

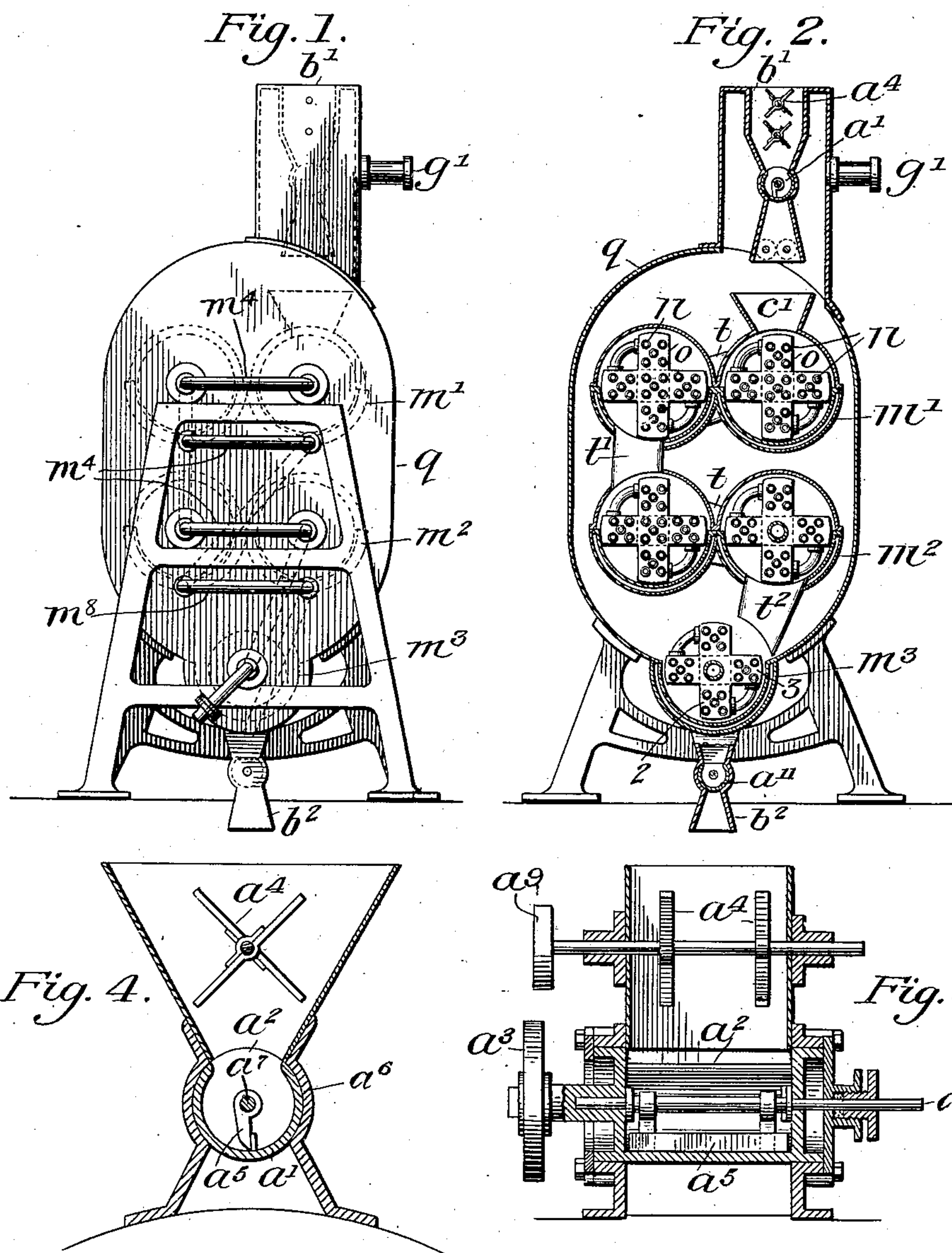
E. LÖWI.

## APPARATUS FOR DRYING INDUSTRIAL WASTES.

APPLICATION FILED APR. 28, 1898.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses.

G. S. Noble  
J. Buchler.

Inventor.

