

(No Model.)

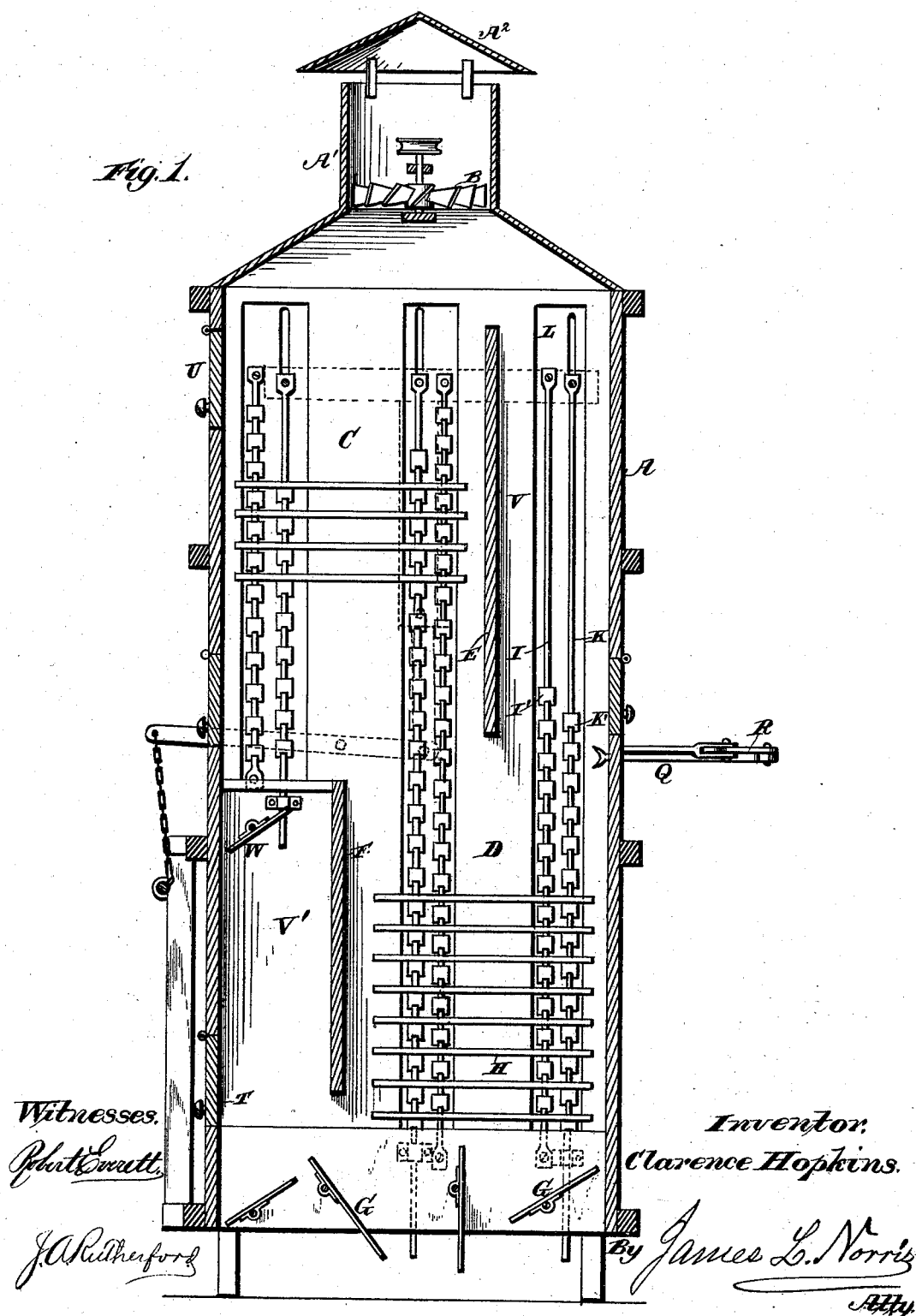
3 Sheets—Sheet 1.

C. HOPKINS.

FRUIT DRIER.

No. 261,715.

Patented July 25, 1882.



