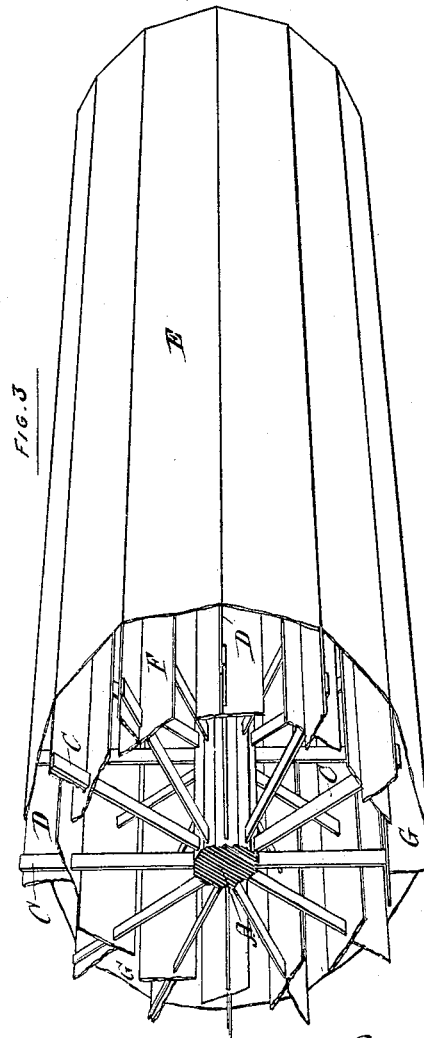
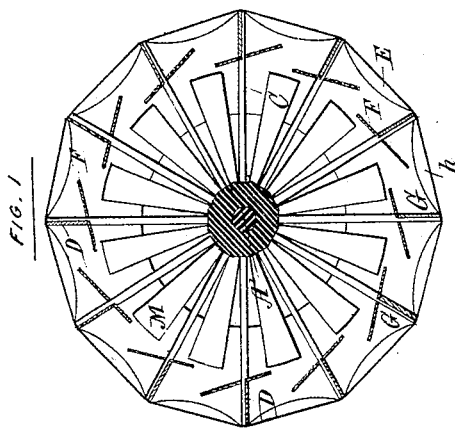
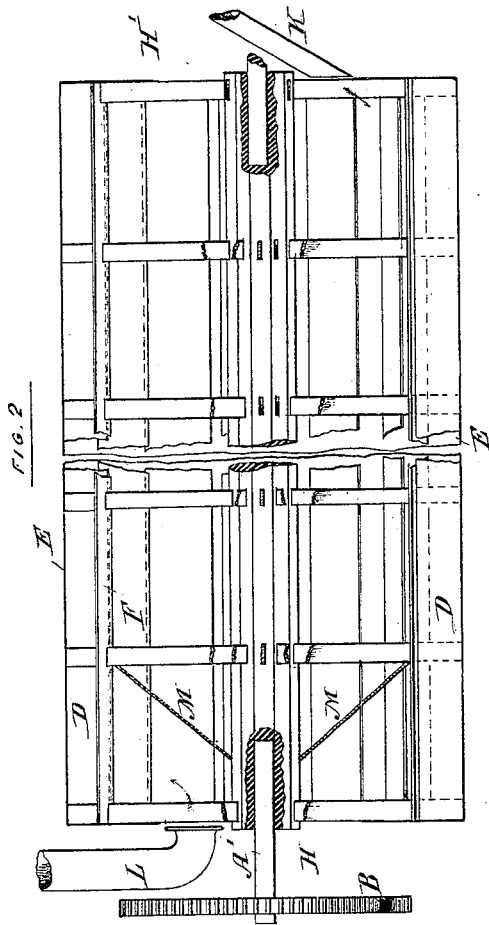


(No Model.)

G. RICE.  
SALT DRIER.

No. 263,584.

Patented Aug. 29, 1882.



Witnesses:  
Owen N. Evans  
J. J. Matthews

George Rice  
Per Elthy  
Geo. H. Lewis  
Inventor.

# UNITED STATES PATENT OFFICE.

GEORGE RICE, OF GODERICH, ONTARIO, CANADA.

## SALT-DRIER.

SPECIFICATION forming part of Letters Patent No. 263,584, dated August 29, 1882.

Application filed May 8, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE RICE, of the town of Goderich, in the county of Huron and Province of Ontario, Canada, have invented  
5 certain new and useful Improvements in Salt-Driers; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention has reference to apparatus  
10 used for finally expelling moisture from any chemical salt crystallized from mother-liquids, and, although primarily intended for operating on common salt (chloride of sodium) as made by evaporating brine, will be found useful in  
15 drying similar small and hard particles—such as drugs and chemicals—or grains—such as oats, wheat, Indian corn, &c.—as it provides means by which this may be done more quickly, economically, and effectually than heretofore,  
20 and at a sufficient low temperature to avoid all possibility of carbonizing—i. e., charring—organic matter, this latter being a point of great importance in drying many substances.

The invention may be described as consisting of one or more cylinders geared together  
25 and supported in a suitable frame, each cylinder being formed by stretching canvas (or any other material to suit the article to be dried) over the outer edges of any desired number of  
30 longitudinal bars or boards of suitable thickness and width, carried on the outer ends of arms radiating from a central shaft or spindle projecting beyond the ends of the cylinder so far as to be carried in the frame, and having a  
35 gear-wheel mounted thereon, preferably at the front end.

