

July 15, 1947.

J. C. LANG

2,423,942

COLLAPSIBLE FIBERBOARD CONTAINER

Filed June 7, 1943

2 Sheets-Sheet 1

Fig. 1.

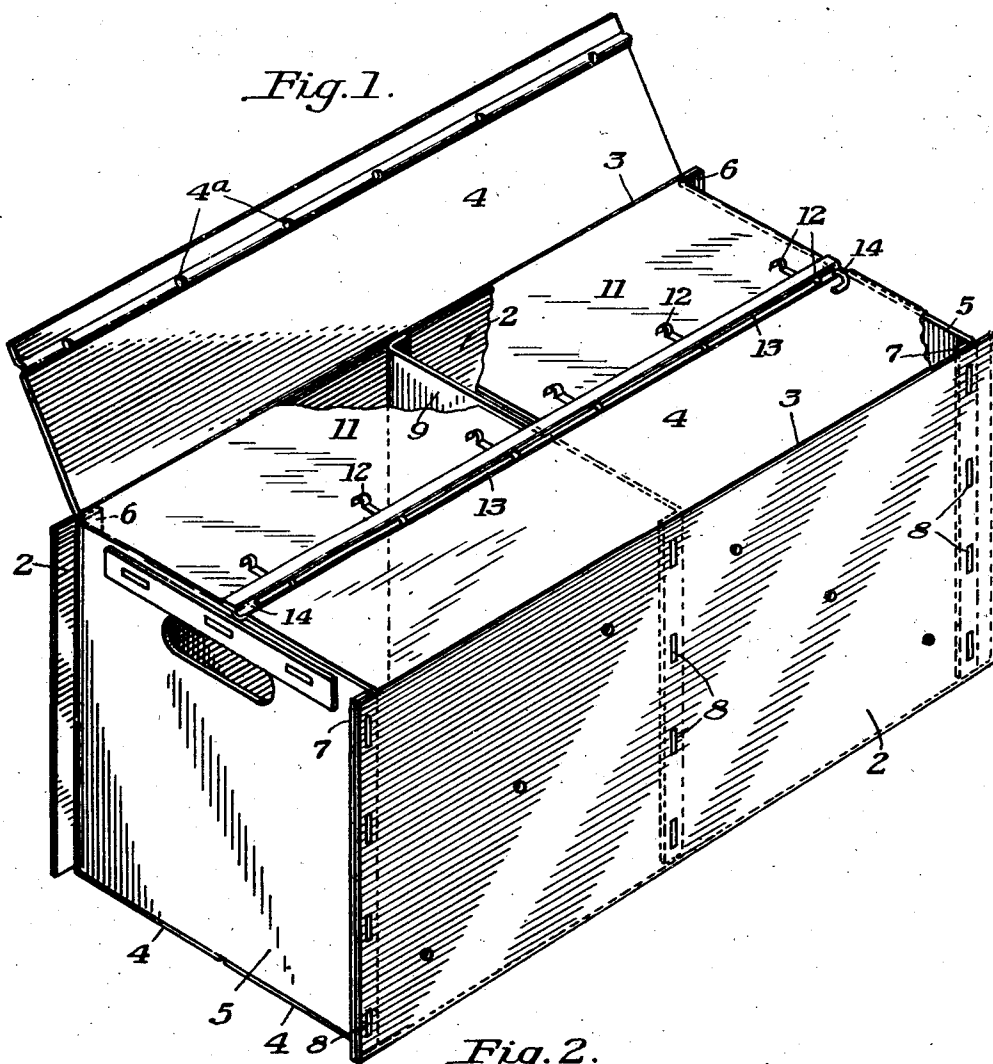
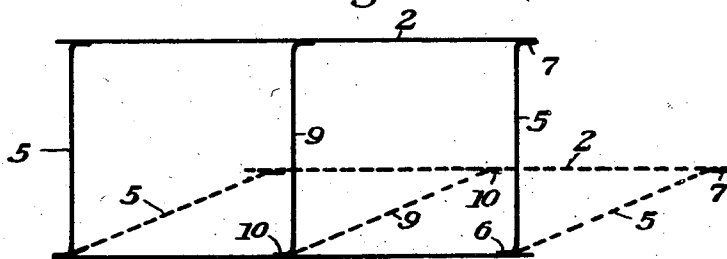


Fig. 2.



