

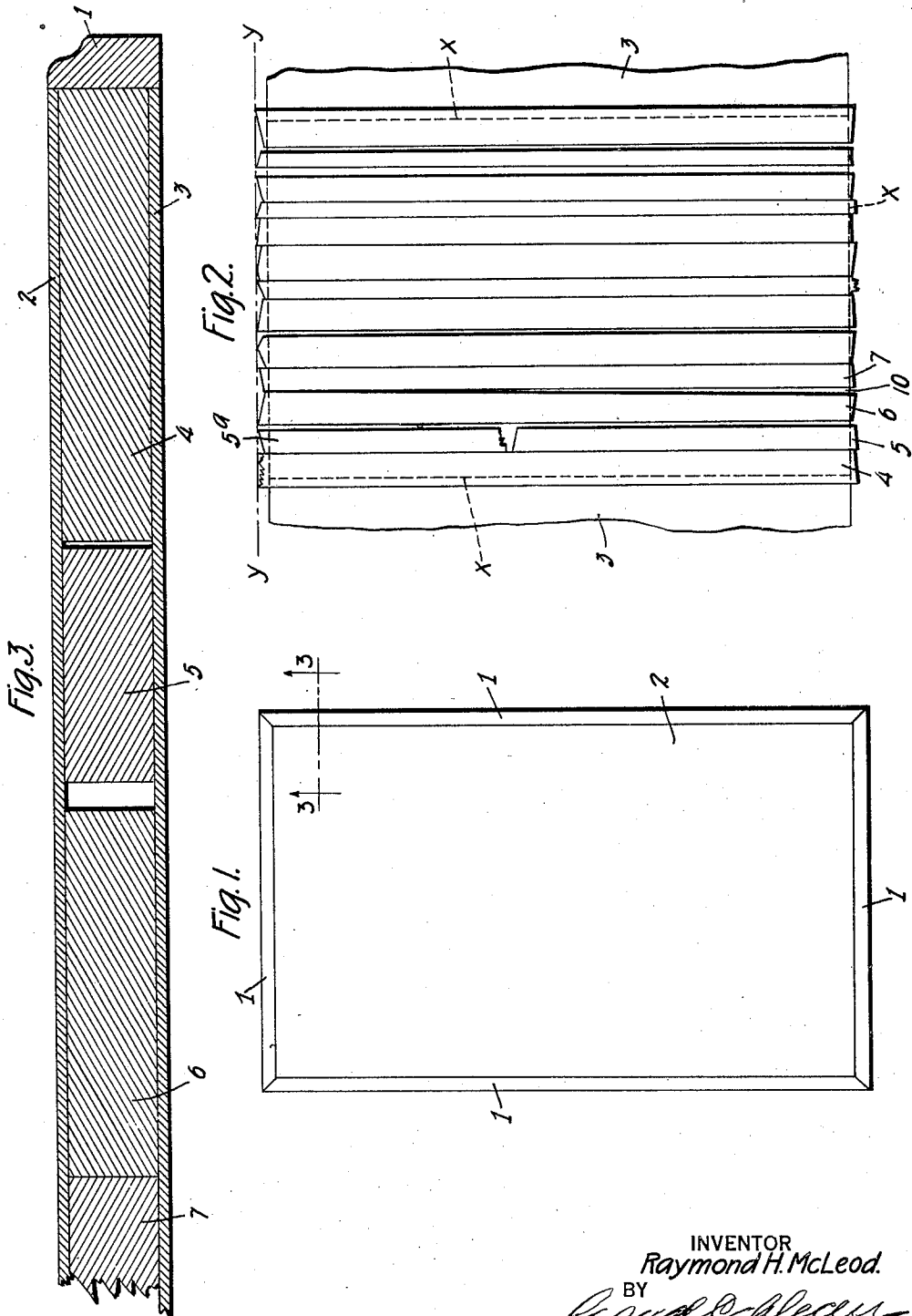
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TOP FOR DESKS AND THE LIKE

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TOP FOR DESKS AND THE LIKE

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My present invention is shown as embodied in a wooden top for desks, tables and the like, but certain features of the invention may be used for other purposes.

