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F. W. GOTTSCHALK ET AL

2,343,410

METHOD OF KILN DRYING LUMBER

Filed April 17, 1942

2 Sheets-Sheet 1

Fig. 1.

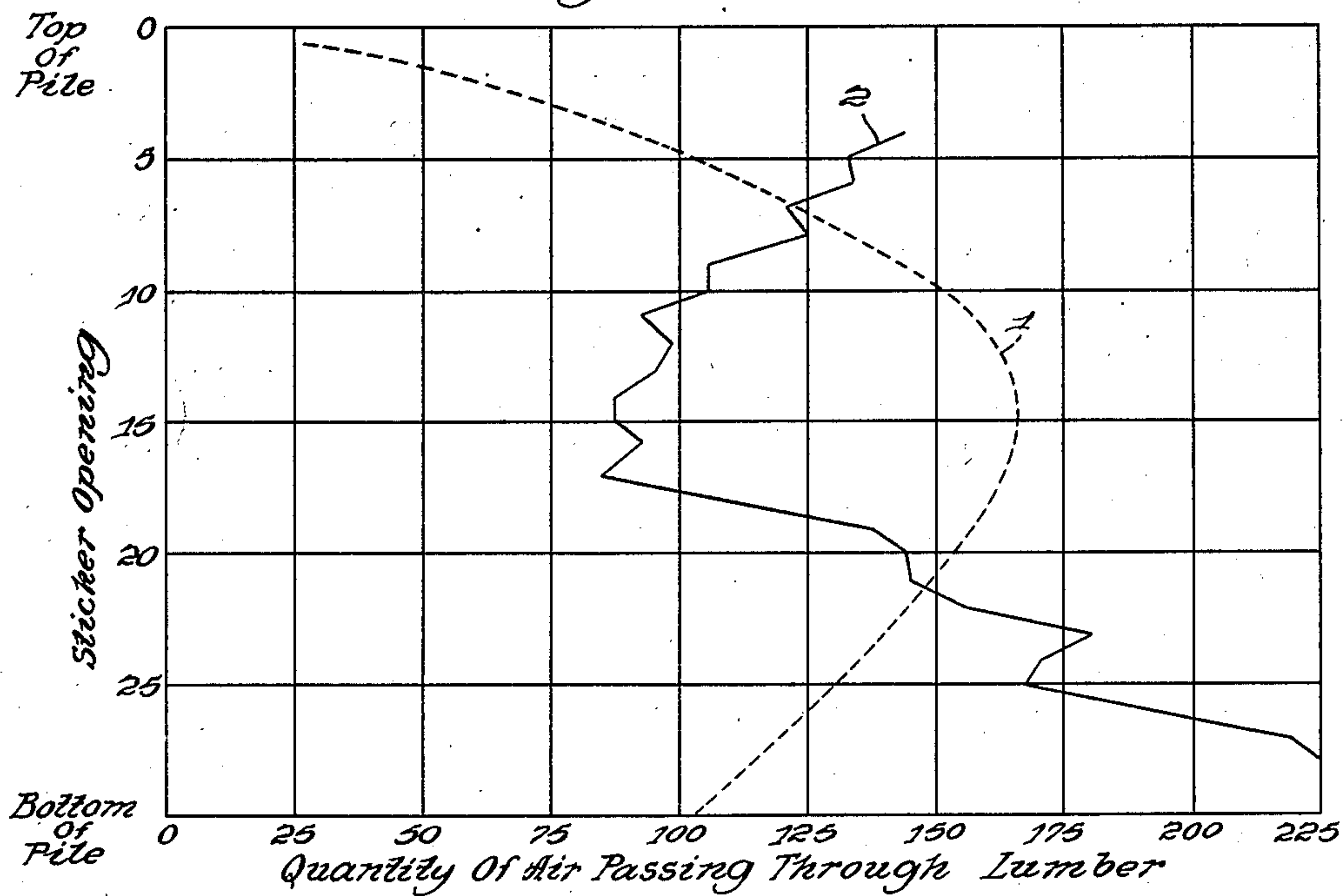
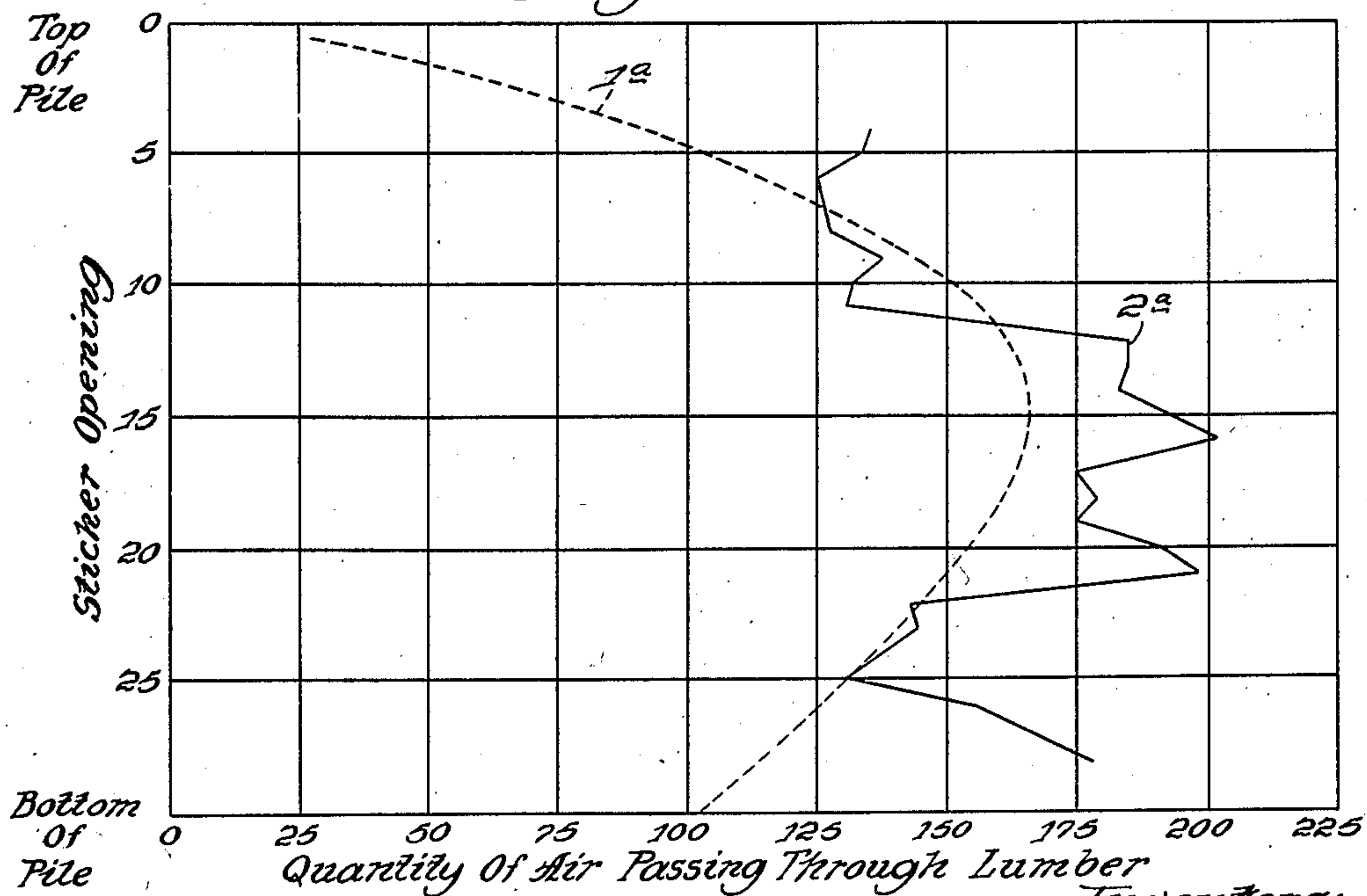


