

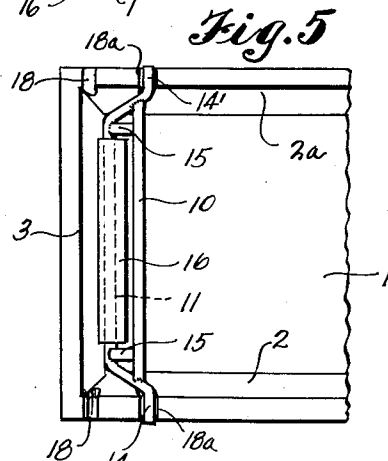
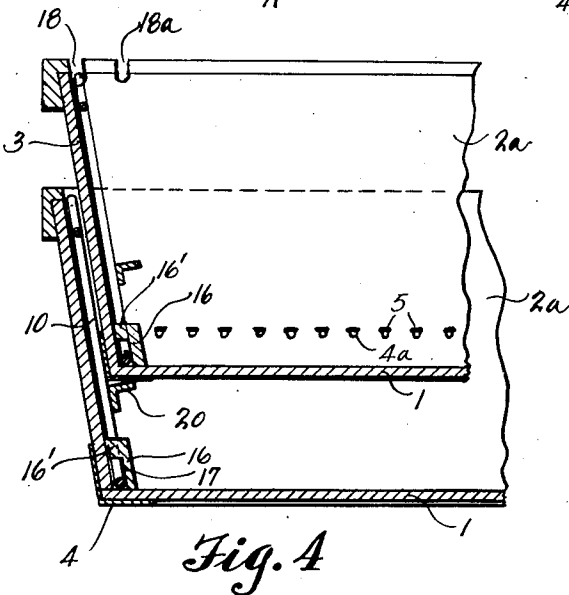
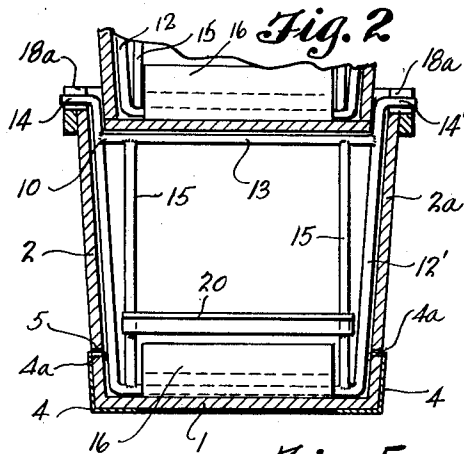
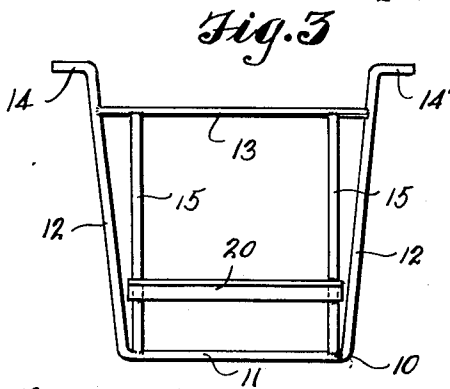
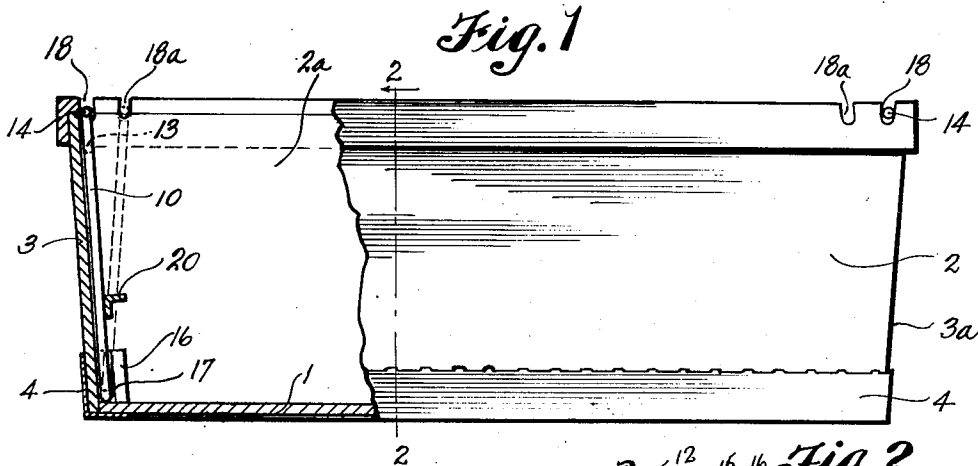
Nov. 7, 1950

