

**Oct. 11, 1960**

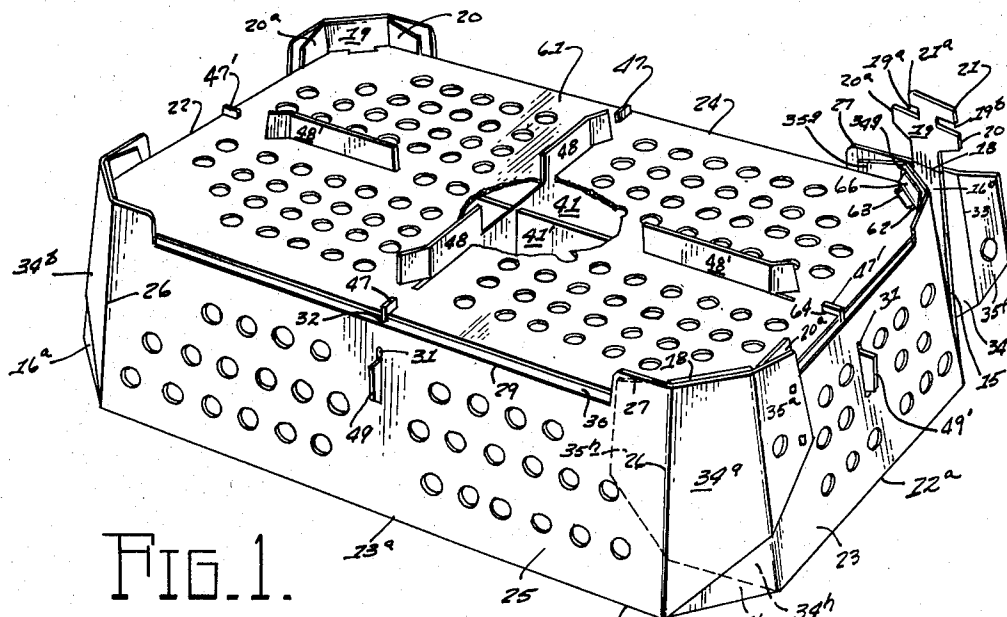
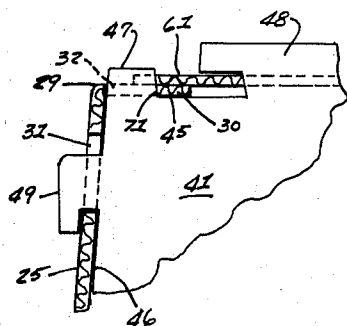
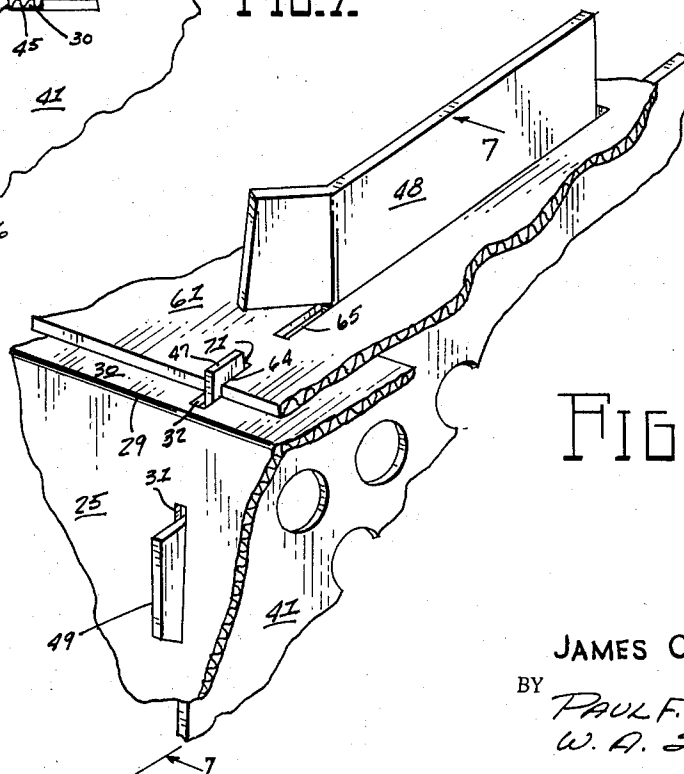
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## POULTRY BOX CONSTRUCTION