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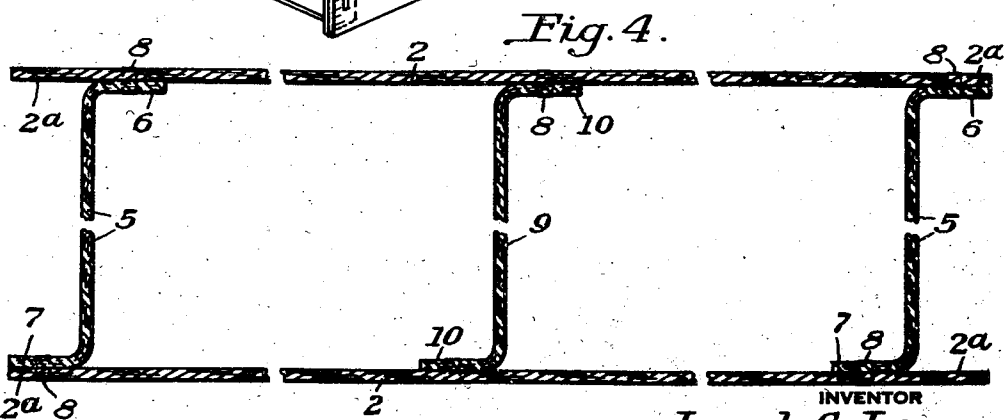
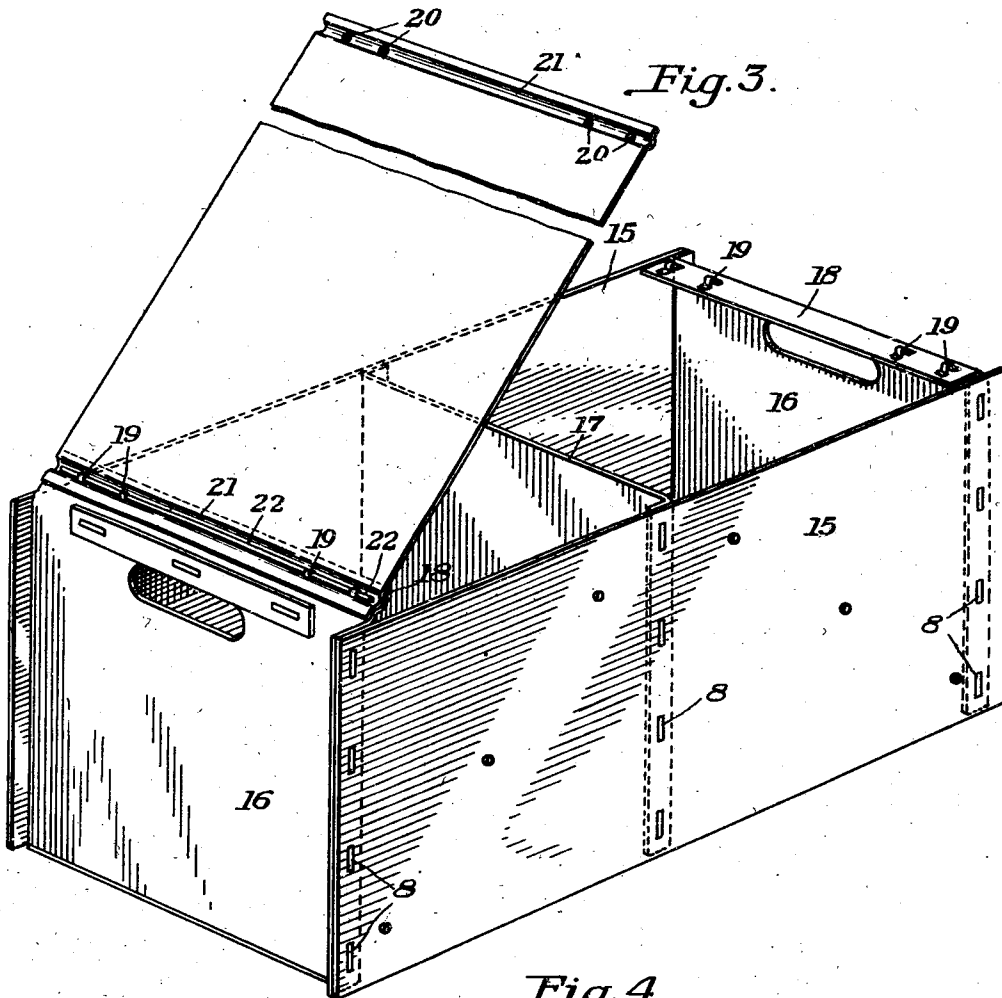
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COLLAPSIBLE FIBERBOARD CONTAINER

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2 Sheets-Sheet 2



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COLLAPSIBLE FIBERBOARD CONTAINER

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1 Claim. (Cl. 229—23)

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This invention is for a box or crate and relates particularly to a folding box or crate especially designed to be constructed of fiberboard or other relatively stiff but bendable material.

Various boxes and crates made of cardboard, fiberboard, and like materials have heretofore been devised, and many of them are designed as foldable or collapsible containers to be used a number of times. In such containers a crease or fold is made in the fiberboard or other material from which the crate or box is formed, along the line or corner at which the folding takes place, this folding or creasing of the sheet material breaking the rigidity of the sheet material and forming, in effect, a hinge. The life of these containers is limited by the flexing of the material constituting the hinge. In the usual box or crate the two end walls are at right angles to the two side walls when the box is open and in condition to hold its intended contents. When it folds, two corners open out flat from the 90° angle, that is, back to the original plane of the sheet material. The other two corners, however, fold around from a 90° angle to a 180° angle from the plane of the original sheet, thus breaking the paper or fiber in the crease or fold, and at the same time the fibers in the crease or fold are stretched. After a few times, the fold weakens and the box is unsuitable for further use.

