Nov. 20, 1934. A. QUIMBY ET AL 1,981,466

PLYWOOD CONTAINER

Filed June 11, 1930

Fig. 1

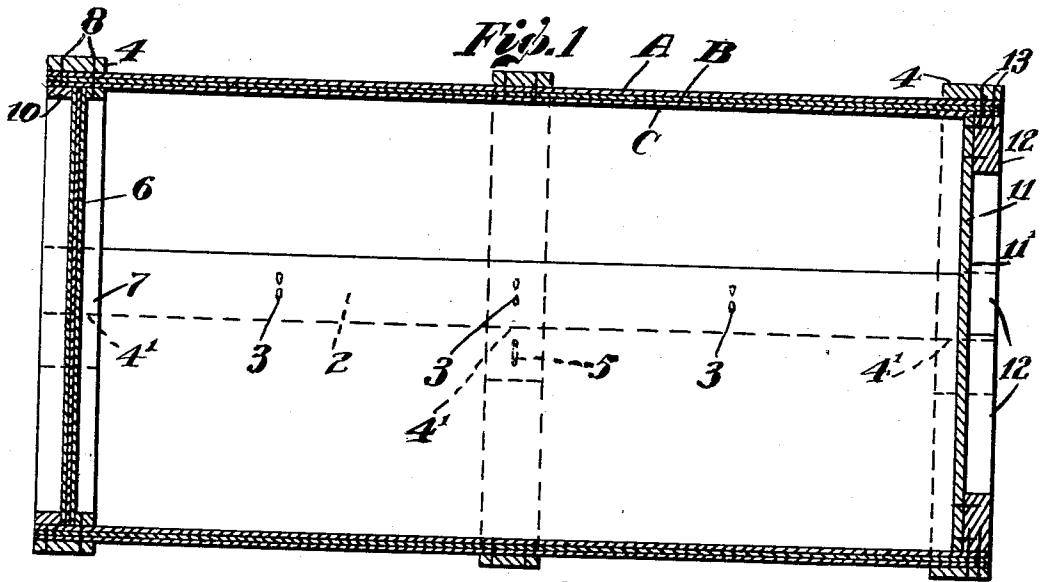


Fig. 3

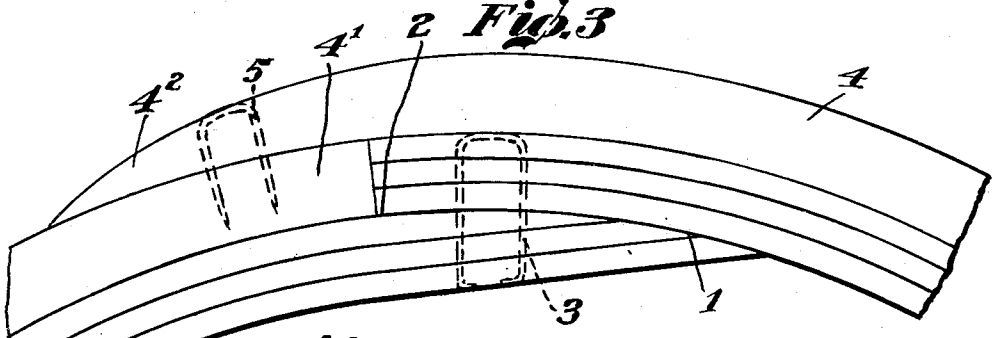


Fig. 2

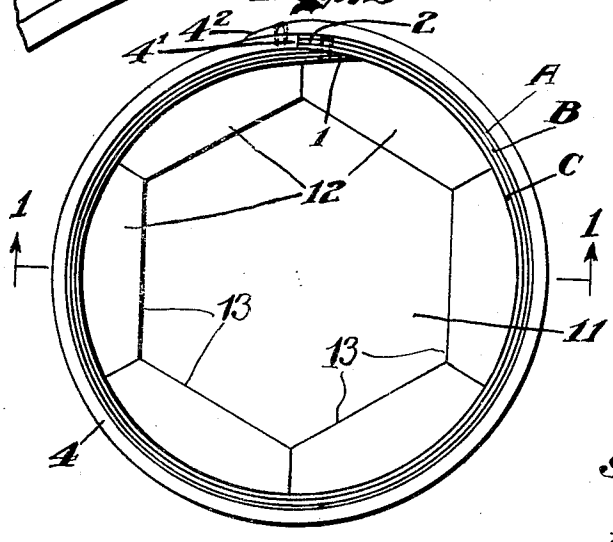
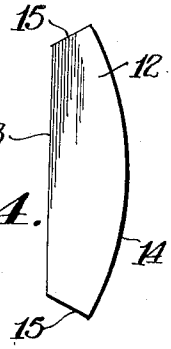


Fig. 4.



