No. 709,836. Patented Sept. 23, 1902.

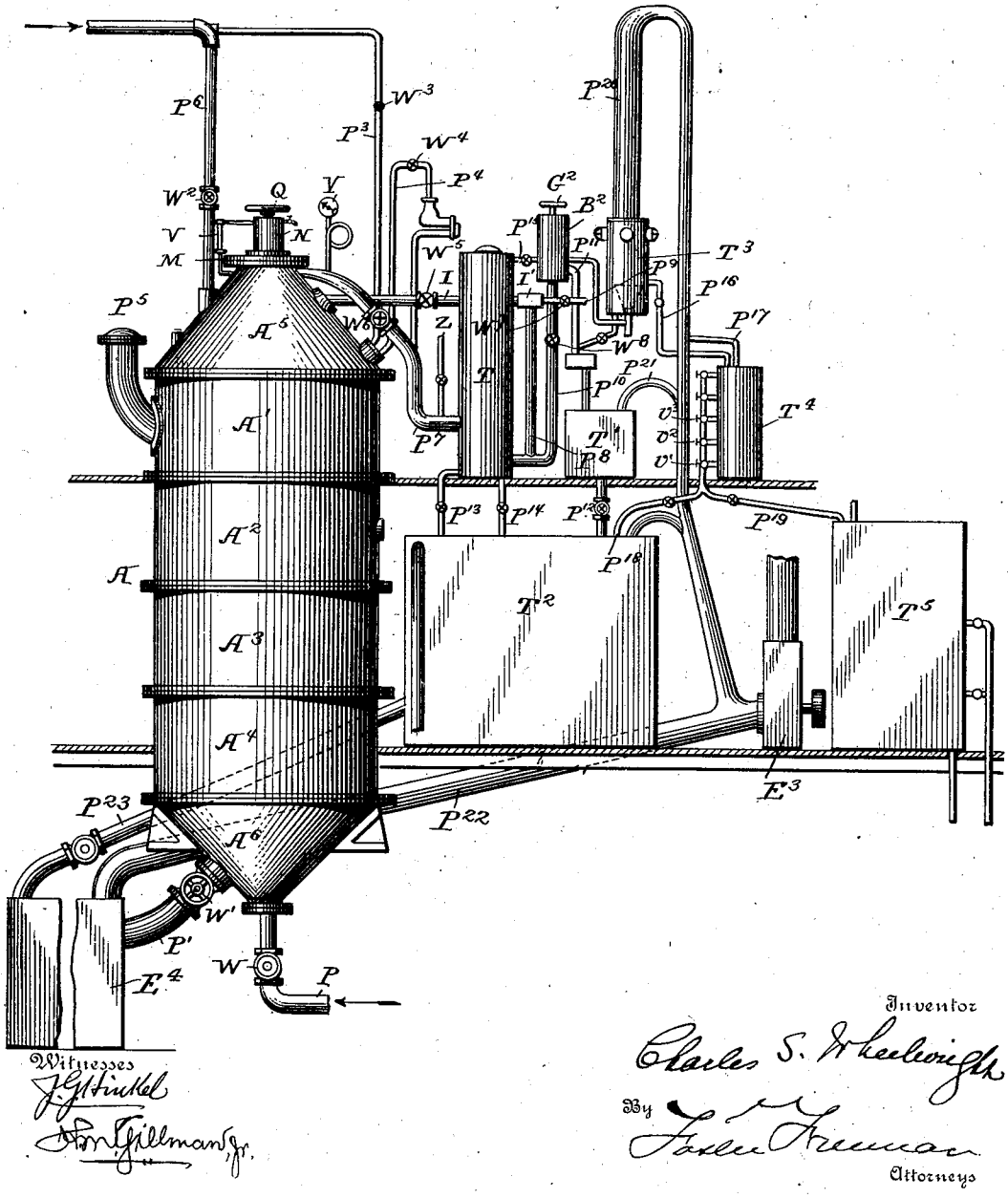
C. S. WHEELWRIGHT.

APPARATUS FOR COOKING GARBAGE.

