

Feb. 4, 1936.

N. TUFTS ET AL

2,029,746

NESTING BOX WITH STACKING IRONS

Filed Sept. 7, 1932

3 Sheets-Sheet 1

FIG.1.

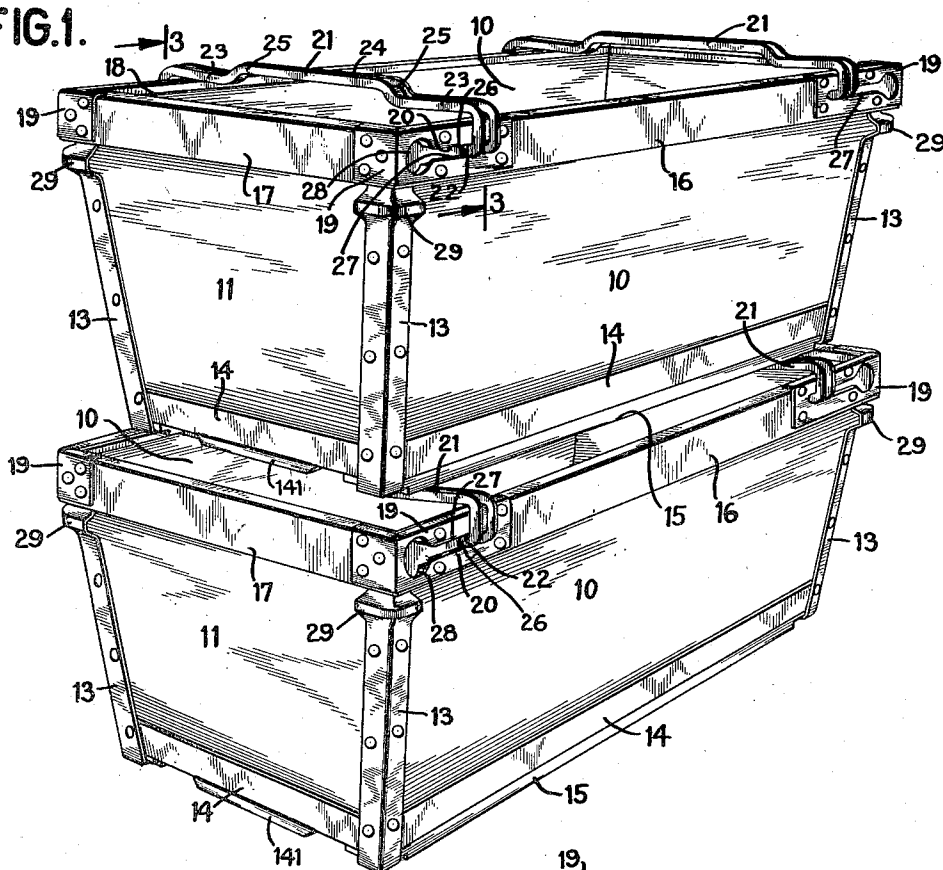
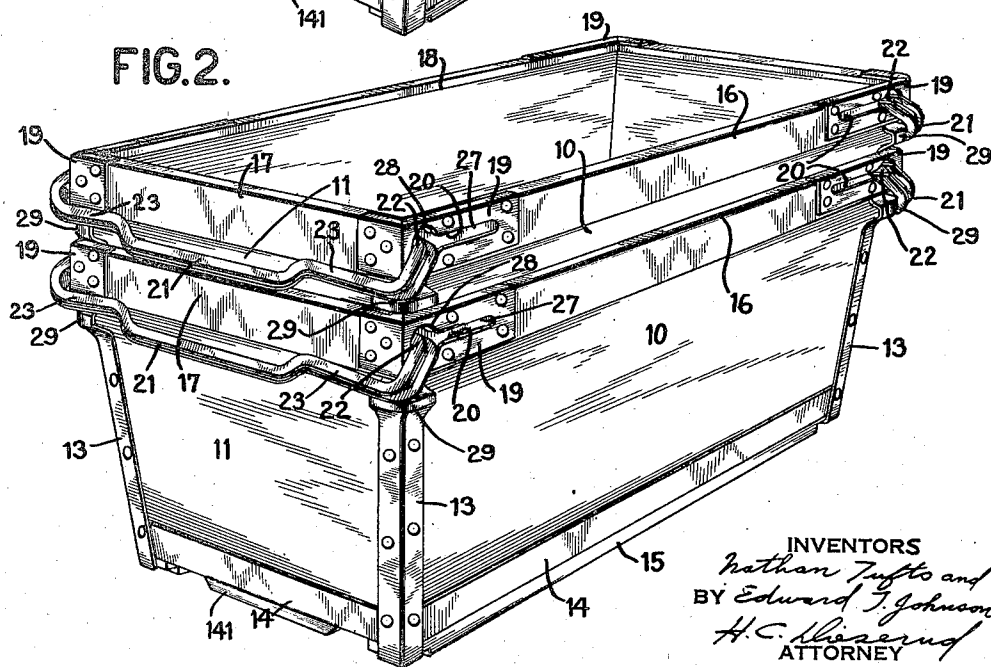


FIG.2.



