

(No Model.)

3 Sheets—Sheet 1.

F. B. DAVIDSON.
CARTON.

No. 533,638.

Patented Feb. 5, 1895.

Fig. 4. B'

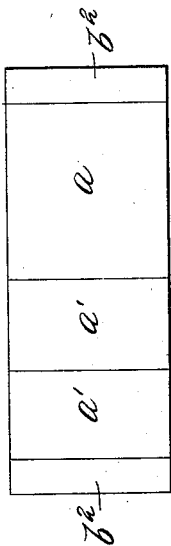
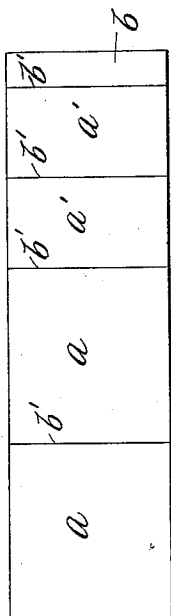


Fig. 3. B



Witnesses.

Wm. M. Rheum
Wm. F. Lanning

Fig. 2.

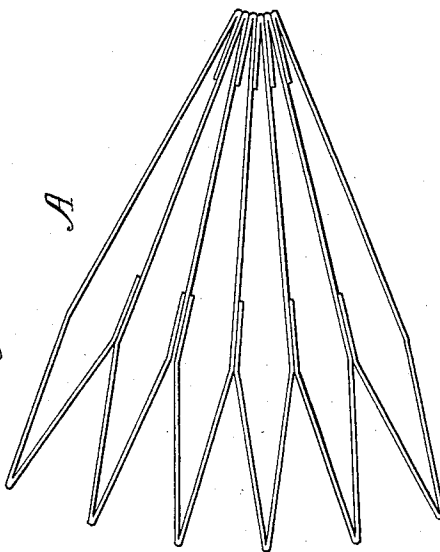
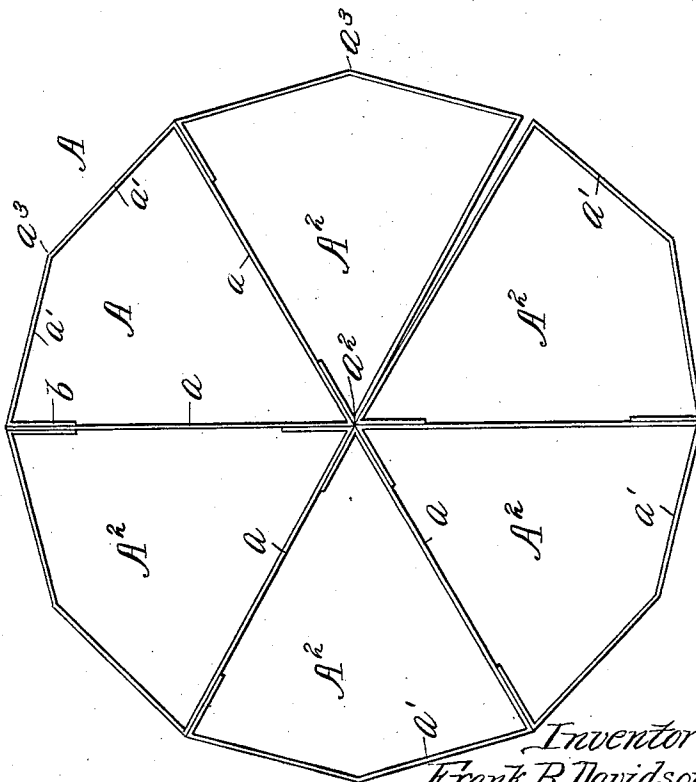


Fig. 1.