Filed July 29, 1957

2 Sheets-Sheet 1



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POULTRY BOX CONSTRUCTION

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2 Sheets-Sheet 2

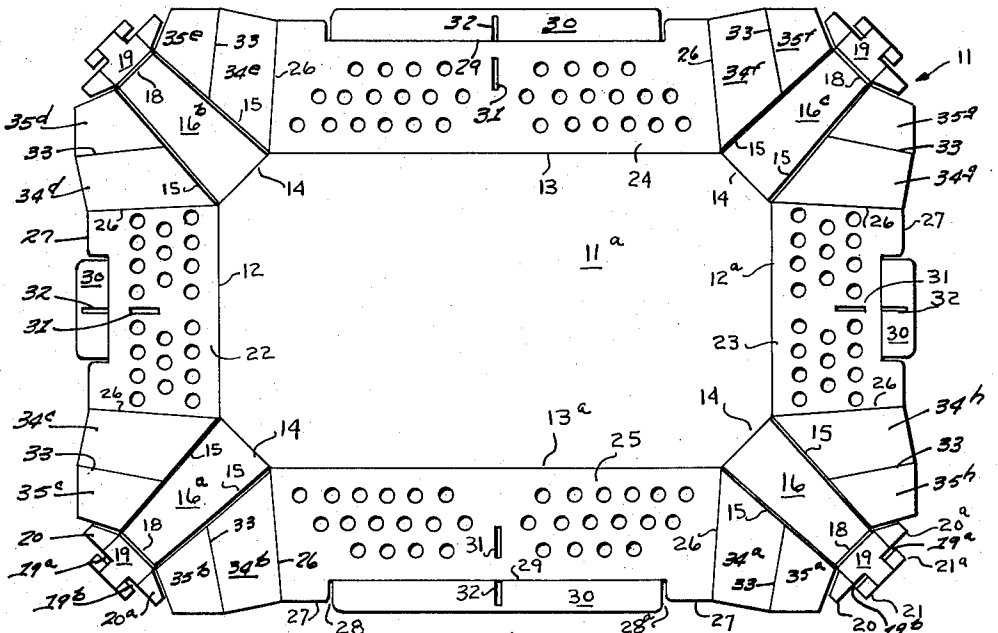


FIG. 3.

FIG. 4.

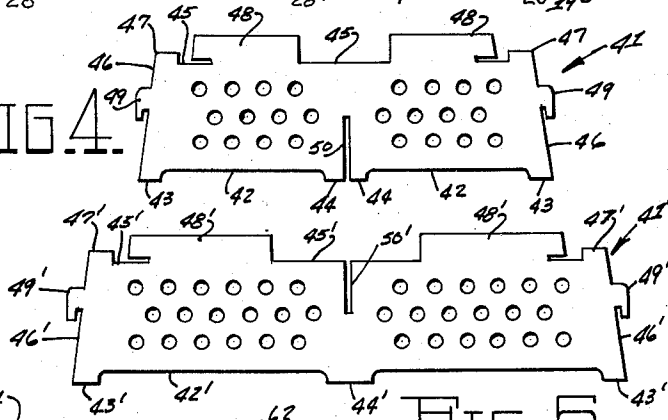


FIG. 5.