Inventors.
Allen Quimby.
Samuel J. Antworth.
By Ellis Spear Jr.
Attorney

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PLYWOOD CONTAINER

Allen Quimby, Portland, and Samuel J. Antworth, Houlton, Maine, assignors to Northern Maine Plywood Company, Portland, Maine, a corporation of Maine

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16 Claims. (Cl. 217—1)

The desirability of light weight containers such as barrels, casks and drums has long been recognized and for this purpose the use of plywood or veneers has been frequently suggested. Such efforts as have been made to produce articles of this sort made from such materials have brought no very satisfactory results, although there were obvious advantages to be attained if the articles were commercially successful.

To attain these advantages it was recognized that the containers should be cylindrical as to their side walls and in order to be readily bent and to have the desired line, it is necessary that the plywood or wall member be relatively thin. This thinness involved several difficulties.

The thin edge of the plywood particularly at the bottom of such an article as a barrel was particularly apt to flex, ravel or splinter, making the article very short lived. Furthermore, the same frailty in the edge made difficult any bracing, which was dependent on the edge for fastening, a matter of uncertain strength and one liable even to defeat its own purpose.

To reinforce the container wall it has been common practice to girdle the same with hoops which were attached to the wall with staples or nails. This, however, has not been wholly satisfactory as in spite of the hoops the edges of the barrel wall were liable to spread. To avoid this spreading, the walls have been overlapped and in some cases the edges have been beveled, but this tended to create a zone of weakness at the very spot where reinforcement was desirable. Furthermore, it has been found inadvisable to drive the staples which hold the hoops to the barrel through the overlapping skived edges of the container wall as this tended to injure the plywood or veneer.

It has also been recognized as desirable to overlap the ends of the hoop but this has not been found practical as it caused an uneven finish for the outside of the container.

In our present invention both the edges of the walls and the edges of the hoops are overlapped, the inner edge of the container and the outer edge of the hoop being beveled so that both the inside and outside finish would conform to the general curvature of the container. By this means a greater thickness through which the staples or nails may be driven is provided and the abutting edges of the overlapped edge end of the hoop and the overlapping edge of the wall are held in union as preventing any likelihood of the hoop to slip from position.

Our invention contemplates containers along the lines recognized as desirable but so constructed as to have a great strength by reason of a combination of simple bottom elements with the edge of the veneer so that the veneer edge is completely protected and the barrel braced and supported.

In the drawing we have illustrated a form of our invention which we have found satisfactory in practical use. Throughout the specification and drawing like reference numerals are employed to indicate the corresponding parts.

In the drawing:

Fig. 1 is a section through one of our improved containers.

Fig. 2 is an end view of the container, and

Fig. 3 is a detail showing the engagement of the wall edges and the connection of the same with the hoop.

Fig. 4 is an enlarged detail view of one of the wood blocks shown in Figs. 1 and 2 of the drawing.

First referring to the construction of the container wall, we have shown a wall which consists of three plys of veneer of plywood which we have indicated as A, B, and C. The outer and inner layers A and C preferably have their grains running vertically or from top to bottom of the barrel, while the intermediate layer or layers have their grain running horizontally. The vertical grain of the outside and inside layers A and C permits for expansion and compression of the container without any likelihood of cracking or breaking the veneer such as might readily take place if all of said layers were of horizontal grain. The edges of the walls are rounded to desired contour and the edges overlapped as shown in Fig. 3. In order to provide a smooth unbroken interior surface for the barrel, the lower or overlapped edge which we have indicated as 1 is beveled, but the full three plys of the plywood overlap this beveled edge 1 as we have shown at 2. The overlapping edge 2 is fastened to the beveled edge 1 by suitable means such as the staple 3. This not only prevents any possible leakage through the same, but the same readily becomes a factor of longitudinal rigidity and so combines with the bottom structure as will be hereinafter described.

