

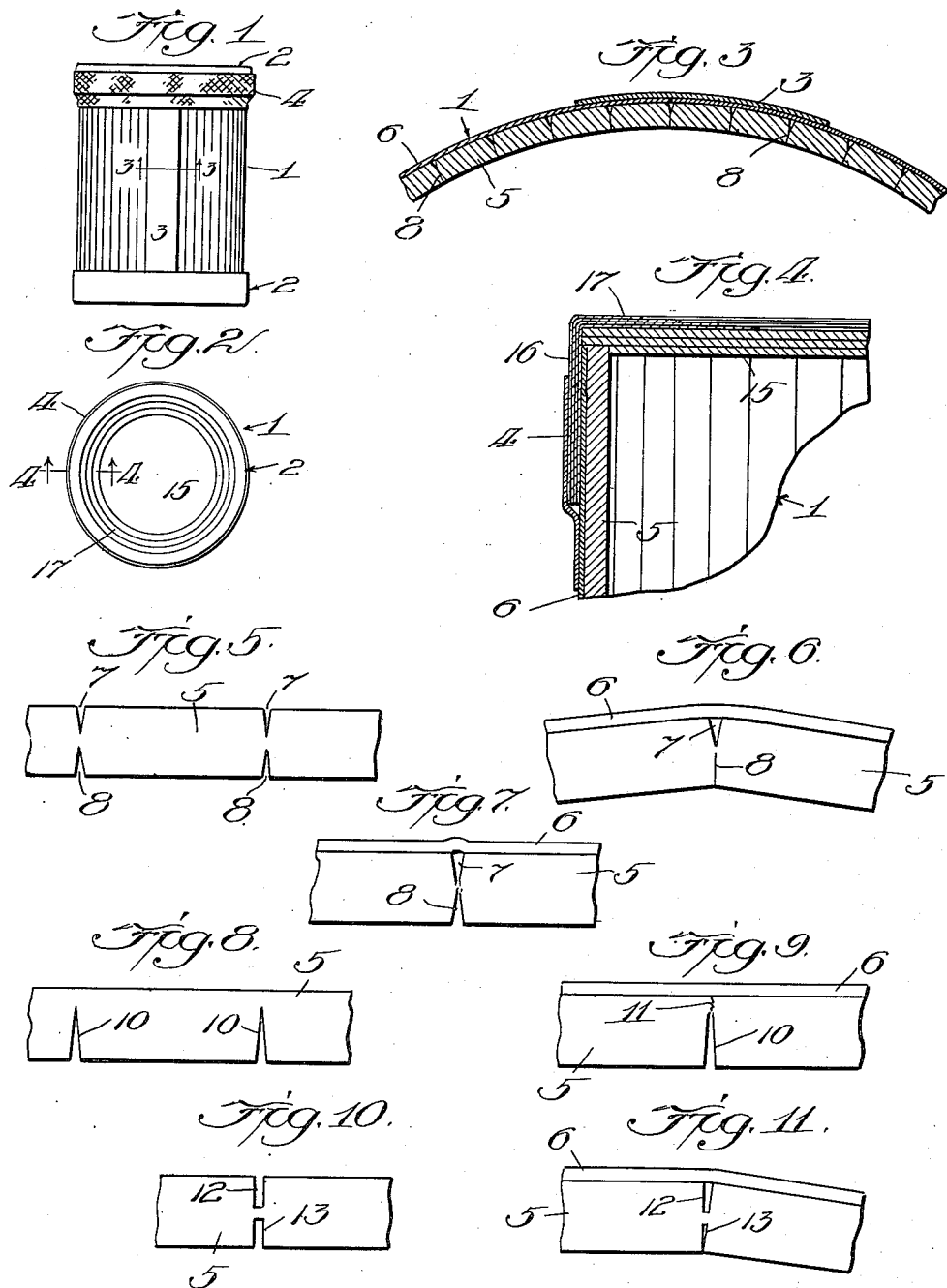
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METHOD OF MAKING FLEXIBLE BLANKS

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METHOD OF MAKING FLEXIBLE BLANKS

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The common wood barrel must be delivered to most users completely set up and, accordingly, takes up an excessive amount of shipping space in proportion to its weight when empty. Furthermore, the principles on which such barrels are constructed cause them to be heavy without being strong under rough handling while in a loaded condition. The freight charges on both empty and full barrels is therefore higher than it is with respect to lighter, stronger containers of equal capacity of the knocked-down box type. Barrels composed of molded fibrous materials are not much better than the ordinary wood barrels insofar as the faults just noted are concerned.

The present invention has for its object to produce, at a reasonable cost, a barrel composed mainly of wood, which shall be light and yet remarkably sturdy, and which can be shipped in a compact knocked-down condition and be quickly and easily set up for use.

