A. L. WARD.

COLLAPSIBLE CONTAINER.

APPLICATION FILED APR. 21, 1917.

1,273,430.

Patented July 23, 1918.

2 SHEETS—SHEET 1.

Fig. 1.

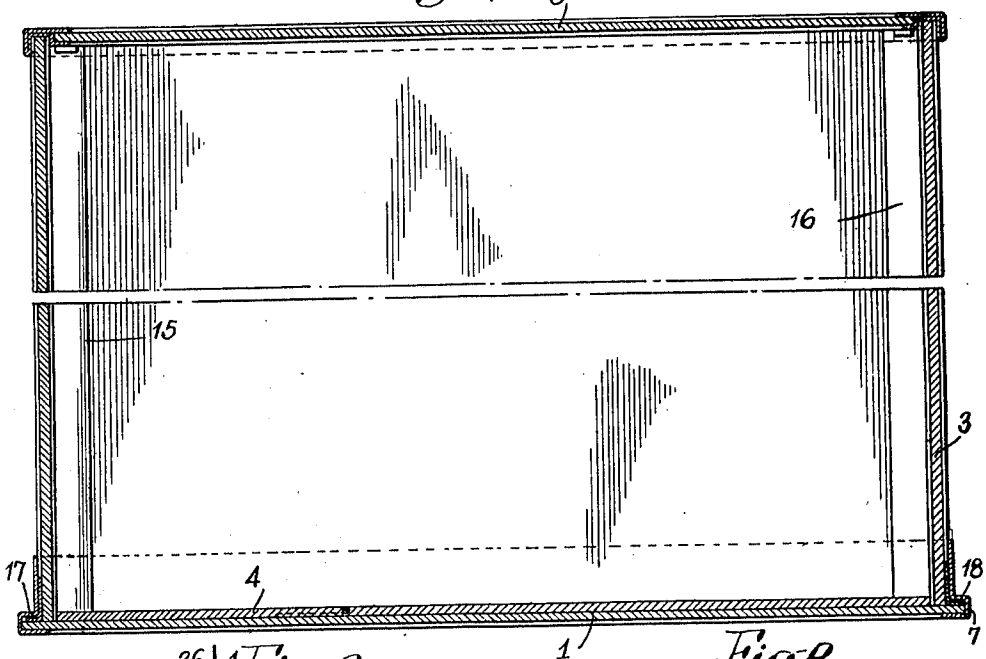


Fig. 2.

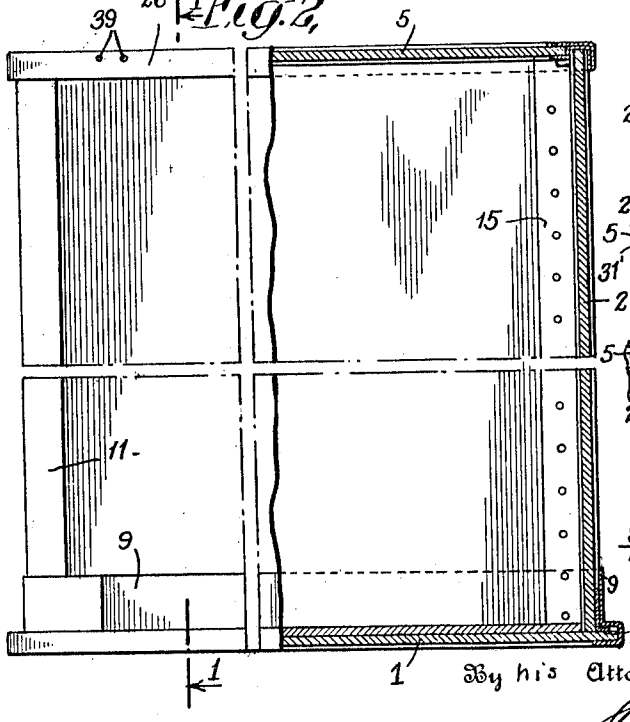


Fig. 8.

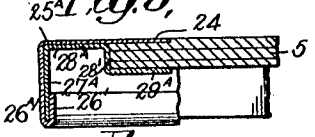


Fig. 9.



Fig. 9a.

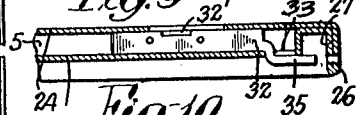
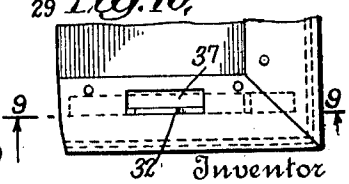


Fig. 10.



