2 Sheets—Sheet 1.

O. F. TIFFANY.

Fruit-Drier.

No. 201,131. Patented March 12, 1878.

Fig. 1.

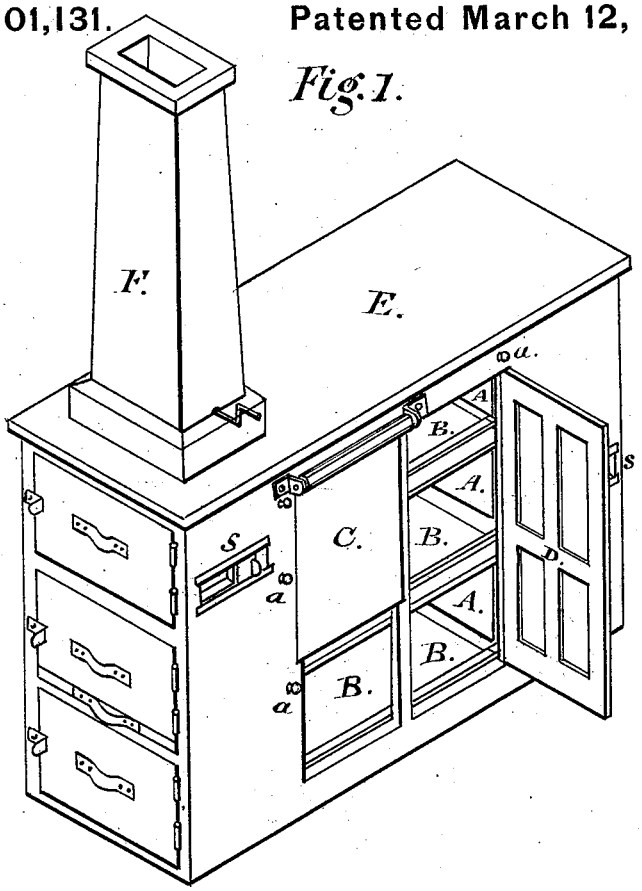


Fig. 2.

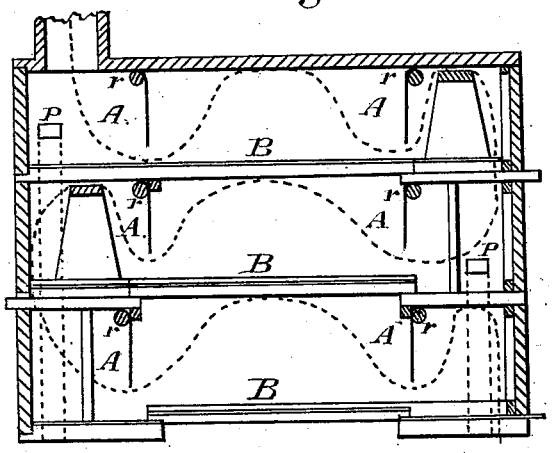
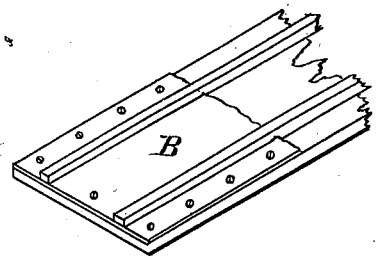


Fig. 3.



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2 Sheets—Sheet 2.

O. F. TIFFANY.

Fruit-Drier.