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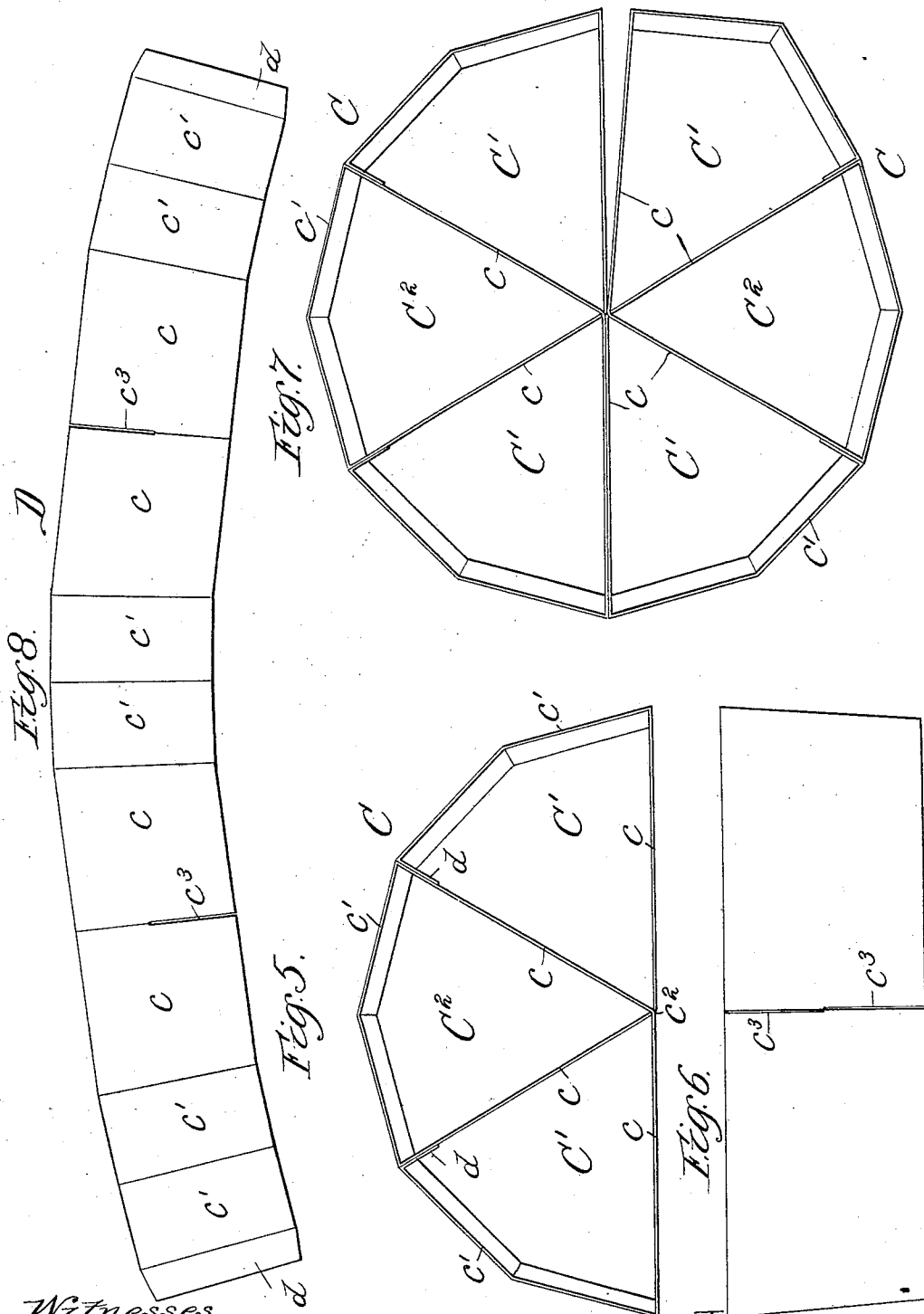
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3 Sheets—Sheet 2.

