(No Model.) 6 Sheets—Sheet 1.

C. C. CURRIER.

APPARATUS FOR TREATING GARBAGE.

No. 593,198 Patented Nov. 9, 1897.

Fig. 1.

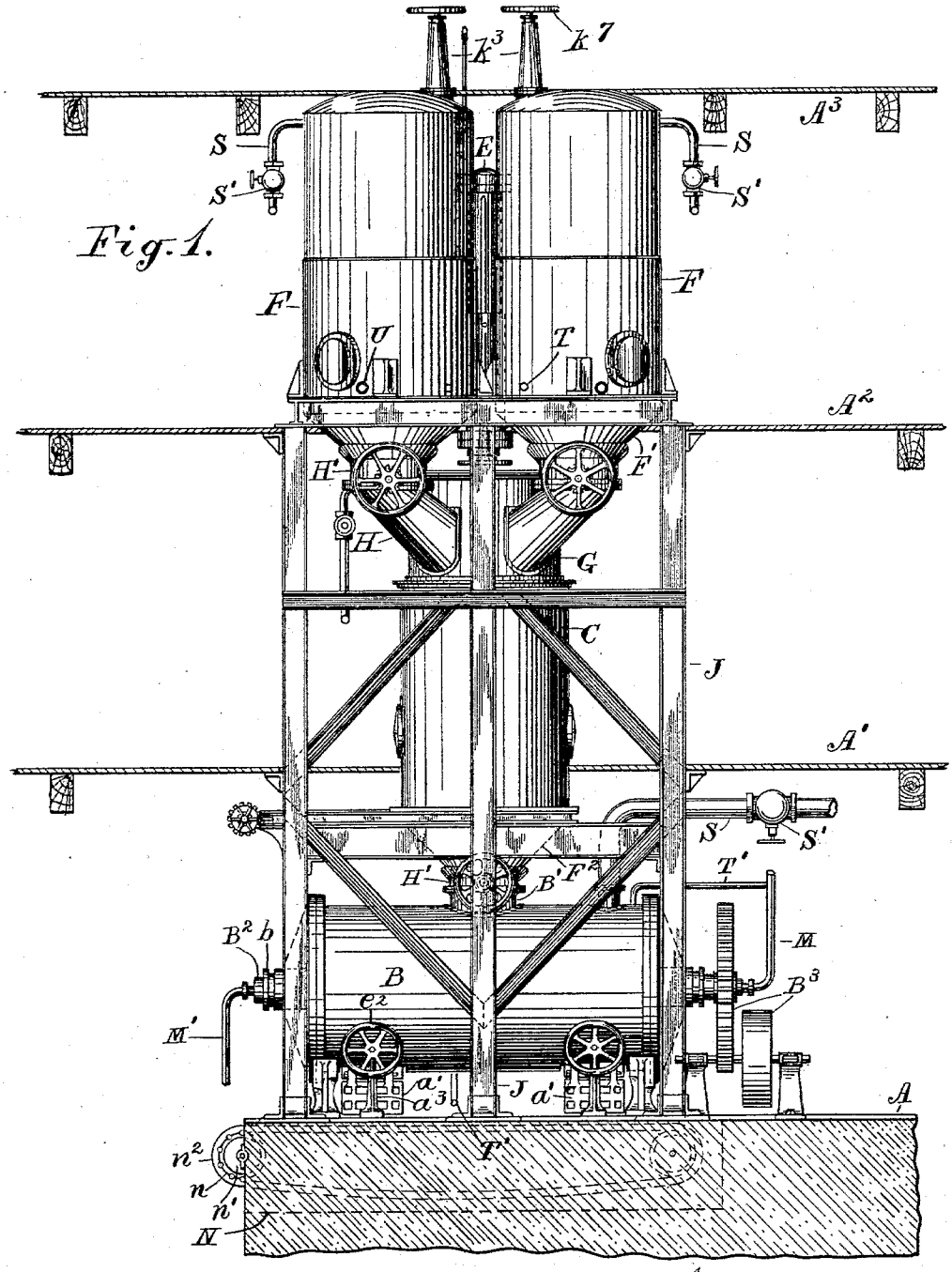

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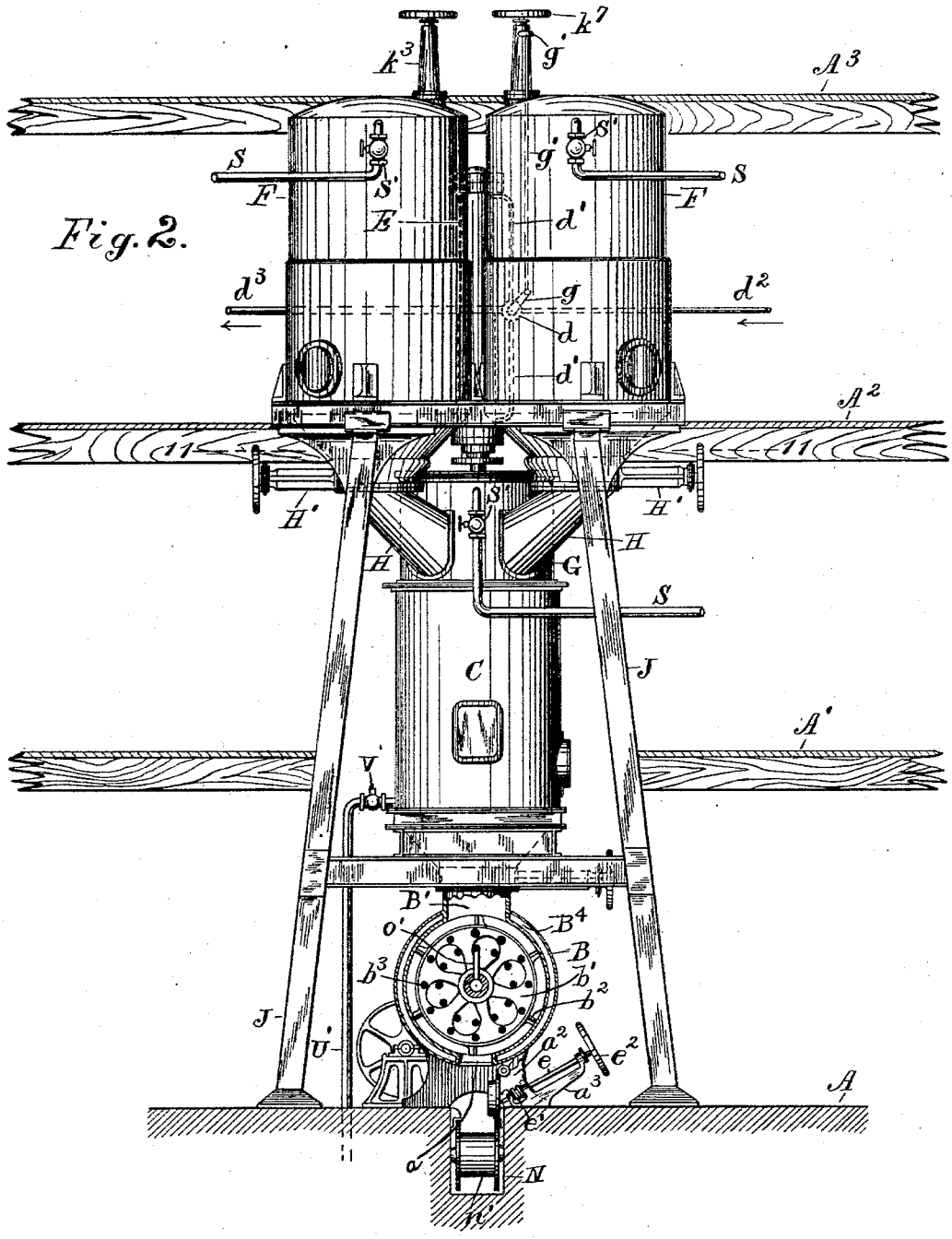
Fig. 2.



