

May 31, 1932.

A. GUSTIN

1,860,836

DIFFUSER

Filed Oct. 1, 1929

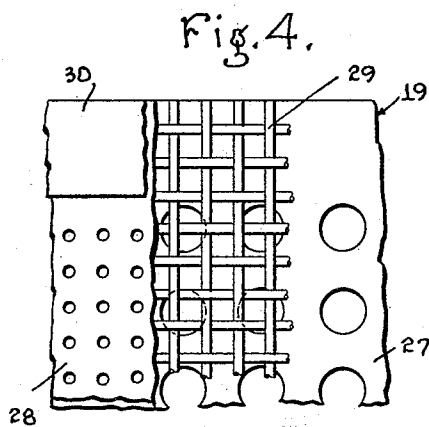
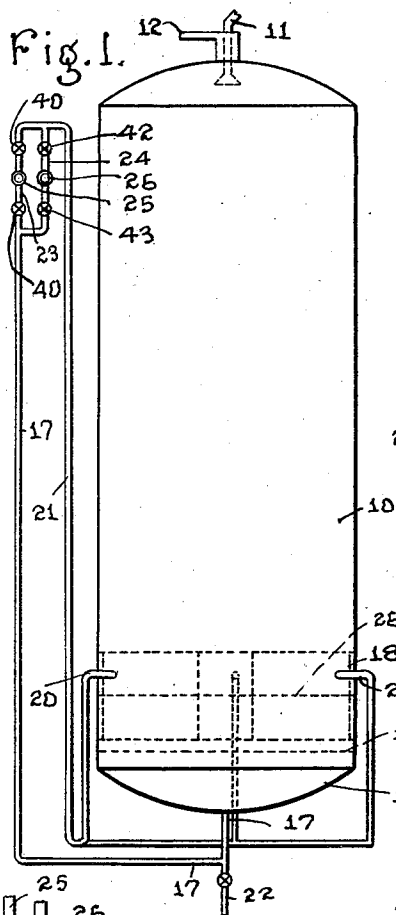
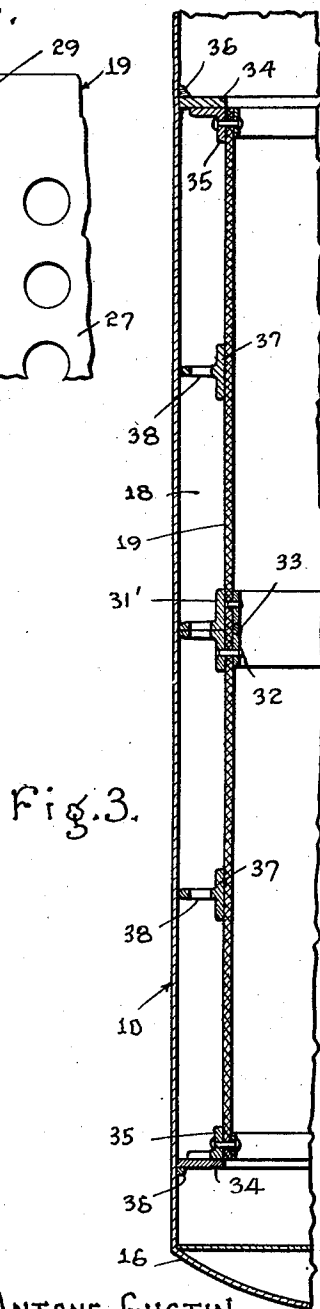
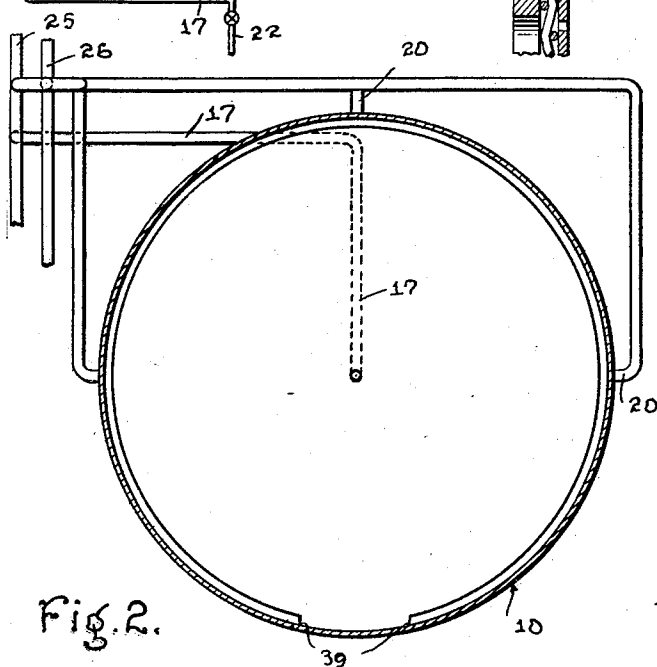
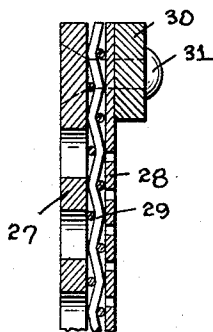


Fig. 5.