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2 SHEETS—SHEET 2.

Fig. 3.

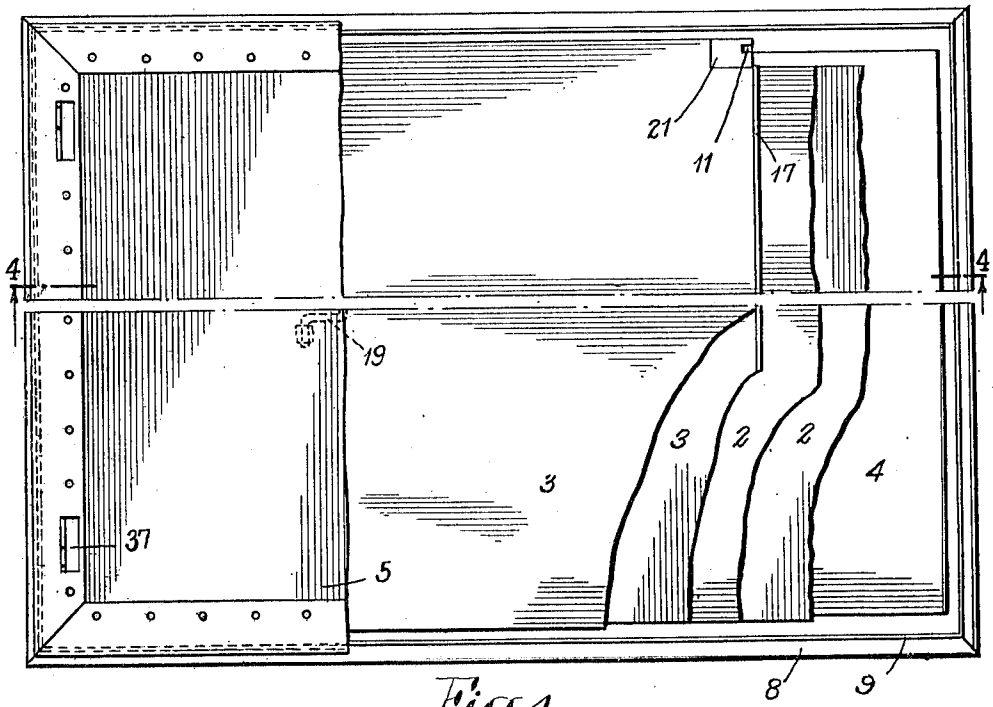


Fig. 4.



Fig. 5.



Fig. 6.

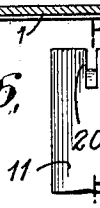
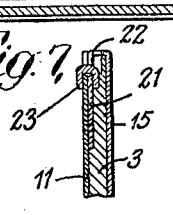


Fig. 7.



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COLLAPSIBLE CONTAINER.

1,273,430. Specification of Letters Patent. Patented July 23, 1918.

Application filed April 21, 1917. Serial No. 163,542.

To all whom it may concern:

Be it known that I, ALEXANDER L. WARD, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Collapsible Containers, of which the following is a specification.

My invention relates to collapsible or knock-down containers or boxes, adapted to be used for packing and shipping various sorts of goods, and is an improvement upon the invention disclosed in my Patent No. 1,205,418, granted November 21, 1916, for collapsible containers. The invention disclosed in my patent referred to is formed of sections preferably of sheet-metal, adapted to be readily set up or knocked down and compactly nested together. By the present invention the various sections are formed of composition board, or other relatively light, strong and cheap material, with flanges required for holding and interlocking the parts in position formed of sheet-metal or the like secured to certain edges of the sections other than the false bottom. With this construction various improved results are attained. The container is considerably lighter and cheaper to produce than a sheet-metal container of the same dimensions made in accordance with my patent referred to, while at the same time remaining strong and rigid. The side and end sections with my improved construction require outwardly extending bottom flanges only, the inwardly extending bottom flanges of the former construction being eliminated. Because of this fact, and because of the thickness of the various sections formed of composition board or the like, it is possible to nest the sections when knocked down in an improved manner. When so nested, with the side and end sections and false bottom contained within the side flanges of the bottom section, and the cover section positioned on the same, the various sections will lie practically flat, one upon the other from top to bottom, without spaces intervening. Because of this arrangement, crushing of the container, when transported in knocked-down form, is practically impossible.