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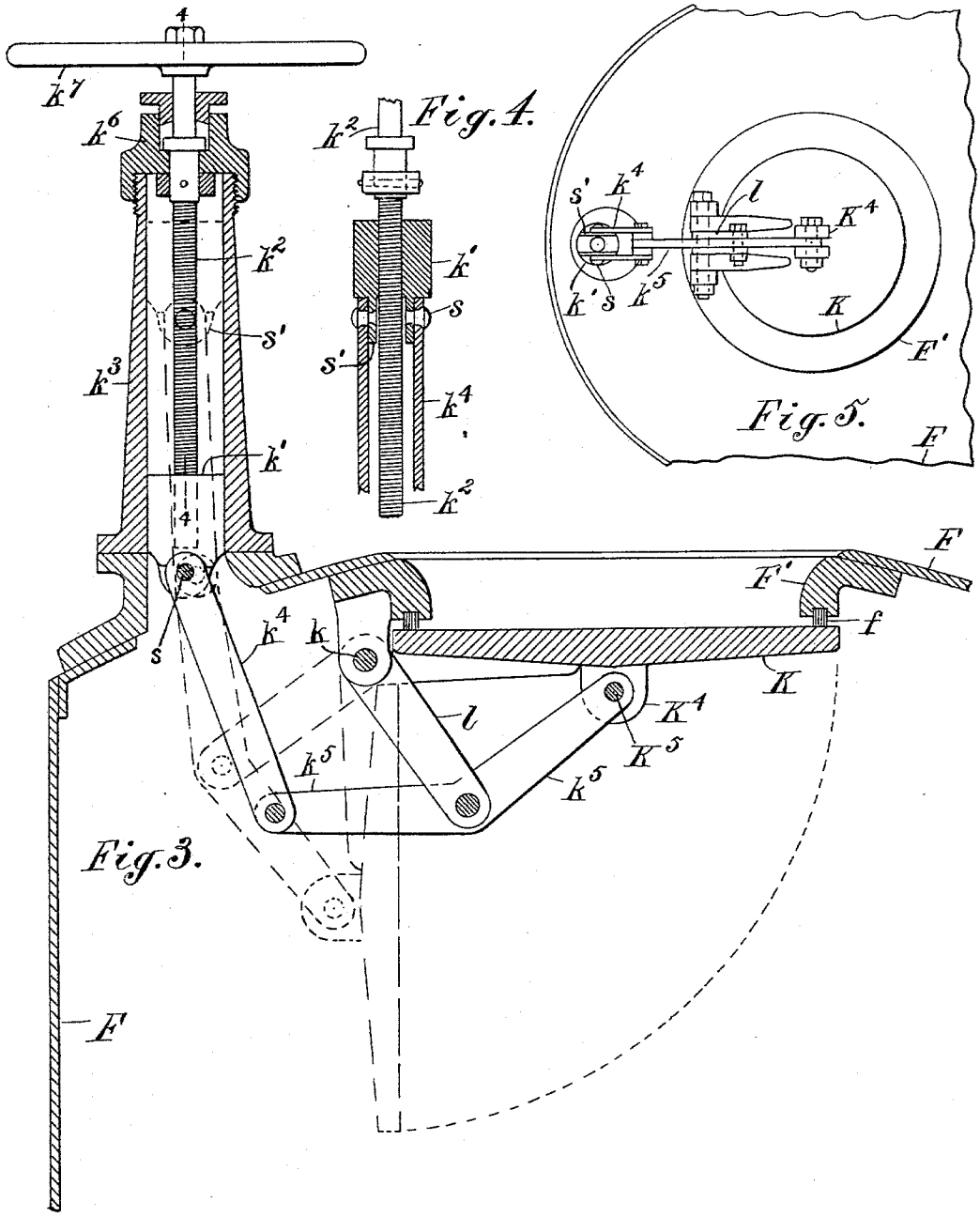

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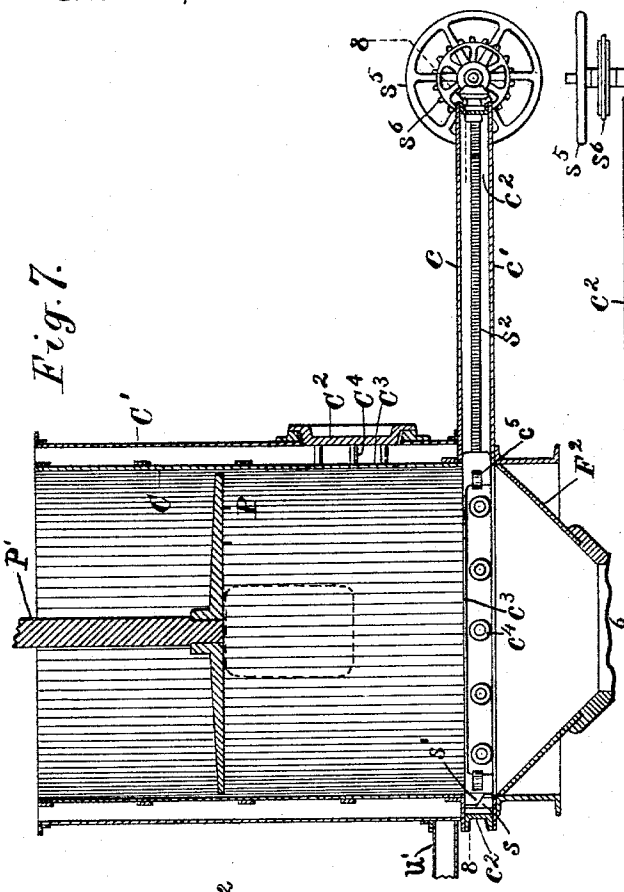

Fig. 7.

