

June 9, 1942.

W. V. ROBERTS

2,285,873

SHIPPING CONTAINER

Filed Oct. 10, 1938

3 Sheets-Sheet 1

Fig. 2.

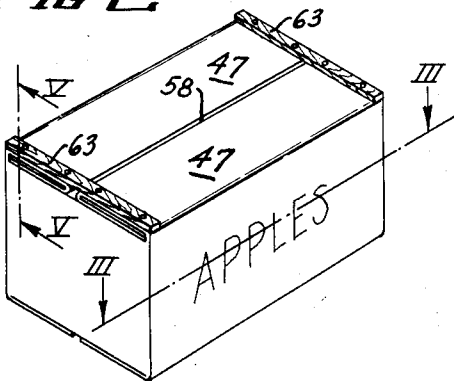


Fig. 1.

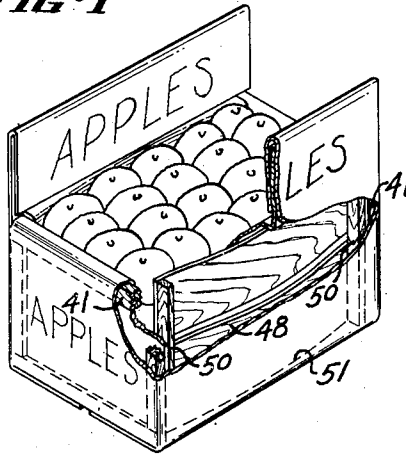


Fig. 5.

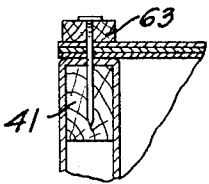


Fig. 3.

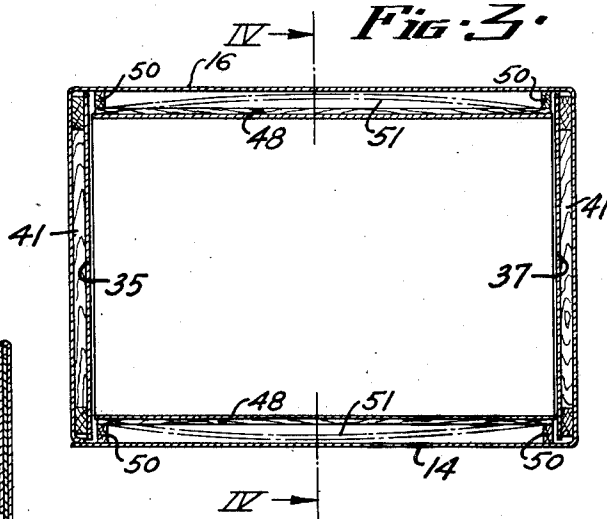
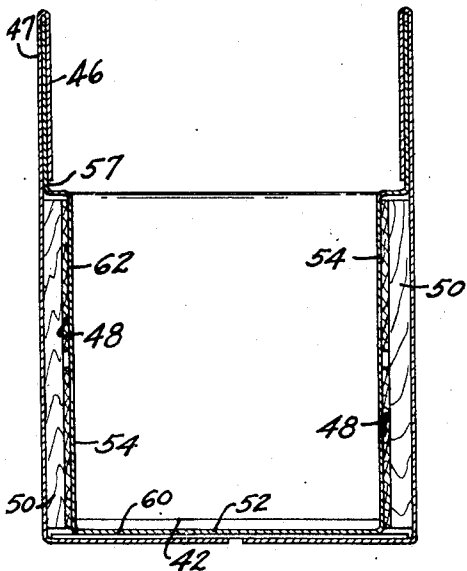


Fig. 4.

INVENTOR.

WILLIAM V. ROBERTS
BY *A. Graham Owen*

ATTORNEY.

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Fig. 7.

