March 27, 1928. 1,664,308

K. I. MILLER

SHIPPING BOX STRUCTURE

Filed Dec. 16, 1926 2 Sheets-Sheet 1

Fig. 1

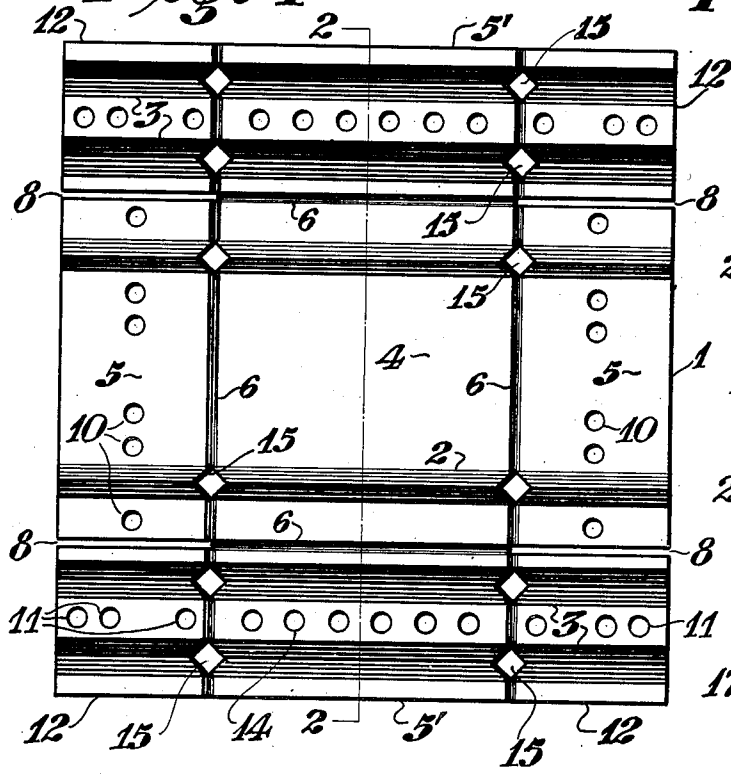


Fig. 2

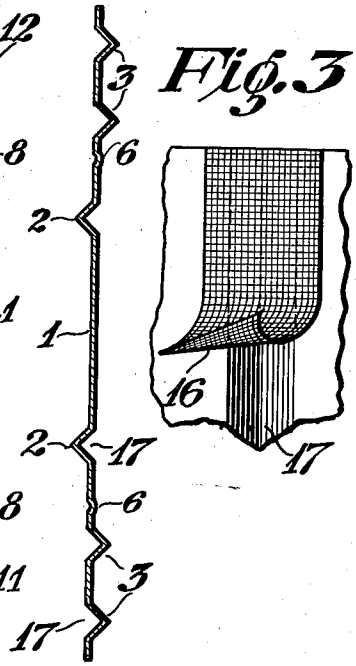
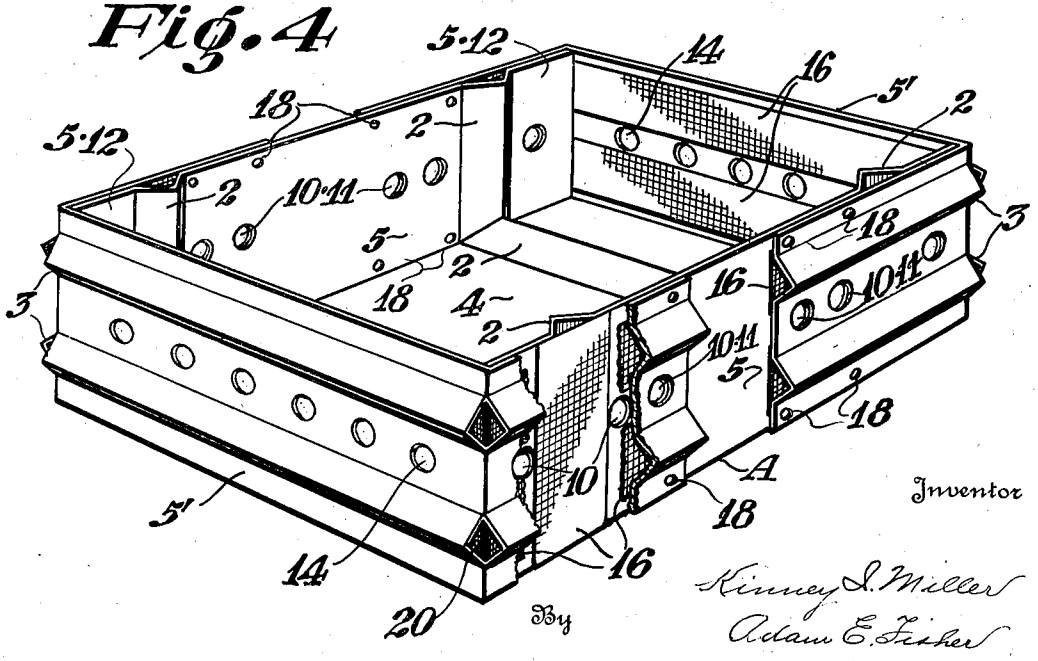


