Oct. 15, 1935. M. BURGER 2,017,650

CARTON

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Fig. 1.

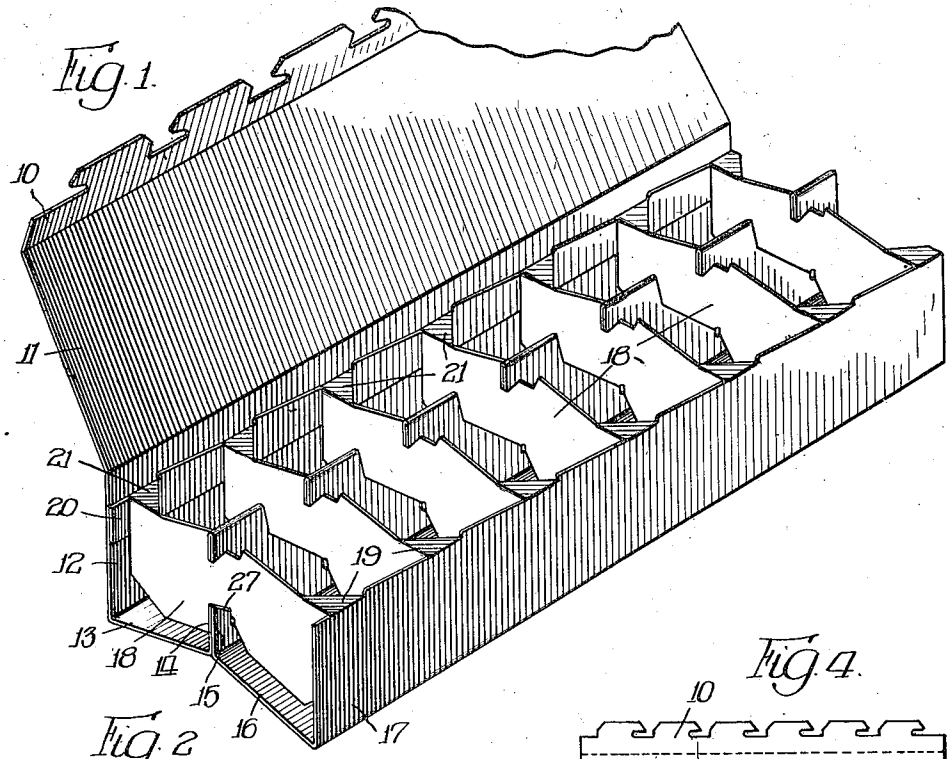


Fig. 2

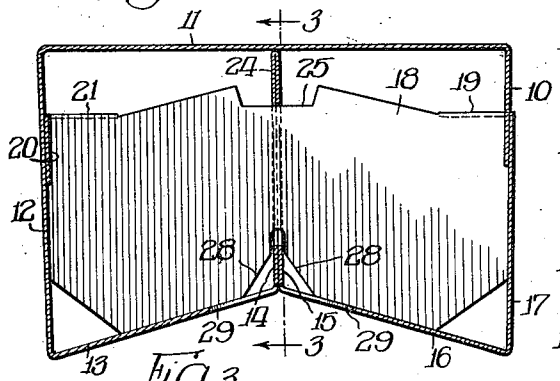


Fig. 3.

