

No. 719,542.

PATENTED FEB. 3, 1903.

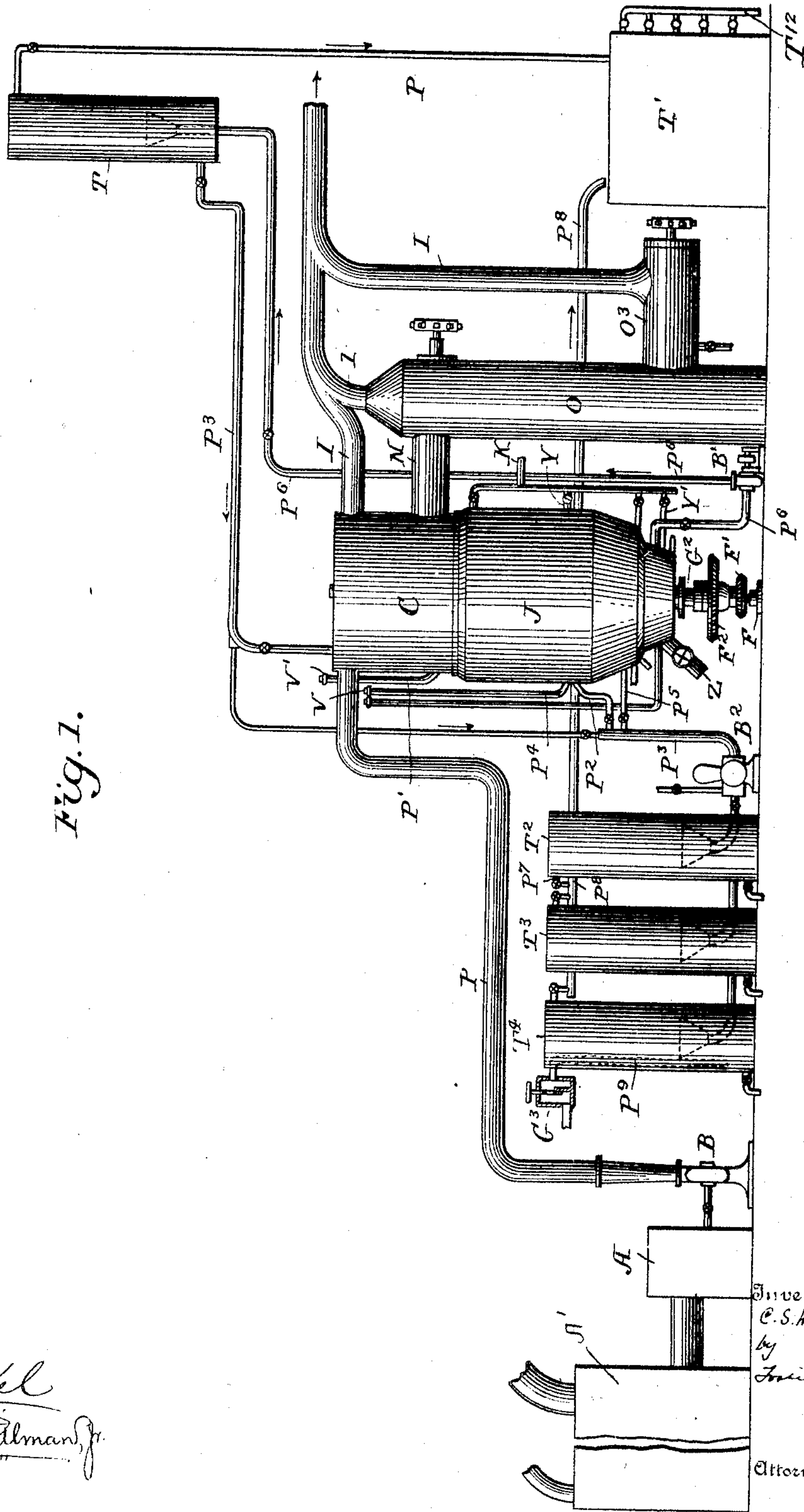
C. S. WHEELWRIGHT.
GARBAGE PLANT.

