No. 638,325. Patented Dec. 5, 1899.

# D. M. ELLSWORTH.

## FRUIT EVAPORATOR.

(Application filed May 27, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

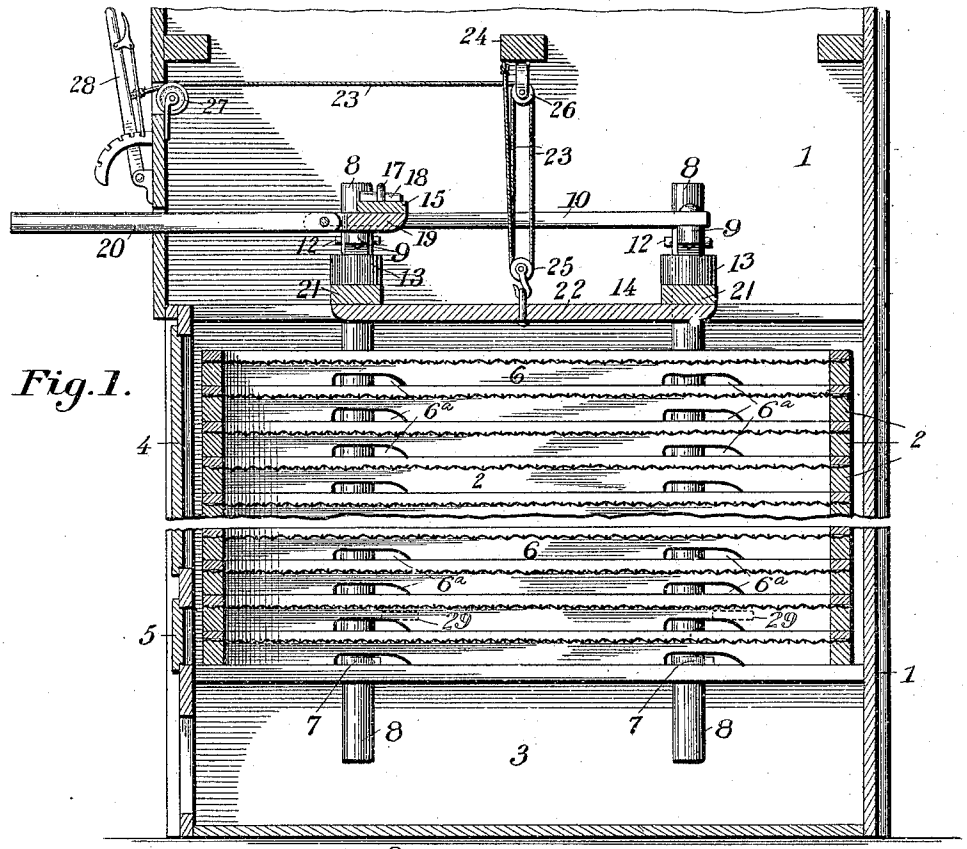
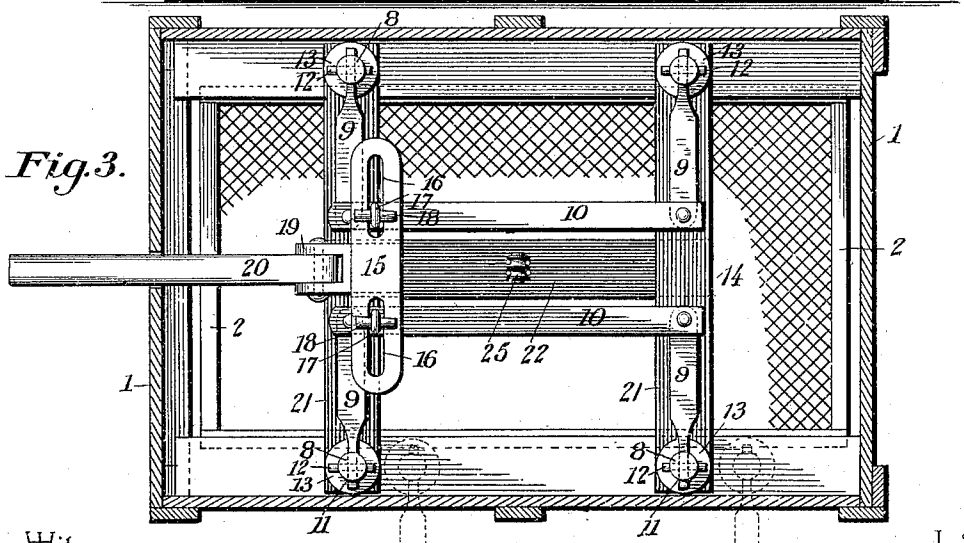



Fig. 3.




