

(No Model.)

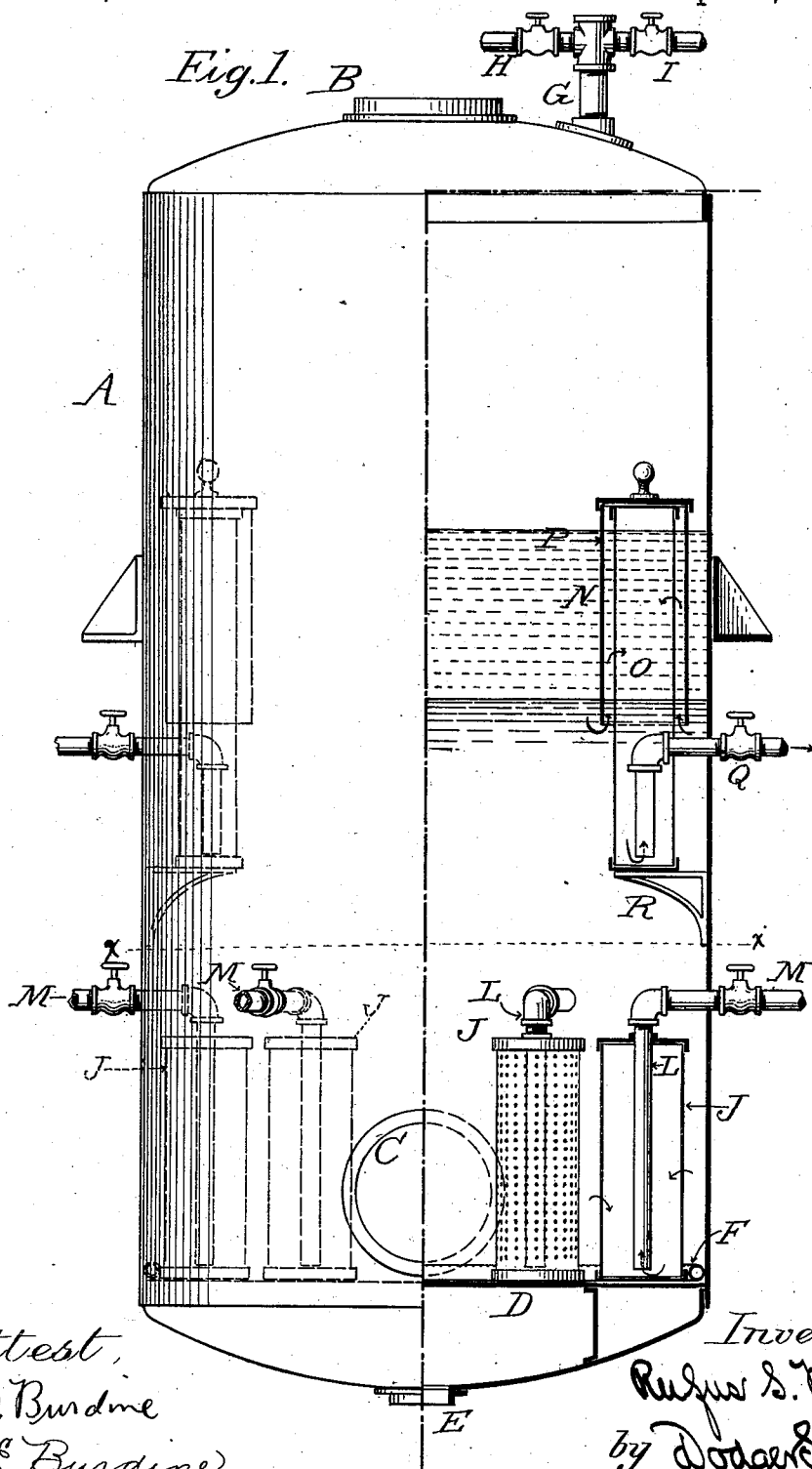
2 Sheets—Sheet 1.