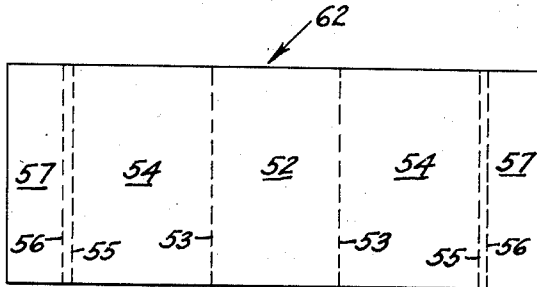


Fig. 6.

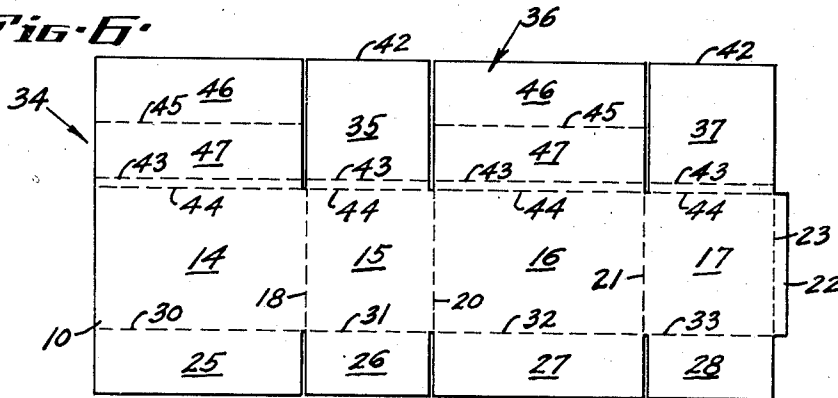


Fig. 7-A.

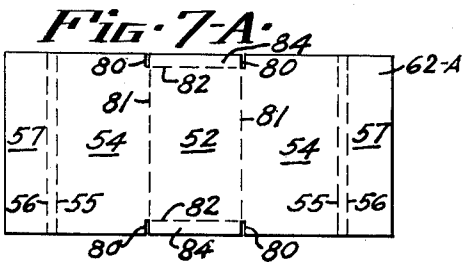
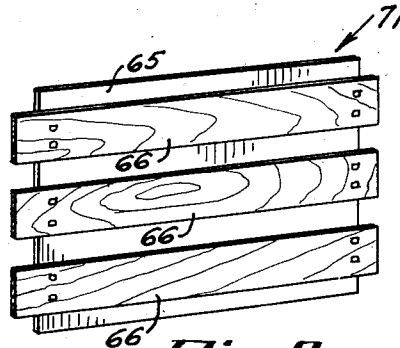
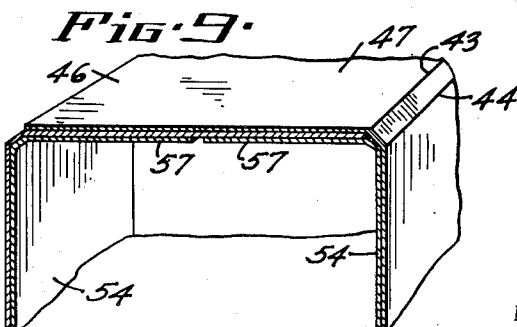


Fig. 9.



INVENTOR.
WILLIAM V. ROBERTS
BY *A. Graham Allen*
ATTORNEY.

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W. V. ROBERTS

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Fig. 10.

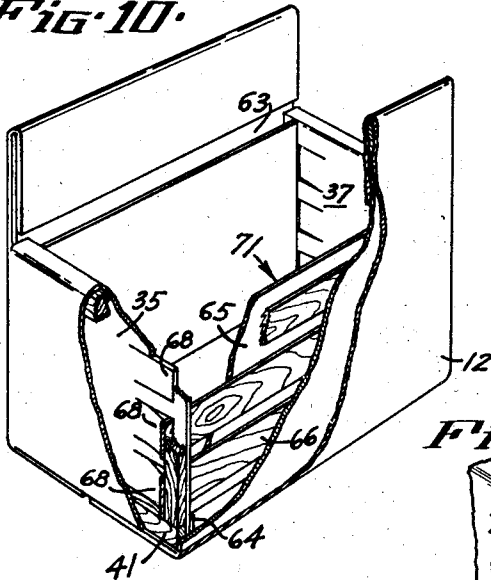


Fig. 11.

