

C. C. MENGEL.
COMPOUND LUMBER.
APPLICATION FILED MAY 5, 1909.

Patented Sept. 21, 1909.
2 SHEETS—SHEET 1.

934,927.

Fig 1

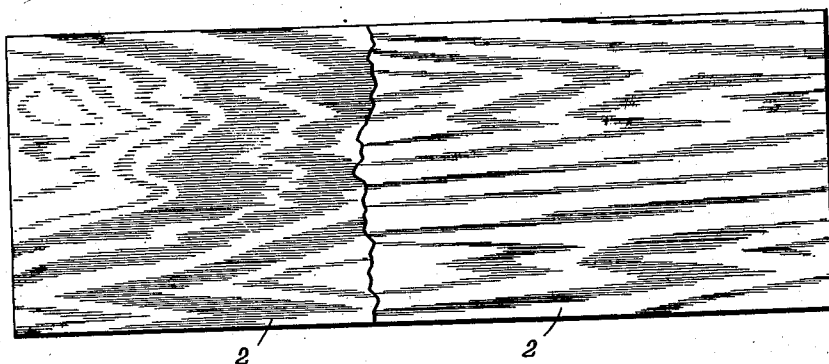
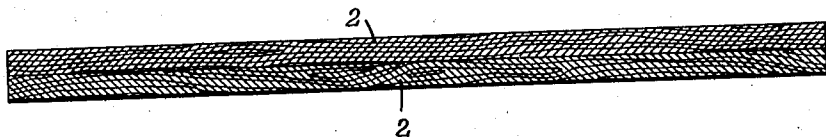


Fig 2



Inventor

Charles C. Mengel

Witnesses

H. C. Rohrer
G. M. Stucker

By

Lugene Cushman Rea

Attorney

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Fig 3

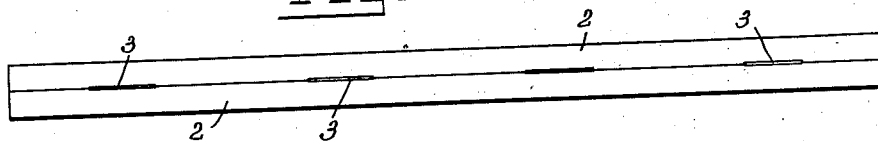


Fig 4

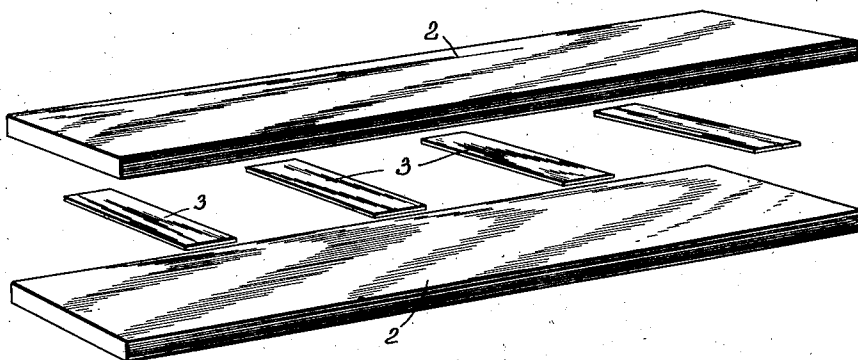
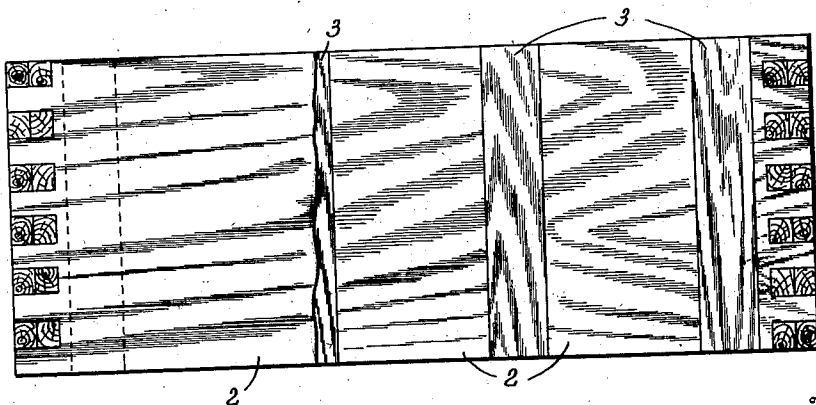


Fig 5



Inventor
Charles C. Mengel

Witnesses
H. C. Robinson
J. M. Stucker

By

Wm. C. Leachman
Attorney

UNITED STATES PATENT OFFICE.