INVENTORS
Nathan Tufts and
BY Edward J. Johnson
H.C. Moser
ATTORNEY

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FIG. 3.

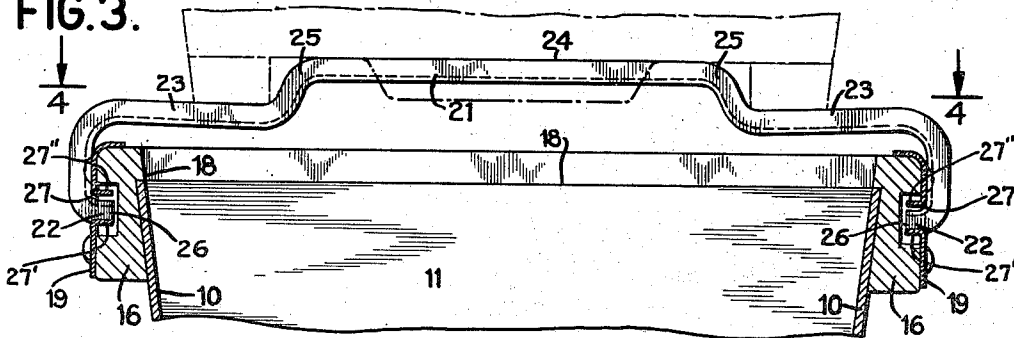


FIG. 4.

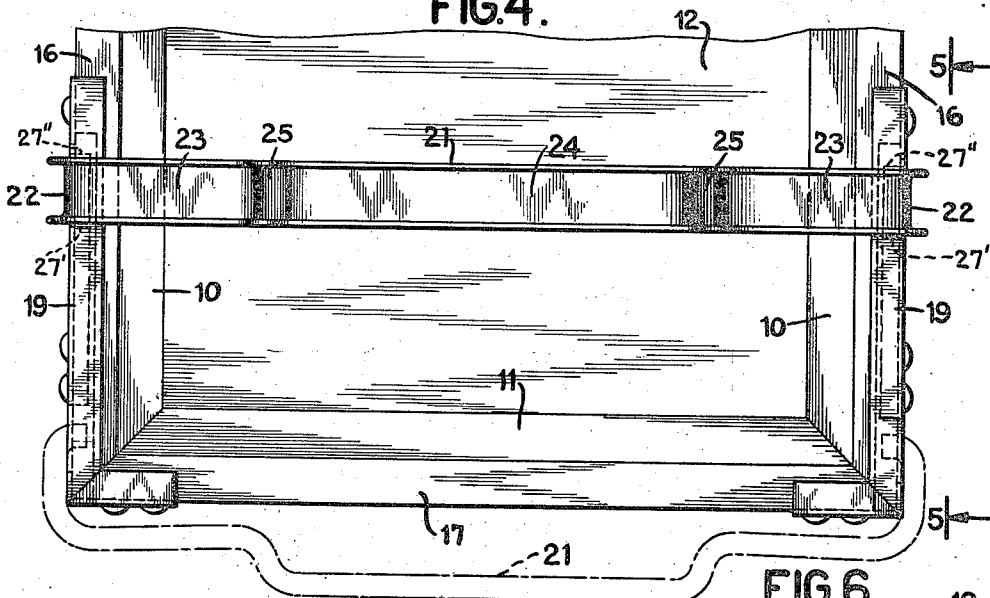


FIG. 5.

