Dec. 12, 1950 R. J. BYERS 2,533,663

CRATE

Filed July 2, 1947 2 Sheets-Sheet 1

Fig. 1

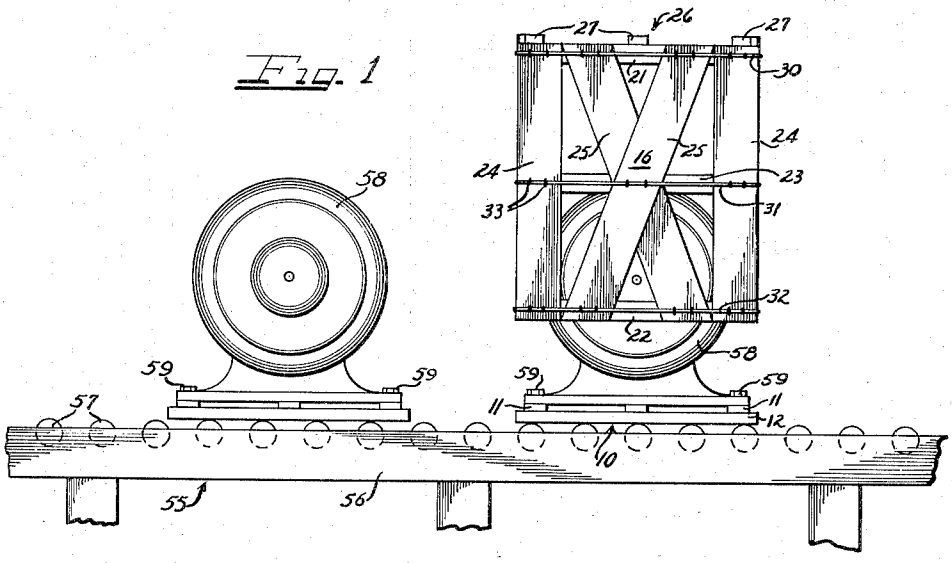
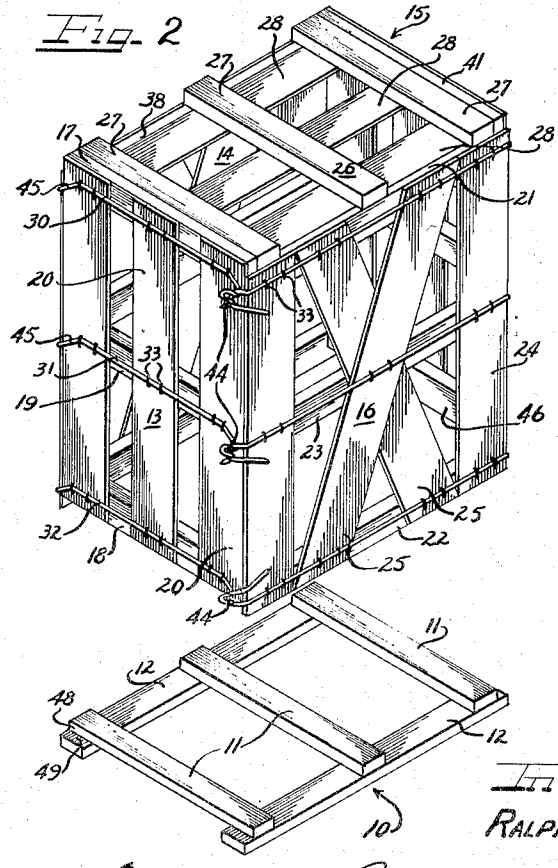