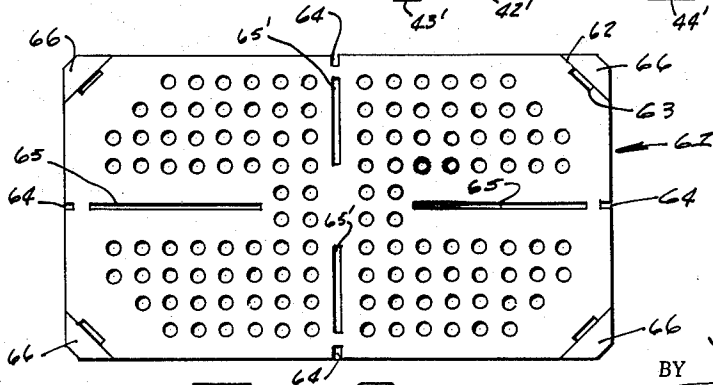


FIG. 6.

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## POULTRY BOX CONSTRUCTION

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5 Claims. (Cl. 229—6)

The present invention relates to a box construction. More particularly, this invention relates to a box construction of the type used to transport or ship live poultry such as chicks, but its significance is not limited thereto. Box constructions of the foregoing type are usually composed of a plurality of compartments and are formed to have a bottom wall, associated upstanding side and end walls, partition members to divide the box into the aforesaid compartments, and a closure lid.

One problem involved in the formation of such boxes from paper board or the like, particularly where fragile objects are to be carried by these boxes, is to provide for appreciable resistance to vertical compression. The boxes are usually stacked one above the other when shipped in trucks or freight cars, and the weight of the filled containers above a given container in the stack tends to collapse or deform the bottom box with consequent peril to its contents.

In the shipment of live chicks, the problem is particularly critical, not only because the chicks themselves are physically delicate, but also because adequate circulation of air to chicks is required if the chicks are to survive the trip. It is customary to provide raised or elevated corners on these chick boxes so that the bodies of the boxes, when stacked, are spaced from one another vertically, thus providing passageway for air circulation. Obviously, if these corners are not of sufficient strength to withstand the weight of the above stacked containers, the corners will collapse and the circulation of air will be cut off, to the detriment of the chicks.

In the past, corner partitions of sufficient compressive strength have been made of multi-ply construction. In this fashion, sheet material such as paper board or corrugated board may be employed. These prior art constructions have, however, not been particularly economical, inasmuch as usually an excessive amount of the sheet material is employed in forming the blanks from which the box will be formed.

It has also been found that, while much attention has been given to the corners of the box, the adjacent side walls have been frequently overlooked. Thus, it is found that the vertical force exerted on the corners of the boxes from above has certain horizontal moments which exert lateral pressures on the side and end walls of the box. The latter frequently causes bowing out of the side and/or end walls. The jostling attending transportation of these boxes in stacked condition aggravates the foregoing, ultimately effecting failure of the box.

Another problem generally prevalent has to do with the ease with which the boxes may be erected and their reliability after erecting. The box blanks are usually shipped to the point of use in flat or collapsed condition, to be erected when and as needed. Boxes which can be erected only with difficulty or which require appreciable time to erect are to that extent undesirable, since such represents uneconomic loss to the users of the containers. The significance of the foregoing is more readily appreci-

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ated when it is considered that boxes of this type are usually erected by hand by unskilled personnel.

It has additionally been found that boxes produced heretofore have been deficient in all-around spatial rigidity and resistance to deformation. Thus, certain of the prior art constructions, while rigid in one plane, are deformable in another. The relationship and interdependence of the members constituting the box, of course, translate such deformation into forces exerted at points other than the corners. Furthermore, repeated deformation cumulatively weakens the box to hasten ultimate failure.

Accordingly, it is an object of the present invention to provide a box construction of the type described hereinbefore which overcomes the problems and deficiencies referred to above.

It is a particular object of this invention to provide a carton construction which is resistant to vertical compression and, at the same time, is extremely rigid and resistant to forces other than vertical.

It is still another object of this invention to provide a carton construction having side walls of unusual strength, although formed of a single sheet of the material of construction.

It is yet another object of this invention to provide a carton construction having the preceding characteristics which is economically formed with a minimum of wastage of the material of construction.

It is a further object of this invention to provide such a carton construction which is easily and simply erected.

