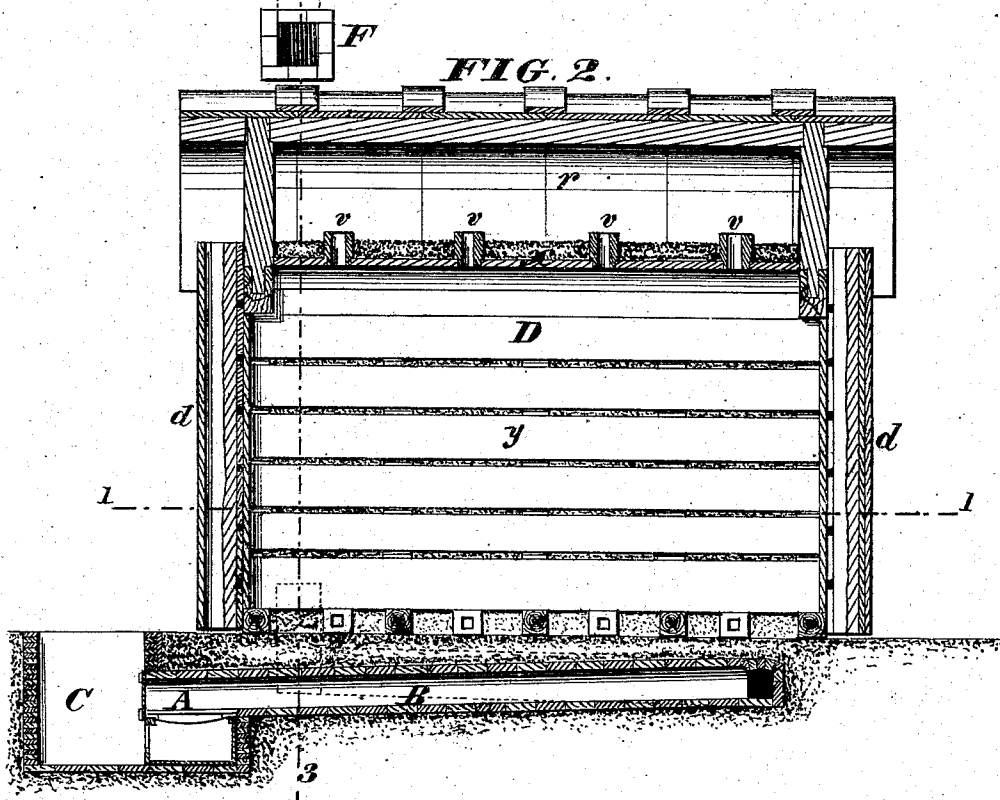
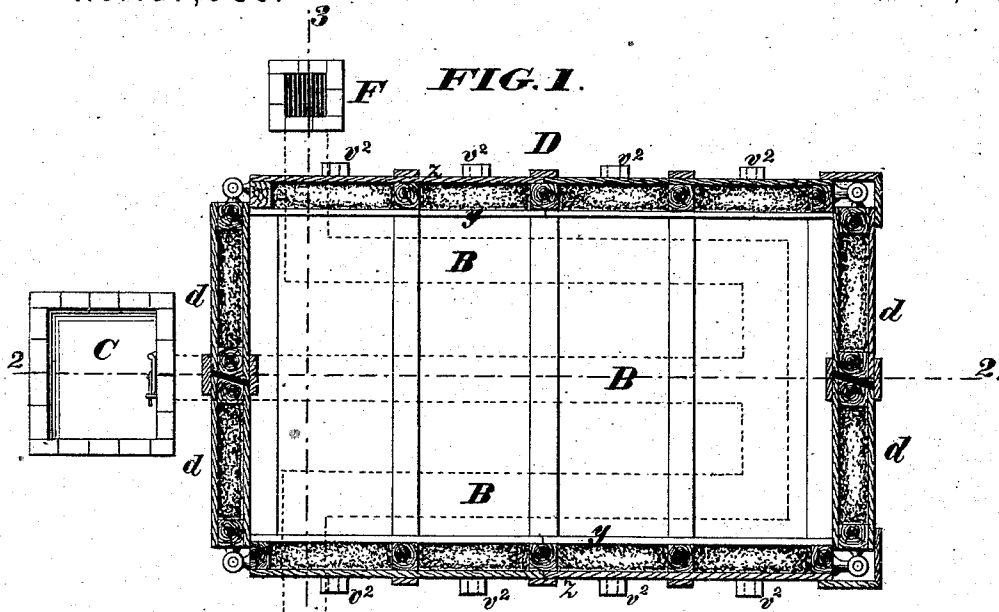


E. DAVEE.
Drying-Kilns.

No. 157,585.

Patented Dec. 8, 1874.



