

June 10, 1941.

E. T. JOHNSON

2,244,841

NESTING BOX

Filed Feb. 5, 1937

4 Sheets-Sheet 1

FIG. 1.

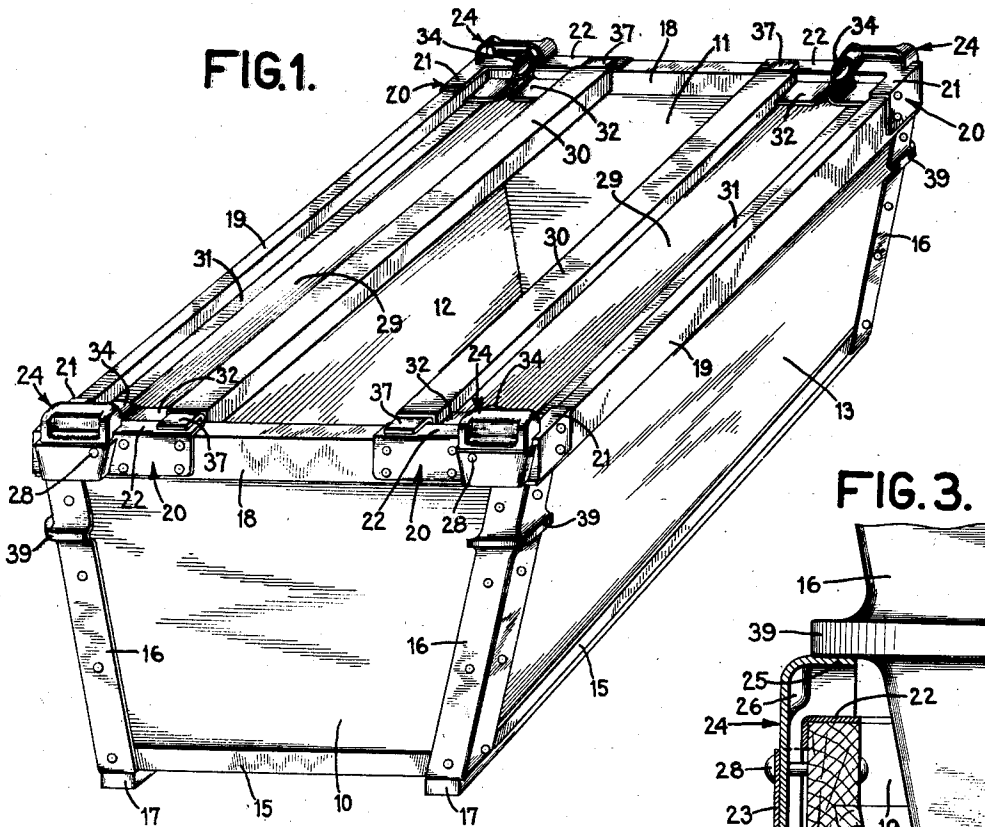


FIG. 3.

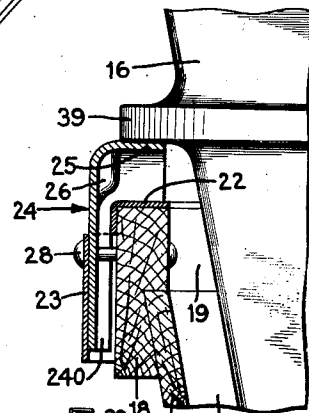
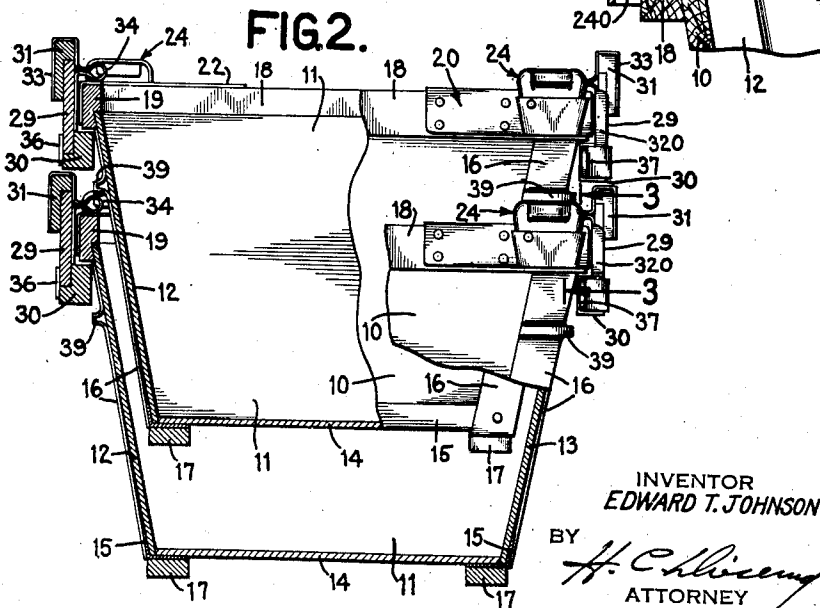


FIG. 2.