R. S. MERRILL.

PROCESS OF AND APPARATUS FOR EXTRACTING LIQUIDS.

No. 567,249.

Patented Sept. 8, 1896.



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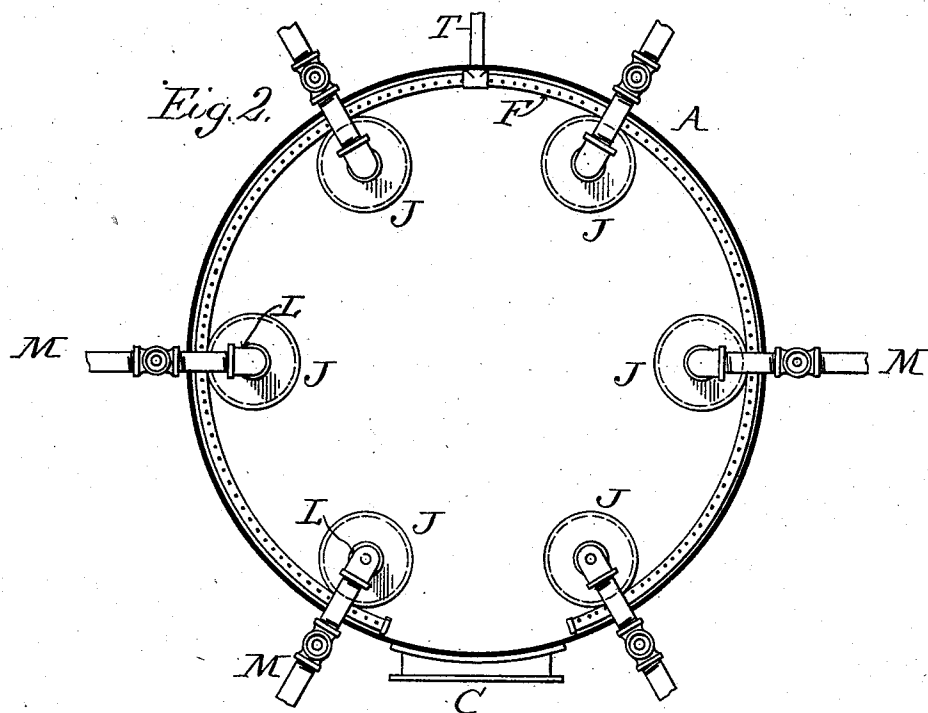


Fig. 3.

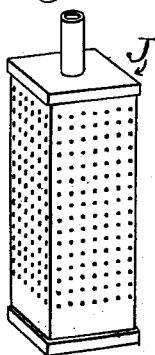


Fig. 4.

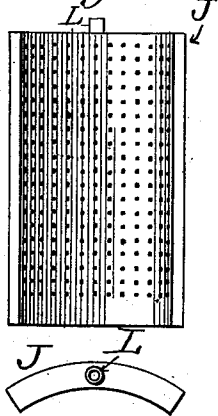


Fig. 5.

Fig. 6.

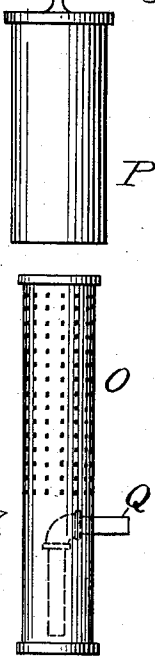
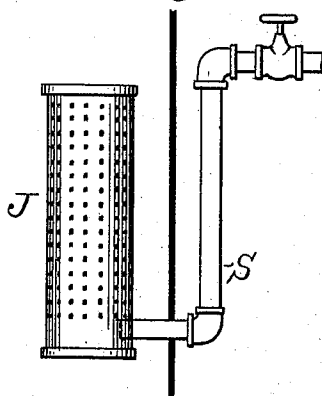


Fig. 7.