APPLICATION FILED MAR. 21, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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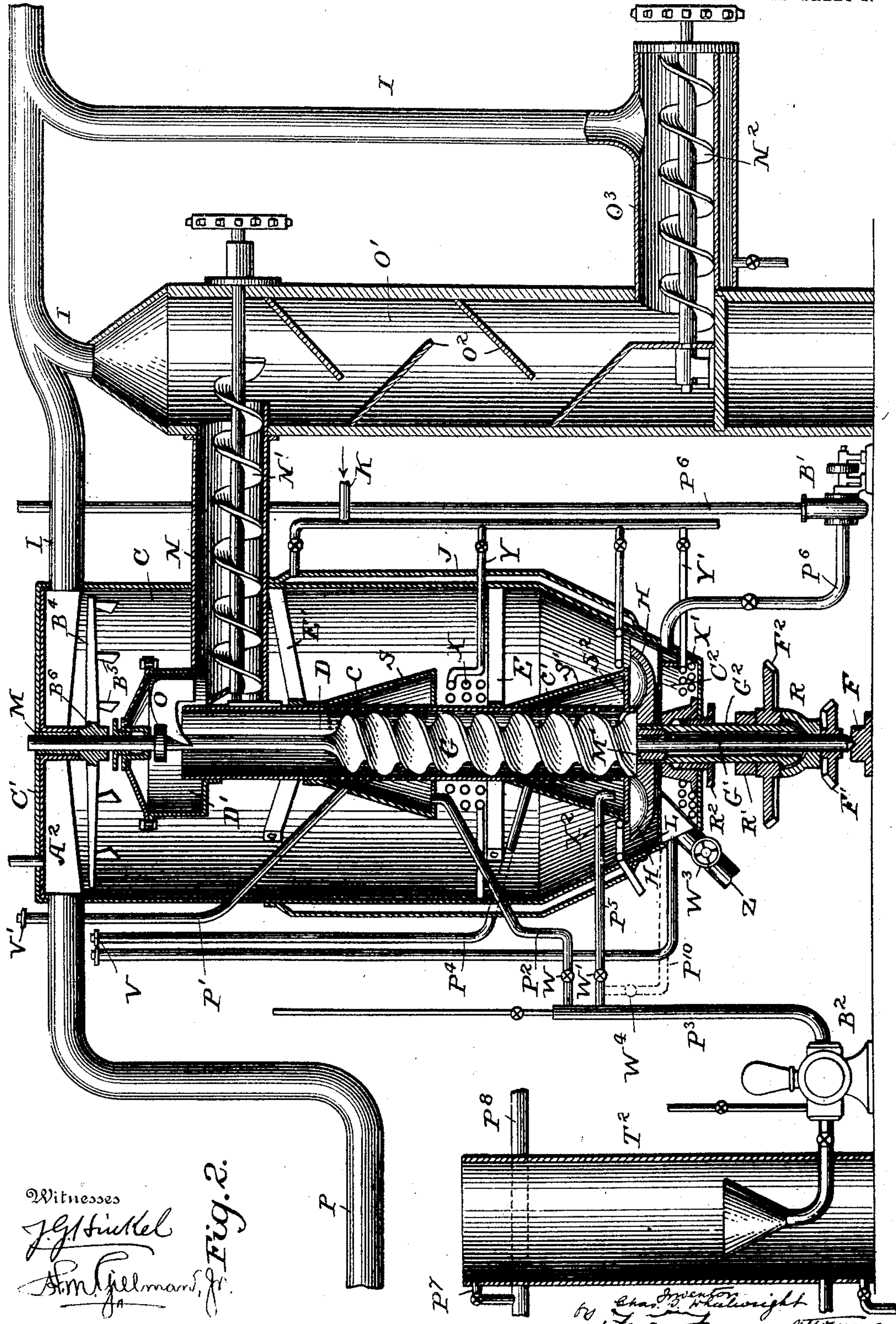
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2 SHEETS—SHEET 2.