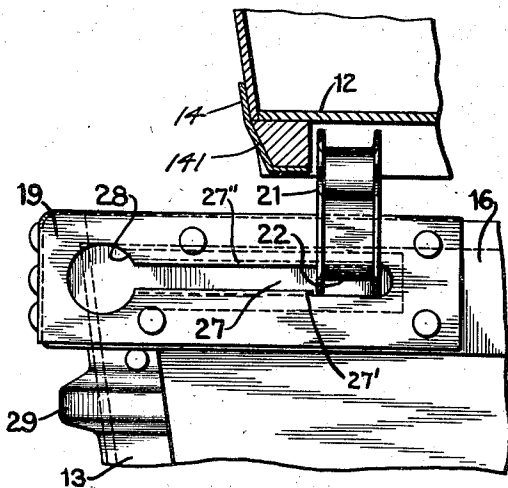
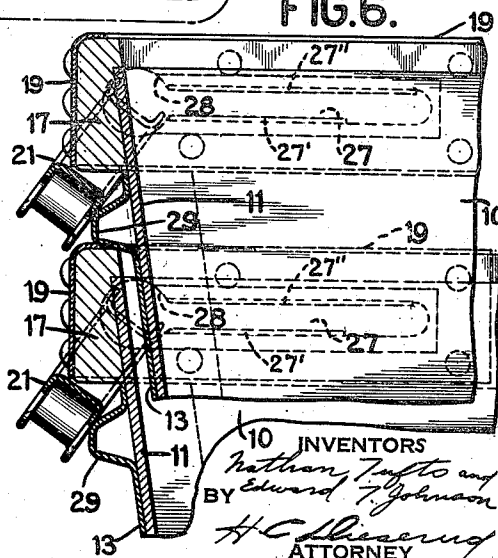


FIG. 6.



INVENTORS
Nathan Tufts and
Edward F. Johnson
BY H. C. Slesinger
ATTORNEY

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N. TUFTS ET AL

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FIG. 7.

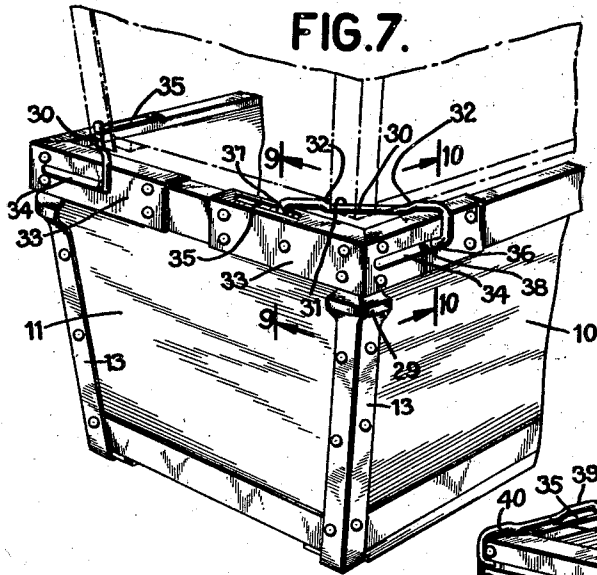


FIG. 9.

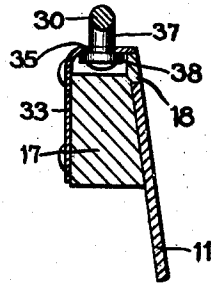


FIG. 8.

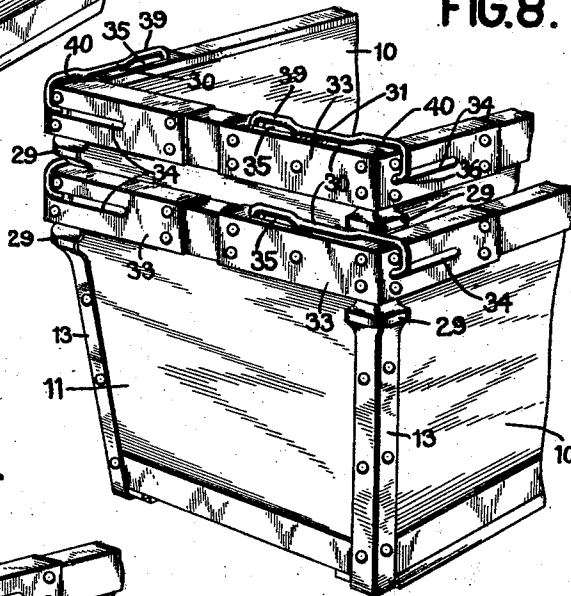


FIG. 10.

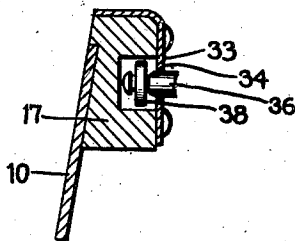


FIG. 11.