Fig. 8.



Attest
W. C. Burdine.

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UNITED STATES PATENT OFFICE.

RUFUS S. MERRILL, OF SCOTLAND, MASSACHUSETTS.

PROCESS OF AND APPARATUS FOR EXTRACTING LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 567,249, dated September 8, 1896.

Application filed May 14, 1896. Serial No. 591,576. (No model.)

To all whom it may concern:

Be it known that I, RUFUS S. MERRILL, a citizen of the United States, residing at Scotland, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Apparatus for and Methods of Extracting Liquids, of which the following is a specification.

My invention relates to an improved apparatus for rendering, expressing, and separating liquids from any material or matter necessary to be so treated, and also to the method and process employed in connection with said apparatus.

The tank hereinafter described and the method of using the same are designed to be employed in extracting and expressing liquid from distillery slops, brewers' slops, ground or crushed grain containing liquid, wet grain, pulp of any nature, wool, spent tan, tankage, slops, or any analogous or similar materials, or in cooking, rendering, and separating lard, tallow, fats, or liquids from any substances requiring such treatment.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of my improved tank; Fig. 2, a horizontal sectional view on the line *xx*, Fig. 1; Figs. 3, 4, and 5, detail views showing modifications of parts of the apparatus; Figs. 6 and 7, details of construction, and Fig. 8 a view showing a further modification.

The body of the tank A is made of any suitable material and of any desired form, and is capable of withstanding any pressure requisite to its proper use. It is provided with a manhole or opening B at its upper end, a similar opening C being formed at or near the lower end, both of which are capable of being securely closed against pressure from within the tank.

D denotes a false bottom secured within the tank, preferably in line with the lower part of the opening C, so that the tank may be conveniently unloaded when necessary or desirable so to do. This bottom may or may not be perforated, and is preferably made in sections and properly supported to sustain the load and pressure to which it is subjected from above. If the bottom be perforate, then a suitable valved draw-off E is provided at the lower end of the tank to insure proper

drainage. Extending nearly around the tank either above or below the false bottom is a perforated pipe or coil F, connected with a source of supply through a valved pipe T.

At the upper end of the tank I provide a pipe G, from which extend valved branches H and I, the former connected with a source of pressure and the latter acting as a blow-off when the cooking agent is being passed through the substance under treatment.

J indicates one of a series of draining-chambers placed within and around the lower part of the tank. In the preferred form they each comprise a perforated cylindrical shell or body provided with a head and a closed bottom. A pipe L extends from near the bottom of each chamber J out through the top thereof, and is connected with a laterally-extending valved pipe M, passing to the outside of the tank. As many of these chambers may be employed as may be found necessary or desirable, and their form may also be varied.

In Fig. 3 the body is shown as rectangular, while in Figs. 4 and 5 it is shown as curved or segmental in cross-section, and these forms are shown merely as types of the many forms that could be used.

N denotes a draining-chamber, designed primarily to extract and convey away the grease from the material being treated, or to carry off the liquid itself. In the form shown it comprises a cylindrical body or shell O, the lower part of which is closed, while the upper portion or section is perforated.

P indicates a hood or casing, of a diameter somewhat larger than the body O, said casing P resting upon the upper end of the body O and extending down and around the same, so that its lowermost edge comes just below the perforations. A space is thus left between the body O and the casing P. A valved pipe Q passes through the wall of the tank into the body O, its end being near the bottom of said body. It is obvious that the form of these parts may be varied without departing from the spirit of my invention, hence I do not desire to restrict myself to the cylindrical form shown. A bracket R or other suitable support may be provided for the body or shell O. The casing or jacket P prevents the mass of material from coming into direct contact with the perforated section of the shell O, and thus

it is that the grease may be carried off readily as it is separated from the mass. In some cases the hood P may be omitted, though its use prevents clogging of the perforations when treating certain classes of materials; thus garbage and matters containing solid impurities and fibrous substances would clog the unprotected perforate shell, while clear tallow or the like would not. As many of these chambers may be employed as found expedient.

