

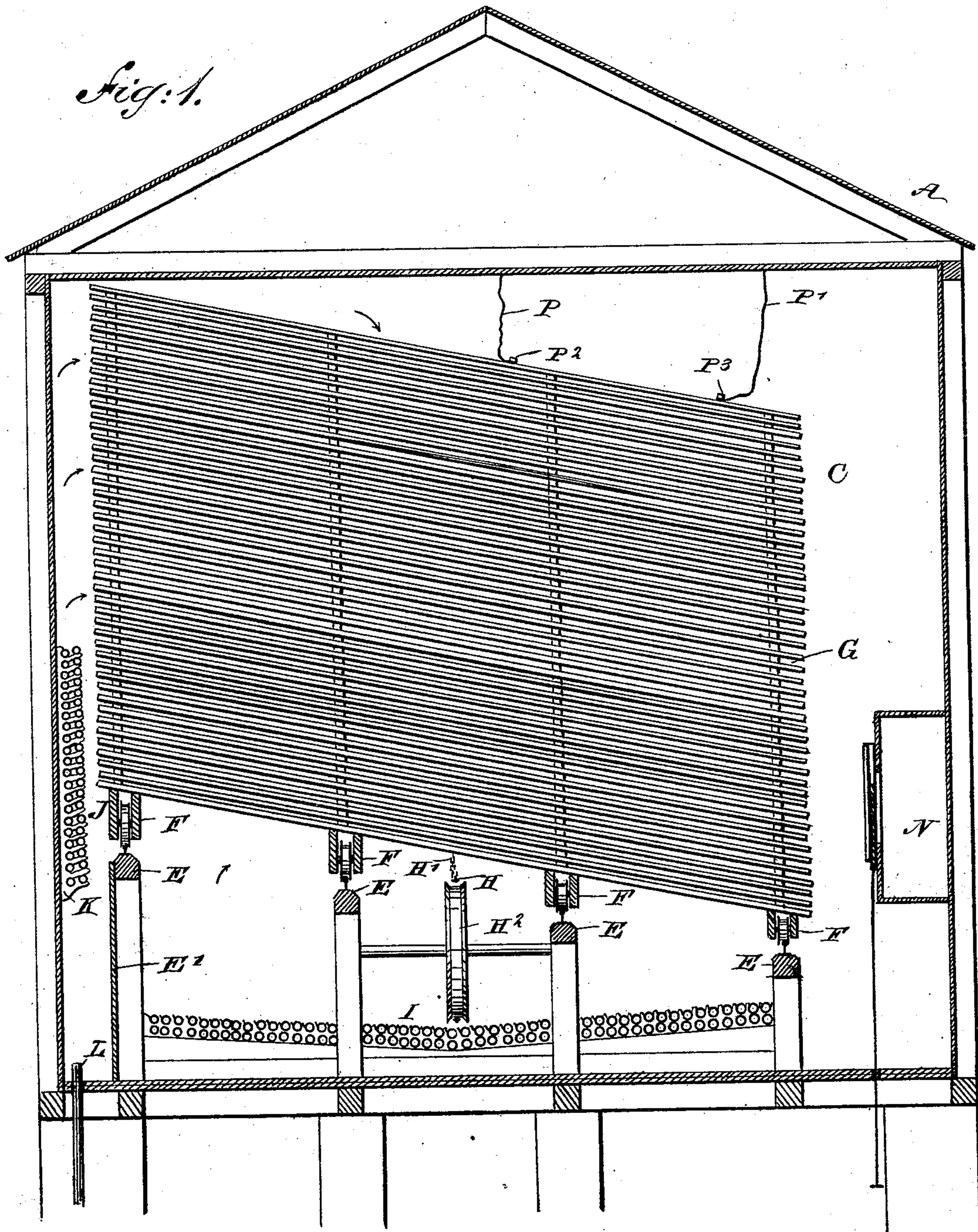
(No Model.)

2 Sheets—Sheet 1.

A. & P. KIMBALL.
DRYING KILN.

No. 517,700.

Patented Apr. 3, 1894.



WITNESSES:

Chas. Nida.
A. Lurcott

INVENTORS

A. & P. Kimball
BY *Munn & Co*

ATTORNEYS.

