

Feb. 28, 1928.

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A. O. MILLER

DRY KILN

Filed Jan. 31. 1925

3 Sheets-Sheet 1

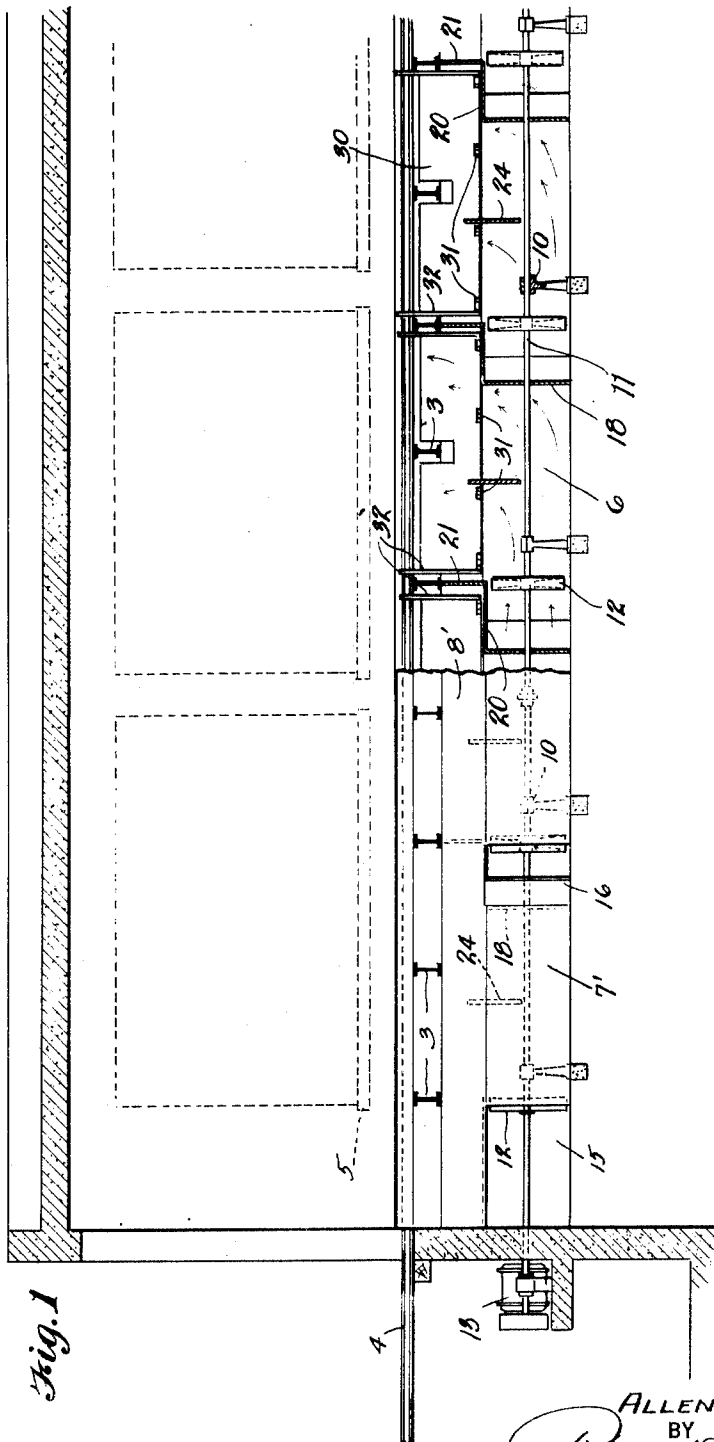