CHARLES C. MENGEL, OF LOUISVILLE, KENTUCKY, ASSIGNOR TO MENGEL BOX COMPANY, OF LOUISVILLE, KENTUCKY, A CORPORATION OF NEW JERSEY.

COMPOUND LUMBER.

934,927.

Specification of Letters Patent. Patented Sept. 21, 1909.

Application filed May 5, 1909. Serial No. 494,181.

To all whom it may concern:

Be it known that I, CHARLES C. MENGEL, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented new and useful Improvements in Compound Lumber, of which the following is a specification.

The present invention relates to compound lumber, designed particularly for the making of boxes, although adaptable to other uses, and the object of the invention is to provide a built-up or compound board which shall have substantially all the homogeneity of a single board without the tendency to warp and separation sometimes found in compound lumber, and which shall at the same time have all the advantages of a cross-grain built-up board, to prevent splitting along the grain, either from usage or because of atmospheric conditions.

I have found in actual practice that a compound board made of two strips of veneer united with the grain of the two pieces running in the same direction, such union being made by a suitable adhesive under heavy pressure, results in a board which is much less liable to separate than where the veneers or plies are united with the grain crossed, as is very common in making up compound lumber. This is due to the fact that where the veneers are arranged with the grain crossing each other the diverse strains by reason of warpage of the different plies, result in a pulling away or separation of the plies, which tendency to pucker and separate is eliminated under my present improvement, in which the plies, having their grains parallel, do not develop the diverse strains and distortions of the cross-grained, built-up boards, but the warpage, if any, is more equal and uniform. Furthermore a more effective union of the plies is secured with this parallel grain arrangement, for the reason that the fibers of the wood, being arranged parallel, will, when the two veneers are placed under heavy pressure, practically engage and interlock, resulting in a homogeneous condition that is not possible when the grains cross each other.

In order that the parallel-grained built-up board may be safe-guarded against any splitting longitudinally along the grain of the wood I provide intermediate these parallel-grain pieces, leaves or wafer strips of exceedingly thin veneer, which wafer strips

have the grain running at an angle, (preferably, although not necessarily, at a right angle), to the grain of the other plies, and these wafer reinforce strips will, when the board is brought together under pressure, embed themselves in the opposed plies so that practically no interference with the union of the two plies takes place. These veneers, in the final product, act as an effective check to any splitting tendency which may develop in the board, for while they are practically forced into and become a homogeneous part of the board, owing to their extreme thinness, yet at the same time they lie across the line of split and oppose any splitting or checking strains lengthwise of the parallel grain board.

The lumber produced according to my improvement is particularly valuable in the making of boxes, for the reason that the parallel grain arrangement of the two veneers tends to eliminate separation of the veneers, first, because of the extremely close union between the adjacent surfaces, and also because of the elimination of the opposing strains due to the diverse warpage which is present in the cross grain arrangement, and, second, because the wafer strips between the parallel grain plies effectively prevent any tendency to split, and secure all the advantages of the usual cross grained arrangement of plies.

In order that the invention may be clear to those skilled in the art I have illustrated in the accompanying drawings one embodiment of my invention, and in said drawings Figure 1 is a plan view of a board made in accordance with my invention. Fig. 2 is a sectional view of the board shown in Fig. 1. Fig. 3 is an edge view of a board with the reinforcing wafer strips inserted. Fig. 4 is a view showing the component parts of the board shown in Fig. 2 separated. Fig. 5 is a side view partly in section of a box formed of boards made up in accordance with my invention as illustrated in Figs. 2 and 3.

