A. MARTIN & A. WHITCOMB.

MACHINE FOR TREATING SEWAGE, REFUSE, OR THE LIKE.

APPLICATION FILED FEB. 26, 1908.

981,445. Patented Jan. 10, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

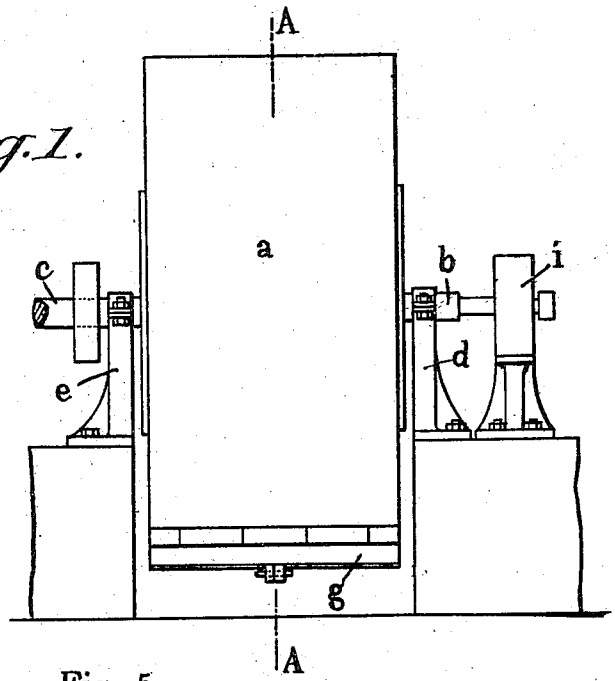
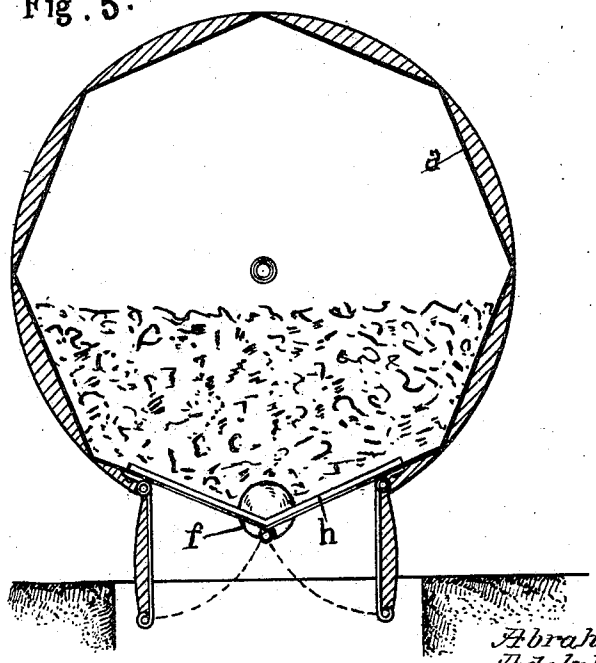


Fig. 5.



WITNESSES:

W. M. Avery

J. P. Davis

INVENTORS

Abraham Martin

Adolphe Whitcomb

BY Munn & Co

ATTORNEYS

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2 SHEETS—SHEET 2.

Fig. 2.

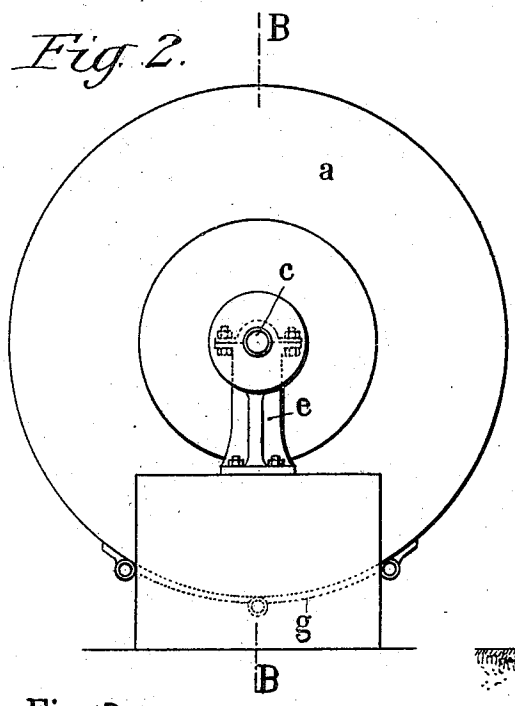


Fig. 4.