Witnesses
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Fig. 2.

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UNITED STATES PATENT OFFICE.

CHARLES S. WHEELWRIGHT, OF BRISTOL, RHODE ISLAND.

GARBAGE PLANT.

SPECIFICATION forming part of Letters Patent No. 719,542, dated February 3, 1903.

Application filed March 21, 1902. Serial No. 99,278. (No model.)

To all whom it may concern:

Be it known that I, CHARLES S. WHEELWRIGHT, of Bristol, in the State of Rhode Island, have invented a new and useful Improvement in Garbage Plants, of which the following is a specification.

The main part of the invention consists in the adaptation to a plant for drying out garbage and reclaiming therefrom grease or oil of an invention for separating or draining liquids from solids described in my application for a patent, Serial No. 81,409, filed November 7, 1901.

It consists, further, in details of construction and in certain combinations with the apparatus of said former application.

A description of the process carried on by the new and improved plant will be given, so far as may be, along with the description of the mechanism or apparatus employed therein.

Use is made of a perforated cylinder, lifting-screw, feeding-blades, and vacuum-chambers, substantially as in my said former apparatus; but whereas in the said former apparatus, which was adapted to the treatment of pulp and similar substances, the liquid was of little value as compared with the solid matter treated, in the apparatus as adapted for garbage plants the liquid is the more valuable, the solid matters being of use for fuel only. Means are therefore provided for reclaiming the grease. Accordingly instead of employing an open vat, as when treating pulp, and employing a scraper to sweep the pulp as it rises to the top of the cylinder into a trough in the open air I employ a closed vat and a scraper within the same to sweep the solid garbage as it comes to the top of the cylinder into a second cylinder, where it is taken by a carrying-screw to further drying mechanism and finally carried out of the machine, and great care is also taken that all the matters treated shall be kept hot, and means are provided, as described, that no liquid shall escape until the grease has been removed therefrom.

In the drawings, Figure 1 is a side elevation. Fig. 2 is a sectional elevation of a greater part of the apparatus.

The process begins after the greater part of the objectionable matters—such as tin cans, bottles, crockery, &c.—have been removed.

In fact, the garbage is the form of a pulpy mass and is in a suitable tank A, which is a catch-all belonging to digesting apparatus (a part of which is marked A', but forms no part of the present invention) in which the garbage has been previously cooked. From this tank it is pumped by pump B through pipe P into the top of an air-tight vat C, built closely upon the lines of the receiving-vat of my said application Serial No. 81,409. It has, however, a steam-tight cover C', (supported by T-iron beams A²,) with an opening large enough to inclose a packing-ring M. The receiving-vat C is conical at the lower end, terminating in a vacuum-chamber C², substantially as in my said former apparatus, and is provided with a steam-jacket J, furnished with steam by means of steam-pipe K. It has a false bottom L, perforated, as shown. D is a cylinder within said vat C, substantially like the cylinder of my said former apparatus, but terminating in a chamber D', secured to it, as shown, the office of which will be described hereinafter. The cylinder D is supported by two spider-frames E E', the former shaped, as shown, to resist the thrust of the double-bladed screw G within said cylinder D, and the latter being arranged to hold said cylinder down against the lifting tendency of said screw and the matters carried by said screw. The said spider-frames are secured to the inner walls of the vat C in any suitable manner. The said double-bladed screw G fits closely the inner periphery of cylinder D and revolves with shaft G', stepped at F and in turn revolved by a gear F'.