Referring to the drawings by numbers, like numbers indicating like parts in the several views, 2 denotes the veneers of which the board is made up, the present embodiment showing a two-ply board, although it will be understood that a greater number of plies could, if desired, be used in practicing my invention. The said veneers 2 are brought together with their contacting faces

coated with a suitable adhesive, and with their grain in parallel arrangement, and then subjected to heavy pressure. This arrangement of the plies with their grains parallel results in a cohesion of the proximate faces and an intermingling of the fibers when the plies are forced together under pressure, as distinguished from the usual surface adhesion of cross-grained plies, in which cross-grain arrangement there could not, of course, be any interlacing of fibers or cohesive condition.

In the form of my invention shown in Figs. 2, 3 and 4, I arrange at intervals between the said plies 2 thin wafer strips of veneer, these wafer strips 3 being laid with their grain running at an angle to the grain of the plies 2, and preferably being arranged at a right angle across the grain of the said plies 2, as shown. The assembled plies 2 and wafer strips 3 are then subjected to heavy pressure, which brings the proximate faces of the plies 2 into intimate contact and indents or embeds the wafer strips 3 in the faces of the plies 2, so that a substantially homogeneous board results. The cross strips 3 are so thin that they do not appreciably separate the plies 2, and I am able to get that intimate contact and interlacing of the fibers of the wood which is desirable, and which gives practically a cohesion of the parts because of the parallel grain arrangement, as distinguished from the condition of adhesion, which is all that could be secured if the grain of the plies 2 were crossed, so that the tendency to separation between the plies is practically eliminated; for, owing to the parallel-grain arrangement of the plies 2, the drying out or seasoning of the plies is substantially uniform, and no distorting and opposing strains are set up. The wafer strips 3, which, as stated, embed themselves into and practically coalesce with the fibrous structure of the plies 2, form an effective safe-guard against any longitudinal splitting or checking which might develop in the parallel grain arrangement shown, for this transverse strip acts as a barrier and check to any longitudinal splitting, and it has been found in practice to prevent any through-and-through splitting of the plies 2 and reduce such splitting, if it develops, to mere surface checks. In other words the wafer strips 3 form cross-ties at intervals throughout the length of the board which effectively tie the fibrous constituents of the plies together across the grain and at the same time the strips 3 are so thin that they do not interfere with the close union between the plies which is desirable.

The box shown in Fig. 5 and which is built of boards made in accordance with my invention, illustrates one practical and valuable adaptation of this board. The box is of the usual matched corner type, and one advantage of the parallel grain arrangement of the plies 2 will be apparent. In tenoning the ends of the boards to form the matched corner the danger of breaking of the tenons, which is always present where the tenoning operation is across the grain, is eliminated, for the tenoning operation when performed in connection with my new board is always parallel with the grain of all the plies instead of across the grain of at least one of the plies, as in the usual two and three-ply lumber, which cross-grain tenoning, as is well known, frequently results in breaking down of the cross grain ply of a tenon.

It will be understood that the adaptation of the board to the making of boxes is simply illustrative of one advantageous use of the new board which I have invented, and is not to be regarded as any limitation of its use.

Such obvious changes in disposition and arrangement of the plies and the wafer strips as would suggest itself to the ordinary workman or meet the requirements of the particular use to which the board is put, may, of course, be made without departing from my invention.

I claim:—

1. A multi-ply board, the several plies of which are cemented together with their proximate faces in actual contact and their grain running in the same direction to permit cohesion of the plies, and thin strips of veneer between and across the grain of said plies at intervals and embedded in the opposite ply surfaces.

2. A multi-ply board, comprising a plurality of plies, and strips of thin wafer-like veneers between and across the grain of said plies at intervals and embedded in the opposed ply surfaces.

3. A multi-ply board comprising a plurality of plies, and thin wafer-like strips between and transversely of said plies at intervals, said strips being so thin as not to interfere with the surface contact of the plies longitudinally.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CHARLES C. MENGEL.

Witnesses:

ROBT. SCHLEICHER,
D. M. LINDLEY.