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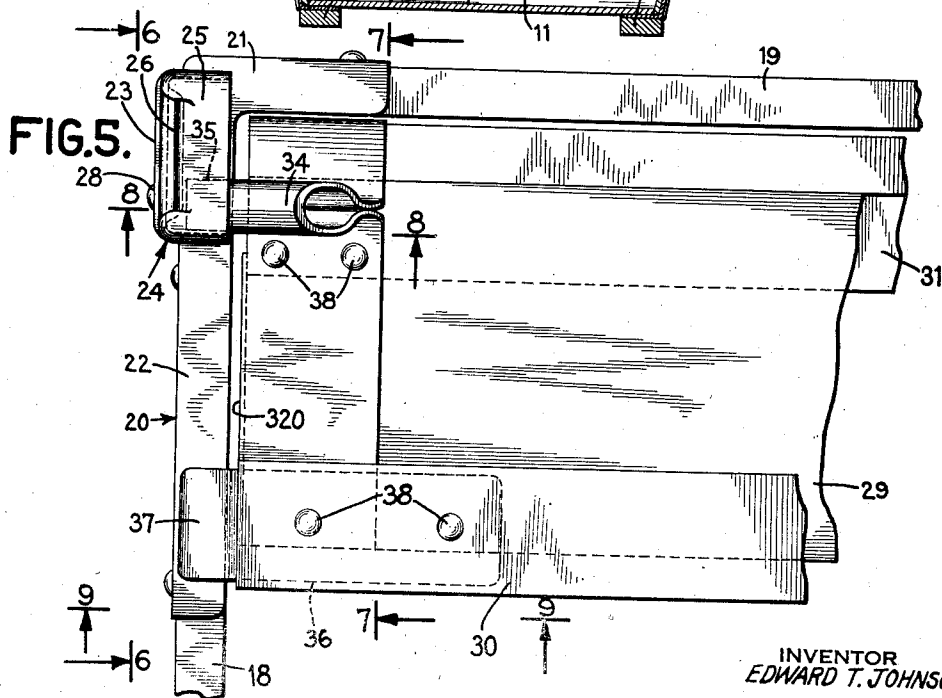
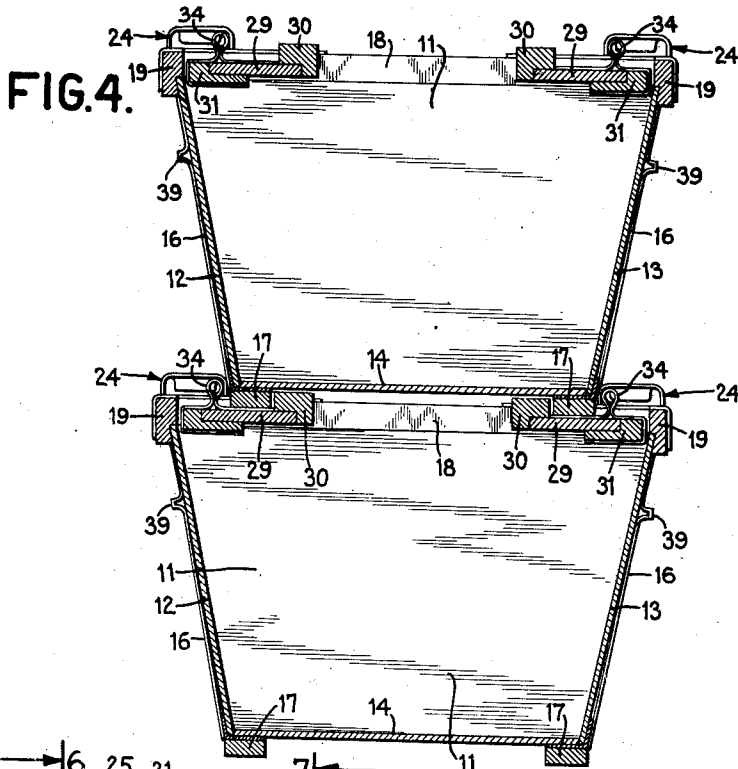
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4 Sheets-Sheet 2