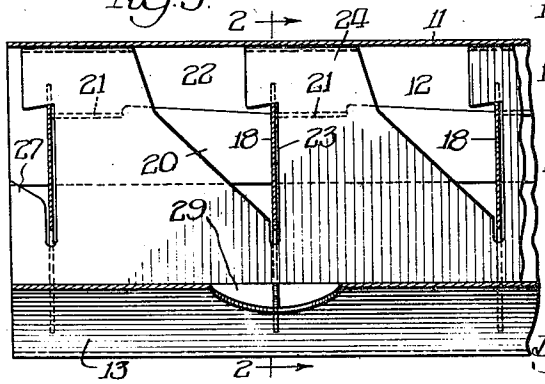
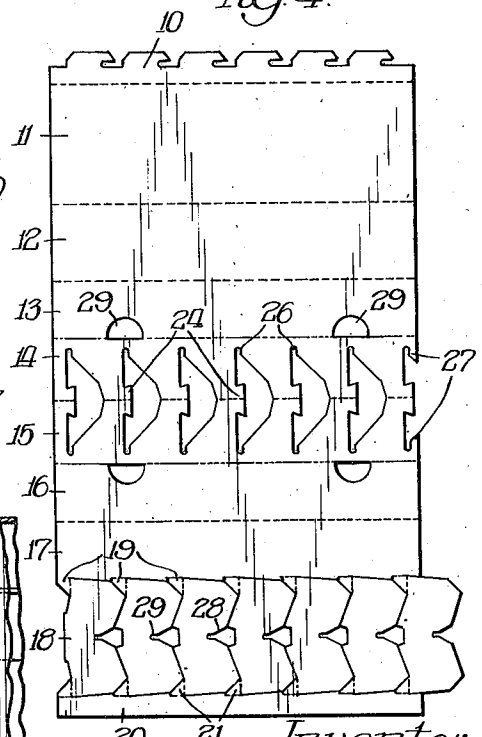


Fig. 4.



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Fig. 5.

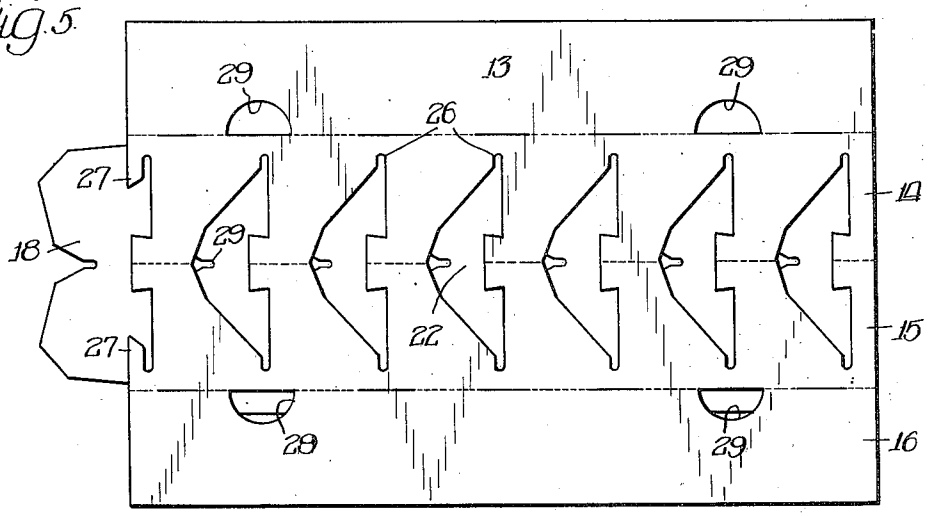


Fig. 6.

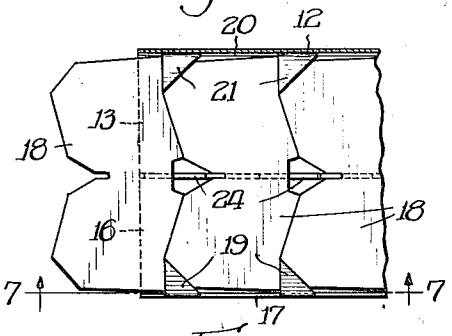


Fig. 8.

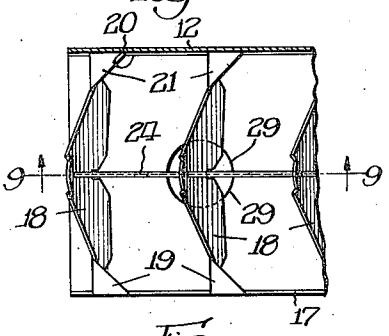


Fig. 7.

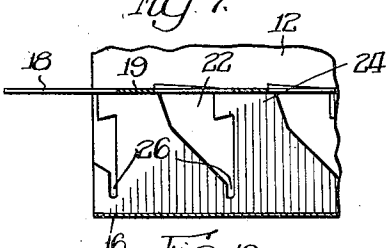


Fig. 9.

