

A. C. BURDICK,
Fruit-Drier.

No. 206,860.

Patented Aug. 13, 1878.

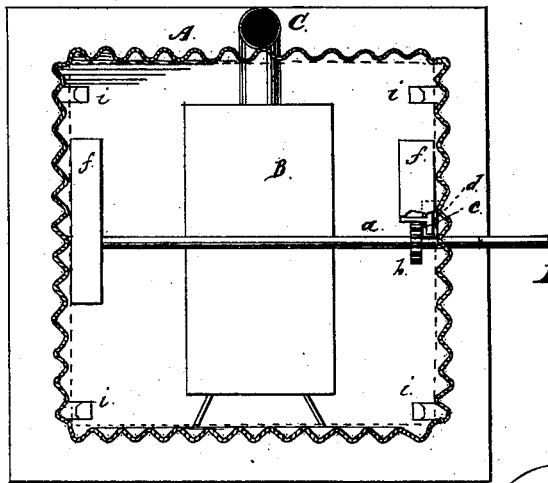
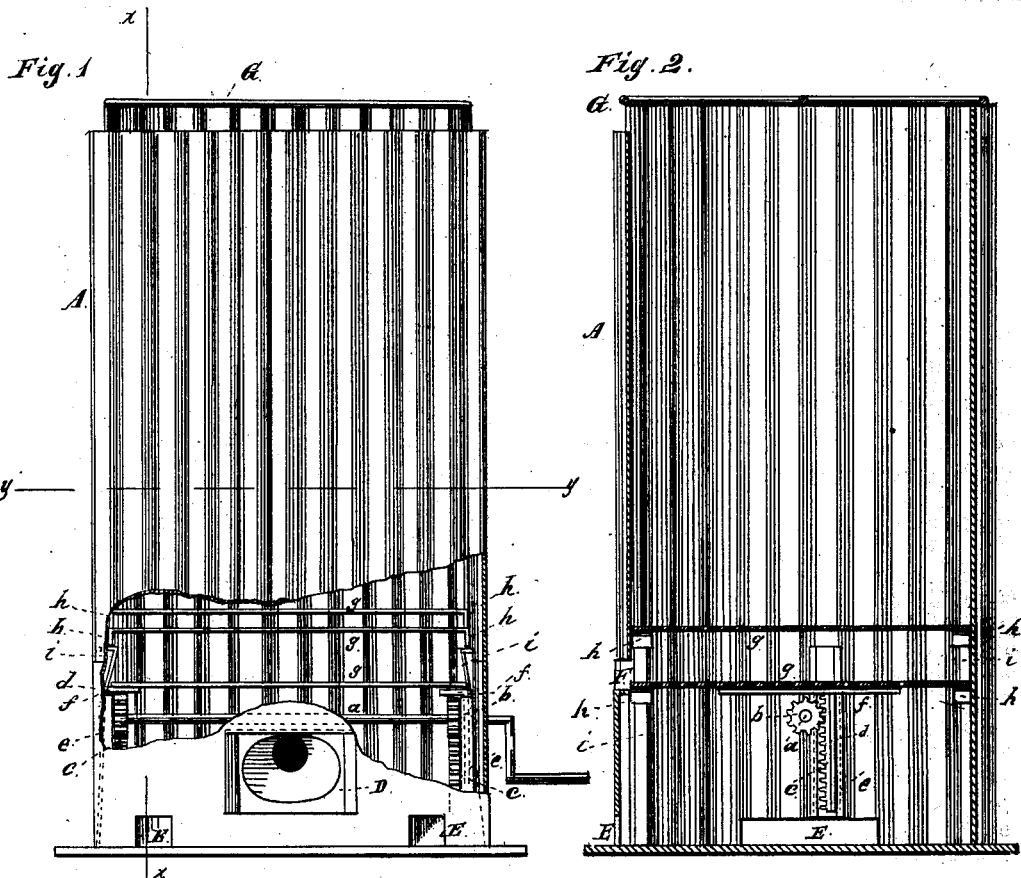


Fig. 3.

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IMPROVEMENT IN FRUIT-DRIERS.

Specification forming part of Letters Patent No. **206,860**, dated August 13, 1878; application filed April 5, 1877.

To all whom it may concern:

Be it known that I, AMBROSE C. BURDICK, of Coldwater, Branch county, State of Michigan, have invented new and useful Improvements in Fruit-Driers, of which the following is a full description, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation, a portion being broken away to show the interior. Fig. 2 is a vertical section on line *x x* of Fig. 1; Fig. 3, a cross-section on line *y y* of Fig. 1.

The object of this invention is to improve the construction and operation of that class of driers, used in drying fruit and other substances, employing a vertical chamber to receive the trays containing the fruit or other substances to be dried, in which chamber the drying process is accomplished; and its nature consists in providing the walls of the chamber with a series of air-passages so arranged as to produce an outward and upward current and a more rapid evaporation and ventilation; in providing improved devices for elevating the trays; in devices for holding one tray up while another is being elevated; and in the several parts and combination of parts hereinafter described and claimed as new.

