June 11, 1929. A. E. CRANSTON 1,716,767

BOX WALL FORMING INTEGER

Filed Dec. 24, 1927

Fig. 1

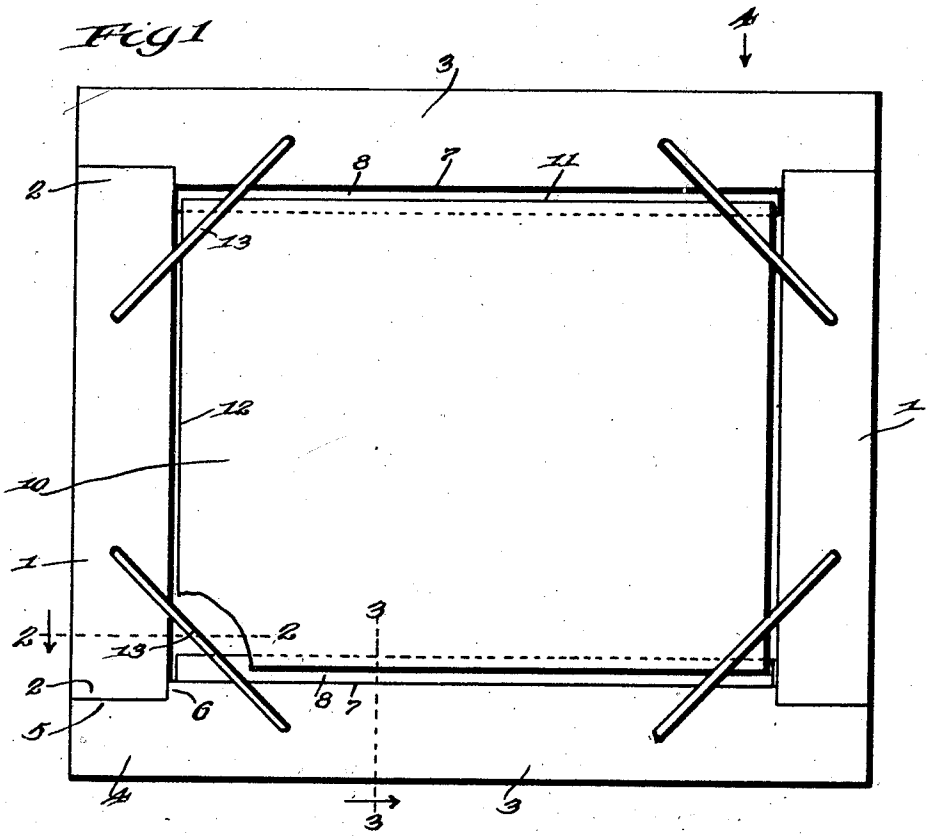


Fig. 2.

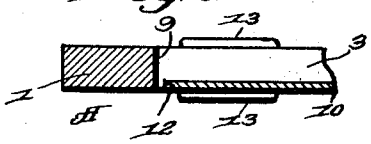


Fig. 4.

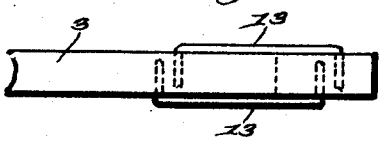
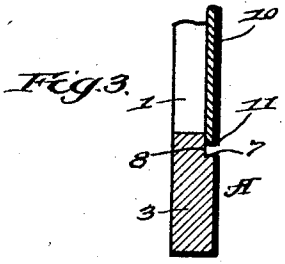


Fig. 3.



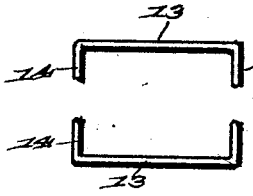


Fig. 5.

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UNITED STATES PATENT OFFICE.

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BOX-WALL-FORMING INTEGER.

Application filed December 24, 1927. Serial No. 242,400.

The object of this invention is to provide an improved box integer from a plurality of which any or all of the wall portions of a box may be formed.

The device of my invention is especially designed and adapted for the construction of fruit and any kind of shipping box where economy of cost and lightness of weight are important.

One of the features of this invention is to provide a box wall forming integer composed of a frame and a panel, and wherein the frame is primarily relied upon to take the load and wherein the panel is primarily a closure for the frame.

A special feature of my invention resides in novel means for rigidly uniting the bars, composing the frame, into a rigid frame structure, and also functioning to retain the panel in assembled relation with the frame.

A further feature consists in a novel frame structure provided with means for floatingly holding the panel in position, thereby not only avoiding the necessity of specifically fastening the panel but also permitting the latter to be set in place with sufficient clearance so that shrinkage or swelling of the panel can take place without rendering the latter defective in the performance of its function, as a closure.