(Application filed Apr. 24, 1902.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.



Witnesses
J. F. Stinkel
Thos. F. Gilman, Jr.

Inventor
Charles S. Wheelwright
By Foster Freeman
Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 709,836. Patented Sept. 23, 1902.

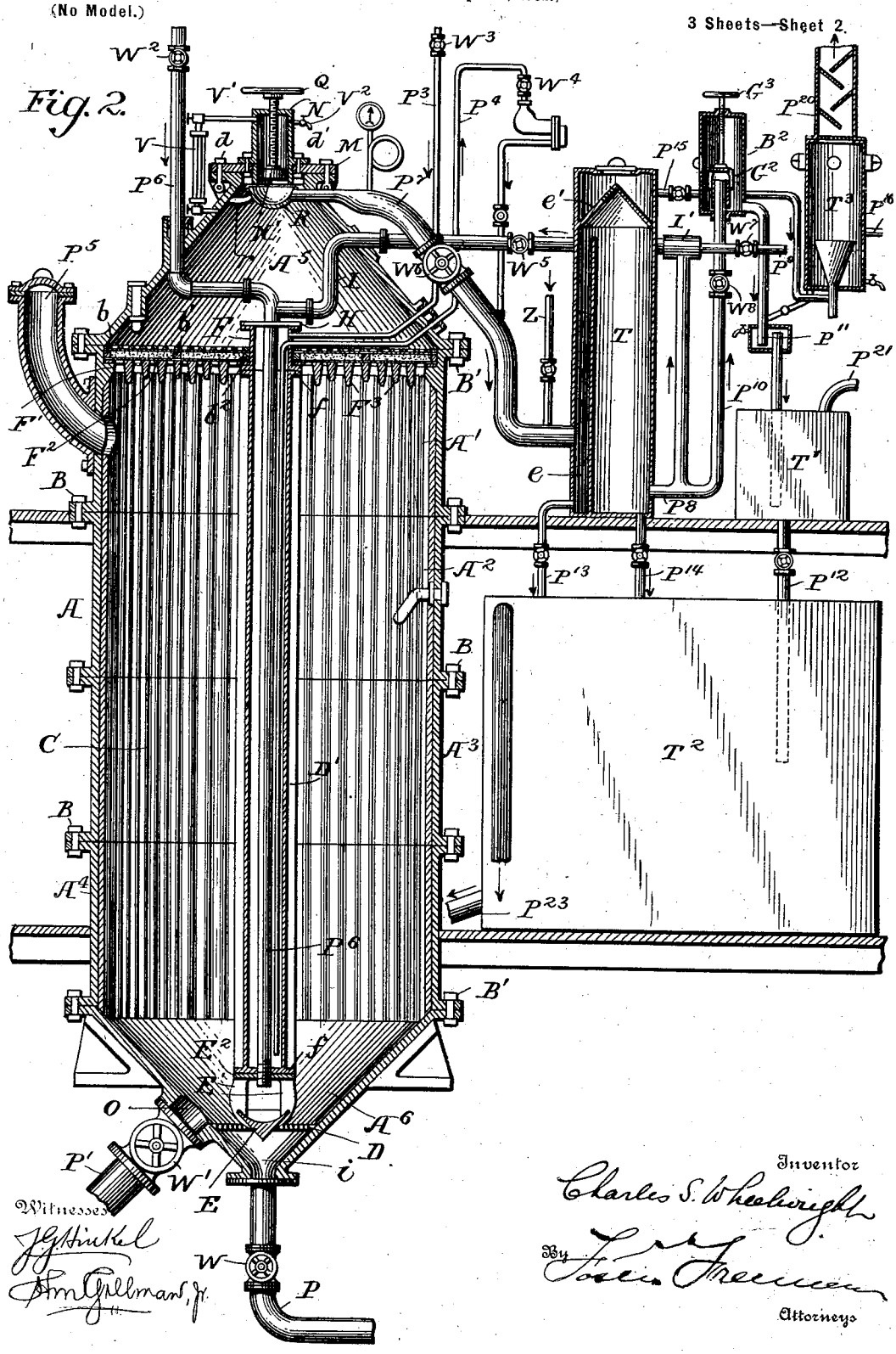
C. S. WHEELWRIGHT.

