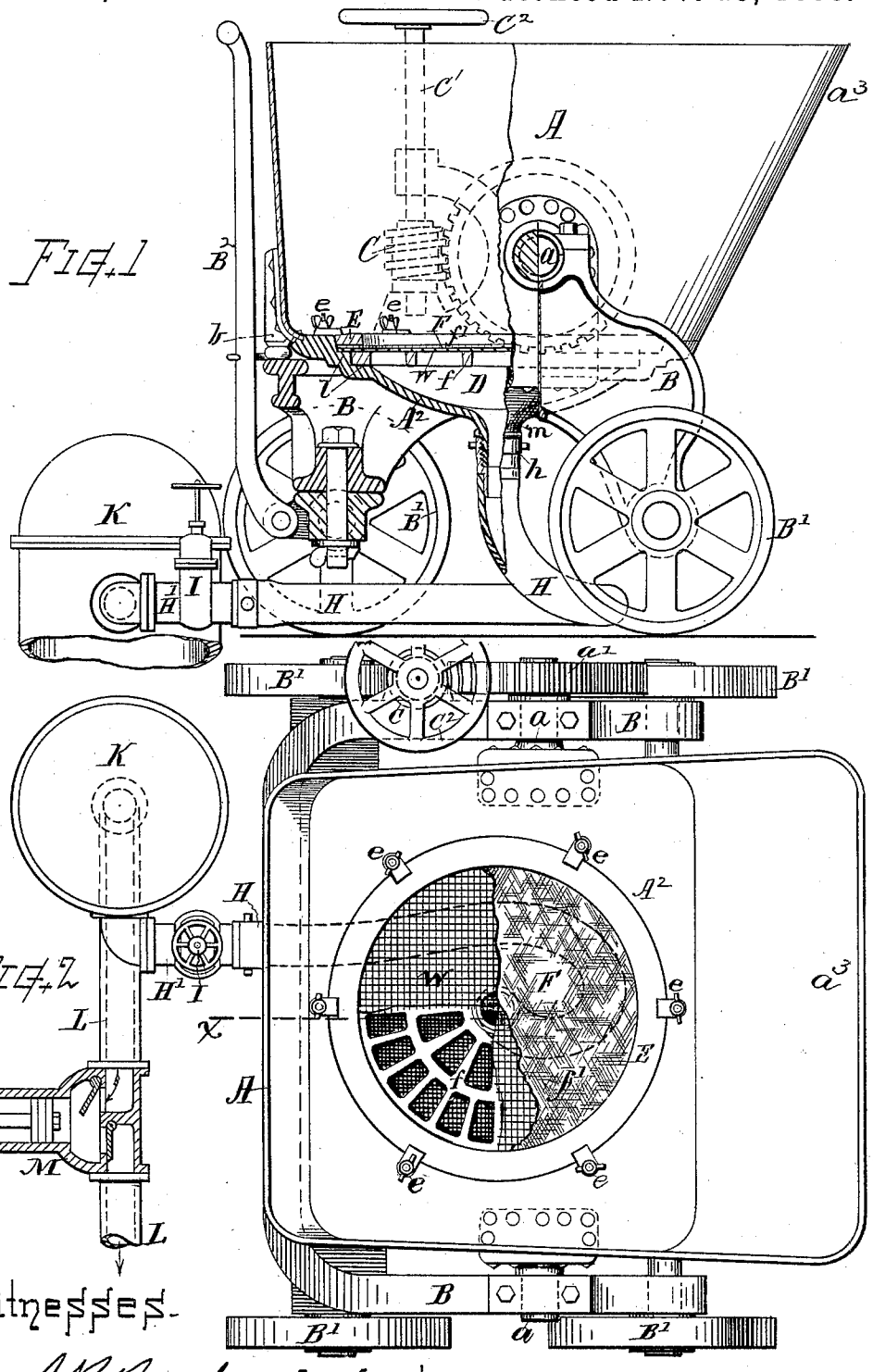
(No Model.)

J. G. HEYWOOD.

APPARATUS FOR TREATING SEWAGE.

No. 392,607. Patented Nov. 13, 1888.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR TREATING SEWAGE.

SPECIFICATION forming part of Letters Patent No. 392,607, dated November 13, 1888.

Application filed January 16, 1888. Serial No. 260,947. (No model.)

To all whom it may concern:

Be it known that I, JOHN G. HEYWOOD, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Sludge-Condensers for Treating Sewage and for Similar Purposes, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

The object of my present invention is to provide a convenient and efficient apparatus for use in the treatment of sewage and for similar purposes, for condensing semi-fluid sludge into a solid or earthy mass and to a comparatively dry condition by means of atmospheric pressure induced by mechanical exhaustion of the air and moisture therefrom, and in which the sludge-receptacle can be conveniently overturned for dumping or discharging the contents thereof.

Another object is to provide an apparatus for the purpose above set forth which is portable or furnished with trucks on which it can be moved from place to place, and also having facilities whereby the condenser-receptacle can be connected with and disconnected from the exhausting mechanism.

These objects I attain by the mechanism shown in the drawings and herein described, the particular subject-matter claimed being hereinafter definitely specified.

In the drawings, Figure 1 is an elevation (part side and part section at line *x*, Fig. 2) showing my improved sludge-condensing mechanism, and Fig. 2 is a plan view of the same.