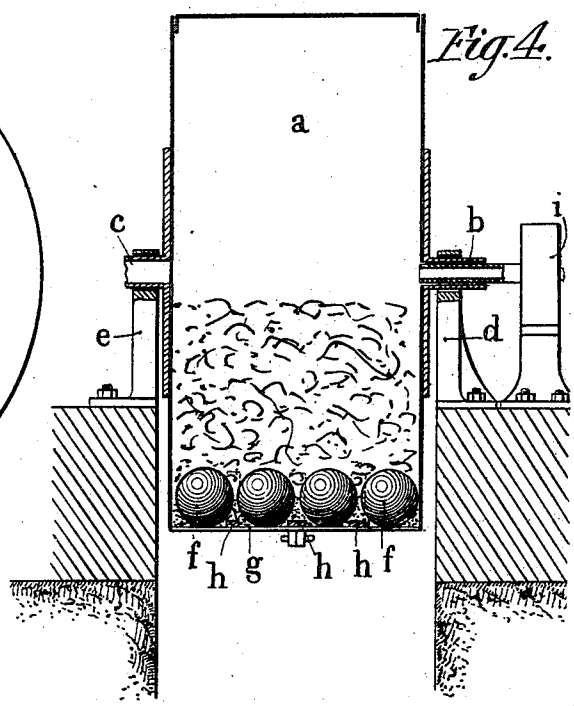


Fig. 3.

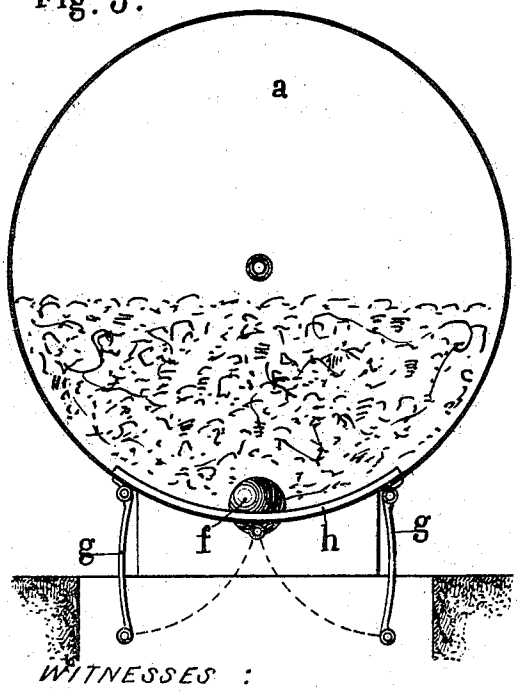
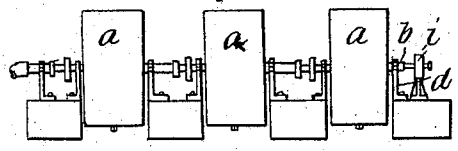


Fig. 6.



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J. P. Davis

INVENTORS
Abraham Martin
Adolphe Whitcomb
BY
Munn & Co
ATTORNEYS

UNITED STATES PATENT OFFICE.

ABRAHAM MARTIN AND ADOLPHE WHITCOMB, OF PARIS, FRANCE.

MACHINE FOR TREATING SEWAGE, REFUSE, OR THE LIKE.

981,445. Specification of Letters Patent. Patented Jan. 10, 1911.

Application filed February 26, 1908. Serial No. 417,830.

To all whom it may concern:

Be it known that we, ABRAHAM MARTIN, of 131 Rue du Faubourg Saint-Denis, mechanical engineer, and ADOLPHE WHITCOMB, of 35 Avenue Hoche, landlord, both in the city of Paris, Republic of France, have invented a Machine for Treating Sewage, Refuse, or the Like, of which the following is a full, clear and exact description.

The present invention relates to a machine for the treatment of sewage, refuse or the like, and has for its object to break up the materials under treatment, to pulverize them, to work them up and to dry them without permitting the escape of bad smells or odors.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a machine constructed according to the present invention. Fig. 2 is an end elevation thereof. Fig. 3 is a vertical transverse section taken on the line A—A of Fig. 1. Fig. 4 is a vertical longitudinal section taken on the line B—B of Fig. 2. Fig. 5 is a similar view to Fig. 3 illustrating a modification. Fig. 6 is an elevation showing a number of drums arranged in series, the view being on a reduced scale.

In the several figures like parts are indicated by similar letters of reference and all said figures are drawn to an equal scale.

Referring to the drawings, the machine comprises a rotatable drum *a* having interiorly a cylindrical form as shown in Fig. 3 or a prismatical form as shown in Fig. 5 and provided with hollow trunnions *b c* mounted in bearings carried by two standards *d e*. Within this drum are arranged heavy weights *f* each constituted, for example, by a hollow cast iron ball loaded with lead or other heavy material of any desired weight.

In the periphery of the drum is formed an opening for charging and discharging the machine and this opening is normally kept closed by a door *g* having two leaves for example.

The weights *f* are retained within the drum in the open position of the door *g* by bars *h* as shown in Figs. 3 and 5.

The trunnion *b* is connected to a fan *i* which drives air (if desired saturated with an antiseptic) into the interior of the drum *a*, while the apparatus in in operation. The second trunnion *c*, from which the air which traverses the drum *a* issues, is connected to the air admission trunnion of a second drum identical with the drum *a*, while the trunnion at which the air issues from this second drum is connected with the air admission trunnion of a third drum and so on. The air exit trunnion of the last drum may be connected by a conduit, with any suitable firegrate.

