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G. E. HARRISON

1,967,506

COLLAPSIBLE LUG BOX

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Fig. 1

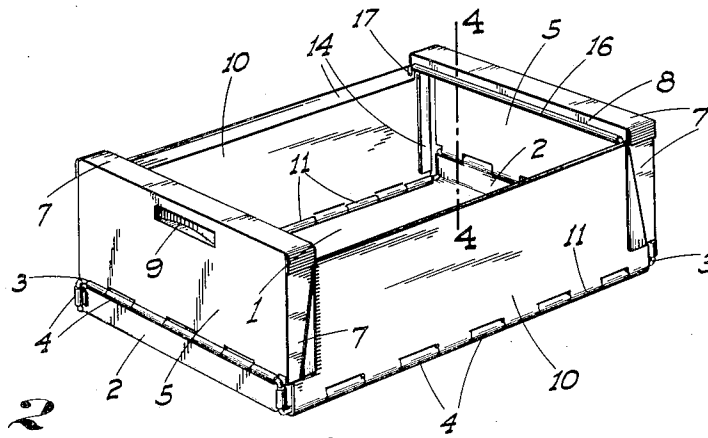


Fig. 2

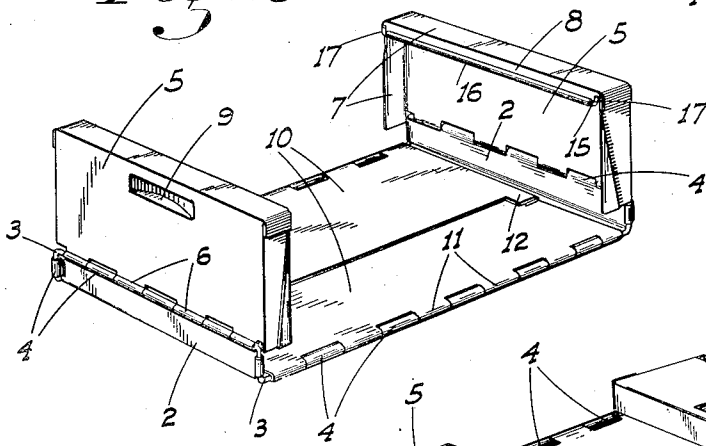


Fig. 3

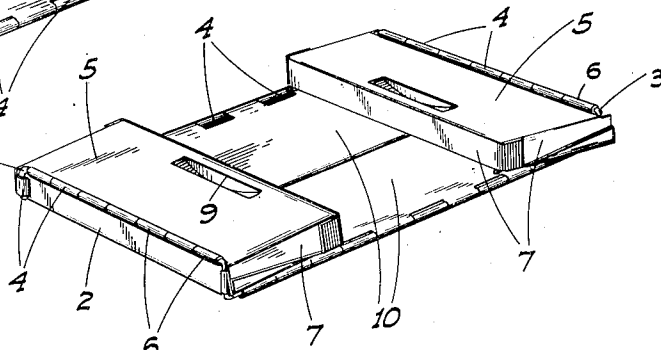


Fig. 4

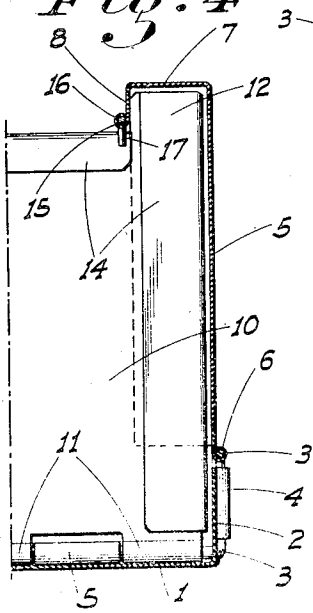
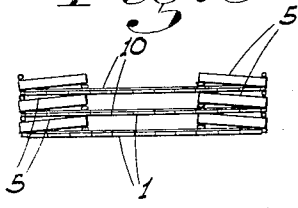


Fig. 5



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COLLAPSIBLE LUG BOX

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5 Claims. (Cl. 220-6)

