

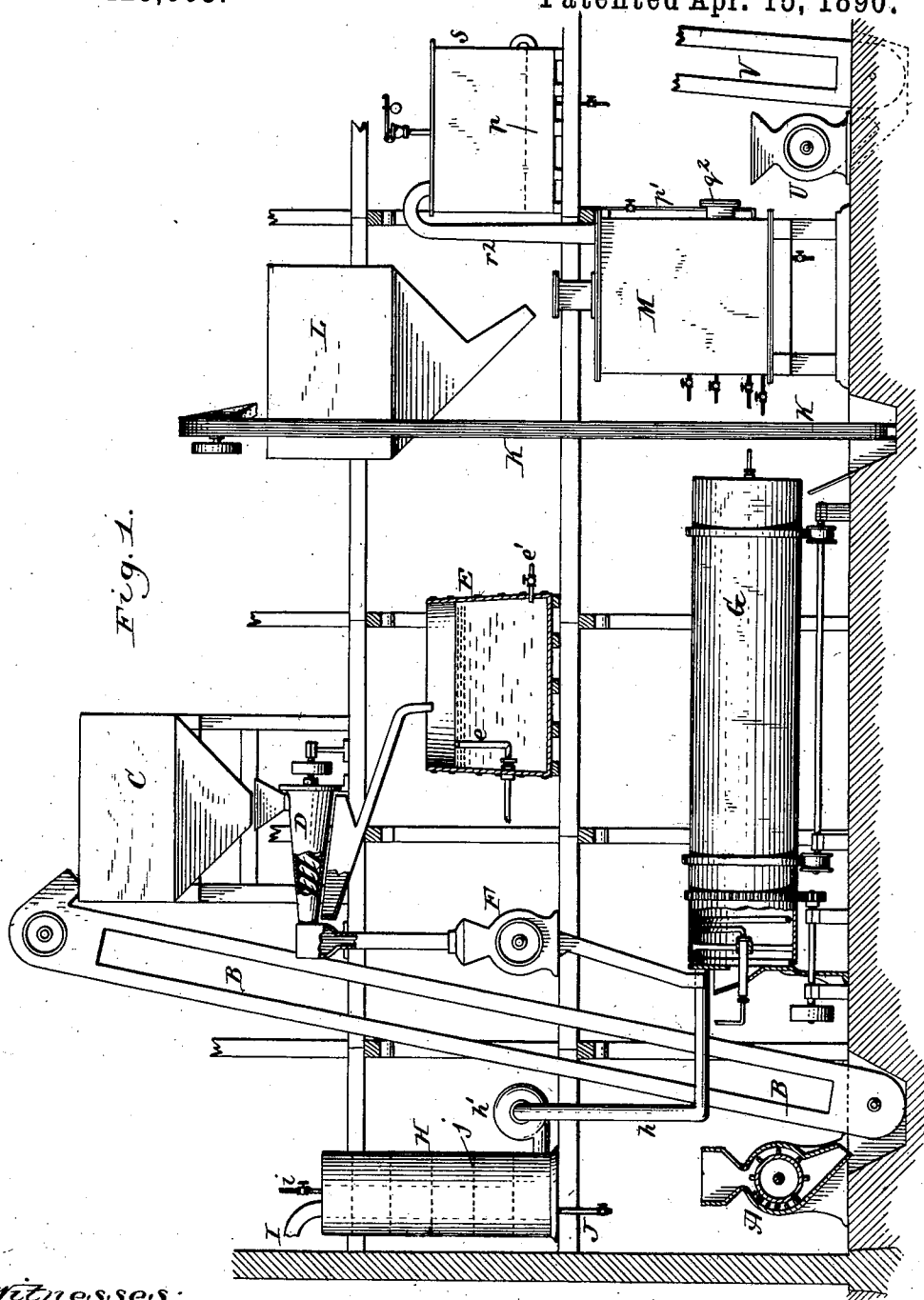
(No Model.)

2 Sheets—Sheet 1.

G. FLEISCHMAN.
PROCESS OF TREATING KITCHEN GARBAGE.

No. 425,603.

Patented Apr. 15, 1890.



Witnesses:

Chas. J. Buchheit.
Emil. J. Neuhart.

Gus. Fleischman Inventor.
By Wilhelm P. Pomeroy.
Attorneys.

(No Model.)

