2 Sheets—Sheet 1.

M. HARRIS.

LUMBER-DRIER.

No. 169,903. Patented Nov. 16, 1875.

Fig. 1.

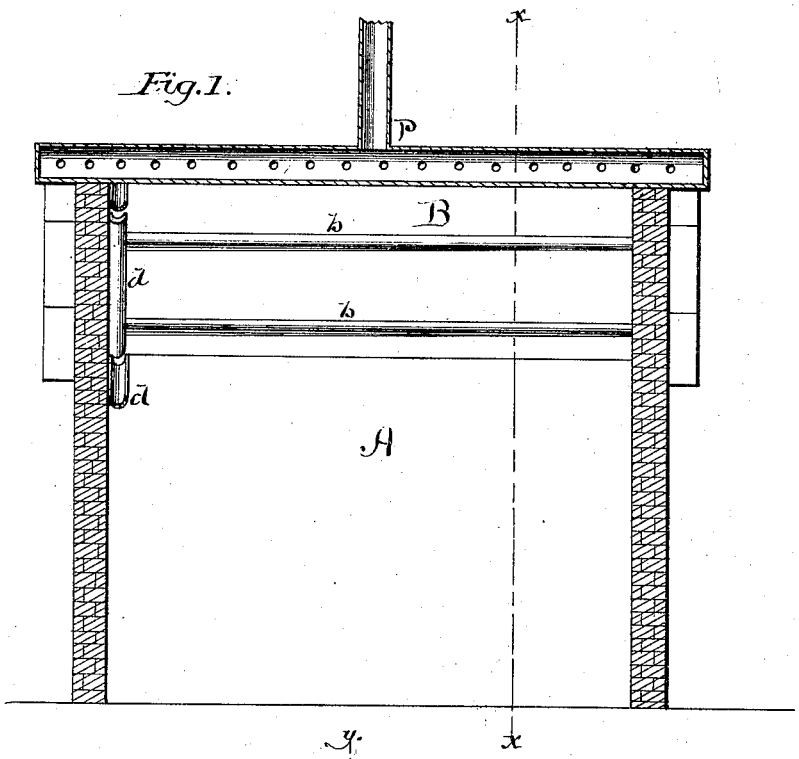
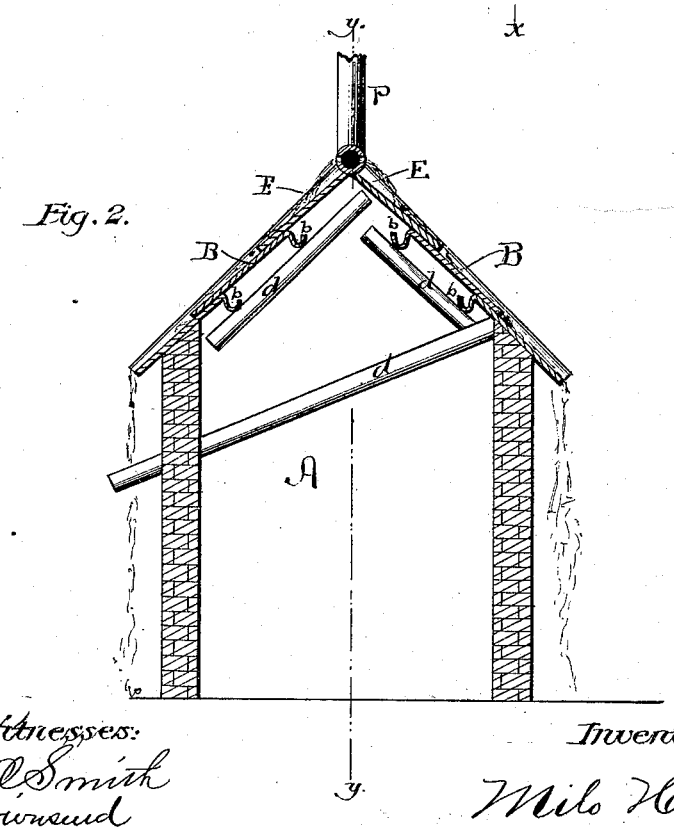


Fig. 2.