APPARATUS FOR COOKING GARBAGE.

(Application filed Apr. 24, 1902.)

(No Model.) 3 Sheets—Sheet 2.

Fig. 2.



THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 709,836. Patented Sept. 23, 1902.

C. S. WHEELWRIGHT.

APPARATUS FOR COOKING GARBAGE.

(Application filed Apr. 24, 1902.)

(No Model.) 3 Sheets—Sheet 3.

Fig. 3.

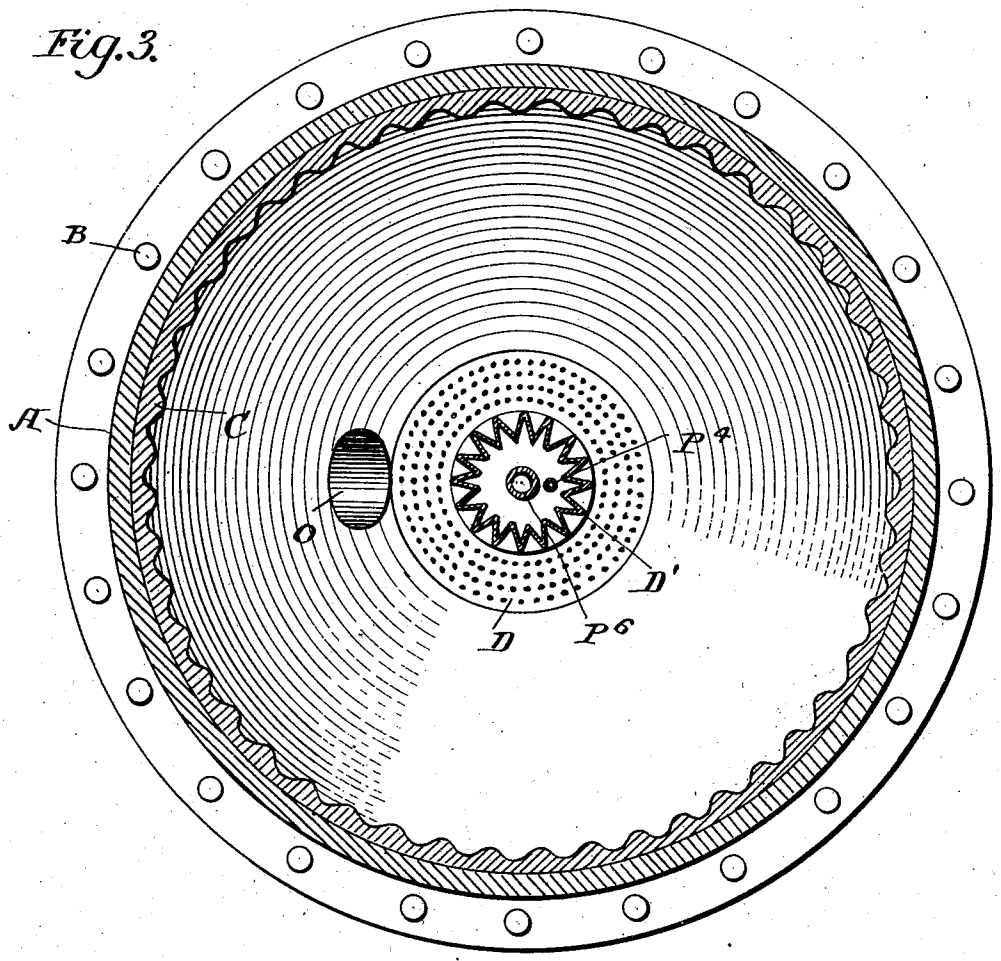
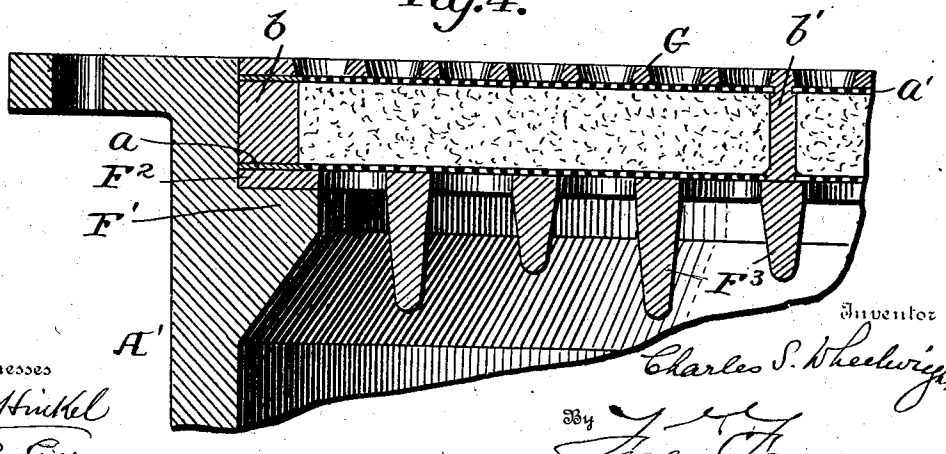