2 Sheets—Sheet 2.

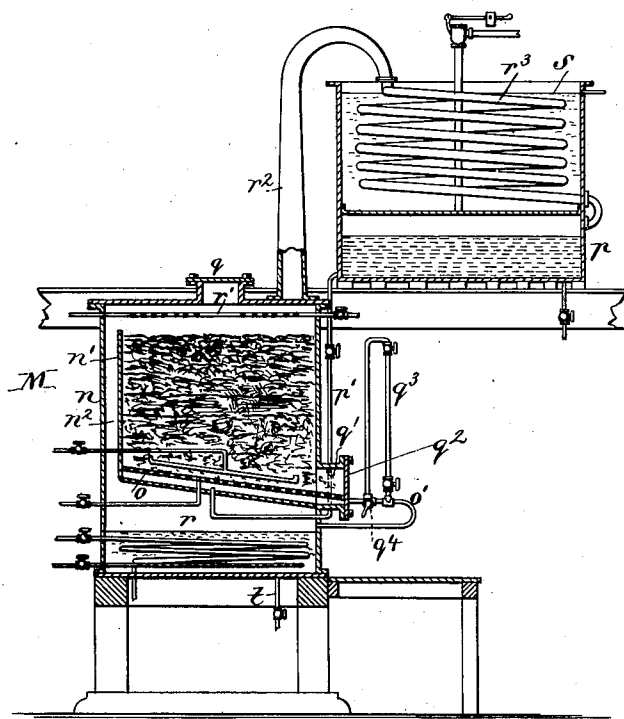
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Fig. 2.



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UNITED STATES PATENT OFFICE.

GUSTAV FLEISCHMAN, OF BUFFALO, NEW YORK.

PROCESS OF TREATING KITCHEN GARBAGE.

SPECIFICATION forming part of Letters Patent No. 425,603, dated April 15, 1890.

Application filed December 19, 1889. Serial No. 334,248. (No model.)

To all whom it may concern:

Be it known that I, GUSTAV FLEISCHMAN, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in the Method of Treating Kitchen Garbage, of which the following is a specification.

This invention relates to a method of disposing of kitchen garbage in cities, and has the object of converting the garbage economically into grease and a dry fertilizer, so that the garbage is worked up into useful and valuable products, whereby the removal and disposition of the garbage is rendered inexpensive and even profitable, instead of involving considerable expense as heretofore.

My invention consists of the improved method of treating garbage, which will be hereinafter fully set forth, and pointed out in the claims.

In the accompanying drawings, consisting of two sheets, Figure 1 represents a sectional elevation of an apparatus which is preferably used in practicing my invention. Fig. 2 is a sectional elevation of the extractor.

Like letters of reference refer to like parts in both figures.

A represents a comminuting or reducing machine, into which the garbage is fed before being further treated, and in which the various constituents of the garbage, which differ widely in size, are cut up or reduced to the same degree of fineness, so that the subsequent treatment will affect all constituents alike, which is not the case when the constituents are treated in the form in which they are collected. I prefer to use for this purpose a machine which consists, essentially, of a rotating cylinder armed with teeth and a concave, also provided with teeth. The machine is provided with a feed-hopper above the cylinder and concave and a discharge-chute below the same.

B represents an elevator, which receives the comminuted garbage and elevates the same to a receiver C in one of the upper stories of the building.

D is a pressing-machine, which receives the comminuted material from the receiver C, and whereby the bulk of the moisture is removed from the material by pressure. The

separated moisture collects in a tank E, which is provided with an adjustable pipe *e*, through which the grease is skimmed off, which is expressed with the moisture, while the water is drawn off through a pipe *e'*. I prefer for this purpose a pressing-machine which has a continuous operation, and in which a rotating tapering pressure-screw is arranged in a tapering perforated case and the wet material is fed into the case at the large end and the partially-dried material escaping at the small end.

F represents a secondary comminuting or reducing machine, which receives the partially-dried material from the pressing-machine, and which disintegrates or comminutes this compacted material and breaks it up and loosens it preparatory to drying the same. I prefer to employ for this purpose a machine similar to that which is used for the first reduction and represented at A in the drawings.

G represents a drier, in which the residue of moisture still contained in the material is removed by the application of heat. I prefer for this purpose a drier consisting of a rotating shell which is provided with an internal steam-coil, and which receives the partially-dried material at one end and discharges the dried material at the other end.

H represents a condenser, to which the vapors and gases liberated in the drier are conducted by a pipe *h* and a suction-fan *h'*. The condenser is provided with a water-supply pipe *i* and with a series of perforated diaphragms *j*, which spray the water. The gases and vapors are purified in passing through the condenser and escape through the pipe *l*, while the water which has absorbed the noxious gases and vapors escapes through the pipe *J*.