Witnesses

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## FRUIT EVAPORATOR.

(Application filed May 27, 1899.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 2.

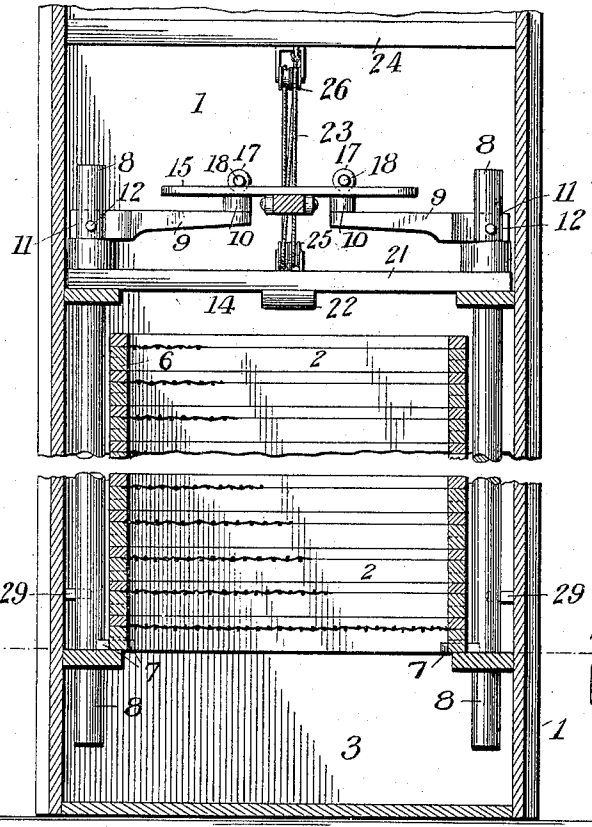
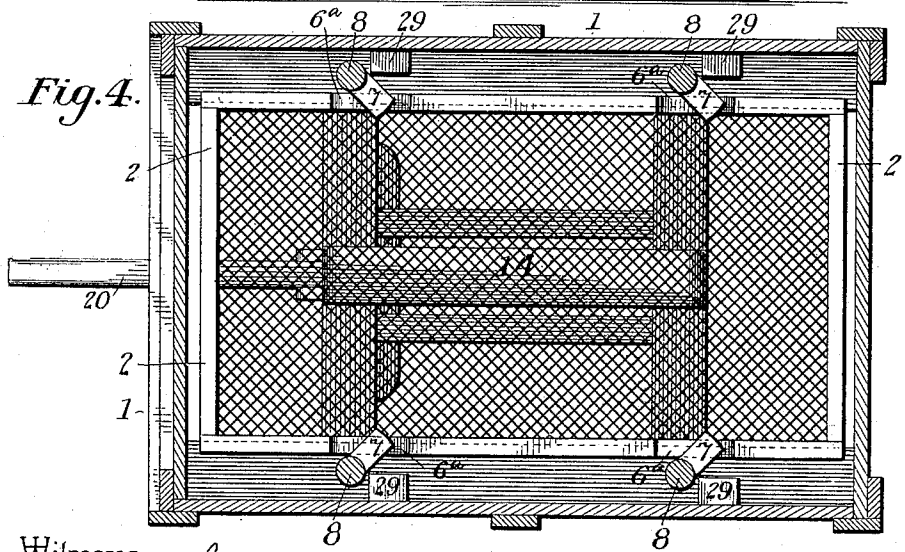



Fig. 4.




Witnesses

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# UNITED STATES PATENT OFFICE.

DAVID M. ELLSWORTH, OF CAMAS, WASHINGTON.

