REUSABLE METAL OR WOODEN COLLAPSIBLE BOX

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1 Claim. (Cl. 220—6)

This invention relates to containers or boxes and, more particularly, has reference to a collapsible container so designed as to be usable to advantage for shipping or storage purposes.

One object of importance is to provide a storage container that will be normally maintained in a flat, compact condition, in which it takes up a very small amount of space. However, in carrying out the invention it is preferred that the container be capable of being opened to a large size, thus to be adapted for holding a substantial amount.

A more specific object is to form the container in a manner such that it can be manufactured at relatively low cost from comparatively inexpensive sheet metal, heavy paperboard, or other readily obtainable, inexpensive materials.

Still another object is to provide a collapsible container as described that will be adapted for re-use an indefinite number of times.

A further object is to incorporate in the container a bottom and top wall construction such that overlapping flanges on the mentioned walls will confine the folded side and end walls of the device when the same is not in use.

Still another object of importance is to provide a collapsible container that will include a novelty designed hinge means facilitating the swift adjustment of the side and end walls between respective extreme positions.

A further object is to provide a collapsible container including novelly designed, inexpensive but strong corner reinforcements, switly applicable to the respective side and end walls.

Yet another object is to provide a collapsible container wherein the corner reinforcements will be formed, in one embodiment of the invention, in a manner to rigidify longitudinally connected sections of each end and side wall, the reinforcing means being further designed to connect sectionally constituted, adjacent side and end walls to each other at the corner defined by the intersection of said walls.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is an exploded perspective view of a collapsible container according to the invention, with the side and end walls in fully collapsed position.

Fig. 2 is a perspective view of the container, with the cover removed and with one of the end walls raised.

Fig. 3 is a perspective view of the completely extended container, one of the corners of the cover being broken away.

Fig. 4 is an enlarged longitudinal sectional view on line 4—4 of Fig. 2.

Fig. 5 is a transverse sectional view on the same scale as Fig. 4, taken on line 5—5 of Fig. 2.

Fig. 6 is a still further enlarged, detail sectional view through one of the hinges on line 6—6 of Fig. 2.

Fig. 7 is a fragmentary, greatly enlarged perspective view of one of the corners of the container, showing the reinforcing means.

Fig. 8 is a transverse sectional view, the scale being enlarged above that of Fig. 7, taken on line 8—8 of Fig. 7.

Fig. 9 is an exploded perspective view of a modified construction.

Fig. 10 is a sectional view on line 10—10 of Fig. 9.

Fig. 11 is a still further enlarged, horizontal sectional view on line 11—11 of Fig. 10, the dotted lines showing the corner reinforcement means before it is applied to the corner of the container.

Referring to the drawings in detail, designated at 10 is a flat bottom wall of the container, integrally formed with an upwardly directed, continuous peripheral flange 12.

Identical, rectangular, wholly flat end walls 14 are hinged to the ends of the bottom wall flange 12. Rectangular side walls 16 are similarly hinged to the sides of flange 12, by hinges 18, formed as tubes of metal or the like (Fig. 6) closed along their sides and loosely positioned through slots 19 formed in flange 12 and in the several walls. Thus, ordinarily, walls 16 are folded flat into a shallow recess defined by flanged bottom wall 10, in overlapping relation (Fig. 2). Walls 14 are then folded into a common plane in which they overlie the walls 16.

In use, the several walls are swung upwardly to a vertical position as shown in Fig. 3. Then, right-angled corner connecting elements 20, each of which is of inverted U-shape in cross section at any location along its angularly related legs, are positioned over the abutting edges of walls 14, 16, at the several corners of the device. This holds the walls in raised positions and provides effective corner bracing.

The cover 22, having a depending flange 24, is now applied as shown in Fig. 3 and the container is ready for use.

Cover 22 is also used when the container is collapsed, cooperating with bottom wall 10 in providing a flat article in which the cover protectively overlies the inwardly folded side and end walls or panels.

