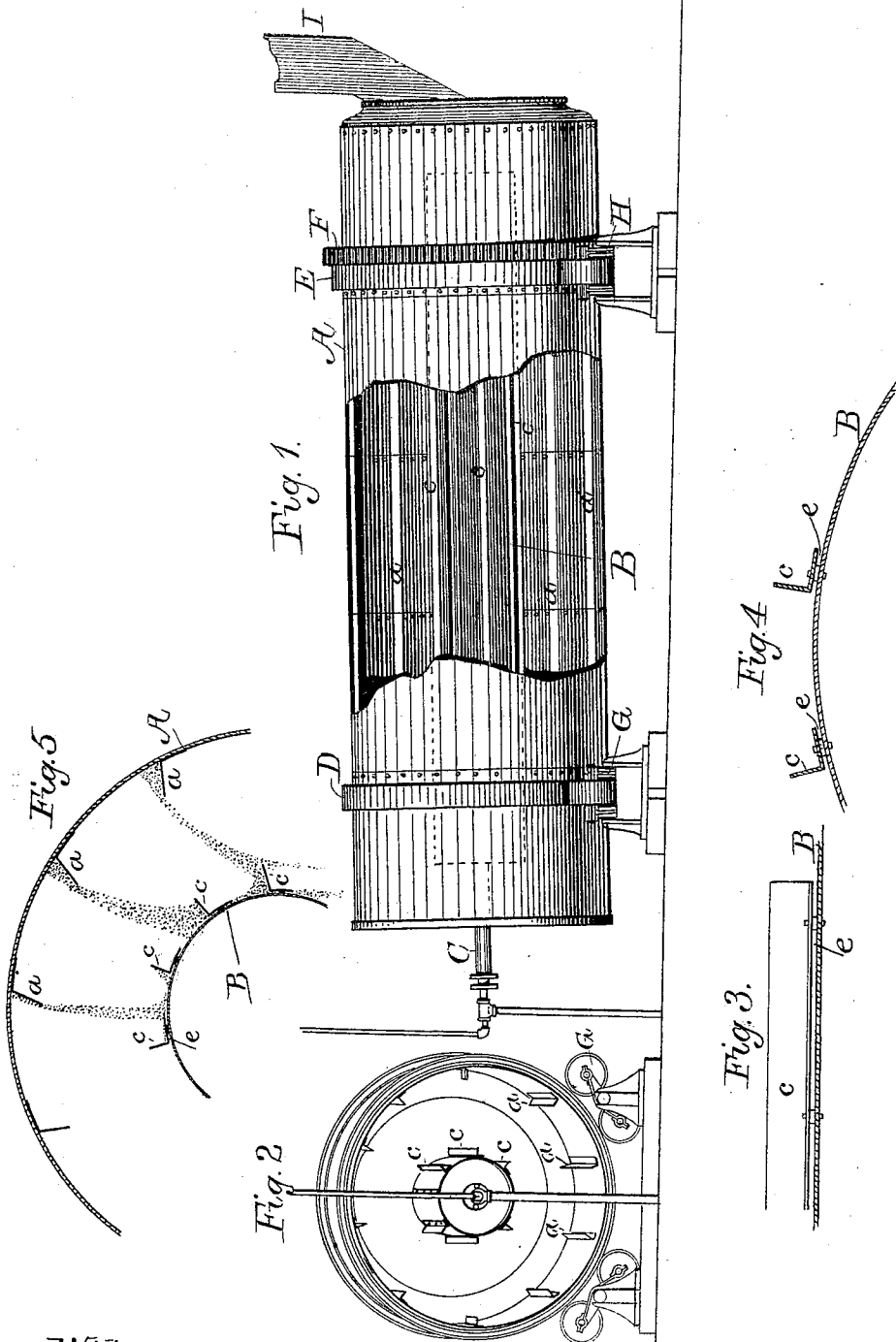


(No Model.)

F. C. HERSEY.
ROTARY STEAM DRIER.

No. 461,577.

Patented Oct. 20, 1891.



Witnesses
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UNITED STATES PATENT OFFICE.

FRANCIS C. HERSEY, OF WELLESLEY, ASSIGNOR TO THE HERSEY MANUFACTURING COMPANY, OF BOSTON, MASSACHUSETTS.

ROTARY STEAM-DRIER.

SPECIFICATION forming part of Letters Patent No. 461,577, dated October 20, 1891.

Application filed June 9, 1891. Serial No. 395,380. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS C. HERSEY, a citizen of the United States, and a resident of Wellesley, in the county of Norfolk and State of Massachusetts, have invented a new and useful Improvement in Rotary Steam-Driers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

This invention relates to that class of rotary steam-driers having an external cylinder with an internal steam-heating cylinder, and which have been the subject of previous Letters Patent to Charles H. Hersey.