An important feature consists in the novel construction whereby one set of bars may be made of uniform cross section throughout their length, and whereby necessary alterations of cross section are wholly confined to the remaining set of bars.

My invention has many other features and objects which will be more fully described in connection with the accompanying drawing and which will be more particularly pointed out in and by the appended claims.

In the drawing:

Fig. 1, is a view in side elevation of an integer showing the most improved form of my invention.

Fig. 2, is a sectional view on line 2—2 of Fig. 1.

Fig. 3, is a sectional view on line 3—3 of Fig. 1.

Fig. 4, is a top plan view looking in the direction of arrow 4, of Fig. 1.

Fig. 5, is a view of the clip means detached from the integer.

Like characters of reference designate similar parts throughout the different figures of the drawing.

As shown, my improved integer includes a frame which is made up of what I will arbitrarily designate as frame and panel bars, although this is a designation primarily adopted for convenience in facilitating a clear description of the frame because as a matter of fact, all the bars are frame bars. However, in this specific form of the invention, I have shown a set or pair of frame bars 1, disposed in parallel relation and having each a cross section which is uniform throughout the length thereof. The ends 2, of said bars are adapted to act as tenons, as will presently be described.

The remaining set or pair of bars, which I will term the panel bars, are designated at 3, and while they are shown to be of greater length than the frame bars 1, this is a mere incident, as in many cases, the two sets of bars may be of the same length, or may vary widely in length. The ends 4, of bars 3, are mortised at 5 and 6 in a manner to receive the tenon ends 2 and form a shouldered engagement, as clearly shown. It may be stated that this mortised reduction of bars 3, is uniform across the thickness thereof thereby greatly simplifying the operation as compared to converging or other tapered forms of mortise and hence avoiding the necessity of carefully shaped parts. As thus far described, there would be nothing to hold the bars 1 and 3, in a single plane in which they are shown disposed, and the device, as thus far described, is clearly an open frame. It is now informative to state that while the frame bars 1 and 3, are relatively narrow in width and relatively slight in thickness, thereby enabling me to make them of trims and edgings, still, they are relatively heavy as compared to the balance of the integer and are designed to take all the load and strain.

I will next describe the means and manner in which I close this open frame and in order to do this, I will revert to certain features of the frame that pertain to this phase of the invention.

The inner edges of bars 3, are shown to be laterally recessed inwardly from what I will term the panel side A, assuming that there is not a double panel. This recess, which is formed on both bars 3, consists of a shoulder 7 and an abutting wall 8, the two forming what might be termed a panel seat. It is a feature of the invention to make this seat only deep enough to substantially correspond to the thickness of the closure used, and fur-

ther, these panel seats only extend between the mortises, or specifically, the shoulders 6, thereof. The inside edges 9, of bars 1, are not in any way modified, as will be seen by reference to Fig. 2.

As a closure for the open frame, I employ a panel 10, which in practice, may be a very thin sheet of veneer that is not designed to take any major stress or strain and is merely capable of forming a closure and sustaining such bulging stresses as the contents may impose. When this closure is of wood, or any material that shrinks or swells, the construction is preferably arranged so that the grain terminating ends 11 will engage the panel seats, it being understood that the grain runs vertically of the panel shown and toward the ends 11. I also cut the panel 10 so that a material clearance will be present between the ends 11, and the shoulders 7, of the panel seats thereby making full allowance for swelling of a wood panel without permitting the same to bulge, the end clearance shown preventing bulging. The side edges 12, which are disposed abreast of the inner edges 9 of bars 1, need not have as much clearance but a slight clearance is afforded to take ample care of such lateral swelling as may occur. It will be noted that the panel 10 fits flush with the panel side of the frame and that the panel is freely set in the frame and is not anchored or in any way rigidly secured thereto but is merely laterally engaged with and structurally supported in and by the frame.

I will next describe an important feature of my invention which interdependently coacts with the frame forming bars and with the panel, to form a complete structure.

I have shown means for rigidly securing the frame and panel bars in frame forming relation, and as shown, said means is in the form of devices for each corner of the frame and as all of said devices are alike in structure and function, only one need be described in detail. Referring to Fig. 5, said devices are in the form of U-shaped staples or clips each having a bight 13 and inwardly bent stapling ends 14. While the frame is under compression in such a manner as to very tightly hold the bars in the position shown in Fig. 1, a staple clip is driven into both sides of each corner of the frame with the stapling ends 14 of opposed clips out of alinement, as shown in Fig. 4. When collapsing pressure on the frame is released, the bar members thereof recoil and hence the clips are under tension. However, even if the frame subsequently shrinks, the clips on opposite sides thereof will hold the frame rigid as the bights 13 have relatively extensive engagement with the sides of the bars, as clearly shown in Fig. 4. Furthermore, this elongated engagement of the bights 13 with the bars 1 and 3, functions most effectively to hold the bars against displacement from a single plane. It will also be noted that the clips extend diagonally across the corners of the frame thereby holding the mortised and tenon ends in firm engagement.

