

(No Model.)

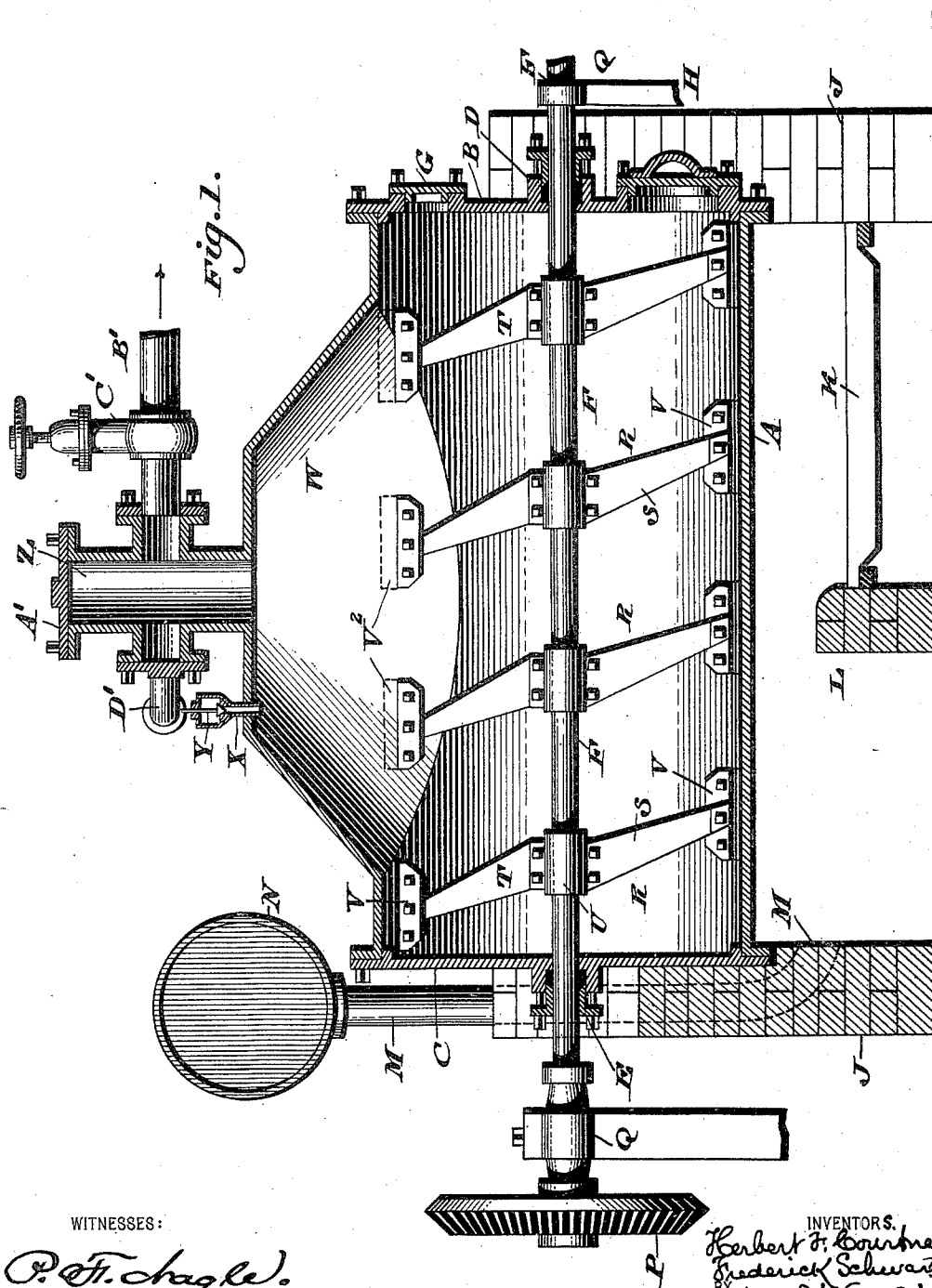
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H. F. COURTNEY & F. SCHWARTZ.

APPARATUS FOR MAKING FERTILIZERS.

No. 572,965.

Patented Dec. 15, 1896.



WITNESSES:

P. F. Chagel.
L. Douville.

INVENTORS.