F. B. DAVIDSON.
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Patented Feb. 5, 1895.



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Wm. M. Rheem
Wm. J. Fleming

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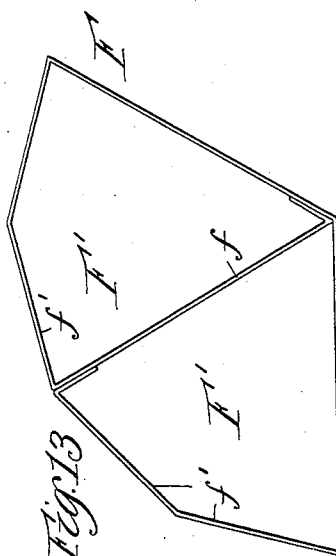
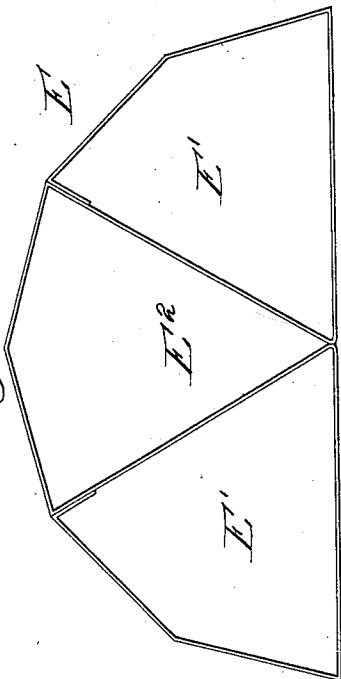
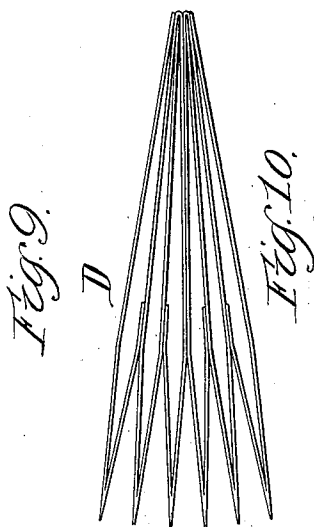
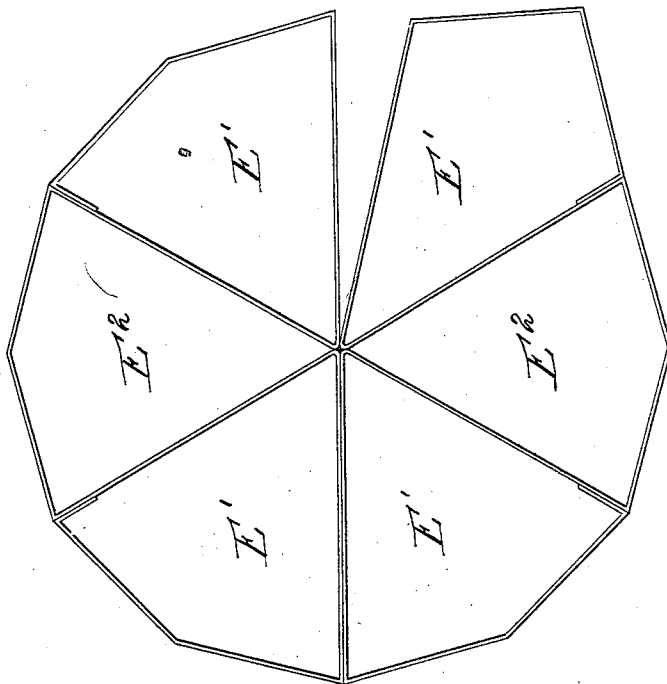
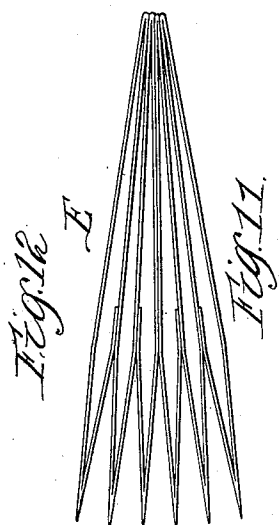
(No Model.)

3 Sheets—Sheet 3.

F. B. DAVIDSON.
CARTON.

No. 533,638.

Patented Feb. 5, 1895.



Witnesses.

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UNITED STATES PATENT OFFICE.

FRANK B. DAVIDSON, OF CHICAGO, ILLINOIS.

CARTON.

SPECIFICATION forming part of Letters Patent No. 533,638, dated February 5, 1895.

Application filed September 5, 1894. Serial No. 522,158. (No model.)

To all whom it may concern:

Be it known that I, FRANK B. DAVIDSON, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Cartons; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in paper or straw board cartons for use in packing candy and other articles in barrels, pails, or other receptacles of circular cross-section.