Fig. 4.



Witnesses
J. J. Hinkel
Wm. Gilman Jr.

Inventor
Charles S. Wheelwright
By Foster Freeman
Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES S. WHEELWRIGHT, OF BRISTOL, RHODE ISLAND.

APPARATUS FOR COOKING GARBAGE.

SPECIFICATION forming part of Letters Patent No. 709,836, dated September 23, 1902.

Application filed April 24, 1902. Serial No. 104,451. (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 Apparatus for Cooking Garbage and Removing the Oil or Grease Therefrom, of which the following is a specification.

The process conducted by the apparatus may be known as the "water" process, the oil or grease in the garbage being taken up by water and conveyed out of the digester to separating-tanks, where said oil and said water are separated, all without the exertion of mechanical pressure upon the garbage.

The invention consists in combinations of mechanisms by which this process may be conducted.

It also consists in an approved form of digester in which the garbage is cooked, and in various combinations therewith of pipes for the admission of water and steam whereby the cooking is conducted.

In the drawings, Figure 1 is a front view of the entire apparatus. Fig. 2 is a similar view, mostly in vertical cross-section, of most of the apparatus. Fig. 3 is a plan of the lower section of the digester. Fig. 4 is a detail.

A is the digester built in concavo-convex sections, A' A^2 A^3 A^4 A^5 A^6 several feet in diameter, bolted together by the bolts B B, which pass through externally-projecting flanges from said sections, as shown. C is a corrugated lining for said digester, very thick, (two inches, more or less) and the corrugations very coarse. The lining is preferably inserted in the digester in sections, so as to break joint with the sections above mentioned in which the digester is built. The top and bottom sections—sections A^5 and A^6—are conical, as shown, and without lining, being bolted, as shown, by bolts B' B', respectively, to sections A' and A^4 of the main body of the digester. The bottom section of the digester A^6 ends in an inlet *i*, with which a pipe P connects, being bolted to said section A^6, as shown. It has also an outlet O large enough to permit the removal through it of the entire contents of the cylinder A, a discharge-pipe P' being bolted to section A^6 about the said outlet O, as shown. The pipe P has a valve W, and the discharge-pipe P' has a gate or valve W', as shown. D is a perforated floor just below outlet O in conical section A^6. This perforated floor serves as a support for a central heating apparatus, which, together with a deflector which intervenes between said floor and said heating apparatus, will be next described. The heating apparatus consists of long corrugated cylinder D', with provision for the admission and relief of steam, to be hereinafter described. It has two flanges *f f* at either end, by means of which it is bolted at the lower end to the said deflector, which consists of a solid circular boss E, resting in the floor D, as shown, with two upright struts E' E' connecting said boss with a head E^2, to which the lower flange *f* is bolted. The lower flange *f* and head E^2 are bored to permit the passage of a pipe P^6, to be hereinafter described. The object of the deflector is to turn back steam or hot water coming through the pipe P^6 through all parts of the contents of the digester. It serves a similar purpose for water entering at inlet *i*.

