R. W. KING.

DRIER.

APPLICATION FILED JUNE 30, 1916.

1,293,799.

Patented Feb. 11, 1919.

2 SHEETS—SHEET 1.

Fig-1

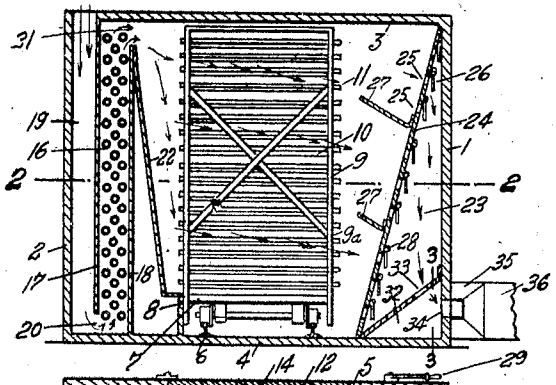
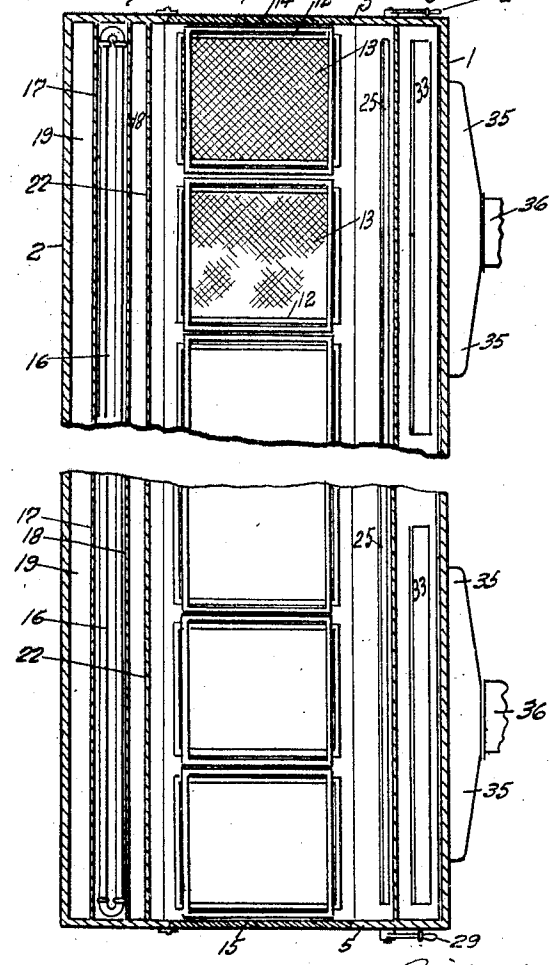


Fig-2



Witness

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2 SHEETS—SHEET 2.