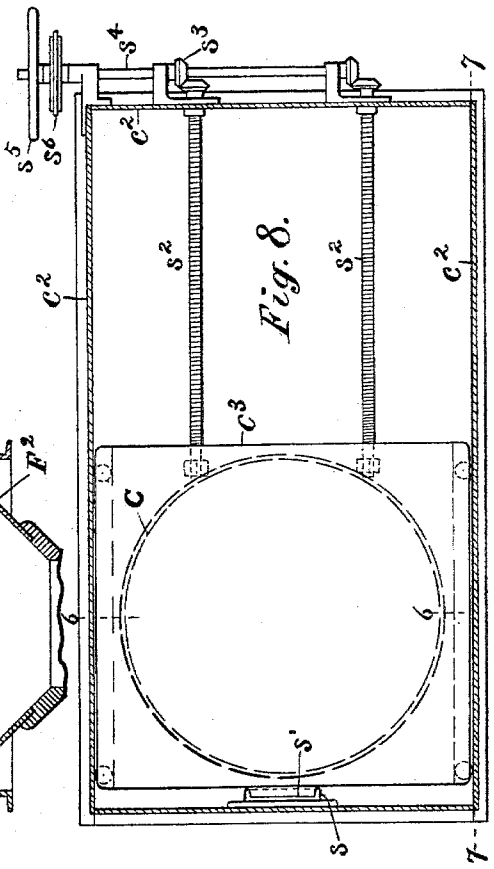

Fig. 8.

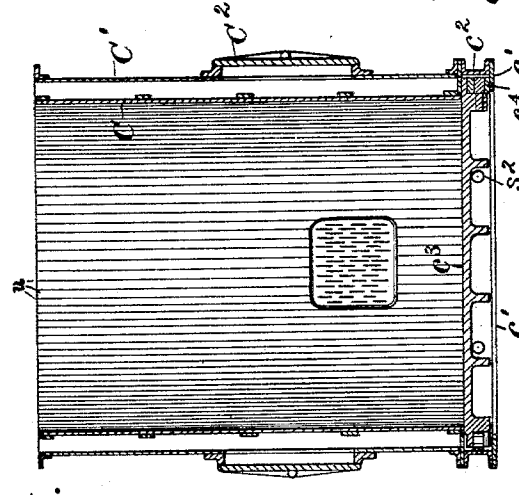

Fig. 6.

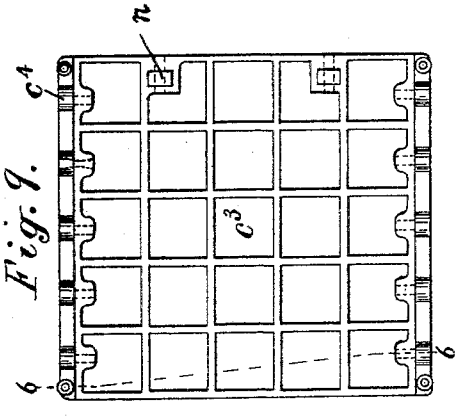

Fig. 9.

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Fig. 12.

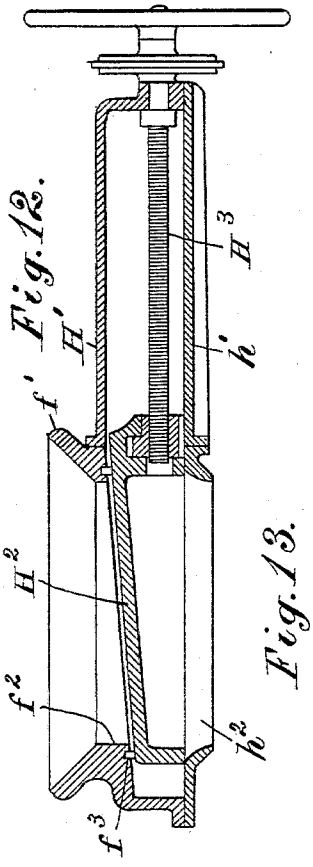


Fig. 15.

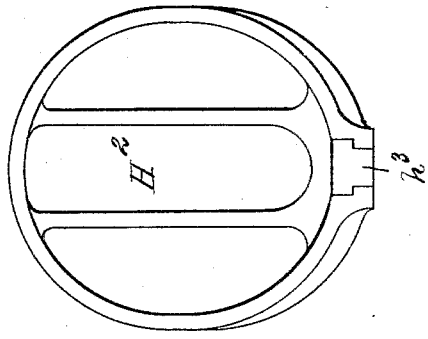


Fig. 13.

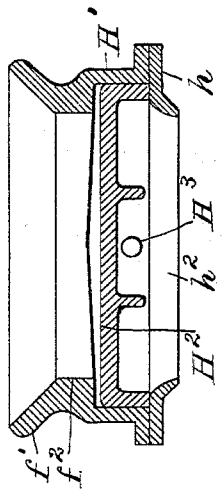


Fig. 14.

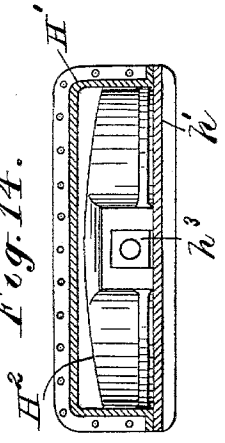


Fig. 10.