These and other objects of this invention will become apparent to those skilled in the art from the following detailed description, taken in conjunction with the annexed sheet of drawings, on which is presented for purposes of illustration only, an embodiment of this invention.

In the drawings:

Fig. 1 is a three-quarter perspective view of a box construction in assembled form embodying the present invention.

Fig. 2 is an enlarged perspective view, with parts broken away, of the side wall construction and associated parts.

Fig. 3 is a plan view of the blank in knock-down form used in forming the principal member of this invention.

Figs. 4 and 5 are plan views of the blanks used as partition members in accordance with this invention.

Fig. 6 is a plan view of the closure lid in blank according to this invention.

Fig. 7 is a fragmentary sectional view taken on the line 7—7 of Fig. 2.

Basically, the present invention comprises a compartmented box construction including a bottom wall, upstanding side walls, partition members, and a novel locking arrangement between the partition members and the side walls. This invention further contemplates a box construction of the foregoing type which includes a novel corner construction incorporating a novel locking arrangement between the corner construction and a closure lid, which cooperates in conjunction with the first-mentioned locking arrangement to impart overall spatial rigidity to the box when assembled.

Referring now more specifically to the drawings, there is shown in Fig. 3 in blank knock-down form, the principal body member 11 used in forming the box of this invention. The blank includes a central bottom wall 11a bounded by parallel end edges 12 and 12a and parallel side edges 13 and 13a perpendicular to the end edges. These edges do not intersect, but are connected by angular edges 14. Extending outwardly from the bottom wall at the edges 14 are corner panel members 16, having side edges 15 generally perpendicular to the edges

14. The corner panel members contain a fold line 18 generally parallel to the edges 14, and extending therebeyond in foldable relation to the corner panels, an extension member 19, having first a pair of foldably connected major lateral ear-type flaps 20 and 20a, and therebeyond a pair of minor lateral ear-type flaps 21 and 21a. The major and minor flaps are separated by a pair of opposed slits 19a and 19b spaced outwardly from the fold line 18. Foldably connected to the edges 12, 12a and 13 and 13a are end wall panels 22 and 23, and side wall panels 24 and 25. Score lines 26 extending outwardly from the intersection of the angular edges 14 with the side and end edges serve to define the ends of the side and end walls when erected. The side and end walls each have an outer edge 27 spaced in generally parallel relationship with the respective edges 12, 12a, 13, and 13a, and each contains a pair of spaced-apart slits 28, 28a perpendicular to the edges 27, and connected by a score line 29, also serving as a fold line. There is thus defined a flange flap 30 foldably secured to each of the side and end walls, which flange flap is inset with respect to the edge 27 and extends for a substantial portion of the length of the wall. Each of the flange flaps 30 contains a centrally positioned aperture 32 adjacent the fold line 29, while the associated side and end wall panels contain a linear slot 31 spaced inwardly therefrom. The foregoing cooperate in a manner explained more fully hereinafter to provide an important feature of this invention.

The portion of the blank between each of the aforementioned score lines 26 and the adjacent edge 15 of the corner wall panels is divided by score line 33 into laterally extending flaps 34 and 35. The flaps extending from each end of the side wall 25 are identified by the designation 34a, 35a at one end, and 34b, 35b at the other end. The flaps extending from each end of the end wall 22 are designated at one end as 34c, 35c, and at the other end 34d, 35d. Flaps extending from either end of the side wall 24 are designated 34e, 35e, at one end, and 34f, 35f at the other end. The flaps extending from either end of the end wall 23 are designated 34g, 35g at one end, and 34h, 35h at the other end. All of the flap members 34 are formed to have a width corresponding to the width of the adjacent corner wall panel, e.g., 16, 16a, 16b, or 16c.

The partition members for the box construction of this invention are formed as illustrated in Figs. 4 and 5. These partition members are of similar configuration, differing only in the length thereof and the location of a slot and, therefore, only one of them will be described in detail.

