G. E. SHATTO.

PERCOLATOR.

APPLICATION FILED MAR. 27, 1916.

1,248,560.

Patented Dec. 4, 1917.

2 SHEETS—SHEET 1.

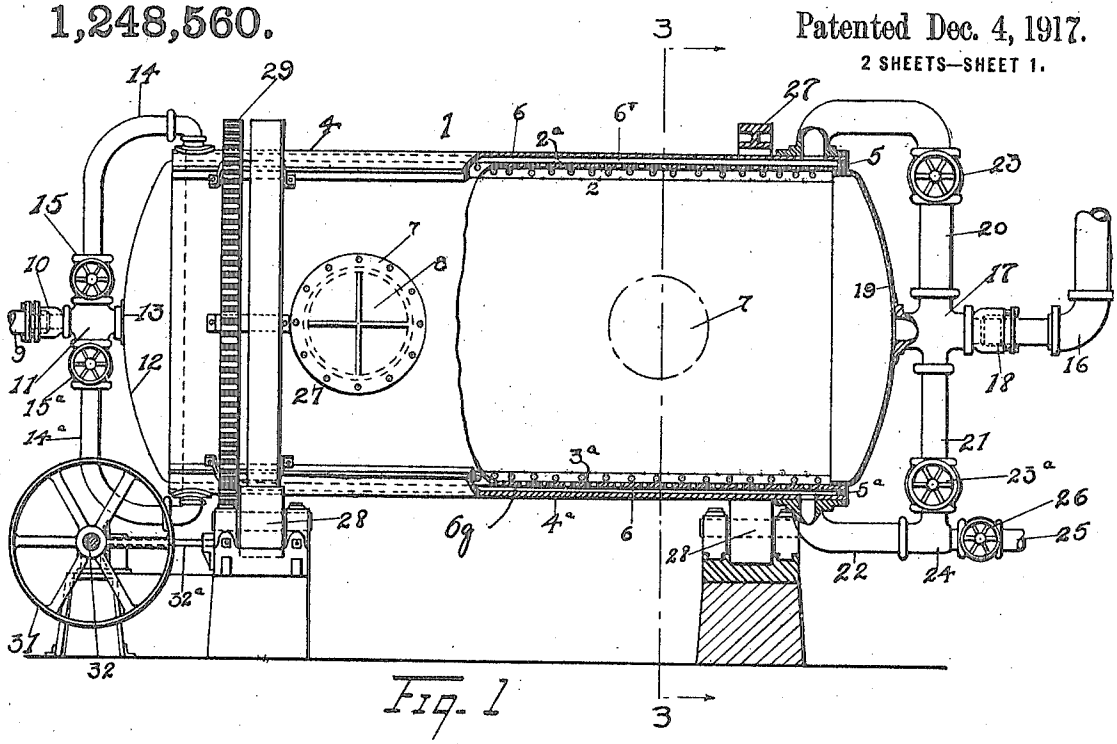


Fig. 1

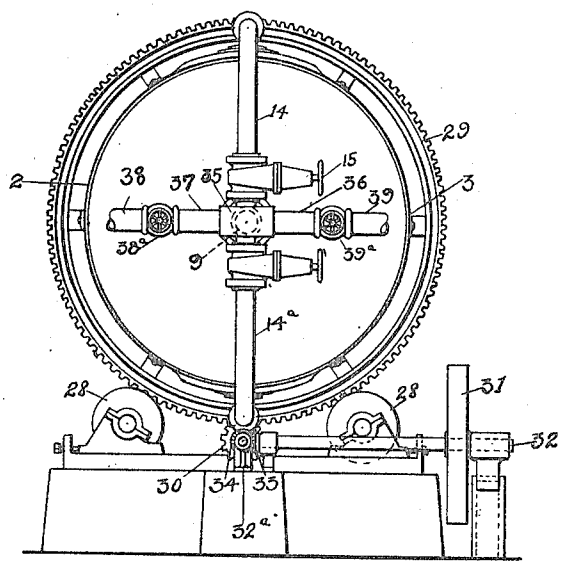


Fig. 2

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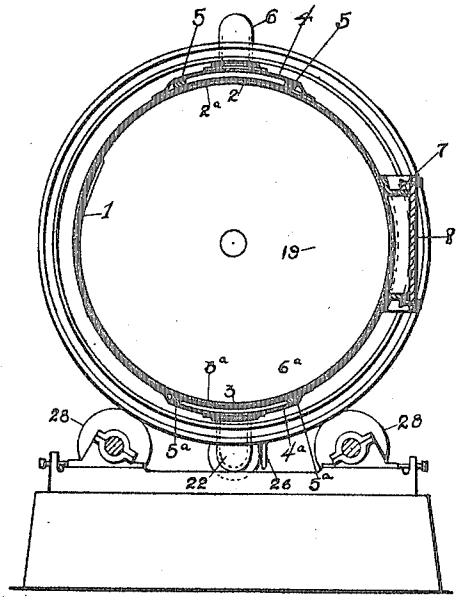


Fig. 3

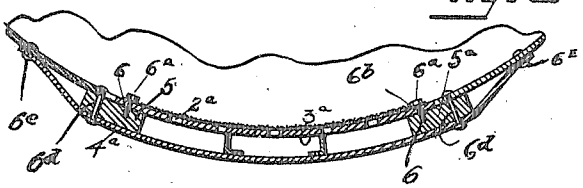


Fig. 5

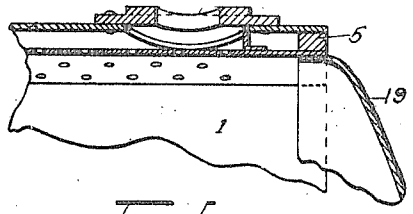