Surrounding the container are a plurality of hoops 4 which may be of different widths, but preferably are relatively wide hoops. The inner end 4^1 of the hoop has a straight edge and abuts the straight edge 2 of the container wall comprising the layers A, B, and C. This hoop encircles the barrel and its opposite end is beveled

or skived as at 4^2 and this beveled portion overlies the end 4^1 to provide a smooth unbroken outer surface for the container. The ends 4^1 and 4^2 of the hoops are stapled or nailed together as indicated at 5 and these staples may extend through the hoop into the plywood to prevent movement of the hoop on the container. All of the hoops on our container are secured in the above manner which is best illustrated in Fig. 3.

The end hoops are positioned so that their outer edges are flush with the edges of the plural plywood wall and serve as a reinforcement therefor.

To provide a bearing for the head 6 as well as an inside reinforcement for the edge of the container wall, we provide an inside hoop 7 which is positioned adjacent to but below the top edge of the container and opposite to the hoop 4 on the outside thereof. Staples or like fastenings 8 pass through these two hoops and the interposed wall of the container to hold the hoops securely in place. To hold the cover in place a retaining hoop 10 is inserted on top of the cover 6, the edge of which hoop 10 is flush with the edge of the container wall and also with the edge of the outside hoop 4 so that the top of the barrel is covered and protected and the barrel may be stood or rolled on that end without any injury to the wall edge.

The bottom 11 is of novel construction as appears in section in Fig. 1 and in plan in Fig. 2, and comprises a bottom head 11^1 which may be of solid wood or plywood and which has a bracing on its lower face as follows:

To the lower face of the member 11^1 are attached a plurality of relatively thick cleats or segments 12, the ends of which abut each other, and the outer edges of which conform to the curvature of the container wall. The inner edges of the segments 12 may define a substantially hexagonal area through which the member 11^1 appears. These segments provide an absolutely tight fit of the bottom end within the container and the construction thereof is such as to prevent any possible loosening or dislodgment of the same once they are fitted in place. Staples or other fasteners 13 pass through the outer hoop 4 and the container wall further to fasten the segments 12 in position. A barrel of even thin plywood when reinforced by these segments 12 is provided with an end capable of withstanding all usual strains and pressures. The outside surface of these segments 12 is flush with the edges of the container wall and the outside hoop 4 and serves to help protect the plywood edge so that the barrel may be shipped, rolled or dragged even when loaded to capacity without breakage or distortion.

The production of our container involves the following method:

Rectangular blanks of plywood or veneer of suitable size and shape are cut and one side edge thereof beveled. The blanks are then bent or rolled into cylindrical form with the side edges overlapped and clamped to each other. This is preferably done on a forming machine set adjacent a stapling machine so that upon rotation of the table the shaped wall may be fed to a stapling machine which progressively staples the overlapped side edges to each other.

From the stapling machines the container wall is passed to the hooping and heading machine where the hoops are positioned and fastened in shape and the bottoms applied. If desired, the tops 6 may next be placed in position in the containers on the hoops 7 or the tops may be shipped separately and installed after the containers are filled.

Various modifications in the manner of uniting the plural walls to each other and the manner of fastening the edges of the layers and the connection of the hoops to the barrel as well as the arrangement of the members of the bottom may all be resorted to without departing from the spirit of our invention if within the limits of the appended claims.

It will be seen, therefore, that the preformed and cleated head or end wall may serve as either the bottom or the top of the barrel, depending upon which end the barrel is standing on. If a head of this kind is used at one end of the barrel, it can be either the top or the bottom, being the latter if the barrel happens to be standing on this end. Also, the barrel may have two heads of this kind, or it have one head of this kind and another head of some other kind. In any event, if it has one head of this kind, it therefore has a bottom head having this cleated construction, as one head of this kind may be either the bottom or the top, depending upon which end the barrel is standing on. Also, it is obvious that this cleated head or end wall or bottom or top is not limited to use thereof in barrels, but may be used in other containers as well.