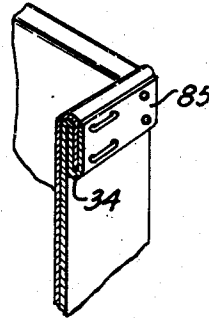


Fig. 11-A.

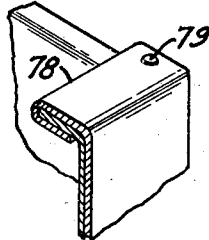
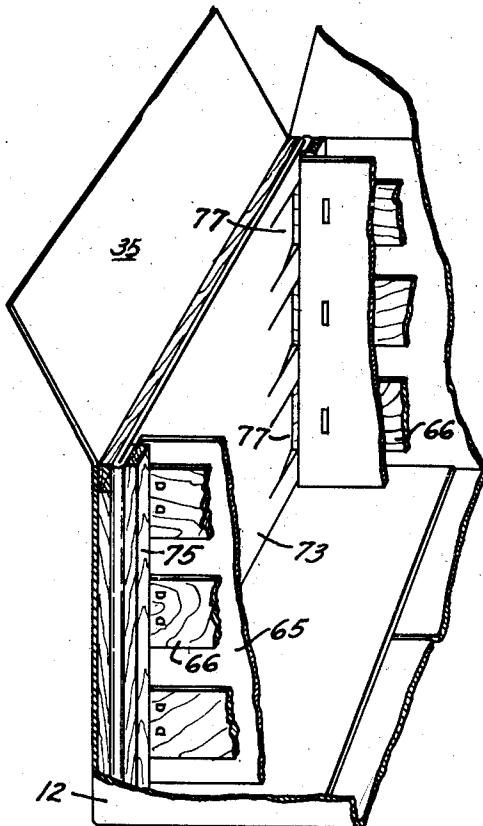


Fig. 12.

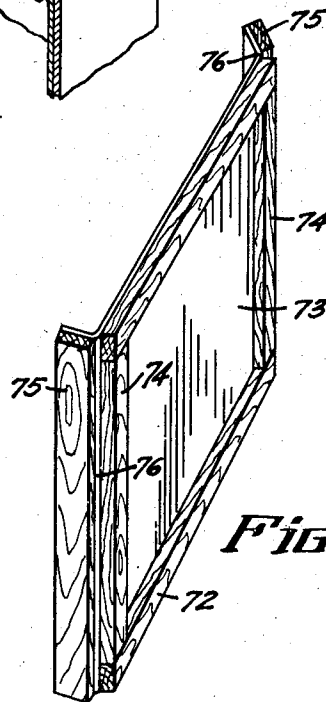


Fig. 13.

INVENTOR.
WILLIAM V. ROBERTS
BY *A. Durham Owen*
ATTORNEY.

UNITED STATES PATENT OFFICE

2,285,873

SHIPPING CONTAINER

William V. Roberts, Oakland, Calif.

Application October 10, 1938, Serial No. 234,117

11 Claims. (Cl. 229—23)

My invention relates to improvements in boxes made from fiberboard and like materials, and particularly to means for accommodating, internally, changes in the volume of the contents.

One of the important uses to which my invention is being put is in connection with the boxing and shipment of apples. It is equally satisfactory for use in packing other fruits such as oranges, pears, and melons, and can be used in packing any equivalent product which is subject to shrinkage between the time of packing and the time of reaching the consumer. It is desirable that the container be adapted to changes in the volume of the fruit so that after the usual shrinkage has occurred the contents will not be loose in the box, which might give a false indication to the consumer of short-weighting. This trouble frequently arises in connection with the wooden boxes used in packing apples and similar fruit. The top and bottom are bowed outwardly at the time the boxes are filled to accommodate a full pack. Since the lid is nailed in an arched position, and retains this arch, even after the fruit shrinks, the contents are too loosely held. Other difficulties are experienced in stacking boxes having curved and irregular top and bottom surfaces; sometimes injury results from direct contact of the contents with the hard or rough wood.