Fig. 6

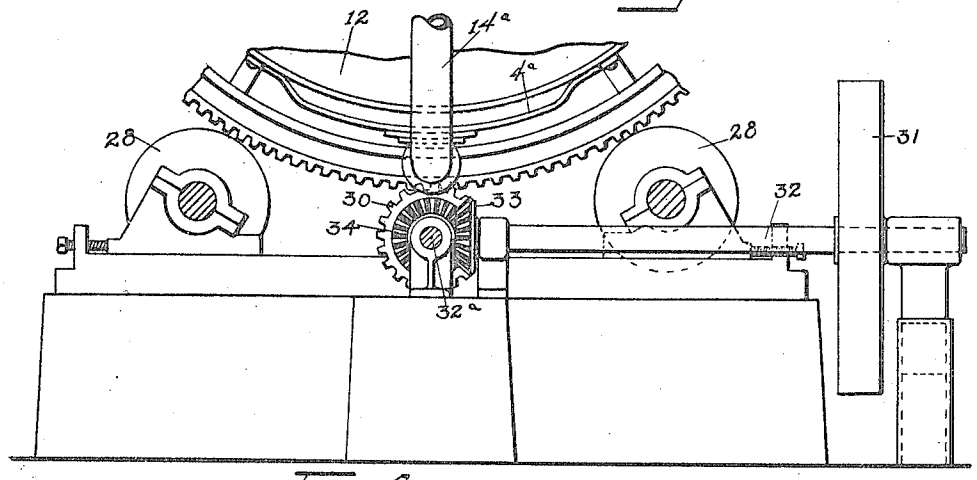


Fig. 4

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UNITED STATES PATENT OFFICE.

GEORGE E. SHATTO, OF CLEVELAND, OHIO, ASSIGNOR TO THE KILBY MANUFACTURING COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

PERCOLATOR.

1,248,560. Specification of Letters Patent. Patented Dec. 4, 1917.

Application filed March 27, 1916. Serial No. 87,031.