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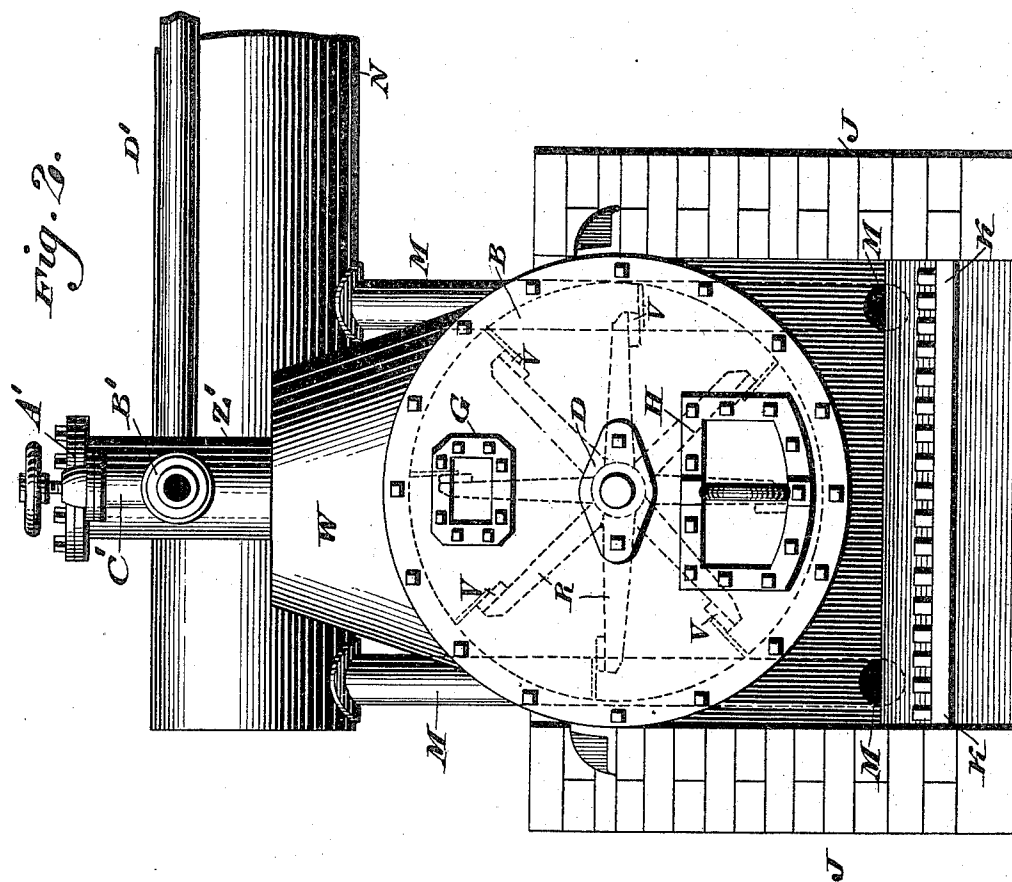
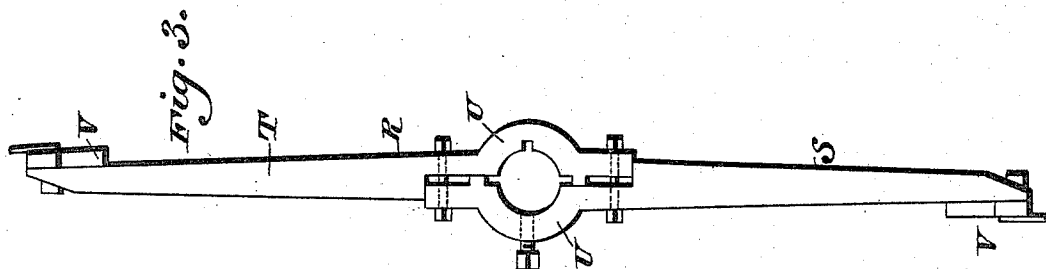
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UNITED STATES PATENT OFFICE.

HERBERT F. COURTNEY AND FREDERICK SCHWARTZ, OF PHILADELPHIA,
PENNSYLVANIA, ASSIGNORS OF ONE-THIRD TO JESSE B. KIMES, OF SAME
PLACE.

APPARATUS FOR MAKING FERTILIZERS.

SPECIFICATION forming part of Letters Patent No. 572,965, dated December 15, 1896.

Application filed July 1, 1896. Serial No. 597,702. (No model.)

To all whom it may concern:

Be it known that we, HERBERT F. COURTNEY and FREDERICK SCHWARTZ, citizens of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Treating Night-Soil, which improvement is fully set forth in the following specification and accompanying drawings.

Our invention consists of an improved construction of apparatus for treating night-soil, the novel features of which will be hereinafter described, and specifically pointed out in the claims.

Figure 1 represents a longitudinal sectional view of an apparatus for treating night-soil embodying our invention. Fig. 2 represents an end view thereof. Fig. 3 represents a side elevation of an enlarged section of the paddle employed, which will be hereinafter referred to.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings, A designates a cylinder or shell in which the night-soil to be treated is placed, said shell being provided with the front and rear heads B and C and the stuffing-boxes D and E, through which passes the shaft F.

G and H designate manholes in the upper and lower portion of the head B, whereby access can be readily had thereto at all times, the night-soil after treatment being withdrawn through the manhole H.

J designates the boiler-setting, upon which the shell A is supported in any usual or convenient manner, the same being provided with a grate K, which may or may not have a bridge-wall L, as may be desired.