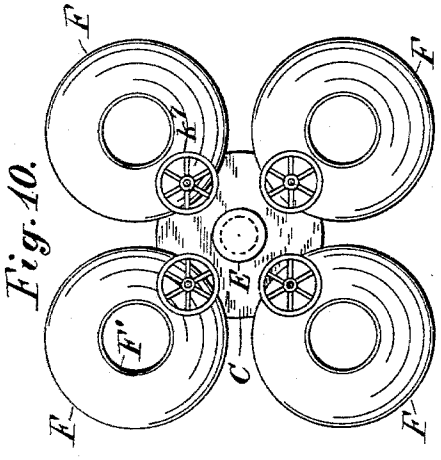
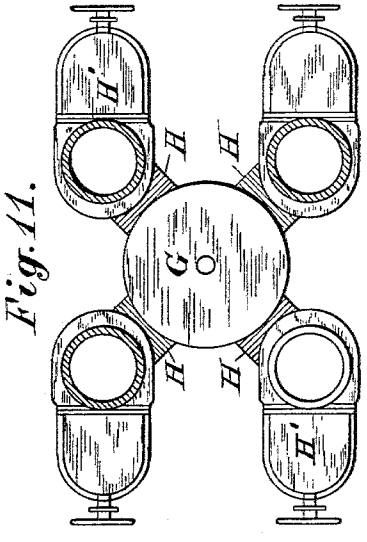


Fig. 11.



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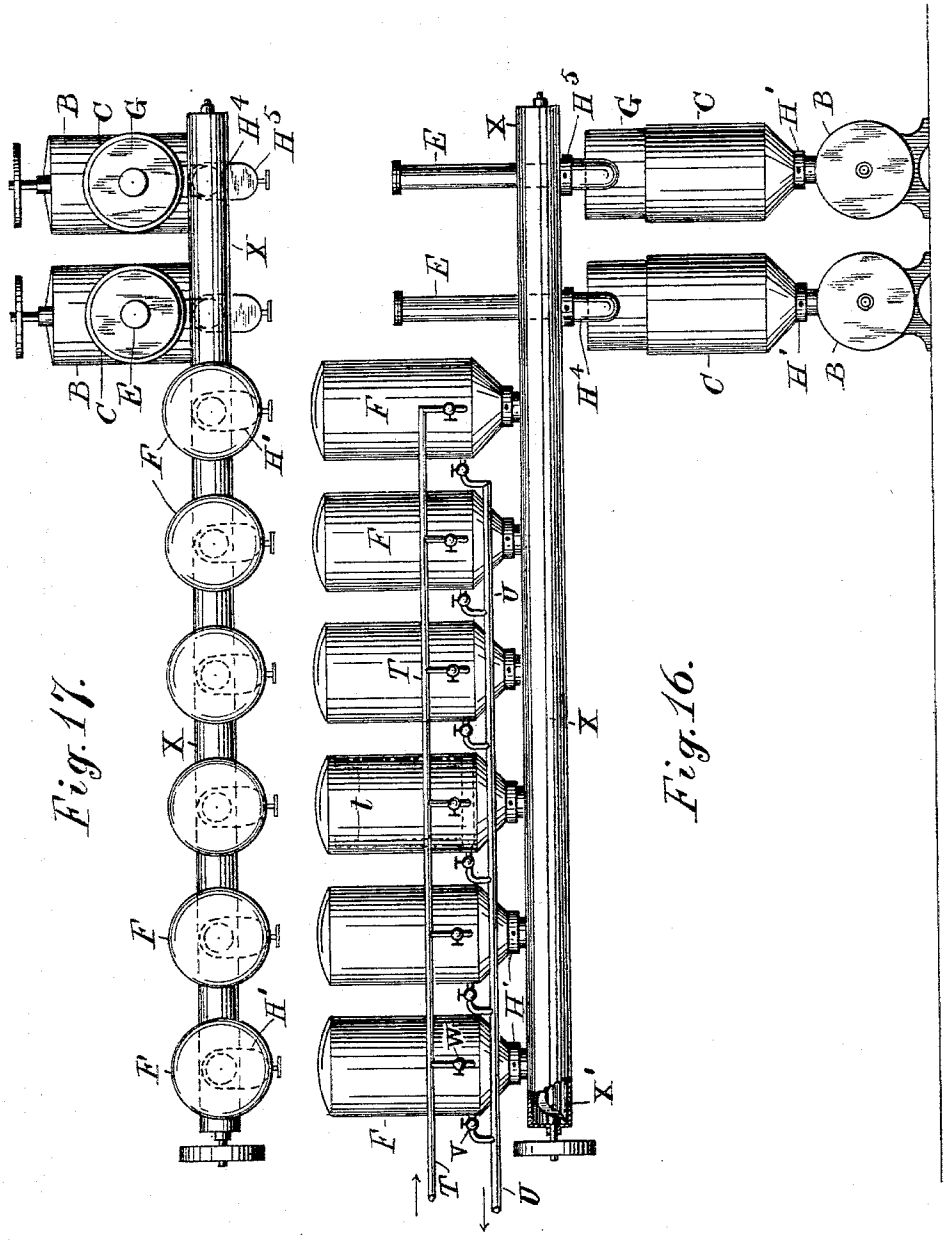

Fig. 17.

Fig. 16.

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UNITED STATES PATENT OFFICE.

CYRUS C. CURRIER, OF SUMMIT, NEW JERSEY.

APPARATUS FOR TREATING GARBAGE.

SPECIFICATION forming part of Letters Patent No. 593,198, dated November 9, 1897.

Application filed December 11, 1896. Serial No. 615,258. (No model.)

To all whom it may concern:

Be it known that I, CYRUS C. CURRIER, a citizen of the United States, residing at Summit, county of Union, State of New Jersey, have invented certain new and useful Improvements in Systems of Apparatus for Treating Garbage, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The present invention relates to such apparatus as is used for pressing and drying the material cooked in a series of rendering-tanks without discharging any noxious gases into the atmosphere. It requires much less time to press or dry the material than to cook the same, and it has therefore been common to press in a single press-curb the material drawn from several rendering-tanks; but the present apparatus furnishes a means of completely treating the material from a number of rendering-tanks in a single press-curb and drier by tightly closing all the receptacles and connecting them all by air-tight pipes and valves, each receptacle being preferably provided with a separate vacuum-pipe to draw off the vapors or gases independently.

My invention also includes means for operating a series of rendering-tanks with any one of several press-curbs and driers.