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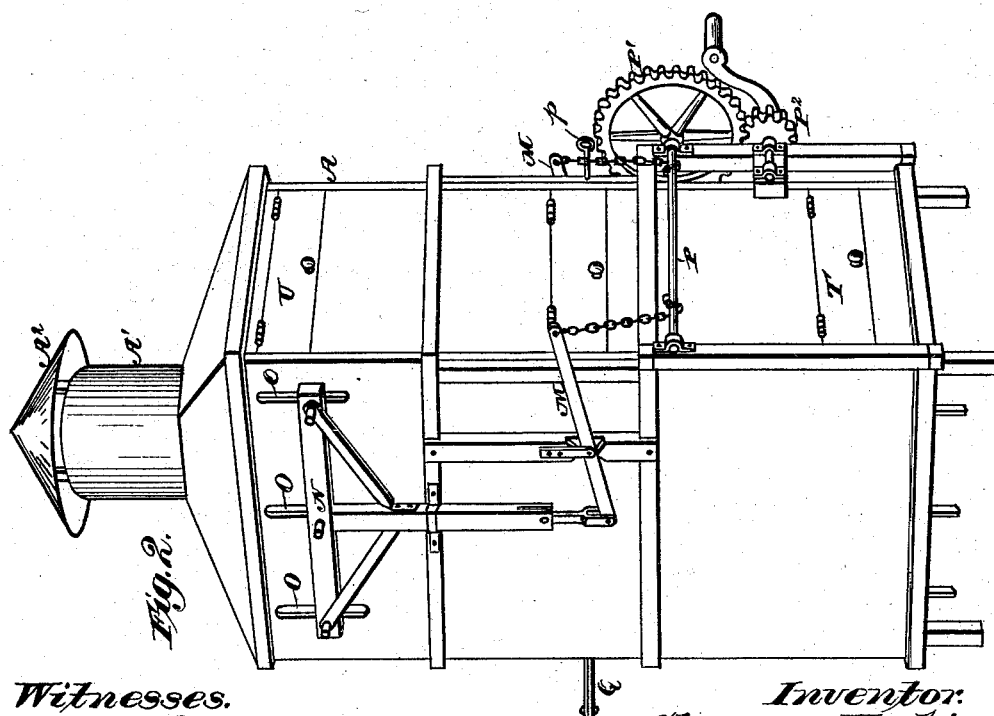
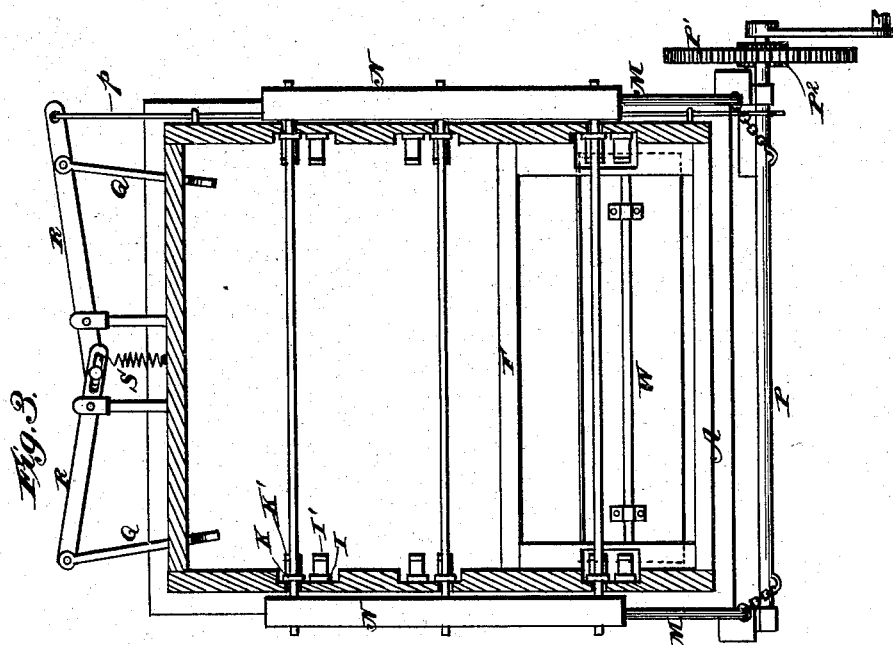
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Witnesses.

Robert Everett.

J. A. Rutherford

Inventor.

Clarence Hopkins.

By James L. Norris,  
Atty.