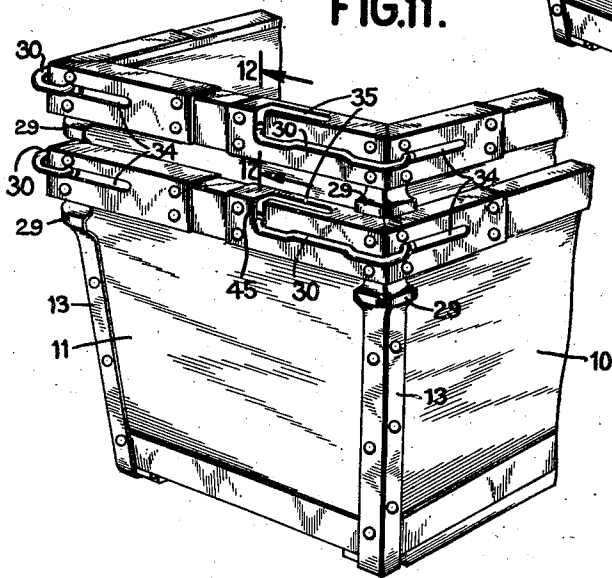
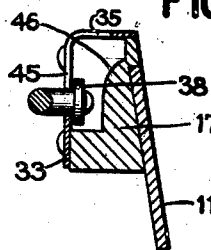


FIG. 12.



INVENTORS
Nathan Tufts and
Edward J. Johnson
BY
H.C. Wisnerud
ATTORNEY

UNITED STATES PATENT OFFICE

2,029,746

NESTING BOX WITH STACKING IRONS

Nathan Tufts and Edward T. Johnson, Greenfield, Mass., assignors to The New England Box Company, Greenfield, Mass., a corporation of Massachusetts

Application September 7, 1932, Serial No. 631,954

21 Claims. (Cl. 220—97)

This invention relates to containers, such as boxes or the like having sloping sides to permit nesting, and more particularly relates to the provision of improved stacking irons which permit containers of this character to be stacked when loaded and nested when empty.

The present invention is particularly applicable to boxes which have rails extending around the upper edges of the same and runners along the bottom of the box, although it may be effectively applied to other types of containers as well. An object of the invention is the provision of novel stacking irons adjacent each end of such a box interengaged with reinforcing elements, provided adjacent the corners at the top of the box, and adapted to be moved to positions inwardly of the ends of the box when supporting a loaded box and to be moved to positions clear of the ends to permit nesting of a superposed box. The boxes are preferably provided with improved means in conjunction with the irons for preventing wedging or jamming together of the boxes when nested.

A more specific feature of the invention resides in the provision of a stacking member or bail which may be of particularly sturdy construction and at the same time be simple and easy to manufacture, in addition to being readily manipulated and effectively used for all of its intended purposes. The improved iron is specially suited for use in lifting the containers to shift them about. Prior devices of this sort have been objectionable from this standpoint due to the danger of scuffing the knuckles against the end of the container as it is lifted by the stacking devices and thrown about. The present construction is such as to minimize the danger of injuries to the knuckles of those handling the boxes. The construction is also neat, light, durable and compact.

While the term "stacking irons" has been applied to the improved members in accordance with the invention, it will be understood that the construction is capable of performing a number of other functions; for example, as pointed out, they may serve as handles to permit the boxes to be lifted and separated.

Other objects and advantages of the present invention will become apparent in connection with the following detailed description of several illustrative box constructions embodying the present improvements. The box shown is especially suitable for use in shipping bananas. However, the present improvements are also applicable to boxes adapted for a wide variety of other uses.

Referring now to the accompanying drawings, forming a part hereof, Fig. 1 is a perspective view

of boxes embodying the present invention in the positions they occupy when loaded and stacked.

Fig. 2 is a perspective view of the boxes shown in Fig. 1, but empty and nested.

Fig. 3 is a vertical section, partly broken away, taken on the line 3—3 of Fig. 1.

Fig. 4 is a horizontal section, partly broken away, taken on the line 4—4 of Fig. 3.

Fig. 5 is an elevation, partly broken away, as viewed from the right-hand end of Fig. 4 in the direction of the arrows 5—5, with a portion of a stacked box in section.

Fig. 6 is a central, longitudinal, vertical section through one end of the boxes as shown in Fig. 2.

Figs. 3, 4, 5 and 6 are all enlarged views as compared to Figs. 1 and 2.

Fig. 7 is a perspective view of one corner of a box embodying a modified form of construction in accordance with the invention, showing a portion of a cooperating box in broken lines, the boxes being in the positions they would occupy when loaded and stacked.