My invention overcomes these difficulties by providing inner movable auxiliary sides adapted to support the fruit resiliently and to adjust automatically to the space left as shrinkage takes place.

It is thus an object of my invention to provide a box structure wherein, as shrinkage occurs, the sides will close in and maintain the contents snugly nested; another object is to provide a fiberboard shipping carton employing wood or other rigid strengthening members, but having no wood surfaces exposed for contact with the contents; still another object is to provide a fiberboard shipping carton having wooden strengthening members extending between the ends.

Further objects are to provide a shipping carton for commodities subject to shrinkage in the container so arranged that volume changes within the container do not interfere with the outer flat surfaces essential to stacking one box on another; to provide a container for material subject to volume changes in which tightly packed material will remain so until the container is opened; to provide a container having resilient means for cushioning the contents when sub-

jected to vibration and jolting during shipment; to provide a fiberboard container with a top which can be closed over a pack extending above the sides of the container without bending out of a flat plane; and to provide a novel form of liner adapted to hold strengthening and supporting members in place in the container.

Other objects of my invention are to provide a box construction having great strength and rigidity and employing strengthening members which may be assembled in the outer box shell without employing nails or adhesive; to provide a container having display spaces for printed matter visible when the top flaps are opened, so arranged that the inside and outside printing may be done by a single operation; and to form the box and associated elements in such a way as to utilize the material most efficiently and with the least waste.

These and other objects may be preferably accomplished in the manner set forth below, but the invention lends itself to embodiment in structures varying therefrom in details. It is to be understood that particular forms shown are set forth for the purpose of explaining the invention, and not with any idea of limiting the invention beyond the requirements of the claims.

In the drawings:

Fig. 1 is a view in perspective showing one form of the invention with the top open and one side of the box cut away to show the resilient side construction and a fragment of the liner;

Fig. 2 is a perspective view of the box when closed;

Fig. 3 is a plan view in cross section of the box taken on the line III—III of Fig. 2;

Fig. 4 is an end view in cross section taken on line IV—IV of Fig. 3;

Fig. 5 is a cross-sectional fragmentary view taken on the line V—V of Fig. 2;

Fig. 6 is a plan view of the blank from which the box is formed;

Fig. 7 is a plan view of one form of insert;

Fig. 7—A is a plan view of a modified form of insert;

Fig. 8 is a perspective view of a modification of the resilient side member;

Fig. 9 is a fragmentary view in perspective showing an alternative method of closing the top;

Fig. 10 is a view in perspective, with one corner broken away, showing a modified form of the invention;

Fig. 11 is a fragmentary view in perspective

showing an alternative construction for the top edge of the box shown in Fig. 10;

Fig. 11—A shows another modification of the top edge of the box;

Fig. 12 is a fragmentary view in perspective of a modification of the end structure of the box; and

Fig. 13 is a perspective view of the end member insert used in the modification shown in Fig. 12.

The box proper is formed from a blank shaped as shown in Fig. 6. Rectangular side and end sections 14, 15, 16 and 17 in sequence are divided from each other by score marks 18, 20 and 21. A tab 22 is formed on the end of side section 17 and is scored at 23. When the blank is folded at right angles on the score marks 18, 20, 21 and 23, tab 22 will overlap side section 14 and may be secured thereto by stapling or other conventional means.

The base of the box comprises rectangular bottom sections 25, 26, 27 and 28, formed integral with the side and end sections 14—17, and separated from each other at their adjacent edges. These bottom sections are marked off from the side and end sections by score marks 30, 31, 32 and 33, respectively, along which they are folded to complete the bottom closure. Thus far the structure is similar to conventional types of paperboard boxes.