It will be seen that by using plywood material having three plies, with the grain of the wood extending longitudinally of the barrel in the inner and outer plies, and with the grain of the wood extending circumferentially in the middle or intermediate ply, it is not only true that a very strong and serviceable barrel is provided, but it is also true that the plywood formation of the side wall material is thereby employed to good advantage to provide clean and smooth edges for the inner and outer edges of the overlapped seam at one side of the barrel. Cutting crosswise of the grain of the wood leaves a rough edge, but with the outermost ply having its grain running longitudinally of the barrel, this outside edge is left smooth and clean, and the same result is obtained inside of the barrel, for the inner edge of the seam or overlap. Moreover, by skiving off the outer side of the inner overlapping portion, it is thinned down to a practically or substantially sharp edge formed only on the innermost ply of the side wall material, which sharp edge bears against the inner surface of the barrel, and in this way a practically unbroken surface is formed circumferentially of the barrel inside thereof. While there is a slight angle at the point where the sharp edge engages the inner surface of the barrel, with a substantially straight surface between this edge and a point about opposite the staple 5, it is nevertheless true that the inner surface of the barrel is thus practically smooth and unbroken and continuous, thus providing a more satisfactory barrel for certain uses thereof. It will also be seen that the bottom head of the barrel is formed of a disk of plywood material fastened to peripheral material, which latter is in the form of blocks 12 secured to the outer side of the plywood bottom head or end wall. Staples are then driven through the outer hoop 4 and through the plywood side walls into these blocks or peripheral material, thus holding the bottom head firmly in place.

By skiving or tapering the outer overlapping end of each hoop, as shown in Fig. 3, and by butting the square inner end of each hoop against

the square or blunt outer edge of the barrel seam or overlap, a smooth and satisfactory joint is provided, both in the side wall structure and in the hoop structure, at one and the same side of the barrel, of a character that does not materially or undesirably increase the normal thickness of the barrel at this side, and does not result in undesirable projections, or protruding or bulging parts, that would tend to make the barrel more or less undesirable.

The preliminary cylinder of plywood, with its inner and outer grain running longitudinally of the barrel, and with its intermediate grain extending circumferentially of the barrel, is rolled up and formed with its overlapped seam as shown and described, and thereafter this preliminary cylinder of plywood is subjected to a hooping and heading operation for attaching the hoops and heads in the manner shown and described, whereby the rolling up of the plywood side wall material is not done at the same time that the hoops and heads are applied, but, to the contrary, is done with considerable advantage before the hooping and heading of the barrel is accomplished. In this way, the hoops are fitted or conformed to a cylindrical barrel body, thereby insuring the proper relation between the hoops and the barrel body for the ultimate or finished barrel.

Thus, it will be seen that the entire improved construction shown and described relates to the manufacture of plywood cylindrical barrels, and to the advantageous use of this plywood material, having three plies, as described, in the production of strong and satisfactory and practically sift-proof cylindrical barrels of this particular character.

Thus the overlapping edge portions are multiple in character, even the thinned or beveled inner portion, providing parallel edges at one side of the barrel.

It will be seen that the outer ply A of veneer and the inner ply C of veneer, with the grain of the wood within thereof, extending longitudinally of the barrel, in effect provide cylindrical stays that stiffen the barrel and prevent circumferential splitting thereof. On the other hand, the intermediate ply B, having the grain of the wood thereof extending circumferentially, in effect provides a cylindrical hoop that prevents longitudinal splitting of the barrel. This is especially effective in the particular method of construction disclosed herein, as both the circumferential splitting and the said longitudinal splitting are prevented, and all danger thereof eliminated, during that step of said method of construction comprising the rolling of a single sheet of plywood of this kind into cylindrical form, for at such time there are no hoops on the cylinder, and nothing but the plywood itself can be depended upon to prevent said splitting. In this way, the three-ply material called plywood herein has inner and outer skins, so to speak, that stiffen the barrel very materially against circumferential splitting, and prevent the two ends of the barrel from falling apart, especially during the preliminary step of rolling the veneer into cylindrical form. And, of course, the intermediate ply or layer of said plywood is in the nature of a cylindrical hoop that is imbedded in the side wall material, and which is not exposed to the atmosphere, except at the extreme edges thereof, and this hoop that circumscribes the barrel is sufficient to prevent longitudinal splitting until the separate hoops are attached to the cylinder.

Looking at Fig. 3 of the drawing, it will be seen that the blunt or square edge of the three-ply material, as at 2, is located at approximately the point where the skiving-off of the underlined material begins, said skiving operation terminating in the sharp edge for the inner ply of the material. With the hoop portions formed as shown in Fig. 3, it will be seen that the fasteners 13 are driven through these hoop portions and through the side walls of the cylindrical body into the blocks 12 of the preformed or fabricated barrel head, to hold the barrel head in place. This provides a very strong head construction for the barrel, and as a consequence the barrel will hold a heavy load and stand up a much longer time under the wear and tear of ordinary transportation and handling.