In the drawings, A represents a vertical drying-chamber, made of sheet metal, galvanized iron, or other suitable material. As shown, this chamber is made of corrugated sheet metal, and these corrugations form a series of air-passages in the walls of the chamber for hot-air currents, so that, as the hot air passes up through the fruit in the chamber, it will be drawn outward to the walls of the chamber. B is a furnace located within and at the bottom of the chamber A. C is the flue or passage for the smoke. D is the opening for the admission of fuel. These parts B, C, and D may be of any of the ordinary forms of furnaces used with driers of this class. E are openings in the walls of the chamber A, at the bottom, for the passage of cold air into the chamber, where it becomes heated, as usual. F is an opening in the front wall or side of the chamber A for the passage of the trays containing the fruit or other substance into the chamber. This opening is located just above the top of the furnace B. G is an opening at the top of the chamber, through which

the trays can be removed from the chamber. *a* is a shaft, provided with a suitable crank at one end, and located in suitable bearings in walls of the chamber A. *b* are pinions secured to the shaft *a*. These pinions are so located as to have a small space between them and the walls of the chamber. *c* are racks, so arranged as to engage with the pinions *b*. *d* are slides, on which the racks *c* are permanently secured. *e* are guideways, permanently secured to the inside of the walls of the chamber A. The slides are operated in the ways *e* by means of the racks and pinions. *f* are arms or supports, permanently secured to the slides *d*. *g* are the trays, formed of wire-cloth or other suitable material. The substance to be dried is placed on these trays. *h* are legs, formed with or attached to the frame of the trays *g* in any suitable manner, and of such length that, when one tray is placed on top of another, there will be a space between them. *i* are springs, one located in each corner of the chamber A, at the bottom, and extending up some distance above the opening F. They are each provided with a projection or support at the top. These springs are so arranged that they will permit the easy insertion of the tray at the opening F, and, after it is raised, they will spring back under the tray and hold it in position by means of the tops of the springs engaging with the legs *h* of the tray.

The shaft *a* should be so located that it will permit the supports or arms *f* on the slides *d* to descend far enough for the trays to rest thereon, their position, when down, being nearly on a line with the bottom of the opening F.

In use, the substance to be dried is placed in the trays *a*, as usual, and a tray is inserted through the opening F, the edges of the tray forcing the springs *i*, and the tray, when in the chamber A, resting on the arms *f*. Then the shaft *a* is turned by means of the crank, revolving the pinions *b*, and, through the racks *c*, elevating the slides *d*, and with them the arms *f* and tray *g* resting thereon; and this raising is continued until the tops of the springs *i* are passed, when the springs will come beneath the legs *h* of the tray by their own action and hold the tray up, while the arms *f* and other parts are returned to receive

another tray, which is accomplished by turning the shaft *a* in the opposite direction. Another tray is inserted and elevated, as before described, the top of the second tray engaging with the legs of the first tray and raising the first tray, while the second takes its place on the tops of the springs *i*, and so on with the remaining trays. When the first tray has reached the top of the vertical chamber *A* the substance thereon will be dried, and the tray and contents can be removed through the opening *G*, and so on with the successive trays as they come to the top of the chamber *A*.

The hot-air currents for drying the substance should be distributed and equalized through and over the substance in order to thoroughly and evenly dry it, during which process such currents become charged with moisture from the substance, which impedes the drying, so that it is desirable and necessary to have the currents charged with moisture taken out and replaced by other currents from the furnace.

By providing the walls of the chamber *A* with a series of air-passages a system of side air-currents will be produced, which travel up these side passages, which currents will be dry and hot all the time when the drier is in operation.

As the hot air, which dries the fruit or other substance on the trays, comes from the furnace or heater *B* it passes up through the substance on the trays and between the trays, and, as the trays fit against the sides of the chamber or air-passages therein, the tendency of these hot-air currents, after they become charged with moisture from evaporation, will be to flow outward between the trays toward the series of air-passages in the sides of the chamber, which will cause them to circulate freely through the fruit or other substance and between the trays or screens, and at the same time allow the air charged with moisture to pass outward to the sides of the chamber, where it interchanges or mingles with the hot and dryer currents running up the series of side air-passages, thus producing a side draft for the moist air, which effectually drives or draws it through and away from the substance and toward and up the sides of the chamber, allowing a hot current from the furnace to take its place, so that a constant stream or current of hot air is made to pass through the fruit.

As shown, this series of side air-passages is formed by making the chamber *A* of corrugated sheet metal, the corrugations forming

the passages; but such side air-passages may be formed by crimping, stamping, pressing, or otherwise making them in the material of which the chamber *A* is constructed.

I prefer to make the chamber of corrugated sheet metal, for by so doing the air-passages may be formed, and I can use a much lighter metal, and still have the necessary strength and stiffness, as though a heavy metal were used, thus saving cost in constructing the drier, and also at the same time making the chamber fire-proof.

For ordinary use I make the chamber *A* from eight to twelve feet high and from two to three feet square. The chamber may be made in a circular form, if desired.

A wooden chamber might be used, having a lining of tin, such lining being corrugated or otherwise constructed so as to form the series of side air-passages.

This drier can be used in the rooms of any ordinary building, or in a wood-shed or other out-building, or it may be used in the open air.

A series of springs similar to *i* might be arranged up the sides of the chamber *A*, to hold the trays as they are elevated. When springs are so used the frames of the trays would have to be cut or beveled at the corners, so as to permit the springs to work.

When springs are used to hold the trays up each tray will have an independent support; and with such construction an opening might be provided part way up the wall of the chamber, so that a tray could be taken out and replaced, to see if the substance was drying properly, without interfering with the elevating of the remaining trays.

What I claim as new, and desire to secure by Letters Patent, is as follows:

1. In a fruit-drier, the chamber *A*, constructed of corrugated sheet metal, and its interior ridges acting as guides for the trays, as described, in combination with trays arranged with a space between them, for permitting the free circulation of the air around the trays and through the fruit, substantially as set forth.

2. In a fruit-drier, the shaft *a* and pinions *b*, in combination with the springs *i*, racks *c*, slides *d*, and arms *f*, for receiving and elevating the trays, substantially as described.

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Witnesses:

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