To all whom it may concern:

Be it known that I, GEORGE E. SHATTO, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Percolators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to apparatus known to the trade as "percolators" which are used for the purpose of extracting soluble fats from tankage or other analogous materials such as are treated at garbage reduction plants and rendering establishments. So far as the general process is concerned, these percolators operate according to the same principle, the tankage therewithin being subjected to the action of a solvent for grease, such as naphtha, and the solvent remaining in the tankage after such grease extraction being recovered by admitting steam to the percolator for the purpose of quickly vaporizing such residual solvent, the solvent being afterward recovered in the liquid state from the condensed steam. It is the object of the present invention to provide a percolator which, while operating upon the old and common principle referred to hereinbefore, is more efficient in operation than any of the others with which I am familiar and one wherein this efficiency is secured in and through a machine which is simpler in construction and more economical of production than such others.

In the drawings forming part hereof, Figure 1 represents a combined side elevation of and longitudinal sectional view through a percolator constructed in accordance with my invention; Fig. 2 is an end elevation of the same taken at the left hand end of Fig. 1; Fig. 3 a transverse sectional view corresponding to the line 3—3 of Fig. 1 and looking in the direction of the arrows; Fig. 4 an enlarged detail view of the end of the machine shown in Fig. 2; and Figs. 5 and 6 are respectively transverse and longitudinal sectional details through one of the distributing chambers.

Describing by reference characters the various parts illustrated herein, 1 denotes a cylindrical drum which is disposed in a substantially horizontal direction. Diametrically opposed segments 2 and 3 of this drum are longitudinally slotted and these slots are covered by perforated plates 2^a and 3^a which extend each substantially the full length of the drum. These segments form each the inner wall of a fluid distributing chamber.

Each distributing chamber is formed by and between this inner perforated wall and an outer wall spaced therefrom. Each edge of each of the segmental slots is bounded by a metal bar 5, 5^a, these bars being fastened to the cylindrical wall in such manner that their inner edges overhang the slot adjacent thereto and constitute a wall or frame surrounding the slot. The edges of the perforated plates 2^a and 3^a are secured to the bars 5 and 5^a, preferably by means of bolts 6 which have heads 6^a and have their threaded ends projecting through the edge portions of the perforated plates and entering coöperating threaded openings in the bars. Metal bands 6^b and a screen of filtering material 6^c—such as burlap—are interposed between the heads 6^a and the inner surfaces of the plates 2^a the bands serving to retain the screen in position. It will be seen that the bars 5 and 5^a form a sort of ledge which surrounds the slots 2 and 3, and this upstanding ledge forms a means for supporting the outer plates 4 and 4^a, these outer plates being preferably riveted to the edges of the shell which inclose the slots as well as the bars, as indicated at 6^d. The lateral edges of the plates 4 and 4^a are bent into engagement with the shell and riveted thereto as indicated at 6^e. By this construction, distributing chambers are formed between the inner perforated plates 2^a and 3^a, the bars 5 and 5^a and the cover plates 4 and 4^a.

Intermediate of the distributing chambers and preferably about 90° from the central portions thereof, the drum is provided with a series of manholes 7 each having a removable cover 8.

9 denotes a supply pipe for the solvent, the delivery end of said pipe being substantially coaxial with the cylinder and having a rotary-joint stuffing-box connection at 10 with one of the axially arranged branches of a T 11. This T may and preferably will be connected rigidly to the central portion