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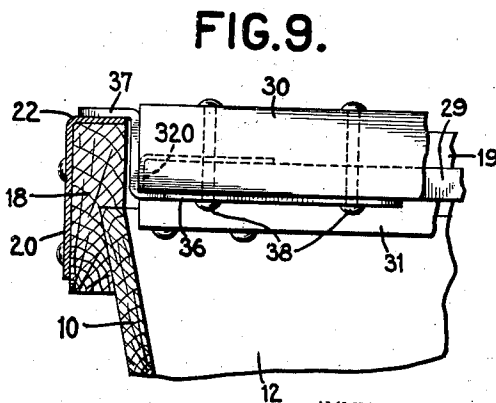
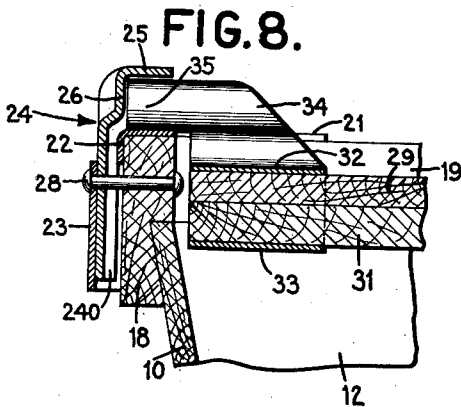
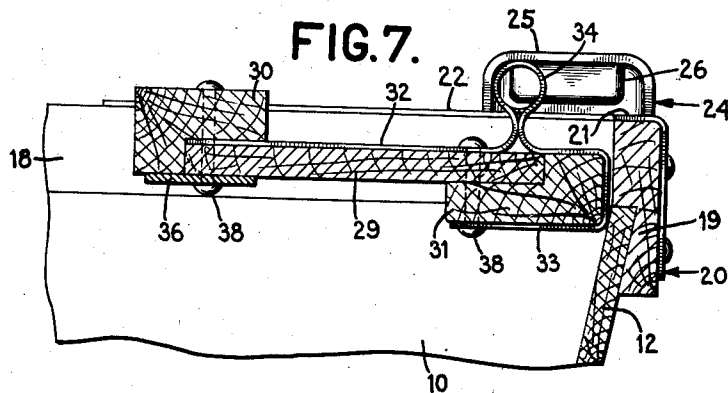
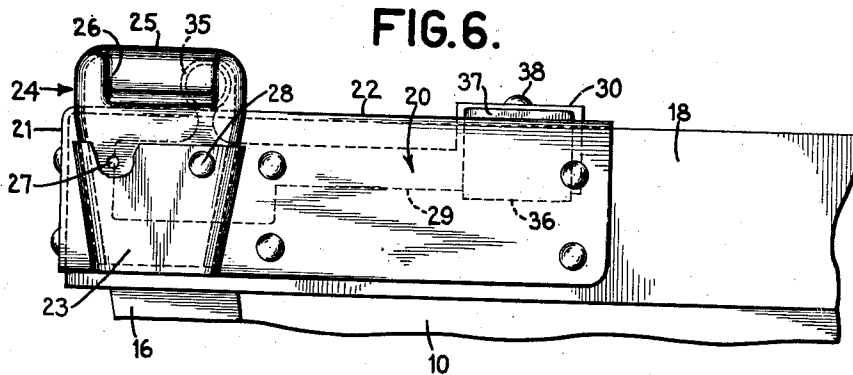
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NESTING BOX

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4 Sheets-Sheet 3



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Filed Feb. 5, 1937

4 Sheets-Sheet 4

FIG.10.

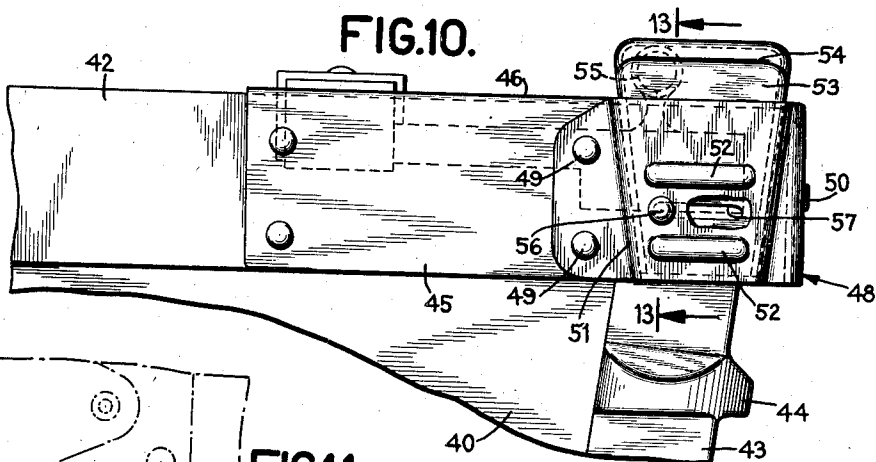


FIG.11.