5 My invention is particularly applicable to the construction of a table or desk top of the type intended to be finished or painted in solid colors rather than varnished or polished to bring out the grain of the wood. For instance, a top for a table or desk made in accordance with my present invention may be stained or painted a suitable shade of green so as to have a soft, agreeable effect on the eyes of the user; or a solid paint back-ground
10 of any desired color may be further decorated with a suitable pattern or picture applied by hand painting, printing or well known transfer process. In either case, the color coating may be protected by pyroxylin and, if desired, the gloss of the latter may be dulled by applying floor wax or similar material.

As concerns the use of solid color paints restful to the eye, my invention may be considered as an improvement over the linoleum topped desks and tables which are now much in vogue. As now made, such tops are expensive, not only on account of the cost of the linoleum, but also because of the cost of the compound or built-up slab of wood, the so-called top, on which the linoleum is glued. Such tops comprise a so-called core built up from relatively narrow strips running the entire length of the top, secured together
25 laterally by tongue and groove or dovetail joint which is also glued. Even when the strips are narrow, warping or curvature transversely of the grain has to be prevented by what is called cross-banding by gluing
30 sheets of veneer to opposite faces of the core, the grain of the veneer running widthwise of the table, that is, at right angles to the grain of said core. Over this again there is another layer of veneer, usually thinner, having the grain running the same direction as the grain of the core. This makes what is called a five-ply built-up top. When the core is carefully made and the two layers of veneer thus applied to both faces thereof, a fairly
45 nonwarping structure is produced, on the

upper face of which is applied the sheet of linoleum of the desired color. This product is of course expensive, and also, as I have discovered, is unsatisfactory because, although the two plies or even one ply of veneer on each face of the core may be adequate
55 to prevent warping, the non-warping effect is due to the symmetry of the tension applied by the tensile strength of the veneer on the top surface being exactly equal to the tension on the bottom surface. But when linoleum is subsequently cemented to one of these surfaces and not to the other, the equality of tension is upset. Such equality might be restored by gluing a similar layer of linoleum on the bottom face of the structure, but the expense would be prohibitive.

By my invention, I am able to produce a table or desk top far superior to those of the prior art as concerns non-warping quality and wear resisting quality and affording a painted surface which may imitate linoleum or may be ornamentally painted to afford yet more original and pleasing effects.

According to my preferred method, I substitute for the top layers (one or two layers of veneer and one layer of linoleum) a single layer of a dense composition of a peculiar kind having a practically negligible temperature expansion and substantially no humidity expansion, the principal reason for the latter being that the composition is non-hygroscopic besides being substantially water-proof under the conditions of use.

While there may be other compositions having the above qualities, I prefer to use a composition made of long fiber, resinous wood pulp, the natural lignins or resins of the wood, preferably constituting the binder. The pulp is preferably that produced by a well known process of subjecting wooden chips to the action of steam or water under suitable pressures whereby the wood is charged with water superheated to a high temperature without burning the fiber or its natural binder material, whereupon the pressure being abruptly released, the fibers are torn apart by the explosive effect of the instantaneously released steam. By suitable methods, such shredded fiber pulp can be
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felted and then formed into dense sheets by applying heavy follow-up pressure of, say 400 lbs. to 600 lbs. or more per square inch, with a suitable degree of heat to expel water and weld the fibers by the natural gums or resins of the wood as the binder. In the preferred product, the natural wood constituents in the pulp have been compressed to a specific gravity which may be and preferably is greater than that of water, even though the wood employed be of specific gravity much less than water. Its peculiarity is remarkable tensile strength combined with remarkable stiffness and limited elasticity, that is to say, it is elastic under slight deflection, but if its limited flexing elasticity be exceeded, it snaps after the manner of a brittle substance. These qualities peculiarly adapt this composition for use as a tensile and compression cross-banding material for a composite core in place of the veneers heretofore used. Moreover, as the product is uniform, precisely similar sheets are assured, for both faces of the core.

As before stated, the material is practically without expansion or contraction under ordinary ranges of atmospheric heat and cold and dryness or humidity.