The improved construction also provides a top section, the upper surface of which all lies in the same plane, so that there is no central depression which might collect water, etc. The objects of my invention reside in the improved construction of parts and combinations of elements which will be more particularly described hereinafter.

In order that my invention may be more clearly understood, attention is hereby directed to the accompanying drawings forming part of this application and illustrating certain embodiments thereof. In the drawings Figure 1 represents a vertical longitudinal section taken on line 1—1 of Fig. 2, Fig. 2 represents an end view of the container assembled, certain parts being shown in section, Fig. 3 represents a top plan view of the container in knocked-down or collapsed condition, parts being shown broken away, Fig. 4 is a vertical longitudinal section taken on line 4—4 of Fig. 3, Fig. 5 is a sectional view similar to Fig. 4, showing the various parts in separated position preparatory to nesting the same, Fig. 6 is an enlarged detail elevation of one of the corners of the container, Fig. 7 is a vertical section taken on line 7—7 of Fig. 6, Fig. 8 is an enlarged vertical section taken through an edge of the top section in a modified form, Fig. 9 is a vertical section taken on line 9—9 of Fig. 10, Fig. 9^A is a similar section showing a modified form of bolt and Fig. 10 is an enlarged top plan view of a corner of the container, shown in Fig. 1, illustrating one of the locking devices.

Referring to the drawings, the box or container comprises a bottom section 1, side sections 2, 2, end sections 3, 3, a false bottom section 4 and a top section 5. Bottom section 1 is preferably formed of composition board, or other relatively light and strong material, the body portions of all of the other sections being formed of the same or similar material.

The side flanges of the bottom section are preferably formed of strips of metal which are secured to the under side of the body portion of the bottom section adjacent its four edges, as at 6, Fig. 5, the securing means, of any suitable character, not being shown. These strips and the strips forming the flanges of the other sections may be secured to the compo board by any desired form of securing devices. The strips which are secured at 6 are bent upwardly to extend alongside the edges of the board and for a short distance above the same, after which they are bent inwardly for a distance, as shown at 8, and are then bent upwardly to form vertical flanges 9. The flanges 7 and 8 provide recesses 10 beneath the upwardly

extending flanges 9 for coaction with base flanges on the side and end sections. The strips forming the vertical flanges 9 are rigidly secured together at the corners, preferably by having the side flanges 9 overlap the end flanges 9 a short distance and securing together the overlapping portions as shown in Fig. 2.

The side sections 2, 2 are each provided with vertical side flanges 11, 11 and 12, 12, which are formed of metal strips secured to the outer faces of the members adjacent their vertical edges and bent inwardly past the side edges of the body portion of the sections, as shown. Each side section is also provided with a short outwardly extending bottom flange 13, which is formed by securing a strip of sheet-metal to the outer face of the section adjacent its bottom edge and bending the same outwardly, as shown. Preferably, the bottom ends of the portions 14 of the side flanges 11 and 12 are bent outwardly into alinement with the bottom flanges 13.

The end sections 3, 3 are formed in the same manner as the side sections, except that the vertical side flanges 15 and 16 are secured to the inner faces of the compo board, the outwardly extending bottom flanges 17 and 18 being secured to the outer faces of the board in the same manner as in the side sections.

When the container is set up, the side sections are positioned with their outwardly extending bottom flanges 13 extending into the recesses 10 beneath the side flanges 9 of the bottom section and the outer faces of the sections contacting against flanges 9. The end sections are then positioned inside the side sections with their bottom flanges 17 and 18 extending into the recesses 10 beneath the end vertical flanges 9 of the bottom section. As so mounted, the outer faces of the end sections, adjacent their vertical edges, will contact against the side flanges 11 and 12 of the side sections with the vertical flanges 15 and 16 of the end flanges contacting the inner surfaces of the side sections adjacent their vertical edges. The false bottom section 4 is then lowered within the container and closely fits within the four walls of the same. This false bottom preferably has a handle or lifting device comprising the bail 19 pivoted at its ends to the false bottom section, and adapted, when depressed, to lie within a suitable recess in the board, as indicated in Figs. 1, 4 and 5, so as not to form an obstruction on the upper surface of the section.

