

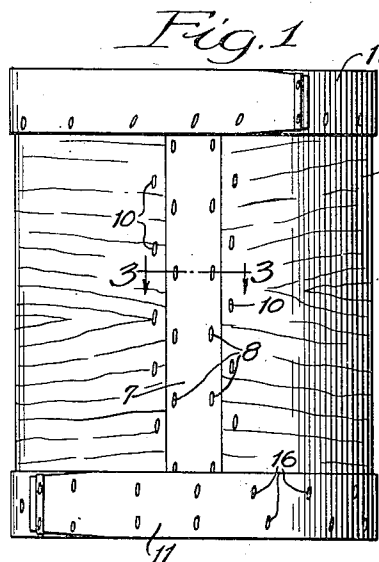
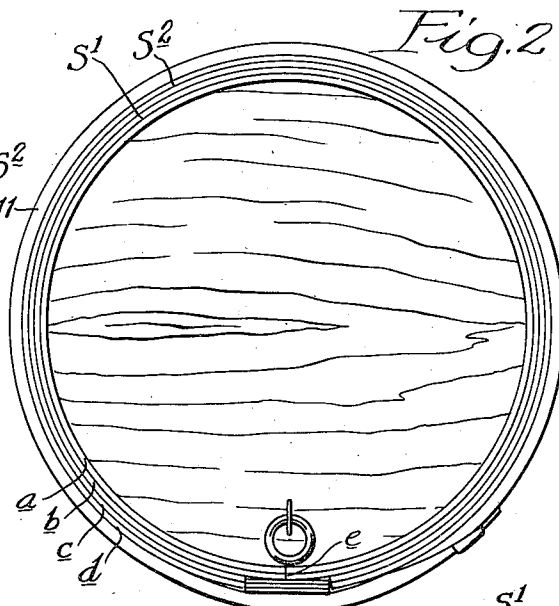
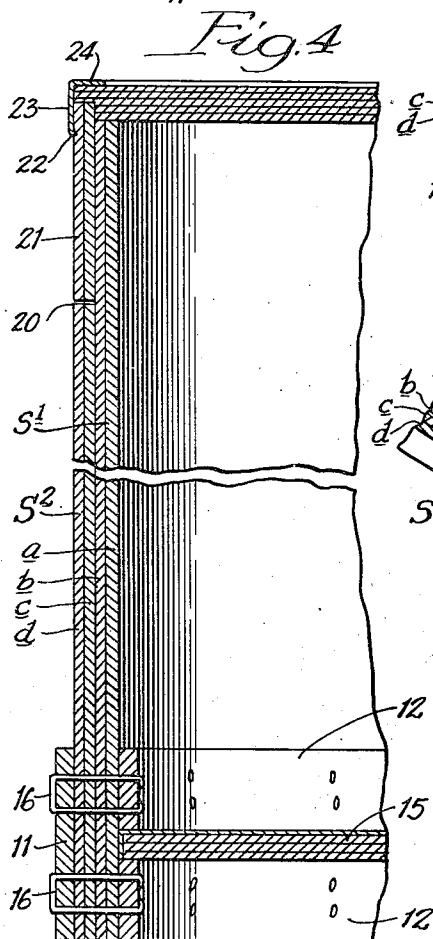
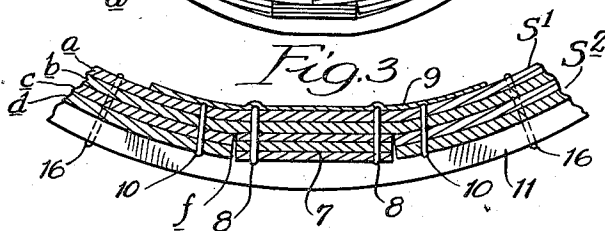
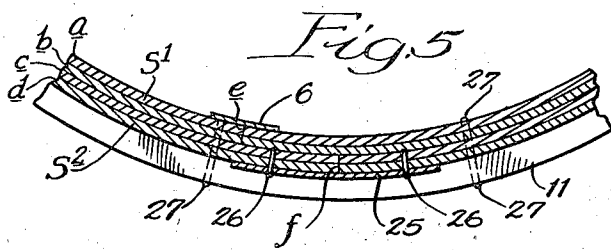
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PLYWOOD BARREL