Edmund Löwi  
by R. Singer  
att'y

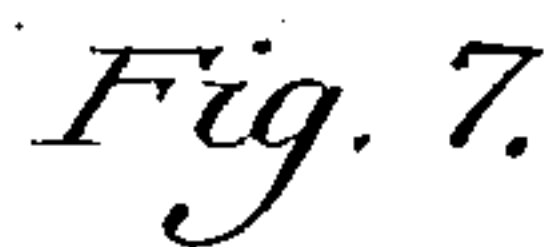
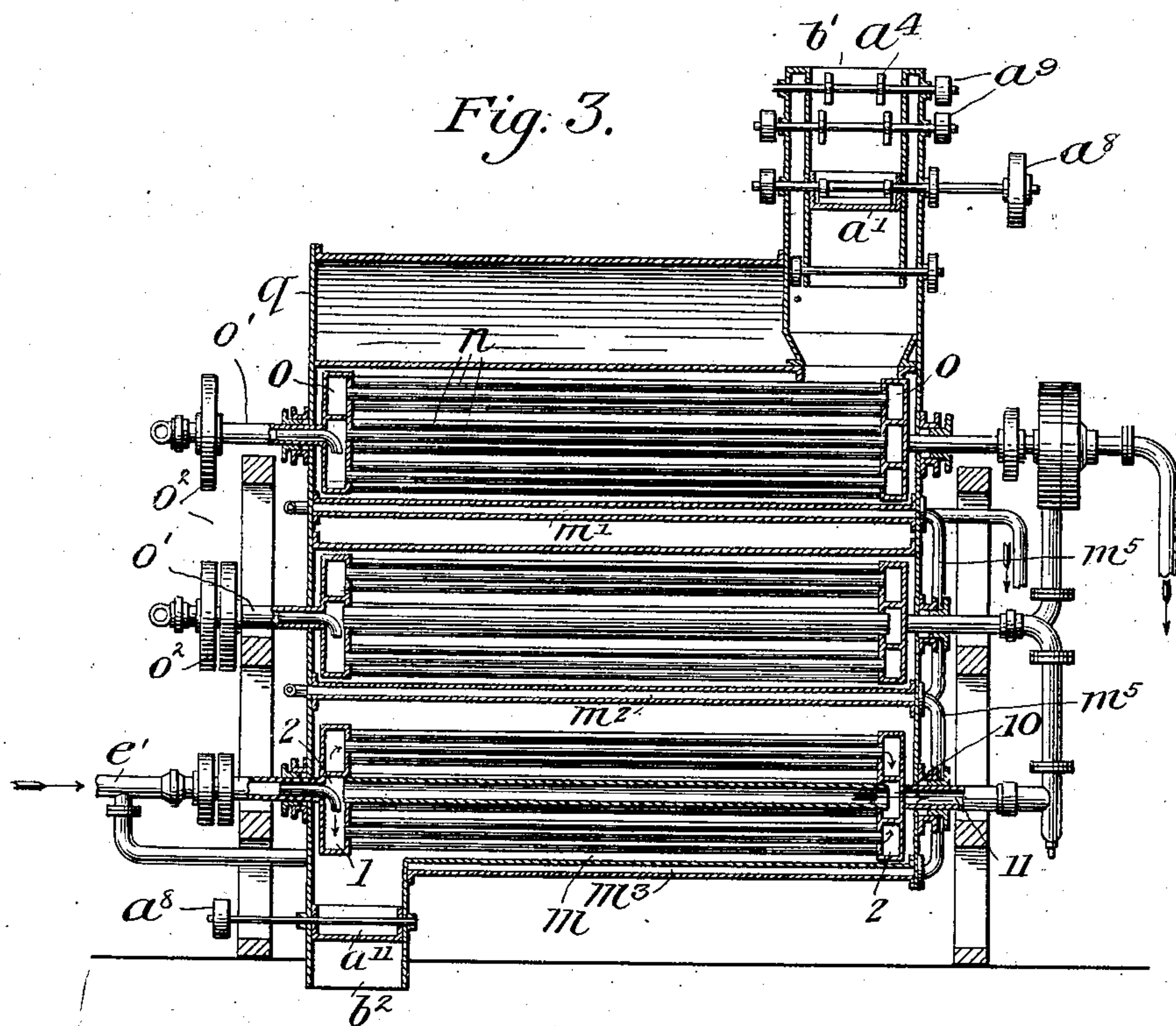
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# APPARATUS FOR DRYING INDUSTRIAL WASTES.

APPLICATION FILED APR. 28, 1898.

NO. MODEL.

2 SHEETS—SHEET 2.



*Witnesses.*

G. S. Noble  
 J. Bruckner.

*Inventor.*

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## UNITED STATES PATENT OFFICE.

EDMUND LÖWI, OF VIENNA, AUSTRIA-HUNGARY.

## APPARATUS FOR DRYING INDUSTRIAL WASTES.

SPECIFICATION forming part of Letters Patent No. 742,337, dated October 27, 1903.

Application filed April 28, 1898. Serial No. 679,120. (No model.)

*To all whom it may concern:*

Be it known that I, EDMUND LÖWI, a subject of the Emperor of Austria-Hungary, and a resident of XX Wallenstein Platz No. 4, Vienna, Austria-Hungary, have invented certain new and useful Improvements in Apparatus for Drying Waste Products, of which the following is a specification.

My invention relates particularly to means for subjecting vegetable or other waste products to the action of heat while being agitated, whereby the moisture is quickly and effectively thrown off and wherein there is a minimum escape of the odors resulting from the operation.

In the accompanying drawings, which form a part of this application, Figure 1 is an elevation of one end of my improved drying-machine. Fig. 2 is a vertical section through the machine near one end. Fig. 3 is a view, partly in side elevation and partly in longitudinal section, of the apparatus. Fig. 4 is a detail, on a larger scale, of the receiving-hopper which forms a part of my machine. Fig. 5 is a detail, in longitudinal section, of said hopper. Figs. 6 and 7 are sectional details of the heating boxes or heads with which the heating-pipes communicate.