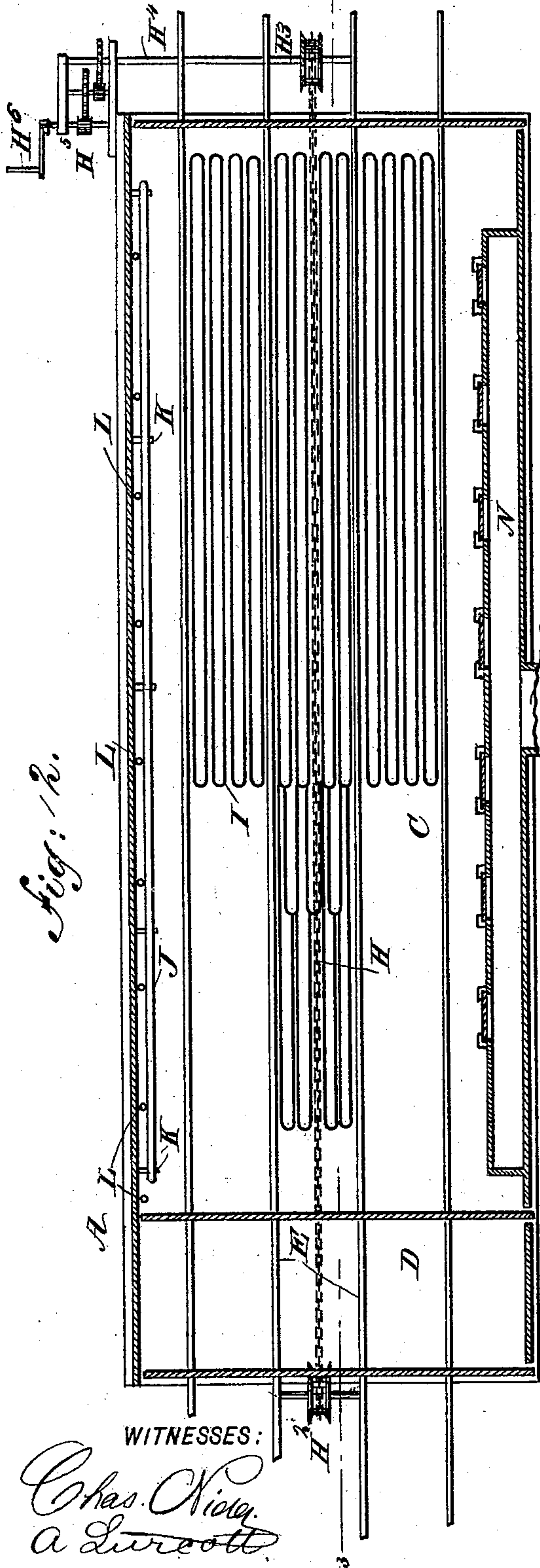
(No Model.)

2 Sheets—Sheet 2.

A. & P. KIMBALL.
DRYING KILN.

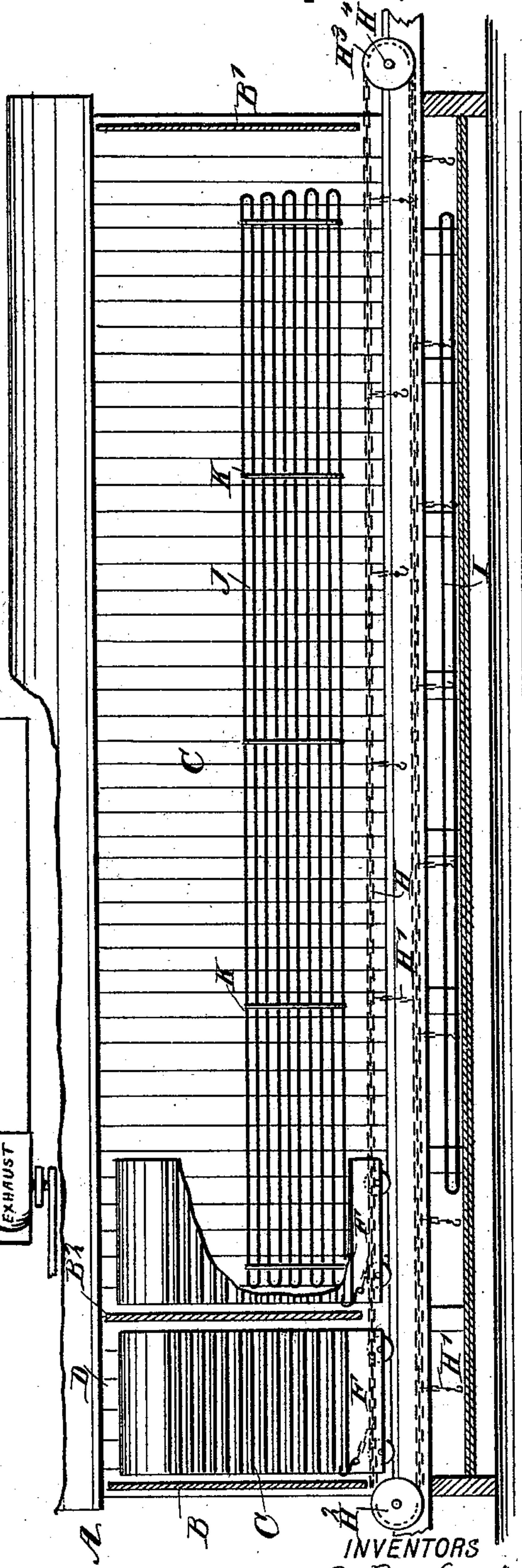
No. 517,700.

