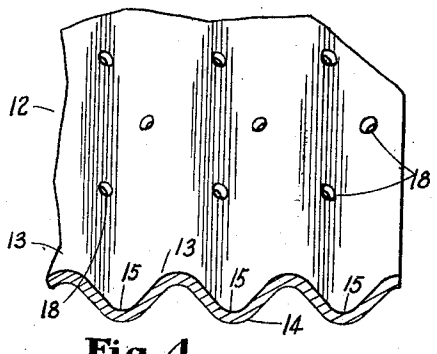


Fig. 4

Fig. 5

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Patented May 19, 1931 1,805,852

UNITED STATES PATENT OFFICE

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LIQUID DISTRIBUTOR

Application filed March 21, 1929. Serial No. 348,961.

This invention relates to an improved liquid distributor used in conjunction with an oscillatory tipping trough for trickling filters, and is especially adapted to the treatment of sewage from school houses, institutions, villages and sewage and wastes from industrial establishments. The primary object of the present invention lies in the provision of an efficient, simple and durable liquid distributor in the form of corrugated boards or sheets provided with a plurality of perforations, through which the liquid discharged from the tipping trough will trickle down to a filtering bed composed of crushed limestone, lathe, or other suitable material.

Heretofore it has been customary to construct liquid distributors of spaced boards nailed in place side by side between which the liquid found its outlet. Although these boards serve the purpose fairly well, there is an objection to this type of distributor, however, for the reason that the boards warp, rot and are affected by atmospheric conditions, moisture, acids, etc. To overcome these objections use is made of a distributor composed of asbestos fibers and cement formed by hydraulic pressure into corrugated sheets of suitable size and length convenient for handling. These sheets are rigid and non-warping, resisting rot, rust, heat and never require painting or similar maintenance. The corrugations are perforated and the latter are so arranged as to give the most uniform distribution of liquid over the entire filter.

With these and other objects in view which will appear as the description proceeds, the invention consists in the novel features of construction, combination of elements and arrangement of parts hereinafter to be more fully described and pointed out in the appended claims.

In the accompanying drawings:

Figure 1 is a plan view of one end of the distributor showing the same in its operative position over a filtering bed,

Figure 2 is a side elevation thereof,

Figure 3 is a transverse vertical sectional view taken on the line 3—3 of Figure 1,

Figure 4 is an enlarged detail perspective view of a portion of the distributor,

Figure 5 is a perspective view showing one of the anti-splash plates used in connection with the distributor.

Referring more particularly to the drawings, the numeral 1 designates the filtering bed in its entirety, the numeral 2 the side walls thereof, and 3 the filtering material which in this instance has been illustrated as crushed stone. This body of stone or filtering material is of a considerable depth and is equipped with a drain (not shown) which leads to any suitable place of disposal. Bridging the side walls 2 and carried thereby is a pair of spaced angle or inverted T bars 4 which are held spaced by bearing blocks 5 carried by the ends of the bars 4. Supported for tilting movement on the bearing blocks 5 by means of knife edge trunnions 6 is a tipping trough 7 which is divided longitudinally into a plurality of liquid receiving compartments 8 by means of a centrally disposed wall member 9. Stationarily arranged over the trough structure is a liquid supply pipe 10 which leads from any suitable source of liquid supply and has its discharge located exactly over the longitudinal axes of turning movement of the trough, so that when the latter is operatively positioned, as shown in Figure 2, liquid will be discharged into one of the compartments 8 until the latter is filled with liquid to a desired extent and until the weight thereof is greater than the weight of the other side of the trough. This causes the trough to oscillate about the axis of its trunnions 6 swinging the trough bodily to its other extreme position to discharge the liquid from the filtering compartment and at the same time to present the empty compartment to the supply pipe 10. The trough structure may also be provided with check devices 11 in the form of air cylinders and plungers which will cushion the rocking or tilting action of the trough structure enabling the latter to operate at a controlled uniform rate of speed and preventing undue spilling of the liquid from the trough.

The present invention refers more particularly, however, to the specific construction of

the liquid distributor 12 and associated apparatus. This distributor, as heretofore mentioned, comprises corrugated sheets 13 of cementitious or other similar material suitable for this purpose, which is not affected by atmospheric changes and which will maintain the sheets in their formed shape under all conditions. The corrugations 14 of these sheets are comparatively shallow and form a plurality of channels 15 which extend at right angles to the longitudinal axes of the tipping trough 7. Due to the corrugations 14 the sheets 13 are strengthened and the ends thereof can rest upon the flanges 16 of the bars 4 and 17 respectively without sagging under the weight of the liquid. Also due to the weight of the material used in forming the sheets the latter will stay in place side by side without the need of fastening means. The side walls forming the channels 15 of the sheets 13 are perforated as at 18 in a staggered manner throughout the lengths thereof and are located at a distance spaced from the bottom of the channels so that the body of liquid may flow from one end to the other of the distributor and trickle down through the perforations to effect the uniform distribution of the liquid over the entire filtering bed. It has been found that by this location of the perforations the same are not apt to clog or stop up by matter introduced with the waste but are kept open and clean as the liquid left in the trough between each discharge remains in the bottom of the channels below the openings or perforations thereof.

To obtain the best results of the liquid distribution the corrugated sheets should be supported in a horizontal plane over the filtering bed. To prevent undue spreading of the liquid at the point of discharge from the filtering trough use is made of shields or anti-splash plates 19 made of non-corrosive material, which together with the vertical leg of the T bar 4 serves to confine the liquid therebetween and allow the same to spread evenly over the corrugated sheets.

From the foregoing it will be seen that I have provided a distributor of substantial and practical design, one which is easy to install and requires but a minimum of attention to be kept in serviceable operation. Further, due to the material from which the distributor is made and due to its corrugated construction long life thereof is secured.

What is claimed is:

1. A liquid distributor of the class described, comprising a corrugated sheet composed of asbestos fibers and cement compressed into a rigid body, said sheet having the walls forming said corrugations formed with perforations.

2. A liquid distributor for a filtering bed comprising a plurality of substantially horizontally positioned parallel V shaped troughs, said troughs having their side walls formed with perforations through which the liquid will percolate to the filtering bed arranged below said troughs, and a pair of flanged members arranged transversely of said troughs and forming the ends thereof serving also to support said troughs above said filtering bed.

In testimony whereof I affix my signature.

ROBERT D. SIMPSON.