The invention will be understood by reference to the annexed drawings, in which—

Figure 1 is a side elevation of the apparatus. Fig. 2 is an end elevation of the same with the body of the drying-cylinder broken away near the inlet and one of the outlets to show the mechanism for working the outlet-valve. Fig. 3 is a central section of the apparatus for operating the valve in the top of one of the rendering-tanks. Fig. 4 is a section of the piston and links in such apparatus upon line 4 4 in Fig. 3. Fig. 5 represents in plan the under side of the valve and its actuating mechanism with a part of the tank-head. Fig. 6 is a section of the press-curb on line 6 6 in Figs. 8 and 9. Fig. 7 is a section on line 7 7 in Fig. 8. Fig. 8 is a plan of the press-curb gate with its chamber in section just above the shifting screws and the shell of the curb C represented in dotted lines. Fig. 9 shows the gate itself inverted. Fig. 10 is a plan of the rendering-tanks and hydraulic press. Fig. 11 is a plan of the apparatus, taken in section on line 11 11 in Fig. 2. Fig. 12 is a central vertical section of one of the rendering-tank valves. Fig. 13 is a cross-section of the same on line 13 13 in Fig. 12. Fig. 14 is a cross-section on line 14 14 in Fig. 12, and Fig. 15 is a plan of the valve detached from the piston. Fig. 16 is an elevation, and Fig. 17 a plan, of a battery of press-curbs.

The drawings represent apparatus of large size having rendering-tanks adapted each to cook many tons of garbage at once, and it is therefore erected in a building provided with floors A A′ A^2 A^3.

Referring to Figs. 1 and 2, the drying-cylinder B is supported upon the lower floor A, and the press-curb C is arranged directly over the same and connected therewith by gate D. A hydraulic cylinder E is supported above the press-curb, and four rendering-tanks F are arranged around the hydraulic cylinder and connected with a hood G upon the top of the press-curb by inclined pipes H, provided each with a horizontally-sliding gate, of which the casing H′ is shown in Figs. 11 and 12. The parts when of the capacity described are very heavy, and a suitable frame J is shown supporting the parts in the proper relation. The floor A^3 is arranged even with the tops of the rendering-tanks, and the filling-inlet in the top of each is made flush with the floor, as shown in Fig. 3, so that the material when hoisted to such floor may be dumped thereon and shoveled directly into the tanks. With this arrangement the rendering-tanks are filled successively at suitable intervals and the contents of each is discharged in succession to the press-curb, where it is pressed and the fluid drawn off. The material is then discharged from the press-curb into the drying-cylinder.

The time required for cooking the material is at least four times as long as that required for pressing or drying the same, and the single press-curb and drying-cylinder are therefore enabled to dry in succession the material rendered in the four tanks F. Each rendering-tank is provided in the top with a valve-seat F′, which projects inwardly from the inlet and is formed with a projecting ring of yielding packing *f*.

The valve K is hinged to a pivot k at one side of the seat and is actuated by a plunger k', which is reciprocated by a screw k^2 in a vertical box k^3 at one side of the pivot k. The valve is provided with an arm k^4, which is connected to the plunger by links k^5, and the screw is journaled in a bearing k^6 upon the top of the box k^3 and is provided with a hand-wheel k^7 or other suitable means to rotate the screw. The bearing k^6 is provided with a packing, and the valve is thus worked within the rendering-tank without causing the escape of any gases. The screw passes entirely through the plunger, which moves up and down upon the screw as the latter is rotated, and the links k^4 are pivoted to studs s, which are riveted in ears s' at opposite sides of the screw upon the bottom of the plunger. The valve is shown in dotted lines in its open position with the plunger k' drawn to the top of the box by the screw k^2. The downward movement of the plunger operates to force the links downward within the box and to push the arm and valve into the position shown in full lines, thus forcing the valve against the packing f upon the seat and tightly closing the inlet. The valve is formed with ears K^4, and the arm k^5 is jointed at its middle to the links l, so that when one end of the arm is forced downward by the plunger and link k^4 the other end of the arm may be pressed toward the valve and force it directly toward its seat. A bolt K^5 is shown passed through the inner end of the arm and the lugs K^4, which serves to open the valve positively when the plunger is raised; but such connection of the arm to the valve is not material, as the weight of the valve tends to open the same automatically.

The rendering-tanks are made of sheet metal, as boiler iron or steel, and each valve-casing H′ is provided with a flaring mouthpiece f' to fit a funnel F′ upon the bottom of each tank, as shown in Fig. 13. The valve H^2 is made of wedge shape to press upon the seat surrounding the inlet f^2 below the mouthpiece f', and the upper side of the valve is made with a smooth face to slip readily beneath the mass of heavy material in the rendering-tank. The under side is hollow and ribbed, as shown in Fig. 15, and its edges are made parallel with the movement of the valve and are supported and guided by a flat base-plate h', which is secured detachably upon the bottom of the casing and provided with a tapering outlet h^2, fitted to the pipe H, leading to the press-curb. The valve-outlet h^2 is larger upon its upper side than the inlet f^2 to prevent the material from lodging within the casing as it passes through the outlet.

A screw H^3 is journaled at one end of the casing to actuate the valve, and a nut h^3 is secured in the end of the valve in the usual manner to fit the same. By means of the flat base-plate h' and the fitting of the valve to slide thereon through its whole range of movement it is adequately supported beneath the heavy pressure of the material in the rendering-tank, which material crowds the valve downward not only when it is closed, but while it is being retracted.

The press-curb, as shown in Figs. 6 and 7, is formed of staves having intervening slots at their vertical joints to discharge the fluid when the material is pressed, and the curb is surrounded by a water-tight jacket C′, having manholes with covers C^2 to clean out the same. A manhole is also formed through the jacket and curb-cylinder, and closed by a tight cover C^2 upon the jacket, with a perforated section C^3 held flush with the interior of the curb by studs C^4. The curb and jacket are attached at the bottom to a rectangular plate c, which in turn is attached to a lower plate c' by a rectangular frame c^2, forming an air-tight gate-chamber within which a rectangular gate c^3 is fitted movably. The gate, like the valve H^2, is made smooth upon the upper side and ribbed beneath and is provided at each edge with bottom rolls c^4, which rest upon the plate c', and with side rolls c^5, touching the side frame c^2. Openings of the same size as the curb-cylinder are made through the pipes c and c', and the gate C^3 is made a little larger than such opening, thus affording it contact with the lower end of the curb and a bearing for the rolls c^4 at opposite edges of such opening. The rectangular frame is provided in one end with an inclined seat s, and the adjacent edge of the gate is provided with inclined lugs s', arranged to contact with the seat when the valve is closed and to crowd the same upward forcibly against the bottom of the curb to close the curb tightly. Two screws s^2 are shown journaled in the opposite end of the rectangular frame and fitted to nuts n upon the gate. The screws are connected by gears s^3 with a shaft s^4, having a hand-wheel s^5 and sprocket-wheel s^6 fitted thereon to rotate the screws by hand or by power.