Fig. 8 is a view similar to Fig. 7 but showing a portion of a pair of boxes empty and nested.

Figs. 9 and 10 are sectional views of portions of the constructions shown in Figs. 7 and 8, taken on the lines 9—9 and 10—10, respectively.

Fig. 11 is a perspective view of still another modification of the present stacking iron construction, the iron being angled into position to permit nesting of the boxes.

Fig. 12 is a section taken on the line 12—12 of Fig. 11.

Each box may include longitudinal side walls 10 and end walls 11 formed of suitable sheet material such as ply-wood, veneer wood, laminated wood, fibre board, or metal. In order that all the boxes may be of the same size and still provide for nesting, the walls 10 and 11 may incline inwardly from the top to bottom of the box. The bottom 12 of the box may be composed of the same material as the walls and ends or of other suitable material. The adjacent ends of the walls 10 and 11 may be reinforced and held together in any convenient manner, preferably by angle irons 13 secured to the walls as by rivets or nails. The bottom of the box may be secured to the side and end walls by similar angle irons 14, and longitudinally extending runners 15 of any suitable material such as wood may be secured at the sides of these angle irons which underlie the box. The angle irons 13 preferably extend downwardly below the runners 15 and may have

their ends bent in under the ends of these runners.

Where the walls 10 and 11 are formed of fairly thin, light material, reinforcing members designated rails 16 and 17 may extend along the upper edges of the walls 10 and 11, respectively, and be fitted together at the four corners, for instance, by mitering their ends. These rails may have their outside faces in vertical planes so as to form a rectangular frame, while their inner faces may be planed off to permit them to lie flat against the inclined walls 10 and 11. The rails may include shoulders 18 adapted to overlie the upper edges of the walls. At each corner of the box, secured to the rails 16 and 17 in any convenient fashion, there may be provided angle irons 19 which not only act to reinforce the box, but also provide for carrying the stacking irons, as will be hereafter described in detail. Where the angle irons 13 extend upwardly to points near the top of the box, the rivets or nails which secure the irons 19 may also extend through the rails 16, 17, irons 13, and panels 10, 11, thus providing an especially sturdy construction.

Each of these angle irons 19 is preferably provided with an elongated slot 20, and in line with the slot the material of the rails 16 is cut away to provide for reception of the ends of the stacking irons. Each stacking iron 21 may be formed by a unitary metal member, for instance, of channelled or U shaped cross section, preferably relatively flat and formed with hook-shaped end portions 22 adapted to lie at either side of the container. Portions 23 extending inwardly from the hook-shaped portions, may be joined with an upwardly offset, central portion 24 by curved parts forming shoulders 25. When a loaded box is supported by these angle irons, the rails 15 of the upper box rest upon the portions 23 and the box is maintained against lateral movement by abutment of these rails with the shoulders 25. The portions 23 may, if desired, be provided with a slight slope downwardly toward the shoulders 25. The intermediate portion 24 of the iron may engage the bottom of the supported box which, as indicated in Figure 3, will be held well above the top of the lower box out of contact with its contents. To prevent longitudinal sliding of the upper box upon the irons of the box below the bottom corner members 14 at the ends of the box may be formed with a downward bulge 141 extending well below the main bottom of the box but not to the plane of the bottom surfaces of the runners 15. These bulges, therefore, will not interfere with the sliding of the boxes on their runners along a flat surface but by cooperation with the sides of the portions 24 of the stacking irons, as indicated in Figures 3 and 5, they will prevent sliding of the upper box longitudinally of the lower. A cleat or block of wood (not shown) may be inserted within the bulged portion 141 to lend it support and prevent it from being dented inwardly. In lieu of providing the bulges 141 the sliding of the boxes may, if desired, be prevented by suitable notches (not shown) provided in the runners 15 and adapted to engage the sides of the portions 23 of the stacking irons. The central portion 24 of the iron should in this event be made somewhat lower or the runners 15 made of somewhat greater depth.

Each end 26 of the hook-shaped portions 22 of the irons is adapted to lie in the narrow portion 27 of the bayonet joint slot 20 in engagement with the walls thereof. Due to the flat, rela-

tively wide form of the ends 26 of the stacking irons they are prevented from rocking when engaged with portions 27 of slots 20. At the same time, these slots are preferably of sufficient length so that the stacking irons may be moved inwardly from the ends of the box far enough to permit persons handling the box to grasp the stacking irons without danger of scuffing their knuckles. The slot portions 27 may incline downwardly somewhat away from the enlarged openings 28, if desired, so that the stacking irons tend to remain in their positions shown in Fig. 1.