Fig. 1

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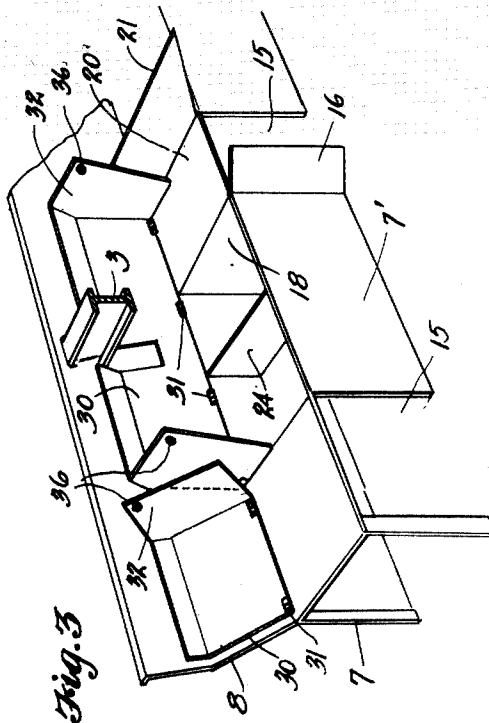
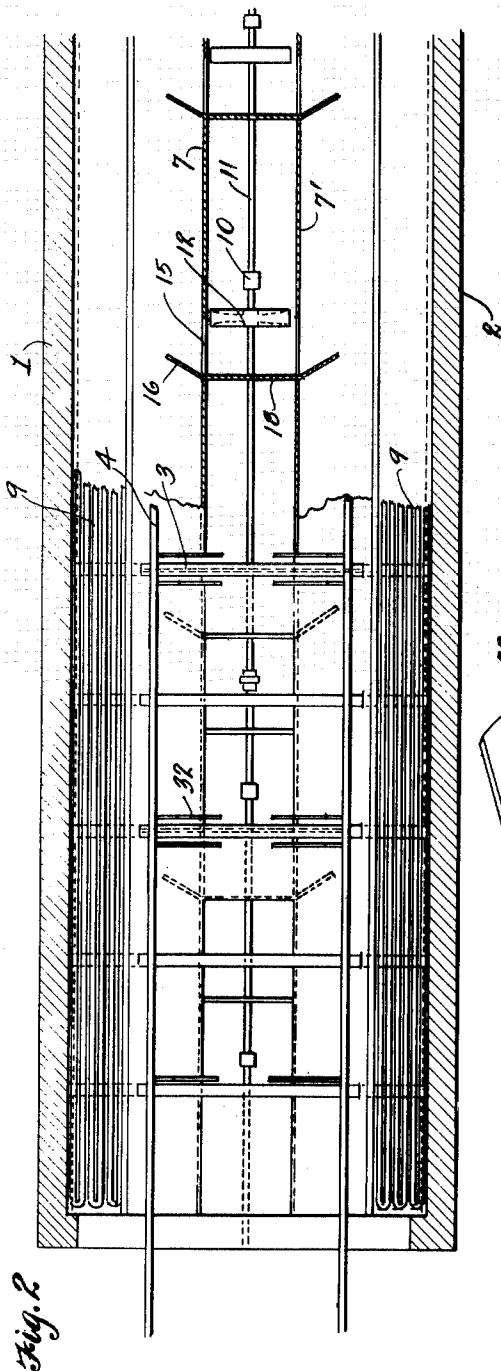