A sheet-metal funnel F^2 is attached air-tight to the opening in the bottom of the gate-chamber, and a valve-casing H′, similar to those at the bottom of the rendering-tank, is attached by a flaring mouthpiece to the bottom of such funnel and its base-plate connected with the inlet B′ of the drying-cylinder. The press-curb is thus provided at the bottom with both a gate and a valve, the former having the full area of the curb-cylinder (at the bottom) to support the material during the pressing operation, but not making an air-tight joint with the bottom of the curb, which would be difficult to accomplish in a very large construction. As the valve connected with the drying-cylinder inlet B′ is made wedge shape, as illustrated in Fig. 12, it may be forced tightly against its seat or against a packing f^3, as shown in Fig. 12, to confine the vapors and gases tightly to the drying-cylinder during the drying operation, which in practice amounts to a destructive distillation of the material.

In gates for water-mains it is common to use a tapering or wedge-shaped valve; but such valves are not supported upon one side throughout the whole range of movement, as in the valves H^2, which are supported upon the base-plate H′ in my construction.

The valve-seat containing the packing f^3, as shown in Fig. 12, is in my construction inclined to the base-plate, so that the valve may move parallel with the base-plate and also wedge against the seat in its forward movement. The relation of the base-plate to the inclined seat and the formation of the valve with a plane surface upon the upper side adapts it especially to support a downwardly-pressing load of rough and heavy material, such as is operated upon in my construction.

A piston P, with piston-rod P′, is shown in the press-curb in Fig. 7, and the rod is shown in Fig. 2 extended through the top of the hood G into the hydraulic cylinder E, where it would be attached to the piston upon which the water-pressure operates. A valve-box d is shown connected with the opposite ends of the hydraulic cylinder by pipes d' and provided with a supply-pipe d^2 and waste-pipe d^3. The handle g of the valve is shown in Fig. 2 provided with a rod g', extended upward by the side of the box k^3 upon one of the rendering-tanks. These boxes carrying the hand-wheels K^2 upon the series of rendering-tanks are preferably arranged, as shown in Fig. 10, upon the inner quarters of the rendering-tanks, so that they may be readily reached by an operator standing between the same upon the floor A^3. The floor is omitted in Fig. 10, and as the boxes and the hand-wheels K^2 are the only objects which project from the rendering-tanks above the floor it is obvious that their arrangement in a central group permits the freest access to the inlets of the rendering-tanks from every side, thus permitting the garbage or other material to be dumped upon the floor A^3 and shoveled into the tanks without obstruction from the valve-closing mechanism, which can be readily actuated by a single operator, as also the handle for governing the hydraulic piston and the movement of the piston in the press-curb.

The cylinder B is shown in Fig. 1 provided with heads having stuffing-boxes b, through which a stirring-shaft B^2 is extended, and provided with cog-wheels and pulley B^3 to rotate the same. The drying-cylinder is shown surrounded by a steam-jacket B^3 to heat the contents, and the stirring-shaft is provided with mechanism for agitating the material and carrying heated pipes through the same, as described in Emil Holthaus's patent, No. 533,896, issued February 12, 1895. Such means consists of spiders b', carrying a series of longitudinal blades b^2 upon their periphery, and a series of longitudinal steam-pipes b^3, connected at each end by pipes o' with steam-passages o in the shaft. Steam inlet and outlet pipes M and M′ are connected by swivel-joints at the ends of the shaft with the passages o, thus forcing the steam through the pipes as they are moved in the material. Two outlets a are formed through the bottom of the cylinder, and manhole-covers a' are hinged at the sides of such outlets and provided each with a toothed segment a^2. A worm-shaft e is mounted in bearings a^3, adjacent to the segment, and provided with a worm e' to fit the segment and with a hand-wheel e^2 to rotate the same. The shaft projects at one side of the drying-cylinder, and the operator can thus actuate the hand-wheel and open and close the manholes without getting beneath the cylinder. A longitudinal channel N is formed beneath the outlets a, and carrier-chains n^2 are traversed through such channel upon driving-wheels n' and provided with an apron or buckets to carry away the material discharged from the drier.

A vacuum-pipe S, provided with cock S′, is extended from the top of each rendering-tank as well as from the top of the hood G and drying-cylinder B. The rendering-tanks are provided internally, as shown in one of the tanks in Figs. 16 and 17, with perforated stand-pipes t, having an annular connection at the bottom, to which a steam-pipe T is extended as well as a drain-pipe U. These pipes are provided, respectively, with cocks W and V.

The bottom of the jacket C′ around the press-curb is also provided with a drain-pipe U′, having cock V′. The jacket of the drying-cylinder is provided with steam inlet and outlet pipes T′. The vacuum-pipes serve, when connected with a condenser, to draw off the gases and vapors generated in the several receptacles. The steam-pipe T diffuses steam throughout the material in each rendering-tank during the cooking operation, and the steam is then cut off by cock W and the drain-pipe opened by means of cock V to draw off as much as possible of the liquid from the tank.

The operation of the apparatus shown in Figs. 1 and 2 is as follows: The garbage is elevated to the floor at the tops of the rendering-tanks, and the latter are filled successively at suitable intervals, as eight hours each, the valves K, H^2, and V being closed and the condenser connection S and steam-inlet T being opened. When the charge in each tank is cooked, the piston P is raised to the top of the hood upon the press-curb, and the gate of the curb being closed the valve H^2 is opened and the contents of the tank discharged into the curb through pipe H. The valve H^2 then being closed, the vacuum-pipe of the press-curb is opened and the drain-cock V′ closed, and the piston is depressed within the curb to force the liquid out of the material. When the material is pressed, the cock V′ is opened, and the liquid escapes through the apertures u in the curb-cylinder C and is discharged through the drain-pipe to a suitable receptacle. The pressing operation occupies but a short time, and the charge of

compressed material is then ready for discharge into the drying-cylinder. The latter being heated by the steam-jacket and the pipes b^3, the gate c^3 and the valve H^2 upon the drying-cylinder are then opened and the material is discharged into the cylinder, while the stirring-blades b^2 are rotated to distribute the same. The valve upon the cylinder is then closed, the vacuum-pipe opened to draw off the gases and vapors, and the stirring continued for several hours until the material is thoroughly dried, when the manhole-covers a' are opened by actuating the hand-wheels e^2 and the dried material discharged upon the carrier in the channel N. By making the press-curb and drying-cylinder of the same capacity as one of the rendering-tanks they are adapted to press and dry the material from all of the tanks as fast as the material can be cooked, as their work in treating each charge can be done in less than one-quarter of the time required to render or cook such charge.