A more positive means of detaining the iron in its stacking position may be provided, if desired. For example the upper and lower edges of the portion 27, of the slot 20 may be turned inwardly into the cut out portion of the rail, thus providing a supporting shelf 27' and, if desired, a parallel portion 27'' at the top. As shown in figure 5 the shelf 27' may conveniently terminate adjacent the stacking position of the iron so that a seat or dwell is provided at the inner end of the slot. This will effectively prevent sliding of the iron when it is supporting the load of a stacked box, or when it is being used to hold down a cover on the box. At the same time the portions 27' and 27'' provide better surfaces for the sliding of the iron from stacking to nesting position and vice versa.

The portions 23 of the iron are preferably spaced slightly from the upper edges of the rails 16 and, accordingly, the entire weight transmitted through the stacking iron is taken by the reinforcing member 19, along the lower edge of the slot portion 27 with which the end 26 has a flat bearing. This provides a very substantial support and insures ample knuckle clearance between the portion 24 and the ends of the box when the iron is being shifted from one position to another. Where the stacking irons are formed as indicated, they can be made in an extremely simple manner as they do not have any complicated bends which have to be formed into different planes. At the same time, if covers (not shown) are to be employed in connection with the boxes shown, they may be slipped in between the tops of the rails 16 and the portions 23 of the stacking irons, the portions 23 then serving effectively to hold the covers in place.

When it is desired to nest the boxes as shown in Fig. 2, the stacking irons 21 may be moved longitudinally until their ends 26 come into the enlarged openings 28 at the outer ends of the slots 20, which openings are somewhat larger in diameter than the width of the ends of the stacking iron so that the irons are permitted to angle or rock freely into their positions shown in Fig. 2, the ends 26 of the irons sliding around the edges of the openings 28, for this purpose. In this way, the stacking irons 21 may be brought entirely clear of the opening at the top of the box.

In order to prevent wedging of the boxes when in stacked relation, suitably shaped lugs or bumps 29 may be formed in the angle irons 13 at the desired points above the bottoms of the boxes. When the boxes are stacked as shown in Fig. 2, the lower surfaces of these bumps or extensions 29 on the upper box are adapted to abut against the upper edges of the rails 16 and 17 of the lower box or against the top portions of the corner members 19, where such members are formed to overlie the rails. If desired, the upper surfaces of the bumps 29 may be so positioned that the portions 23 of the stacking irons 21 rest against these surfaces when the stacking irons

are not in use. In this manner, the stacking irons may be supported slightly outwardly from the end walls of the boxes so as to permit one easily to grip the portions 24 of the stacking irons.

In manufacturing a box in accordance with the present invention, it is merely necessary to assemble and secure the panels 10 and 11 and the angle members 13, as well as the angle members 14 and the runners 15 in place. The top rails 16 and 17 and the corner elements 19 as well as the stacking irons 21 may be separately assembled and then applied to the top of the walls 10 and 11. The ends 26 of the stacking irons 21 thus need not be sprung apart to engage them with the bayonet joint openings 20. In fact it would be difficult to spring the ends of a channel bar member, of the type shown to either apply it to or remove it from the box when completed. When the box is constructed in this fashion, the annoyance and expense of losing the handles or stacking irons is substantially eliminated, and at the same time, the construction of the box is not complicated.

Referring now to Figs. 7, 8, 9 and 10, there is shown a box which may be similar to the type already described, including panels 10 and 11 and reinforcing angle members 13. In the modified form, however, a stacking iron 30 may be employed at each corner of the box, so that four small irons will be applied to each box in lieu of having two larger irons across the ends. Each iron 30 may have a depressed portion 31 for supporting a corner of a superposed box, said depressed portion lying above the level of the upper edges of the top rails of the box to permit sliding of the iron in the manner to be explained. Shoulders 32 may be provided to engage the lower corners of the supported box and thus prevent accidental sliding of the latter. The top of the box may be provided with a corner reinforcing member 33 having a slot 34 in one side portion and a slot 35 in one top portion. The iron 30 may be of round stock or of other suitable cross-section, and have adjacent one end a hook-shaped portion 36 the end of which lies in slot 34, and adjacent its other end a generally vertical portion 37 the end of which lies in slot 35. In order to prevent the ends of these irons from becoming disengaged from the slots 34, 35, the ends may be provided with washers 38 attached to the same in any convenient manner, as by reducing the ends of the irons, slipping the washers onto the reduced ends, and then upsetting or heading the ends. The washer in slot 34 should be free to angle with relation to the end of the iron as the stacking iron moves from its position in Fig. 7 to its position in Fig. 8. In assembling this construction the ends of the iron 30 may be slipped into the slots 34, 35, the washers 38 applied, and heads then formed at the ends of the iron. The corner members 33 may then be riveted to the box or otherwise secured thereto.