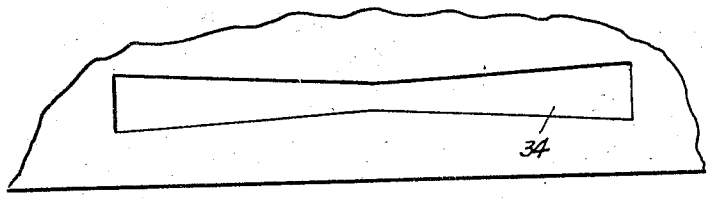


Fig-3

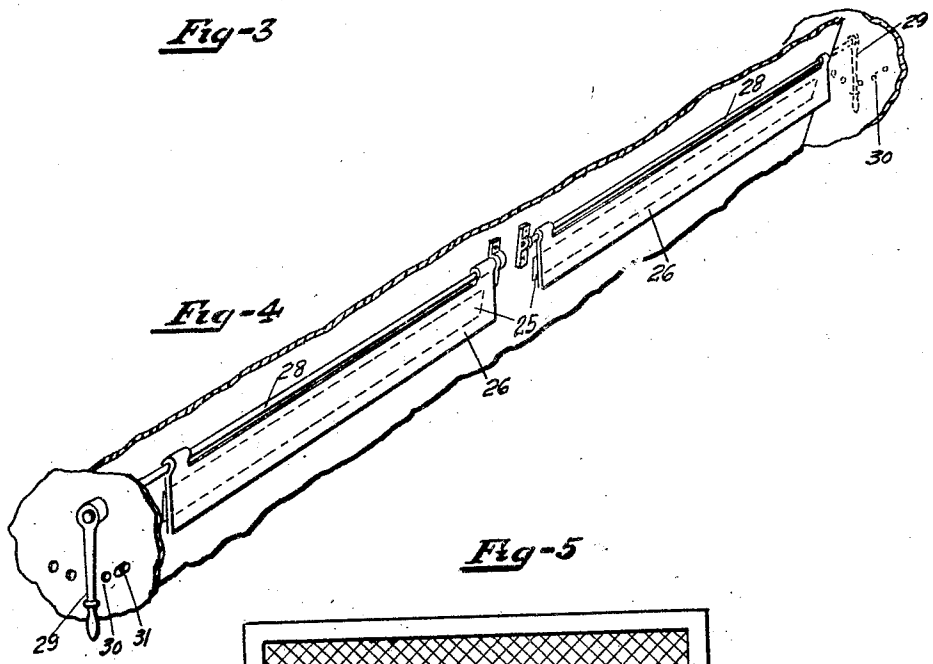
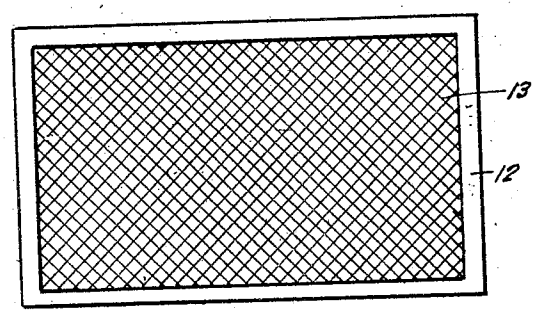


Fig-4

Fig-5



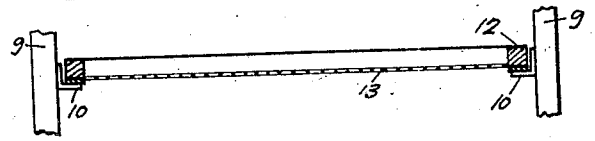


Fig-6

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UNITED STATES PATENT OFFICE.

RALPH W. KING, OF THE DALLES, OREGON, ASSIGNOR TO PACIFIC EVAPORATOR COMPANY, OF PORTLAND, OREGON, A CORPORATION OF OREGON.

DRIER.

1,293,799. Specification of Letters Patent. Patented Feb. 11, 1919.

Application filed June 30, 1916. Serial No. 106,330.

To all whom it may concern:

Be it known that I, RALPH W. KING, a citizen of the United States, residing at The Dalles, in the county of Wasco and State of Oregon, have invented new and useful Improvements in Driers, of which the following is a specification.

This invention relates to driers and consists in certain improvements in the construction thereof as will be hereinafter fully described and pointed out in the claims.

More particularly the invention is adapted for drying vegetables and fruit products and as shown it is so adapted.

The invention is illustrated in the accompanying drawings as follows:—

Figure 1 shows a cross section of the drier.

Fig. 2 a section on the line 2—2 in Fig. 1.

Fig. 3 a view of the side of the supplemental air chamber.

Fig. 4 a perspective view of the valves for controlling the air to the outlet chamber.

Fig. 5 a plan view of a tray.

Fig. 6 a fragment of a tray rack with a section of a tray shown therein.

The drying chamber which is ordinarily as shown in the form of a tunnel is formed with the side walls 1—2, top wall 3, bottom wall 4 and end walls 5. A track 6 extends from end to end of the tunnel and cars 7 are arranged on these tracks. A closure 8 is arranged along the inlet side of the car so as to drive the air through the contents carried by the car. A tray rack 9 is formed on the car. This may be of any desirable construction. As shown it is made up of the posts 9^a and angle irons 10 forming supports for the trays 11. The trays are formed with the sides 12 and the perforated bottom 13 preferably of wire mesh. The cars are moved into and out of the tunnel by way of the doors 14 and 15. A vertical heating coil 16 is provided for heating the air. It is arranged between the vertical partitions 17 and 18. An air passage 19 is formed between the partition 17 and the wall 2. There is an opening between the partition or wall 17 and the bottom wall 4 so that air passes down through the passage 19, through passage 20 and upwardly along the vertical coil between the partitions 18 and 18 and out through a passage 21 formed between the top wall 3 and the top of the partition 18. An inclined wall 22 extends from the wall 18 at its top and the closure board or partition 8 at the bottom, thus forming with relation to the stack of trays an air passage larger at the top than at the bottom for carrying the air downwardly along the face of the trays.