WITNESSES;

Gas L. Ewin
Walter Allen

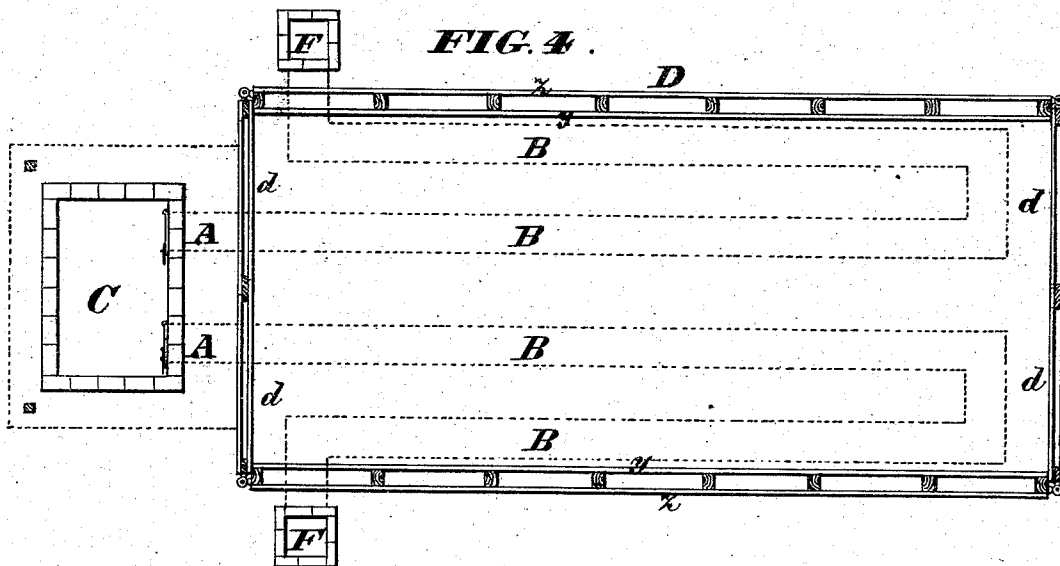
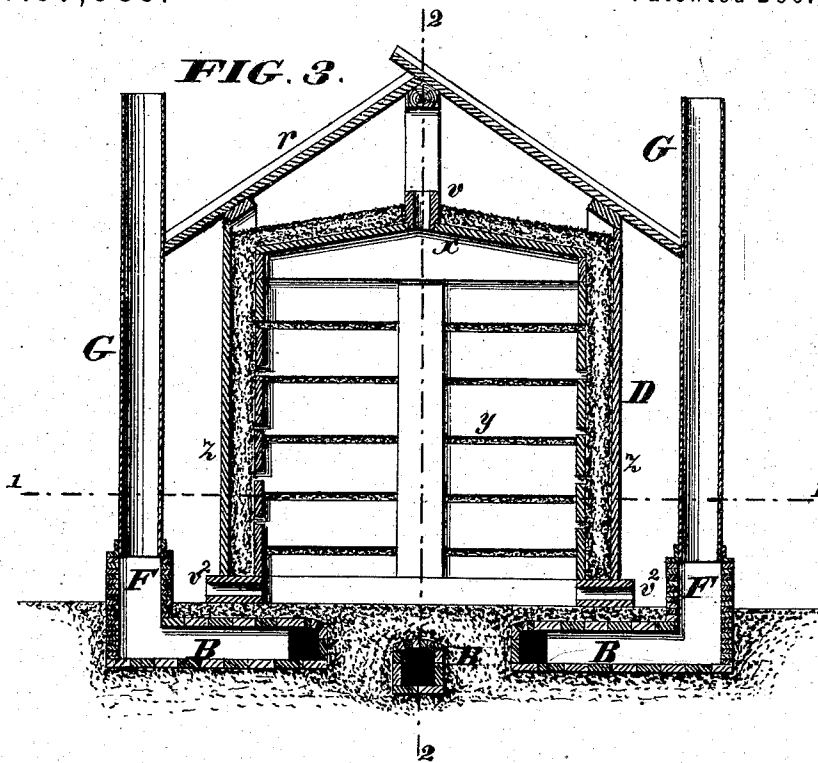
INVENTOR;

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WITNESSES.

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Walter Allen

INVENTOR.

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UNITED STATES PATENT OFFICE.

EZRA DAVEE, OF MARSHALL, ILLINOIS.

IMPROVEMENT IN DRYING-KILNS.

Specification forming part of Letters Patent No. **157,585**, dated December 8, 1874; application filed July 13, 1874.