At the two sides of the depressed portion 31 of each iron there are formed raised portions 39 and 40. When the stacking irons are moved to their positions shown in Fig. 8, the portions 40 may be engaged by the lugs 29 of the upper box. As shown, the portions 39, 40 lie above the upper surface of the corner members 33 to provide clearance for the depressed portions 31, the irons being supported only adjacent their ends. Thus in supporting a box above the end 36 of each iron will bear upon the lower edge of slot 34 while the end 37 will bear upon the bottom of the groove

in the top rail. Through this construction, the boxes, when nested may be lifted to separate them by placing the fingers under rails 17, as the boxes are maintained sufficiently spaced to permit this. The shoulders or bumps 29 may be omitted in this construction, if desired, the corner reinforcements 13 being thus simplified, and the raised portions 39 and 40 of the irons may be relied upon to provide the spacing between the boxes. It will be understood that all the corner stacking irons 30 as well as the corner members 33 may be identical. This simplifies manufacture and makes it possible to shift all of the irons from idle to active positions or vice versa by movements in the same direction. However in the case of rectangular boxes it may be advantageous to have one of the portions 39 or 40, to be placed at the longer side of the box, longer than the other portion to be placed at the end of the box, in which case the irons at opposite corners will not be identical but will be of opposite hand and they will be symmetrically arranged. In this case two different types of corner member 33 will also be required, the arrangement of the slots 34 and 35 being reversed.

In the construction shown in Figs. 11 and 12, a vertical slot 45 may be cut in the member 33 at the end of slot 35, and the rail 17 is cut away or rounded as at 46, so that the stacking iron 30 may be angled into the position illustrated after it has been moved to a position parallel with the end of the box, slot 34 being of sufficient length to permit this. In this manner, the stacking irons 30 may be shifted entirely clear of a superposed nested box which may be supported by its projections 29 as shown in Fig. 11. It will be apparent that while the details of this last-described embodiment are somewhat different from those of Figs. 1-6, the two forms have much in common, particularly in their mode of operation. That is to say, both have a combined sliding and angling movement into box-supporting position or into a position to clear the top of the box to permit nesting. In neither form is it necessary for the irons to rest upon the tops of the rails, they are supported at or adjacent their ends. In both forms the iron is produced by bending a straight member in a single plane.

The terms and expressions which have been employed are used as terms of description and not of limitation, and there is no intention in the use of such terms and expressions, of excluding any equivalents of the features shown and described or portions thereof, but it is recognized that various modifications are possible within the scope of the invention claimed.

We claim:

1. In combination with a nestable box, means secured at opposite sides of the box and providing slots therein, and a stacking iron having its ends slidable within said slots and adapted to engage the walls thereof, the engagement between said iron and slot walls preventing pivotal movement of said stacking iron when in box stacking position.
2. In combination with a nestable box, the walls of said box having elongated slots formed therein, a stacking iron adapted to engage said slots, said stacking iron being slidable within the slots to a position over the top of the box to permit a similar box to be stacked thereon and movable to a position where it is clear of the top to permit a superposed box to be nested.
3. In a box of the character described, a member carried by the box and providing a bayonet

joint slot adjacent the top of a wall thereof and a stacking iron having an end adapted to travel in said slot, said iron being constrained to slide within the narrow portion of said slot.

4. In combination with a nesting box having slots in the walls thereof, a stacking iron having a portion for engaging the bottom of a similar superposed box, said iron having portions adapted slidably to engage said slots in the box, said last mentioned portions being engaged with the lower edges of said slots to support the iron and superposed box.

5. In combination with a nesting box, a stacking iron having a portion for engaging the bottom of a similar superposed box, the walls of said box having slots formed adjacent the upper edges thereof, portions of said iron being arranged and adapted to slide in said slots, to place the iron either in stacking position or in a position to permit nesting of another box.

6. In combination with a nesting box, a stacking iron having a portion for engaging the bottom of a superposed box, the walls of said box having slots formed adjacent the upper edges thereof, said iron having portions adapted to enter said slots, said last-named portions and said slots being constructed and arranged to provide for sliding movement of said stacking iron, and an angling action.