Witnesses:
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F. B. Townsend

Inventor:
Milo Harris

2 Sheets—Sheet 2.

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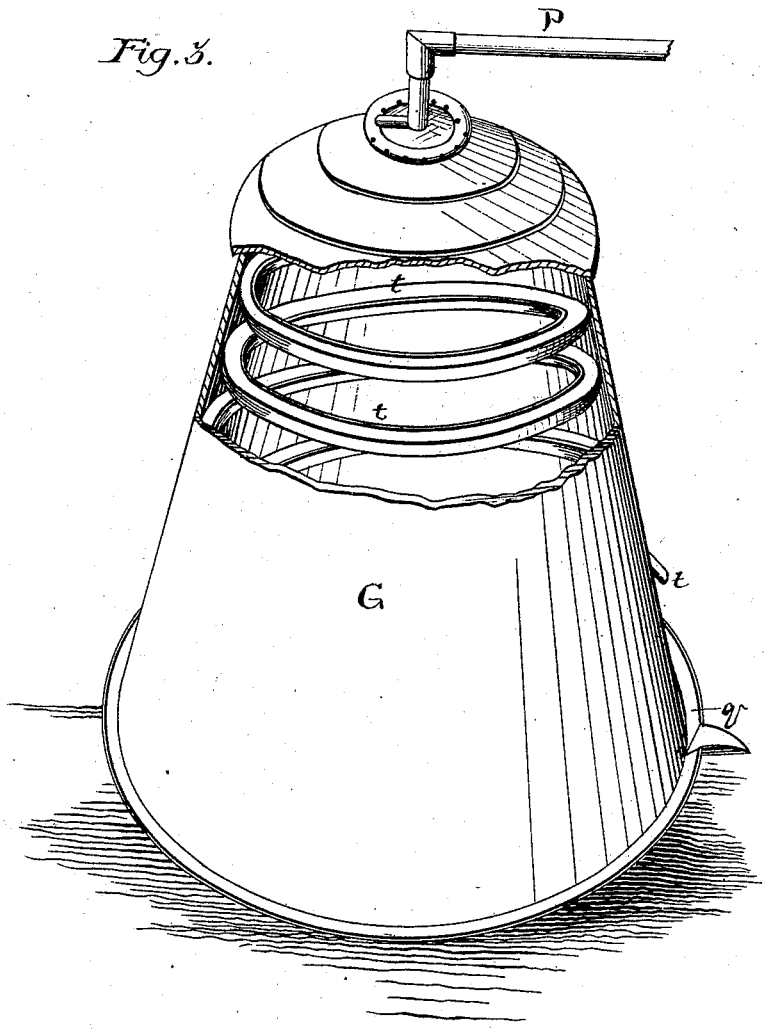
Fig. 3.



Witnesses:
R. D. O Smith
F. B. Townsend

Inventor:
Milo Harris

UNITED STATES PATENT OFFICE.

MILO HARRIS, OF JAMESTOWN, NEW YORK.

IMPROVEMENT IN LUMBER-DRIERS.

Specification forming part of Letters Patent No. **169,903**, dated November 16, 1875; application filed October 9, 1875.

To all whom it may concern:

Be it known that I, MILO HARRIS, of Jamestown, in the county of Chautauqua and State of New York, have invented certain new and useful Improvements in Dry-Kilns for Lumber, &c.; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to that class of drying-kilns wherein condensing-surfaces are employed to extract from the hot air the moisture withdrawn from the substances being submitted to the drying process; and it consists, first, in the construction of the ceiling or walls, whereby separate gutters or conductors for the water of condensation are not required; second, in water-conductors in connection with a metallic roof or wall, whereby the temperature of the condensing-surface may be kept at the desired point.

Heretofore when condensing-surfaces have been employed with means for reducing the temperature, as by the use of water, the same has been applied by means of circulating-pipes placed inside the drying-chamber. The objection to this method is in its cost, and the liability to derangement by leaks, &c.

By my improvement the wall of the chamber becomes the condensing-surface, and no extra receptacle is required, while the edges of the metallic sheets composing the walls constitute the gutters to convey away the water of condensation.