To the above longitudinal bars or boards attached to the ends of the radiating arms are fastened on their inner edge similar boards,  
40 thus forming a series of compartments round the periphery of the cylinders. These inner boards are of such width and secured to the longitudinals at such an angle that while affording in each compartment an opening the  
45 whole length of the cylinder quite sufficient to secure free ingress of hot dry air and equally free egress of the same air when saturated with moisture, they yet practically confine the material being dried to the compartment into  
50 which it was originally fed, in whatever position this may be during the whole time that it is under treatment in the cylinders. By thus

confining the material to be dried in its own compartment the object is gained of not only placing a larger quantity under the drying influences of the blast of hot air passing through,  
55 but the cylinder or cylinders, being always perfectly balanced, require very little power to rotate them when full, and no strain occurs in doing so.

The material to be dried is fed into the rear and higher end of such cylinders through any suitable hopper and spout, and gradually passes through and out of the front and lower end of whatever compartment it may fall into simply  
60 by its own gravity and the tendency to slide into the lowest point as the cylinder revolves, being met during its whole passage through by a counter-current of hot air, and the time of its passage being regulated by the speed at  
70 which the cylinders revolve, or preferably by raising or lowering the front end of the frame carrying them by suitable screws or other convenient means.

With the object of diverting the current of  
75 hot air into the compartments and more effectually increasing its circulation through and over the substance being dried, rather than through the central portion of the cylinder, small slats are placed at the entrance with the small end  
80 secured to the central shaft, and the wider ends, sloping backward and outward, are fastened to the radial arms—one to each arm or compartment—each one being of such width and placed at such an angle as will best turn the  
85 current of hot air into the compartments.

By the apparatus just described the material being dried is kept in continuous gentle motion simply by its own gravity in seeking the lowest point it can reach as the cylinder  
90 revolves, from this cause occupying successively each of the four sides of its own compartment during each and every revolution. This gentle sliding motion, while continuously exposing fresh particles of material to the current of hot air under the most favorable  
95 conditions, has the further advantage of not only preventing its aggregation into hard lumps, but keeps it in a perfectly loose and pulverulent state.

For full comprehension, however, of the invention reference must be had to the annexed drawings, forming part of this specification, in which Figure 1 is a transverse sectional eleva-  
100

tion of a cylinder, looking toward the front; Fig. 2, a longitudinal sectional elevation, and Fig. 3 a perspective view with the front end removed.

5 Similar letters of reference indicate like parts.

A is the shaft, having secured in its ends iron gudgeons A', carried in proper bearings, on one of which is secured the gear B, through  
10 which A is rotated.

C C are arms radiating from the shaft A, to the outer ends of which are secured, as shown in Figs. 1 and 3, longitudinal boards or divisions D of any width desired, over the outside  
15 edges of which is stretched canvas in one or more thicknesses, as shown at E. Other material may be substituted for canvas to suit the requirements of the substance to be dried.

F F are boards secured to the edges of the  
20 boards D at the exact angle thereto, and with such projection on either side as the material to be treated may require, thus forming a series of compartments round the drying-cylinder, as shown at G G.

H H' are the ends of the cylinder, arranged so as to admit at the rear end of the introduction of the salt or other material to be treated, which is fed through a pipe, K, connected with any suitable hopper or receptacle  
25 in which it is stored, and at the front of a current of hot air forced in through the pipe L. In the front end, H, of the cylinder are formed openings h—one to each compartment—through which the material passes out from  
30 the cylinder.

M M are slats or wings secured on the main shaft A at or near the front end of the cylinder, and sloping backward, so as to divert the hot air forced into the cylinder into the compartments G G.  
35

Although the shaft A, with its radial arms C C, is usually formed of wood, these, with the gudgeons A' A', on which it is carried, may be of cast-iron or other suitable material.

45 The operation of my invention is as follows: The cylinder A, which is inclined at any suitable angle, by the means previously mentioned, from the feed to the delivery end, is rotated at the desired rate of speed by any power, a hot blast being at the same time turned in at the  
50 delivery end. The salt or other material is then allowed to pass down through the pipe K into the cylinder, falling directly into those of the compartments G which are at the moment at the lower side. Each compartment,  
55 as it reaches and passes the lowest point, thus

receives a small portion of the material, which, by the time a full revolution has been made, has slid over in turn each of the four faces of the compartment and sufficiently forward to  
60 make room for the portion it will again receive or reaching the proper position at the lowest point under the spout. To attain this the boards must be set at an angle, varying more or less from a right angle, according to the  
65 moisture contained in the material, so as to secure its being caught by the shorter and lower lip when sliding off the wider and higher one, and prevent it from falling directly to the lower side of the cylinder.  
70

It will thus be seen that each compartment is always ready to receive a fresh supply after each revolution, the salt or other material having, during that time, moved sufficiently forward and downward.  
75

The salt or other material from one or more cylinders on arriving at the lower end passes out through the opening h, thence falling preferably into a long hopper or spout common to them all, and being conducted preferably to  
80 a machine which will separate it into any desired number of grades, throwing out all small lumps and pieces of pan-scale, &c.; or it may be run directly into packages or kept in bulk without further treatment.  
85

What I claim is as follows:

1. A drying apparatus composed of a single rotating cylinder set in an inclined position, and having formed on the inside of its periphery compartments, each communicating  
90 with the interior and having a separate outlet through the head, all substantially as herein described, and for the purposes set forth.

2. The combination, with the shaft A, of arms C and boards D and F, all contained  
95 within the cylinder, as and for the purposes set forth.

3. In a drying apparatus, the combination, with a revolving single cylinder provided with inside compartments communicating with in-  
100 terior, of a blast-pipe discharging into cylinder at one end, all as herein set forth, and for the purposes described.

4. In combination with a revolving cylinder furnished with internal compartments, slats  
105 M, mounted on the shaft A, as and for the purposes described.

Goderich, May 2, A. D. 1882.

GEORGE RICE.

Witnesses:

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