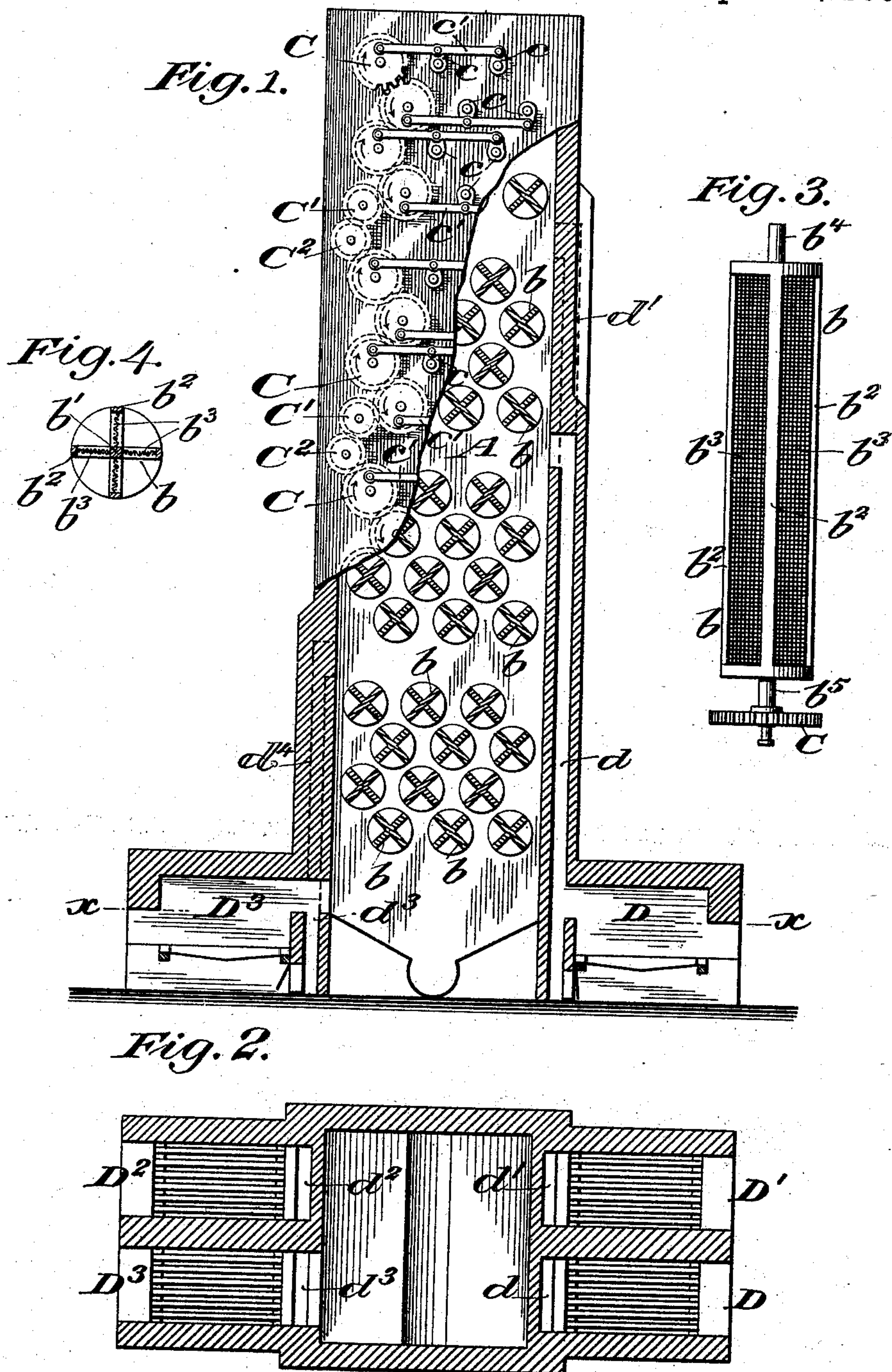


(No Model.)

E. F. MEAD.
DRYING APPARATUS.

No. 505,116.

Patented Sept. 19, 1893.



Witnesses:-
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UNITED STATES PATENT OFFICE.

ERASTUS F. MEAD, OF NEW YORK, N. Y.

DRYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 505,116, dated September 19, 1893.

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To all whom it may concern:

Be it known that I, ERASTUS F. MEAD, of New York, in the county and State of New York, have invented a new and useful Improvement in Drying Apparatus, of which the following is a specification.

My invention relates to an improvement in drying apparatus in which provision is made for distributing heat of different degrees of intensity at different points throughout the height of the drying chamber and for exposing the material to be operated upon thoroughly to the action of the hot air and gases during its course from the upper to the lower portion of the heating chamber.