It is obvious that if the drying-cylinder or press-curb were disabled four rendering-tanks, which are shown in Fig. 1 connected therewith, would be useless, and I have therefore in Figs. 16 and 17 illustrated an arrangement by which a large number of rendering-tanks may be connected at pleasure with any one of two or more press-curbs and drying-cylinders, thus enabling a large plant to work without interruption during the repairs or cleaning of any one of its parts. In these figures the rendering-tanks F are shown arranged in a row over a conveyer-box X, with the valve-casing H′ upon each tank connected to such box to discharge therein. Two drying-cylinders B, having each a press-curb C, are connected with the conveyer-box by pipes H^4, and the conveyer X′ within the box is operated to carry the material from any of the rendering-tanks to either of the press-curbs at pleasure. The pipes H^4 are provided each with a valve H^5 at its junction with the box X, and the reception of the material by either of the press-curbs or drying-cylinders is determined by opening the proper valve. Conveyers have long been used to transport material in any direction and to any elevation, and when a conveyer is used to connect the rendering-tanks with the press curb or curbs it is not essential that the press-curb should be placed below the level of the rendering-tanks. With this construction it is obvious that any of the tanks may be connected with either of the curbs or drying-cylinders, and the plant may thus be operated if either of the curbs or drying-cylinders is disabled by accident.

In a plant for large cities six or eight of the drying-cylinders would be furnished and forty or fifty of the rendering-tanks, each capable of holding several tons of material, and by the mode of connection just described the tanks may be operated without liability to interruption by accident.

Very great economy of operation is secured by the combination of a series of rendering-tanks with a single press-curb and drying-cylinder, as the operations are so nearly automatic that very few operators are required, and the operation is rendered entirely hygienic by connecting the parts with air-tight pipes and valves, so that the gases and vapors may be prevented from escaping into the atmosphere.

By providing the press-curb, rendering-tank, and drying-cylinder with separate vacuum-pipes for connecting them to a condenser the vapors generated in each of the receptacles can be drawn off separately when the same is tightly closed and thus disconnected with all of the others. Such a construction has been found essential to constitute an entirely odorless apparatus and completely prevents the escape of all offensive odors in all stages of the treatment.

With the apparatus thus far described the press-curb can only be charged when the cooking is completed in some particular rendering-tank, but the apparatus may be used to press and dry independent of the periods when such cooking is completed.

Where it is desirable, a storage box or receptacle common to all the rendering-tanks may be interposed between the same and the press-curb, so that the material may be discharged from the rendering-tanks whenever the cooking is completed, which permits the press-curb to be charged with the same and the pressing and drying effected at periods of time entirely independent of those at which the rendering is completed in a given tank. The conveyer-box X (shown in Fig. 16) serves as such storage-box, being represented of greater depth than the conveyer-screw X′, and would in practice be made of sufficient capacity to receive and retain the contents of one or more tanks. The screw is used to move the material from such box when filling one of the press-curbs.

The rendering-tank, the press-curb, and the drier are the necessary elements in treating the garbage to dispose of the same, but it will be obvious that the receptacles themselves and the pipes and valves do not need to be literally air-tight where the receptacles are connected with suitable condensing apparatus by the vacuum-pipes shown in the drawings, as the escape of noxious gases to the atmosphere is wholly prevented by the maintenance of a partial vacuum within the receptacles.

In practice the receptacles are all made water-tight to prevent the leakage of offensive liquids, and they are closed as tightly as possible during the treatment of the garbage, as the leakage of air into the receptacles through imperfect joints would greatly increase the

expense of maintaining the vacuum therein. The most perfect form of the apparatus is that in which all the joints are air-tight and the receptacles are hermetically sealed during the treatment of the garbage.

No claim is made herein to means for disposing of the liquids, gases, and vapors which are generated during the rendering and drying operations, as they form no part of the present invention.

Having thus set forth the nature of my invention, what I claim herein is—

1. An apparatus for treating garbage, comprising the press-curb C having perforated walls and an outlet at the bottom for the pressed material, the tight jacket C′ surrounding the same, with pipe to discharge the expressed fluid therefrom, the piston fitted to the curb with piston-rod extended upwardly therefrom, the cylindrical air-tight hood secured to the top of the curb with inlets upon its sides, and having on the top a stuffing-box fitted to the piston-rod, the hood being adapted to admit the piston above such inlets when retracted from the curb, means for reciprocating the piston, the series of rendering-tanks arranged above the hood, with funnel upon the bottom of each, and a valved outlet from the bottom of the funnel with pipe H connecting such outlet tightly with the inlet upon the side of the hood, the whole being adapted to charge the press-curb successively from the several rendering-tanks without opening the press-curb, or discharging any of the noxious gases, substantially as herein set forth.

2. An apparatus for treating garbage, comprising the press-curb C having perforated walls and an outlet at the bottom for the pressed material, the tight jacket C′ surrounding the same, with pipe to discharge the expressed fluid therefrom, the piston fitted to the curb with piston-rod extended upwardly therefrom, the cylindrical air-tight hood secured to the top of the curb with inlets upon its sides and top having stuffing-box fitted to the piston-rod, the hood being adapted to admit the piston above such inlets when retracted from the curb, means for reciprocating the piston, the series of rendering-tanks arranged above the hood with funnel upon the bottom of each, a valved outlet from the bottom of the funnel with pipe H connecting such outlet tightly with the inlet upon the side of the hood, the tops of the rendering-tanks being provided with filling-inlets, and a floor arranged at the tops of such tanks to support the material when filling the same, a valve fitted to open inwardly upon each tank-inlet, and a movable hand-wheel supported above the floor with connections for opening and closing each of said valves, as and for the purpose set forth.

3. In a rendering-tank having a filling-inlet with valve, the combination, with the valve-seat F, of the valve K hinged to pivot k at one side of the seat, and provided with an operating-arm, the vertical box k^3 upon the top of the tank adjacent to such pivot, a screw fitted within the box, and links connected with the arm upon the valve and actuated by the screw to open and close the valve, substantially as herein set forth.