Fig. 3

Fig. 4



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Filed Dec. 16. 1926 2 Sheets-Sheet 2

Fig. 5

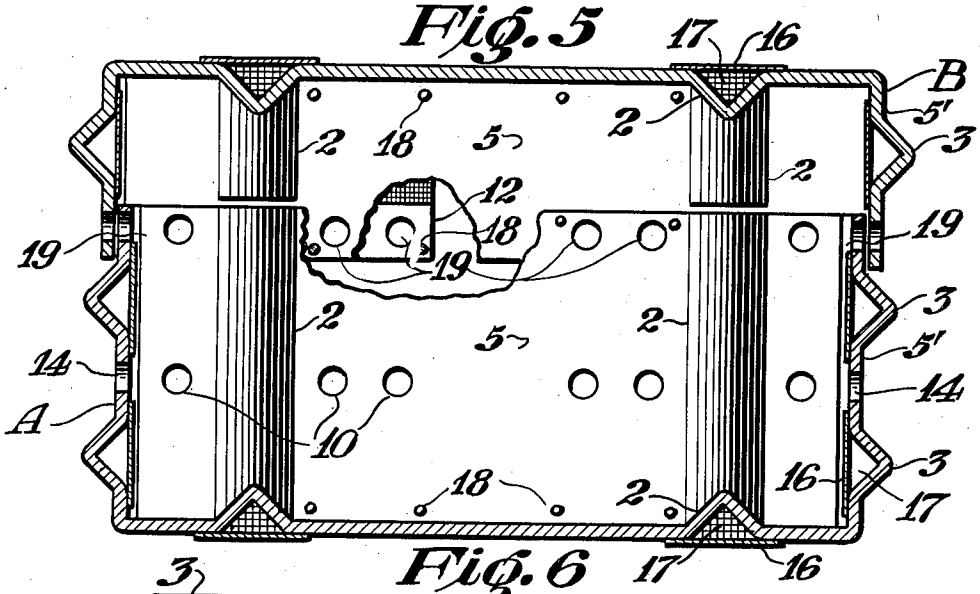
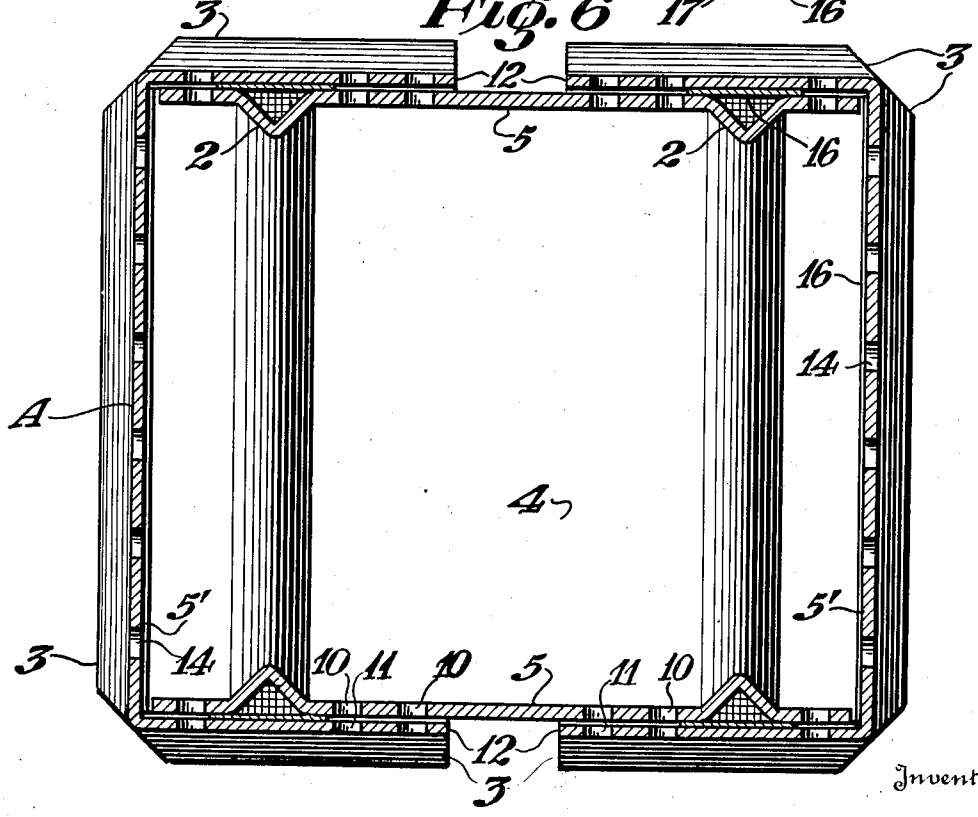