My improved sludge-condensing apparatus consists of a tank, tub, or open receptacle, A, mounted upon a supporting-frame, B, by means of trunnions *a*, fixed to its sides. Upon one of the trunnions is secured a gear-wheel, *a'*, that meshes with a worm, C, on a shaft, C', that turns in bearings supported on the frame B, and which is provided with a hand-wheel, C^2, by which the shaft, worm, and gear can be revolved and the receptacle thereby inverted or overturned.

The receiving-tank A has a chamber, D, in its bottom, between which and the interior of the receptacle is arranged a close pervious separating-plate, F, which in the present instance consists of a rigid supporting grating, *f*, a wire-netting, *w*, and a top sheet of fibrous material, *f'*, herein shown as made of circular form and confined upon ledges *l*, formed on the bottom casting, A^2, around the chamber D by means of a binding-ring, E, and screw-connected clamps *e*, arranged to confine the parts securely in place, while permitting their ready removal when desired. Other than circular form may be adopted for the suction-chamber D and separating-plate F when desired.

The supporting-frame B can be made stationary, if desired, or, as herein shown, provided with truck-wheels B'. A tongue, B^2, is arranged in connection therewith for moving the receptacle from place to place. In the bottom A^2 there is provided a coupling-boss, *m*, to which is coupled a flexible pipe, H, which extends to and is connected with an exhauster, K. A gate, I, is arranged in the connecting-section H' for opening and closing the passage through the pipe H. From the lower part of the exhauster a pipe, L, is arranged for carrying off water and air, (either or both,) and suitable pumping mechanism, M, is combined therewith, which serves, when working the apparatus, to create a partial vacuum within the exhauster K. The flexible pipe H can be readily attached to or detached from the bottom of the receptacle by means of the coupling *h*, which is screwed to the boss *m* in the manner of an ordinary hose-coupling.

The receptacle, which is formed open at the top, can be made with sheet-metal sides and a cast-metal bottom. It is preferably shaped outwardly inclined at one side, as at a^3, and provided with a stop or lug, *b*, at its opposite side, that rests upon the supporting-frame when the receptacle is in upright position. The outwardly-inclined side facilitates the discharge of the contents when the receptacle is overturned upon its trunnions.

In cases where it is most convenient or desirable to have the condensing-receptacles located at permanent positions the truck-wheels can be omitted and the frame which carries the trunnion-bearings be made to rest on solid foundation.

In the operation the sludge in semi-liquid condition is placed within the receptacle A,

nearly filling it, or in such quantity as may be desired. The receptacle then being connected to the exhauster K by the pipe H, coupled thereto, the gate I is opened, and the air from the chamber D is drawn out by the exhaustive action, and a partial vacuum is formed in said chamber D, thereby inducing atmospheric pressure upon the mass of sludge, condensing and pressing it together, while the moisture and air contained therein are sucked or drawn through the pervious separating-plate F into the suction-chamber and thence pass through the pipe H into the exhauster K to be discharged through the pipe L. When the condensing operation has been carried to the desired degree, the gate I is closed and the contents removed from the receiver by rotating or tipping it on its trunnions *a*, which can be done by turning the hand-wheel and screw that engages the gear fixed on one of said trunnions.

The flexible pipe permits the overturning of the receiver without uncoupling it from the exhauster when it is not required to shift the position to any great distance. When it is desired to remove it to some distant position before overturning it, the pipe H can be uncoupled from the boss *m* and the receptacle then hauled on its truck B to the desired position for discharging the contents.

I am aware that the condensation of peat for fuel by exhaustion of air from a containing-chest has been described in a foreign patent, and I do not therefore herein broadly claim apparatus for effecting condensation by exhaustion otherwise than such as shown and described.

In another application for Letters Patent, Serial No. 260,945, I have described a sludge-condenser, such as herein claimed, as employed in connection with other mechanisms in a plant for treating sewage. It will therefore be understood that the claims in this my present case embrace features of construction appertaining to the sludge-condenser itself, while the claims in my other application embrace the combination of the sludge-condenser with other mechanisms.

What I claim as of my invention, and desire to secure by Letters Patent, is—

1. The combination of the tank A, provided with trunnions *a* and having the suction-chamber D, with the coupling-boss *m* and pervious separating-plate F, as shown, and the supporting-frame B, provided with trunnion-bearings for supporting said tank, the worm-screw C, arranged in connection with said frame, and gear *a'* on the tank-trunnion, all substantially as and for the purpose set forth.

2. The condensing-tank A, having trunnions *a* and provided with the suction-chamber D and pervious separating-plate F, as shown, in combination with the frame B, having truck-wheels B' and trunnion-bearings whereon said tank is pivotally supported, the tilting-gear *a'* on one of said trunnions, the worm-screw C, and operating-shaft C', for overturning said tank, and the exhauster connecting-pipe H, all constructed and arranged for operation as herein shown and described.

3. The combination, with the receptacle A, its bottom having the suction-chamber, with an attaching-boss for the connection of an exhaust-pipe, of a removable separating-plate, F, composed of the grating *f*, netting *w*, and fibrous sheet *f'*, arranged across the bottom, supported on the ledge *l*, and confined by the removable annular fastening-rim E and screw-threaded clamps *e*, substantially as set forth.

Witness my hand this 7th day of January, A. D. 1888.

JOHN G. HEYWOOD.

Witnesses:
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