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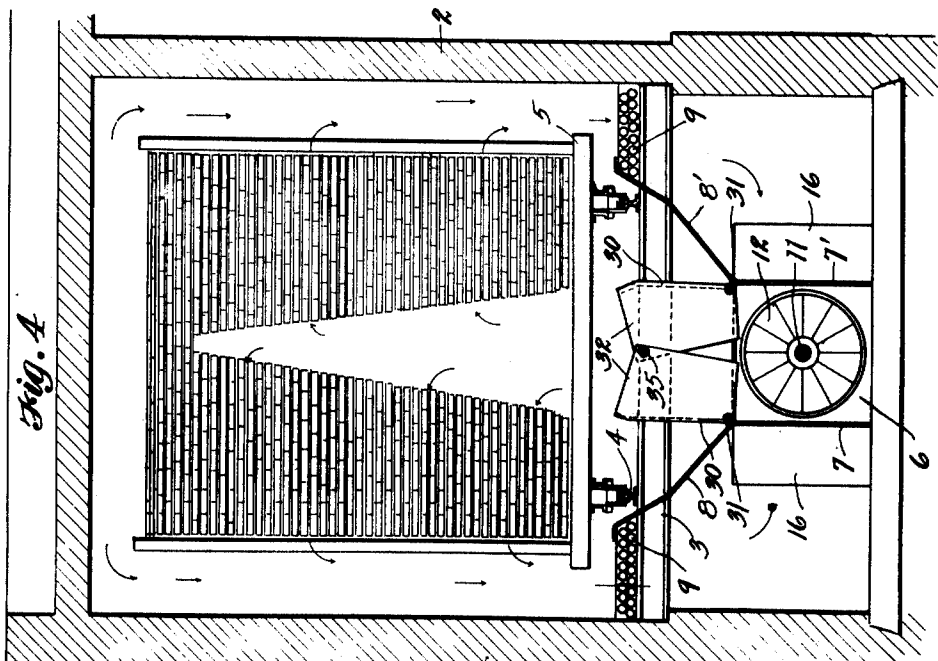
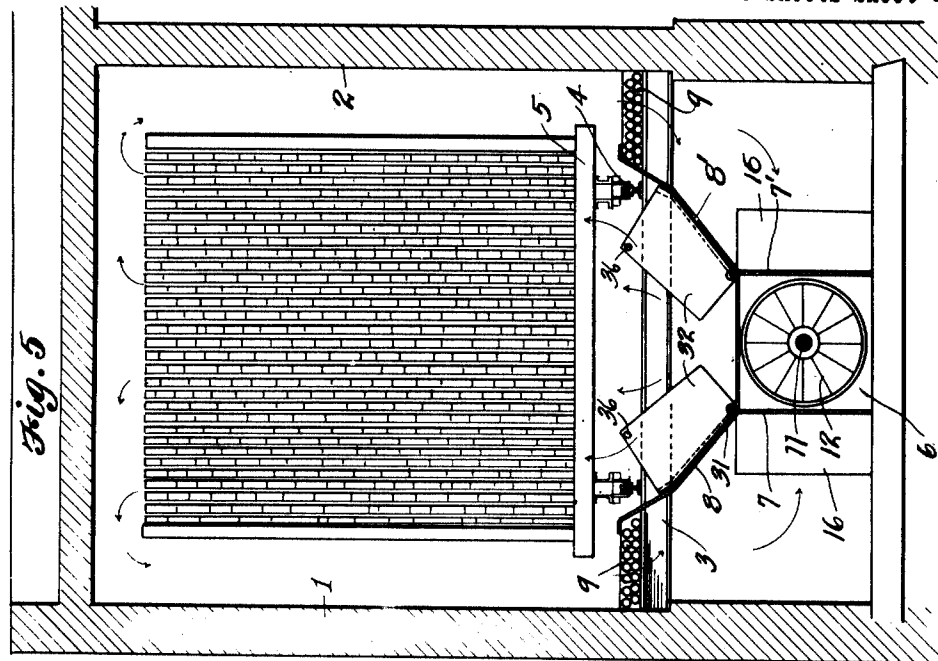
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE.