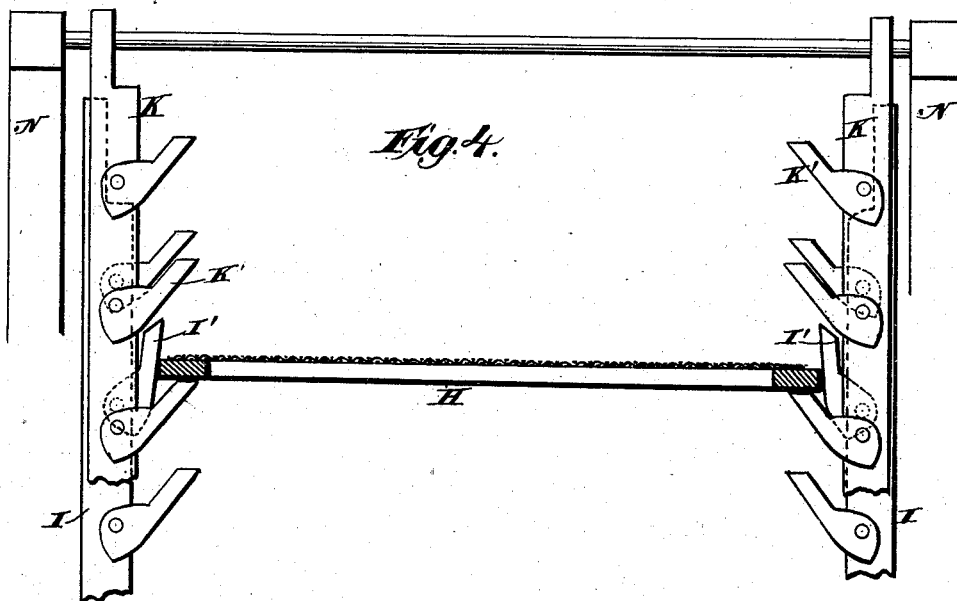
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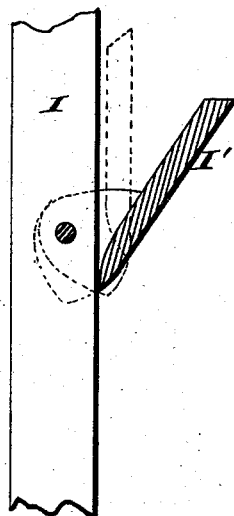
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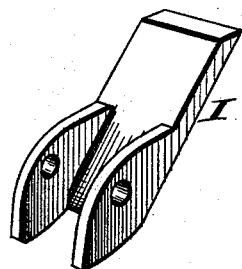
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*Fig. 5.*



*Fig. 6.*



*Witnesses,*

*Robert Everett.*

*J. A. Rutherford.*

*Inventor,*

*Clarence Hopkins.*

*By James L. Norris*  
*Att'y.*

# UNITED STATES PATENT OFFICE.

CLARENCE HOPKINS, OF MILFORD, DELAWARE.

## FRUIT-DRIER.

SPECIFICATION forming part of Letters Patent No. 261,715, dated July 25, 1882.

Application filed June 19, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, CLARENCE HOPKINS, a citizen of the United States, residing at Milford, in the county of Kent and State of Delaware, have invented new and useful Improvements in Fruit-Driers, of which the following is a specification.

The object of this invention is to provide means for supplying fresh heated air to the fruit during the successive stages of drying, and to subject the fruit, after being partially dried, to fresh heated air free from moisture and of a more moderate temperature; also, to provide improved means for passing the trays from one compartment to another, and to generally improve the construction of the apparatus. These objects I attain by means of the devices illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section through the drier; Fig. 2, a perspective view of the same; Fig. 3, a horizontal section; Fig. 4, an enlarged detail view, showing the tray lifting and supporting devices. Fig. 5 shows one of the tray-supports pivoted to a bar, and Fig. 6 is a perspective view of one of the tray-supporting arms.

The casing A of the drying-chamber is open at the bottom and adapted to be placed over a furnace or other suitable heater. This trunk or case is provided with a roof or cover having a stack A', in which is arranged a rotary fan, B, for inducing an upward current of air through the drying-chamber. This fan can be rotated in any convenient way—as, for example, by means of clock mechanism actuated by a spring, or by means of a drum and weighted cord.

A suitable cap, A<sup>2</sup>, is supported above the stack, so as to protect the drying-chamber from rain where the apparatus is located in the open air.

The drying-chamber is subdivided into upper and lower communicating compartments, C and D, by means of two vertical partitions, E and F, respectively located at opposite sides of a vertical plane taken centrally through the trunk or case, and made of such length that the top edge of the lower partition shall be below the level of the bottom edge of the upper partition in order to leave room for the trays

to be shifted horizontally between the partitions from one compartment to the other. At the bottom of the drying-chamber are located a set of rotary dampers, G, which can be turned and set at any desired angle, so as to regulate the supply of hot air to the two drying compartments. The devices for supporting the trays H within these compartments of the drying-chamber consist of vertical rods I, secured to opposite walls of the chamber, and provided with brackets or arms I', which are pivoted to the bars so that they can be extended therefrom so as to support the trays or be swung up against the bars in order to allow the trays to be raised within the compartments. These pivoted supporting-arms each consist of a plate or bar having at its inner end two perforated bars or flanges which embrace the rods I, and through which the pivots pass. The said supporting-arms normally stand in an inclined position, and are beveled at their outer ends, so that when they are thus inclined their beveled ends will afford level supporting-surfaces for the trays.

