April 14, 1925. 1,533,715

H. D. TIEMANN

PROGRESSIVE DRY KILN FOR LUMBER

Filed May 23, 1924 2 Sheets-Sheet 1

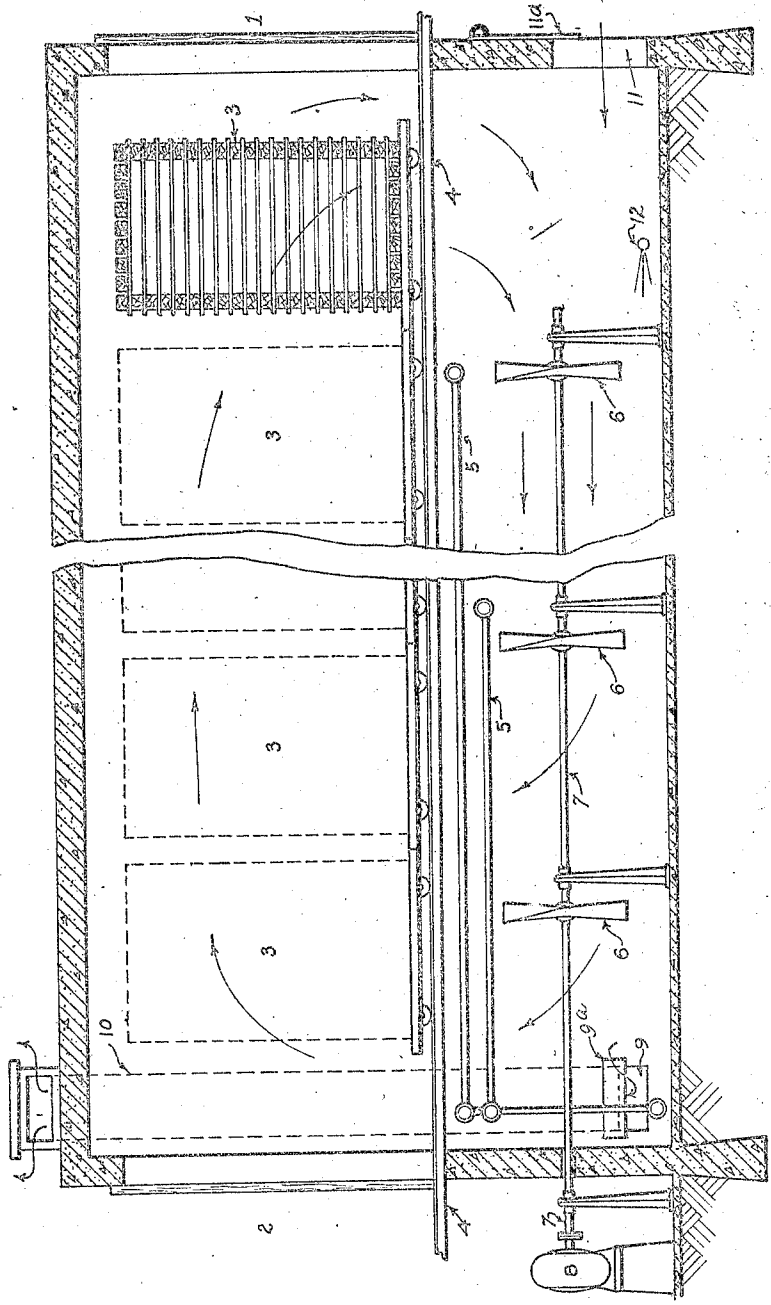


Fig. 1

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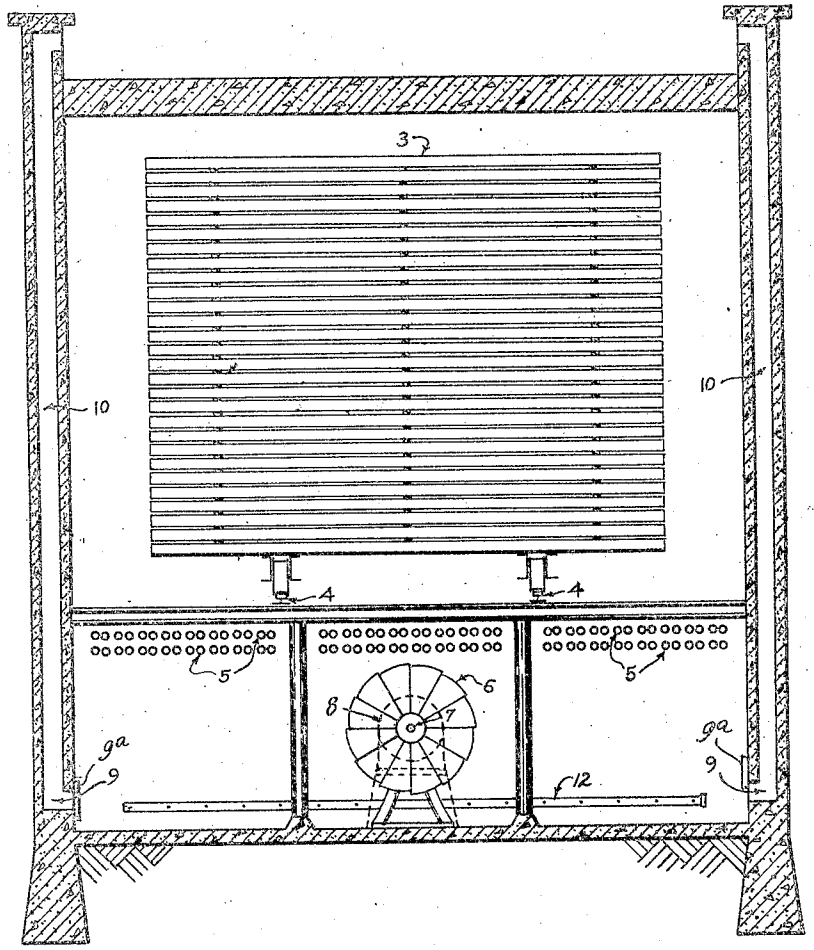


Fig-2

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UNITED STATES PATENT OFFICE.

HARRY DONALD TIEMANN, OF MADISON, WISCONSIN, DEDICATED, BY MESNE ASSIGNMENTS, TO THE CITIZENS OF THE UNITED STATES OF AMERICA.

PROGRESSIVE DRY KILN FOR LUMBER.

Application filed May 23, 1924. Serial No. 715,459.

(GRANTED UNDER THE ACT OF MARCH 3, 1883; 22 STAT. L. 625.)

To all whom it may concern:

Be it known that I, HARRY D. TIEMANN, citizen of the United States of America, and employee of the Department of Agriculture, residing in Madison, Wisconsin, whose post-office address is Madison, Wisconsin, have invented an Improvement in a Progressive Dry Kiln for Lumber.

This application is made under the act of March 3, 1883, Chapter 143 (22 Stat. 625) and the invention herein described and claimed may be used by the Government of the United States, and its officers and employees, and by any person in the United States without the payment to me of any royalty thereon. I hereby dedicate the same to the free use of the Government and the people of the United States.

My invention consists of an improvement in a progressive type of dry kiln consisting essentially in one or several fans placed beneath the heating coils arranged so as to assist the natural current of air returning from the cold to the hot end of the kiln, and so disposed with reference to the heating coils, ventilators, lumber piles, and steam jets as to produce an increasingly drier and hotter current of air passing through the piles of lumber as the piles are progressed from the hot to the cold end of the kiln. The lumber may be piled either flatwise or edgewise, but not flatwise end-piled. If piled flatwise the length should be crosswise of the kiln, but either cross-piling or end-piling will do for edgewise piled lumber.

Progressive kilns of various types arranged for endwise circulation of the air so that the discharge end is hot and dry and the filling end cooler and moist have been in use many years. For the drying of green lumber the air circulation is frequently insufficient in such kilns. The essential feature of my invention which I claim as novel consists in the placement of fans beneath the lumber in a progressive kiln in such a manner as to accelerate and control the circulation lengthwise of the kiln.

In the accompanying drawings:

Fig. 1 is a longitudinal section through the kiln.

Fig. 2 is a cross sectional elevation.