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DIFFUSER

Application filed October 1, 1929. Serial No. 396,570.

The present invention relates broadly to diffusers and is more specifically directed to the type of diffuser used in the paper industry for draining the digesting liquor from the wood pulp after the same has been treated in the digesters; the same diffuser being also used for washing the wood pulp so as to free the same of any substantial quantities of the digesting liquor.

Diffusers of the type described above generally comprise closed tanks of large dimensions some of them being 30 ft. in height and 12 ft. in diameter. The wood pulp together with the liquor is fed or washed into the diffusers from the digester and the digesting liquor is drained and the wood pulp is washed by water under pressure. Such diffusers are generally provided with a perforated plate disposed over and spaced from the bottom of the diffuser and the liquor as well as the wash liquor is drained through an outlet at the bottom of the diffuser.

One of the objects of the present invention is to provide a diffuser of novel construction which will minimize the time consumed in the draining of the digesting liquor and in the washing of the wood pulp in the diffuser.

Other objects will be apparent to the persons skilled in the art from the drawings and the specification submitted herewith.

In order to accomplish this purpose, the diffuser shown and described herein comprises a lateral drainage zone in addition to the bottom drainage zone with which such diffusers are usually provided. The lateral drainage zone is preferably disposed near the bottom of the tank or diffuser and preferably extends vertically along the lateral wall of the diffuser for a fraction of the height of the tank. By these means drainage takes place at the bottom of the tank and also at several points in the lateral wall of the tank with the result that the washing of the wood pulp is accomplished much more rapidly than by the use of diffusers known hitherto. The disposition of the lateral drainage zone in the lower portion of the tank permits the wash liquor to pass through substantially the entire column of wood pulp before the same is drained.

The lateral drainage zone is formed by mounting a lateral filter plate against the lower portion of the lateral wall of the tank, the filter plate being so constructed that it can withstand the pressures existing within the diffuser; the filter plate being spaced from the lateral wall so as to provide a substantially annular drainage chamber.

The following is a description of one embodiment of the present invention. It will be understood that modifications and changes may be made without departing from the spirit of the invention and without exceeding the scope of the claims.

In the drawings:

Figure 1 is a lateral view of the diffuser embodying the present invention.

Figure 2 is a plan view of the diffuser showing the piping arrangement.

Figure 3 is a longitudinal sectional view showing the construction and arrangement of the lateral filter plate within the diffuser.

Figure 4 is a partly broken detailed view of the filter plate.

Figure 5 is a sectional view of the filter plate construction.

Referring to the drawings, the diffuser 10, which is generally in the form of a vertically disposed tank frequently having the dimensions of 30 ft. in height and 12 ft. in diameter, is provided at its top with a valve inlet 11 for the mixture of wood pulp and digesting liquor and a valve inlet 12 for water or any other wash liquor.

After the digestion of the wood pulp is completed in the digester, the contents of the digester, which consists of wood pulp and liquor, is permitted to flow into the tank 10 through the inlet 11, the inlet 12 being used for the introduction of water or any other washing liquor, such as the weak liquor referred to in a later portion of this specification. The wash liquor may be introduced into the diffuser under pressure.

A perforated plate 15 is disposed over the bottom of the tank forming the bottom drainage zone 16, which is provided with an outlet 17. The lateral drainage zone 18 is preferably disposed near the bottom of the diffuser 10 and is formed by mounting plate

19 on the lateral wall in such a manner as to form a closed drainage zone which is provided with a plurality of lateral outlets 20. The outlets 20 are all connected together and lead to the drainage conduit 21. The outlet 17 of the bottom drainage zone is provided with the valved lead pipe 22 for discharging the liquor into the sewer system when desired. The conduit 17 which runs parallel to the conduit 21 and upwardly to approximately the level of the top of the tank is provided at its upper end with two parallel branches 23 and 24 connected to the upper end of conduit 21. The pipe 25 connected to the middle of the branch 23 leads to the strong liquor header (not shown), while the pipe 26 connects to the weak liquor header (not shown). Valves 40 and 41 are disposed in branch 23 as shown and valves 42, 43 are disposed in branch 24 as shown. It will be seen that by means of the piping arrangement shown and described herein, the drainage from the two zones may be made to flow in any manner desired. The liquor from these zones may either be made to flow concurrently into the sewer system by opening all valves in the system which will cause the flow of all of the liquor through the conduit 22, or, the drainage from the two zones may be made to flow concurrently either into the conduit 25 leading to the strong liquor header or to the conduit 26 leading to the weak liquor header; and if desired the liquor from the two zones may be made to flow separately, one into the strong liquor header and the other into the weak liquor header.