The partition 41 illustrated in Fig. 4 is defined by a bottom edge 42 from which depend feet 43 at the extremities, and feet 44 intermediate the feet 43, an upper edge 45 parallel to the lower edge 42, and side edges 46 extending from the feet 43 upwardly and slightly inwardly. The side edges are slanted as described in order to supportingly abut the side walls in erected form. The side edges 46 terminate at the upper corner of the partition member, where there is provided upstanding corner tabs 47. Intermediate these corner tabs are provided a pair of larger upstanding tabs 48, the outer portions of which are slightly undercut by the upper edge 45. The partition member is provided at each end with axially extending hook tabs 49. A vertical slot 50 extends upwardly from the bottom edge between the feet 44.

The partition member illustrated in Fig. 5 is identified by the numeral 41', and the individual components thereof will be identified by the same numerals used in identifying corresponding components of the partition member 41 except that the (') will be used to differentiate them. Instead of a slot in the bottom edge of the partition member, as in partition 41, the partition 41' is provided with a slot 50' extending vertically down from the

upper edge 45'. As a consequence, the member 41' has a single central foot 44'. The slots 50, 50' in the respective partition members permit them to be interfitted in perpendicular relationship and, when inserted into the erected carton, will, in this embodiment, provide equal sized compartments. The aforementioned feet serve to elevate the lower edge of the partition members with respect to the bottom of the box to thereby avoid pinching of the toes of the poultry contained therein.

In Fig. 6, there is shown a closure lid 61 in blank form in accordance with this invention. The lid is of general rectangular shape with the corners cut off. Score lines 62 are impressed across each of the corners and, adjacent to the score lines, a slot 63. The score lines define, thereby, four small corner flaps 66 which are foldable with respect to the lid proper. Each of the four main edges of the closure lid contains a small centrally positioned notch 64 and, between each pair of oppositely disposed notches, a pair of linear slots in respective alignment therewith.

The box construction provided by this invention, as can be seen by reference to the blank shown in Fig. 3, is economical and accompanied by very little wastage, inasmuch as the blank has an outer contour which very closely approximates a rectangle, the area of which is almost completely present after scoring and slotting. It can be further seen that the carton construction of this invention comprises, in the embodiment shown, only four members, namely, a principal body member, two partition members, and a closure lid. If it be desired to make the box square, the partition members would be identical, except for the location of the slot permitting interfitting thereof.

The method of erecting the box construction into assembled form will now be described, with particular reference to Fig. 1, wherein the individual components thereof will be identified by the same numerals utilized in identifying them in the foregoing description of the carton construction in knock-down blank form. The principal body member 11 slotted and scored as described in connection with Fig. 3, is laid out flat on a surface, and the end wall panels 22 and 23 are lifted into upstanding relationship with respect to the bottom wall 11a. The longer partition member 41' is then positioned between these end walls and the hook tabs 49' passed through vertical slots 31 in panels 22 and 23. The hook tabs will serve to hold the end walls in upstanding relationship with respect to the bottom wall. The flange flaps 30 associated with each of the end walls are then folded inwardly so that the aperture therein receives and is positively engaged by the upstanding corner tab 47' of the partition 41'. The inner extremities of the flange flap 30 will rest on the upper edge 45' (Figs. 5 and 7) of the partition and will be supported thereby. The other partition member 41 can now be introduced by engaging the respective slots 50 and 50' in a manner discussed hereinbefore. Next, side walls 24 and 25 are lifted into upstanding relationship with respect to the bottom wall 11a, and the hook tabs 49 of partition 41 passed through the vertical slots 31 contained in the side walls 24 and 25. This will hold the wall at a slight inclination inwardly from vertical from bottom to top and in contact with the edge 46 of the partition. In a manner similar to that described in connection with the end walls, the flange flaps 30 of the side wall are folded inwardly, and the aperture 32 engaged with the corner tab 47 of the partition 41. At this stage, the box is partially erected with the side and end walls in perpendicular self-held relationship with respect to the bottom wall, and both hands of the person erecting the box can be directed to assembling the corner portions of the box construction.