The object of the invention is to provide an improved construction in devices of the character referred to, and it consists in the matters hereinafter set forth and particularly pointed out in the appended claims.

A carton embodying my invention is composed of sector shaped cells or compartments which are formed by a plurality of radius walls arranged to radiate from a common apex or center, and arc walls which connect the radius walls and are provided in pairs of equal and similar sections adapted to fold upon their lines of juncture with each other simultaneously with the folding of the radius walls about their apexes, so that the carton as a whole may be collapsed or folded flat for transportation or storage.

In the accompanying drawings, Figure 1 is a top plan view of an extended carton constructed in accordance with my invention. Fig. 2 is a similar view of the same when partially collapsed. Figs. 3 and 4 show the construction of the blanks from which the carton is formed. Fig. 5 is a top plan view of a sector shaped carton somewhat modified in construction from that previously shown. Fig. 6 is a side elevation thereof. Fig. 7 is a top plan view of a double carton formed by connecting together two of the cartons shown in Figs. 5 and 6. Fig. 8 illustrates the blank from which the modified carton is formed. Fig. 9 shows the carton as it appears when partially collapsed. Figs. 10, 11, and 12 illustrate a still different construction embodying the same general principles. Fig. 13 is a top plan view of a carton having but two cells.

In said drawings (Figs. 1 to 4), A designates the carton as a whole, and A' A² the sector

shaped cells or compartments into which it is divided. One of said cells, the cell A' in this instance, is complete in itself, being formed from an elongated strip or blank B the ends of which are brought together and secured to each other by means of a paste strip b, or otherwise as desired. Said blank is folded upon suitable transverse score lines b' which divide it into four sections a a' a'. Of these the sections a a are equal and similar to each other and form the radius walls of the sector shaped cell, while the sections a' a' form the arc walls of the cell and are also made equal and similar to each other, but will ordinarily be of considerably less length than the radius walls a a. In any case, however, the combined length of one radius wall and its adjoining arc will obviously be exactly equal to the length of the other radius wall and its adjoining arc wall. Consequently, the cell is free to be collapsed or flattened by the folding together of the radius walls about their apex a² and of the arc walls about their juncture a³ until the two walls forming each pair are brought into contact with each other, whereupon the cell will lie perfectly flat and will occupy the least possible space in storage and transportation.

The second cell or compartment A² is built upon the primary cell A', thus described, by the attachment thereto of a second blank B', which is provided at its opposite ends with paste strips B², said strips being secured to the exterior surface of one of the radius walls a of the primary cell at the opposite ends thereof. The blank B' is also folded upon score lines b' which divide it into three sections a' a' a' which are exactly like the correspondingly lettered sections of the blank B and which form the outer radius wall and the two arc walls respectively of the new cell, its other radius wall being formed by the wall of the primary cell to which the blank B' is secured.

Other cells A² may be provided in the same manner as the second cell, above described, by the attachment of additional blanks B' to the cells previously formed, and in this way a carton comprising any desired number of compartments may be constructed. Such carton, as a whole, as well as each cell or compartment thereof, will obviously be of sector

shape and will cover or include more or less of a complete circular area according to the number of cells assembled and the size of the apex angle of each, a convenient and usual construction being that in which a single carton comprises an entire circle and will constitute one complete layer in the circular receptacle in which it is packed.

As herein shown, the cells A' A^2 are six in number, each having an apex angle of sixty degrees. When extended, therefore, the outer radius walls of the two end compartments will be brought into contact with each other, and the center angle as a whole will comprise three hundred and sixty degrees, or a complete circumference. Other numbers of cells of different apex angles might, however, be employed, and cartons embracing but a semi-circle, more or less, may be constructed if desired. In any case, however, each of the several cells may obviously be collapsed in the same manner as the primary cell, so that no matter what the size of the carton or the number of cells included therein it might be collapsed or folded flat for storage and transportation.