Fig. 2.



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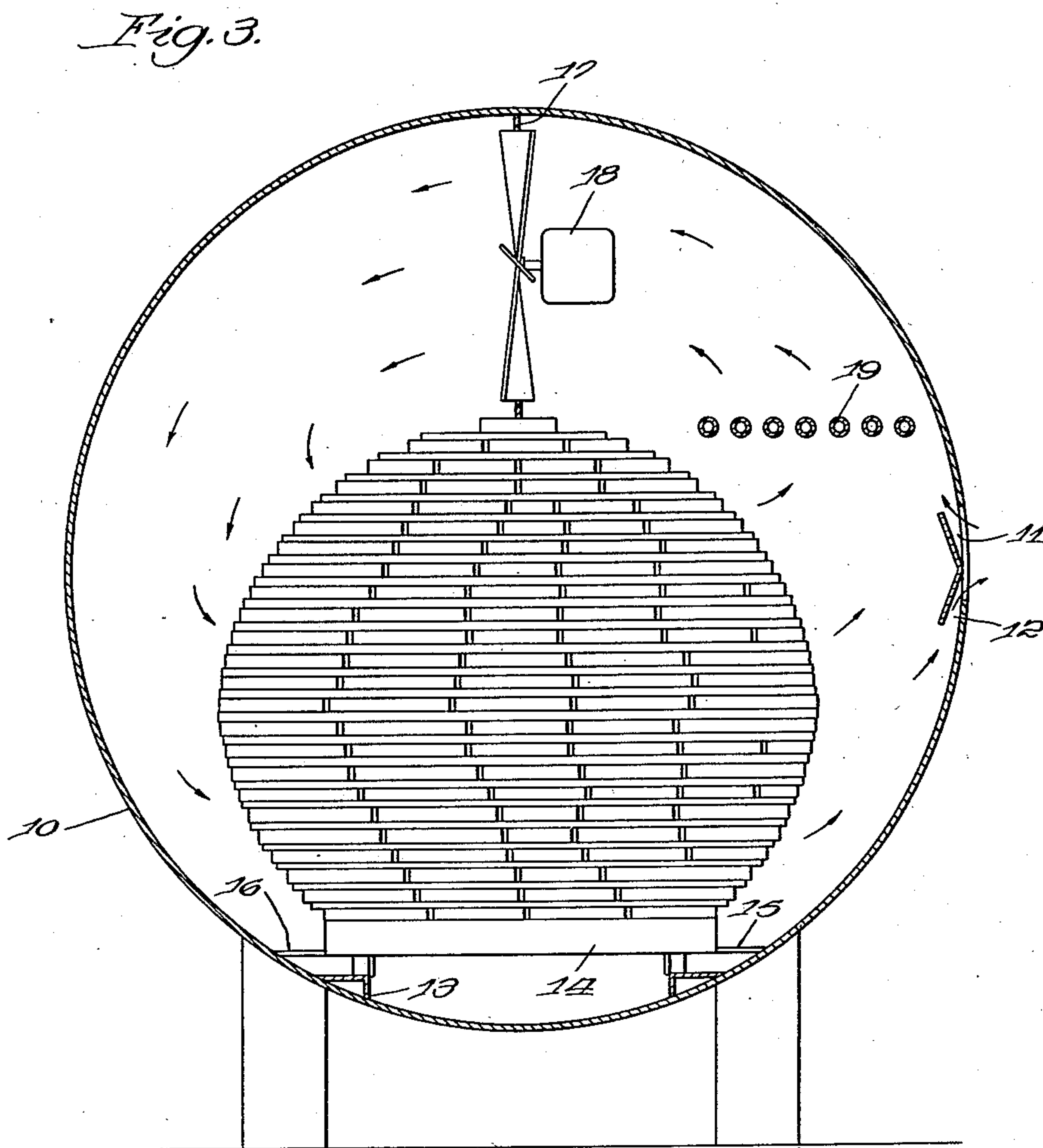
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UNITED STATES PATENT OFFICE

2,343,410

METHOD OF KILN DRYING LUMBER

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Application April 17, 1942, Serial No. 439,362

4 Claims. (Cl. 34—38)

It has heretofore been the practice in kiln drying lumber to separate the various layers or "courses" of lumber by means of "stickers." These stickers have heretofore been of the same thickness throughout the pile of lumber regardless of the shape of the pile or the characteristics of the air flow within the kiln. This meant that each sticker supported opening offered the same resistance to air passage throughout the pile, per unit of length. However, the air from the circulating fans or other distributing medium is not distributed equally to all portions of the lumber but more or less unevenly, depending upon the construction of the kiln and the speed of the fans.

The invention relates primarily to the treatment of lumber of substantially circular cross section in which the air has to pass a much greater distance through the pile at certain points than at others. This means that the wider portions of the pile of lumber not only have a greater resistance to the flow of air, so that the velocity of the air passing therethrough is reduced, but they also require a greater quantity of air because there is more lumber to be treated in the thicker portions.