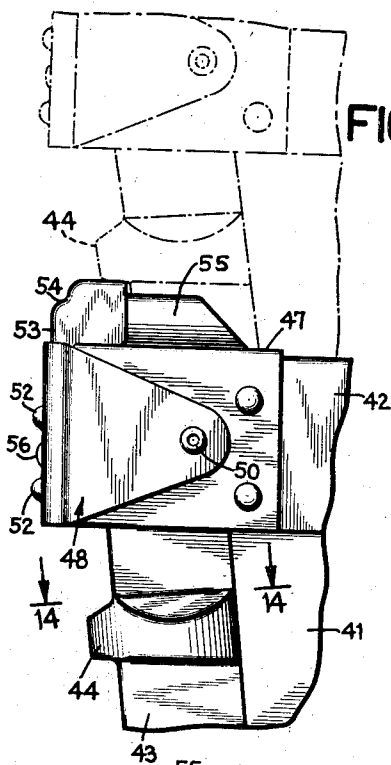


FIG.12.

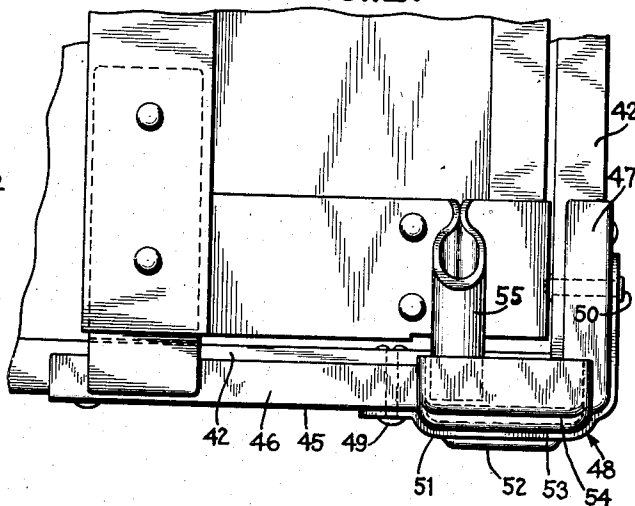


FIG.13.

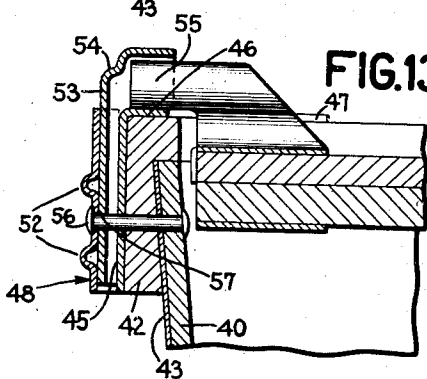
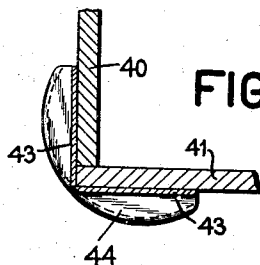


FIG.14.



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2,244,841

NESTING BOX

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Application February 5, 1937, Serial No. 124,188

6 Claims. (Cl. 220-97)

This invention relates to improvements in nesting boxes of the type now commonly employed in the transportation or handling of various commodities, such as bread, bananas, and the like. The boxes are, in fact, capable of application to a wide variety of uses. More particularly, the invention has to do with improved means, on a container of this character, by which a series of the same may be stacked one upon the other in loaded condition and which may be readily shifted to a position enabling a series of the containers to be nested when empty.