In Figs. 5 to 13 inclusive I have shown a construction somewhat modified from that heretofore described, in which a carton embodying my invention in another form is made from a single strip or blank of uniform width by folding the same in such manner as to form two or three cells which are substantially sector shaped in cross-section, and are so proportioned that when arranged with their apexes at a common center two or more of the cartons will exactly cover a complete circular area, and form one horizontal layer or zone in the pail or barrel for which they are intended, and which at the same time are so constructed as to be capable of being folded or collapsed in substantially the same manner as the cartons previously described. Preferably in this construction also the blank will be so folded as to form cells having an angle of sixty degrees at their apex, in which case two of the three cell cartons or three of the two cell cartons obviously occupy a complete circle, and by pasting or otherwise securing such requisite number of cartons together the several cells occupying one horizontal layer may in this case be provided in what will practically amount to a single carton.

As shown in Figs. 5 to 9, C designates a three celled carton formed by folding a single strip or blank D so as to bring its extremity at the juncture of the interior radius sides c c with their adjoining arc sides c' c' . The opposite end portions of the blank form the arc sides of the two outer cells C' , and the outer radius sides of said cells are each made continuous with the arc sides which adjoin them. At the apex c^2 of the carton the meeting portions of the blank are made to cross each other by means of slits c^3 , one of which extends half way across the strip starting at its lower edge, while the other extends half way

across the strip starting at its upper edge, the unsevered portion of the blank or strip opposite each slit being inserted in the opposite slit, as shown in Fig. 6. Each of the interior radius walls is therefore continuous with the remote exterior radius wall, but both of said interior radius walls are continuous with the arc walls which connect them and which obviously constitute the central portion of the blank.

In folding the blank to form the carton it is first looped at its middle portion to form the middle cell or compartment C^2 , its end portions being carried by each other far enough to permit their being crossed at the slits c^3 . Said end portions are then separately bent around to form the end cells C' C' and are attached to the outer ends of the interior radius walls c c by means of paste strips d which are provided on the extremities of the blank. Preferably, and as herein shown, each of the cells of a carton of this construction is made to include an apex angle of sixty degrees so that the entire carton is of semicircular shape and two of them only are required to fill one horizontal layer of the pail or barrel for which they are adapted. Accordingly, they may be conveniently provided in pairs, pasted or otherwise secured together along two of their exterior radius walls, as shown in Fig. 7 one such carton then serving to form a complete layer in the receptacle. A carton of this construction may obviously be collapsed or folded flat in exactly the same manner as the circular carton first described. The carton in this instance illustrated in Figs. 5 to 9 is designed for use in a receptacle which is slightly conical in form, or of greater diameter in one part than another, as for example, an ordinary bucket or pail; and to this end it is made slightly flaring or larger at its upper than at its lower end so as to conform more closely to the outline of such receptacle. The radius walls in this case will obviously be of slightly trapezoidal shape and the arc walls of slightly tapered shape, the blank D being somewhat curved or arc shaped in its general outline. Obviously, however, when designed for use in a perfectly cylindrical vessel all of the walls will be of rectangular form and the top and bottom of the carton will be of equal size. On the other hand, any of the other cartons shown may be made flaring to fit within receptacles of conical shape, if so desired.

The carton E, shown in Figs. 10, 11, and 12, is formed by folding a single blank, substantially similar to the blank D, in a slightly different manner to that employed in forming the carton C. In this case, the end portions of the blank are each looped to form an end compartment or cell E' , which are connected by the central portion of the blank. The apexes of the two end cells E' are then brought together and the space inclosed between their adjacent radius walls and said central portion of the blank forms, in effect, the central

cell or compartment E². A double carton of this form also may be provided by pasting together two single cartons, as shown in Fig. 11.

11. Such double carton will obviously serve to form one complete layer in the receptacle, and may be collapsed or folded flat in the same manner as the previous construction. Its several cells, with the exception of the two whose radius walls are pasted together, will obviously not be attached at the common apex, but the wall of the surrounding receptacle will maintain the carton in shape after it has been placed therein.

In Fig. 13 I have illustrated the manner in which a two celled carton F may be formed from a single blank, the extremities of the blank in this instance occurring, one at the apex of its two cells F' and the other at the juncture of its interior radius wall f with its adjoining arc wall f'. Three such cartons with sixty degree cells would obviously cover an entirely circular area and might be pasted together in the same general manner as the cartons illustrated in Figs. 7 and 11.