Thin wood boards or thick wood veneers faced with tough paper are strong and light but, heretofore, it has apparently not been conceived that such materials could be used to make knocked-down barrels or the like. Such two-ply material is stiff and cannot be bent into the shape of a cylindrical shell to provide the body for a barrel if it initially be flat. By my invention the two-ply structure is permitted either to lie flat or to take the shape of the stiff cylindrical shell required for the body of the barrel. Therefore, a barrel having such a body member may be shipped in a knocked-down state and the body member be easily assembled with suitable heads at the point of use.

The various features of novelty whereby my invention is characterized will hereinafter be pointed out with particularity in the claims; but, for a full understanding of my invention and of its objects and advantages, reference may be had to the following detailed description taken in connection with the accompanying drawing, wherein:

Figure 1 is a side view of a barrel made in accordance with the present invention; Fig. 2 is a top plan view of the barrel; Fig. 3 is a section, on a much larger scale, on line 3-3 of Fig. 1; Fig. 4 is a section, on the same scale as Fig. 3, on line 4-4 of Fig. 2; Fig. 5 is an edge view, on a still larger scale, of a small fragment of the wood board or veneer after slitting or grooving; Fig. 6 is a view similar to Fig. 5, showing the board or veneer bent in the manner required before bonding the facing sheet thereto, together with the

facing sheet in place thereon; Fig. 7 is a view similar to Fig. 6, showing the two-ply panel flattened; Figs. 8 and 9 are views similar to Figs. 5 and 7, respectively, showing a modification; and Figs. 10 and 11 are views similar to Figs. 5 and 6, respectively, showing a still further modification.

In Figs. 1 to 4 of the drawing 1 represents the cylindrical body of a barrel or keg and 2, 2 represent heads that complete the structure. The body member is a panel that is stiff in the direction of the length of the cylinder and flexible in the transverse direction to the extent of being able to lie flat or to be curved into cylindrical shape. In setting up the barrel the meeting edges of the body member are conveniently secured together by a wide tape 3 glued over the joint between them, as shown in Figs. 1 and 3. The head members are of the cap type into which the ends of the body member are set. In assembling the parts of a barrel or keg, the bottom head is preferably fastened permanently to the body member by spreading glue on the interior surfaces of the head or on the periphery of the body member, or both, before placing the head on the body member. After the barrel or keg is filled, the upper head may be applied and be secured by a tape 4 surrounding the barrel and overlapping both the cylindrical wall of the head and the adjacent portion of the outer surface of the body shell, as shown in Figs. 1 and 4; a suitable bonding material, preferably highly water resistant, being interposed between the tape and the barrel surfaces with which it engages. The upper head may therefore be easily released by cutting the tape in two lengthwise along the line of the free edge of the cylindrical wall of the cap. That is, the point of a sharp knife need only be pushed through the tape just below the flange portion of the cap or head in Fig. 4 and be run entirely around the barrel to cut the head loose.

The body member of the barrel is a fairly thin panel consisting of a thin wood board or a piece of thick wood veneer 5 having a much thinner sheet 6 of tough flexible material bonded thereto. In the case of a nail keg, for example, the wood ply may be about three-sixteenths of an inch thick and the other ply may be Kraft paper about thirty-thousandths of an inch thick. The paper is preferably waterproofed and the bonding material between the two plies is preferably water resistant. Soya bean adhesive and casein adhesive are suitable for this purpose.

The structure of the body member and the manner of making it are illustrated in Figs. 5 to

7. As appears in Fig. 5, cuts are made through both faces of the wood member along parallel lines extending in the general direction of the grain of the wood, as indicated at 7 and 8, so as to transform the wood member into a series of narrow strips connected together by little unsevered sections between the ends of corresponding cuts on opposite faces of said member. In the example given, the cuts in each series or group are preferably spaced about one-half inch apart to produce strips of that width. The cuts illustrated are of the type made by knives that do not remove any of the wood but simply compress the wood to make room for thicker parts of the knife as the thin edge moves into the wood. Thus, the slits are initially wedge-shaped in cross section. The slits may be created in some other fashion, however, as, for example, by making saw cuts or shaper cuts and thus removing some of the wood.

If the facing sheet were glued to the wood with the latter in a flat condition, the resulting panel would be stiff and flat. However, by creating the bond between the flexible facing and the panel while the strips stand at the same angles to each other as they later will in the completed barrel, and forcibly flattening the panel, the panel can always be bent into the cylindrical shape when it is desired to do so. As shown in Fig. 6, the size and shape of the slits 8 is such that these slits are completely closed when the panel takes its cylindrical shape. This not only provides the interior of the barrel body with a substantially continuous face, but causes each strip to act as a lateral support for the two strips between which it lies. The bonding of the two plies may be accomplished either by progressively bending the wood ply and simultaneously bonding the flexible sheet to the same, or by first bending the wood ply into its cylindrical shape and then attaching the flexible sheet.

