(No Model.) 2 Sheets—Sheet 1.

G. A. & C. F. FLEMING.

FRUIT DRIER.

No. 362,736. Patented May 10, 1887.

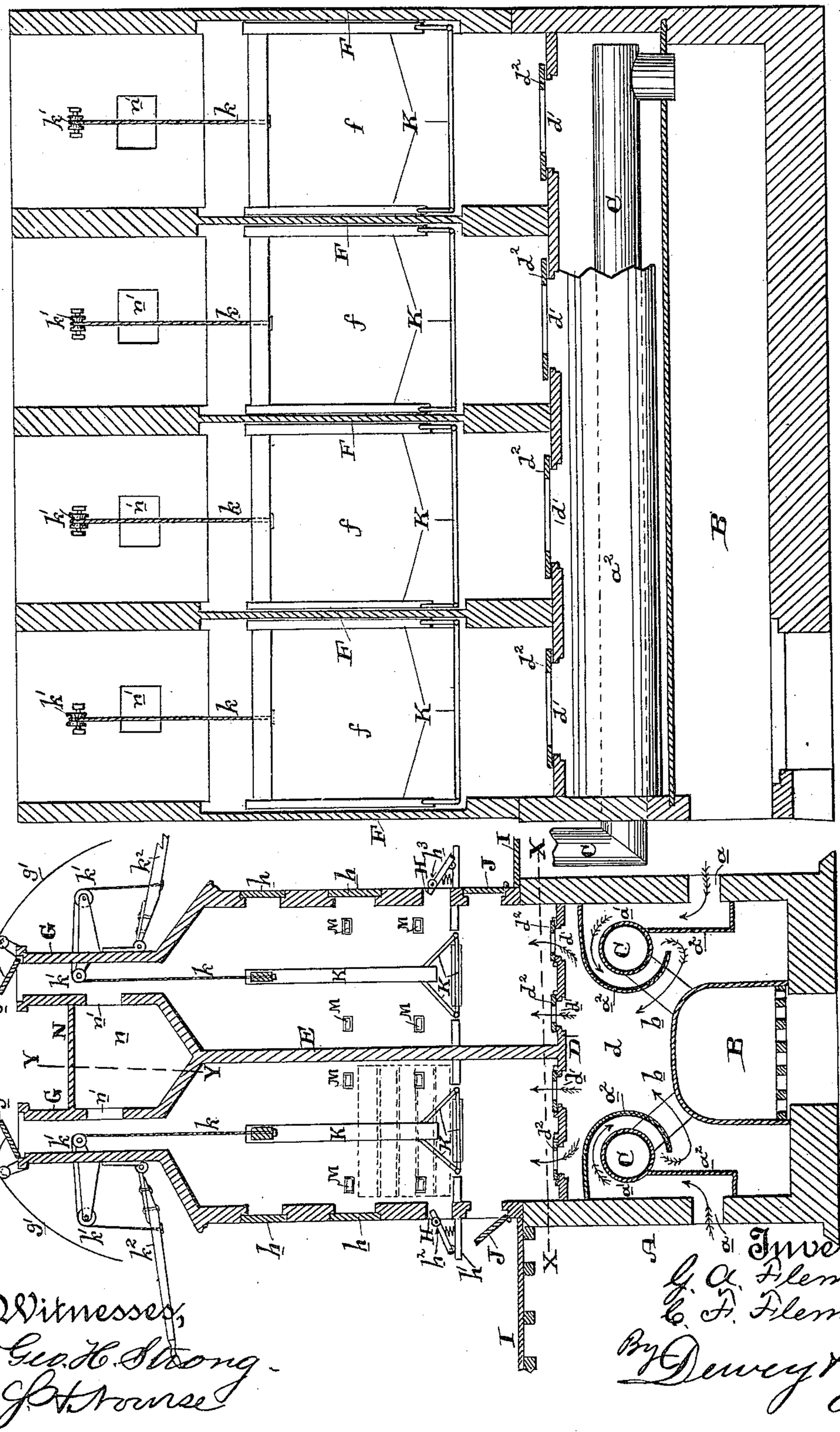

FIG. 2.

FIG. 1.

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(No Model.) 2 Sheets—Sheet 2.

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FIG. 1.