It will be understood that the liquor drained at the beginning of the washing operation is strong both in zones 16 and 18. At the beginning of the washing operation therefore the valves 42 and 43 may be closed and the valves 40 and 41 opened, at the same time maintaining the valve in outlet 22 closed. This will cause the liquor from both zones to flow into the strong liquor header. After the washing operation has proceeded for a substantial length of time the drainage liquor from zone 18 will become weak while the drainage liquor from zone 16 remains strong. Under these conditions if desired the liquor from zone 16 may be made to flow to the strong liquor header while the drainage from the zone 18 may be made to flow to the weak liquor header. This is accomplished by closing valve 40 and opening valve 42. After the washing has proceeded a little further the liquor in both zones will be weak, and if desired the liquor from both zones may be then made to flow to the weak liquor header by closing valve 41 and maintaining valve 40 closed and by opening valve 43 and maintaining valve 42 open. After the washing has progressed to the extent that the drainage liquor is so weak that it is not desirable to store the same in either the weak or strong

liquor headers, it may be caused to flow out through the outlet 22.

The drainage zone 18, which if desired, may be made to constitute an annular chamber around the entire internal circumference of the tank, is preferably so constructed that it does not quite extend entirely around the tank. The zone constitutes a closed chamber separated from the interior of the tank by the perforated plate 19 and is non-communicative with relation to the bottom drainage zone 16.

The plate 19 is preferably composed of a plurality of sections both vertically and horizontally, the horizontal sections being indicated by the dotted line 26 in Figure 1. Each section consists of two flat perforated plates 27 and 28, the perforations in plate 27 being relatively larger than the perforations in the plate 28. Plate 28 may be termed a facing plate in that it faces interiorly of the tank while the plate 27 is a backing plate. A reticulated plate 29 is interposed between the plates 27 and 28. The edges of the plates are held together by means of the binder straps 30 and rivets 31. The horizontal as well as the vertical edges of the adjacent sections are joined by means of the L-shaped angle irons 31', which are in turn riveted by means of the rivets 32 which pass through the binder straps 30 and the angle irons 31. The adjacent edges of the binder straps 30 are welded as shown at 33. The L-shaped angle irons 31' are preferably provided with vertical openings to provide vertical passages for the liquor that is being drained.

The drainage zone 18 is closed at the upper and lower edges of the plate 19 by means of the bars 34 to which the L-shaped angle irons 35 are bolted. The inner edges of the plates 34 are preferably welded against the wall of the tank as shown at 36. In order to give the sections of the plate 19 additional rigidity T-shaped angle irons 37 are disposed between the plate 19 and the wall of the tank, these angle irons also being provided with vertical passages 38.

The vertical ends 39 are closed in the same manner as the horizontal upper and lower edges of the zone 18.

While I have illustrated and described one preferred form of my invention it is understood that the invention may be embodied in other structures. I do not, therefore, desire to limit myself to the specific construction shown.

I claim:

1. A diffuser for draining the digesting liquor from wood pulp and for washing the wood pulp, comprising a closed tank having a lateral drainage zone and a bottom drainage zone, said zones being non-communicative interiorly of the tank, a pair of discharge conduits, and means for draining said zones

concurrently through the same conduit or through separate conduits as desired.

2. A wood pulp diffuser, comprising a closed tank, having a foraminous plate disposed over and spaced from the bottom of said tank and forming a bottom drainage zone, an outlet from said bottom drainage zone, a lateral foraminous plate spaced from the lateral wall of said tank and forming a lateral drainage zone, an outlet from said lateral drainage zone, a pair of discharge conduits, and means for causing the drainage zones to discharge simultaneously to either conduit or to separate conduits.

3. A wood pulp diffuser, comprising a closed tank, having a foraminous plate disposed over and spaced from the bottom of said tank and forming a bottom drainage zone, an outlet from said bottom drainage zone, a lateral foraminous plate spaced from the lateral wall of said tank and forming a lateral drainage zone, an outlet from said lateral drainage zone, a pair of discharge conduits, and means whereby said zones may be drained concurrently through the same conduit or through separate conduits, or individually through either conduit.

4. A wood pulp diffuser comprising a closed tank, and a filter plate carried by the lateral wall of said tank, said plate comprising a reticulated body, a perforated facing plate and another perforated backing plate.

5. A wood pulp diffuser comprising a closed tank, and a filter plate carried by the lateral wall of said tank, said plate comprising a reticulated body, a facing plate having relatively small perforations, and a backing plate having relatively large perforations.

In testimony whereof I have affixed my signature to this specification.

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