When the false bottom is in position, it prevents the side and end sections from moving inwardly and forms a strut member at the bottom to stiffen the container in the horizontal plane of its bottom section. With the construction described, it is not necessary to have inwardly extending bottom flanges on the side and end sections upon which the false bottom rests, as described in my patent referred to. In my present construction, the false bottom section is sufficiently thick to hold the side and end sections in position without resting on any inwardly directed bottom flanges, as in the previous construction.

The top edges of the side and end sections are conveniently secured together by clips. For this purpose the upper edges of the vertical flanges 11 and 12 of the side sections may be slightly notched, as shown at 20. The portions 15′ and 16′ of side flanges 15 and 16 of the end sections, which are secured to the inner faces of the end sections, are extended around the upper edges of the end sections and extend for a short distance down the outer faces of the end sections, as shown at 21 in Fig. 7. The upper portions of these bent portions 21 are slotted, as shown at 22, and recesses formed in the bodies of the end sections in alinement therewith. U-shaped clips 23 are slipped into position through the alined notches 20 and 22 at the four upper corners with the upper portions of the clips within the alined notches, as shown in Figs. 6 and 7.

The cover section 5 is preferably formed as shown in Figs. 1 and 4, with the body of the section formed of compo board or the like extending in a horizontal plane. An edge flange is formed, so as to extend about the same somewhat like an inverted U, by securing strips of sheet-metal 24 to the upper surface of member 5 adjacent its edges. These strips extend outwardly past the edge in a horizontal flange, as shown at 25, the metal then being bent downwardly, as at 26, and again upwardly, as at 27, flanges 26 and 27 being pressed into contact with each other. The metal is then bent horizontally, as shown at 28, into contact with the under side of flange 25 and then downwardly, as shown at 28′, in contact with the edge of the body portion 5. The metal is then bent horizontally, as shown at 29, where it is secured to the under side of the board 5. By this means, a marginal groove is provided between the downwardly extending flanges 26 and 27 and the flange which rests in contact with the edge of the board.

A somewhat modified construction is shown in Fig. 8, in which the downwardly extending flange 26^A is not integral with the adjacent vertical flange 27^A but is lapped around the same at the bottom, as indicated at 26′. In this case the strip secured to the upper face of the board comprises the parts 25^A, 26^A, and 26′, while the strip secured to the under side of the board comprises the parts 29^A, 28^A and 27^A.

When the side and end sections have been assembled and secured together, as stated,

the top section is placed thereon with the upper edges of the side and end sections fitted within the marginal groove referred to. The box may then be locked by appropriate locking devices, of which the devices shown in the drawing are preferred. As there indicated, four sliding bolts 30 are mounted in the metallic marginal flanges of the cover section, parallel to the ends of the cover adjacent to the corners. Each bolt is preferably L-shaped in cross-section, adapted to slide in contact with the edge surface and adjacent under surface of the board 5. One of the flanges 31 of the bolt slides between the under surface of board 5 and the adjacent metal strip 29, the wood being somewhat recessed to receive it, as shown at 31'. The other flange of the bolt, 32, slides between the edge of the wood and the adjacent vertical metal flange 28'. The strip 29 is cut away adjacent its end, as shown at 33, and the flange 31 of the bolt has a downwardly bent portion 34 and a forwardly extending bolt portion 35 extending therethrough. The portion 35 is adapted to be shot through an opening 36 in the adjacent side flanges 26 and 27, as shown in Fig. 9. The top metal strip 24 has a portion which is slotted and depressed slantingly, as shown at 37 in Figs. 1 and 10, and the upper edge of flange 32 of the bolt in part extends through this slot (but not above the top plane of metal 24) and in part slides in contact with the under surface of metal 24, adjacent to the slot. Holes 38 are provided through the flange 32, which are alined with holes, such as those illustrated at 39, in the end flanges 26, 27, of the cover section (Fig. 2), and corresponding holes in the vertical metal flanges 28', not shown, when the bolt is shot, to permit sealing wires to be extended therethrough. It will be understood that holes 39 are provided through the end flanges 26, 27, of the cover, at both ends, adjacent the corners, and correspondingly through flanges 28' parallel to said end flanges, in position to aline with the sealing holes 38 in the four bolts, when the latter are shot through the openings 36 in the side flanges 26, 27. When the box is set up, a hole 3' in the upper edge of a flange 15 or 16 of an end section, and a corresponding hole in the upper edge of the wood of a side section 2, adjacent the corner, will be in line with each bolt 35 and opening 36, so that the side and end sections will be locked to the cover by the bolts. The bolts, instead of being L-shaped in cross-section, as described, may, of course, have the horizontal flange 31 omitted and slide entirely between the edge of the wood and the adjacent flange 28' of strip 29. This construction is shown in Fig. 9a. Also as there shown, the upwardly extending portion 32x of the bolt shown in Fig. 9, which slides in the slot in the upper layer of metal 24, and is used for operating the bolt, may be omitted, the bolt having instead a nick 32'. This slides in alinement with the slot in the upper layer of metal, and the bolt may be operated by pressing a pointed instrument through the slot into engagement with this nick.

