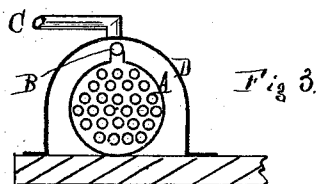
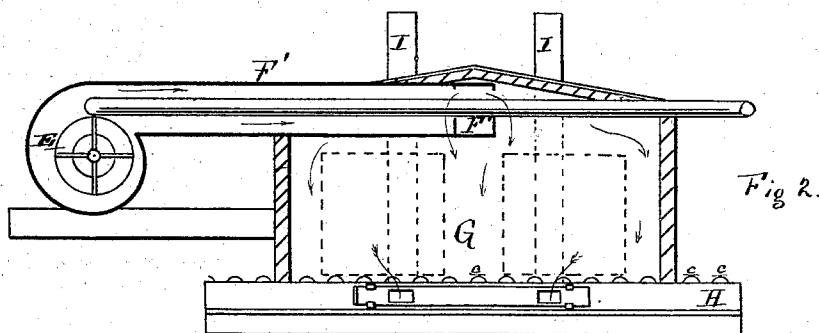
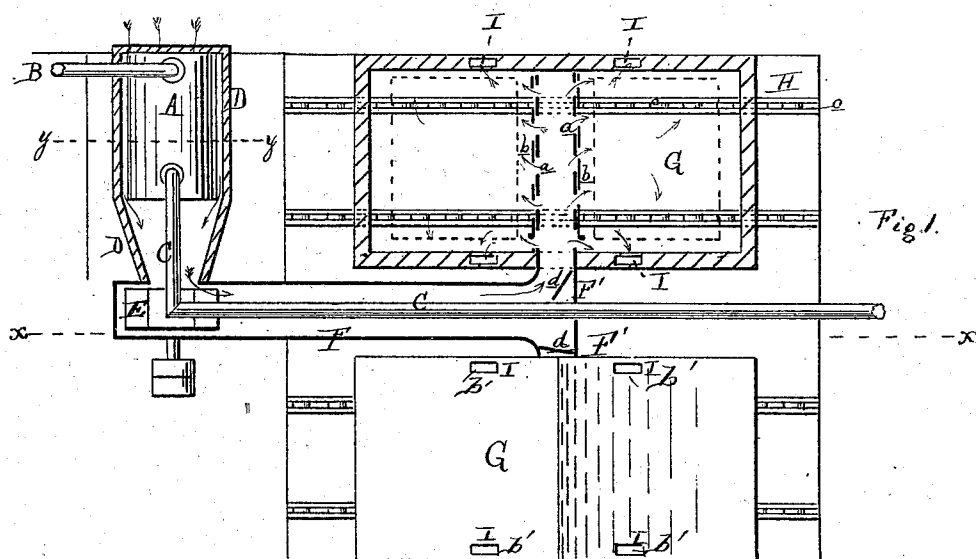


S. R. KIRBY.
Kilns for Drying Lumber.

No. 143,912.

Patented Oct. 21, 1873.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN KILNS FOR DRYING LUMBER.

Specification forming part of Letters Patent No. **143,912**, dated October 21, 1873; application filed August 11, 1873.

To all whom it may concern:

Be it known that I, STEPHEN R. KIRBY, of Detroit, in the county of Wayne and State of Michigan, have invented an Improvement in Kilns for Drying Lumber, of which the following is a specification:

The first part of this invention relates to an improvement in the construction of that class of kilns for drying lumber wherein the heated air is admitted to the chambers at the top, and exhausted through flues at the floor. The second part of the invention relates to the means employed for keeping up the temperature of the blast after it has left the blower, until the point or points of delivery are reached. The invention consists in the peculiar construction and arrangement of a heater for raising the temperature of a large volume of air in a blower for forcing the blast to the kilns, constructed in the manner more fully hereinafter described, and in inclosing the exhaust-steam pipe in the air-trunk, which distributes and delivers the blast.

Figure 1 is a sectional plan view of a pair of dry-kilns fitted with my improved heater and blast apparatus. Fig. 2 is a longitudinal vertical section at *x x* in Fig 1. Fig. 3 is a cross-section of the heater and casing at *y y*, Fig. 1.

Like letters refer to like parts in the several figures.

In the drawing, A represents a cylindrical shell fitted with numerous tubes lying on suitable supports in a horizontal position. B is a pipe conveying exhaust steam from an engine into one end of the heater A. C is the exhaust-pipe, issuing from the other end of the heater. D is a casing surrounding the heater, and is open at one end, the other terminating in a cone emptying into the side opening of a blast-fan, E, which delivers its blast through a trunk, F. The exhaust-pipe C is led from the heater into the trunk; or may be passed through the cone and heater into the trunk, extending beyond its terminus for the purpose of sustaining the temperature of the blast, which would otherwise be lowered by radiation and convection. At F' the trunk is branched to extend across the dry-kilns G G

just under the apex of their roofs, where each side of each trunk is perforated with openings *a*, the area of whose discharge may be regulated or shut off entirely by a perforated valve-plate, *b*, fitted in slides on the side of the trunk. The walls of the dry-kilns are double, the space between them being filled with sawdust or some other non-conductor. One end wall of each dry-kiln is hinged at the top to form a door; and through the chamber is laid a pair of iron-faced rails, H H, in the surface of which are journaled rollers *c*. At each side of the chamber flues I I extend from the bottom up through the roof, with a valve-plate, *b'*, fitted in slides to regulate the emission of the vapor-laden air-currents.

The lumber to be dried is piled crosswise of the track upon skids laid longitudinally upon the rollers *c*, about two thousand square feet being piled on each of two pairs of skids, and pushed into the kiln, and the end door closed, when the blast may be turned on by opening a gate, *d*, in the branch F' of the trunk. The air for the blast is drawn by the fan through the tubes of the heater, and between the heater and its casing, being heated by the exhaust steam passing through the former. The fan drives the blast through the trunk to the drying-chambers, where it comes into contact with the green lumber, which liberates its moisture, which is absorbed by the rarefied air, rendering the latter heavier, and causing it to settle to the floor, whence it is drawn up and out of the chambers by the exhaust-flues.

The blast, being continuous, soon evaporates the liquids contained in the cells of the timber, and thus dries the lumber without checking or warping it.

These kilns are more especially adapted for lumber-mills and wood-working establishments, whose exhaust steam is thus rendered available; and are not liable to take fire from overheating, as is the case where stoves or live steam are used.

The range of kilns in two rows, as described, may be continued or enlarged so as to absorb and utilize the entire volume of exhaust steam, and the temperature of the blast be kept up to the end of the trunk by carrying the exhaust-pipe through it. This gives the present ar-

rangement a great advantage over any range of kilns whose blast-trunk is of any considerable length, and is arranged in the usual manner.

I am aware that tubular heaters and blast-fans have been combined for the purpose of heating and forcing a volume of air through a blast-trunk to a drying kiln or chamber; and, while I disclaim, broadly, the invention of such—

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. The arrangement of the exhaust-steam pipe C within the blast-trunk F, and with re-

lation to the blast-fan E, tubular heater A, and casing D, substantially as and for the purpose set forth.

2. The combination of the blast-trunk F, the kilns G G, in pairs, the trammels F' F', gates *d d*, flues I, and valve-plates *b' b'*, all constructed and arranged substantially as described and shown, for the purpose set forth.

STEPHEN R. KIRBY.

Witnesses:

H. F. EBERTS,
H. S. SPRAGUE.