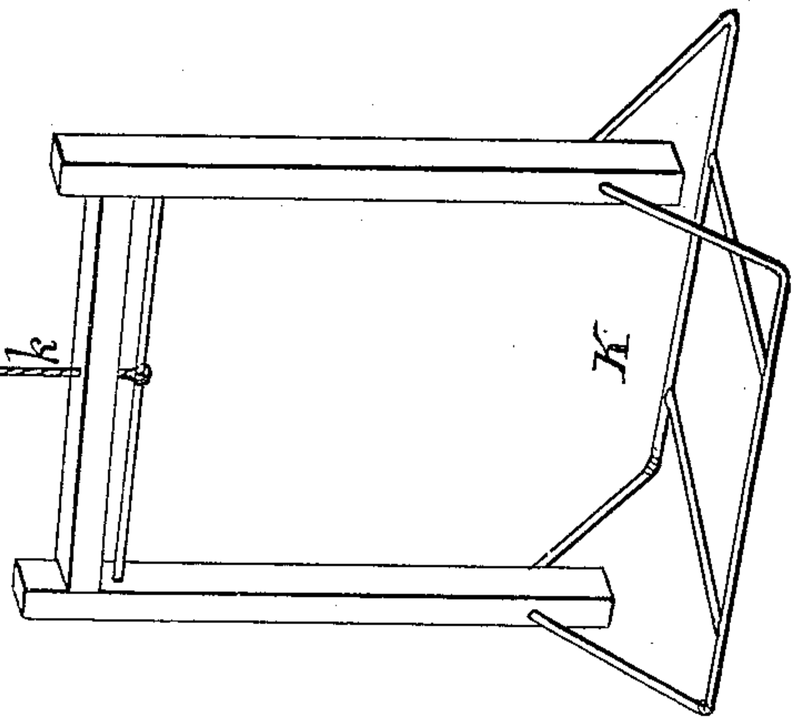


FIG. 6.

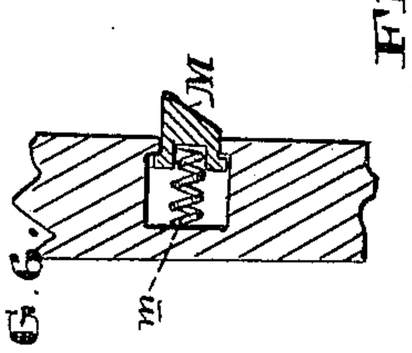


FIG. 7.

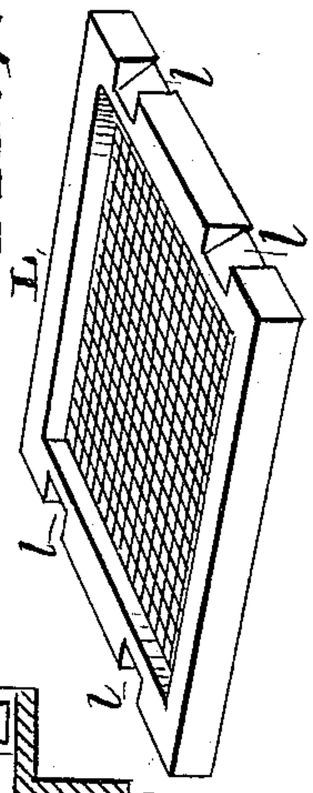


FIG. 3.