A. R. ROSS
SHIPPING BOX AND CRATE

2,528,551

Filed Oct. 30, 1944

2 Sheets-Sheet 1



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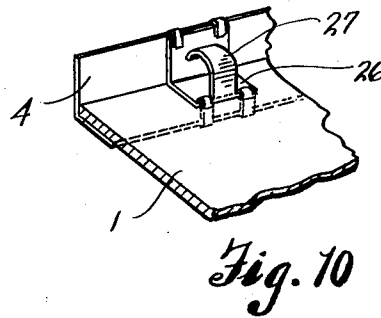
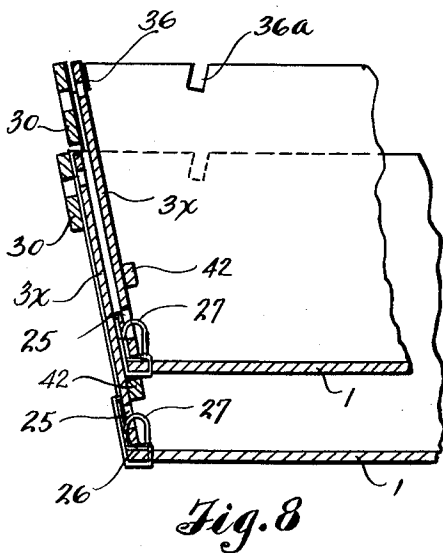
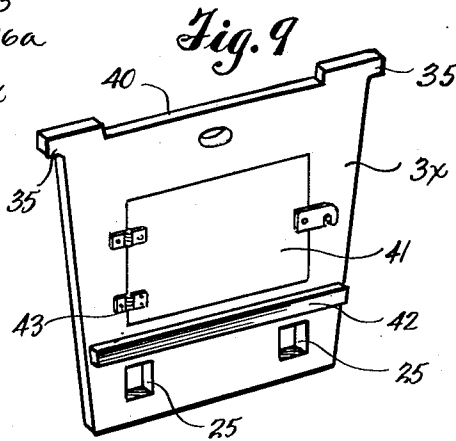
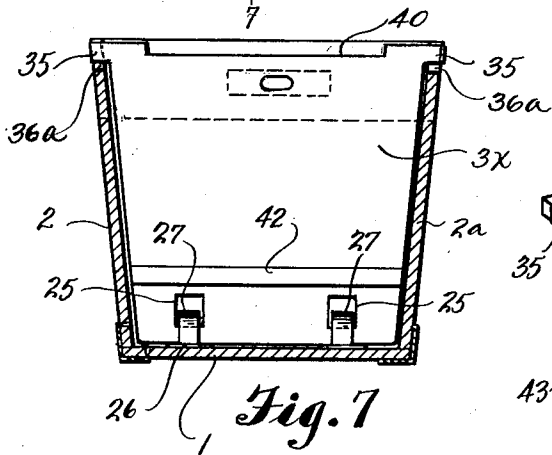
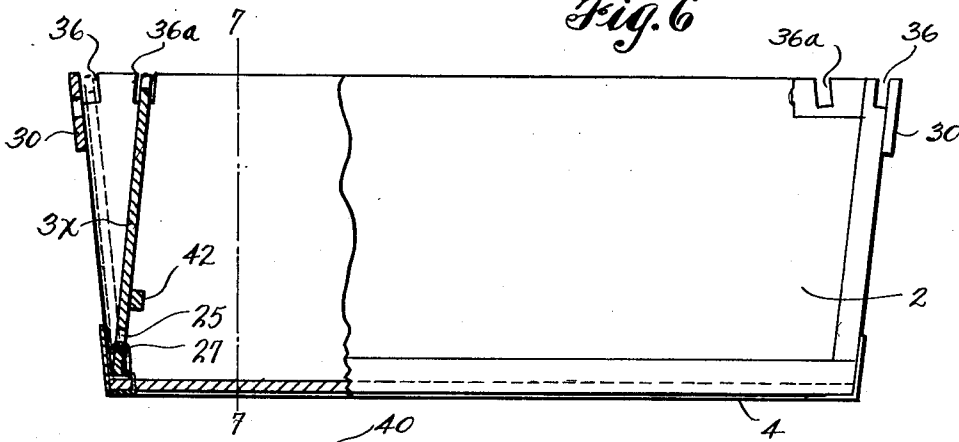
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SHIPPING BOX AND CRATE