Fig. 6



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UNITED STATES PATENT OFFICE.

KINNEY I. MILLER, OF LANCASTER, MISSOURI.

SHIPPING-BOX STRUCTURE.

Application filed December 16, 1926. Serial No. 155,177.

This invention pertains to the manufacture of shipping boxes, such as are ordinarily made of strawboard or the like. As now made these boxes are usually stamped out in the form of blanks, with the side, end and corner parts properly cut and formed, and are shipped to the users "knocked down", and the user then sets them up. These strawboard boxes are used by shippers for a variety of purposes, some of these purposes requiring a ventilated box, as in the shipment of live baby chicks, birds, rabbits and certain kinds of merchandise stocks. It is also necessary that the boxes be constructed as light as possible in order to lessen transportation charges, and at the same time strong enough to withstand the crushing effect of piling them in tiers in a car. In boxes as now made and in the smaller sizes, the item of ventilation is partially cared for in the stamping out of the blanks, by cutting out air vents or ports in those portions of the blank which are intended to form the top, and certain of the sides of the completed box, that is to say, those two opposite sides which are to remain of a single thickness of material when the box is completed. In these smaller blanks air ports are not cut in the other two sides for the reason that they would be covered up anyway by the double folds of overlapping material upon those sides when the box is "set up". In the larger sized boxes, however, ports are generally cut upon all four sides of the blank. Ventilation ports, however, should be provided through all four sides of all sized boxes, the small ones as well as the large. Not only this, but cooperating means should be provided to keep the boxes slightly spaced apart when piled in tiers in a car, so that the air may find a way between them and into the boxes, where the contents of the boxes require air or ventilation. Provision should be made so that the matter of thorough ventilation is automatically taken care of, no matter how the boxes are piled together.

Conventionally, the item of reinforcing and strengthening these strawboard shipping boxes is taken care of by securing wooden slats across the top of the box; but these slats require considerable time to attach and also add considerable to the weight of the box.

The general objects of my invention, therefore, are to provide a method of making an improved strawboard box of the character described and which shall overcome the said objections to conventional forms of boxes; and to provide the improved box itself as a new article of manufacture.

More specifically, the object is to point out a method of making, and to provide a strawboard shipping box having integrally formed ribs or bosses which shall serve both to strengthen the box and to hold the boxes spaced apart when piled in tiers so that air may pass between them for ventilating the contents of the boxes, and to provide cooperating air vents at all sides of the box.