ALLEN O. MILLER, OF SEATTLE, WASHINGTON.

DRY KILN.

Application filed January 31, 1925. Serial No. 6,094.

This invention relates to improvements in dry kilns, and more particularly to kilns of that character especially designed for the drying of lumber and wherein mechanical means is provided for effecting a circulation of air through the kiln.

versely between the walls in spaced apart relation for the support of rails 4 forming a track along which a truck on which the lumber is stacked for drying is movable into and from the kiln.

Extending longitudinally of the kiln, below the cross beams 3 and midway between the opposite side walls 1 and 2, is an air duct, designated at 6 having vertical, opposite side walls 7 and 7' with outwardly inclined upper portions 8—8' that extends upwardly beyond and along the outer sides of rails 4 and which overlap the top surfaces of heating radiators 9 supported by the beams 3 along opposite sides of the kiln; the said radiators comprising a plurality of steam pipes arranged closely together and in parallel relation as is best shown in Figures 4 and 5.

Mounted rotatably in suitable supporting bearings 10 and extending longitudinally of the air duct is a shaft 11 on which, at regularly spaced intervals, blower fans 12 are mounted. The shaft may be driven by any suitable means, such as the electric motor 13 that is located at one end of the kiln, as shown in Figure 1, and which has a belt and pulley driving connection with the end of the shaft.

The gist of this invention resides chiefly in the means for deflecting and circulating the air through the stacked lumber in equally distributed and heated amounts and this is accomplished by the novel arrangement of deflectors and baffles in the air duct which will now be described.

In the opposite side walls 7—7' of the air duct, just forward of each blower fan, openings 15 are provided for the intaking of air and extending laterally and rearwardly from the forward edge of these openings except the two at the extreme forward end of the duct are wing deflectors 16. The air duct, between the walls 7—7' is closed off by transverse partition walls 18 located just forwardly of each set of side openings 15 and the top of the duct, between the top edges of the walls 7—7' is covered by short wall sections 20 that extend rearwardly from the upper edges of each partition wall 18 to points directly above the adjacent fan, at which points they join with the lower edges of vertical baffle plates 21 that extend transversely between the opposite side walls 8—8'

The principal object of this invention resides in the provision of a kiln of the above character having a longitudinally extending air duct in which blower fans are located at intervals and operated to make possible a quick circulation of a large volume of air through the kiln and which is equipped with deflectors, or baffles of novel construction and arrangement, some of which are adjustable to different positions to effect the proper and most satisfactory distribution and circulation of air for drying both edge and flat stacked lumber.

Another object resides in the arrangement of the fans on a single shaft which provides for a reversal of the current of drying air by a reversal in the direction of rotation of the fans.

Other objects reside in the various details of construction and combination of parts embodied in the invention as is hereinafter described.

In accomplishing these and other objects of the invention, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawings, wherein—

Figure 1 is longitudinal, sectional view of a dry kiln embodying the present invention.

Figure 2 is a horizontal, sectional view showing the disposition of the air delivery fans and arrangement of baffles and deflectors along the air duct.

Figure 3 is a perspective view of a part of the air duct, particularly illustrating one of the adjustably, hinged deflectors.

Figure 4 is a transverse, sectional view of the kiln showing the disposition of the hinged deflectors when drying flat, stacked lumber.

Figure 5 is a similar view showing their disposition for drying edge, stacked lumber.

Referring more in detail to the drawings—1 and 2, respectively, designate the opposite side walls of a dry kiln constructed in accordance with the present invention and 3 designates I-beams that are extended trans-

of the duct. The top of the duct between each of the baffles 21 and partition wall 18 rearward thereof is uncovered to permit a free passage of air upwardly.

To effect an upward deflection of air at a point midway between each of the fans and next rearward partition wall 18, I have placed vertical baffles 24 across the duct above the shaft 11. The air that is driven by the fans below these latter baffles is finally caused to be deflected upwardly by contact with the partition walls 18.

For the reason that there are two common methods of stacking lumber for drying, namely, edge and flat stacking and for the reason that they require different methods of air circulation to obtain satisfactory drying results, I have provided deflectors or baffles that are adjustable and which may be moved to different positions to obtain the best results in accordance with the method of stacking used.