For the bolt last described the edge of the wood 5 must, of course, be cut back to make room for the bolt. Both forms have the advantage of locating the bolts beneath the upper surface of the cover and utilizing the flanges of the cover for bolt housings.

To nest the parts when the container has been taken apart, the false bottom member 4 is first laid within the vertical flanges of the bottom member. There is a space between the side edges of the false bottom member and the side flanges 9 of the bottom member 1 because of the fact that the false bottom is adapted to lie within the side and end sections when the same are mounted in the assembled box. One of the side sections is then slipped into position upon the false bottom with the outwardly extending bottom flange 13 of this side section extending downwardly between the adjacent side edge of the false bottom and the adjacent flange 9 of the bottom section. This bottom flange 13 of the side section is no wider than the thickness of the false bottom section, so that this side section 2 is adapted to lie flat on the false bottom section with flange 13 extending downwardly alongside the edge of the false bottom section, and the side flanges 11 of the side section extending upwardly closely adjacent to the end flanges 9 of the bottom section. The other side section 2 is then laid on the side section 2 thus positioned with the bottom flange 13 of the upper side section extending downwardly alongside the side edge of the underneath side section which does not have a bottom flange thereon. The vertical flanges 12 of the upper side section fit closely within the upwardly extending flanges 11 of the under side section.

It will thus be seen that the false bottom section and the two side sections are closely nested together within the bottom section, the bottom flange 13 of the lower side section extending alongside a side edge of the false bottom but not quite reaching to the upper surface of the bottom section, and the bottom flange of the upper side section extending alongside the opposite side edge of the under side section, but not quite reaching to the upper surface of the false bottom section.

One of the end sections 3 is then laid over the topmost side section at right angles to the direction of the same, so that the vertical side flanges 15 of this end section extend

downwardly on each side of the top and bottom edges of the side sections, these flanges being sufficiently narrow, so that they do not quite reach the upper surface of the false bottom section, that is to say, these flanges are no wider than the combined thickness of the two side sections. The bottom flange 17 of this end section extends upwardly, as shown, so that the end section lies flat on the side section below the same. The other end section 3 is then laid on top of this with its side flanges 16 extending over the side flanges 15 of the under end section and its bottom flange 18 extending upwardly at the opposite edge from the flange 17. The end sections are now moved over to one end of the bottom section, as shown in Fig. 4, with the flange 18 and flanges 11 and 12 closely adjacent to an end flange 9 of the bottom section. The flange 17 of the under end section is closely adjacent to the opposite edge of the top end section and is sufficiently narrow, so that it does not rise above the upper surface of the same. The upper edge of the flange 18 should not rise above the upper edge of the adjacent flange 9. The top section is now positioned on the nested box, as shown in Fig. 4, with the flanges 9, 12 and 18 contained within the marginal groove of the cover section at one end and the flanges 9 and 12 contained within the marginal groove at the other end. The flanges 9 at the sides will be contained within the marginal grooves at the sides of the cover section, and the lower surface of the cover section will rest flat on the upper surface of the upper end section 3, as shown. These results are attained by properly proportioning the thicknesses of the various sections to the height of flanges 9 and the depth of the marginal groove of the cover section. The bolts of the cover section are then shot through the holes 36 of the cover section and the corresponding holes 9′ of the bottom section, whereupon the bolts may be sealed as previously described.

The container may be a cube, or of any other desired rectangular shape, provided that its height is no greater than its width. One side section and one end section are slightly shorter than the other side and end section, respectively, between the side flanges to permit nesting the same, as shown.

In forming the top section, the corners of the flanges are preferably strengthened by having the flanges slightly overlap. Thus one of the flanges 26 and 27 at each end may be somewhat longer than the flanges 24 and 29 of that end, the extra length of each end flange composed of a single thickness 26 or 27 being bent and inserted between the ends of the flanges 26 and 27 of the adjacent side flange, the three thicknesses of metal thus appearing adjacent the corner being riveted, welded, or otherwise secured together.