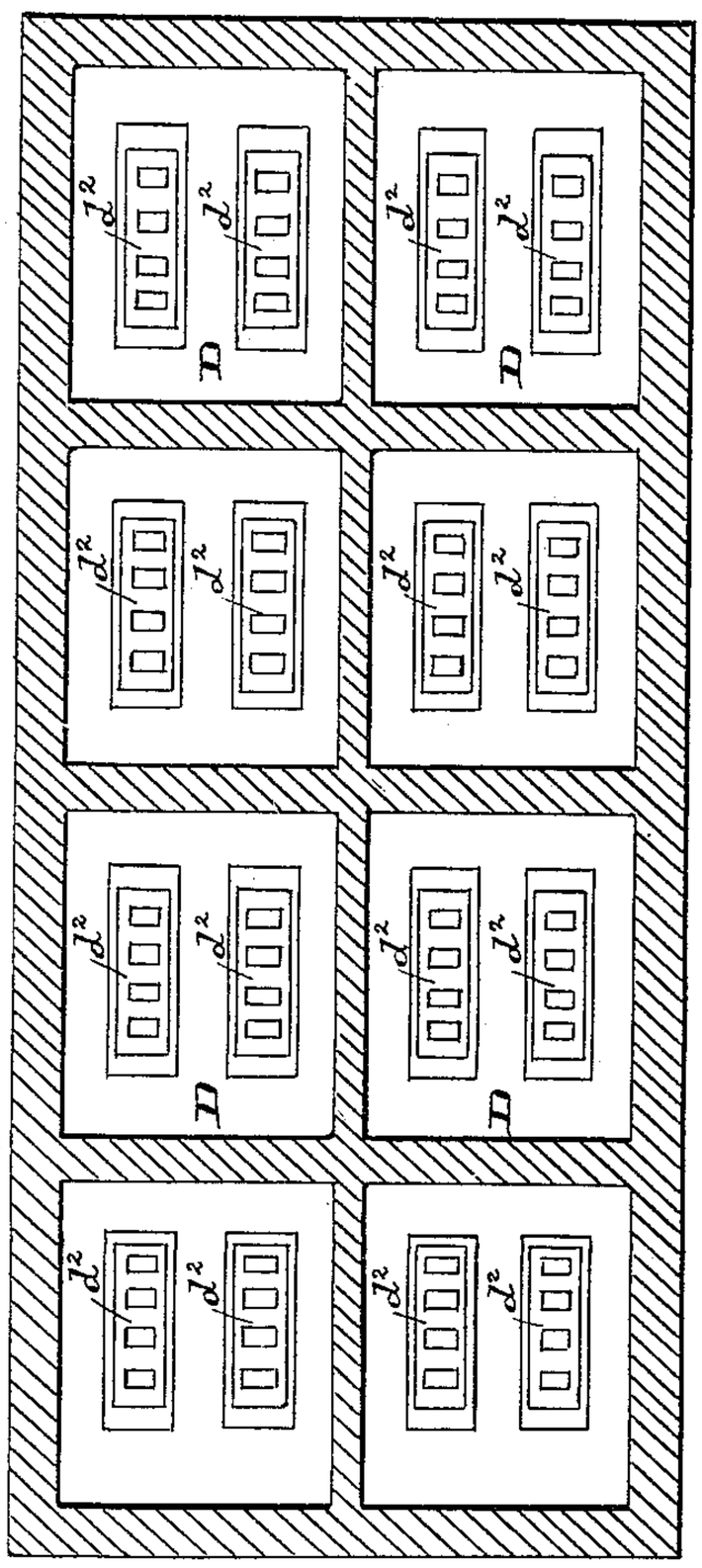
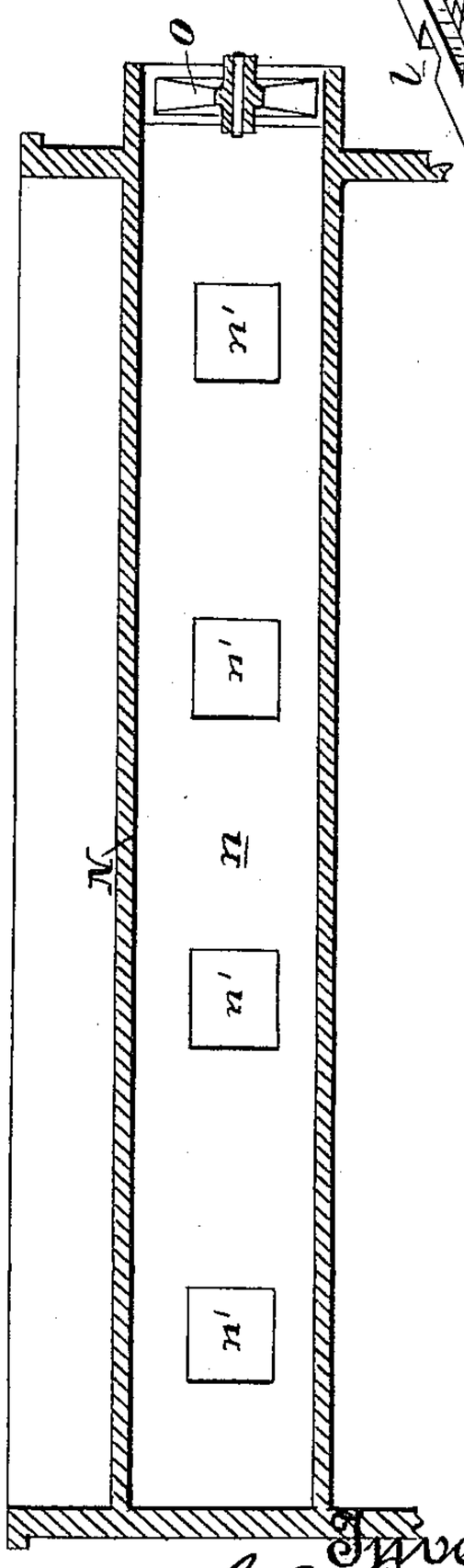