A feature of the invention is the provision of means of the character mentioned which not only enables stacking or nesting of the boxes, as desired, but also provides at least a partial cover for the top of the box to protect its contents. Heretofore it has frequently been the practice to equip nesting boxes with a special form of stacking iron which may be swung across the top of the box for stacking purposes. Either in addition to or in lieu of such irons, boxes of this character have frequently been provided with separate covers whenever the character of the contents has required the protection of a cover. This has had many disadvantages. In the first place it has been quite expensive to provide both stacking irons and covers, with the result that one or the other has often been omitted to the detriment of the contents of the boxes. If merely the irons are used, the contents of the boxes are not well protected against dirt and moisture and there is danger that the corner of a box being stacked will accidentally strike and damage the contents of the lower box. Moreover, when detachable lids or covers are provided, it is necessary to ship them separately when the boxes are being returned empty to the initial point of shipment. This means that because covers are separate from the box, more space is required for return of these covers than if they were attached to the box. Furthermore, a large percentage of loss and breakage of covers has usually resulted from this method of handling. Then, too, when the boxes are being loaded, time and labor are consumed in locating and applying the covers to the boxes. All of these things add to the expense of using boxes with separate, detachable covers.

According to the present invention, cover members are attached to the tops of the boxes in such a way that they may be swung either into a position largely concealing and protecting the contents of the boxes and enabling stacking of the same or into a position entirely clear of the tops to enable nesting. When in the effective

covering position, the members need not, and preferably will not, entirely close the top since for certain types of contents, particularly foods, it is desirable to allow for the circulation of air. Furthermore, the bottom of the box next above serves largely to close the gap between a pair of cover members. The danger of injury to the contents of a box, due to the accidental dropping of another box into it, in the course of stacking, is substantially eliminated.

The improved cover members are so constructed and mounted that they are capable of supporting a considerable number of loaded boxes. It will be understood that if ten loaded boxes are stacked, the cover members of the lowermost box must be capable of supporting the weight of nine loaded boxes with a reasonable factor of safety. This, the present construction is readily capable of doing. Moreover, it is such that any appreciable relative movement between the stacked boxes is definitely prevented.

An object of the invention has been to provide a construction of the character set forth above, which is simple and inexpensive to construct, easy to assemble and repair, and has maximum strength and durability. The cover members, under ordinary conditions, will have a life equal to that of the box proper but in the event of accidental breakage, they are readily replaced. In its preferred form the construction provides largely for metal-to-metal, or hardwood to hardwood, contact between the stacked or nested boxes and between the cover members and box proper.

Another object has been to so provide the cover members that they will cover a large portion of the top of the box when in stacking position but, on the other hand, will occupy a minimum of space and will not interfere with substantial nesting of the boxes when shifted to their nesting position. At the same time the covers may be very readily shifted by a simple flip of the finger, from one position to the other, will not catch at any point in the course of shifting, and will remain only in its two extreme positions.

The preferred construction is such that when the cover members are in stacking position, they will present a supporting surface slightly below the top of the box. This not only assists in preventing relative movement of a series of stacked boxes but also reduces the overall height of the stack.

In the preferred arrangement the various elements entering into the cover members and the means for attaching them are made largely in-

terchangeable, thereby simplifying the problems of manufacture and assembly. The parts are such, furthermore, that they may be readily applied to existing box structures of the nesting type.

Other objects and advantages of the invention will appear from the detailed description of an illustrative form of the same which will now be given in conjunction with the accompanying drawings, in which:

Figure 1 is a perspective view of an illustrative form of box embodying the invention.

Figure 2 is a view, partly in end elevation and partly in vertical section, illustrating a pair of boxes in nested relation.

Figure 3 is an enlarged detail in section along the line 3—3 of Figure 2, showing a portion of the corner construction.

Figure 4 is a vertical, transverse section through a pair of boxes in stacked relation.

Figure 5 is an enlarged detail view, in plan, of one corner of the box.

Figure 6 is a fragmentary, elevational view taken along the line 6—6 of Figure 5.

Figure 7 is a fragmentary, vertical section along the line 7—7 of Figure 5.

Figure 8 is a vertical section through the upper corner of the box, along the line 8—8 of Figure 5.

Figure 9 is a fragmentary, vertical section along the line 9—9 of Figure 5.

Figure 10 is an end view, in elevation, of one of the upper corners of a modified construction.

Figure 11 is a side view, in elevation, of the box corner illustrated in Figure 10, the corner of a similar, nested box being shown in dot and dash lines in appropriate relation thereto.

Figure 12 is a plan view of the corner of said modified box.

Figure 13 is a vertical section along the line 13—13 of Figure 10, and

Figure 14 is a horizontal section along the line 14—14 of Figure 11.