The operation of the tank is as follows: Assuming the material in this instance to be of such a nature as to require cooking, the manhole C is closed, the tank is filled or loaded, and then the opening or manhole B is closed. The outlet or exhaust valve I is then opened, and at the same time the cooking agent is admitted into the perforated coil F. The cooking agent passes up through the material being treated, and when it has entirely permeated the same, the valve I may be partially closed, so as to economize the cooking agent and yet not prevent its passage through the material. When said material is sufficiently cooked, the valve I and that controlling the perforated coil are closed. The valve H and those in the pipes M and Q are then opened. The fluid under pressure, entering the tank through valve H, acts upon the top of the material and forces the water into the drains J and N, and from thence out through the pipes M and Q into any suitable receptacle. So long as the material does not fall below the lower end of the shell P, the drain Q will continue to act; but should the material fall below that point, then the valve in the pipe Q should be closed. When the liquid has been sufficiently expelled from the material, the inlet-valve H is closed, the valve I is opened and kept open until the chamber is freed from pressure, and then the manholes B and C are opened and the material is withdrawn through the latter. When substances containing grease are treated, the grease rises to the surface of the material and is withdrawn from the tank through the separating-chamber N. This may, if desired, be done while the material is being cooked. When the pressure is applied within the tank, it forces the rendered fats and liquids supporting them up through the space between the body O and shell P, from whence they pass through the perforations into the lower part of body O, and thence out through pipe Q, the liquid and grease being strained of all extraneous matter. This action continues until the level of the liquid falls below the end of shell or jacket P. Generally during this operation the lower draining-chambers are kept out of action; but should the level of the liquid in the tank be too high for the separator N to withdraw the grease, the lower separators or draining-chambers may be

brought into use, and the level of the liquid lowered to the desired point. If desired, both chambers can be operated at the same time. As the ends of the pipes L and Q extend nearly to the bottom of the chambers J and O, they always take the liquid from the bottom, and so long as there is any liquid in said chambers it will be forced out through the pipes. Thus it is that a seal is formed by these pipes, which prevents the compressing agent from escaping until the material in the tank falls below the ends of the pipes.

If the apparatus is to be used for treating only substances not requiring cooking, the coil F may be omitted; or it may be present and merely left unused. In some cases a tight coil may be used for merely heating the charge. The process may include or omit the preliminary cooking as a step.

A modified form of the separating-chamber J is shown in Fig. 8. Here the body of the chamber is the same, but the drain-pipe enters the side of the chamber near its base, and is connected with an upwardly-extending branch or pipe S, to which in turn is secured the valved discharge-pipe. Cloth or other pervious material may be applied over the perforate or foraminous walls of the separating-chambers, grid, &c.

Having thus described my invention, what I claim is—

1. A grease-extractor for tanks, comprising a shell or casing having an upper perforate section and a lower imperforate portion; a jacket or cover of a larger diameter suspended over the shell and extending down and around at a distance therefrom to a point below the line of perforations; and an outlet for the lower inclosed portion of the shell.

2. A grease-extractor for tanks, comprising a closed bottom shell or casing, having its upper portion perforated; and an outlet for the shell consisting of a pipe extending through the shell to a point near its bottom.

3. The herein-described method of treating substances for the recovery of grease therefrom, which consists in the following steps; first cooking the mass in a suitable tank or receptacle; second opening an outlet in that portion of the chamber occupied by the grease, and simultaneously admitting fluid under pressure into the upper portion of the tank, and lastly closing the grease-outlet and withdrawing the remaining liquid from the lower part of the chamber, under the fluid-pressure within the tank or receptacle.

In witness whereof I hereunto set my hand in the presence of two witnesses.

RUFUS S. MERRILL.

Witnesses:

WILLIAM W. DODGE,
HORACE A. DODGE.