Preferably before the clips are attached, the panel 10 is disposed in the frame as shown in Fig. 1. Now it is a feature of this invention to so dispose the clips that the bights 13, thereof will extend across portions of the panel 10, preferably across corner portions thereof, as shown. Hence, the clips perform the dual function of rigidly connecting the bars in frame forming relation, and also, holding the panel in assembled relation with the frame. Thus it will be seen that I avoid not only the extra operation but also the material necessary to specifically anchor the panel 10 to the frame.

It will now be clear that the panel is floatingly mounted in the frame and that by reason of the end clearance provided, I not only avoid the necessity and expense of cutting the veneer to accurate lengths, but I can use veneer successfully irrespective of shrinkage or swelling either longitudinally or laterally. Where the panel is made of non-shrinkable material such as card-board, it may be fitted more snugly, even tightly, in the frame, although the function and interdependence of the parts would still be present as in either case, the panel would be frictionally held in assembled relation with the frame.

By means of this construction, I can use material for the frame of a very narrow width and a very slight thickness and still make a frame that is capable of taking all the major stresses. By reason of the fact that the panel is desirably flush with one side face of the frame, the bights 13 serve to engage and hold the panel so close to the recessed portions 8, that a very compact and secure structure is afforded.

Irrespective of the panel, I consider that the frame structure itself, is patentable.

I have termed the device of my invention a box wall forming integer for boxes, and in this connection, I use the term "wall" generically, to include box tops, bottoms, sides, ends and partitions. In some of these integers, especially the partitions, the panel may be duplicated to present flush faces on both sides of the frame.

It will now be clear that by merely making up the integers in the proper sizes, the walls of an entire box, or in other words, an entire box may be made with these integers, the bars thereof forming convenient and stable nailing stock.

It is believed that the device of my invention will be clearly understood from the foregoing description, and while I have herein shown and described one specific form of my invention, I do not wish to be limited thereto except for such limitations as the claims may import.

I claim:

1. In a box wall forming integer, a plurality of endwise abutted bars jointly forming an open frame, a panel closing said frame and being structurally and floatingly supported thereby, and means holding said bars united in frame forming relation and engaging said panel to hold the latter in structural relation with said frame.

2. In a box wall forming integer, a plurality of relatively strong bars disposed to form an open frame and certain of said bars having their inner margins laterally recessed to form a panel receiving portion, a relatively thin panel freely set in said receiving portion, and devices rigidly holding said bars in frame forming relation and laterally engaging said panel to hold the latter in floating relation with said frame.

3. In a box wall forming integer, a plurality of bars in endwise shouldered open frame forming relation and one set of bars being laterally recessed on their inner margins, a panel set in said frame against said recessed margins and closing said frame, and tension clips connecting said bars rigidly in shouldered relation and extending across corner portions of said panel to retain the latter in assembled relation with said frame.

4. In a box wall forming integer, a plurality of bars in shouldered relation jointly forming an open frame and certain of said bars being laterally recessed on one side thereof to a sufficient depth to receive a relatively thin panel, a panel of a thickness to seat in the recessed portion of said bars and fit substantially flush with one face of said frame, clips extending diagonally across the shouldered junctures of said frame on both sides of the latter to hold said bars in rigid frame forming relation, and those clips on the panel side of said frame being located to extend across corner portions of said panel to floatingly and frictionally hold the latter in assembled relation with said frame.

5. In a box wall forming integer, parallel frame and panel bars jointly forming an open frame, said frame bars being of uniform cross section throughout their length and the ends of said bars being adapted to form tenons, said panel bars being mortised at their ends to receive the tenon ends of said frame bars, and said panel bars having their inner edges recessed to form panel seats extending between the mortised ends of said bars, a panel closing said frame and having its grain terminating end edges engaging said panel seats with a shrinking or swelling clearance and the side edges of said panel being in clearance relation abreast of the inside edges of said frame bars, and clips on opposite sides of said frame extending diagonally across the corners thereof and uniting said bars, certain of said clips extending across corner portions of said panel to hold the latter in assembled relation in said seats and with said frame.

In witness whereof, I hereunto affix my signature.

ALBERT EARL CRANSTON.