FIG. 4.



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UNITED STATES PATENT OFFICE.

GEORGE A. FLEMING AND CHARLES F. FLEMING, OF SAN JOSÉ, CALIFORNIA.

FRUIT-DRIER.

SPECIFICATION forming part of Letters Patent No. 362,736, dated May 10, 1887.

Application filed August 7, 1886. Serial No. 210,367. (No model.)

To all whom it may concern:

Be it known that we, GEORGE A. FLEMING and CHARLES F. FLEMING, both of San José, Santa Clara county, State of California, have invented an Improvement in Fruit-Driers; and we hereby declare the following to be a full, clear, and exact description of the same.

Our invention relates to the class of fruit-driers; and it consists in the various details of construction and arrangement relating to the heating of the air, its control and admission to the fruit-chambers, the management and disposal of the fruit-trays, the natural and artificial draft, and other features, all of which we shall hereinafter fully describe.

The object of our invention is to provide a simple and effective fruit-drier.

Referring to the accompanying drawings for a more complete explanation of our invention, Figure 1 is a vertical transverse section of our drier. Fig. 2 is a vertical longitudinal section of the same. Fig. 3 is a section on line X X, Fig. 1. Fig. 4 is a section on line Y Y, Fig. 1. Fig. 5 is a perspective view of the elevator. Fig. 6 is a sectional view of the spring-catch. Fig. 7 is a perspective view of the fruit-tray.

A is the shell of the drier. B is the furnace, located in its base.

C are return-flues, which are separately connected with the rear of the furnace-chamber by pipes *b*. These flues pass through the front wall of the shell, as shown in Fig. 2, and are supposed to unite in a suitable smoke-stack. (Not here shown.) Across the shell, horizontally, is fixed a partition or diaphragm, D, whereby the air-chamber *d* is formed below. Cold air has access to this chamber through openings *a*, made in the sides of the shell, which openings communicate with curved passages *a'*, formed around the flues C by the plates a^2, as shown clearly in Fig. 1, in which the entrance of the air to the chamber is indicated by the inleading arrows. The diaphragm or partition D has a number of apertures, *d'*, made through it, which are controlled by valves, d^2, Fig. 3, in the nature of dampers, by the adjustment of which the air passing from the chamber *d* through the diaphragm is regulated and controlled.

The interior of the shell above the diaphragm is divided longitudinally by a vertical partition, E, and transversely by vertical partitions F into any number of chambers, *f*, as shown in Fig. 2. These are fruit-chambers, and receive their hot air through the valved diaphragm below, their discharge being through individual stacks G, (shown in Fig. 1,) the upper ends of which are controlled by valves or gates *g*, operated in any suitable manner, as by the cords *g'*. Access to these chambers *f* is had through feed-apertures H at their base, which admit the fruit-trays, and through door-controlled apertures *h* in the side walls above, inspection and discharge of their contents may be effected.

Just below the entrance or feed apertures H is a shelf, *h'*, to which is hinged a spring-actuated inclined flap-door, h^2, which normally closes the feed-aperture, as shown in Fig. 1, but which yields to the pressure of the tray when being inserted and immediately closes again. Rollers h^3 are located upon the upper end of the door, by which the friction of the tray is avoided. I is a shelf upon which the operator stands in feeding the drier. J are hinged gates for affording access to regulate the valves in diaphragm D.

In each fruit-chamber *f* is an elevator, K, (shown particularly in Fig. 5,) consisting of a light frame-work, to the upper portion of which is connected a rope or cable, *k*, passing over guide-pulleys *k'*, Fig. 1, and attached to pivoted levers k^2, by the operation of which the elevators are raised and lowered. L is a fruit-tray. (Shown particularly in Fig. 7, and indicated in Fig. 1 by dotted lines.) This tray is pushed in over the door, through the feed-aperture H, and is seated upon the elevator K.