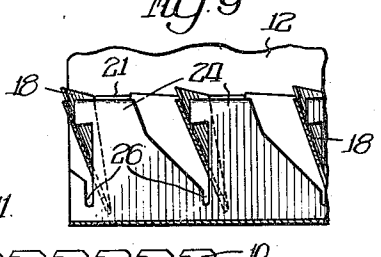


Fig. 10.

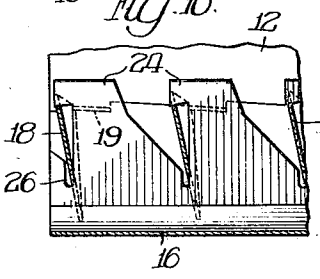
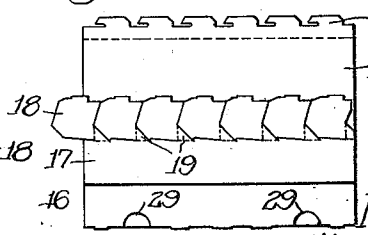


Fig. 11.



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Fig. 12.

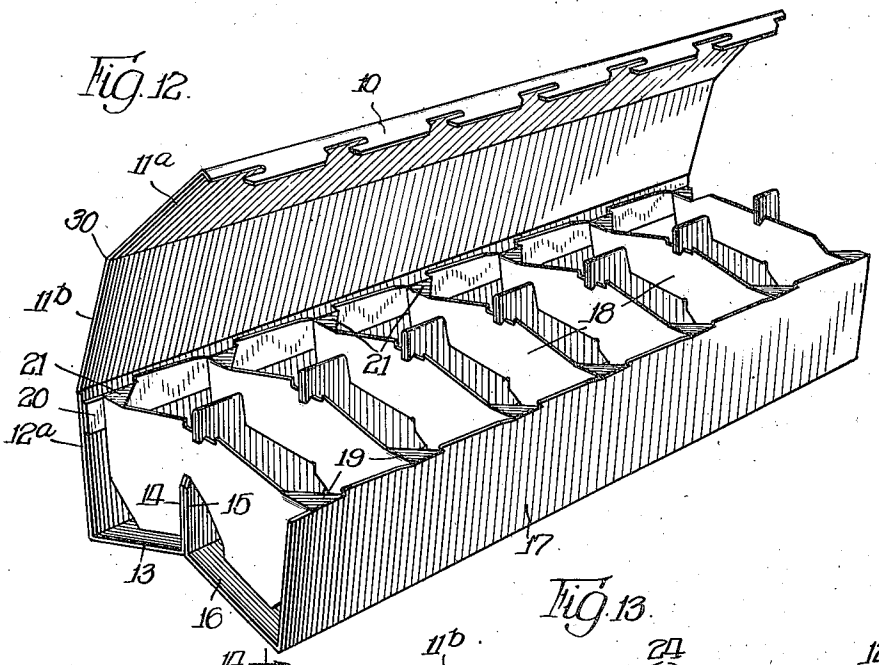
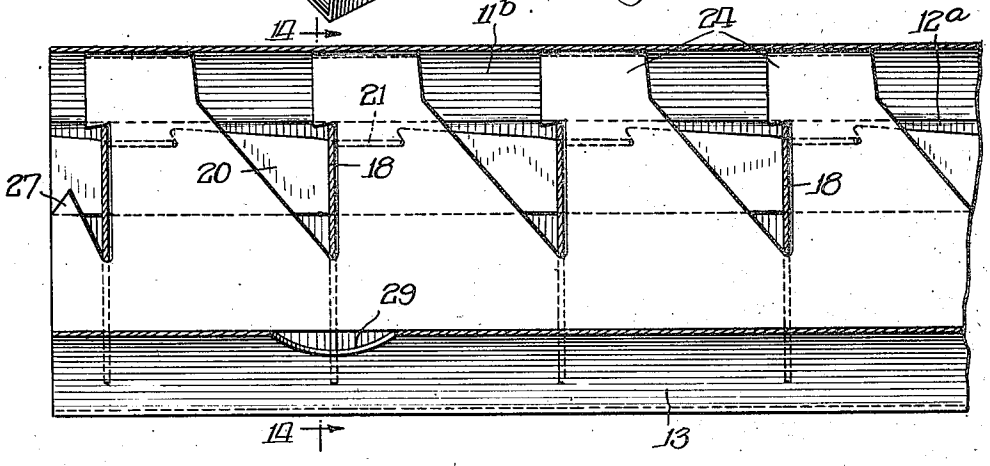


Fig. 13.