When made by the preferred process, one face of the composition, preferably the upper surface, contacts with a smooth compression member or platen and is finished to great density and smoothness either with or without a lubricant or finish such as paraffine. Preferably, the surface in contact with the other compression member, is carried by or compressed against some sort of reticulated surface such as a fine wire netting on which it has been felted. The surface being marked or grooved by the reticulation is peculiarly adapted to take the glue which must be used for securing it to the core or filler.

With the above or similar sheet composition for cross-banding, I have discovered that it is not necessary to build up a core by glued tongue and groove or dovetail joints. According to my preferred method, a board-like sheet of the composition of the proper size for the table top is laid on the assembly table, with a wire-marked or raw surface upward, and the filler strips corresponding to the core are simply coated with glue on their opposite faces and laid on the board until the area is filled up with such strips, whereupon a similar board of the composition is laid over the upper surfaces of said strips, preferably smooth face upward. This three-ply structure is placed in clamps, subjected to great pressure and so remains for, say, twelve hours. The long staple, natural wood composition described above is peculiarly adapted to absorb considerable quantities of glue and permits of a better glue joint than can possibly be made in the old way, between

a built-up core and relatively thin veneer sheets.

If desired, the sheets of composition board may be reduced to uniform thickness and raw surfaces of the composition exposed, before assembly, by grinding or "sanding" off both the smooth top and the wire marked bottom of the board. The filler strips should be all kiln dried to substantially the same degree of dryness and should be accurately planed to have uniform thickness and perfectly plane parallel top and bottom surfaces. If these precautions be observed, it will be unnecessary to have the edges of the strips contact with one another, much less dovetailed or glued to one another. Short pieces with irregular ends and wood having worm holes or similar defects may be used if the major portion of it is sound.

The composite material being thus built up, the rough edges may be sawed and smoothed to precise surface dimensions required for the top and a protecting edge strip or molding glued against said edges. An ornamental molding may be used for this purpose.

The top and bottom may then be finished by grinding off its upper surface to a true plane exactly parallel with its lower surface, care being taken to leave the composition board facings of substantially the same thickness. This has the advantage of removing the planished surface of the composition to expose a relatively raw surface that will take stain, paint or the like, as may be desired. For the color, I may use oil mixed with pigment and benzol which will penetrate the fibers and give the desired color. The color surface may then be covered with a thin, transparent coat of pyroxylin, the gloss of which may be removed by wax, as above described. Also, as above described, any desired pictures or ornamentations may be handpainted or otherwise placed upon the surface before the pyroxylin protection is applied.

The accompanying drawings, which are necessarily more or less diagrammatic, indicate certain features of my method and the product thereof. In these drawings,

Fig. 1 is a plan view of a top made in accordance with my invention;

Fig. 2 is a schematic view indicating how filler strips may be assembled and glued to the face of a board of the wood pulp composition instead of being built up beforehand as a complete core; and

Fig. 3 is an enlarged sectional detail of the complete product as, for instance, on the line 3-3, Fig. 1.

In Fig. 1, it will be understood that 1 is the molding or frame glued to the edges of the completed top of which only the upper composition layer 2 is visible.

Figs. 1 and 2 indicate the simplest and

cheapest method of assembling. As before stated, the essential for the filler strips, as 4, 5, 6, 7, 8, etc. is that they be uniformly kiln dried and that they be planed to exactly uniform thickness so that when assembled on the surface of the lower composition board 3, their upper surfaces will present a level surface for reception of the top board 2. Waste lumber from other furniture making operations may be used without any particular regard for smoothness or fit of their adjacent lateral edges, nor indeed is it necessary that the strips be through-extending.

As shown in Fig. 2, the dotted rectangle x represents the bottom composition board sheet 3, on which are assembled strips enough to cover it and preferably to overlap the edges both at the sides and ends. While the material and size may be the same for all the filler boards, miscellaneous scrap is preferably used because it is cheaper. As an illustration, the piece 4, Fig. 2, may be ordinarily kiln dried wood from a southern gum tree, say 4 inches wide and 3 feet long. The next piece, 5, may be 3 inches wide of tupelo and it may be only 15 inches or so long, the remainder of the length being filled out by an entirely separate piece, 5a. 6 may be oak, 7 may be a 2-inch width of beech, etc., etc. The assembler simply has a stack of these fillers of proper thickness. He takes them one at a time and applies the opposite surfaces to the glue applying apparatus, not caring whether or not any glue gets on the side edges. Tests seem to show that the lengthwise strength is as great or even greater when the strips are not glued together laterally, but they may be so glued if desired. Preferably all the strips extend beyond the margin of the composition sheet both at the ends and at the sides. It is immaterial if there be quite substantial spaces up to a quarter of an inch or more between strips, as at 10, Fig. 2.