It is to be understood that my invention is not strictly limited to the exact construction described, but that all reasonable equivalents are included.

What I claim is:—

1. In a collapsible container, the combination of a bottom member having upwardly extending flanges, inwardly from the edges, with recesses beneath the same, side and end members having outwardly extending bottom flanges, a false bottom member, and a top member, said parts being adapted to be assembled with the bottom flanges of said side and end members inserted in said recesses, the false bottom member fitted snugly within the side and end members, and the top member mounted on the upper edges of the side and end members; the parts also being adapted to be packed with the false bottom on the bottom member, the side and end members, in overlapped relation, on that, and the top member mounted on the flanges of the bottom member and of some of the members contained therein, the thicknesses of the members and the heights of the flanges being so chosen that all of said members will lie in substantially surface contact with each other when so packed, substantially as set forth.

2. In a collapsible container, the combination of a bottom member having upwardly extending flanges, flanged side and end members, a false bottom member and a top member having a groove extending upwardly from its lower surface, adjacent its edges, said parts being adapted to be assembled with the side and end members standing within the flanges of the bottom member, the false bottom member fitted snugly within them, and the top member mounted on them with their upper edges within said groove; the parts also being adapted to be packed with the false bottom on the bottom member, the side and end members on that, and the top member mounted with its side groove embracing the flanges of the bottom member, the thicknesses of the members and the heights of the flanges being so chosen that all of said members will lie in substantially surface contact with each other when so packed, substantially as set forth.

3. In a collapsible container, the combination of a bottom member having upwardly extending flanges and separable flanged members adapted to be assembled therewith in interlocked relation to form a complete container, including side members having side flanges and a top member with a downwardly extending marginal flange spaced therefrom to form a groove between the edges of the member and the flange, said members being adapted to be packed with the top member resting on the flanges of the

bottom member with said flanges entering said groove, the other parts within said flanges, said side flanges also entering said groove, and the proportions of the parts being so chosen that all of said members will lie in substantially surface contact with each other when so packed, substantially as set forth.

4. In a collapsible container, a top section formed of a body portion of stiff material having a marginal flange formed of sheet-metal secured to its upper and under surfaces and shaped to form an inverted U beyond the edges, and locking bolts carried thereby, each bolt extending lengthwise of one of said flanges adjacent a corner, the bolt having a bearing portion of angular section slidably mounted between the lower surface and edge of said body portion and the adjacent portions of the metal, the upwardly extending flange of said bearing portion of the bolt sliding in alinement with a slot in the metal strip secured to the upper surface of said body portion, and said bolt having an outer end portion adapted, when shot, to extend through an opening in the outer depending flange of the top section at right angles to the bolt, substantially as set forth.

5. In a collapsible container, a top section formed of a body portion of stiff material having a marginal flange formed of sheet-metal secured to its upper and under surfaces and shaped to form an inverted U beyond the edges, and locking bolts carried thereby, each bolt extending lengthwise of one of said flanges adjacent a corner, the bolt having a bearing portion slidably mounted between said body portion adjacent an edge and the adjacent metal, the upper layer of metal having a slot therein in alinement with the bolt for a portion of its length, and said bolt having an operative end portion extending through a slot in the lower horizontal layer of metal and adapted, when shot, to extend through an opening in the outer depending flange of the top section at right angles to the bolt, substantially as set forth.

6. In a collapsible container, the combination of a pair of side members and a pair of end members, each having inwardly directed vertical side flanges and an outwardly directed horizontal bottom flange, and an unflanged false bottom member, said parts being proportioned to nest together, with a side member on the false bottom member, the bottom flange of the side member extending downwardly alongside a side edge of the false bottom member; the other side member laid on that, with its bottom flange extending downwardly alongside a top or bottom edge of the first side member, and its side flanges received within the side flanges of the first side member; an end member laid on the upper side member, with its side flanges extending downwardly alongside the top and bottom edges of the upper side member, and the other end member laid on that, with its side flanges extending downwardly over the side flanges of the under end member; the bottom flange of the under end member being alongside the adjacent edge of the upper end member, the bottom flanges of the members being no wider than the thickness of the members, and the side flanges of the end members being no wider than the thickness of both side members, substantially as set forth.

This specification signed and witnessed this 12th day of April, 1917.

ALEXANDER L. WARD.

Witnesses:
DYER SMITH,
I. MCINTOSH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."