With further reference to the blocks 12, it will be seen that when these are made of wood, as is preferable, the grain of the wood will necessarily extend lengthwise thereof. In this way, the grain of the wood will extend parallel with the straight inner edges 13 of the blocks, and while the curved side 14 will cut across the grain here and there, it will not materially weaken the strength of the block, inasmuch as there will be a substantial amount of the grain that will extend unbroken from one beveled end 15 to the other similar end. Obviously, the blocks would have no strength if the grain of the wood extended crosswise thereof, or very little strength, and consequently these blocks are necessarily and naturally formed from straight blocks or strips that have the grain of the wood extending longitudinally thereof, as shown and described. In this connection, it will also be seen that the side walls of the barrel in effect provide a practically one-piece cylindrical body having a longitudinal joint at one side thereof, and capable in itself of maintaining its shape or form. In other words, the single sheet of three-ply wood veneer, with the different plies arranged as stated, forms a preliminary cylinder that has great strength and rigidity, and that is capable in itself of maintaining its shape and form, without any hoops or other things. But, of course, hoops are desirable, in order to augment or reinforce the circumferential strength of the middle ply, in which latter the grain of the wood extends circumferentially and concentrically to the hoops of the barrel. Thus a self-maintaining cylindrical body is provided, which is rigid and practically of one piece construction from end to end thereof, and which gives the barrel very great primary and inherent strength, even without the reinforcement of the hoops.

Of course, it will be seen that the inherent strength and rigidity of the three-ply cylinder forming the body of the container is not only because of the character and arrangement of the plies, as previously explained, but is also because of the stitching of the lap-joint at one side of the cylinder. Staples or wire stitching, when inserted in this manner, in two layers of plywood, as shown and described, do not pull out, and confer great strength and resistance to the bursting strain when the barrel is loaded. It is this permanent stitching, as well as the character and arrangement of the plies of the practically one piece body, that enables the cylinder to have great primary strength, so that it is capable in itself of maintaining its shape and form, even though no hoops are provided. In this way, it may practically be said that the cylindrical one piece body, with its strong cylindrical hoop, formed by the middle ply, and with its permanent wire stitching for the joint at one side there-

of, provides not only the primary strength, but also the major strength of the barrel. The ordinary barrel or container, of course, has practically no load-sustaining strength, and no resistance to the bursting strain, until the hoops are put on, so that practically the major strength is in the hoops. But with the construction shown and described, which is illustrative of the invention, the complete structure of the container starts with a strong and rigid and practically one piece cylinder which, because of the permanent wire stitching for the joint thereof, has great primary strength, and may even constitute the major strength of the container.

As a matter of fact, with the solid three ply veneer side walls of adequate thickness, and with the overlap seam at the side of the barrel strongly and permanently fastened, it has been found that the seam becomes the strongest part of the body, that the barrel practically does not need any hoops, and that such hoops as shown and described are practically merely for the barrel to roll on. By "permanently stitched" is meant that the overlap seam is so strongly stapled or otherwise fastened that it will not pull apart under the bursting strain of the load, and that in fact the overlap seam is somewhat stronger and less liable to break than the other portions of the cylindrical body, even practically without hoops.

It will also be seen that the blocks on the head are pushed or tilted outwardly, when the end wall is dished or outwardly bulged by the pressure of the load. In other words, the curvature of the end wall, when bulged outwardly, tends to tilt the blocks or cleats tightly against the side walls of the barrel, so that pressure of this kind on the end wall really serves to tighten the head in the end of the barrel.

Furthermore, it will be seen that the entire bottom or end wall struoture, comprising the sheet material 11 and the blocks 12, is formed of wood cut to provide an annular periphery for the bottom, but with the grain of the wood everywhere extending straight and unbent, there being no bent wood whatever in the bottom structure, but the wood being cut in a manner to in effect provide a peripheral ring on the under side of the bottom.

The head 6, it will be seen, is in the form of an impervious cover for the top end of the barrel, and this co-operates with the impervious bottom 11 to form a thoroughly tight container for the shipping of various products.