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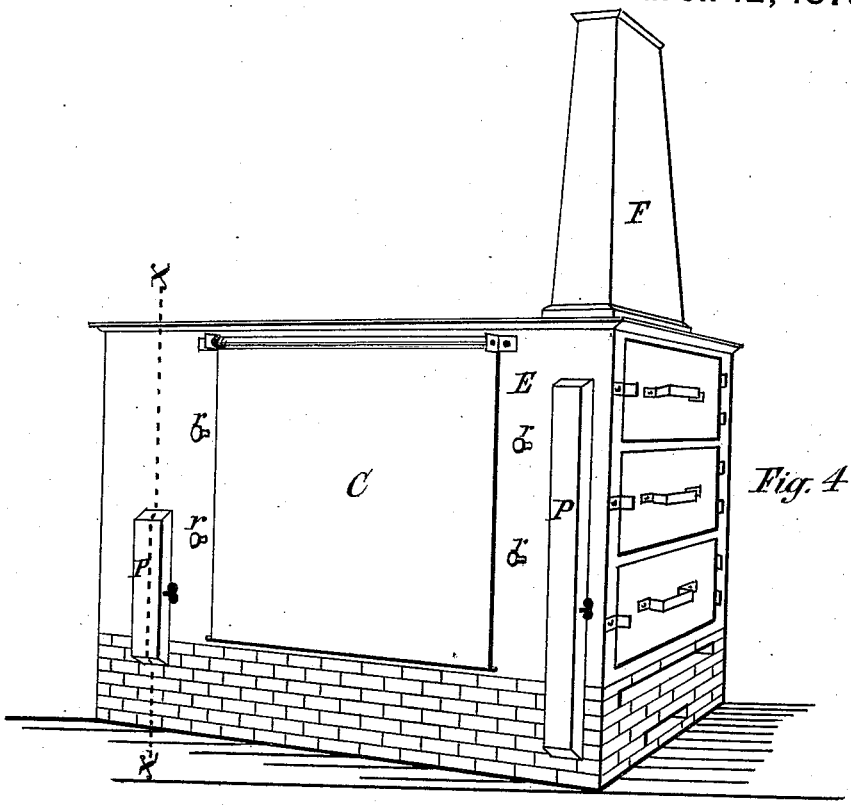

Fig. 4

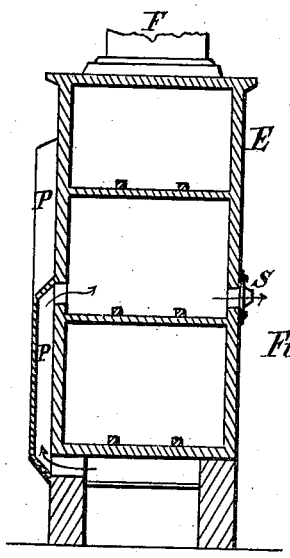

Fig. 5

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UNITED STATES PATENT OFFICE.

OSCAR F. TIFFANY, OF SYRACUSE, NEW YORK.

IMPROVEMENT IN FRUIT-DRIERS.

Specification forming part of Letters Patent No. **201,131**, dated March 12, 1878; application filed November 20, 1877.

To all whom it may concern:

Be it known that I, OSCAR F. TIFFANY, of the city of Syracuse, State of New York, have invented new and useful Improvements in Fruit-Driers, of which the following, taken in connection with the accompanying drawing, is a full, clear, and exact description.

This invention relates to improvements in that class of apparatus in which fruit, vegetables, meats, &c., are dried or preserved by being passed through a series of horizontal compartments or flues arranged one above the other, and through which hot air is circulated in a sinuous course.

The invention consists, essentially, first, in covering the top surface of the floors of the drying-compartments with metal or other material having superior power of conducting and reflecting heat, whereby the heat is attracted to the floors of said compartments, and which, in conjunction with partitions or barriers, is the means of preserving the fruit, &c., in their natural flavor; second, in the combination, with the respective drying-compartments, of curtains or other suitable partitions, forming barriers and deflectors of the hot-air current, to retard the escape of same, and thoroughly diffuse the heat in the compartments; third, in the combination, with the upper drying-compartments, of hot-air flues or conductors extended from the hot-air furnace direct to said compartments, for regulating and equalizing the heat in the drier; and, fourth, in the combination, with the aforesaid compartments, of cold-air exits for the expulsion of cold air usually remaining dormant in the corners or recesses of the said compartments, and hitherto impairing the effectiveness of the drier, all constructed and arranged substantially in the manner hereinafter fully described.

The invention is clearly illustrated in the accompanying drawing, wherein Figure 1 is an isometric view of a fruit-drier provided with my improvements; Fig. 2, a longitudinal section of same; Fig. 3, a detail view of a portion of the floor of one of the drying-compartments; Fig. 4, a perspective view of the side of the drier opposite that shown in Fig. 1, and Fig. 5 a transverse vertical section on line *x x* in Fig. 4.

Similar letters of reference indicate corresponding parts.

E represents the drying-chamber or evaporator, divided into a series of horizontal compartments or flues, arranged one above the other, through which the substance to be dried or preserved is successively conveyed, the said compartments communicating with each other by hatchways at alternate ends, and with a furnace underneath, from which the heat is circulated in a sinuous course through the superstructed chamber E to the exit-flue or stack F.