A practical embodiment of my invention is represented in the accompanying drawings in which—

Figure 1 is a view of the drier in side elevation, partly in section. Fig. 2 is a transverse horizontal section through line x, x of Fig. 1. Fig. 3 is an enlarged view in detail of one of the rotary trays for distributing the material within the heating chamber, and Fig. 4 is a transverse section of one of the trays.

My invention contemplates a plurality of furnaces independent of one another and flues leading from the independent furnaces and communicating with the interior of the drying chamber at different points throughout its height so that one of the furnaces may be forced to furnish intense heat to act upon the damp material as it first enters the drying chamber, the fire in another furnace being kept at a more moderate degree of heat for application to the material after it has become warm and partially dried.

My invention further contemplates the dumping of the material from tray to tray and holding it at intervals within trays having perforated bottoms as it passes down through the heating chamber.

The heating chamber is represented as a whole by A and is shown in the present instance as an elongated upright column of rectangular shape in cross section and is provided on its interior with sets of rotary trays, a dozen more or less of the trays being grouped in a set, and so arranged that the loads on the trays above will be dumped into

the trays below as they are rotated upon their axis.

The trays consist of wings b radiating from a common axis b' and are provided at their outer edges with lips b^2 extending at an angle to their bottoms b^3 and serving to hold the loads on their bottoms until the latter have become tilted at a considerable angle. The bottoms b^3 are preferably formed of wire gauze or other perforated material to permit the free passage of the hot air and gases into contact with the material to be dried. In the present instance I have shown four of the wings b radiating from the axle at right angles with each other.

The trays are provided at their ends with journals b^4 and b^5 by means of which they are supported in the sides of the drying chamber, one of the journals, b^5 for example, extending through the side of the chamber and having fixed upon it a spur-wheel C by means of which a rotary motion is imparted thereto. I find it convenient to provide one only of the journals of a horizontal series of trays with a spur-wheel C, the others of the horizontal series being provided with cranks c connected by a common bar or rod c' with the spur-wheel C whereby they are caused to rotate in unison. The spur wheel of one horizontal series of trays is arranged to intermesh with the spur-wheel of the next adjacent series, the train of gear being made complete between the groups of trays by intermediate wheels C', C^2 . The power is communicated to one of the wheels C from a suitable source of power not shown herein.

At the base of the chamber A, I provide a plurality of independent furnaces, in the present instance four, represented respectively by D, D', D² and D³. I find it convenient to build the furnaces into or as a part of the base wall of the drying chamber, but this is not essential. One of the furnaces, D' for example, has a flue d' leading therefrom up the side wall of the drying chamber and into the interior of the chamber near its upper end where the material to be dried enters the chamber and first becomes distributed therein. The furnace D has a flue d leading therefrom to a point within the chamber A an interval below the point where the flue d'

communicates with it and flues d^2 and d^3 lead from the furnaces D^2 and D^3 respectively to points within the chamber A at intervals below the point where the flue d enters it.

5 In the form in which I have herein illustrated the apparatus, I have arranged to admit the heated products of combustion and hot air into the chamber A at points between two adjacent groups of trays. By the above
10 arrangement I may force the furnace D' so as to direct intense heat into contact with the material at the point where it first enters the chamber and where it is commonly cold and damp and there is no danger of burning
15 it, while the fires in the furnaces D , D^2 and D^3 may be kept at a more moderate heat, the intensity being proportioned to the state of the material as it travels along down the drying chamber. I thus provide against any liability
20 of burning the material and at the same time dry the material thoroughly and with great rapidity and economize fuel.

What I claim is—

1. The combination with a drying chamber
25 open throughout its length for the continuous passage of the material to be dried under the influence of gravity, of a plurality of independent furnaces the flues of which
30 communicate with the interior of the drying chamber at different points throughout its

height and means for distributing the material during its travel through the drying chamber, the interior of the drying chamber forming a common flue for the ascent of the heated products of combustion whereby the
35 heated products of combustion may be delivered directly from the furnace into engagement with the material to be dried and under varying temperatures, substantially as set forth. 40

2. The combination with the drying chamber and means for supplying heat thereto, of rotary trays arranged in series within the drying chamber to distribute the material to be dried therein, the trays consisting of perforated wings radiating from a common axis,
45 the outer edges of the wings being provided with lips extending laterally away from their exterior faces to retain the load thereon during a portion of their revolution and the trays
50 of a succeeding series being arranged alternately with respect to the trays of a preceding series to dump the material from one tray to another in its downward course, substantially as set forth.

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Witnesses:

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