Referring to the drawings in detail,  $m'$ ,  $m^2$ , and  $m^3$  indicate double-wall troughs, which are secured within the metal casing  $q$ . The troughs  $m'$   $m^2$  are arranged in pairs, the former above the latter, and the troughs of each pair are connected with each other by conduits  $t$ , through which the materials being treated may pass from one to the other. One of the troughs,  $m'$ , is connected with the trough  $m^2$  immediately below it by a conduit  $t'$ , through which the materials being treated may pass by gravity, and the other trough,  $m^2$ , is connected with the bottom trough  $m^3$  by a conduit  $t^2$ , having the same function as the conduit  $t'$ . From the bottom trough the material passes by gravity through the hopper  $b^2$  at the bottom of the machine.

To permit the introduction and withdrawal of the material while the apparatus is in continual operation with the least opportunity for the escape of odors, the receiving and discharging hoppers are respectively provided with rotary cylinders  $a'$   $a''$ , which extend across the vents of the hoppers and have an

opening in one side which serves to receive material when the openings are turned upward and to discharge material when the cylinder is inverted. The receiving-hopper has rotatably mounted therein a blade  $a^5$ , which is fixed on a shaft  $a^7$ , which is driven by a pulley  $a^8$  from any suitable source of power. The rotary cylinder  $a'$  is mounted in a box or casing  $a^6$ , which forms part of the receiving-hopper and through one end of which extends the stem on which is fixed the pulley  $a^8$ , which is drivable from any suitable source of power, as shown in Fig. 5. The rotation of the cylinder is so timed that when it is full its mouth will be turned down, thus discharging the contents into the hopper  $c'$ , which communicates directly with the first trough  $m'$ . The rotation of the blade  $a^5$  is so timed that it will tend to scrape the contents of the cylinder when in its discharging position.

In each of the receptacles  $m'$ ,  $m^2$ , and  $m^3$  is arranged a series of pipes  $n$ , through which steam or hot air passes, said pipes communicating at their opposite ends with hollow heads  $o$ , and the heads of each pair of receptacles are connected by pipes  $m^4$ , and the receptacles  $m'$  have their pipes communicate with the pipes of receptacles  $m^2$  by other pipes  $m^5$ , arranged on the outside of the casing, and communication with the pipes of receptacle  $m^3$  is established in the same manner. The pipes  $n$  are arranged in groups, as shown, and each group has its ends communicate with a compartment, as 1 2 3, &c., in the heads  $o$ , suitable partitions being placed between the two sides forming the head to provide such compartments. Two of the compartments in each head are connected by pipes  $o'$  at one end, the compartments 1 2 and 3 4 being connected, and at the opposite end of the same group of pipes the compartments 2 3 and 1 4 being connected as shown in Figs. 6 and 7, thus requiring the steam or hot air to traverse the entire length of pipes in each group before it can circulate through all of said pipes. From the last pipes through which the steam passes in each group the steam is conducted by the outside pipes above described to the first set of pipes in the next adjacent group or in the next group below. Through the center compart-



ment 10 a pipe 11 passes, which communicates with an exhaust-pipe placed exteriorly of the machine and which may lead to another machine of the same character. The  
 5 heads of each group of pipes form with the latter a rigid system which rotates on the hollow shafts cast integral with the heads, the rotation being accomplished by means of  
 10 suitable pulleys secured to said shafts and driven by belts from any source of power. The shafts are represented in the drawings by  $o'$  and the pulleys by  $o^2$ .

In the top of the machine, in the compartment in which the receiving-hopper is located, is a discharge-pipe  $g'$ , through which  
 15 escape the vapors arising from the material being treated.

The stirrers are mounted on suitable shafts, which are driven by pulleys  $a^9$ , and  
 20 the rotating cylinders in the hoppers are mounted on shafts  $a^7$ , driven by pulleys  $a^8$ . In Fig. 3 the stirrers are omitted from the discharge-hopper  $b^2$ .

Having fully described my invention, what  
 25 I claim, and desire to secure by Letters Patent, is—

1. In an apparatus of the character de-

scribed, a plurality of communicating receptacles located within a casing, and having means for introducing and discharging the  
 30 products to be treated, each of said receptacles being provided with rotating parallel hot-air or steam carrying pipes mounted on a hollow hot-air or steam carrying shaft and  
 35 longitudinally arranged in different radial planes and in two series crossing each other at right angles, substantially as set forth.

2. In an apparatus of the character described, a plurality of communicating receptacles, means for admitting and withdrawing  
 40 the products to be treated, each of said receptacles being provided with agitating and heating devices consisting of series of rotating hot-air or steam carrying pipes communicating with hollow heads and with hollow  
 45 shafts upon which they are mounted and longitudinally arranged in different radial planes and in two series crossing each other at right angles, substantially in the manner set forth.

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Witnesses:

ALFRED BORN,   
 LUDWIG LÖBLY.