Referring now to Figures 1 to 9 of the drawings, the box is shown as comprising a pair of end members 10 and 11, side members 12 and 13, and a bottom 14 formed of any suitable material, such as plywood. It will be understood that various other types of material might be substituted for the plywood but the latter is preferred due to its strength, resilience, durability, and lightness. As shown, both the ends and sides of the box taper inwardly toward the bottom to enable appropriate nesting of a series of boxes. Any suitable construction may be employed for uniting the ends, sides and bottom to form a sturdy box structure. An exceptionally strong box may be formed by employing a series of angle members 15 extending along the meeting edges between the bottom and the sides and ends. The vertical corners, between the sides and ends, may also be suitably reinforced and held together by metal angle members 16. A pair of runners 17, preferably of hardwood, may be provided along the longitudinal edges of the bottom to lend additional rigidity and strength. If desired, the corner members 16 may extend to the bottom of the runners and may be turned under the ends of the latter in the manner disclosed in the Tufts and Johnson Patent No. 2,029,746, granted February 4, 1936, or if preferred they may simply terminate adjacent the upper edges of the runners, as shown. A top rail or frame structure may suitably be provided around the top of the box and secured thereto by nails or any other

convenient means. This frame structure may comprise end rails 18 and side rails 19, preferably of hardwood, mitred or otherwise inter-fitted at the corners and preferably rabbeted to receive and overlie the tops of the end and side members of the box.

At each of the top corners of the box there is provided a metal corner reinforcement 20 of appropriate construction. These corner reinforcements are preferably formed with a short side or leg 21 and a long side or leg 22, each side consisting of a vertical plate extending along the outer face of the top rail and a horizontal flange extending over the top rail. Each side may also include, if desired, a flange extending a short distance under the top rail. The longer legs of the corner reinforcements extend along the end rails 18 while the shorter legs extend along the side rails 19. It will be understood that these reinforcements are of right and lefthand construction, two of each being required to fit the four corners of the box. Adjacent the corner of each member 20 the vertical portion of the leg 22 is slit longitudinally, to a limited extent, a short distance down from the top edge and the portion of the side plate below the slit is bulged outwardly to provide a pocket 23. This pocket is open at its bottom and preferably has side edges which taper inwardly toward the bottom. While it is preferable to form it integrally with the leg 22 in the manner explained, it may, if desired, be formed as a separate element riveted, welded, or otherwise secured to the leg 22.

Within the pocket 23 there is inserted a downwardly extending portion 24 of a pivot-providing or locking member 24. This member is suitably formed with inwardly tapering side edges and is adapted to be snugly received by the pocket 23. The upper portion 25 of the locking member 24 extends inwardly to overlie and rest upon the top of the leg 22. This portion 25, in conjunction with the top of leg 22, provides an elongated enclosure forming a slot for the reception of a trunnion or pivot pin, to be later described. The outer wall of the locking member is preferably indented at 26 to provide an abutment for the pivot pin, in the manner to be explained. For the purpose of permanently attaching the locking member to the box, it is provided with a pair of openings 27 through one of which a rivet 28 is passed. The purpose of providing two openings 27 is to avoid the necessity of having right and lefthand members, the construction within the box being such that adequate space is not available for appropriate handling of a centrally located rivet. Rivet 28 passes through an opening in the pocket 23 in line with the opening 27 and also through an aligned hole in the top rail 18.

The cover members are preferably formed of hard wood so as to have a strength and durability commensurate with other portions of the box. Each cover member may comprise a central portion 29, preferably formed of plywood to provide a desired resilience coupled with strength. Along one of the longitudinal edges of the member 29 there is provided a rail 30, preferably also of hard wood, rabbeted to overlie a portion of the top as well as the edge of the member 29. Along the other longitudinal edge of member 29 a similar rail 31 is provided and this also is preferably rabbeted to underlie the lower surface of member 29 and overlie the longitudinal edge of the latter. Adjacent each end of the cover member there is provided a metal strap 32 having one end extending into the rabbeted portion of the

rail 30 and having its other end 33 looped around three sides of the rail 31. At an intermediate point the strap 32 is formed with a loop 34 disposed almost centrally over the rail 31 and at some distance above the surface of the latter. This looped portion of the strap is appropriately formed, by bending, cutting, pressing and the like, to provide a hollow trunnion or pivot pin 35 extending some distance beyond the end of the cover member. The pivot pin so formed is of suitable dimension to have a free sliding fit within the elongated slot formed between the extension 25 and the top of leg 22. In lieu of forming a hollow pivot pin in the manner explained, the loop 34 might, if desired, be constructed to simply receive and detain a separate pin which would extend and operate in the manner indicated. A flange 320 is bent downwardly at one edge of the strap 32 to overlie a major portion of the end of the member 29. It will be seen that the straps 32 are of right and left-hand construction but are otherwise of identical form. Beneath the rail 30 there is provided, adjacent each end, a plate 36 having a portion bent around the end of the rail and then outwardly to form a projection 37 adapted to rest upon the top of the leg 22. The various elements of the cover may be held together in any suitable way, as by means of rivets 38, or the like, extending through the rails 30 and 31, the portion 29, strap 32, and plate 36. Any other appropriate mode of connection might be employed.