That others may fully understand my improvement, I will more particularly describe it, having reference to the following drawing, wherein—

Figure 1 is a longitudinal section of my kiln. Fig. 2 is a transverse section of the same. Fig. 3 exhibits, in perspective, a modified form of drying-chamber, to the whole surface of which water may be applied from a single point.

A is my drying chamber or kiln, the walls of which may be constructed of any suitable material—of brick, if desired, as represented in the drawings—because the most efficient condensing-surface will be at the roof or ceiling, which I propose to construct of galvanized iron or other suitable sheet metal. The separate sheets composing the roof B are guttered along one edge, substantially as shown at *b*, and this guttered edge is placed on the inside surface of the roof, so as to catch the water which is condensed against the metallic surfaces above, and trickles down. The several roof-sheets are laid slightly diagonal to the to the ridge-line, so that the several gutter edges of one line of plates will form a continuous gutter, extending, if required, the whole length of the roof, and at the end discharging into a trough, *d*, which conducts the water delivered by the several roof-gutters *b*, into any suitable receptacle, or discharges it outside of the kiln.

It is not convenient to support a roof so constructed upon rafters below the roof-plates in the usual way, because the rafters would not only impair the action of the roof-plates as a condensing-surface, but would interfere with the continuous passage of the gutters *b*. I, therefore, make my roof-frame or rafter structure outside of the roof-skin. This structure is shown by the rafters E, to the under side of which the plates B are secured by any suitable means. The lapping edges of the plates B may be secured together by solder, or in any other proper way.

Heat is imparted to the air inclosed within the chamber A by steam-coils at the bottom, or in any other suitable way. To regulate, as far as necessary, the refrigerating power of the roof-plates B—that is to say, to keep them cool while the sun is shining upon them—I provide a pipe, P, which is placed along the highest part of the roof B, and discharges water thereon through perforations along its sides, or by discharging into an open trough, which overflows, or in any other proper way, the design being to cover the entire roof surface with a sheet of running water, or with a refrigerating-coating composed of some substance such as matting, which will hold a small quantity of water, and constitute an evaporating-surface, which may be continually supplied from the trough or pipe P, and water may be forced into and through the pipe P by the hydro-

static pressure of a fountain or reservoir at a greater height, or by any suitable pumping mechanism.

In Fig. 3 I have shown a modified structure, adapted for use on a small scale, as for drying fruit, &c., for family use. G is a conical or pyramidal shaped case or chamber of sheet metal, with a spiral trough, *t*, or gutter around its inner surface, extending from its apex to its base, where it discharges at the outside of the chamber. A pipe, P, discharges water upon the apex of the chamber G in such a manner that the whole surface shall be covered and kept wet with a film of running water. A trough, *q*, may be placed around the base of the chamber G to receive the water discharged from the pipe P, and conduct it away. With care, however, the discharge of the pipe P may be so regulated that it will just balance the surface evaporation, in which case no water would reach the base of the chamber G on the outside.

The chamber G may be constructed from the guttered plates described, in connection with the roof B, or the spiral trough may be separately made and attached by solder.

A flexible pipe may be employed to conduct water to the pipe P to render the chamber G easily movable.

In using this invention for the drying of fruit, heat may be derived from a stove, or from hot-water pipes, or in any convenient way, and the fruit may be spread upon suitable perforated or reticulated shelves above the heater.

Having described my invention, what I claim as new is—

1. The plates B, constructed with the guttered edge *b*, and secured together as set forth to form a condensing roof or wall of a drying-kiln, with gutters to receive and carry away the water of condensation, as set forth.

2. The condensing-plates B, gutter *b*, and pipes P, all made, combined, and arranged in manner, and for the purpose set forth.

3. The roof-plates B, with guttered edges, combined with supporting-rafters E placed outside of said roof-support, the same as set forth.

In testimony that I claim the foregoing as my own invention, I affix my signature in presence of two witnesses.

MILO HARRIS.

Witnesses:
JAMES H. WARING,
JOHN T. ARMS.