What we therefore claim and desire to secure by Letters Patent is:

1. In plywood barrel construction, a cylindrical body of plywood having three plies fastened together with the grain of the wood in the inner and outer plies extending longitudinally of the barrel, thereby in effect providing inner and outer cylindrical stays that prevent circumferential splitting of the barrel on the inner and outer surfaces thereof, and with the grain of the wood of the middle ply extending circumferentially of the barrel, thereby in effect providing a cylindrical hoop that prevents longitudinal splitting of the barrel, forming in effect a practically one-piece cylindrical three-ply body having a permanently stitched longitudinal joint at one side thereof and capable in itself of maintaining its shape and form, together with separate hoops and end walls or heads for said cylindrical body, all forming a cylindrical barrel of uniform diameter throughout the length thereof, said plywood material being overlapped at one side of the barrel, forming a longitudinal seam down this side of the barrel, the inner edge portion being skived off on the outer side thereof to a substantially sharp edge formed on the innermost ply of said material, whereby the said innermost ply of the cylindrical body forms a practically continuous or unbroken inner surface throughout the circumference thereof, the outer edge of said seam or overlap having a blunt square edge, and the hoops of the barrel each having one end butted against said square edge, and having the other end stapled to the inner end portion of the hoop that is thus butted against the outer square edge of the seam.

2. A structure as specified in claim 1, comprising a preformed or fabricated barrel head inserted within one end of the cylindrical body, formed of a disk of flat material secured by fasteners to reinforcing peripheral material, and fasteners inserted inwardly through said hoop and the side walls of the body into said fibrous material, thereby to hold the barrel head in place.

3. A structure as specified in claim 1, comprising a preformed or fabricated barrel head inserted in one end of the cylindrical body, formed of a disk of flat material secured by fasteners to blocks disposed end to end, and fasteners inserted inwardly through said hoop and through the side walls of the body into said blocks to secure the barrel head in place.

4. In plywood barrel construction, an annular body of plywood having three plies fastened together with the grain of the wood in the inner and outer plies extending longitudinally of the barrel, on the exposed inner and outer surfaces of the body, thereby in effect providing inner and outer longitudinal cylindrical stays that prevent circumferential splitting of the barrel, and with the grain of the wood of the middle ply extending circumferentially of the barrel, thereby in effect providing a cylindrical hoop between said stays that prevents longitudinal splitting of the barrel, forming in effect a practically one-piece cylindrical three-ply body having a permanently stitched longitudinal joint at one side thereof and capable in itself of maintaining its shape and form, together with separate hoops and end walls or heads for said cylindrical body, all forming an annular barrel with opposite countersunk heads of uniform diameter throughout the length thereof, said plywood material being overlapped at one side of the barrel, forming a longitudinal seam down this side of the barrel, the inner edge portion of the overlap being skived off on the outer side thereof to a substantially sharp edge formed on the innermost ply of said material, forming the inner longitudinal edge of said seam, whereby the said innermost ply of the cylindrical body forms a practically continuous or unbroken inner surface throughout the circumference thereof, the outer edge of said seam or overlap having a blunt square edge at approximately the point where the skiving begins on the underlying material, and the hoops of the barrel each having one end butted against said square edge, and having the other end tapered and stapled to the inner end portion of the hoop that is thus butted against the outer square edge of the seam.

5. In plywood barrel construction, a body of plywood having three plies fastened together with the grain of the wood in the inner and outer plies extending longitudinally of the barrel, thereby in effect providing inner and outer stays that prevent circumferential splitting of the barrel on the inner and outer surfaces thereof,

and with the grain of the wood of the middle ply extending circumferentially of the barrel, thereby in effect providing a hoop that prevents longitudinal splitting of the barrel, together with separate hoops and end walls or heads for said body, all forming an annular barrel with opposite countersunk heads, said plywood material being overlapped at one side of the barrel, forming a longitudinal seam down this side of the barrel, the inner edge portion being skived off on the outer side thereof to a substantially sharp edge formed on the innermost ply of said material, whereby the said innermost ply of the body forms a practically continuous or unbroken inner surface throughout the circumference thereof, the outer edge portion of said seam or overlap engaging the skived surface having a blunt edge on the exterior of the barrel, and staples inserted through the skived lap-joint thus forming said seam.