This invention relates to fruit boxes of the type known in this State and the west generally as "lug boxes", and which are used to convey certain kinds of fruit and vegetables from the orchards and fields to the canneries or to the grading and packing houses. Such boxes at present are made of wood of a fairly heavy and substantial character since they are subjected to hard service and are intended to be used over and over again indefinitely. Boxes of this character however are objectionable and their use disadvantageous for the reason that they are bulky and when empty occupy an excessive amount of space on the truck or other vehicle by which they are returned from the cannery etc. to the orchard. Also, if left lying in the open as they frequently are, they are sometimes stolen by tramps and the like and broken up for fuel or kindling. This, in addition to the natural deterioration of a wooden box, places a somewhat heavy burden for upkeep and overhead expense on the orchardist or other owner of the boxes.

The principal object of my invention is to avoid these objectionable features by providing a box which cannot bend, which is practically non-destructible, and which can be collapsed so as to occupy the minimum of space. The latter feature is especially advantageous in that it permits a great number of boxes to be stacked when empty on a truck etc. without the load reaching to a great height. This in turn permits the truck to be driven between or under the trees in the orchard, and the boxes to be discharged at the points needed. This is something which usually cannot be done with the present type of box since a full load on a truck interferes with the low branches of the trees. The boxes must therefore be discharged at the entrance to the orchard or in some other clear space and carried piecemeal by hand from such point of discharge to the point of use. This is a feature of expense and loss of time in the present operations which I eliminate with my improved box. The difference in size between my box when collapsed or folded and that of the ordinary non-collapsible box is so great that five folded boxes may be placed in the space occupied by one ordinary box.

Another advantage of my box is that while it has ample strength to resist crushing loads, as when a number of loaded boxes are disposed in stacked relation, the walls are so thin that a box having a carrying capacity equal to that of the ordinary wooden box is sufficiently small in external diameter to allow for an extra row of boxes being placed on the floor of a truck of a given

length, thus further increasing the useful load carrying. The box may be quickly and easily opened up to an operative position and as quickly folded. The advantages of the box as above outlined are so great that even if the initial cost is greater the ultimate cost to the owner is less than with the present type of box, since upkeep and loss will be reduced to a minimum and return transportation costs, which are based largely on volume of space occupied are greatly reduced.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawing similar characters of reference indicate corresponding parts in the several views:

Fig. 1 is a perspective view of the box unfolded and ready for use.

Fig. 2 is a similar view showing the sides folded.

Fig. 3 is a similar view showing the box completely folded.

Fig. 4 is a fragmentary longitudinal section taken on the line 4-4 of Fig. 1.

Fig. 5 is a diagrammatic elevation of a number of stacked and folded boxes.

Referring now more particularly to the characters of reference on the drawing, the box comprises a sheet metal bottom 1 formed with short upstanding end walls 2 at its ends. The edges of the members 1 and 2 are bound with a stiff continuous rod 3 secured in place by spaced sleeves 4 formed on said members, so that the latter together with the rod form a very rigid unit.

The ends 5 proper of the box when unfolded project upwardly from the walls 2 and are hingedly connected to the adjacent portions of the rod 3 by sleeves 6 formed on said ends and engaging the rod between the corresponding sleeves 4. This hinge mounting allows the ends to turn from a vertical position to a horizontal position in overhanging relation to the bottom. The ends are formed with flanges 7 along the top and sides to stiffen the same, said flanges projecting inwardly of the box or toward the opposite ends. Each top flange 7 is formed with a short depending flange 8 along its inner edge and which extends from side to side thereof. The width of the flanges 7 approximates the height of the rigid end walls 2 so that when the ends are folded over, with the flanges resting on the parts below, they will lie substantially horizontal. The above construction of the ends provides a relatively wide supporting surface for engagement with the bottom of a superimposed box and gives the ends

the necessary rigidity to withstand collapse from any load likely to be supported. The ends near the top are formed with hand recesses 9 of conventional form whereby the box may be conveniently lifted.