Near the top of the main portion of the digester, just below the conical portion A^5, the upper end of central heating apparatus D' is bolted by means of its upper flange *f* to the lower flange of a doubly-flanged pipe F, which extends into the conical section A^5 of the digester. It serves as a central support for a filtering or clarifying screen or bed, made up as follows: Upon the lower flange of the flanged pipe F (see Figs. 2 and 4) and a flange F' from the inner side of the outer shell in section A' above the lining of the digester rests a perforated ring-plate F^2, cast in section, with irregular teats F^3, as shown. Upon this perforated ring rests a perforated plate *a*. Next resting upon perforated plate *a* are three rings *b b' b²*, the first named, *b*, being near the inner periphery of the digester, b^2 being about the flanged pipe F, and *b'* midway between, its office being to keep a second perforated plate *a'*, resting upon the three rings *b b' b²*, and a perforated ring-plate G, which rests upon plate *a'*, from sagging. The plates *a* and *a'* and ring-plate G, like ring-plate F^2, are all cast in section. The space between the plates *a* and *a'* is filled with charcoal or other clarifying substance.

The upper flange of the flanged pipe F is

bolted to a head H, which is bored to admit the pipe P^6, which is carried through to a packing-box in the lower flange of pipe F, through the entire length of the corrugated cylinder D', and then through a packing-box in the lower flange of the cylinder and the head E^2 of the deflector.

The cylinder D' is steam-tight. A pipe P^3, passing through the shell of the upper conical casting A^5 and through the side of the pipe F, furnishes direct steam to the interior of the corrugated cylinder D, while a similar pipe P^4, leading from near the bottom of said cylinder D, passes through the side of pipe F and then through the shell or cone A^5 of the digester, serving as a drip-pipe. The pipe P^3 has a valve W^3 and the pipe P^4 has a valve W^4.

Pipe I passes through a steam-joint in upper cone A^5, being bent within the cone to allow for expansion and contraction. It opens into pipe P^6, as shown. Outside of cone A^5 it is furnished with a valve W^5, and beyond the valve W^5 is an injector I', which is fed by direct steam in pipe P^9, as indicated.

P^5 is the entrance to the digester, through which the digester is loaded with garbage. It is bolted to section A, as shown, and has a cover which is bolted in place after the digester receives its charge.

Direct steam for cooking is supplied through pipe P^6, which has a valve W^2 and passes through a packing-ring in cone A^5, as shown. It passes through the middle of the central heating-cylinder D'.

Steam flowing through pipe P^6 strikes the deflector and is thrown back through the garbage to cook the same. At the same time cooking also results from the corrugated cylinder D', filled with direct steam through pipe P^3.

The cone A^5 of the digester is open at the top and about the opening is provided with a movable plate M, bolted to the cone, as shown, by bolts *d d*. In turn there is bolted to the plate M, by bolts *d' d'*, as shown, a cylinder N, in which a piston N', provided with a packing-ring, as shown, is raised or lowered by a hand-wheel Q. The piston N' regulates the height to which water is allowed to stand in digester A. A glass water-gage V shows this outside, V' being an air-pipe entering the dome or cylinder N above the piston N'.

V^2 is an air-cock.

R is a cast-iron plate, cup-shaped, as shown, and held in place by two supports *r*, only one of which is shown. Attached to this cup-shaped plate is the exit-pipe P^7 for the liquid when it has become charged with grease. The pipe P^7 has a valve W^6.

T is a reclaiming-tank having a compartment *e*, as shown, with which pipe P^7 communicates near the bottom, while at the upper portion it has a perforated partition *e'* for the passage of the lighter oil, while the heavier liquid sinks to the bottom and passes into pipe P^8, communicating with the injector I'. Pipe P^8 communicates also with pipe P^{10}, having a valve W^8, which until the operation of the mechanism thus far explained is described will be supposed to be closed.