Filed Oct. 30, 1944

2 Sheets-Sheet 2



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2,528,551

SHIPPING BOX AND CRATE

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Application October 30, 1944, Serial No. 560,944

3 Claims. (Cl. 220—97)

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This invention relates to improvements in crates and boxes, and has reference more particularly to crates and boxes designed for the repeated shipment of products therein and for the storage of products, and which are of a construction that adapts them, when empty, to be nested together for convenience in storage, or for return shipment, and which are equipped with novel means that provides that they may be stacked, one upon the other without nesting, when filled.

More specifically stated, the present invention relates to improvements in crates or boxes, which may be made quite economically from plywood or the like, with their opposite side and end walls downwardly and inwardly inclined as necessary for the desired nesting of unfilled boxes, and wherein certain novel frames or supports are arranged for adjustment from what may be referred to as their "non-functional" or "nesting" position, to their "functional" or supporting positions to prevent, when in the latter position, the nesting of the crates and to provide for their being stacked one upon the other without damage to their contents.

It is the principal object of this invention to provide stacking frames for such crates that are relatively simple in construction, and relatively inexpensive, and designed to be associated directly with a crate for the support thereon of a similar crate without nesting, and in such manner that all weight of the supported crate will be transmitted to the bottom of the crate and its side walls will not be required to sustain it, as has been the case in the past.

More definitely stated, the objects of the present invention reside in the provision of a box, or crate, having a bottom wall and opposite side walls, forming a downwardly tapered container and wherein, at the ends of each box are supports bearing on the box bottom and adapted to be adjusted from outwardly inclined positions at which they permit the nesting of boxes, to inwardly inclined positions where they will serve as supports for a superimposed box.

Furthermore, it is an object of the present invention to so arrange the movable stacking supports in a box that no weight of supported boxes will be transmitted downwardly against the side walls of any box lower in a stack.

Other objects of the invention are to be found in the provision of boxes or crates of the character above stated having end walls which are adjustable from inclined positions at which they permit the nesting of boxes, to substantially upright positions at which they will serve as supports for the stacking of boxes in accordance with the objects of the invention.

Another object of the invention is to provide means in combination with the stacking supports whereby the extent of nesting may be limited and wedging of boxes together eliminated.

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A further object of the invention is to provide boxes or crates of the above character wherein provision is made for gaining access to the inside of stacked boxes through an end wall opening without necessitating the removal of any box from the stack in which it is contained.

Other objects of the invention reside in the novel construction of the stacking supports and in the means for and manner of pivotally or hinged affixing them in place in a box.

Still other objects reside in the various details of construction and combination of parts, and in the mode of use of the boxes or crates as will hereinafter be fully described.

In accomplishing these and other objects of the invention, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawings, wherein—

Fig. 1 is a side elevation of a box, or crate embodied by the present invention; a part of the adjacent side wall being broken away and an end wall being shown in section for better understanding of construction and better illustration of one of the stacking frames as disposed within the end of the box.

Fig. 2 is a cross section of the crate taken on line 2—2 in Fig. 1.

Fig. 3 is a side view of one of the stacking frames.

Fig. 4 is a longitudinal, vertical section through the end portions of two nested boxes, illustrating the disposition of the stacking frames when the boxes are nested.

Fig. 5 is a top, or plan view of the end portion of one of the boxes showing the stacking frames adjusted to functional position preparatory to stacking a box thereon.

Fig. 6 is a side view of a box having its end walls hinged for adjustment between positions permitting nesting to positions for stacking of similar boxes thereon.

Fig. 7 is a cross section, on line 7—7 in Fig. 6.

Fig. 8 is a longitudinal section of an end portion of nested boxes.

Fig. 9 is a perspective view of one of the end wall panels of the box of Fig. 6, showing it as equipped with a door.