It will be understood that in Figs. 1, 7, and 11 the adjoining walls of the two end cartons have been left slightly separated for the purpose of better illustrating the construction, although in practice they will be brought into contact. Similarly in Figs. 2, 9, and 12 the several cartons have been shown only partially collapsed for the same reason, although obviously capable of being entirely collapsed and flattened for transportation and storage, as hereinbefore set forth. It will also be understood that the term "sector shaped," as herein applied to the form in cross-section of the cartons and cells, is not used in its accurate geometrical sense as comprising an area including an arc and two radii of a circle, but is employed in a more general sense as the term which most nearly expresses the shape in cross-section of a carton in which the convex wall is formed by a plurality of plane surfaces which approximate to the theoretical curve of such wall sufficiently close for practical purposes, it being obvious that the curved wall required in the construction of a theoretically perfect sector-shaped carton would be difficult to manufacture and would necessarily be distorted when the carton was collapsed or folded flat.

The cartons constructed as herein described have the obvious advantage over cartons heretofore made for the same purpose, of requiring a minimum amount of time or labor in opening or expanding them into condition for use and placing them in the pail or receptacle. When "knock-down" cartons of box form have been employed, of which a number are needed to make a single layer, each carton must be separately set up and thereafter packed one by one in the pail, an operation which requires a considerable amount of time. In the use of other cartons containing a plurality of cells the cartons have been so made that it is necessary to connect a number of different

parts or flaps in order to set up the carton in form for use. In a carton constructed as herein proposed no manipulation of the parts to form separate cells is necessary, but, on the contrary, the carton being itself complete in its knock-down or flat form, all that is needed to open or expand it to its fullest extent is to spread apart its ends in order to prepare it for insertion in the pail, this being an operation requiring but an instant of time for its completion.

I claim as my invention—

1. A carton, comprising a plurality of partition walls radiating from a common apex and flexibly connected with each other at such apex, and arc walls, two of which are permanently connected with one of the radial walls, substantially as described.

2. A carton, comprising a plurality of partition walls radiating from a common apex and flexibly connected with each other at such apex, and exterior walls connected with the radial walls and provided with intermediate folds or creases between the radial walls, whereby the carton may be folded into flat form for transportation, substantially as described.

3. A collapsible, sector shaped carton, comprising a plurality of partition walls radiating from a common apex at which they are flexibly connected with each other, and exterior or arc walls connected with the radial walls and provided with central folds or creases, each of the radial walls consisting of a single thickness of straw-board or the like, and the arc walls being permanently secured to the outer margins of the radial walls, substantially as described.

4. A collapsible sector shaped carton, comprising a plurality of cells, one of which is formed by securing together the opposite ends of a blank, and the other or others of which are provided by securing the opposite ends of an additional blank or blanks to the cell or cells previously formed, all of the blanks being so folded as to provide radius walls arranged to radiate from a common apex, and arc walls provided in pairs connecting the outer edges of said radius walls and adapted to fold upon their line of juncture when the radius walls are folded about their apex, substantially as described.

5. A collapsible circular carton, comprising a plurality of partition walls radiating from a common apex and flexibly connected with each other at such apex, and arc walls connected with the outer margins of the radial walls and provided with central folds or creases, the arc walls being of such length that when extended they will form a complete circle and give circular form to the carton, substantially as described.

6. A sector shaped box or carton comprising a sector shaped cell formed by connecting the opposite ends of a blank and folding the latter to form two equal and similar radius walls connected to form an apex, and two

equal and similar arc walls connecting the
outer ends of said radius walls, and an addi-
tional cell or cells provided by securing the
opposite ends of another blank to the radius
5 wall of a cell previously formed, such other
blank being folded to form a radius side ra-
diating from the apex of the first cell, and
two equal and similar arc sides connecting the
outer ends of said radius side with the outer
10 end of the adjacent radius wall of the first
cell, the arc walls of all the cells being adapted

to be folded together about their lines of
juncture when the radius sides are folded
about their apex, substantially as described.

In testimony that I claim the foregoing as 15
my invention I affix my signature in presence
of two witnesses.

FRANK B. DAVIDSON.

Witnesses.

TAYLOR E. BROWN,
WM. S. HALL.