## FRUIT-EVAPORATOR.

SPECIFICATION forming part of Letters Patent No. 638,325, dated December 5, 1899.

Application filed May 27, 1899. Serial No. 718,540. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID M. ELLSWORTH, a citizen of the United States, residing at Camas, in the county of Clarke and State of Washington, have invented a new and useful Fruit-Evaporator, of which the following is a specification.

The invention relates to improvements in fruit-evaporators.

The object of the present invention is to improve the construction of fruit-evaporators and to provide a simple and comparatively inexpensive one, adapted to contain a maximum number of trays and capable of being operated with great rapidity with the expenditure of a minimum amount of labor.

A further object of the invention is to enable the improvements to be readily applied to the ordinary construction of evaporators without reconstructing the same and to provide an economical device adapted to enable the trays to be introduced at the top of the stack and removed from the bottom, so that the fruit to be dried will be gradually brought toward the heating apparatus or the hottest part of the evaporator to prevent dripping and to avoid placing a tray of green fruit beneath trays which are dried or partially dried.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is a vertical sectional view, taken longitudinally, of a fruit-evaporator constructed in accordance with this invention. Fig. 2 is a transverse sectional view. Fig. 3 is a plan view, partly in section. Fig. 4 is a horizontal sectional view on line 4 4 of Fig. 2.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates a frame or casing forming an evaporating chamber or compartment for the reception of a vertical series of trays 2, and beneath the evaporating-chamber is arranged a fire-pit 3 for the reception of a suitable heating apparatus. The frame or casing is provided with upper and lower doors 4 and 5 for the introduction and removal of the trays, which are placed in the device at the top and gradually lowered to the bottom, where after the fruit has been thoroughly evaporated they are removed. The trays, which may be of any desired size and construction, have fitted to the under side of the opposite side bars thereof the longitudinally-disposed supporting-strips 6, each of which is provided in the lower edge thereof with a pair of spaced engaging notches $6^a$, located, respectively, adjacent to the opposite ends of the strip and of a sufficient width and depth so as to receive the horizontally-swinging lower supporting-arms 7 of the vertical rock-shafts 8, which are adapted to lift the entire stack of trays, with the exception of the bottom one, to free the latter, to enable the same to be removed, examined, and replaced if its contents are not thoroughly evaporated or dried. The rock-shafts, which are journaled in suitable bearings, are capable of vertical reciprocation to lift the stack, and they are provided at their upper ends with arms 9, extending inward and connected by longitudinal bars 10, arranged at opposite sides of the evaporator, as clearly shown in Fig. 3 of the accompanying drawings. The arms 9, which are detachable, are secured in slots 11 of the upper ends of the vertical shafts by suitable fastening devices 12, and washers 13 or spacing devices are interposed between the arms 9 and a lifting-frame 14, which connects all of the rock-shafts and which is adapted to move the same vertically.

The longitudinal bars 10, which connect the arms 9 at the sides of the evaporator, are connected at their front ends by a transverse bar 15, provided at its ends with slots 16, adapted to receive the fastening devices of the longitudinal bars 10 and permitting the necessary lateral movement of the same incident to the oscillation of the upper arms of the rock-shafts. The fastening devices which connect the transverse and longitudinal bars may consist of eyebolts 17 and keys 18, secured in the eyebolts and spanning the slots 16. The transverse bar is provided at its center with a bifurcated lock 19, in which is pivoted one end of a longitudinal operating-rod 20, which extends through the front of the frame or casing and which is adapted to

be reciprocated to rotate the rock-shafts partially for carrying their lower arms into and out of engagement with the trays.