The top sections of the box, however, are made longer than in such conventional designs. Top sections 34—37, inclusive, are formed as extensions of the side and end sections 14—17, respectively, but are marked off therefrom by double score marks 43 and 44. These score marks are separated just enough so that the top end sections 35 and 37 may be folded down into the box to enclose end braces 41 snugly: sections 35 and 37 being dimensioned to extend to the bottom of the box. While I have shown the end braces 41 as flat rectangular wooden frames, it is obvious that they may take any other convenient form.

The top sections 34 and 36, extending from side sections 14 and 16 respectively, are scored centrally at 45, to define inner and outer halves, and are so dimensioned that when the outer halves 46 are bent over on the inner halves 47, a double thickness top closure is produced for the box which will leave a ventilating gap 53 (Fig. 2) when closed down on the double scorings 43 and 44. The gap 53 may vary in width, depending on the height of fruit packed in the box. I have found the combination of double scores 43 and 44 and the variable width gap 53 to be a distinct advantage in forming a tight closure over packs of different size without causing the top and sides to bulge so as to interfere with stacking the boxes in stable piles.

Resilient side members 48 are placed in the box after folding the top end sections 35 and 37 over the end braces 41, the sections 35 and 37 being of such size that their upper edges 42 substantially cover the braces. Side members 48 may be conveniently formed of thin wooden slats, and are secured at each end to cleats 50, which maintain the proper clearance from the side walls 14 and 16 of the box.

A liner 62 is placed within the box, covering the bottom, the side members, 48, and extending upwardly past the top of sides 14 and 16. The liner may be cut from fiberboard or similar stock, in the rectangular form shown in Fig. 7, and may be scored to divide a bottom portion 52 from side portions 54 along lines 53. Side portions 54

are separated from top portions 57 by double scoring along lines 55 and 56. These scorings are so placed that when the liner is in position, the portions between them will cover the space between the resilient sides 48 and the box sides 14 and 16, and the top portions 57 may extend between the outer and inner halves 46 and 47 of the box top sections 34 and 36, which are folded together and fastened down by suitable cleats 63.

Additional strength can be obtained by cutting the liner blank so that the "grain" lies normal to that of the box proper.

The resilient side walls 48 permit the structure to adapt itself by internal changes to shrinkage. When the fruit is packed, the walls 48 bulge outwardly into the position indicated by dotted lines 51 in Figs. 1 and 3. As the fruit shrinks, the resilience of the walls 48 will cause them to maintain an inward pressure so that the contents are at all times held gently but firmly in position. Since the positional changes of the resilient walls do not cause the outer walls of the box to bow or bulge, and since the double scorings 55 and 56 permit the top to be closed smoothly, the box presents flat surfaces on every side, and can be stacked readily in stable piles.

It will be seen that the construction is such that the respective parts of the completed container keep their proper position without extensive use of nails or other fasteners. The end braces are held in place by the infolded flaps 35, 37, which in turn are held by the ends of the resilient sides, and the liner is secured by the top halves 46 and 47.

It will also be seen from Figs. 1 and 6 that an additional feature is that advertisements may be printed in position to be seen when the box is open, as well as when closed, in a single operation.

In Figs. 7—A, 8 and 10 a modification is shown in which unitary resilient side walls are separated from the outer walls without using cleats 50. The unitary walls 71 each comprise a fiberboard liner section 65, to which are stapled several narrow resilient strips 66, extending beyond each end of the liner section 65, and longer than the inside length of the box. Tabs 68 may be cut in the folded down top sections 35 and 37 that when the sides are inserted in the box 12, the ends of strips 66 may force them back. This permits the strip ends to extend through sections 35 and 37 to engage brace 41, which then acts as a separator, while the tabs press against and retain the resilient side walls 71 in place.

The liner 62—A, shown in Fig. 7—A, differs from that of Fig. 7 by being lengthened to extend the full distance between end walls 15 and 17. The bottom portion 52 is transversely scored at 82 to define tabs 84, and cuts 80 are made to permit the tabs to fold along the scoring.