According to my invention, there is provided a corner construction in which the material in any corner is not flexed or folded beyond 90°, and the fiberboard, cardboard, or other material at every corner opens out flat to its original plane when the box is "knocked down." My invention, moreover, provides a collapsible or folding box of improved design, which is of stronger construction than boxes of this character as generally made, so as to be better adapted to repeated use and the abuse of much handling.

My invention may be readily understood by reference to the accompanying drawings in which:

Figure 1 is a perspective view of one form of box embodying my invention;

Figure 2 is a schematic view showing the manner in which the box folds;

Figure 3 is a view similar to Figure 1 of a modified form; and

Figure 4 is a transverse horizontal section, which may be a section of either the form shown in Figure 1 or the form shown in Figure 3.

Referring to Figures 1, 2, and 4, the box, which is formed of fiberboard, cardboard, laminated material, or other appropriate composition material, has two side walls 2. Along the top edge

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of each side wall is a fold line 3, there being a flap or lift 4 attached to the top edge of each side wall, these lifts being one-half the width of the box. In Figure 1, one lift 4 is opened out and the other is folded in. The bottom of the box is constructed the same as the top, and will not therefore be described in detail.

The two side walls are connected by two end walls 5. Each end wall has a fold at each of the two vertical edges thereof, the material at one edge folding out and at the other edge folding in. This is clearly seen in Figure 4, where the edge portions 6 turn to the left and the edge portions 7 at the opposite ends turn toward the right.

The end walls are set in from the vertical edges of the side walls, so that the outwardly turned edges may bear flat against and be attached to the inner faces of the side walls. I prefer to use staples to secure the parts together, and staples are indicated at 8. Likewise those folded edges of the end walls which are inside the cavity of the box are also secured by staples to the inner faces of the side wall members. The arrangement causes the end portions 2a of the side wall members to extend beyond the end walls, which is highly desirable from the standpoint of strength and ability to resist rough handling.

For use as an egg crate, fruit box, or other purposes, there may be a transverse partition 9 with reversely turned or folded portions 10, that are stapled or otherwise secured to the side walls of the box.

By reference to Figures 2 and 4 it will be clearly seen that, because of the reverse folds on the ends and partition members, all 90° folds or angles open out to the original plane of the flat sheet material, and the box may fold down flat without tending to break or stretch the fiberboard at any corner fold.

In the construction shown in Figure 1, the end walls 5 have flaps 11 at the top edge thereof, which fold inwardly under the top flaps 4 on the side wall members, and the bottom, of course, is the same.

The flaps 11 have double-lobed staples 12 on the top thereof, one lobe or eye of each staple being at each side of the longitudinal center line of the box in its erect form, and the side flaps 4 have holes 4a therein along the edges thereof. When the side flaps fold in over the end flaps, the folds or eyes of the staples pass through these holes 4a, and a wire 13 may pass through the tops of these eyes to secure the closing of the box. To facilitate the insertion of the wire the fiber box

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may have grooves 14 pressed therein in the flaps 4 in line with the holes 4a.

When the box is folded, the flaps 4 are opened out to the plane of the sides 2, and the end flaps 11 are folded out to the plane of the end walls, permitting the collapse of the box.

The box shown in Figure 3 is more especially designed for an egg-crate. It has side walls 15 connected by end walls 16 with reversely turned ends, and there is a partition 17, also having reversely turned ends. The sides and ends are joined as in Figure 1. Instead of the sides and ends having flaps, as previously described, the end walls only have folded tabs or lips 18, which carry eye-forming staples 19. There is a one-piece top having a series of holes 20 along each end, through which the staple eyes may pass. A depression 21 in the top surface adjacent each end is in line with the holes 20 to receive a wire 22. In Figure 1 one end of the cover is shown attached by its wire, whereas at the other end the wire is removed, showing how the top may be detached to swing the lift up. The bottom may be formed in the same way.

This modification provides a strong, serviceable egg-crate or fruit-box or like container, with a cover (and bottom) that can be turned back or easily removed and which can be easily set up or folded.

Either form of the invention provides a box wherein the fiberboard never has to be turned or "hinged" more than 90° from its original plane. In each form the box is readily adapted to reuse, and in each the corners are well protected.

Various modifications may, of course, be made within the contemplation of my invention and under the scope of the following claim.

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I claim:

A foldable box of the class described formed of fibrous material having stiff side walls and end walls, the end walls having folds at the opposite ends thereof which are reversely turned whereby the fold at one end of each end wall is turned inwardly and that at the other end is turned outwardly of the box, the two end walls have their corresponding folds faced in the same direction, means for fastening the folded portions to the side walls, and flaps pivoted along the top and bottom edges, respectively, of at least one of said walls, all folds of the box opening to substantially a single plane when the box is folded.

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