7. In combination with a nesting box, a stacking iron adapted to extend diagonally across the corner of the box for supporting a corner of a superposed box, and constructed and arranged to be moved to a position generally parallel to the end of the box.

8. In combination with a nesting box, a stacking iron adapted to extend diagonally across the corner of the box for supporting a corner of a superposed box, and constructed and arranged to be moved to a position generally parallel to the end of the box and subsequently angled to a position free of the top of the box.

9. A stacking iron for nesting boxes, having shouldered portions for engaging runners on the bottom of a superposed box, and U-shaped portions, the ends of which are adapted to slidably engage the walls of slots formed in the box to provide for lifting the box by means of the stacking iron.

10. A nesting box comprising walls having slots therein, a plurality of stacking irons having shouldered portions for engaging runners on the bottom of a similar superposed box, said irons having U-shaped portions the ends of which are adapted to slidably engage the edges of said slots formed in the box walls, said irons when in stacking position being free of the top edges of the walls of the box.

11. In a box of the class described having side and end walls, reinforcing members at the top corners of said box, and stacking devices slidably and rockably carried by said members, said devices being shiftable into positions over the top of said box or into positions clear of the top, as desired.

12. In a box of the class described having retaining walls, reinforcing members at the top corners of said box, said members having elongated slots formed therein, and stacking devices having their ends engaged in said slots, said devices being shiftable in said slots to positions over the top of said box or into positions clear of the top, as desired.

13. In a box of the class described having retaining walls, reinforcing members at the top

corners of said box, said members having elongated slots formed therein, and stacking devices having their ends engaged in said slots, said devices being shiftable in said slots to positions over the top of said box or into positions clear of the top, as desired, and said devices transmitting the load of a superposed box to said members along the lower edges of said slots.

14. In a box of the class described having side and end walls, reinforcing members at the upper corners of said box, and stacking irons extending across the top of said box adjacent each end, the ends of said irons having sliding engagement with said members, whereby said irons may be shifted into position to extend across the open top of said box or into position to clear the top.

15. In a box of the class described having side and end walls, reinforcing members at the upper corners of said box, and stacking irons extending across the top of said box adjacent each end, the ends of said irons having sliding engagement with said members, said irons being bent in a single plane, coacting means on said members and irons for retaining the latter in a vertical plane when shifted into position over the top of the box, and means enabling said irons to be rocked when shifted into a position to clear the open top.

16. In a box of the class described having retaining walls provided with slots, a plurality of stacking irons bent in a single plane, the ends of said irons being retained in said slots and cooperating therewith to hold the irons in a vertical position, said slots permitting sliding of the irons into positions over the top of the box or into positions clear of the top.

17. In a box of the class described having retaining walls provided with slots, a plurality of stacking irons bent in a single plane, the ends of said irons being retained in said slots and cooperating therewith to hold the irons in a vertical position, said slots permitting sliding of the irons into positions over the top of the box or into positions clear of the top, said slots having portions also permitting rocking of the irons clear of the upper edges of the box walls.

18. A stacking bail extending in a single plane and having end portions adapted to engage a box, inwardly directed portions adjacent said end portions, a central portion, and upstanding shoulders connecting said inwardly directed portions and said central portion, said central portion being adapted to lie above said inwardly directed portions when the bail is in stacking position.

19. A stacking bail extending in a single plane and having hooked end portions presenting a flat bearing to horizontal supporting surfaces and adapted to engage recesses in a box, inwardly directed portions adjacent said end portions, a central portion, and upstanding shoulders connecting said inwardly directed portions and said central portion.

20. A nesting box having a plurality of wooden sides inclined inwardly from the top toward the bottom, metal reinforcements provided at each of the corners between adjoining sides and extending substantially the full length of the adjacent edges of said sides, each of said reinforcements having an integral bulge formed therein without rupturing the metal, all of said bulges being arranged at the same elevation and being adapted to maintain the box out of wedging relation with respect to another similar box when the boxes are nested.

21. A nesting box having a plurality of wooden

5 sides inclined inwardly from the top toward the bottom, metal reinforcements provided at each of the corners between adjoining sides and extending substantially the full length of the adjacent edges of said sides, each of said reinforcements having an integral bulge formed therein without rupturing the metal, all of said bulges being arranged at the same elevation and being adapted to maintain the box out of wedging relation with respect

to another similar box when the boxes are nested, and members attached to said box movable to a position across the top of the latter to support a similar box and movable to a position clear of the top and in engagement with said bulges, said members when engaged with said bulges having portions arranged to be readily grasped. 5

NATHAN TUFTS.

EDWARD T. JOHNSON.