Patented Apr. 3, 1894.



WITNESSES:

Chas. Kier.
A. L. Lunt.



INVENTORS

A. & P. Kimball.
BY *Munn & Co.*

ATTORNEYS.

UNITED STATES PATENT OFFICE.

ADOLPHUS KIMBALL AND PHINEAS KIMBALL, OF ARKANSAS CITY,
ARKANSAS.

DRYING-KILN.

SPECIFICATION forming part of Letters Patent No. 517,700, dated April 3, 1894.

Application filed July 25, 1893. Serial No. 481,419. (No model.)

To all whom it may concern:

Be it known that we, ADOLPHUS KIMBALL and PHINEAS KIMBALL, both of Arkansas City, in the county of Desha and State of Arkansas, have invented a new and Improved Kiln, of which the following is a full, clear, and exact description.

The invention relates to kilns for drying lumber, and its object is to provide a new and improved kiln, which is simple and durable in construction, very effective in operation and arranged to rapidly and evenly dry the lumber.

The invention consists principally of an air-proof building provided at its green end with a steaming room, for softening the lumber by steam, previous to drying it in the air chamber adjacent to the steaming room.

The invention also consists of certain parts and details, and combinations of the same, as will be hereinafter described and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is an enlarged cross section of the improvement. Fig. 2 is a sectional plan view of the improvement; and Fig. 3 is a sectional side elevation of the same on the line 3—3 of Fig. 2.

The improved kiln is provided with a substantially air-proof building A formed at its ends with an inlet door B and an exit door B', a third door B² being arranged near the inlet door B, so as to divide the building into the air drying chamber C and the steaming room D, of which the latter is adjacent to the inlet door B. Through the building A run tracks E arranged longitudinally and in step-form as will be readily understood by reference to Fig. 1, the said tracks being adapted to receive the lumber trucks F, supporting the pile of lumber G to be dried.

It will be seen that by arranging the tracks in step-form the lumber is piled up on the trucks in an inclined position, as plainly illustrated in Fig. 1, so that the air readily passes through each pile of lumber on a set of trucks, as hereinafter more fully described, and also to permit the sap to readily drop off

the lower ends of the lumber at one side of the building.

The sets of connected lumber trucks carrying a pile of lumber are adapted to be hooked onto short chains H' forming extensions from an endless chain H passing over pulleys H² and H³ journaled in suitable bearings, the pulley H² being connected by its shaft H⁴ with a train of gear wheels H⁵ adapted to be driven either by a crank arm H⁶ or by a pulley connected by a belt with suitable machinery. Thus when the shaft H⁴ is rotated either by hand or by power, a traveling motion is imparted to the endless chain H so that the short chains H' thereof exert a pull on the lumber trucks to move the piles of lumber longitudinally through the building from the steaming room D into the drying chamber and through the latter until the lumber is finally dried and passes out through the door B', it being understood that the truck carrying the dried lumber is disconnected from its chain at the time the lumber passes out of the door B'.