To all whom it may concern:

Be it known that I, EZRA DAVEE, of the town of Marshall and county of Clark, in the State of Illinois, have invented a certain new and useful Improvement in Drying-Kilns, of which the following is a specification:

This invention relates primarily to improved means or apparatus for carrying out the inventor's process for seasoning timber, which constitutes the subject-matter of Letters Patent No. 115,446, dated May 30, 1871. This process consists in applying heat for drying or seasoning timber through the medium of a wall or interval of earth, and within an air-tight covering or envelope of earth. The heat thus applied to the timber causes the moisture to be rapidly evolved therefrom, and at the same time absorbed by the earth which envelops it. The present invention consists in a drying-kiln of peculiar construction for applying this process in a superior manner to all kinds of timber, and for extending its application to tobacco and other substances or materials. The improved apparatus operates to dry, season, or cure the material treated therein by the patented earth process hereinbefore referred to. In this apparatus the fire-flues, proportioned to the size of the kiln or receptacle, are arranged wholly beneath the surface of the ground, in connection with a superstructure of wood or other material, having double or hollow walls and doors, filled with earth or any equivalent substance, and a top or ceiling correspondingly covered. A complete air-tight envelope is thus formed when the doors are shut so as to exclude air, and to confine the heat which comes from the fire-flues below through the earth. The double or hollow walls and doors are made close or tight on the outside, and a suitable water-tight roof is provided to protect the enveloping substance from the weather. The walls and doors are made open inside to expose the earth to a certain extent, and to prevent injury by expansion. Ventilators are properly arranged at the top and bottom of the kiln for the escape of heated air, and for the admission of cold air, as required to regulate the heat, which should not exceed 250° Fahrenheit.

In the accompanying drawing, Figure 1 is

a plan or horizontal section of a drying-kiln illustrating this invention. Fig. 2 is a vertical longitudinal section of the same. Fig. 3 is a vertical transverse section thereof. Fig. 4 is a plan view of a larger kiln, illustrating certain modifications hereinafter referred to. The planes of the sections represented by Figs. 1, 2, and 3, respectively, are indicated by dotted lines in the other figures correspondingly numbered.

One or more fire-places, A, for burning wood or coal, are formed in the mouths of a variable system of horizontal or nearly horizontal fire-flues, B, which are constructed of brick or suitable material beneath the surface of the ground, the tops of the flues being located at from eighteen (18) to twenty-four (24) inches below the surface. An excavation or pit, C, is formed to give convenient access to the fire-doors and ash-pits of the fire-places. Above the system of flues B a superstructure, D, preferably of wood, is constructed with double or hollow walls at its sides and rear end; and these walls are formed with close outer planking *z* and open inner planking *y*, laid horizontally, with narrow interstices or spaces between the boards of one-half ($\frac{1}{2}$) to five-eighths ($\frac{5}{8}$) of an inch. A floor, *x*, of rough boards is placed overhead, with the edges of the planks close together, and upon this some six (6) or eight (8) inches of earth or an equivalent substance is spread. The double or hollow walls are filled with the same material, and also the doors *d*, which are constructed in the same manner as the walls, with close bottoms in addition. Doors may be arranged at one or both ends of the kiln, as illustrated in Fig. 1, and when the kiln is closed by shutting the doors it forms an air-tight envelope of earth for the timber or other material placed therein to be dried or cured. A roof, *r*, protects the earth or equivalent substance used as the envelope from the weather. The open inside planking exposes the earth within, and prevents the displacement of the boards by expansion. A sufficient number of ventilators, *v v'*, which may be simple tubes open at both ends, provide for the escape of hot air at top, when desired, and for the admission of air at the bottom of the kiln, as may be required to regulate the heat so as not to permit it at any

time to exceed two hundred and fifty degrees Fahrenheit, (250° F.) The ventilators should be about four (4) feet apart, and about five (5) inches in diameter, varying in number and arrangement according to the size and form of the kiln. They may be closed and opened, as required, by applying or removing caps or plugs. The fire-flues B are extended upward above the surface of the ground by chimney-bases F, on which chimneys G, Fig. 3, are erected. These complete the apparatus. The kiln represented in Figs. 1, 2, and 3 has a single fire-place in a fire-flue leading directly from in front of the kiln to the rear end of the same, and there connected by a transverse flue to return-flues extending along the sides of the kiln to a line near the front end, and thence carried outward to a pair of chimneys. The larger kiln (illustrated in Fig. 4) has two fire-flues correspondingly arranged. A single chimney, or more than two, may be employed, if preferred, and the apparatus may be other-

wise modified in details. A shed at the front of the kiln, to cover the fire hole or pit C, is represented in Fig. 4 by sections of corner-posts, and a dotted outline of the roof. The chimneys may be of any approved construction, and their number and arrangement will vary with those of the fire-places and the other accessories of the latter.

The following is claimed as new in this invention, namely:

The combination of a horizontal system of fire-flues, A B, covered with earth, and a superstructure, D, with double or hollow walls and doors filled with earth, and a top or ceiling covered with the same substance to form an air-tight earth envelope, substantially as herein shown and described.

Witness my hand this 4th day of May, 1874.

EZRA DAVEE.

Witnesses:

S. S. WHITEHEAD,
T. H. JONES.