The container may be readily knocked down, merely by removing the corner braces 20, to permit the several panels 14, 16, to fall into collapsed conditions within the container bottom.

Figs. 9—11 show a modified construction having a greater capacity than that of the first form.

In this form, each end and side wall is sectionally constructed and there are provided lower end wall sections 26 and lower side wall sections 28, hingedly connected at 30 to the ends and sides of flange 12 of the bottom wall. Upper end and side wall sections 32, 34, respectively, are hinged at 36 to the top edges of the sections 26, 28. All the hinges are in the form of sleeves such as shown at 18, so that ordinarily, each wall is collapsed by folding the sections thereof into face-contacting relation, after which the folded sections are swung down into a shallow bottom portion.

The reverse operation is used to raise the walls.

The corner braces in this form have been generally designated 38 and each extends almost the full distance from the top of the container to the bottom thereof. Each corner brace is of a right-angled cross section at any location along its length and includes the external portion 40 and the internal portion 42.

Referring to Fig. 11, portion 40 is in overlying relation to the outer surface of the associated container.
corner. Portion 42 is in overlying relation to the inner surface of the corner. The portions are internally connected at the upper end of the corner brace by a bight portion 44 which overlies the top edge of the container. Structured out of the material of the respective, angularly related sides of portion 42 are bendable tongues 46, which normally extend straight outwardly from their associated sides or legs of portion 42 as shown in dotted lines in Fig. 11.

In applying the corner brace, it is shifted downwardly to its Fig. 9 or Fig. 10 position. The connection 44 permits springing of the portion 42 outwardly to the dotted line position of Fig. 11 at this time. When, however, the device is in its fully applied position, the tongues 46 are disposed for extension through openings 48 of the portion 40. Further, the tongues extend through horizontal, elongated slot-like apertures 50 formed in the respective side and end walls.

When each tongue has been extended through the associated aperture 50 and opening 48, the inner portion 42 will now be in its full line position of Fig. 11. Now the tongue 46 may be bent into overlying relation to the portion 40. This locates the portions 40, 42 in their full mean position of Fig. 11, connecting them to one another by means that extends directly through the associated end and side walls. The corner brace elements are thus positively connected to the walls, in position rigidifying the sections of each wall against relative swinging movement about their hinges 36 and in position, further, holding all the walls against swinging movement about their hinges 30.

To knock down the box, one need merely return tongues 46 to their normal straight condition, after which the portion 42 is swung outwardly freeing the corner brace for removal and allowing the several wall sections to swing to collapsed positions.

In both forms of the invention, there is a common characteristic wherein the container can be inexpensively formed from light, readily obtainable materials. Further, both forms of the invention are adapted to collapse into substantial flat articles while still being swiftly and easily raised into their use positions shown in Figs. 3 and 9, respectively.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and that various changes and modifications may be made within the scope of the invention as defined in the appended claim.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

A collapsible box for storage and like purposes, comprising a rectangular body having a rectangular flat horizontal base with an upstanding flange at each edge thereof, rectangular side and end walls hinged to the respective flanges and disposable coplanar therewith in upright positions with respect to the flat base to define an open top box-like structure, a rectangular wall extension section secured by hinges to each of the upper free edges of the side and end walls for coplanar extension thereof, brace members, each of said brace members having a double wall structure with inner and outer spaced right angular portions resiliently joined together at one end thereof, each of said side and end walls and the wall sections secured thereto having tongues formed at vertical edges thereof, said brace members being removably mounted on adjacent ones of said side and end walls and wall sections with the ends of the braces fitting on free top ends of the wall sections, said members having apertures receiving said tongues to form a rigid open top box structure, and a flanged rectangular cover adapted to close said box structure by fitting over the top ends of the wall sections, said walls and wall sections all being collapsible onto said base upon removal of said braces, with said cover then fitting on the flanges of the base to enclose said side walls and wall sections between the base and cover.

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