After the sheet or board x is thus covered with filler strips, a similar board as 2, is applied in registry with x , whereupon clamps are adjusted to apply great pressure and so remain for the time necessary to allow the glue to set, say 12 hours. This is facilitated by the nature and depth of the composition employed.

Thereupon the completed structure is removed from the clamps and is sawed along or, preferably, slightly within the line x , x , to form a perfectly true rectangle with vertical edges. Thereupon the frame or molding strips 1 are glued about the edges and held in clamps until the glue is set. Finally, the entire top and bottom are sanded off to true parallel planes, removing any slight projections of the molding 1. Preferably, a week or ten days are allowed for the structure to set and temper, before the final grind-

ing of the surfaces in the sand papering machine.

The resulting product is perfectly non-warping and has remarkable transverse stiffness. While the stiffness is naturally greater, the greater the total thickness of the slab, it will be found that for equal thicknesses my simple three-ply top is stiffer and stronger than the expensive jointed and built-up five-ply tops of the prior art. The stiffness, density and glue receptive quality of the top and bottom sheets and probably also the precise uniformity of thickness of filler strips, contribute to produce a remarkably rigid structure.

In the specific embodiment shown in Fig. 3, the composition sheets 2, 3, are each substantially one-eighth inch in thickness and the filler core three-fourths of an inch, making the total thickness of the slab one inch. While precise dimensions are not the essence of my invention and while the thickness of the core may be increased as may be desired for the most massive table top and may be decreased to three-eighths or one-fourth inch or less, for a card table, it is desirable that the composition sheets be kept thick enough to ensure board-like stiffness and a tensile strength sufficient to completely control the warping tendencies of the core.

While I prefer to use composition boards made by the above described process, I do not wish my invention to be limited to this precise material. Moreover, while the extremely simple, almost haphazard method of assembling described in connection with Fig. 2 is very inexpensive and entirely satisfactory, it is evident that the same boards similarly applied to a previously built-up core and surrounded by molding might afford some of the advantages of the preferred arrangement described above.

In the particular case shown, most of the filler strips are through-extending and run lengthwise of the completed top, but this is not at all necessary. Frequently, the waste end of furniture wood used for this purpose are of short irregular lengths, say 15 inches to 30 inches and it is often desirable to lay them widthwise of the completed top, instead of lengthwise as, for instance, in the case of a large table top, say, 36 inches by 72 inches. Obviously, board sheets of maximum length, say 48 inches by 96 inches, may be used to build up a single large unit which may be either used as a unit or may be sawed up into smaller units.

While I have referred to the preferred long-staple fiber board compressed from steam exploded resinous wood chips, as being waterproof under the conditions of use, it is to be understood that the board is far less waterproof edgewise than flatwise and that is one of the reasons why it is highly desirable, if not absolutely necessary, to com-

pletely protect the edges by waterproofing expedients. In the present case the glued-on molding serves this purpose perfectly.

5 A raw top or bottom surface exposed by the sanding machine will "take" water or a benzol stain or glue but does not "soak" or transmit it in the direction in which the sheet was compressed. Consequently, any stain or filler, particularly when protected by
10 pyroxylin as above described, makes the exposed surfaces absolutely proof against moisture.

I claim:

15 A fabricated three ply panel comprising a sheet of the long fiber, grainless composition produced by the high compression of steam-exploded wood, reinforcing members below said sheet and in the form of wooden strips of uniform thickness spaced apart within
20 limits which will require a minimum of material while leaving no part of said sheet unsupported through an area great enough to permit a flexure sufficient to overcome the elastic limits of said sheet, a second sheet
25 similar in size and composition to said first sheet below said reinforcing members, the whole united by glue and pressure into a unitary structure.

30 Signed at New York city, in the county of New York, and State of New York this 4th day of January, A. D. 1928.

RAYMOND H. McLEOD.

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