The devices for raising the trays consist of the vertically-movable bars K, located at two opposite sides of the compartments, and arranged to slide alongside of the fixed bars or rods I, and provided with pivoted teeth or arms K', constructed and arranged in the same way as the pivoted arms I', just described. These fixed and sliding rods or bars I and K lie in pairs in channels L, formed vertically in the walls of the drying-chamber, one fixed and one sliding rod being in each channel.

The mechanism which I have shown for raising the sliding bars consists of the levers M, pivoted on opposite sides of the case, and connected by suitable links or joints with the T-shaped frames N, which are in turn connected with the sliding bars by means of horizontal rods passing through vertical slots O in the case and connecting the two frames and the two sets of sliding bars.

The levers M are operated by means of a suitable windlass, P, connected with the lever by chains or ropes, and having its large cog-wheel P' driven by a smaller cog, P<sup>2</sup>, which is turned by a suitable crank-handle.

The mechanism for shifting the trays from compartment D into compartment C consists

of a pair of horizontal sliding rods, Q, passing through one side of the case and forked at their inner ends, the outer ends of said rods being pivotally connected to the levers R, which are arranged outside of the drier and connected with each other by means of a slot-and-pin connection. These levers are pivoted in brackets secured to the casing, and are operated so as to move the rods against the edges of a tray by means of a rod, p, or other suitable device.

S indicates a spring connected with one of said levers, and adapted to act upon the same so as to cause the rods Q to be projected out from the casing and away from the line of trays after the device for operating the levers has been released.

The drier is provided with a lower door, T, for inserting the trays into compartment D, and with an upper door, U, for removing the trays from compartment C.

Under the present arrangement of fixed and sliding rods carrying the pivoted tray-supports, two of said bars at each side of the chamber extend from the top nearly to the bottom thereof, and answer for both compartments.

The trays are placed upon the arms of the fixed rods in the lower compartment, and elevated, as desired, by raising the sliding bars K, the pivoted arms of which will lift the trays, and the latter in moving upward will push back the pivoted arms of the fixed rods and ride by the same. These pivoted arms drop into their former inclined positions as soon as the trays have passed, and when the sliding bars K are lowered their pivoted arms will be pushed back by contact with the trays, so that they will pass the latter.

The green fruit will be subjected to the greatest heat in the lower compartment, D, from which latter the damp air will pass up through the casing V, between the upper portion and the casing, and to prevent the air from passing from the lower compartment into the upper one any suitable sliding partition, damper, or curtain will be provided between the two.

After the fruit has remained for a sufficient length of time in the lower compartment the trays can be raised and successively shifted from the same into the upper compartment by operating the levers controlling the forked shifting rods. The fruit will be subjected to a direct current of heated air in this upper compartment, the air passing up into the same through the passage V', between the casing and the lower partition.

Air will not be so hot when it enters the upper compartment as the air entering the lower one, and it will be free from moisture, whereby the fruit thus dried or cured will be better preserved and have a brighter color. An upper damper, W, is also provided in the passage V, whereby the supply of heated air to the upper drying-compartment can be regulated,

and hence a moderate heat only maintained therein.

Having thus described my invention, what I claim is—

1. In a fruit-drier, the combination of two communicating compartments, D and C, arranged one above the other in different vertical planes, a passage leading from the lower compartment to the upper part of the drier, a passage leading from the bottom part of the drier to the lower compartment, and mechanism for causing the fruit-carrying trays to ascend through both of said communicating compartments, substantially as described.

2. The combination, in a fruit-drier, of the two communicating compartments D and C, located in different planes, with a passage leading from the lower compartment to the top of the drier, a passage leading from the bottom of the drier into the upper compartment, the dampers at the bottom of the drier for controlling the admission of air, mechanism for raising the trays, and devices for shifting horizontally the trays from one compartment into the other, substantially as described.

3. The combination, in a fruit-drier, of the two communicating chambers D and C with the mechanism for shifting the trays from one compartment into the other, consisting of the horizontally-sliding rods passing through the casing, and the pivoted levers for actuating said rods, substantially as described.

4. In a fruit-drier, the combination, with the upper and lower communicating compartments, C and D, arranged in different vertical planes, of the fixed bars I, arranged respectively in the upper and lower compartments, and each provided with a series of pivoted arms, I', the vertically-reciprocating bars K, arranged respectively at the sides of the fixed bars, and provided with pivoted arms K', frames N, connected with the reciprocating bars, and mechanism for alternately raising and lowering said frames, substantially as described.

5. In a fruit-drier, the two chambers C and D, arranged one above the other in different vertical planes, the lower part of the chamber C communicating with the upper part of the chamber D through a horizontal passage, in combination with mechanism for elevating the fruit-trays through both of said chambers, and means whereby the trays may be transferred from the upper part of the lower chamber into the lower part of the upper chamber, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CLARENCE HOPKINS.

Witnesses:

D. H. WEEKS,  
LAWRENCE PITMAN.