A particular feature of the invention as referred to hereinbefore is that relating to the cooperative engagement between the corner tab 47 and the side wall. The tab 47 exerts an inward pressure against the inward edge

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71 (Fig. 7) of the aperture 32 in the flange flap 30. This, in conjunction with the action of the hook tab 49, provides a side wall which, although composed of only one thickness of the material of construction (in this case, corrugated board), is uniquely resistant to bowing outwardly of the side wall panel.

In describing the erection of the corner portion, attention will be directed to the corner wall panel 16c, which at this stage is lying outwardly in the plane of the bottom wall, and to the adjacent lateral flap extensions 34g and 35g of the end wall 23 and the lateral flap extensions 34f and 35f of the side wall 26. First, the flap 34g is folded into vertical alignment with the adjacent corner edge 14, and the flap 35g is positioned along and in abutment with the inner surface of the side wall 24. Then, the corner wall panel 16c is folded upwardly into abutment with the outer surface of the flap 34g. Next, the flap 34f is wrapped about the corner wall panel 16c with the flap 34g in surface abutment therewith, and the flap 35f is folded about the edge 15 of the corner panel 16c into surface abutment with the outer surface of the end wall panel 23. Any convenient fastening means may be employed to hold the flaps 35 in the position described. One or two staples have been found to be sufficient in this regard. The remaining corners of the box are treated in the same manner as just described. It will be seen that the upper edge 27 of the extremities of the side and end walls corresponds in height to the height of the corner wall panel 16 as defined by the fold line 18. This serves to define an elevated corner with respect to the major portion of the box, the height of which is governed by the flange flap 30 in its folded over position.

The closure lid 61 is next applied, as follows: First, the corner flaps 66 of the closure lid are folded upwardly about the fold line 62, and then the lid is lowered down onto the flange flaps 30, with the notches 64, 65, and 65' in registry with the upstanding tabs 47, 47', 48, 48', of the partition members. The closure lid will, as can be seen, assume recessed relationship with respect to the elevated corners and with respect to the upstanding tabs of the partition members. The upstanding tabs and the elevated corners serve to provide a stable platform for more convenient, safe vertical stacking. In particular, the tabs 48 and 48', located centrally, prevent the bottom of the box stacked above from sagging. It may also be noted that the outer extremities of these latter tabs, which were undercut by the upper edges of the partition members, may be bent or folded out of alignment, as illustrated in Fig. 2, to aid in locking the closure lid. The score line 62 of the closure lid is in close relationship with respect to the elevated corner, and the corner flap 66, as previously turned upwardly, will be in close abutment with the upper portion of the flap 34.

To finally lock the carton construction of this invention, the flap extensions 19 of the corner panels are folded down about the fold lines 18, and the minor ear flaps 21 and 21a are inserted into the angular slot 63 in the lid member. The central portion of the extension 19 will thus overlie the corner flap 66, and the major ear flaps 20 and 20a will lie in abutment with the upper portions of the flaps 34 or 35, as the case may be. The slots 19a and 19b are chosen to have a thickness corresponding to the thickness of the closure lid, and the distance between the slots 19a and 19b is chosen to correspond to the longest dimension of the slot 63 in the closure lid. The foregoing insures positive locking engagement of the corner panel member with respect to the closure lid and, additionally, prevents lateral displacement of the closure lid. This, it was discovered, is translated into a cooperating strengthening of the side walls through the edge notches 64, the corner tab 47 of the partition member, and the aperture 32 in the flange flap 30. The foregoing cooperative strengthening provided by the various locking features serves to provide a carton construction possessed of overall spatial rigidity and resistance to deformation.