The mode of operation is as follows: All valves are supposed to be closed. Valve W is first opened and water under sufficient head flows into the digester about half-way up section A^4, when valve W is closed. The digester is filled with garbage up to the entrance of pipe P^5, the water in the digester serving as a cushion for the lower cone A^6. The cover to the pipe P^5 is now closed. Valve W^3 in pipe P^3 is now opened and live steam fills the corrugated cylinder D', a relief-valve W^4 in pipe P^4 being opened as often as necessary. Valve W^3 remains open during the remainder of the process. Valve W^2 in pipe P^6 is also opened, and steam flowing from said pipe enters and passes through the entire length of said pipe and thence against the deflector E, and so permeates the entire mass of the garbage. This is kept up for several hours until the upper cone of the digester becomes filled with liquid from the condensed steam, the valve W^2 in pipe P^6 being closed or partially closed from time to time, if necessary, as may be determined upon inspection of the steam-gage Y. The teats F^3 upon the plate F^2 keep the heavier part of the garbage from clogging the filter apparatus, which operates as indicated. When the cooking of the mass of garbage is finished, the valve W^2 in pipe P^6 is finally closed and valves W^6 in pipe P^7, W^5 in pipe I, and W^7 in pipe P^9 are opened. This arrangement of pipes and valves, including the injector I', is an important feature of my invention. It is necessary that the mass of garbage in the digester shall be kept hot, and accordingly by this arrangement the injector constantly injects a stream of hot water saturated with steam into the garbage through pipe I, now fed entirely by the injector. It is obvious that additional heat is imparted to the liquid by the live steam striking the liquid in the injector. This heat is maintained throughout the portion of the pipe P^6 into which pipe I enters that lies in cylinder D' by the live steam in pipe P^3. On leaving pipe P^6 this steam is turned upward by the deflector E. Valves beyond the system as thus far described are now opened, and the circulation of water at a high temperature injected by the injector being constantly freshened finally removes pretty much all the oil from the garbage.

A very large part of the oil or grease removed from the garbage by the process and apparatus thus described, still accompanied by much water, passes through the perforated partition *e'* of tank T. The contents of the upper part of tank T flows through pipe P^{15} into tank T^3. Thence it flows through pipe P^{16} into tank T^4, which is furnished with an air-pipe P^{17}. Tank T^4 is also furnished with

a set of valves v' v^2 v^3, &c., the lower one of which at the proper time is opened to let water in the bottom of the tank flow into the hot-water-storage tank T^2 by pipe P^{18}, as shown, while at proper times valves v^2 v^3, &c., are opened to let oil flow through pipe P^{19} into the oil-storage tank T^5.

The tank T^3 is furnished with a set of inward-suction valves communicating by a pipe P^{20} with the exhaust E^3 of the entire apparatus. The pipe P^{20} is provided with inwardly-projecting wings, as shown.

The course of the heavy hot liquid in tank T not taken up by the injector is through pipe P^{10}, valve W^8 being open, to a flow-box B^2, containing a flow-gate G^2, regulated by a hand-wheel G^3. This flow-gate determines the height to which water shall stand in the entire apparatus. From the flow-box B^2 the liquid, still hot, flows by pipe P^{11} to a relief-tank T', whence it is drawn or allowed to descend by pipe P^{12} into the hot-water-storage tank T^2. Pipes P^{13} and P^{14} communicate with hot-water-storage tank T^2, allowing liquid to be drawn directly from compartment *e* or tank T.

P^{21} is a pipe leading from the relief-tank T' to the exhaust E^3.

Pipe Z is a water connection communicating with pipe P^7 to introduce cold water to the circulation if the pressure at any time becomes too great. The same effect can be produced by opening valve W in water-pipe P.

The entire process having been carried into effect, the garbage is removed through pipe P' into a receptacle E^4, which is provided with a pipe P^{22}, leading to the exhaust-chimney E^3.

P^{23} is a pipe leading from tank T^2 to receptacle E^4 and is used for washing out the receptacle.