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PLYWOOD BARREL

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2 Claims. (Cl. 217-72)

The present invention is concerned with certain improvements of a barrel made of plywood or similar material. For its objects it aims to provide a barrel structure which, without increased expense, will have greater strength and capacity to withstand the rigors encountered in shipment and usage. More particularly, the present improvements are directed toward a novel assembly and securement of the plies comprised in the barrel whereby two or more concentric shells are provided, each shell being formed of a plurality of plies immovably united to each other, the several shells, however, being so secured as to have capacity for slight or relative movement.

A barrel of this general description may be variously formed and be equipped with numerous accessory features, all as hereinafter pointed out in connection with the accompanying drawing wherein are shown certain embodiments of my invention in the manner following:

Figure 1 is a view in elevation of the present barrel, looking toward the covered joint between the meeting ends of the outer shell;

Fig. 2 is a top plan view of the barrel showing a removable head or cover fitted in place;

Fig. 3 is an enlarged detail in section taken on line 3-3 of Fig. 1;

Fig. 4 is a fragmentary longitudinal section through the barrel to which is applied a head of modified construction; and

Fig. 5 which is a view similar to Fig. 3 illustrates a slight modification in the construction of the barrel.

In producing the present barrel I form at least two shells S^1 and S^2 , each of circular form and of approximately the same diameter. The shells, as shown, are made of plywood, i. e., the inner shell S^1 consists of two or more sheets a and b of veneer or like material each of which with the aid of pressure is adhered to the adjacent sheet or sheets continuously over every portion of their contacting surfaces, and the outer shell S^2 is similarly formed from two or more like sheets c and d . By employing heat and pressure each plywood board may be bent into circular form thus to remain permanently, or substantially so, thereby producing a shell capable of association with other like shells in the special manner hereinafter described.

The number of plies united into each shell is desirably two, although more may be employed if any advantage is obtainable by so doing. Likewise, two shells so formed are desirably united to produce the present barrel, it being

understood, however, that this number may be increased should there be any advantage in doing so. The thickness of each ply is desirably somewhat less than that which is usual for each of the plies in the ordinary multiply barrel in which the standard wall thickness is about .3" for a three-ply structure, a suggested thickness for the present barrel, if made of four plies, being .25".

When combining one shell with the other in concentric relation therewith the joints e and f formed by the meeting ends of each shell may be variously disposed. If the two shells be made initially of the same diameter (as shown in Figs. 2 and 3), then it will be necessary in fitting the outer shell around the one inside to spread somewhat the adjacent ends which otherwise would ordinarily meet. The joint f thereby produced is relatively open, whereas the joint e in the shell inside is closed. In order to render the barrel so formed tight against leakage of fine particles, a tape or thin strip 6 should desirably be applied over the inner surface of the inner shell at the joint. Within the space which is left by the open joint of the outer shell, a filler strip 7 may be fitted. It is ordinarily good practice to locate the joints remotely from each other, although in the present construction this is not essential.

The tape applied to the inner surface of the inner shell may conveniently be adhered thereto as by a suitable glue or adhesive. The filler strip which is fitted into the open joint of the outer shell, however, should desirably be secured as with the aid of staples 8. Such a strip may itself be of multiply construction with its several plies adhered firmly to each other in the manner already explained. When fitted in place, the fastening staples or nails are desirably driven through the filler strip and through the inner shell as well whereby the filler strip is permanently and immovably secured in place. The clinched ends of the staples or nails may be covered with a paper strip 9 or other suitable protecting sheet material.

A barrel so made comprises two concentric shells, one fitted loosely upon the other, and each made up of a plurality of plies which are continuously adhered to each other over every portion of their contacting surfaces. It is desirable that the shells themselves be interconnected in such a way as to provide for slight relative movement therebetween, should this be necessary. To accomplish this I again utilize staples or nails 10 which may be driven through the walls of the two shells with the projecting ends clinched upon the inner surface of the

inner shell. These fastenings may be located close to each end of the outer shell, the intervening space being occupied by the filler strip as already described, and adjacent the meeting ends of the inner shell. By so proceeding the two shells are joined by a series of spot connections which serve to hold the otherwise unsecured ends of the two shells fixedly in place.