An air chamber 23 is arranged at the outlet side of the chamber along the wall 1, the wall 1 forming one wall of the chamber 23. The inner wall 24 of this chamber is inclined being more distant from the trays at the top than at the bottom and it is provided with a series of slots 25, which extend horizontally across the chamber. These slots are controlled by the valves 26, these valves being in the form of plates carried by rods 28. The rods extend through the end walls and are provided with rocking levers 29. Series of holes 30 are arranged in the end walls and pins 31 are adapted to be inserted in these holes 30 for locking the lever 29 in any position to which it may be adjusted and thus locking the valves in any position that they may be adjusted. By adjusting the various valves 26 a uniform flow of air may be induced throughout the air tunnel and a slight inclination may be given to this air for the purpose hereinafter described.

The chamber 23 opens through the slot 33 into a supplemental chamber or collector 32 arranged at the lower corner of the main chamber and this is connected by the slot 34 with the passages or tubes 35 and the tubes 35 lead to an exhaust pipe 36, the exhaust pipe leading to an exhaust fan, not shown. The slot 34 is tapered being larger at the ends than the center so as to neutralize the greater effect of the fan at its immediate connection than at the end. In this way the current may be tempered so as to give uniformity. Deflector plates 27 may be arranged along the face of the wall 24. These assist in giving to the air the proper directioning through the chamber.

It is desirable to pass the air through the bottoms of the trays because in this way the air is made to contact a greater part of the surface of the material. It is desirable to have the air pass through the bottom of one tray because if the air is given a greater inclination to the trays than such as will effect a passage through a single tray, that part of the tray nearest the incoming air will be subjected entirely to the fresh

or non-moisture laden air while that part of the tray near the outlet would, if the air extended through more than one tray, be subjected to the moisture-laden air incident to the passage of the air through the first tray. The result would be a great lack of uniformity in the product and a lack of efficiency in the drier as a whole.

With my invention I give to the air just sufficient inclination so that the main volume of air which passes through the tray bottoms passes through but one tray bottom and consequently there is a uniform drying throughout the length of the tray. I prefer to introduce the air from a side and at the top of the tray stack because it is more easily controlled when given a downward deflection than an upward deflection and I prefer to give the air an inclination to pass through the tray bottom from the top downwardly.

What I claim as new is:—

1. In a drier, the combination of a chamber; means for stacking trays in spaced and open relation one above another therein; trays in said means having perforated bottoms on which the material to be dried is supported; and apparatus for passing a current of air past said trays and directing said air at a slight inclination to the tray bottoms to produce currents through the tray bottoms with the main volume passing through the bottoms limited by the direction of the currents to a passage of the same air through but one bottom.

2. In a drier, the combination of a chamber; means for stacking trays in spaced and open relation one above another therein; trays in said means having perforated bottoms on which the material to be dried is supported; and apparatus for passing a current of air past said trays and directing said air at a slight inclination downward to the tray bottom to produce currents through the tray bottoms with the main volume passing through the bottoms limited to a passage of the same air through but one bottom downwardly.

3. In a drier, the combination of a chamber; means for stacking trays in spaced relation one above another therein; trays in said means; a vertically arranged heating coil having a vertical passage thereby; means of communication leading from the heating unit to the top of the chamber at the side of the tray stack; and means for compelling the passage of a current of air through the chamber and heating unit.

4. In a drier, the combination of a chamber; means for stacking trays in spaced relation one above another therein; an exhaust chamber facing said means, said exhaust chamber presenting an inclined wall to said means more distant from the means at the top than the bottom and having a series of openings therein; and means for drawing air from said air chamber.

5. In a drier, the combination of a chamber; means for stacking trays in spaced relation one above another therein; an exhaust chamber facing said means, said exhaust chamber presenting an inclined wall to said means more distant from the means at the top than the bottom and having a series of openings therein; valves controlling said openings; and means for drawing air from said air chamber.

6. In a drier, the combination of a drying chamber; means for stacking trays in spaced relation one above another therein; an exhaust chamber facing said means and having a series of openings therein; valves for controlling said openings; a supplemental chamber leading from said air chamber; and means for exhausting air from the supplemental chamber.

7. In a drier, the combination of a drying chamber; means for stacking trays in spaced relation one above another therein; trays arranged in said stack, said trays having perforated bottoms; a vertical heater; a passage from the heater to the top of the drying chamber adjacent to the means; an outlet chamber at the opposite side of the drying chamber having a series of valve openings therein; and means for exhausting air from the air chamber.

In testimony whereof I have hereunto set my hand.

RALPH W. KING.