Since heat naturally ascends, the current of hot air generated by the furnace underneath the chamber E hitherto passed along the top of the respective drying-compartments, and escaped through the stack without producing the desired effect on the fruit or other substance placed in the drier, and at the same time carried off the aroma and natural flavor emitted by the same during the process of drying or curing.

To prevent this waste of heat and the deteriorating effect on the substance to be dried or preserved, I cover the hitherto wooden floors B B of the respective drying-compartments with galvanized iron, tin, zinc, tile, or other material neutral to the action of acidulous gases, and having superior power of conducting and reflecting heat.

Floors of this description, while presenting non-conducting ceilings to the compartment underneath, attract with their top surface the heat from above, and thus equalize the temperature in the compartments, and, in conjunction with certain deflectors or barriers hereinafter described, are the principal means of preserving the substance subjected to the process of drying in its natural flavor and aroma.

To retard the escape of the hot-air current with its attendant vapor emitted by the substance undergoing treatment, and to thoroughly diffuse the same within the compartment, I place at proper positions or intervals in said compartment curtains A A, or other suitable partitions or barriers, fitted closely to the top and sides of the interior, and arranged to be adjustable in their proximity to the floor, as

illustrated by knobs or handles *r*, Fig. 4, on the protruding end of the curtain-roller, so that the ingress and egress of the hot-air current can be regulated. By means of these barriers the current of hot air is deflected to the bottom of the compartment, and with its natural ascent between the barriers it is imparted a roving or sinuous course, as indicated by dotted line in the drawing, and becomes thoroughly diffused within the compartment. The vapor meanwhile emitted by the substance subjected to the heat, becoming dense and heavy, descends through the said substance to the floor of the compartment. This, having become heated, immediately evaporates the moisture, and causes the vapor to again rise and penetrate the car or crate containing the aforesaid substance, and thus constantly envelops the substance in its own vapor and its attendant aroma and saccharine atoms, which hitherto were allowed to escape. The aroma being absorbed by the said substance, and the saccharine matter forming a coating on the surface thereof, it is evident that this process preserves the aroma and natural flavor in the fruit and other substance, and constantly enriches the same.

To adapt the apparatus for drying or preserving substances of various natures, and for different purposes, I connect with the transparent portion of the drying-chamber a removable cover, such as a curtain, C, or door D, as illustrated in the accompanying drawing. By means of this cover the light can be excluded from the interior of the chamber E, when containing substances in which discoloration is objectionable, while at the same time observations of the progress of drying or curing within the chamber can be readily obtained by removing or opening the shutter. This arrangement is very essential to the manufacture of raisins and other dried fruit, which require special care and management.

P P are the direct hot-air flues or conductors, extended on the exterior of the drier from the furnace to the upper drying-compartments, and provided with a damper for regulating the ingress of the hot air to the latter. By this adjunct, the temperature in the several drying-compartments can be equalized or varied at pleasure.

S S are the cold-air exits, in the form of apertures in the sides of the chamber directly opposite the hot-air conductors P P, provided with movable covers for closing the same when the drier is in full operation. These exits are opened when first starting the heat in the drier, so that the cold air, which usually remains for some time dormant in the corners of the upper drying-compartments, may be allowed to escape, thus insuring a uniform temperature throughout the drying-chamber, and expediting the process of drying or curing.

Having thus described my invention, what I claim is—

1. In combination with the deflectors A A, constructed as shown, the floors B B, covered with material having power of conducting and reflecting heat, substantially as described, for the purpose specified.

2. In an apparatus for drying or curing fruit and other substances, the combination, with the drying-compartments, provided with means for passing a current of hot air through them, as described, of the barriers or deflectors A A, substantially as described and shown, for the purpose set forth.

3. In the within-described fruit-drier, the combination and arrangement, with the upper drying-compartments, of the direct hot-air conductors P P, substantially as described and shown, for the purpose set forth.

4. The combination and arrangement, with the drying-chamber E, provided with means for passing a current of hot air through it, of the cold-air exits S S, substantially as and for the purpose specified.

OSCAR F. TIFFANY.

Witnesses:
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I. C. LAASS.