The sides 10 of the box are hingedly connected to the rod 3 along the sides of the bottom by integral sleeves 11 engaging the rod between the corresponding sleeves 4. The height of the sides is such that when unfolded or upstanding the upper edges are substantially aligned with the lower edges of the end flanges 8 as shown in Figs. 1 and 4. The sides extend practically the full length of the bottom between the members 2, so that their end edges are close to the ends 5 when unfolded and in working position. At their ends the sides are provided with relatively small rectangular extensions 12 which project above the top edges of the sides and are of a size to fit between the ends 5 and the adjacent flanges 8, as shown in Fig. 4. The sides are stiffened and reinforced by flanges 13 extending along the side and top edges and formed by bending the metal over so that said edge portions are of double thickness.

By reason of this construction it will be seen that to unfold the box the ends must first be unfolded to a vertical position, as shown in Fig. 2, and the sides may then be successively unfolded so that the extensions 12, with such unfolding, can pass into place between the ends 5 and the flanges 8. As a matter of fact however this unfolding operation of the ends and one side may take place simultaneously, since it is only necessary to pull up on the uppermost one of the folded sides, which movement of course also raises the ends and in so doing causes the extensions 12 to be automatically received in place at the top of the ends. The other side may then of course be similarly raised into position.

The ends cannot then fold down on account of their engagement with the end edges of the sides and of the engagement of the lower edges of the flanges 8 with the top of the sides, nor can they swing beyond a vertical position on account of the engagement of the flanges 8 with the extensions 12. The sides cannot swing outwardly beyond a vertical position on account of their engagement with the side flanges 7 of the ends. To prevent the folding movement of the sides when once they have been raised to a vertical position, I mount rods 15 along the front of the flanges 8 at the bottom, said rods being turnably supported by sleeves 16 formed on said flanges. The rods are a little shorter than the width of the ends 5 and at said ends are formed with right angle bends 17 forming catches adapted to be turned down when the sides are unfolded so as to project inwardly of and below the sides, as shown in Figs. 1 and 4.

To fold the box it is only necessary to turn the catches up, fold the sides down and then fold the ends down and toward each other until they rest on said sides as shown in Fig. 3. The parts are disposed so that when folded the corresponding hinged sleeves 4 and 6 are horizontally aligned with the opposite upper edges of the ends so a box supported thereon has contact with the box below at four points in its length as indicated in Fig. 5.

From the foregoing description it will be readily seen that I have produced such a device as

substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention what I claim as new and useful and desire to secure by Letters Patent is:

1. A folding box comprising a bottom plate, side and end members separately hinged on said plate along its edges for folding and unfolding movement, cooperating means between the end and side members and functioning with the raising of the same to hold the end members against any movement and the side members against outward movement when said members are raised to vertical operating positions, rods turnably mounted on the inner faces of the end members transversely of the box and above the plane of the top of the side members, and catch elements projecting radially from the ends of the rods and adapted to be turned down, after the sides are raised, so as to lie inwardly of and below the top of the side members.

2. A folding box comprising a bottom plate, side and end members separately hinged on said plate along its edges for folding and unfolding movement, flanges along the top and side edges of the end members disposed in facing relation when said members are raised to a vertical position, flanges depending from the outer end of the top flanges and extending to the side flanges, the top edges of the side members when unfolded lying just below said depending flanges, extensions projecting upwardly from the side members at their ends to fit between the depending flanges and the end members, and releasable catches on the end members adapted to be turned down to engage the inner surfaces of the side members at the top and when raised to hold them against folding movement.

3. A structure as in claim 3, in which the bottom plate is formed with upstanding extensions at its ends the height of which approximates the width of the flanges on the end members; the latter being hinged along the upper edges of said extensions.

4. A folding box comprising a bottom plate, side and end members separately hinged on said plate along its edges for folding and unfolding movement, the end members when folded lying in superimposed relation to the side members, extensions on and projecting above the upper edges of the side members at their ends, and flange elements on the end members cooperating with said extensions to hold the end members against any movement and the side members against further unfolding movement, when said members are raised to a vertical position.

5. A folding box comprising a bottom plate, side and end members separately hinged along the edges of the bottom plate for folding and unfolding movement, and cooperating means on the side and end members which interlock as such members are unfolded to vertical position and prevent movement of the members beyond vertical position.

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