H H are spoon or propeller shaped blades revolving with easy clearance in the conical or lower portion of the vat or shell C just above the false bottom L by means of a hollow vertical shaft G², to which they are rigidly secured. The said shaft G² is hollow to permit the passage through it of the shaft G'. It has an end bearing R, also hollow for the same purpose, and supporting-bearings R' R², the latter being a packing-box in the bottom of vat C. The hollow shaft G² is revolved by gear F². A packing-box between said shaft G' and said hollow shaft G² is marked M'. The lifting-screw G and the propeller-blades H H revolve in opposite directions.

S is a funnel-shaped vacuum-chamber secured to cylinder D in any convenient way, the said cylinder being furnished with perforations *c*, &c., in that portion about which the said vacuum-chamber lies. P' is a pipe leading from said vacuum-chamber to the outside of the vat C and there provided with a vacuum-valve V'. Another pipe P², with a valve W, is a discharge-pipe for liquid from said vacuum-chamber, as shown, discharging into a common pipe P³, whose office will be explained hereinafter. S' is a similar funnel-shaped vacuum-chamber surrounding the cylinder D near the bottom thereof, where the outer conical form of the chamber, together with the inner conical form of the vat C at such portion thereof, gives a general direction to the contents of the vat as such contents are fed to the blades H H, while its bottom S² prevents the contents of the blades H H from escaping from the inner portion of the back edges of the blades and directs such contents to the said screw G. The curves of the blades H H are such that they force the heavier part of their contents toward the center of the machine underneath the bottom S² of the vacuum-chamber S' to be taken up by the screw G and yet permit the lighter or extremely watery part to pass over their back edges outside of the bottom S² and fall upon the false perforated bottom L below. The cylinder D is provided with perforations *c'*, as shown, within the vacuum-chamber S', and the latter is provided with a vacuum-pipe P⁴, which passes outside of the vat, and is provided with a vacuum-valve *v*, as shown. It has also a discharge-pipe P⁵, furnished with valve W' and communicating with pipe P³.

It is necessary that the process be carried on at a temperature that shall keep the grease in a liquid state, as otherwise, for instance, it would tend to fill the perforations in the false bottom L or the perforations *c* and *c'* in the vacuum-chambers, S and S'. To provide sufficient heat, besides the steam-jacket J a coil X, fed by pipe Y from steam-pipe K, surrounds the cylinder D just below the vacuum-chamber S, and a similar coil X', fed by pipe Y', is placed in the vat below the false bottom L. Other coils may be used. A third coil X² for direct steam is shown just above the level of the bottom S² of vacuum-chamber S'.

Z is a pipe with a valve W³, through which the chamber C², below the false perforated bottom L, may be cleaned.

The garbage in a wet or pulpy state having been pumped to the top of the vat C falls to the bottom, where the heavier portion is fed to the screw G by blades H H, as previously stated; but the watery portion escaping over the backs of the blades H H passes through the perforations of the false bottom L into vacuum-chamber C, whence it is pumped by pump B' and pipe P⁶ to reclaiming-tank T, (see Fig. 1,) where the oil rises to the top and is drawn off through pipe P¹¹ to a suitable

tank T' below, while the heavier water is drawn through pipe P³ by means of pump B² and forced into a set of tanks T² T³, &c., similar in construction and operation to tank T. The pipe P³ passes over the top of the vat C and is there furnished with pipes to let a portion of its contents, still in a heated condition, flow into the vat C, where it thus tends to keep the mass of garbage in a more liquid state. The heavier mass of garbage being lifted by screw G loses water or liquid all the time into vacuum-chamber S' through the perforations *c'*, and from the said vacuum-chamber the said water or liquid is drawn by pump B² through pipe P⁵ and pipe P³ and forced into the reclaiming-tanks T² T³ T⁴, &c. Still lifted by the screw G, the heavier mass of garbage, more solid than before, loses more of its liquid through the perforations *c c* into the vacuum-chamber S, whence the said water or liquid is drawn by pump B² through pipes P² and P³ and forced into the reclaiming-vats T² T³, &c. Still lifted by the screw G, the mass of garbage now being comparatively dry is forced into chamber D', mentioned above, whence by a revolving sweeper O it is swept into a horizontal cylinder N, secured to cylinder D and chamber D', as shown. A delivery-screw N', revolving in the lower part of this horizontal cylinder and having bearings, as shown, carries the nearly-dried mass to a tower O', furnished with inclines O², which break up the garbage as it falls to a similar cylinder O³ and delivery-screw N², by which it is carried out of the machine. The liquid loaded with oil or grease entering the reclaiming-tank T², the oil or grease in a liquid state flows to the top of the tank and thence is drawn through pipes P⁷ and P⁸ into the general receiving-tank T', while the heavier liquid descending is drawn into the next tank T³, and so on. The last tank is furnished with a refuse-pipe P⁹ and a gate G³ for determining the level at which the oil shall be drawn from the several reclaiming-tanks through pipe P⁸, the opening in the gate being set at the level or slightly above the level of the oil-discharge pipes P⁷, &c. The tank T' is provided with a series of draw-off pipes P¹².