6. In plywood barrel construction, a practically one-piece body of plywood having three plies fastened together with the grain of the wood in the inner and outer plies extending longitudinally of the barrel, thereby in effect providing inner and outer stays that prevent circumferential splitting of the barrel on the inner and outer surfaces thereof, and with the grain of the wood of the middle ply extending circumferentially of the barrel, thereby in effect providing a hoop that prevents longitudinal splitting of the barrel, forming a body of major strength capable in itself of maintaining its shape and form, separate hoops and end walls or heads for said body, all forming an annular barrel with opposite countersunk heads, substantially or practically radial fasteners inserted at intervals through a hoop and said body into a head, and longitudinal fasteners holding the parts of the head together, said plywood material being overlapped at one side of the barrel, forming a permanent longitudinal seam down this side of the barrel, the inner edge portion being skived off on the outer side thereof to a substantially sharp edge formed on the innermost ply of said material, whereby the said innermost ply of the body forms a practically continuous or unbroken inner surface throughout the circumference thereof, the outer edge of said seam or overlap having a blunt edge, and the hoops of the barrel each having one end butted against said blunt edge, and having the other end stapled to the inner end portion of the hoop that is thus butted against the outer square edge of the seam.

7. In plywood container construction, the combination of imperforate side walls forming the annular body of the container, and a preformed imperforate head or closure for one end of the container, said head comprising a plurality of wood blocks arranged in series, of a width and thickness to receive both axial and radial fasteners, with the outer edge of each block curved to conform to the shape of the container, and with the inner edge of each block straight, the grain of the wood extending transversely of the container and parallel with the straight inner edge of each block, sheet material on the flat inner sides of said blocks, fasteners inserted through said sheet material into said blocks, serving to hold the blocks permanently end to end, forming a countersunk head which can be inserted as a unit in the body, with said blocks in position to be grasped by their straight edges, and other fasteners inserted inwardly through the side walls into said blocks, serving to hold the preformed head in place, whereby each block has a set of axial fasteners and a set of radial fasteners, the heads of said first-mentioned fasteners being on the interior of the container, the heads of said other fasteners being on the exterior of the barrel, and the points of all of said fasteners being imbedded and concealed in said blocks, together with an outside hoop fastened by said other fasteners to said blocks.

8. A structure as specified in claim 7, said sheet material having an unbroken or continuous annular edge flush with the outer edges of said blocks, and the side walls being formed of solid three-ply material forming a practically one piece body which in itself is capable of maintaining its shape, forming in effect a tight hoop around the periphery of said head, secured to the outer edges of said blocks.

9. In plywood barrel construction imperforate side walls formed of three-ply material, with the plies solidly united, forming in effect a practically one-piece annular body having a permanently fastened longitudinal lapped joint at one side thereof and capable in itself of maintaining its shape or form, the grain of the wood of the outermost ply extending longitudinally of the container, the grain of the wood of the middle ply extending circumferentially of the container, and the grain of the wood of the innermost ply extending continuously from one end of the container to the other, together with preformed opposite countersunk imperforate heads which can be inserted in the body, encircled and tightly held in place by the opposite three-ply end portions of said body, at least one head comprising straight-edged blocks arranged end to end, of a width and thickness to receive both axial and radial fasteners, forming hand grips at the end of the barrel, fasteners inserted through a head wall into said blocks, serving to permanently hold the blocks end to end, and other fasteners inserted inwardly through said body into said blocks, whereby each block has a set of axial fasteners and a set of radial fasteners, the heads of said first-mentioned fasteners being on the interior of the container, the heads of said other fasteners being on the exterior of the barrel, and the points of all of said fasteners being imbedded and concealed in said blocks, together with an outside hoop fastened by said other fasteners to said blocks.

10. In plywood barrel construction, imperforate side walls formed of three-ply material, with the plies solidly united, forming in effect a practically one-piece annular body having a permanently fastened longitudinal lapped joint at one side thereof and capable in itself of maintaining its shape or form, the grain of the wood of the outermost ply extending longitudinally of the container, the grain of the wood of the middle ply extending circumferentially of the container, and the grain of the wood of the innermost ply extending continuously from one end of the container to the other, together with imperforate preformed opposite countersunk heads which can be inserted in the body, encircled and tightly held in place by the opposite three-ply end portions of said body, at least one head comprising material extending around externally of the barrel inside an end of the body, of a width and thickness to receive both axial and radial fasteners, interior fasteners inserted through a head wall into said material, serving to permanently hold the latter in place on said wall, and exterior fasteners inserted inwardly

through said body into said materials, whereby said material has a set of axial fasteners and a set of radial fasteners, the points of all of said fasteners being imbedded and concealed in said material, together with an outside hoop fastened by said exterior staples to said material.