Fig. 10 is a perspective view of an attaching clip for the hinging of the end panel.

Explanatory to the present invention, it will here be mentioned that boxes or crates of a similar character and adapted to be nested and stacked, have heretofore been in use, but to my knowledge, where stacking was accomplished, certain specific forms of stacking irons have been employed; such irons being extended between opposite side walls of the crate and arranged to rest upon the top edges of or within notches formed in the top edges of the opposite side walls.

The present invention embodies novel features in the means of support for stacked boxes and provides for the transmittal of the weight of superimposed boxes directly to the bottom of the next lower box, and thereby relieves the side walls of the boxes of all direct weight, thus permitting less expensive construction than otherwise is required, and without detriment to the sufficiency of the support.

Referring more in detail to the drawings—

First, considering the box of that kind shown in Fig. 1: This has a rectangular bottom wall 1, opposite side walls 2 and 2a and opposite end walls 3 and 3a.

The two opposite side walls 2 and 2a and also the opposite end walls 3 and 3a are inclined symmetrically to provide the necessary downward taper of the box for the nesting, one within the other of similar boxes, as has been illustrated in Figs. 4 and 8.

The extent to which the nesting may take place will be determined by the taper of the boxes, and this should be to an appreciable extent. However, it is desirable that there should be supports to positively limit the nesting and prevent wedging of boxes one within another. Such supports as herein provided will presently be described.

One of the preferred means for stacking crates of this character has been illustrated in Figs. 1 to 5. In this disclosure, each crate is equipped closely within each of its opposite end walls with a hingedly attached stacking frame, designated in its entirety by reference character 10. Each frame, as observed best in Fig. 3, comprises a stiff, metallic rod, bent to form a horizontal bottom cross member 11, with rigid upwardly directed arms 12 and 12' at its opposite ends. Also, there is a horizontal cross rod 13 extended between and welded at its ends to the upper end portions of the arms 12—12'; and arms 12 and 12' having outwardly directed portions 14—14' at their upper ends. For additional strength, I have provided vertical brace rods 15—15 between the cross rods 11 and 13 and these are welded in place.

The frames 10 are of such dimensions that they may be located within the crate ends, transversely thereof and closely adjacent the inside faces of the end walls, as shown best in Figs. 1 and 4. The width of the frames is such that the arms 12 and 12' will lie closely adjacent the side walls 2 and 2a as observed in Fig. 2 in which it is also shown that the cross bar 11 rests flatly upon the floor 1 and that the cross bar 13 is set down somewhat below the upper ends of the arms 12 and 12' so that the latter will retain a supported box against lateral displacement while the end walls of the supporting box retain the supported box against endwise slippage.

In Figs. 2 and 4 it has been shown that each of the end frames 10 of a box or crate is fixed in place adjacent the end wall 3 or 3a by a cross cleat 16 which extends transversely of the box overlying the cross rod 11 and fixed to the end wall through the mediacy of a spacer 15', leaving a transverse pocket or channel 17 between the wall and cleat in which the cross rod 11 of the frame is contained for limited vertical lifting.

It is observed that the out-turned portions 14—14' at the upper ends of the arms 12—12' are adapted to be selectively located within paired upwardly opening notches in the top edges of the side walls; there being one set of notches 18

for each frame 10, that are adapted to receive the out-turned portions 14—14' when the frame is disposed in its "non-functional" position; that is, when disposed flatly against the corresponding end wall, as shown in Fig. 1. Also, there is another set of notches, 18a, for each frame, spaced inwardly from the end wall, to seat the outwardly turned portions 14—14' therein when the frame is in its supporting or "functional" position, as indicated in dotted lines in Fig. 1. The height of the frame and the depth of the notches is such that the parts 14—14' cannot rest in the bases of the notches; therefore, any weight sustained by the frames in the support of a box upon the cross members 13 of the frames, will be transmitted through the arms 12—12' and braces 15—15, to the cross bar 11 and directly to the floor of the crate against which the bar 11 bears.

It is also to be noted that the channels 17 containing the cross bars 11 are of such vertical height as to permit the frame to be lifted to clear the parts 14 and 14' from one set of notches for disposition in the other set.