4. In a rendering-tank having a filling-inlet in the top, the combination, with the valve-seat F, of the valve K hinged to pivot k at one side of the seat and provided with the link or links l with arm k^4 jointed thereon, the vertical box k^3 upon the top of the tank with stuffing-box k^6 at its upper end, a screw fitted within the box and journaled in the stuffing-box k^6, the plunger k' threaded upon the screw, and the links k^5 jointed to the arm k^4, the screw being provided with means for turning the same and thus reciprocating the plunger and opening and closing the valve, substantially as herein set forth.

5. An apparatus for pressing garbage, comprising the press-curb C having perforated walls with air-tight jacket C′ surrounding the same, and provided with pipe U′ to withdraw the expressed fluid, a cylindrical hood fitted air-tight to the top of the curb, and provided upon the side with inlet having air-tight pipe and valve to receive the material, and having its entire bottom open to discharge the compressed material, a piston fitted to the curb with piston-rod projected upward through the hood, and adapted to retract the piston within the hood above the inlet, and a gate for closing the entire bottom of the curb during the pressing operation, and afterward opening the entire bottom of the curb to discharge the pressed material, substantially as herein set forth.

6. In an apparatus for treating garbage, the combination, with a press-curb having perforated walls, of an air-tight jacket surrounding the same and having a pipe to withdraw the fluid, a hood fitted air-tight to the top of the curb with pipe and valve to receive the material, a piston with rod projected upward through the hood, a funnel below the curb, and a gate fitted to the bottom of the curb above the funnel, and adapted when retracted to open the entire bottom of the curb, as and for the purpose set forth.

7. In an apparatus for treating garbage, the combination, with a press-curb having perforated walls, of an air-tight jacket surrounding the same and having a pipe to withdraw the fluid, a hood fitted air-tight to the top of the curb with pipe and valve to receive the material, a piston with rod projected upward through the hood, an air-tight gate-chamber attached to the bottom of the curb, and projected at one side of the same, a funnel connected with the bottom of the gate-chamber, and a gate fitted to the bottom of the curb, and adapted when retracted to open the entire bottom of the curb, as and for the purpose set forth.

8. In an apparatus for treating garbage, the combination, with a cylindrical press-curb

having perforated walls, of an air-tight jacket surrounding the same, with pipe to discharge the fluid, the rectangular plate c attached to the bottom of the curb with the plate c' connected thereto by rectangular frame c^2, the openings through the plates in line with the bore of the curb, the rectangular gate c^3 fitted movably between the plates and provided with bearing-rolls c^4, a screw or screws s^2 journaled in the frame c^2, with nut or nuts to move the gate, and means for rotating the screw or screws to retract the gate, as and for the purpose set forth.

9. In an apparatus for treating garbage, the combination, with a cylindrical press-curb having perforated walls, of an air-tight jacket surrounding the same, with pipe to discharge the fluid, the rectangular plate c attached to the bottom of the curb with the plate c' connected thereto by rectangular frame c^2, the openings through the plates in line with the bore of the curb, the inclined seat s at one edge of the curb, the rectangular gate c^3 fitted movably between the plates and provided with bearing-rolls c^4, and with inclined lug s' to fit the seat s, and means, as the screw or screws s^2, to reciprocate the gate, as and for the purpose set forth.

10. In an apparatus for treating garbage, the combination, with a drying-cylinder having filling-inlet in the top and means for stirring the material, of the funnel F^2 attached to the inlet, the valve H^2 at the bottom of the funnel, and gate-chamber H′ attached to the top of the funnel, the press-curb attached to the top of the gate-chamber, with gate movable in the chamber and adapted when retracted to open the entire bottom of the curb in discharging the material to the drier, the gate-chamber and funnel being air-tight to transfer the material without the escape of gas and vapor, substantially as herein set forth.

11. In an apparatus for treating garbage, and comprising a drying-cylinder with press-curb mounted upon the top of the same and connected therewith, the combination, with the drying-cylinder having means for stirring the material, and outlet a from the bottom of the cylinder, of the manhole-cover a' hinged at the sides of said outlet, worm-gearing connected with said cover, to close it from the side of the drier, and a carrier movable beneath the outlet, to carry away the material when discharged from the outlet, as and for the purpose set forth.

12. In an apparatus for treating garbage, the combination, with a single press-curb and a piston movable therein, of an air-tight casing fitted to the top of the curb, a hydraulic cylinder sustained above the hood with piston-rod extended through the top of the same to the piston P of the press-curb, a series of rendering-tanks arranged about such hydraulic cylinder above the hood, and separately connected therewith by air-tight pipes and valves, a floor arranged at the tops of the rendering-tanks to support the material when filling the tanks, a valve fitted within each rendering-tank to close the inlet, the vertical boxes k^3 projected from the tops of a tank upon the contiguous quarters of the same and provided with means for actuating the valves and a valve-box with valve and pipes for controlling the movement of the fluid in the hydraulic cylinder, with a handle g' extended adjacent to the vertical boxes k^3, so as to be actuated by the same operator, substantially as shown and described.

13. In an apparatus for treating garbage, the combination, with the rendering-tank or press-curb having a funnel at the bottom, of the valve-casing H′ having the mouthpiece fitted to such funnel, the base-plate h' attached to the bottom of such casing, and provided with outlet h^2 below such mouthpiece, the wedge-shaped valve H^2 with screw to move it upon such base-plate, and a valve-seat inclined to the base-plate, the valve being thus supported upon the base-plate throughout its entire range of movement, as and for the purpose set forth.

14. An apparatus for treating garbage, comprising a tight conveyer-box, a series of air-tight rendering-tanks above the same with tight pipes and valves connecting them separately to the conveyer-box, a series of air-tight press-curbs connected with the conveyer-box by suitable air-tight pipes and valves, and a conveyer within the conveyer-box for transporting the material from any of said tanks at pleasure to any of said press-curbs, substantially as herein set forth.

15. In an apparatus for treating garbage, the combination, with a press-curb having a gate at the bottom adapted to sustain the material when pressing the same, of a drier with air-tight pipe and valve connecting it to the outlet of the press-curb, means for tightly closing the press-curb when charged, and vacuum-pipes for connecting the press-curb and drying-cylinder separately with a condenser to draw off the vapors, substantially as herein set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CYRUS C. CURRIER.

Witnesses:
THOMAS S. CRANE,
F. C. FOSTER.