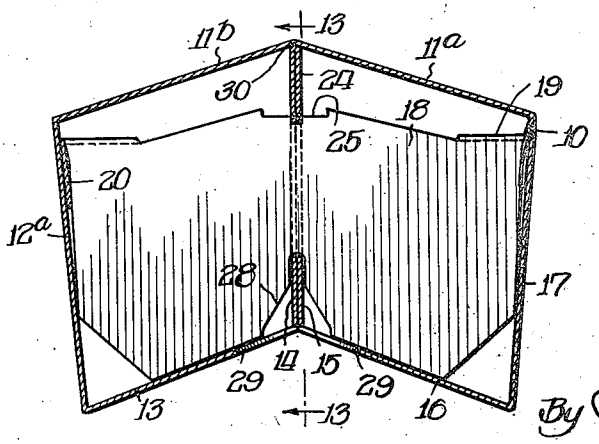


Fig. 14.

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UNITED STATES PATENT OFFICE

2,017,650

CARTON

Martin Burger, Morris, Ill., assignor to Self-Locking Carton Co., Chicago, Ill., a corporation of Illinois

Application May 29, 1933, Serial No. 673,458

5 Claims. (Cl. 229—29)

The present invention relates to cellular cartons and has particular reference to improvements in cellular cartons of the type disclosed in the copending application of John W. Cox, Serial No. 618,929, filed June 23, 1932.

A primary object of my invention is the provision of an improved carton and method of erecting the same.

An additional object is to provide a carton which may be easily erected from a collapsed condition into an erect condition suitable for carrying eggs and the like.

These and other objects will be apparent from a consideration of the following description and by reference to the accompanying drawings in which

Fig. 1 is a perspective view showing a carton constructed in accordance with my invention and in erect position;

Fig. 2 is a cross sectional view of the carton shown in Fig. 1 taken along line 2—2 of Fig. 3;

Fig. 3 is a longitudinal section of the carton taken through the central portion thereof as indicated by the line 3—3 of Fig. 2;

Fig. 4 is a plan view of the blank from which the carton is constructed;

Fig. 5 is a plan view of the carton shown in Fig. 1 in collapsed or flattened condition;

Fig. 6 is a fragmentary plan view of the carton shown in Fig. 5 and discloses the first step in the erection of the carton;

Fig. 7 is a sectional view taken along line 7—7 of Fig. 6;

Fig. 8 is a top fragmentary view of the carton showing the second step in the erection of the same;

Fig. 9 is a fragmentary longitudinal section of the carton taken along line 9—9 of Fig. 8;

Fig. 10 is a fragmentary longitudinal section showing the final step in the erection of the carton;

Fig. 11 is a view of the carton showing it in a modified collapsed position;

Fig. 12 is a perspective view of a modified form of the carton;

Fig. 13 is a longitudinal section taken through the center of the carton shown in Fig. 12 and represented by line 13—13 of Fig. 14; and

Fig. 14 is a cross sectional view taken along line 14—14 of Fig. 13.

In the carton disclosed in the aforesaid copending application, the tops of the cross partitions are preferably of the same height as the hinged portions thereof and in the fabrication of the carton the tops of the cross partitions are inserted beneath the hooks on the longitudinal partitions, whereby the carton may be erected by merely pressing the walls into erect positions and revolving the cross partitions into vertical relation to the walls of the carton. This type of carton is easily erected but has the disadvantage of necessitating an added step in the manufacture of the carton, namely, the insertion of the tops of the cross partitions beneath the hooks on the longitudinal partitions. In accordance with my invention the carton is provided with improvements by which it may be erected without the insertion of the tops of the cross partitions beneath the hooks on the longitudinal partitions.