11. In a container, an annular body forming the side walls of the container, and a bottom or end wall for said container, said bottom comprising sheet material having blocks fastened to the under side thereof, at the periphery of the bottom, outside the container, each block having a straight inner edge and a curved outer edge, the latter conforming to the periphery of the bottom, these blocks being made of wood with the grain thereof extending transversely of the container and parallel with the straight inner edge of each block, forming a countersunk head with said blocks in position to be grasped by their straight edges, and means inserted externally of and inwardly through the side walls into said blocks to fasten the bottom or end wall in place.

12. In a container, an annular body forming the imperforate side walls of the container, and a preformed imperforate bottom or end wall for said container, fully formed as a separate unit for insertion in the body, said bottom comprising wood suitably cut to provide an annular periphery fitting within the lower end of the container, providing in effect an external and permanent annular ring on the under side of the bottom, of a width and thickness to receive both axial and radial fasteners, with the grain of the wood in the entire bottom structure everywhere extending unbent and straight, so that the grain is everywhere horizontal and straight, to entirely obviate the use of any bent wood, means inserted externally of and inwardly through the side walls into said ring to fasten the bottom in place, and an outside hoop fastened by said means to said ring.

13. In a plywood barrel construction, the combination with a circumscribing annular body formed of a single sheet of plywood having the ends thereof overlapped and secured together with one edge of the sheet exposed, and with the inner edge thinned down to a thin edge on the innermost ply only, said plywood comprising at least three plies with the grain in the inner and outer plies extending longitudinally of the body and with the grain in the middle ply extending circumferentially of the body, of a plurality of hoops surrounding the said body and secured thereto, of a thickness substantially the same as said sheet, the ends of said hoops being overlapped and one end of each hoop abutting the exposed edge of the sheet, and a bottom unit fitting snugly within and secured to said body and one of said hoops.

14. As an article of manufacture, an impervious cover, a container comprising annular plywood side walls of solidly united plywood secured to said cover, forming a practically one-piece impervious body with a permanently stitched longitudinal joint at one side thereof and capable in itself of maintaining its shape and form, with the outside ply having the grain of the wood thereof extending longitudinally from top to bottom of the container, forming in effect an annular stay to prevent the top and bottom of the container from breaking apart, and with an inner ply having the grain of the wood extending circumferentially of the container, forming in effect an annular hoop to prevent longitudinal splitting of the container, having top and bottom lapped encircling hoops, with one end of each hoop butted squarely against the outer edge of said joint, and staples by which the plywood and hoops are bound together and by which overlapping portions of the side walls are fastened together at said joint, whereby each staple in any position thereof must and does straddle some of the grain of the wood of said walls, regardless of the angle of the head of the staple, together with an impervious bottom co-operating with said cover and side walls to form a thoroughly tight container.

15. As an article of manufacture, a container comprising a hoopless impervious cover, annular side walls of solidly united plywood fastened to said cover, with overlapping portions fastened together at one side of the container, forming a practically one-piece body with a permanently stitched longitudinal joint at one side thereof and capable in itself of maintaining its shape and form, with the grain of the wood of the outer ply extending longitudinally of the container, forming a clean square external edge extending from top to bottom down the one side of the container, top and bottom hoops encircling the container, each hoop comprising a single thickness wood strip with an underlying end butted squarely against said square edge, and with an overlying end extending beyond said edge, together with staples inserted through the hoop and plywood to bind the materials together in said relation, an inner ply of said walls having the grain of the wood thereof extending circumferentially of the container, forming in effect a hoop co-operating with said other hoops to prevent longitudinal splitting of the container, together with an impervious bottom co-operating with said cover and side walls to form a thoroughly tight container.

16. As an article of manufacture, a hoopless impervious cover, a container having round or curved side walls formed from a single sheet of cross grain plywood material, forming a practically one piece body with a permanently stitched longitudinal joint at one side thereof and capable in itself of maintaining its shape and form, outside hoops each having an inner end butted squarely against the outer edge of said joint, said material comprising a plurality of plies of wood veneer solidly adhering to each other, with the grain of the outside ply extending up and down or vertically of the container and forming in effect an annular stay to prevent the top and bottom of the container from breaking apart, with the grain of the wood of an inner ply extending circumferentially of the container and forming in effect an annular hoop to prevent longitudinal splitting of the container, and with end portions of the sheet overlapped to form a lap-joint or seam at one side of the container, said grain of the wood forming a clean outer multi-ply edge for said lap-joint or seam, together with an impervious bottom co-operating with said cover and side walls to form a thoroughly tight container.

ALLEN QUIMBY.
SAMUEL J. ANTWORTH.