of the adjacent head 12 of the drum, as indicated at 13, whereby it is firmly secured in place. From the opposed branches of the T the pipes 14 and 14ª extend to and are connected with the adjacent ends of the plates 4 and 4ª respectively, the delivery ends of the pipes 14 and 14ª discharging into the chambers 6 and 6ª respectively. The pipes 14 and 14ª are provided each with a valve 15, 15ª respectively whereby the supply of solvent to the chambers 6ᶠ and 6ᵍ may be cut off, established, and controlled. The opposite end of the drum is provided with a vapor outlet pipe 16 which is connected to one branch of the T 17 by means of a rotary-joint stuffing-box connection 18. The T 17 is preferably rigidly connected to and supported by the adjacent head 19 of the drum and, from its opposite branches, the pipes 20 and 21 extend, said pipes being provided with valves 23 and 23ª respectively. The pipe 20 communicates with the adjacent end of the chamber 6ᶠ, being connected to the plate 4, while the pipe 21 communicates with the adjacent end of the chamber 6ᵍ through a pipe 22, the latter pipe being connected to the wall 4ª. The pipe 22 is connected by an elbow 24 with the pipe 21 and with an outlet pipe 25 having a valve 26, for a purpose to be described hereinafter.

The drum is provided at each end with a bearing ring 27 whereby the drum may be rotarily supported upon rollers 28, the drum being provided at one end with a circular rack 29 and a pinion 30 for driving said rack, the pinion 30 being operated through the ordinary pulley 31 and shafting 32, 32ª and bevel gears 33, 34.

By reference to Fig. 2 it will be seen that, at a short distance from the rotary coupling 10, the pipe 9 is provided with a T, the pipe communicating with the axial arranged branch 35 thereof, while the lateral branches 36 and 37 of this T communicate respectively with pipes 38 and 39 having valves 38ª and 39ª therein respectively. The purpose of this construction is to enable naphtha to be supplied to the T (as through the pipe 38) and thence to either or both of the pipes 14 and 14ª for the purpose of extracting the grease and subsequently to supply steam to the T (as through the other pipe 39) and thence through either of the pipes 14 or 14ª for the purpose of volatilizing any naphtha or other solvent that may remain in a liquid state within the material in the drum. The pipes 14 and 14ª thus serve in turn to conduct either the solvent or the vaporizing fluid to either or both of the distributing chambers.

In the operation of my apparatus, the drum will be rotated so as to bring the manholes substantially vertical and the drum will then be filled as full as possible with tankage. The covers will be applied to the manholes and the drum will then preferably be rotated a quarter revolution so that the chambers 6 and 6ª will be respectively at the top and the bottom of the drum with the pipe 22 leading from the bottom. Naphtha, gasolene, or other solvent liquid will be turned on to the tank and will be distributed throughout the chamber 6 into the interior of the drum, completely filling the same. After the naphtha has remained a sufficient length of time for the grease extraction, it may be withdrawn through the pipes 22 and 25 by opening the valve 26. The grease-laden solvent will be pumped through the pipe 25 to the treating tank where the grease will be recovered in the usual manner. This operation may be repeated as often as desirable or necessary.

Sometimes it may be desirable to introduce the solvent through both of the chambers 6 and 6ª or through the lower chamber; the arrangement of the valve-controlled pipes 14, 14ª permits this operation. After having extracted the grease, steam will be turned onto the tank for the purpose of volatilizing any solvent that may remain in the material therewithin and the steam, laden with the vapors of the solvent, will be conducted to the condenser. This steam will be introduced to the tank through either or both of the connections 14, 14ª—generally through one only of these connections—and will be allowed to circulate through the tank or drum, escaping to the condenser (not shown) through either of the outlet pipes connected to the chambers 6, 6ª and the pipe 16—the valve 26 being closed. After the steam has passed through the tank for, say an hour, the tank is rotated for the purpose of loosening and mixing the material therewithin in order to expose it better to the further action of the steam. This turning operation may be conducted without cutting off the steam. Care must be taken that, whichever of the pipes 14 or 14ª may be employed in supplying steam to the drum, the diametrically opposed outlet 21 or 22 will be employed to conduct away the vapor-laden steam; otherwise the steam would pass directly through the chamber 6 or 6ª to the outlet, without passing through the tank and the material therewithin.

The apparatus disclosed herein is unique in that it combines greater efficiency with greater simplicity of construction and economy of production than any other type of percolator with which I am familiar.