In order to supply the necessary heat for drying the lumber, we provide steam pipes I connected with a suitable source of steam supply and arranged in increasing number in the chamber C from the door B² to the door B', so that the highest heat is obtained in the said chamber C near the exit door B'. A second set of steam pipes J are arranged on that side of the chamber C containing the highest elevated track E and these pipes J are arranged longitudinally and supported on suitable metallic brackets K attached to the wall of the drying chamber C; (see Fig. 1.) The air to be heated is introduced into the drying chamber C by vertically-disposed pipes L entering through the bottom of the chamber C at the rear side directly under the pipes J; see Figs. 1 and 2. The support for the rear rail E is covered up by a longitudinally-extending partition E' forming, with the rear side of the kiln, an air flue to direct the air to the pipes J, as shown in Fig. 1. The heated air after passing through the lumber to be dried passes to an air receiving box N arranged on the front wall of the room C or at the inside thereof, the said box being provided with a series of openings adapted to be opened and closed

by suitable doors so as to regulate the amount of air passing from the chamber C into the box N at any desired place in the drying chamber C. The middle of the box N is connected by a flue O with an exhaust fan or blower of any approved construction, so as to exhaust the air from the box N and to draw air into the latter from the chamber C.

From the ceiling of the chamber C extend downward one or two curtains P, P', arranged longitudinally and weighted at their lower ends by chains or bars P² and P³ respectively, the said bars resting on the uppermost layer of lumber as indicated in Fig. 1 to prevent the air from passing over the entire top of the pile to the front part of the chamber, it being understood that that part of the air which passes onto the uppermost layer of lumber at the high end of the pile is forced down again in and through the pile of lumber by the said curtains.

The operation is as follows: The lumber piled on a car truck running on the tracks E is first moved into the steaming room D and then the door B is closed, the inner door B² being in the same position. The operator then connects the nearest branch chain H' with the truck containing the pile of lumber and then turns on the steam so that the lumber is rendered soft by the action of the steam. After this has been done, the door B² is opened and the chain H started so that the truck with its pile of lumber, is drawn into the drying chamber C, after which the door B² is closed and a new car is moved into the room D to steam the lumber supported on the second car. The exhaust fan is set in motion soon after the steam is turned on, so that air passes through the pipes L into the drying chamber C and is heated by the steam heated pipes I and J over which the air passes. The heated air passes through the pile of lumber so as to effectively dry the same, it being understood that the car is moved forward gradually so as to be gradually exposed to air heated to a higher temperature until the lumber finally arrives in a dried condition at the exit door B'.

It is understood that the cars containing the lumber are moved close to each other through the drying chamber C, each pile of lumber, however, being steamed previously to entering the chamber in the drying room C. The nearer the lumber passes to the dry or hot end of the kiln, the faster the air passes through it, as the doors for the openings in the air box N are opened wider to admit more air into the box N. It is understood, however, that the current of air is regulated according to the nature of the material to be dried.

It matters not what part of the kiln the lumber is passing through, as the air passes

directly endwise with the lumber and at any speed desired, and neither does the same air, in going from the kiln to the fan pass through lumber at different stages of drying, that is to say, the air which leaves one of the pipes L becomes heated and passes through only one car and then directly out of the kiln by way of the air box N.

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

1. In a kiln provided with a track having its several rails arranged in different horizontal planes, in step form, substantially as shown and described.

2. A kiln, provided with a track having the several rails arranged in step form, and lumber trucks mounted to travel on the said rails and adapted to support the lumber in an inclined position, substantially as shown and described.

3. A lumber drying kiln having a plurality of movable carriers arranged in step form and having their supporting faces inclined, transversely whereby to support the lumber in a transversely inclined position in the drying chamber, substantially as shown and described.

4. An improved lumber drying kiln, comprising a drying chamber, having steam pipes held therein, movable carriers arranged longitudinally and in step form, whereby the lumber will be held inclined, a longitudinal cut off projected from the top of the chamber to the top of the lumber, a cold air inlet at one side of the chamber, means for carrying such air above the carriers, whereby it will pass transversely of the chamber between the lumber, an air duct at the opposite side of the chamber, and a suction fan connected therewith, all arranged substantially as shown and described.

5. A lumber drying kiln, comprising a heating chamber, a series of longitudinal tracks arranged in step form, a longitudinal cold air way formed at the high track side of the chamber, a series of steam pipes held at that side over the mouth of such way, and an air duct having openings communicating with the chamber, disposed at the low track side of such chamber, a suction fan connected therewith, and cold air inlets opening into the bottom of the cold air way, all arranged substantially as shown and for the purposes described.

ADOLPHUS KIMBALL.
PHINEAS KIMBALL.

Witnesses:

DAVID A. GATES,
H. THANE.