The materials to be treated; sewage, refuse or the like, are shot into each drum, the door *g* being opened, through a hopper beneath which is brought into position the opening of the drum which latter is held in that position by any suitable arresting means. When the charging operation is completed the door *g* is closed and the apparatus put in action. In consequence of the movement of rotation imparted to the drum *a*, the weights *f* constantly roll upon the interior of the latter, crushing beneath them the material which carried around in the movement of rotation of the drum is constantly thrown in front of the weights. By its successive passages under the weights *f*, the material is broken up and finally pulverized. During the operation of breaking up, the fan *i* drives air through the trunnion *b* into the interior of the drum, and thus air passes through the moving materials, dries them, draws with it the combustible gases and bad odors and separates the materials during their treatment, and said air and the gases drawn with it leave by the trunnion *c* as above pointed out. The duration of the operation will be about 30 minutes, but it will be understood that this time should be modified according to the materials to be treated. When the operation is concluded the drum *a* is arrested in the position represented in the drawing, the door *g* is opened and the material which has been pulverized, dried, and deprived of its bad odors is discharged.

The apparatus is economical and hygienic; since on the one hand, it effects, at one operation by a very simple arrangement the breaking up, pulverization, drying and deodorization of the materials while on the other hand, the germs of fermentation and the gases separated from the materials during treatment cannot be diffused into the atmosphere of the works but are carried away and burned as above pointed out.

Under these conditions the atmosphere of the works is not infected as is at present the case with works where refuse is treated.

The machine may be constructed in any form or of any dimensions and the details of construction thereof may be modified according to its applications.

We claim—

1. An apparatus for treating sewage, refuse and the like, comprising a rotatable drum, weights within the drum, means for introducing cold air into the drum for the purpose of cooling the matters to be treated and causing this cold air to circulate through the drum while the latter is rotating for the purpose of freeing the matters from any bad odor and germs of fermentation, the said drum being provided with an opening in its periphery, a door normally closing said opening, and means for retaining the weights within the drum, when the door is in the open position.

2. An apparatus for treating sewage, refuse and the like, comprising a rotatable drum containing heavy balls, means for rotating the drum, a fan for passing a continuous current of air through the drum while the latter is rotating, the drum being provided with an opening in its periphery for the admission and discharge of the material, a door normally closing said opening, and bars at said opening for retaining the balls within the drum.

3. An apparatus for treating sewage, refuse and the like, comprising a rotatable drum provided with hollow trunnions, one of said trunnions being an air inlet trunnion, and the other trunnion being an air exit trunnion adapted for connection with a fire grate, bearings in which the trunnions are mounted to turn, heavy balls within the drum, a fan connected with the air inlet trunnion, the said drum having an opening in its periphery for the admission and discharge of the material, a door normally closing said opening, and means for retaining the balls in the drum when the door is in the open position.

4. An apparatus for treating sewage, refuse and the like, comprising a rotatable drum, heavy balls within the drum, the drum being provided with hollow trunnions, supports provided with bearings in which the trunnions are mounted to turn, and a fan connected with one of said trunnions for forcing cold air into the interior of the drum for the purpose of cooling the matters to be treated and causing this cold air to circulate through the drum while the latter is rotating for the purpose of freeing the matters from any bad odor and germs of fermentation, the air passing from said drum by way of the other trunnion.

5. An apparatus for treating sewage, refuse and the like, comprising a series of drums, heavy balls within the drums, the drums being provided with hollow trunnions mounted to turn in suitable bearings, and a fan connected with one of the trunnions of the first drum of the series, the trunnions of the said drums being connected whereby the air passes successively into and through the said drums, the air exit trunnion of the last drum being adapted for connection with a fire grate.

6. An apparatus for the treatment of sewage, refuse and the like, comprising a rotatable drum presenting a polygonal internal surface, heavy balls moving freely therein, and means for introducing cold air into the interior of the drum for the purpose of cooling the matters to be treated and causing this cold air to circulate through the drum while the latter is rotating for the purpose of freeing the matters from any bad odor and germs of fermentation.

7. An apparatus for the treatment of sewage, refuse and the like, comprising a rotatable drum presenting a polygonal internal surface and containing heavy balls adapted to move freely therein, means for passing a current of air through the drum, the said drum being provided with an opening in its periphery for the admission and discharge of the material, a door for normally closing said opening, and means at said opening for retaining the balls within the drum when the door is open and the drum is in the discharging position.

The foregoing specification of our machine for treating sewage, refuse or the like signed by us this 11th day of February, 1908.

ABRAHAM MARTIN.
ADOLPHE WHITCOMB.

Witnesses:
FERNAND MARTIN,
MAURICE H. PIGNET.