Having thus described my invention, what I claim is:—

1. In a percolator, the combination of a horizontally disposed cylindrical drum, said drum having oppositely arranged segmental

distributing chambers extending substantially the length thereof, the inner wall of each chamber being perforated, an axially arranged supply pipe, a pair of branch pipes communicating with the chambers, there being a rotary connection between the supply pipe and the branch pipes, an axially arranged outlet pipe extending from the opposite end of the drum, a pipe leading from one of said chambers to such outlet pipe, a pipe leading from the other chamber to the outlet pipe, there being a rotary connection between the outlet pipe and the last two pipes, and a separate outlet pipe for one of the last two pipes.

2. In a percolator, the combination of a cylindrical drum having circumferentially spaced series of perforations extending longitudinally thereof, such perforated areas forming inner walls of distributing chambers, a plate secured to the drum outside of each series of perforations and forming the outer walls of said chambers, spacing means interposed between each of said plates and the inner wall coöperating therewith, and one or more pipes communicating with each of said chambers through said plates.

3. In a percolator, the combination of a horizontal cylindrical drum having a pair of circumferentially spaced distributing chambers extending substantially the length thereof, said chambers being formed by plates secured to the exterior of said cylindrical drum, each of said chambers having a perforated inner wall and the drum being provided with charging and discharging openings between said chambers, a supply pipe for solvent and for a vaporizing fluid communicating with each of said chambers adjacent to one end of the drum, an outlet pipe communicating with each chamber adjacent the other end of the drum, and means whereby said drum may be rotated about its horizontal axis.

4. In a percolator, the combination of a horizontal cylindrical drum having a pair of circumferentially spaced distributing chambers extending substantially the length thereof, each of said chambers having a perforated inner wall and the drum being provided with charging and discharging openings between said chambers, a supply pipe for solvent and for a vaporizing fluid communicating with each of said chambers adjacent to one end of the drum, an outlet pipe communicating with each of said chambers adjacent the opposite end of the drum, a common axially arranged outlet pipe for the last two pipes, a separate outlet pipe for one of said last two pipes, valves for said pipes, and means whereby said drum may be rotated about its axis.

5. In a percolator, the combination of a horizontally rotatable drum having a pair of circumferentially spaced longitudinally extending distributing chambers the inner walls whereof are perforated, an inlet pipe communicating with one end of each of said chambers adjacent one end of the drum, an outlet pipe communicating with the opposite end of each of said chambers adjacent the opposite end of the drum, connections whereby solvent may be supplied through either of the inlet pipes, connections whereby a vaporizing fluid may be supplied through either of said pipes, a common outlet pipe for the other two pipes, and a connection extending from one of the last mentioned pipes for conducting to a suitable place of treatment the solvent which has passed through the drum.

6. A percolator comprising a shell having a distributing chamber, said chamber comprising a slot in the wall of the shell, a perforated plate secured in said slot, bars secured to the shell and surrounding the slot, and an outer plate inclosing said bars and having edges projecting beyond the bars and secured to the shell.

7. A percolator comprising a shell having a slot in its wall, bars surrounding and overhanging the slot inwardly, a perforated plate secured to the overhanging edges of the bars, a screen covering said perforated plate, means securing said plate to said bars and adapted to compress the screen against the edges of the plate, an external cover plate secured to the bars and to the shell and forming with said bars and the inner plate a distributing chamber, and a fluid connection leading to said chamber.

8. A percolator comprising a shell having a segmental slot extending longitudinally thereof, a wall surrounding and overhanging the slot inwardly, a perforated segmental plate adapted to substantially close the slot and being secured to the parts of the wall overhanging the slot, a screen covering said plate, means securing the said plate and the screen to the wall, and an outer plate secured to the wall and to the shell and forming the outer wall of a chamber including the inner plate and the wall.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

GEORGE E. SHATTO.

Witnesses:
R. L. BRUCK,
G. M. FROMANT.