The material is discharged from the drier G in a thoroughly-dried condition, and is elevated by an elevator K to a receiver L, from which it is delivered into an extracting apparatus M, in which the grease or fatty matter is extracted by a volatile solvent—for instance, benzine. I prefer for this purpose an apparatus of the following construction, and which is represented in Fig. 2.

n represents an outer closed vessel, and *n'* an inner open vessel, which is separated from the outer vessel by a space *n²*. The inner

vessel n' is provided with a perforated bottom o , and a communication is formed between the inner vessel below the perforated bottom and the lower portion of the outer vessel by means of a pipe o' .

p is the benzine-tank, and p' the pipe whereby the benzine or other solvent is conducted from the tank p to the inner vessel n' . The outer closed tank n is provided with an opening in its top, through which the dried garbage is deposited into the inner open vessel n' , which opening is closed by a cover q . The inner vessel n' is provided with a discharge-opening q' near its bottom, which is closed by a cover q^2 . When the vessel n' has been filled with the dried garbage taken from the drier G , a quantity of the solvent from the tank p is admitted into the inner vessel n' through the pipe p' until the solvent in the vessel n' reaches the level of the dried garbage contained in the vessel, which is determined by a gage q^3 . While the solvent is being admitted to the vessel n' from the tank p , the pipe o' , which opens into the outer vessel n below the inner vessel, is closed by a three-way cock q^4 . When the pipe o' is closed by the three-way cock q^4 , the latter is turned so as to open the passage between the inner vessel n' and the gage q^3 . When the desired quantity of the solvent has been admitted to the inner vessel n' , the flow from the tank p is closed, and the three-way cock q^4 is turned to open the passage through the pipe o' with the outer vessel n , whereby the solvent and the fatty matter liberated from the garbage pass through the pipe o' into the lower portion of the outer vessel n . This lower portion of the vessel n is provided with a heating-coil r for heating the fatty matter accumulating therein and volatilizing and liberating the solvent therefrom. The solvent vapor rises in the passage n^2 , and is again condensed by a coil r' , arranged above the inner vessel and through which cold water circulates. The condensed vapor drops back into the vessel n' , where it again acts upon the garbage, and the uncondensed vapors pass off through a pipe r^2 and coil r^3 , arranged in a water-chamber s above the tank p , where they are condensed. The lower end of the coil r^3 opens into the tank p , into which the condensed vapors are delivered. The fatty matter extracted is drawn off through a pipe t , and the material remaining in the vessel n' is removed through the discharge-opening q' . The dry residual matter passes from the extractor to a mill U , in which it is ground or reduced to the desired degree of fineness. This matter forms a valuable fertilizer, and is conducted from the mill U by an elevator or conveyer V to a warehouse for storing and packing.

The extracted grease or fatty matter may

be used in the manufacture of soap and for other purposes.

By first reducing the garbage to a uniform fineness the subsequent steps of removing moisture by pressure and by heat are more satisfactorily and evenly performed, because when the garbage is treated in the condition in which it is collected the large lumps are not easily deprived of their moisture either by pressure or heat, while the smaller particles are often overheated and burned in attempting to dry the large lumps by heat.

By removing the bulk or a considerable portion of the moisture by pressure the cost of the process is largely reduced, because the more expensive operation of removing the moisture by heat is confined to that part of the moisture which cannot be removed by the cheaper and quicker operation of removing it by pressure.

I have described and illustrated what I consider to be the best mode of practicing my invention; but I do not wish to limit myself to the mechanical construction of the several machines shown and described, as they may be modified in various respects without departing from my invention.

I claim as my invention—

1. The herein-described process of converting garbage into a dry fertilizer and grease, which consists in first reducing or comminuting the garbage, then removing the bulk of the moisture by pressure, then removing the residue of the moisture by heat, and then removing the oil and fatty matter by a volatile solvent, substantially as set forth.

2. The herein-described process of converting garbage into a dry fertilizer and grease, which consists in first reducing or comminuting the garbage, then removing the bulk of the moisture therefrom by pressure, then comminuting or reducing the partially-dried material, then removing the residue of the moisture by heat, and then removing the oil and fatty matter by a volatile solvent, substantially as set forth.

3. The herein-described process of converting garbage into a dry fertilizer and grease, which consists in first reducing or comminuting the garbage, then removing the bulk of the moisture therefrom by pressure, then comminuting or reducing the partially-dried material, then removing the residue of the moisture by heat, then removing the oil and fatty matter by a volatile solvent, and then grinding the dry residual matter, substantially as set forth.

Witness my hand this 16th day of December, 1889.

GUSTAV FLEISCHMAN.

Witnesses:

JNO. J. BONNER,
FRED. C. GEYER.