The cylindrical barrel thus formed is fitted at its opposite ends with appropriate hoops 11 and stays 12. The hoops, as shown in Fig. 1, are applied exteriorly and may be so disposed that the upper edge of one and under edge of the other lies flush with the top and with the bottom of the barrel, respectively. Fitted to the inside of the barrel opposite the bottom hoop (see Fig. 4) is a pair of stays in spaced relation so as to accommodate between them the lower head 15. Connecting the hoops and stays are staples or nails 16 having their inner ends clinched upon the stays. It will be noted that the staple fastenings last described supplement those which hold the ends of the two shells in place, all of them together constituting a plurality of spot connections which may give or yield slightly in the event the barrel be subjected to a severe shock or strain.

Referring now to Fig. 4, the barrel therein shown responds to the preceding description except that the upper end of the inner shell extends on beyond the upper end of the outer shell so as to provide upon the barrel exterior an annular shoulder 20 over which may be fitted a hoop 21 whose upper portion is surrounded and gripped by the burred or crimped lower edge 22 of a metallic band 23 which is affixed to the top head or cover 21, the band being provided with an intumed flange 24 adapted to overlie the head for a short distance. It may be convenient to form the head of five united plies of veneer or other appropriate material, those adjacent its lower face being of slightly reduced diameter to provide an annular shoulder against which the hoop 21 may be fitted. In such a head assembly the band serves as a connecting medium by which to retain the hoop as a permanent part thereof. Accordingly, in applying the head the hoop is first fitted over the upper end of the inner shell before the head can be advanced to position, the lower edge of the hoop finally approaching the shoulder 20 whereon it may possibly rest. Such a head construction is practicable when its associated hoop as well as the inner shell is sufficiently thin to flex as required for the fitting of the one over the other, there being a common tendency for cylindrical plywood structures to bulge slightly out of round at the joint regions so that a close interfitting is ordinarily difficult if not impossible.

In Fig. 5 I have shown a construction in which the veneer sheet forming the outer shell is slightly longer than the one used for the inner shell so that the meeting ends of each may abut to form a closed joint. With such a construction, I may secure the ends of the outer shell by affixing over the joint a metallic strip 25 fastened in place with the aid of staples or nails 26 which pass therethrough and through the outer shell, preferably at points relatively close to the joint. The joint of the inner shell may occupy an offset position with respect to that of the outer shell—it may be anywhere from a few degrees off to a point which is 180 degrees opposite. Such an inner shell is desirably secured to the outer shell with the aid of staples or nails

27 which, by preference, pass through both shells and through the hoops 11 which are affixed to the outer face of the outer shell. Between or beyond such hoops the staples or nails will pass through the two shells and nothing else. If desired, a number of such fastenings may be placed close to one of the ends of the inner shell, adjacent its joint *e*, as shown in Fig. 5. Over the joint may be adhered a tape or other strip 6 by which to provide against leakage of material therethrough.

A loaded barrel, when moved or subjected to usual conditions of service, must often withstand sudden and severe shocks and strains of many kinds. If the barrel be formed of two or more plies which are interconnected continuously over their contacting surfaces by an adhesive, in accordance with usual practice, any shock is absorbed at the point of impact, and in consequence a fracture is liable to take place. To withstand as much as possible such a contingency it is customary to build up the barrel thickness to about 3" or more.

In the case of a three-ply board which is bent into cylindrical form with the grain of the inner and outer plies extending circumferentially, it is necessary for the inner ply to compress in excess of one inch where the cylinder is, say, 13" in diameter. Since the adhesion between the contacting surfaces of the several plies is more or less continuous, the entire cylindrical structure is maintained under a considerable strain as the result of such bending operation. A noticeable tendency for splitting on the part of the outer ply in particular is always present in such a construction. The barrel structure thus produced from a conventional plywood remains constantly under tension so that in case of sudden shock a rupture is liable to take place.