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Modifications may be resorted to within the spirit and scope of this invention as defined in the appended claims. I claim:

1. In a poultry box formed of relatively stiff sheet material, said carton having a bottom panel, integral, upstanding side and end walls foldably connected to said bottom panel, separate upstanding partitions for dividing said carton into a plurality of compartments, and a separate top closure panel, the improvement which comprises flange flaps foldably connected to said end and side walls, and having a slot adjacent said end and side walls and being folded inwardly, tabs on said partitions projecting upwardly in registering locking engagement with said slot, said top closure panel also being provided with an aperture in assembled registry with said slot and embracing said tab, and hook tabs extending outwardly and downwardly from the ends of said partitions, said side and end panels being provided with openings engageable therewith.

2. A container construction comprising a body member including a bottom wall, side walls, corner wall panels between said side walls, partition members adapted to fit within said body member in erected form and a closure lid, said side walls including a flange flap folded inwardly to assume assembled parallel spaced relationship with respect to said bottom wall, flaps extending laterally from said side walls for overlapping abutment with said corner wall panel and a portion of the next adjacent side wall, said corner wall panel and said flaps defining an elevated corner, said corner wall including an extension foldably related thereto having opposed aligned slits therein defining lock tabs, said partition including an upper edge for supporting said flange flap, end edges abutting said side walls, a second lock tab extending axially from said end, an upper tab projecting upwardly from said upper edge adjacent the end, said side wall and flange flap being provided with slots for receiving said lock tab and upper tab, said closure lid being constructed and arranged to rest on said flange flap in recessed relationship with respect to said elevated corners, said closure including upwardly folding corners for overlapping abutment by said corner wall panel extension, and an opening adjacent each corner for receiving and engaging said first-mentioned lock tab and openings in registry with said upper tabs on said partition.

3. A multi-compartment container formed of relatively stiff sheet material comprising, in combination, a principal body member including a bottom wall defined by side edges connected by angular corner edges, upstanding side wall panels foldably connected at said side edges, each having a generally central slot, a flange flap foldably connected to each of said side wall panels and extending inwardly therefrom in generally parallel spaced relationship with respect to said bottom wall, each of said flange flaps having an aperture in the same vertical plane as said slot in the associated side wall panel, upstanding corner wall panels foldably connected to said corner edges, an extension foldably secured to the upper end of said corner wall panel including lateral ear flaps, flap extensions projecting laterally from each end of said side wall panels, the first of which being adapted to abut the adjacent corner wall panel, and the second adapted to abut a portion of the side wall panel complementary thereto, a pair of upstanding interfitted partition members arranged in perpendicular relationship with respect to each other and characterized by ends in supporting abutment with said upstanding side wall panels, hook tabs extending axially from said partition members for locking engagement with said slots, and a closure lid constructed and arranged to seat on said flange flaps and having appropriate openings for said upper projections and including upwardly foldable corners adapted to underlie said corner wall extension, and angular slits spaced inwardly therefrom for receiving said ear portions.

4. A container comprising a box-like structure which

includes a bottom wall and upstanding side walls integral therewith, a flange flap foldably connected to each side wall at the top and being folded inwardly, and a linear upstanding partition member spanning the distance between said opposed walls, said member having ends in abutment with said side walls, said ends further comprising lock tabs at each end extending axially therefrom and tabs adjacent each end projecting upwardly, said opposed side walls being provided with an aperture engaging said axially extending lock tabs and each of said flaps being provided with an aperture, said apertures being inter-engaged by said upwardly extending lock tabs.

5. A multi-compartmented container comprising, in combination, a bottom wall, side walls integral with said bottom wall and extending upwardly therefrom, each of said side walls being provided with a slot, flange flaps connected to said opposed side walls extending horizontally inwardly and being provided with an opening spaced from the free edge of said flange flaps, a linear upstand-

ing partition adapted to fit within said container to provide said compartmentation, lock tabs on said partition extending axially outwardly from each end and downwardly to engage said slot in said side walls, and tabs located proximate the ends of said partition extending upwardly to be engaged by said openings in said flange flaps, said axially extending tab engagement and said upwardly extending tab engagement holding said side wall and said flange flap in secure erected relationship.

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