In the drawing, which represents a relatively small sized box,

Figure 1 is a plan view of a strawboard blank, stamped and cut as required for making up the body of my box; the portions intended for forming the sides and strengthening ribs being indicated in solid lines; and the proposed ventilation apertures through the double folds of material at two opposite sides, as well as the conventional ventilation apertures through the other two sides, being also indicated in solid lines;

Figure 2 is a section upon the line 2—2 of Figure 1;

Figure 3 is a detail of a strip of reinforcing tape intended for pasting along and over the gaps or openings of the strengthening ribs;

Figure 4 is a perspective view of the body portion of the completed box, a section of one of the overlapping corner folds being cut away to show the arrangement of the elements;

Figure 5 is a vertical section taken through the body portion of a completed box and lid, showing the tape represented in Figure 3 as pasted over the gaps of the reinforcing ribs; sections being cut out of the upper edge of the body portion and the lower edge of the lid portion, to show the arrangement of the elements;

Figure 6 is a horizontal section through the completed box.

The present invention is an improvement upon the structure shown in my copending application, Serial Number 121,588, filed July 10, 1926, on reinforced lids for chick boxes. A complete box constructed in accordance with the present invention includes the body portion A and the lid portion B. In carrying out this invention and for

making the body portion A for example, I take a blank sheet 1 of pasteboard or strawboard stock, or any other suitable light and flexible material, and in any conventional manner, as by the use of a suitable die or dies, I press and form across the sheet 1 a number of spaced strengthening bosses or ribs as shown at 2 and 3, and which are preferably angular or V-shaped in cross section as here shown. Simultaneously, with the formation of the ribs 2 and 3, the conventional bending grooves 6 are pressed in the sheet 1, parallel with the edges of the sheet and spaced sufficiently from the edges to provide and demark a bottom portion 4, side portions 5 and 5′ and corner portions 12. At the same time the conventional corner incisions 8 are made between the side portions 5 and the corner or end portions 12 at opposite sides of the sheet 1 and along the outer ends of the grooves 6, thereby enabling the turning up of the side portions 5 and 5′ and the turning back of the free corner portions 12. As shown in the structure as represented in the accompanying drawing, the ribs or bosses 2 are formed across and are confined to the bottom portion 4 of the sheet 1 and the two opposite side portions 5 thereof, and these ribs are all adapted to protrude inwardly of the completed box. On the other hand, the ribs 3 are formed across and confined to the other two and opposite side portions 5′ and the corner end portions 12, and extend parallel to the ribs 2; and the ribs 3 are all adapted to protrude outwardly of the completed box. The purpose of this arrangement of the ribs will presently appear.

Ventilation apertures 10 and 11 are pierced through the side portions 5 of the blank 1 and through the free corner ends 12 formed by the incisions 8, and at opposite sides of the incisions 8, the two sets of apertures being equal in number and arranged in such registering relation that when the side portions 5—5′ are bent up at the grooves 6, and the free corner ends 12 formed by the incisions 8 are bent or folded back upon the adjacent side portions 5, the two sets of apertures 10 and 11 will automatically register with one another to form continuous air vents or ports 10—11 through the doubled corners 5—12 of the box body. As air vents 14 are conventionally provided for the other two sides 5′ of the box, the box is thus equipped for ventilation through all four sides thereof. Rectangular cut-outs 15 are also made transversely through the ribs 2 and 3 at points registering with the grooves 6 to facilitate the bending up of the sides 5—5′ and the bending back of the corner ends 12.

In the preferred method of construction as herein contemplated, the several strengthening ribs 2 and 3, grooves 6, incisions 8, apertures 10 and 11, and cut-outs 15 are all formed and cut at a single operation of the dies or other tools, although of course this is not absolutely essential; after which strips of reinforcing tape 16 are next pasted along over the gaps 17 of the said ribs 2 and 3. The side portions 5 and 5′ are then turned perpendicularly to the bottom portion 4, the said free ends 12 are folded back upon the adjacent side portions 5 to form the doubled corners 5—12 with the apertures 10 and 11 in register, and the corner ends 12 are then stapled or otherwise fastened to the said side portions 5 as shown at 18, thus completing the body portion A of the box.

The lid portion B is constructed similarly and somewhat wider so as to fit over the body portion A. It is not thought necessary to provide air vents into the box through the doubled corners of the lid, but this may be easily done if desired, by likewise forming the single and doubled corner portions of the lid blank with registering air vents in manner similar to the formation of the air vents of the body blank 1, and in addition stamping air ports or vents in the body blank 1 which will register with the said vents of the lid, in the completed box, as shown at 19 in Figure 5. By using a perforated or web form of tape 16, as shown in the drawing, additional ventilation is afforded into the box through the open or spread corners 20 of the outwardly protruding ribs 3.