In my improved barrel, the several plies are of under-size thickness so as to retain greater flexibility. It is preferable that the grain of the inner ply of each shell extend lengthwise thereof, and that the veneers used for such plies be rotary-cut from the tree, thus preserving the original tendency of the wood to maintain its curvature. When associated with an outer ply whose grain may extend transversely to that of the inner ply, the fibers of the inner ply will compress easily, as required when reaching the curved form of the shell. There is accordingly a minimum of strain in the completed shell, due to the fact that internal resistance is largely eliminated.

In the completed barrel of this invention, each shell is relatively flexible and is free to "work" slightly with respect to the others. This capacity for slight relative movement is sufficient to distribute throughout the entire barrel structure any strain or shock which otherwise might produce a break in the container. Damage, if sustained, may be confined to the outer shell, and with the inner shell still intact the container is still serviceable. I have also ascertained that the strength of a container made of two shells each comprising two plies, and each lighter because the plies are thinner, is greater than a single shell container of greater thickness, made up of three or four plies united in the usual way. All these features of advantage contribute to the durability and strength of the present barrel.

The outer shell may continue for the full length of the barrel, as indicated in Fig. 1, or it may extend for a lesser distance, as suggested in Fig. 4. In the case of a cover with a depending hoop, as shown in Fig. 4, the hoop itself

serves as an outer shell to protect the other shell which lies to the inside thereof. In whatever form the barrel may take, there is the ever-present combination of two or more flexible shells, each made up of a plurality of thin plies which over every portion of their contacting surfaces are united to the adjacent plies, the shells themselves being interfitted and/or interconnected for relative movement. More than usual strength is achieved, not by building up the wall thickness through the union of many plies, but rather by connecting for relative movement two or more shells having a total thickness which is less than that of the usual rigid walls of a plywood container, each shell being itself flexible so as to accommodate itself to the other whereby to better distribute and neutralize shocks proceeding from impacts upon the exterior of the barrel.

I claim:

1. A barrel in which is comprised a flexible cylindrical shell formed of a plurality of plies, each contacting and adhered immovably to the one adjacent continuously of every portion of their opposed surfaces, a second flexible cylindrical shell also formed of a plurality of plies each contacting and adhered immovably to the one adjacent continuously of every portion of their opposed surfaces, the two shells being of approximately the same peripheral length and the ends of the inner shell being in contacting relationship and the ends of the outer shell being spaced and positioned adjacent the contacting ends of the inner shell, the exterior surface of one shell and the interior surface of the other shell being smooth and each conformable to the other whereby when the shells are interfitted one within the other the confronting smooth surfaces of the two shells will be in substantial continuous and mutual supporting engagement throughout

out their entire opposed areas, means connecting said shells together peripherally at the ends of the barrel, and between the ends of the barrel over a limited area at one side only thereof, said limited area being the end contacting portions of the shells, the contacting unconnected areas of the shells having a sliding engagement with each other, said securing means extending through both shells and laterally of the barrel, and a filler strip fitted in the space between the ends of the outer shell.

2. A barrel in which is comprised inner and outer cylindrical shells, each formed of a plurality of plies, each ply contacting and adhered immovably to the one adjacent continuously over every portion of their opposed surfaces and the two shells being loosely interfitted one within the other with their terminal portions located at the same side of the barrel and the terminal portions of the inner shell being secured only to the terminal portions of the outer shell within a limited area between the ends of the barrel, and means connecting said shells together peripherally at the ends of the barrel, the exterior surface of the inner shell and the interior surface of the outer shell being smooth and each conformable to the other and the smooth confronting surfaces of the two shells being in substantially continuous mutual supporting and unconnected engagement throughout their opposed areas except at said limited secured terminal areas and at said ends of the barrel, the contacting unconnected areas of the shells being free for slight relative sliding movement and having a sliding engagement with each other so that shocks to the outer shell will be yieldably and slidably received and resisted by the inner shell and injury to the barrel reduced to a minimum.

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