In the application of the cover members to the box two of the locking members 24 are attached to the box at one end, in the manner explained, while the two for the opposite end are left free until the covers are set in place. The pins 35 at one end of the cover members are inserted in the attached locking members while the free locking members are applied over the other pins 35 and then inserted in their pockets 23. The assembly is then completed by simply applying the two rivets 28. Should it be necessary to replace a cover member this may be accomplished by simply removing one of the rivets 28 and thus freeing one of the locking members and the corresponding end of the cover member.

When it is desired to stack a series of loaded boxes the cover members are swung into the position indicated in Figures 1, 4, 5 and 7. In this position the pivot pins 35 are at the inner ends of the elongated slots formed by the member 24, and the projections 37 rest upon the tops of the legs 22. A slight clearance is provided between the looped portions 33 of the straps 32 and the rails 19 and a slight clearance is also provided between the vertical portions of the plates 36 and the rails 18, thereby eliminating any substantial rubbing of metal on wood. It will be apparent, however, that no substantial movement of the cover is permitted when it is in the stacking position. Endwise movement of the cover members adjacent their pivots is substantially prevented by the abutment of the ends of the pivot pins 35 against the indented portions 26 of the locking members.

Now, when it is desired to nest a group of empty boxes it is simply necessary to swing the cover members outwardly by appropriate movement of the hand or by a simple flip of the finger. The cover member is first brought into a substantially vertical position and then slides on its pivots to the outer ends of the elongated slots formed by the members 24. When in this position the swinging movement may continue

until the cover members drop into the positions indicated in Fig. 2. Here they are entirely clear of the open top of the box and, by virtue of their form, occupy very little space beyond the rails 19. While the movement of the cover has been described as taking place in several distinct steps, the entire motion may, in fact, be accomplished in one smooth, continuous operation, the swinging taking place at least in part, with the sliding. A small bump or bulge 39 is preferably formed on each of the corner members 16 to engage the top surfaces of the portions 25 of the locking members to prevent the upper box from descending into wedging relation with the lower box. These bumps are preferably so located that the covers when swung into nesting position will be held apart with a slight clearance. However, if a greater degree of nesting is desired than is permitted in this way, the covers of an upper, nested box may be permitted to overlap the covers of the lower box and may be held outwardly at a slight angle. Or the bumps 39 may be omitted altogether and the desired spacing of the boxes when nested may be accomplished through the engagement of the lower edges of the rails 30 of the upper box, when positioned as in Figure 2, with the upper edges of the covers of the lower box.

It will ordinarily not be necessary nor desirable to employ cover members of such width that the entire top of the box will be closed. Members which close the top to the extent indicated in Fig. 4 will provide all of the protection ordinarily required in the shipment of bread, bananas or similar goods. The opening between the ends of the cover members is not great enough to permit any large and heavy body, such as another box, to be dropped any appreciable distance into the box. Furthermore, the bottoms of the upper boxes substantially complete the closure of the lower boxes. Should it for any reason be necessary, or desirable, to close a greater portion of the top of the box, the cover members may be appropriately widened. Under some circumstances they may be widened sufficiently to completely close the top. When the members are so widened, it may be desirable to correspondingly reduce the degree of nesting to avoid interference between the covers when the boxes are nested, although a greater degree of nesting may be permitted so long as there is no objection to allowing the cover members to extend outwardly at a small angle, as explained above.

Again, considering the stacked condition of the boxes, it will be noted that due to the cooperation between the runners 17 and the rails 30, as best shown in Fig. 4, any appreciable, lateral movement of the upper box relative to the lower will be prevented. Similarly, cooperation of the ends of the runners with the inner edges of the straps 32 will substantially prevent endwise shifting of the upper box on the lower. Should an exceptionally heavy jar carry the runners of the upper box over the straps 32, the sliding movement will be arrested when the runners engage the end rail 18 of the lower box. This is made possible by the fact that the supporting surface of the cover is an appreciable distance below the top edge of the box.