When the box is being assembled, the liner 63 is inserted before the end braces 41, with tabs 84 bent up. Braces 41 are then put in place, the end sections 35 and 37 folded down over them, and tabs 84 allowed to press against and hold them in position. Finally, the wall sections 71 are inserted, the strips 66 are engaged with tabs 68, the top halves 46 and 47 of the box are folded over the top portions 57 of the liner, and the box is ready for use.

Another modification is shown in Figs. 12 and 13, wherein the end sections 35 and 37 are not folded down into the box, but are used as part

of the top closure. End support is provided by strengthening a liner section 73 with horizontal brace members 72 and vertical brace members 74. Liner section 73 extends beyond braces 74, and has attached thereto additional end braces 75, which may be folded back on the liner, acting as a hinge 76. Tabs 77, shown only in Fig. 12, may be cut in the liner section 73, and the ends of strips 66 forced therethrough when it is desired to lock the sides in place. End braces 75 then provide lateral support for the resilient side walls. It is preferred that the end braces be left floating. The box 12 has been shown in Fig. 12 without the additional liner 63 for the sake of clarity. In use, it is inserted as described above in connection with Fig. 10.

Fig. 9 shows a modification of Fig. 10 particularly suited for use where a tight seal is desired. Here the inner and outer top halves 46 and 47 are not folded back on each other, but are folded flat over the top of the contents and the liner 57 so that there is no ventilating aperture, as in Fig. 1. Suitable fastening means may be used, as glue or staples, for example, and the double scoring 43 and 44 provides, as in the other embodiments, means for adjusting the cover to the height of the pack.

Additional embodiments are shown in Figs. 11 and 11—A, in which the top is narrowed to adapt the container to "open box" use. In Fig. 11, the top section 34 is narrowed, folded over a narrowed portion 57 of liner 62, bent outward and downward, and nailed, stapled, or otherwise secured to form a rim 85 along the top of side sections 14 and 16.

In Fig. 11—A the construction differs in that the narrowed top sections are folded inwardly and held at right angles to the sides by nails 79 driven into the end braces to form a narrow rim 78. Since these forms do not have lids, there is no necessity for using resilient inner sides to adjust for changes in the volume of fruit in addition to the resilient box walls themselves, and they are omitted.

The improved box forms set forth herein have been described with particular reference to the packing of apples and similar fruit, but it is to be understood that the principles are equally applicable to containers for any material subject to considerable changes of volume after packing.

The resilient side walls permit tight packing of material subject to shrinkage, while keeping the pack tight as the shrinkage occurs. The exposed sides retain their flat condition even when the box is filled completely, so that the boxes can always be stacked in steady piles.

Economy is secured by the use of less expensive bracing material, by so forming the box blanks as to waste a minimum of material, by making the parts self-sustaining in their respective positions with as little use of nails or other fasteners as possible, and by so forming the blank that external and internal display advertising may be printed in one operation.

It will be understood that other materials may be used, and variations in the structural details made without departing from the principles of my invention, as set forth in the appended claims.

I claim:

1. A container having sides, ends, and a bottom; extensions on said sides; end braces adjacent said ends; means for covering said end braces; resilient auxiliary side members; and means for covering said side members, said last named covering means including portions ex-

tending above said side members and engaging said side extensions to form top members for said container; both said side extensions and said covering means portions being connected to their respective elements by a double score line hinge to permit adjustable positioning of said top members.

2. In a rectangular container having sides, ends, and a bottom; end braces placed therein; end extensions arranged to fold over and cover said braces; resilient auxiliary sides within said container; a liner positioned therein to cover said bottom and auxiliary sides and to extend therebeyond; side extensions formed on said container sides and scored to enable said extensions to enfold the extending portions of said liner to form three layer top sections; and means for maintaining said top sections in a closed position at the top of said container.

3. In a rectangular container having sides, ends and a bottom; end braces placed therein; end extensions arranged to fold over and cover said braces; resilient auxiliary sides within said container; a liner positioned therein to cover said bottom and auxiliary sides and to extend therebeyond; side extensions formed on said container sides and foldable over the extending portions of said liner to form three-layer top sections; said liner and side extensions being connected by a flexible hinge for adjusting the position of said top sections; and means for maintaining said top sections fixed in desired position.