As shown in the drawings, a blank is properly cut, scored and folded to form in the order named, as shown in Fig. 4, a cover-locking strip 10, a cover 11, a rear wall 12, a rear bottom section 13, a rear longitudinal partition section 14, a front longitudinal partition section 15, a front bottom wall section 16, a front wall 17, cross partitions 18 hinged to said front wall by means of triangular webs or hinges 19, and an attaching strip 20 hinged to the opposite sides of the cross partitions by means of triangular hinges or webs 21. The different elements of the blank are suitably separated by score lines represented by the dotted lines shown in Fig. 4, whereby the folding or bending of the carton is facilitated.

In production of the carton the cut and scored blank is folded along the score line between the bottom wall sections and the front and rear walls respectively, the cover portion 11 overlying the cross partitions and the attaching strip. The attaching strip is secured to the rear wall by means of a suitable adhesive.

The front wall 17 is of less height than the rear wall 12. In accordance with the invention the elements of the carton are constructed so that the widths of the cross partitions plus the widths of the front and rear walls below the points at which the cross partitions are hinged thereto equal the widths of the front and rear bottom sections plus the widths of the front and rear longitudinal partition sections. Also it is necessary, for fragile eggs held in the carton, to provide a carton with a cushioned bottom, that is, a bottom which is suspended above a flat surface upon which the carton is positioned. To produce this result the front wall is lowered and the attaching strip 20 is secured to the rear wall at a height equal to the height of the front wall. The longitudinal partition sections are then drawn up and suspended to the cross partitions, thereby maintaining the bottom sections in substantially inverted V-shape.

The longitudinal partition sections are provided with cut-out portions 22 adjacent the space of rotation of the cross partitions whereby the latter may be rotated about the hinged portions 19 and 21 into a vertical position in which the lower portion of the cross partitions extend into the longitudinal partitions. It is preferred to provide a vertical edge 23 on the back of the cut-

out portions 22 and adjacent the vertical plane of the cross partitions whereby to limit the rotation of the latter. At the top of the cross partitions the longitudinal partition sections are provided with hooks 24 which extend into the openings 22 and cross the vertical plane of the cross partitions. On the tops of the cross partitions 18 are provided shoulders 25 which are positioned in a central portion of the cross partitions and are adapted to receive the hooks 24 when the cross partitions are thrust therebeneath, thereby providing a means for suspension of the longitudinal partition sections and the bottom sections above a flat surface upon which the carton is positioned. It is to be observed that the shoulders 25 may be higher than the height of the hinged portions 19 and 21 when the cross partitions are in erect position or the shoulders 25 may be at the same level as the hinged portions or at a lower level, in any case the dimensions of the hooks 24 being such as to insure a proper suspension of the longitudinal partition sections. Generally as the height of the shoulders 25 is lowered the vertical dimensions of the hooks 24 are increased, that is, the under sides of the hooks are lowered in accordance with the position of the shoulder 25. In the modification shown in the drawings, the shoulder 25 is at a higher level than the hinged portions 19 and 21, and, as the longitudinal partitions cannot be subjected to substantial longitudinal movement the cross partitions must be rotated into vertical position prior to their insertion beneath the hook portions.

At the bottom of the openings 22 and communicating therewith are a series of partition-engaging slots 26 which engage the lower central portion of the cross partitions when the cross partitions are beneath the hooks 24 and prevent the cross partitions from being again rotated into horizontal position. It is preferred that the openings 22 at the top of the longitudinal partition sections be of sufficient width to permit free rotation of the cross partitions, this opening tapering off towards the partition-receiving slot 22. The openings or cut-away portions 22 are sufficiently narrow adjacent their lower portions to prevent the free rotation of the cross partitions.

At the end of the carton towards which the hooks 24 are pointed the last cross partition is set back or spaced from the end of the walls a sufficient distance to provide space for the end hook 24 to project and to provide room for projections 27 on the longitudinal partition sections to extend upwardly beyond the lower portion of the cross partitions and provide means for securing the cross partitions in erect position.