Owing to the reversed direction of the ribs 2 and 3, there is no interference between them when the box is "set up". The inwardly projecting ribs 2 also serve to additionally strengthen the box as a whole when "set up". This strengthening function of the ribs 2 is especially apparent in respect of the upturned portions of the ribs 2 extended transversely of the side portions 5 of the completed box, as clearly shown in Figures 4 and 5. It will be noted from an inspection of the drawing that upon the side portions of the completed box, the inwardly turned ribs 2 running in one direction are perpendicularly crossed by the outwardly turned ribs 3 running in an opposite direction. Inasmuch as these overlapped portions of the box are fastened together, the result is a very strong structure. It is also apparent that in order to form the ribs 2 at all, the same must be extended clear across the blank 1, as otherwise the blank would be torn. The portions of the ribs 2 extending across the bottom portion of the completed box, likewise serve as strengthening elements for the box as a whole. Boxes constructed in accordance with the method here pointed out are sufficiently strong for the purposes required and described, are light in weight, are provided with air or ventilation ports at all four sides of the box, and the outwardly

protruding ribs 3 cooperate to prevent the jamming of the boxes closely together when piled in tiers, so as to exclude air entering through the air ports at the contacting sides of the boxes. In other words, no matter how the boxes are piled or faced, they are held spaced apart, and provision is made for ventilation at all sides.

While I have herein described a certain procedure and order of steps, in the stated method of making the said box, and have described the said box itself as being constructed in a particular way, it is understood that I may vary the said method and procedure of construction, and may construct the box itself with minor changes and variations, not departing from the spirit of my invention as defined in the appended claims.

I claim:

1. A strawboard box blank having integrally formed strengthening bosses protruding at one side across the bottom portion and two opposite connected side portions, and having similar bosses protruding at the opposite side of the blank across the two remaining opposite connected side portions and connected corner portions, all of the said bosses running parallel with one another.

2. A strawboard box blank having integrally formed strengthening bosses protruding at one side across the bottom portion and two opposite connected side portions, and having similar and parallel bosses protruding at the opposite side of the blank across the two remaining opposite connected side portions and connected corner portions, all of the said bosses running parallel and means for reinforcing the said bosses against crushing under pressure.

3. As an article of manufacture, a rectangular sheet of flexible material adapted for forming a box, the same having integrally formed strengthening ribs upon those portions intended for two opposite sides and connected corner portions of the box, the said ribs being extended parallel to the lines demarking the said side portions from the bottom portion of the box, and being intended to protrude outwardly of the completed box, and reinforcing tape secured over the gaps of the said ribs.

4. As an article of manufacture, a rectangular sheet of flexible material adapted for forming a box, the same having integrally formed strengthening ribs upon those portions of the sheet intended for two opposite sides and the connected foldable corner portions of the box, the said ribs being extended parallel to the lines demarking the said two opposite side portions from the bottom portion, and being adapted to protrude outwardly of the completed box.

5. As an article of manufacture, a rectangular sheet of flexible material adapted for forming a box, the same having integrally formed strengthening ribs upon those portions of the sheet intended to serve for the bottom and two of the opposite sides of the completed box, the said ribs all running parallel from end to end of the sheet and being adapted to protrude inwardly of the box and so that the ribs for the two said opposite side portions of the completed box will stand perpendicular to the ribs of the bottom portion when the box is set up; the said sheet having also similar ribs upon those portions intended to serve for the two remaining and opposite side portions and the connected and foldable corner portions of the completed box, these said ribs running also parallel with the first mentioned set of ribs and being adapted to protrude outwardly of the completed box, with the ribs of the corner portions extending athwart the ribs of the said side portions.

6. A strawboard box having integral, inwardly protruding ribs across the bottom and two of the opposite sides, the planes of the said ribs being all parallel and perpendicular to the bottom of the box; and integral, outwardly protruding ribs upon the two remaining opposite sides and the connected overlapping corner portions, the planes of the latter ribs being all parallel with each other and with the bottom of the box.

In testimony whereof I affix my signature.

KINNEY I. MILLER.