The kiln itself consists of a long chamber of wood or brick or any suitable building material through which the piles of lumber may be moved from one end to the other in a progressive manner, the usual method being to place lumber on wheeled trucks which run on rails extending through the length of the kiln. Beneath the rails are placed steam heating pipes. The chamber may be of any length or cross section, but preferably 16 to 20 feet wide with three rails for cross-piled lumber or 4 rails for edge stacked end-piled, and 8 to 14 feet with two rails for edge stacked end-piled lumber, about 16 feet in height and from 80 to 160 feet in length. In this respect the kiln does not differ essentially from the many well known progressive kilns now in use. In the space beneath the heating coils and the floor are placed the several fans, in one row for narrow kilns or in two rows for wider chambers. The fans are propelled by an electric motor placed outside the kiln. The fans are not housed except as far as necessary to protect them from injury.

In the drawings 1 is the loading end of the kiln closed by a suitable tight fitting door; 2 is the discharge end with a similar door. 3, 3 are the loads of lumber (shown flatwise cross-piled in this case); 4, 4 are the rails; 5, 5 the heating pipes which are arranged so as to concentrate the heat at the discharging end under the lumber about to be removed; 6, 6, 6 are fans fastened to a common shaft 7 driven by the motor 8. While I have indicated a single motor driven shaft for operating the fans, I do not restrict my invention to this arrangement, as the fans may manifestly be operated separately and by belt connected engines or motors. 9 is an opening with an adjustable damper 9^a into an exhaust flue 10; 11 is a fresh air inlet regulated with a damper 11^a; 12 is a series of steam jets consisting of a line of perforated pipe or any other suitable form of steam jets, for adding humidity to the air when required.

As will be observed from Fig. 1 the heating pipes do not extend clear to the cool or loading end, 1, of the kiln and near the discharging or hot end, 2, more pipes are added. The hot dry air ascends towards the end 2, passes in a generally horizontal direction through the piles towards the opposite end, 1. In doing so it absorbs moisture from the lumber and is cooled thereby and descends near the end, 1, passing below the

heating pipes. Here it travels in the reverse direction towards the end 2, being assisted by the fans, rising again at this end completing the circuit. To prevent the air from becoming too moist fresh air is admitted through the duct 11 and the excess moist air escapes through the ventilator 9. If the air is too dry, moisture is added by the steam jets. As the lumber is shoved in the opposite direction to the air movement, it encounters first cool damp air in a partly descending direction, and finally hot dry air in a somewhat ascending direction as indicated by the arrows.

Having fully described the improvement in the progressive type of dry kiln and the manner of its operation, I claim as original:

1. In a progressive dry kiln arranged for flatwise cross-piling or for edgewise end- or cross-piling of lumber, fans without housing placed beneath the lumber in such a manner as to accelerate the endwise circulation of air in the kiln, and means for rotating the fans.

2. In a progressive dry kiln arranged for flatwise cross-piling or edgewise end- or cross-piling of lumber fans placed beneath the piles of lumber in such a manner as to accelerate the endwise circulation of air in the kiln, and means to rotate the fans.

3. In a progressive dry kiln arranged for flatwise cross-piling or for edgewise end- or cross-piling of lumber the combination of heating coils beneath the lumber arranged so as to concentrate the heat towards the dry end of the kiln, fans without housing placed beneath the lumber in such a manner as to accelerate the endwise circulation, means for rotating the fans, and steam jets below the rails, substantially as shown.

4. In a progressive dry kiln containing lumber, the combination of heating coils beneath the lumber, fans without housing placed beneath the lumber in such a manner as to accelerate the endwise circulation, means for rotating the fans, and steam jets below the rails, substantially as shown.

5. In a progressive dry kiln arranged for flatwise cross-piling or edgewise end- or cross-piling of lumber, fans placed beneath the piles of lumber in such a manner as to accelerate the endwise circulation of air in the kiln, means to rotate the fans, heating pipes arranged to concentrate the heat towards the dry end of the kiln, and steam jets beneath the rails, substantially as shown.

6. In a progressive dry kiln containing lumber, the combination of heating coils beneath the lumber, one fan without housing placed beneath the lumber in such a manner as to accelerate the endwise circulation, and means for rotating the fan.

April 3, 1924.

HARRY DONALD TIEMANN.

Witnesses:
J. D. MacLean,
Benj. L. Nelson.