These deflectors, as shown best in Figures 4 and 5, comprise relatively long, flat plates 30 that are hinged fixed along their lower edges, as shown at 31, to the top edges of the walls 7-7' in such manner that they may be folded outwardly to lie upon the upper surfaces of the walls 8-8', as shown in Figure 5, or may be swung up to vertical position, as shown in Figure 4. The end portions of the plates are turned inwardly at right angles to the body portion to provide the deflector plates 32. Hinged deflectors of this character are located opposite each other along the upper edges of the walls 7-7'.

For drying flat stacked lumber, as shown in Figure 4, the deflectors are swung upwardly on their hinged mountings so that the plates 30 extend substantially in vertical position or are inclined slightly toward each other and the end plates 32 of deflectors at opposite sides of the duct are brought into overlapped relation and are secured together by bolts 35 extended through registering openings 36 provided therein. The deflectors, when so disposed, cause the air to be directed into the triangular opening or recess provided in the center of the stack of lumber, and effect a better and quicker drying. The deflector plates 32 supplement the vertical deflectors 21 and 24 for the purpose of directing the air currents upwardly.

When drying edge stacked lumber, as shown in Figure 5, where it is desired that the air be directed over the entire lower surface of the stack, the deflector plates are disconnected and are swung outwardly, to rest upon the side walls 8-8'. When so disposed, they do not interfere with the outward spreading of the air and the deflector plates 32 again serve to deflect the air currents upwardly.

With the kiln so constructed and equipped,

it is readily apparent that a quick circulation of a large volume of air is possible. The fans operate to drive the air from within the duct against the deflectors and baffles upwardly through the stacked lumber after which it travels downwardly along the side walls, between the heating pipes and again to the air duct through the openings 15 provided therefor.

By arranging the blower fans on a single shaft extended the length of the kiln, it is possible to provide a brisk circulation of air, and the direction of this circulation may be periodically reversed, when such is desired, by reversing the direction of the driving shaft. This would cause the air to be driven upwardly along the opposite sides of the stack and to be drawn downwardly through the stack and into the air duct. Such a reversal would prevent the lumber nearest to the fans from drying faster than that more distant.

Having thus described my invention, what I claim as new therein and desire to secure by Letters Patent, is:

1. In a dry kiln, the combination with an air duct having top openings and means for delivering air from the same, of deflector plates supported at opposite sides of said openings and adjustable to control the direction of flow of the air.

2. In a dry kiln, the combination with an air duct having top openings through which air may be discharged, of deflector plates supported adjustably at opposite sides of the openings and movable from and toward each other to control the direction and spread of the air stream as it is discharged.

3. In a dry kiln, the combination with an air duct having top openings for the discharge of air, of deflector plates hinged fixed along their lower edges to the duct at opposite sides of the openings and adapted to be swung toward and from each other at their upper edges.

4. In a dry kiln, the combination with an air delivery duct having top openings for the delivery of air and provided with deflectors for effecting an upward discharge of air through said openings, of paired deflector plates hinged fixed along their lower edges to the duct at opposite sides of the openings and adapted to be swung from or toward each other at their upper edges, and means for securing them so as to provide a relatively narrow discharge opening between their upper edges.

5. In a dry kiln, the combination with an air delivery duct having top openings for the delivery of air and provided with deflectors for effecting an upward discharge of air through said openings, of paired deflector plates hinged fixed along their lower edges to the duct at opposite sides of the openings and having laterally turned

opposite end portions forming baffle plates and means for holding the deflector plates at different positions of adjustment.

6. In a dry kiln of the class described, the
5 combination with an air duct having top openings for the discharge of air and having deflectors therein for the upward deflection of air through said openings, of deflector plates hingedly fixed along their lower edges
10 to the duct at opposite sides of the openings; said plates being adapted to swing toward

and from each other at their upper edges and having laterally turned opposite end portions forming baffles provided with apertures, said baffles of plates at opposite sides 15 of the duct being adapted to overlap and to be secured together to provide a relatively narrow air discharge passage between the plates.

Signed at Seattle, King County, Washing- 20
ton, this 26th day of November, 1924.

ALLEN O. MILLER.