The vertically-movable frame 14 is composed of transverse beams 21 and a central longitudinal connecting bar or beam 22, and the said frame is lifted by means of a cable or rope 23. The cable or rope 23, which has one end connected with a support 24, is rove through double pulleys 25 and 26, mounted, respectively, on the bar or beam 22 and the support 24, and it extends forward over a guide-pulley 27 to an operating-lever 28, fulcrumed on the front of the frame and adapted to be readily grasped by the operator. The operating-lever is located adjacent to the reciprocating operating-bar, and when it is desired to remove or examine the contents of the bottom tray the lower arms of the rock-shafts are disengaged therefrom, if this has not already been done, and the vertically-movable frame is partially raised to bring the said lower arms on a line with the notches $6^a$ in the strips 6 of the tray next to the bottom. The reciprocating operating-rod is then drawn outward to engage the lower arms of the rock-shafts with the strips 6 of the said tray next to the bottom, after which the same and the trays above it are elevated by means of the operating-lever. Any suitable means may be provided for retaining the stack in such position while the bottom tray is being removed and examined, and if the contents of such tray are satisfactory the stack is again lowered. In order to limit the upward movement of the lower arms of the rock-shafts preparatory to engaging them with the notches or recesses $6^a$ of the strips of the tray next to the bottom, stops 29 are provided, and after the arms 7 are engaged with the said tray they are carried out of line with the stops which do not then lie in their paths.

In the accompanying drawings the mechanism for handling the stack so that the bottom tray will be removed is shown applied to a single stack of trays for convenience of illustration; but it is designed to be employed in evaporators having a large number of stacks. When the device is arranged in this manner, it does not necessitate more than the usual space between the stacks, and the rock-shafts of the adjacent stacks will be arranged as illustrated in dotted lines in Fig. 3 of the accompanying drawings.

The invention has the following advantages: The evaporator, which is of simple and economical construction, is adapted to receive the trays in stacks, and the trays are arranged one upon the other, so that the maximum number may be placed in it. The mechanism for handling the stack so that the bottom tray may be removed and examined before removing the other trays is exceedingly simple and is adapted to be rapidly operated with little labor, and it is capable of enabling the trays to be introduced at the top and removed from the bottom, so that the fruit will be gradually brought to the bottom or hottest portion of the evaporator and thereby gradually dried. This manner of handling the trays of fruit prevents dripping and avoids placing green fruit between the source of heat and trays, the contents of which have been dried or partially dried.

Changes in the form, proportion, size, and the minor details of construction within the scope of the appended claims may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

What is claimed is—

1. A device of the class described comprising vertically-movable rock-shafts designed to be located at opposite sides or ends of a stack of trays and provided with supporting devices adapted to be carried into and out of engagement with the trays, whereby the stack may be elevated to free the bottom tray, substantially as described.

2. A device of the class described comprising vertically-movable rock-shafts provided at their lower portions with arms adapted to support a stack of trays, and means for rotating the rock-shafts to carry said arms into and out of engagement with the trays and for moving the rock-shaft vertically, substantially as described.

3. A device of the class described comprising vertical rock-shafts provided with arms adapted to support a stack of trays, means for rotating the rock-shafts to carry the arms into and out of engagement with the trays, and a lifting device connecting the rock-shafts and adapted to move the same vertically, substantially as described.

4. A device of the class described comprising rock-shafts provided with upper and lower arms, the lower arms being designed to support a stack of trays, an operating-rod connected with the upper arms and adapted to rotate the rock-shaft, a frame connecting the rock-shaft, and hoisting mechanism for raising and lowering the frame, substantially as described.

5. A device of the class described comprising rock-shafts provided with lower tray-supporting arms, a vertically-movable frame connecting the rock-shafts, a hoisting rope or cable connected with the said frame, an operating device arranged at the outer end of the rope or cable, and means for rotating the rock-shaft, substantially as described.

6. A device of the class described comprising vertical rock-shafts provided at their lower ends with tray-supporting devices and having arms at their upper ends, longitudinal bars connecting the arms, a transverse bar loosely connected with the longitudinal bar, an operating-bar pivotally connected with the transverse bar, and hoisting mechanism for raising and lowering the rock-shaft, substantially as described.

7. A device of the class described comprising vertically-movable rock-shafts provided at their lower ends with arms adapted to sup-

port a stack of trays, stops located in the paths of the arms when the latter are out of engagement with the trays and adapted to limit the movement of the same when the said arms are raised to clear the bottom tray, and means for rotating and for raising and lowering the rock-shafts, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

DAVID M. ELLSWORTH.

Witnesses:

B. W. PETTIT,

GEO. H. PARK.