4. A rectangular container having sides, ends, and a bottom; end braces therein; end extensions arranged to fold over and cover said braces; auxiliary sides within said container comprising resilient sections and rigid spacing elements; a liner arranged to cover said bottom and auxiliary sides, to overlie said auxiliary sides, and to extend therebeyond into cooperation with extensions formed on said container sides to form top sections; means for closing said top sections substantially flat over varying heights of contents within said container; and means for maintaining said top sections fixed in closed position.

5. A rectangular container having sides, ends, and a bottom; end braces therein adjacent said ends; end extensions arranged to fold over and retain said braces in position; auxiliary sides within said container comprising resilient portions spaced from said container sides by separators; a liner arranged to cover said bottom and said auxiliary sides, to overlie the space separating said resilient portions from said container sides, and to extend therebeyond; extensions formed on said container sides and scored to enable said extensions to be folded over said extending liner portions and to form therewith top sections for said container; double scorings in said top sections adjacent said sides to constitute a flexible hinge and impart adjustability to said top sections; and means for maintaining said top sections fixed in a closed position.

6. In a container, the combination of a blank formed into an outer casing having bottom, sides, ends and extensions on the sides and ends and with the grain in the material running in one direction in the sides; a liner for said casing, scored to form portions to overlie the bottom, sides, and part of the side extensions of the casing, the grain in the material of the liner running in a direction other than parallel to the grain in the adjacent casing portions; a reinforcement set adjacent each end of the casing and enfolded within said casing end, the exten-

sions on the liner extending substantially halfway over the extensions of the sides so that the latter may be folded inwardly, enclosing said liner extensions to form three-ply top sections and being arranged to be secured to the casing end reinforcements by fastening means, and resilient side members disposed between said outer casing and liner sides.

7. In a container, the combination of a blank formed into an outer casing having bottom, sides, ends and extensions on the sides and ends and with the grain in the material running lengthwise in the sides; a liner for said casing, scored to form portions to overlie the bottom, sides and side extensions of the casing; a reinforcement set adjacent each end of the casing and enfolded within said casing end extensions; the extensions on the liner covering substantially half of the extensions of the sides, and the uncovered side extension portions being folded back thereon for enclosing said liner extensions to form a three-ply top, said top being arranged to have the ends thereof secured to said casing end reinforcements, and resilient auxiliary sides disposed between said sides and said liner.

8. In a fabricated container, the combination of an outer casing having bottom, sides, and ends, and extensions on the ends adapted to be bent inwardly into a spaced position substantially parallel with the ends, a reinforcing member fitted against each of said ends and enclosed within said space, and a liner fitted to said container having an adjacent portion thereof in engagement with one of said inwardly directed extensions, and having a bent up element resiliently

engaging the other of said inwardly bent extensions to secure said reinforcing members against displacement.

9. A container comprising a pair of opposing end walls and a pair of opposing side walls; a tab extension at the upper edge of each of one pair of said opposing walls, each of said tab extensions being foldable back upon itself; and a liner nesting between the opposing walls with the tab extensions thereon and having portions thereof extendable between the folds of said tab extensions.

10. A container comprising a pair of opposing end walls and a pair of opposing side walls; a tab extension at the upper edge of each of one pair of said opposing walls, each of said tab extensions being foldable back upon itself; a liner nesting between the opposing walls with the tab extensions thereon and having portions thereof extendable between the folds of said tab extensions; and auxiliary resilient members between said liner and said walls having the tab extensions thereon, and retained in position therebetween.

11. A container comprising a pair of opposing end walls and a pair of opposing side walls; a tab extension at the upper edge of each of one pair of said opposing walls; and a liner nesting between the opposing walls with the tab extensions thereon and having extensions extendable above the upper edges of said walls, said tab extensions being each folded back upon itself with a liner extension between the folds to form an upper portion of said container.

WILLIAM V. ROBERTS.