Furthermore, in a closed system such as a kiln with an internal fan, the air discharged by the fans tends to return to the intake side of the fans as quickly as possible. Therefore the larger bulk of the air tends to shunt across the top of the pile if the fans are overhead or across the bottom of the pile if the fans are underneath the lumber.

It has now been discovered that these difficulties may be greatly reduced if not thoroughly overcome by the use of stickers of varying thickness in the different portions of the lumber pile. In the case of conventional rectangular load small stickers are used in the top third of the pile if the fans are overhead, or in the bottom third if the fans are underneath. For instance, one-quarter to one-half inch stickers may be employed in the bottom one-third and three-fourths to one-half inch stickers in the upper two-thirds. In general, the size of the larger sticker is determined by the size normally employed in the drying of the lumber and the smaller size adjusted from that. That is, if one-half inch stickers are normally employed then these may be used in the upper two-thirds of the load and one-quarter inch stickers in the lower one-third, for an underneath fan. In the case of round or other irregular loads the variation of sticker size will depend somewhat upon

the construction of the kiln and the speed of the fans. In the so-called circular cross sectional loads the larger stickers are employed in the middle courses and the smaller stickers at both ends.

The invention is illustrated somewhat diagrammatically in the drawings, in which

Figure 1 represents the air distribution through a circular cross-sectional pile of lumber using $\frac{3}{8}$ inch stickers throughout. The dotted line 1 represents theoretically ideal distribution of air, and the solid line 2 represents the actual distribution obtained.

Figure 2 represents the correction obtained by employing $\frac{3}{8}$ inch stickers in the top eleven courses, one-half inch stickers in the next ten courses and $\frac{3}{8}$ inch stickers in the bottom nine courses. The dotted line 1a represents theoretically ideal distribution and the solid line 2a represents the actual air distribution.

Figure 3 represents a cross section of a kiln of the type employed in the tests. As there shown the kiln comprises a metallic shell 10 provided with an air inlet 11 and an air exhaust 12. The lumber is maintained upon a track 13 which supports the carriage 14. Floor baffles 15 and 16 are provided to reduce air leakage around the lumber. A longitudinal partition 17 is fitted at intervals with fans 18 directly above the center of the lumber. A series of heating coils 19 are provided between the inlet and the fan.

In another test of a circular cross sectional tank in which the lumber was piled in generally circular cross-sectional piles in which the axis of the wood pieces was parallel with the long axis of the tank, successful results were obtained using $\frac{3}{8}$ inch lath as stickers in the first seven courses from the bottom and the last seven courses from the top and using one-half inch stickers in the middle ten courses. The resulting air distribution using 24 inch fans in a 124 inch internal diameter kiln while circulating air as shown in Figure 3 at 850 R. P. M. of the fan and using approximately .3 horsepower, corresponded substantially with the theoretical ideal distribution.

This application is a continuation-in-part of our copending application Serial No. 393,818, filed May 16, 1941.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom.

We claim:

1. In the method of drying lumber in which a

pile of lumber is placed within a drying chamber, the steps of forming the pile of lumber in horizontal layers by associating elongated individual pieces of wood with their long axes parallel, separating the progressive layers of lumber by transverse stickers, forming the layers of progressively varying widths to produce a generally circular cross-sectional pile and providing thin stickers between the layers where the layer width is small, and thick stickers where the layer width is great, and blowing heated air transversely of the pile between the layers, the variation in size of the stickers being such as to provide substantially uniform air resistance transversely of the pile.

2. The method as set forth in claim 1 in which stickers having a thickness of one-half inch are employed in the central portion of the pile and stickers of three-eighths inch thickness are employed in the upper and lower portions of the pile.

3. The method as set forth in claim 1 in which stickers having a thickness of one-half to one

inch are employed in the central portion of the pile and appropriately smaller thickness stickers of one-quarter to one-half inch thickness are employed in the upper and lower portions of the pile.

4. In the method of drying lumber in which a pile of lumber is placed within a drying chamber, the steps of forming the pile of lumber in horizontal layers by associating elongated individual pieces of wood with their long axes parallel, separating the progressive layers of lumber by transverse stickers, forming the layers of progressively varying widths and providing thin stickers between the layers where the layer width is small and thick stickers where the layer width is great, and blowing heated air transversely of the pile between the layers, the variation in size of the stickers being such as to provide substantially uniform air resistance transversely of the pile.

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