Shaft G' near the top of the receiving-vat C is provided with a leveling-bar B⁴, furnished with teeth B⁵, as shown, and rigidly secured to said shaft by a hub B⁶.

I I I are pipes leading from the vat C, the tower O', and discharge-pipe O³ to a tall chimney for carrying off odors, gases, &c.

The pump B², it will be observed, is a force-pump or pumping-engine drawing liquid through the system of pipes from tank T and the vacuum-chambers S' and S and forcing it into the succession of reclaiming-tanks T² T³, &c. In some cases the pump B' becomes unnecessary—i. e., it may not be necessary in all cases to allow liquid from the reclaiming-tank T⁰ to flow down through the contents of the vat C. In such cases a valve in pipe P⁶ is closed, when the liquid from vacuum-cham-

ber C² will be drawn by pump B² into pipe P³ through a pipe P¹⁰, (shown in dotted lines,) a valve W⁴, also shown in dotted lines, having been opened.

5 I claim—

1. In a rendering apparatus, the combination with the steam-tight vat C provided with a false bottom L and a vacuum-chamber C² beneath, perforated cylinder D within said
10 vat furnished with lifting-screw G, the periphery of whose blades closely fits the interior of said cylinder, feeding-blades H, H, in the bottom of said tank beneath said lifting-screw, the said feeding-blades being adapted
15 to revolve in one direction and the said screw in the opposite direction, and vacuum-chamber S, in combination with chamber D' at the top of said cylinder and open thereto, revolving scraper O within said chamber D' and
20 rigidly attached to the shaft of said lifting-screw, cylinder N communicating with said chamber D', screw G for carrying off matters received from chamber D' through said cylinder N, and a pump, pipes and reclaiming-
25 tanks for drawing liquid from said vacuum-chambers and separating oil or grease from said liquid, substantially as described.

2. In a rendering apparatus, the steam-tight vat C, the cylinder D within said vat,
30 the feeding-blades H, H, and the screw G re-

volving the said blades in one direction and the said screw in the opposite direction, the chamber D' at the top of said cylinder, the scraper O rigidly attached to the shaft of said screw, and cylinder N for receiving solid mat- 35
ters in combination with the vacuum-chamber S and pump B², the said cylinder D being perforated where it lies within said vacuum-chamber, and the said pump being adapted to discharge liquid flowing through the per- 40
forations, substantially as described.

3. In a rendering apparatus, the steam-tight vat C, the cylinder D within said vat, the feeding-blades H, H, and the screw G revolving the said blades in one direction and 45
the said screw in the opposite direction, the chamber D at the top of said cylinder, the scraper O rigidly attached to the shaft of said screw, and the cylinder N for receiving solid matters, in combination with the vacuum- 50
chamber C², perforated floor L and vacuum-chambers S' and S, the said cylinder D being perforated within the said chambers S' and S, as described, and the pump B² for drawing liquid from the several said vacuum- 55
chambers, substantially as described.

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Witnesses:

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