Referring now to Figures 10 to 14, inclusive, there is shown a slightly modified construction for the upper corners of a box produced in accordance with the invention. It will be understood that in general the box may be construct-

ed in substantially the same manner as the box illustrated in Figures 1 to 9 and will include end walls 40 and side walls 41 tapering inwardly from the top toward the bottom of the box. A top rail construction 42 may be provided to reinforce the upper edges of the side and end walls as before. At the vertical corners between the sides and ends, angle members 43, formed of metal, may suitably be provided to secure and reinforce these corners. At an appropriate point adjacent the top of each angle member 43 the metal may be bulged outwardly to form a bump 44, having the configuration shown in Figs. 10, 11 and 14. This bump is intended to serve the purpose of the bump 39 of the first embodiment of the invention but, due to its configuration, is somewhat more readily produced. To secure and reinforce the top rails 42 and provide for the attachment of the covers, metal corner members 45 may be provided, these preferably having a long leg extending along the rail at the end of the box and a short leg extending along the rail at the side of the box. The top of the member 45 may suitably be bent over to provide horizontally extending portions 46 and 47 engaging the upper edges of the rails, these portions preferably being formed as an uninterrupted flange extending over the top rails at the corner. Member 45 may be secured to the top rails in any convenient way, as by means of the rivets shown.

In lieu of forming a pocket directly in the member 45, similar to the pocket 23, a separate plate 48 may be secured to the outer face of the member 45 on each side of the corner by means of rivets 49 and 50. The plate 48 is formed to provide a tapering pocket 51 which protrudes outwardly from the longer leg of the member 45. One or more ribs 52 (two being shown) may be formed in the wall of the pocket 51 to render the same more rigid. The pocket so formed is adapted to receive a locking member similar to member 24 of the first form. If desired, it may be identical with the member 24 or it may be modified slightly to provide an indentation 54 extending completely across the member to form a shoulder for limiting the inward movement of the hollow pivot element 55 secured to the cover member. To secure the member 53 within the pocket 51, a rivet 56 may be passed through a suitable hole in the wall of the pocket and through the aligned portions of the box structure, including the corner member 45, rail 42, angle member 43, and wall 40. A suitable aperture is also provided in the member 53 in alignment with the opening through the pocket. To enable use of the same form of locking member 53 at each of the four corners, it may either be provided with two holes, one or the other of which is adapted to receive the rivet 56, depending upon the location of the member, or it may be provided with a single, elongated slot, as indicated at 57 in Fig. 10.

In other respects the modified construction may suitably be the same as the box first described and the box will function in substantially the same way.

While several illustrative forms of the invention have been described in considerable detail, it will be understood that numerous changes in the construction and arrangement of the various parts may be made without departing from the principles and scope of the invention. The materials employed in the construction of the various parts may be varied to suit the particular requirements. The terms and expressions used herein are to be regarded as terms of description and not of limitation.

What I claim is:

1. In a nesting box having side and end walls, a cover member, means on said member providing a pivot therefor intermediate its edges and above the plane thereof, and means on opposite walls of the box to receive said pivot means, said pivot receiving means presenting an elongated opening enabling said pivot means to slide.

2. In a nesting box having side and end walls, a cover member, means on said member providing a pivot therefor intermediate its edges and above the plane thereof, and means on opposite walls of the box to receive said pivot means, said pivot receiving means having shoulders cooperating with the ends of said pivot means to receive thrusts therefrom.

3. In a nesting box having side and end walls, cover members for partially closing the top of the box, pivot elements secured to said members and projecting beyond the ends thereof, metal reinforcements at the upper corners of the box, pockets formed in said reinforcements, locking members inserted in said pockets and projecting therefrom to provide openings to receive said pivot elements, and means for retaining said locking members in said pockets.

4. In a nesting box having side and end walls, a cover member, pivot elements secured to said member and projecting beyond the ends thereof, metal reinforcements at the upper corners of the box, means on said reinforcements providing pockets with inwardly sloping side edges, locking members having portions arranged to fit snugly within said pockets and projecting portions arranged to receive said pivot elements, and means for retaining said members in said pockets.

5. In a nesting box having side and end walls, a cover member, a metal strap secured to said cover member adjacent each end, said straps being formed to provide pivot means intermediate the longitudinal edges of said member and above the upper surface thereof, and means on said box adjacent the upper edge thereof for receiving and retaining said pivot means.

6. In a nesting box having side and end walls, a cover member, a metal strap secured to said cover member adjacent each end, said straps being formed to provide pivot means intermediate the longitudinal edges of said member and above the upper surface thereof, slot means on said box adjacent the upper edge thereof for receiving and retaining said pivot means, and means on said member removed from said pivot means for engaging the top of said box.

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