If it should be desired, the material between the notches 18 and 18a could be cut away, thus to permit swinging of the frame from one position to the other. In such case, provision for lifting the frame would not be required.

Assuming the crates or boxes and frames to be so constructed and arranged, it is quite apparent that when it is desired to stack one box upon and above the other, as indicated in Fig. 2, it is only necessary that the stacking frames of the lower box be disposed in that position at which the out-turned feet 14—14' are registered in the paired notches 18a. Then a box may be disposed upon the cross bars 13 of the two frames and all weight of that box will be sustained through the frames by the floor of the lower box.

For nesting the crates, it is only necessary that the frames 10 first be disposed in positions against the end walls, and the crates assembled as in Fig. 4. It is desirable however that nesting should not be to an extent that will result in the boxes becoming wedged together. Therefore, to prevent this, I affix angle strips 20 to the vertical, as seen in Fig. 4, against which the nested box will engage and be supported before wedging takes place.

In the structure that has been illustrated in Figs. 6 to 10, the box is of a construction similar to that of Fig. 1, except that the end walls are movable relative to the side walls for inward and outward hinging action like that of the frames 10, and the frames 10 are eliminated; the end walls themselves serving as the stacking means.

As noted best in Fig. 9, each end wall 3x has two transversely spaced rectangular openings 25 through its bottom edge portion and clips 26, fixed to the top side of the bottom wall, have prongs 27 bent to pass through the wall openings to hingedly attach the wall in the box. The lower edges of the hinged end walls bear directly against the bottom wall and their upper edge portions are designed to rest against cross cleats 30, extending between the upper corners of opposite side walls.

Each end wall 3x has lateral extension lugs 35 at its upper corners adapted to be received in notches 36 and 36a in the top edges of the side walls, corresponding to the notches 18 and 18a of the structure already described. In use, the hinged end walls when adjusted to their inwardly inclined positions, serve as stacking supports, by resting the superimposed box directly thereon, and it is preferred that the top edges of these

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walls be recessed, as seen at 40 in Fig. 9, to retain the supported box against lateral slippage.

The openings 25 are of such vertical depth that the end walls may be lifted to clear the stops from the notches for wall adjustment from one position to another. Boxes may be nested, when these end walls are in their outwardly adjusted positions, as in Fig. 8, and the extent of nesting may be limited to prevent wedging, by affixing cleats 42 across the inner sides of the walls, as noted in Fig. 8.

In order that access may be had to stacked boxes or crates, a hinged door, as shown at 43 in Fig. 9, may be provided in an end wall, or a sliding panel may be used if this is preferred.

Boxes and crates of this kind may be made in various sizes and for various purposes, and due to the provision of the hinged end walls, or end frames, they may be stacked, or nested by proper adjustment of the end walls or frames. Also, when stacked, no weight is applied to the side walls but is transmitted to the box bottoms and no bulging or distortion results.

Having thus described my invention, what I claim as new therein and desire to secure by Letters Patent is—

1. A crate of rectangular form, having inwardly inclined side and end walls and a bottom wall less in width and length than the open top, flat transverse stacking frames located within the crate and disposed flatly against the respective end walls thereof and engaged at their lower ends against the bottom wall and movable at their upper ends toward each other to a spacing less than the spacing between them at their lower ends, said side walls having recesses therein extending away from the end walls and said frames having projecting portions contained in said recesses and adapted to engage with the ends thereof to limit the extent of swinging movement of said frames.

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2. A crate of rectangular form having inwardly inclined side and end walls and a bottom of less width and length than the open top, flat transverse stacking frames located within the crate and disposed flatly against the respective end walls thereof for the nesting of a second crate therein, said stacking frames being adapted to be swung at their upper ends away from the end walls and having laterally extended edge portions at their upper ends and said side walls having notches opening to the top edges thereof to selectively receive the said laterally extended portions of the frames therein to retain the frames closely adjacent the end walls or at a distance spaced therefrom suitable for the stacking of a second crate on the frames and means retaining the lower ends of the frames adjacent the end walls but permitting the limited lifting of the frames.

3. A device as in claim 2 wherein each of the stacking frames comprises a bottom cross bar that normally bears against the crate bottom wall, upright opposite side legs extended upwardly from the ends of the bottom bar and a cross rail connecting the legs below their upper ends and below the top edges of the side walls of the crate.

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