After the bonding has been completed, or as the bonding proceeds if it is done progressively, the panel is flattened as indicated in Fig. 7. It will be seen that the slits 7 and 8 have now become widened somewhat through a stretching of the wood, transversely of the slits and parallel to the faces of the panel in the regions between the inner ends of corresponding slits 7 and 8; this stretching of the wood ply across the width thereof being necessary to compensate for the greater corresponding dimension of the facing ply which spanned an equal angle but at the end of a longer radius than the wood ply at the time the bonding was effected.

The slitting or cutting of the wood ply can also be done as indicated in Figs. 8 and 9. In this construction, the slits 7 of the first form are omitted and the slits 10, corresponding to the slits 8, are deepened. In the completed, flattened panel, the slits 10 are widened as are the slits 8 in Fig. 7 and the transverse stretching of the wood ply occurs in the uncut sections 11 between the bottoms of the slits and the face to which the sheet 6 is bonded.

In Figs. 10 and 11 the slits 12 and 13 correspond to the slits 7 and 8 as to location, but are in the form of saw cuts or shaper cuts. The stretching of the wood occurs in the uncut sections between the inner ends of corresponding slits or grooves 12 and 13.

All that is needed to produce barrels or kegs of great strength is to provide the cylindrical body members with heads that are themselves strong and reenforce the ends of the body members. In

the arrangement shown, each head comprises a plywood disk 15 the overall diameter of which equals the outside diameter of the cylindrical shell, while for some distance upward from the under face the diameter is reduced to that of the interior of the shell. Therefore, a part of the disk fits into an end of the shell while the part of larger diameter rests on the end edge face shell. The cylindrical flange that gives to the head the character of a cap is part of a multi-ply ring L-shaped in cross section attached to the disk. The cylindrical part or flange 16 of the ring surrounds the disk and fits against the periphery of the portion of the latter that is of larger diameter. The other flange 17 of the ring, which is flat, rests on top of the disk and is secured thereto, preferably by bonding. This ring may conveniently be composed of several plies of kraft paper thinner than the facing sheet 6 and bonded to each other.

While the particular form of my invention heretofore described in detail is the one which I prefer, substantially the same results can be obtained by rupturing and expanding the veneer as in my prior patent No. 1,819,775, of August 18, 1931. However, the veneer, in that case, must be broken down before the flexible facing is applied thereto, so as to permit the necessary expansion of the veneer to be effected before bonding the facing sheet thereto. It is, of course, evident that the amount of expansion must be just enough to permit the fractures to close fully on the concave side when the structure assumes the cylindrical shape.

My novel barrel or keg is very much stronger and more durable and lasting than the old types. Thus, for example, a keg of nails embodying the present invention resists many times the number of standard drop tests, before showing serious damage, that suffice to destroy an ordinary full wood nail keg or to break open a full keg composed of molded fibrous material. At the same time, my keg weighs less than the others and can be shipped in a knocked-down condition. Furthermore, my keg or barrel can be opened quickly by simply cutting the tape that holds on the top head or cover and can be sealed again, after being refilled, by applying a new piece of tape. Accordingly, goods may be distributed more safely and more securely and at a lower cost in my improved containers than in barrels or kegs or previously known types.

While I have illustrated and described with particularity only the single preferred form of my invention, with a few slight modifications, I do not desire to be limited to the exact structural details thus illustrated and described; and intend to cover all forms and arrangements which come within the definitions of my invention constituting the appended claims.

I claim:

1. The method of making a flexible blank for a cylindrical container body which may be shipped in a flat condition, which consists in cutting into at least one face of and partly through a sheet of wood veneer along parallel lines running in the general direction of the grain to transform it into a series of strips integrally connected with each other by uncut portions of the veneer, bending the veneer on a radius corresponding to that of said body, with said face on the concave side, bonding to the convex side of the veneer a sheet of tough, flexible material, and then flattening the resulting two-ply member.

2. The method of making a flexible blank

which may be shipped in a flat condition, which consists in cutting into at least one face of and partly through a sheet of thin wood along parallel lines running in the general direction of the grain to transform it into a series of strips integrally connected with each other by uncut portions of the sheet of wood, bending the sheet

5 of wood into the form of a cylindrical shell with said face located on the inner side, bonding a sheet of tough flexible material to the exterior of the shell, and then flattening the resulting two-ply member.

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