When the carton is in erect condition the longitudinal partition sections are prevented from downward movement by their being engaged with the cross partitions and further upward movement of the bottom sections may be prevented, as shown in Fig. 2, by extending the bottoms of the cross partitions downwardly to engage the bottom sections. It will be seen that the bottom sections 13 and 16 are inclined upwardly toward the center of the carton and meet at a point from which the longitudinal partition sections extend vertically to the top of the carton, the latter forming a brace for the cover of the carton and lying in contiguous relation. To prevent collapse of the carton by the spreading apart of the longitudinal partition sections the cross partitions are cut away in their lower central portion first along a substantial angle as shown by the edges 28 in Fig. 2 and then along a narrow slot 29 which is only slightly wider than the thickness of the double longitudinal partition section. The walls of the slot 29 extend downwardly past the openings 26 when the carton is erected and retard the transverse movement of the longitudinal partition sections. The walls 28 are cut so as to form a substantial opening in the central openings of the cross partitions in order to facilitate the rotation of the cross partitions with respect to the longitudinal partition sections.

In the front and rear bottom sections 13 and 16 are provided a number of openings 29 along the edges of the bottom sections adjacent their lines of jointure with the longitudinal partition sections. These openings are preferably of suitable size and position to receive the thumb and one finger of each hand of one operating the carton, the purpose of this being described more specifically hereinafter. In addition to constituting a satisfactory carton from the standpoint of manufacture and egg-carrying efficiency, it is possible by utilizing my carton to employ a new and desirable means of setting the carton up from collapsed position.

As shown in Fig. 5, the carton is collapsed along the outer edges of the bottom sections and is packed with the cover portion down. In this position the openings 29 in the bottom sections face upwardly and are accessible to an operator seeking to set the cartons up. In accordance with my method of erection, the operator grasps closed openings in the bottom sections with the thumb and a finger of each hand. The thumbs and fingers are then brought together, thereby squeezing the opposed openings 29 towards each other, which results in the score line between the longitudinal partition sections being pressed inwardly and the longitudinal partition sections being brought into contiguous relation. In this position, as shown in Figs. 6 and 7, the cross partitions are in horizontal position and the longitudinal partition sections are completely therebeneath, the bottom sections not having a final inverted V-shape, such as shown in Fig. 2, for example, wherein the longitudinal partition sections are projecting above the cross partitions. While the longitudinal partition sections are in this lowered state the cross partitions are rotated from the horizontal position shown in Figs. 6 and 7 to a partially erected position, such as shown in Figs. 8 and 9, in which the bottoms of the cross partitions have been rotated until the cross partitions engage the vertical wall 23 of the back of openings 22 and the longitudinal partition sections and the upper portion of the cross partitions are pressed outwardly and engaged by the front edges of the hooks 24, the cross partitions being thereby distorted out of their usual shape and the side walls of the carton being slightly pressed inwardly to allow for such distortion. As will be seen from Figs. 8 and 9, when the cross partitions are in this position the lower edges thereof are suspended above the partition-engaging slots 26.

From the position shown in Figs. 8 and 9 the longitudinal partition sections are pressed inwardly with respect to the carton until the hooks 24 are above the shoulders 25. Relative movement is then produced between the tops of the cross partitions and the longitudinal partition sections, whereby the cross partitions are moved into a vertical plane beneath the hooks 24.

To facilitate the operations described, it is desirable to employ a setting-up block in which a

plurality of projections equal in number to the number of cells in the carton are provided, the blocks being separated by longitudinal partition-receiving channels and by transverse receiving channels. However, it will be seen that the method of erecting the carton is independent of any particular type of setting-up mechanism and may be carried out, if desired, by hand.

In Fig. 11 the carton is shown in a modified collapse. That is, the cross partitions are scored along their longitudinal central portion and the carton is collapsed by folding the body portion along its score line and the score lines between the longitudinal partition sections and the bottom sections, the longitudinal partition sections being folded inwardly. This method of folding is of advantage since the carton may be erected by merely pressing it downwardly against a setting-up block of the type described in my co-pending application, Serial No. 673,457, filed concurrently herewith. When pressed downwardly the carton is held through the openings **29** as described heretofore and the walls of the carton are distended into erect position. The upper edge of the longitudinal partition is received in the slide bent in the center of the cross partitions and along the score line of the latter, thereby preventing the longitudinal partition from being moved out of position in the center of the carton. The erection of the carton is then completed in the manner described heretofore.