The object of my invention is to produce a more perfect and rapid drying of those materials which cannot be subjected to high temperatures or continuous contact with highly-heated surfaces without injury to them.

The improvements herein set forth are of special value in the drying of sugar, salt, sand, and the like, the first two of which will burn, scorch, or stick if subjected to contact with highly-heated surfaces for any length of time, but which at the same time require a certain amount of contact with heating-surfaces to procure rapid and effectual drying. In the latter (sand) too long contact with highly-heated surfaces injures it materially for use in the manufacture of mortar or cements. It is for the purpose of more rapidly drying this kind of material that I have devised the following improvements in this class of drying-machines.

In the drawings, Figure 1 is a longitudinal elevation, partially in section, of a rotary drying apparatus of the class to which I apply my improvement. Fig. 2 is an end view of the same. Fig. 3 is a longitudinal section of one of the buckets, showing its method of attachment to the internal cylinder of the drying apparatus. Fig. 4 is a cross-sectional view of a portion of the internal cylinder, showing the method of attachment of the buckets to the cylinder. Fig. 5 is a cross-sectional view of the drier, showing the operation of the material.

In Fig. 1, A is a cylinder, preferably of iron, although in the handling of some material, like

salt, it may be constructed of wood, having secured to the two ends rings D E, which are located to rest upon trucks or carriages G H in order that the machine may turn freely when power is applied to rotate it. F is a gear secured to the cylinder, with which the driving mechanism engages to rotate it. B is an internal heater-cylinder provided with inlet and outlet pipe C, arranged to admit steam as the apparatus rotates upon its trucks and maintain a continuous supply, and at the same time it carries off the condensed steam from the interior of the cylinder. *a a* represent longitudinal buckets or wings secured to the interior of the cylinder for the purpose of carrying the material from the bottom of the cylinder and showering it upon the internal heated cylinder. So far as I have described these parts are of the regular form and construction usually adopted in the manufacture of these drying apparatus under Letters Patent of Charles H. Hersey.

The improvement which I have invented is the attachment of buckets or wings to the exterior of the internal steam-cylinder shown at *c c c c*. By referring to Figs. 3 and 4 it will be seen that these buckets *c c c* are secured upon the cylinder, so that there is a space *e* between the buckets and the exterior of the cylinder. These spaces are made by placing washers underneath the buckets or in any other manner lifting them a slight distance from the cylinder. The object of this arrangement is to retard the material which is being dried.

Referring to Fig. 5, it will be seen that the buckets in the interior of the outside cylinder pick up the material that is being dried as the machine rotates and shower it upon the internal heated cylinder. Ordinarily the material slides off the cylinder and drops to the bottom, getting a limited amount of contact with the cylinder, which by very slow operation of the drier produces the desired effect; but the material to which I have reference can be dried much more quickly if held in contact for a longer time against the heated cylinder, and yet at the same time not sufficiently long to allow it to burn or cake onto the cylinder. I therefore construct buckets upon the internal cylinder, as described, so

that they will retard the material upon the cylinder, allowing it to collect upon the buckets *c c c* and gradually slide underneath the buckets to the bottom of the main cylinder, and at the same time it will be thrown off on the opposite side as the cylinder rotates, the object being to retard the material upon the cylinder more or less, according to the number of buckets and the spaces between them.

10 I have found by actual practice that by this improvement I am able to operate the driers with greater speed than heretofore, effecting a perfect drying.

The complete operation will be as follows:

15 The material is fed through a chute I into the upper end of the cylinder. As the machine is rotated it gathers the material up by the buckets on the interior of the outside cylinder and showers it through the heated air to the central heater-cylinder, by which it has a retarding contact with the cylinder through the aid of the buckets mounted upon the outside of the cylinder. This operation is continued as the machine rotates, and on account

25 of the inclined position of the cylinder the

material gradually forwards in the machine and is emptied at the opposite end.

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

1. A steam drying apparatus composed of a slightly-inclined rotary cylinder provided with buckets or wings secured to its interior and an internal steam-heating cylinder provided with buckets or wings secured to its exterior, having spaces between the buckets or wings and the cylinder to which they are attached, and a steam supply and exhaust pipe and anti-friction trucks or carriages arranged to support said drier, substantially as and for the purpose set forth and described.

2. A cylinder for rotary steam-driers having a series of buckets or wings attached to its exterior and having spaces between the buckets or wings and the cylinder to which they are attached, substantially as and for the purpose set forth and described.

FRANCIS C. HERSEY.

Witnesses:

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