M designates flues leading upwardly from the rear portion of the furnace and conducting the products of combustion into the outlet or stack N.

P designates a beveled gear mounted on the shaft F, which latter is provided with suitable bearings Q, which assist to sustain the weight of said shaft.

R designates beaters or paddles which are employed to thoroughly treat the night-soil, the same consisting of the blades S and T,

which are provided with the hubs or clamps U, which embrace the shaft and are secured thereto and to each other in any suitable manner, whereby in case of accident to one of said blades the entire paddle or beater does not have to be thrown away, but can be readily replaced, as will be evident. The said blades R are provided with the heads V and are preferably arranged on the shaft F in staggered order, as will be evident from Fig. 2, although it will be apparent, as desired, that the same may be arranged in longitudinal order or alinement, as seen in Fig. 1, the preferable construction, however, being that seen in Fig. 2, it being further noted that the heads V of each paddle are not in vertical alinement, as will be apparent from Fig. 1.

W designates an enlargement or chamber in the central portion of the shell A, on the upper portion of which is located the valve-casing X, which is adapted to receive oil of vitriol, the discharge of the same into the interior of the shell A being regulated by means of a suitable valve Y.

Z designates an inlet-passage, located in the present instance upon the chamber W, and is provided with a cap A', upon the removal of which the night-soil can be introduced within the shell.

B' designates a pipe leading from the passage Z to a suitable exhaust mechanism, whereby the odors, gases, or vapors which are evolved in the treatment of the night-soil are withdrawn and conducted to any desired point, said pipe B' being provided with a gate or other valve C'.

D' designates a pipe leading from the passage Z, by means of which any carbonic-acid or other gas escaping may be conducted to a furnace, combustion-chamber, or other desired point, said pipe having a suitable valve therein, closed during operation.

The operation is as follows: Upon the removal of the cap A' the night-soil can be inserted through the opening Z until the cylinder is filled to the desired extent, after which the cap is replaced, and fire having been started upon the grate K the shaft F and the paddles or beaters are caused to revolve. The oil of vitriol or similar material is allowed to enter the interior of the shell

A through the medium of the valve X, and the gases or vapors evolved are exhausted through the pipe B', as stated, the oil of vitriol and the night-soil being thoroughly commingled by the action of the beaters. The material within the shell A, after being heated to the required degree, is withdrawn through the manhole H in a somewhat plastic condition, after which it is run into molds or bricks, which can be utilized for fertilization or other purposes.

It will thus be seen from the foregoing that by our invention we are enabled to produce an apparatus which is especially designed for the odorless treating of night-soil under a vacuum, and one requiring less than 150° of heat in the drier, the chemical treatment of the same with sulfuric acid or oil of vitriol causing the ammonia to be retained in the form of sulfate, while the conversion of the phosphates into superphosphates and the thorough disintegration of all the animal and vegetable matters are effected by the action of the sulfuric acid and the agitation caused by the beaters.

In the preferred embodiment of our invention we provide the heads V with the scrapers V², as shown in dotted lines, the function of the same being to scrape the interior of the shell A as the paddles revolve.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In an apparatus of the character named, a cylinder, a shaft rotatably mounted therein, means for heating said cylinder, paddles mounted on said shaft, said paddles having their ends out of vertical alinement with each other, and being mounted in staggered order upon said shaft, an inlet-passage for the introduction of night-soil to the cylinder, means for exhausting the gases and vapors evolved from said cylinder, and means for introducing oil of vitriol into the latter.

2. In an apparatus of the character named,

a stationary cylinder having in the upper central portion, an extension W, a rotatable shaft mounted in the ends of said cylinder and provided with paddles thereon, the inlet-passage Z leading into said extension, the cap A' for said inlet-pipe, the inlet-pipe X with valve Y, and the exhaust-pipe B' leading from said inlet-passage Z.

3. In an apparatus of the character named, a stationary cylinder having an extension W in its upper central portion, the rotatable shaft F with the blades S, T thereon, the inlet-passage Z leading into said extension W, the inlet-pipe X, the outer exhaust-pipe B' leading from said passage Z and having the valve C' therein and the gas-escape pipe D' leading from said passage.

4. In an apparatus of the character described, a cylinder, a shaft rotatably mounted therein, paddles mounted on said shaft, said paddles being made in sections and having their ends out of vertical alinement with each other and being mounted in staggered order upon said shaft, means for heating the cylinder, a valve for introducing oil of vitriol to the interior of the cylinder, and means for exhausting the gases or vapors evolved from said cylinder.

5. In an apparatus of the character named, a shaft rotatably mounted therein, paddles mounted on said shaft and having scrapers attached to their heads, said paddles being made in sections and having their ends out of vertical alinement with each other, and being mounted in staggered order upon said shaft, means for heating the cylinder, a valve for introducing oil of vitriol to the interior of said cylinder, and means for exhausting the gases or vapors evolved from said cylinder.

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