In the modified form of the carton shown in Figs. 12, 13 and 14 the upper portion of the carton is of "house top" construction in that the height of the rear wall is reduced by means of a score line which may be slightly above the level of the cross partitions **21**. The top is comprised of a front portion **11a** and a rear portion **11b** separated by a longitudinal score line **30** which, when the top is closed, rests on the upper edge of the longitudinal partition. The width of the cover-locking portion **10** is preferably reduced an amount corresponding to the reduction in height of the rear wall, thereby producing a carton which slants downwardly from its upper longitudinal portion. An advantage of this type of structure is that when stacked in an egg case, as is customary in shipping, the V-shaped bottom of the upper carton straddles or fits over the roof-like cover of the next lower carton. It will be observed that the slant of the top of the carton is less than the slant of the inverted V-shaped bottom, whereby the bottoms of the cartons are suspended above the tops of the next adjacent lower cartons to provide a cushion for the eggs. When of this roof-like structure the cover of the carton firmly engages the tops of eggs held therein, this being of advantage since I have found it prevents the tops of the eggs from shaking within the carton. Also, considerably less room is occupied in an egg case by cartons of this construction, which permits the cartons to have a larger effective body portion. The carton is erected in precisely the same manner as described heretofore.

My invention is susceptible of modifications as will be seen by one skilled in the art and all embodiments coming within the spirit of my invention are intended to be included in the appended claims.

I claim:

1. A carton, comprising front and rear walls, cross partitions hinged to the upper portions of said walls and rotatable from a horizontal position into an erect position, front and rear bottom sections, front and rear longitudinal partition sections having cut-away portions adjacent said cross partitions, hooks on said longitudinal partition sections extending across the plane of said cross partitions when the latter are in erect position, and shoulders on said cross partitions engaging the under side of said hooks when the cross partitions are in erect position, said cross partitions extending beyond said cut-away portions of the longitudinal partition sections to maintain the latter in contiguous relation, and said bottom sections having openings adjacent the lower portion of said longitudinal partition sections.

2. A carton, comprising front and rear walls, cross partitions hinged to the upper portion of said walls, front and rear bottom sections, and front and rear longitudinal partition sections connected to the inner edges of said bottom sections and being connected to said cross partitions, said bottom sections having openings adjacent their edges to which the longitudinal partition sections are connected.

3. A carton, comprising front and rear walls, cross partitions hinged to the upper portion of said walls, front and rear bottom sections and front and rear longitudinal partition sections having means for engagement with the cross partitions, the widths of said front and rear walls below the points to which the cross partitions are attached plus the width of the cross partitions being equal to the widths of the front and rear bottom sections plus the widths of the front and rear longitudinal partition sections, and said bottom sections having openings adjacent the lower portion of said longitudinal partition sections.

4. A carton, comprising a blank cut, scored and folded to form a rear wall, a rear bottom section inclined upwardly toward the center of the carton, a rear longitudinal partition section, a front wall, cross partitions hinged to the top of the front wall, an attaching strip hinged to the opposite side of said cross partitions and being secured to said rear wall, said longitudinal partition sections having cut-away portion adjacent said cross partitions, hooks on said longitudinal partition sections extending across the plane of said cross partitions when the latter are in vertical position, shoulders on said cross partitions engaging the under side of said hooks when the cross partitions are in erect position, and means on said cross partitions for maintaining said longitudinal partition sections in contiguous relation, said bottom sections having openings adjacent the lower portion of said longitudinal partition sections, and the widths of said front and rear walls below the points at which said cross partitions are hinged thereto plus the width of said cross partitions being equal to the widths of said bottom sections plus the widths of said longitudinal partition sections.

5. A carton of the type described, comprising front and rear walls, cross partitions hinged to the upper portion of said walls, front and rear bottom sections, front and rear longitudinal partition sections connected to the inner edges of said bottom sections, said bottom sections having openings adjacent their edges to which the longitudinal partition sections are connected, and said carton being collapsed along the central portion of the cross partitions and the inner edges of the bottom sections.

MARTIN BURGER.