In the side walls of the fruit-chambers are located the beveled catches M, Fig. 6, which are influenced by springs *m* to remain normally projected. There are two sets of these catches, as shown in Fig. 1.

The edges of the trays L, Fig. 7, are provided with beveled notches *l*, so that when the elevator is raised the notches of the tray engage the catches and force them back to allow the tray to pass, the catches springing out under and supporting it when the elevator is withdrawn.

The particular object of the notches *l* we shall hereinafter explain. Between the stacks G of the fruit-chambers is set a horizontal wall

or plate, N, Fig. 1, which forms, with said stacks and their bases, a longitudinal passage, *n*, with which the stacks communicate by openings *n'*. At one end of this passage, as is shown in Fig. 4, is placed a suction-fan, O.

The operation of our drier is as follows: The heated gases and products of combustion from the furnace, after passing directly back through the main fire-chamber, are led forward again through the return-flues C and are disposed of in the smoke-stack. The cold air enters through the apertures *a* in the base of the shell, and passes through the passages *a'*, encircling the return-flues C, and is thereby heated. Entering the air-chamber *d*, it passes up through the valved partition or diaphragm D in such quantities and in such directions as may be desired, and is completely under control, so that it may be admitted to one or more or all of the fruit-chambers *f*, the proper adjustment of the dampers of the diaphragm being effected through the side gates, J. A fruit-laden tray, L, is passed through the feed-apertures H, the spring-actuated hinged door yielding to its passage, and is seated upon the elevator K in the fruit-chamber. By the movement of the lever k^2 the elevator is now raised until its tray has passed the lower set of catches, M, when the elevator is lowered again, the tray remaining and being supported upon the catches. A second tray is now inserted into the fruit-chamber and seated on the elevator, which is again raised, and the frame of its tray, coming up under the frame of the tray previously placed in the chamber, raises the latter tray directly upon itself, and is itself supported by the catches while the elevator withdraws. A third tray is now placed in position, and it in turn raises the other two and is supported upon the catches.

In Fig. 1 we have shown by dotted lines three trays, one above the other, supported upon the lower set of catches, while the fourth is seated upon the elevator and ready to be raised. These trays fit quite snugly in the fruit-chambers, and resting directly upon one another their frames form the walls of vertical flues, through which the heated air is passed, thus effectively drying the fruit resting upon them. The upper trays in each chamber are thus gradually brought to the top and their fruit completely dried, so that they may be withdrawn to make room for fresh ones below, the entire process being thereby rendered continuous.

The object of the notches *l* in the frame of the trays is to allow the uprising tray to come in contact with the under surface of the one above and raise it off the catches before its own frame comes in contact with said catches and attempts to force them back. In this way the weight is completely removed from the catches before they are forced back, thus providing for their easy operation. The employment of a second set of catches above the first provides for the examination of the fruit after it has passed a given point in the trip upward. The gates *g* on the top of the stacks G enable us to control the draft. It may be found that the natural draft will not be sufficient to remove the damp air which usually collects in the top of the fruit-chambers; but to provide for this we connect all the chambers through the apertures *n'* with the longitudinal passage *n*, and thus by the operation of the suction-blower O at the end of the passage are enabled to provide for an artificial draft, which may be used either alone or to supplement the natural draft.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a fruit-drier, the shell A, having the cold-air apertures *a*, in combination with the furnace B, the return-flues C, connected therewith, and the plates a^2, whereby the curved passages *a'* are formed about the return-flues for admitting the outer air to the interior of the shell, substantially as herein described.

2. In a fruit-drier, the combination, with the shell A, having a diaphragm dividing the said shell into a flue and heating-chamber, respectively, of a furnace, B, the return-flues separately connected with the rear of the heating-chamber, passages *a*, formed in the sides of the shell, and the curved plates a^2, forming the passage *a'* around the return-flue for admitting the outer air to the heating-chamber, substantially as herein described.

In witness whereof we have hereunto set our hands.

GEO. A. FLEMING.
CHAS. F. FLEMING.

Witnesses:
D. W. SNOW,
EUGENE D. SNOW.