Other pipes and valves are shown in the drawings, whose office will be readily understood. So, also, are shown several indicators, which it will be unnecessary to describe.

I claim—

1. The digester A for cooking garbage provided with a central heating apparatus, consisting of the steam-tight cylinder D' extending from the bottom to near the top of said digester, a steam-pipe P^3 for providing direct steam to said cylinder and a steam-relief pipe P^4 leading from near the bottom of said cylinder, in combination with a live-steam pipe P^6 passing through the said cylinder which is provided with suitable packing-boxes at the ends thereof, the heat in said pipe P^6 being adapted to be maintained by steam from said pipe P^3, substantially as described.

2. The digester A for cooking garbage provided with a central heating apparatus consisting of the steam-tight cylinder D', extending from the bottom to near the top of said digester, live-steam pipe P^3 and steam-relief pipe P^4, in combination with live-steam pipe P^6 passing through said cylinder, suitable packing-boxes being provided in the ends of said cylinder and the deflector E, for turning hot steam upward through the mass of garbage, substantially as described.

3. The digester A for cooking garbage provided with a water-pipe P entering at the bottom, and a central heating apparatus, consisting of the steam-tight cylinder D' extending from the bottom to near the top of said digester, live-steam pipe P^6 passing through said cylinder, suitable packing-boxes being provided in the ends of said cylinder, and furnishing direct steam to the contents of said digester, and live-steam pipe P^3 whereby said cylinder is heated and heat is maintained in said pipe P^6, substantially as described.

4. A digester for cooking garbage provided with a steam-pipe adapted to deliver its steam at the bottom of the digester, a valve in said steam-pipe, an exit-pipe for liquid near the top of said digester, a pipe communicating with said steam-pipe inside of the valve therein, and a steam-injector adapted to return a portion of the contents of said exit-pipe through said communicating pipe and said steam-pipe, to the bottom of the digester after the valve in said steam-pipe is closed, substantially as described.

5. A digester for cooking garbage formed in sections with conical ends, and provided with means for causing steam to permeate the contents of the digester from bottom to top, in combination with a filtering or clarifying apparatus having large teats below the upper conical section of said digester, substantially as described.

6. The combination with the digester A of live-steam pipe P^6 delivering its steam at the bottom of said digester, valve W^2 in said pipe P^6, exit-pipe P^7 for the escape of steam and hot water from said digester, valve W^6 in said pipe P^7, receiving-tank T provided with compartment *e* for receiving steam and hot water from said exit-pipe P^7, pipe P^8 communicating with tank T, pipe I entering pipe P^6, valve W^5 in said pipe I, live-steam pipe P^9, valve W^7 in said pipe P^9, and injector I', whereby when said valve W^2 in said pipe P^6 is closed and the other said valves are open, a circulation of hot water saturated with steam may be maintained, substantially as described.

7. The combination with the digester A, of water-pipe P and valve W therein for furnishing a supply of water, and live-steam pipe P^6, delivering its steam at the bottom of said digester, valve W^2 in said pipe P^6, exit-pipe P^7 for the escape of steam and hot water from said digester, valve W^6 in said pipe P^7, receiving-tank T provided with compartment *e* for receiving steam and hot water from said exit-pipe P^7, pipe P^8 communicating with tank T, pipe I entering pipe P^6, valve W^5 in said pipe I, live-steam pipe P^9, valve W^7 in said pipe P^9, and injector I', whereby when said valves W and W^2 are closed and the other said valves are open, a circulation of hot wa-

ter saturated with steam may be maintained, substantially as described.

8. The combination with digester A provided with central heating apparatus, cylinder D′, and pipes P^3 and P^4, of steam-pipe P^6, valve W^2, pipe P^7, valve W^6, pipe I, valve W^5, receiving-tank T provided with compartment *e*, pipe P^8, and injector I′, substantially as described.

CHARLES S. WHEELWRIGHT.

Witnesses:
CHARLES K. COBB,
WILLIAM D. WHITMORE, Jr.