Fig. 2



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CRATE

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Fig. 3

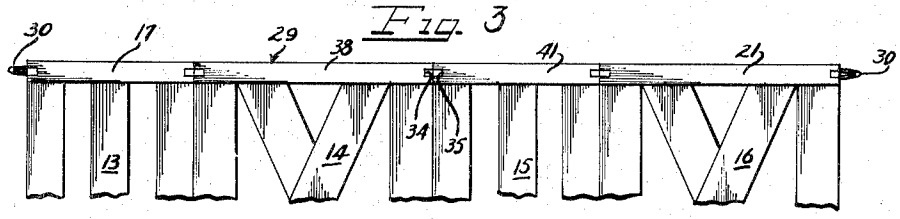


Fig. 4

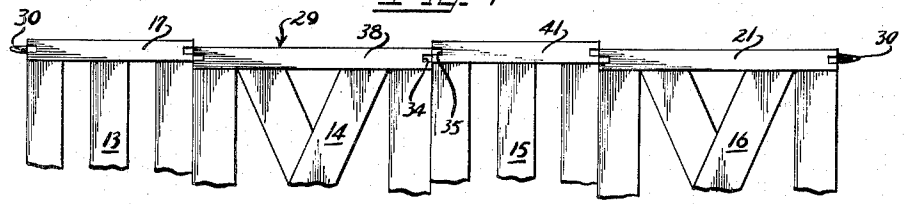


Fig. 5

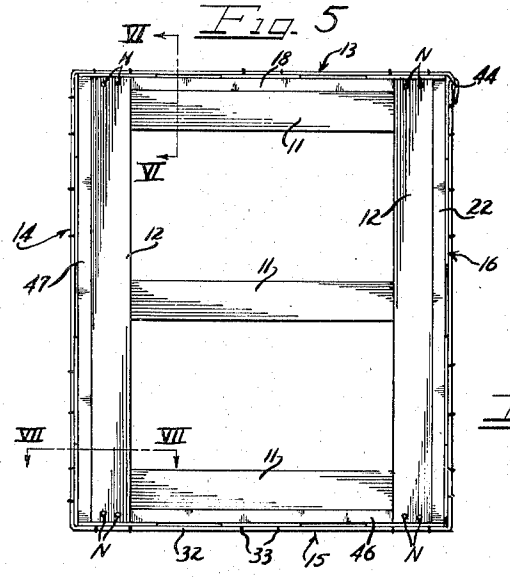


Fig. 6

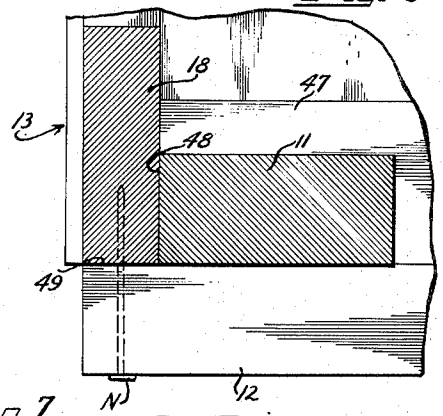


Fig. 7

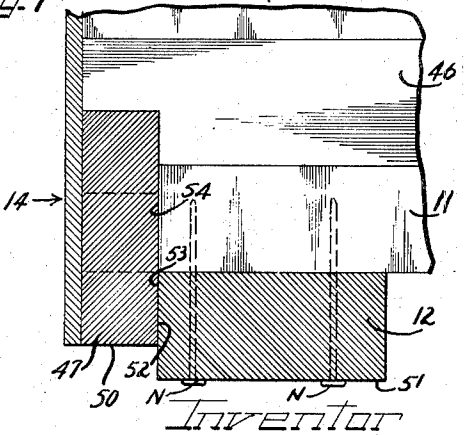
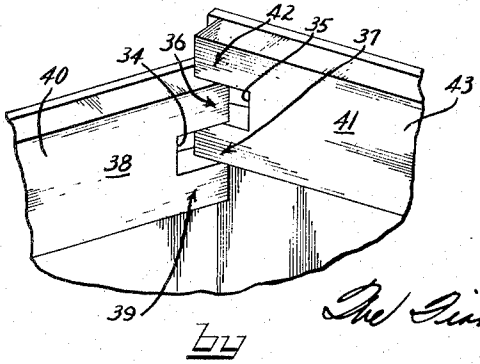


Fig. 8



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Patented Dec. 12, 1950

2,533,663

UNITED STATES PATENT OFFICE

2,533,663

CRATE

Ralph J. Byers, Chicago, Ill., assignor to Chicago Mill and Lumber Company, Chicago, Ill., a corporation of Delaware

Application July 2, 1947, Serial No. 758,637

8 Claims. (Cl. 217—48)

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This invention relates to a crate construction and more particularly to a crate construction suitable for crating heavy articles such as stoves, motors, etc.

One of the difficulties encountered in providing a crate suitable for shipment of articles of this type is to minimize the time it takes to completely crate the article without sacrificing strength and rigidity of the crate. For example, one could rather quickly fold a wire-bound mat about the article and close the ends of said mat to complete the crate, but the resulting crate would lack strength and rigidity since none of the sides would be interlocked in any way with each other or with the ends. While some of the known types of crates are provided with members which interlock to give the crate rigidity, it has been my experience that the type of interlocking employed requires the crate to be assembled in a sequence of steps which are unnecessarily time-consuming.

Furthermore, I have found known types of interlocking to be deficient, particularly in those crates where the crate sides are offset from each other, in maintaining the sides self-centered and in allowing variation in the amount of offset to compensate for irregularities in the dimensions of members in contact with each other. While the types of wood used to make packing crates are quite practical for the purpose, it is evident that a packing crate is hardly a finished article of cabinet work. Consequently, preformed blanks may vary in dimensions and a satisfactory type of interlock should afford compensation for this variation.

With the foregoing in mind, I have invented a crate which can be quickly assembled from preformed blanks, and which, when assembled, is satisfactorily strong and rigid. In fact, my crate is particularly adapted for production line work where articles are to be quickly crated and dispatched for shipment. In accordance with the teaching of my invention, preformed blanks can be assembled at chosen locations along a conveyer line. With such an assembly line, articles to be crated can be secured, say at one location, to a base member and the partial assembly then quickly forwarded to another location where the crate sides and top have been formed into a hood ready to be rapidly lowered over said article and secured to the base member to complete the crating operation.

The assembled crate is strong and rigid. The crate sides are offset from each other alternately, and the opposite ends of the crate which, of

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course, can be the top and bottom of the crate, are both secured in interlocking relationship with the offset sides. I employ a type of interlock between adjacent sides of the crate which provides firm lateral support by means of the cleats thereof. Unlike many structures of this type, the side cleats have vertical end surfaces in interlocked abutment, thus providing unusually great resistance to the collapse of the sides inwardly, or sidewise shifting thereof. This feature is of particular advantage in the central portion of the sides where the lateral support furnished by the top and bottom of the crate is relatively ineffective, and the intermediate cleats which are mutually supported furnish strong resistance to collapsing forces on the sides. Likewise, my interlock provides strong resistance to relative shearing forces on the sides of the crate, as would occur in lifting upwardly on the raised pair of opposed sides on structures of this type. The interlock further tends to maintain each side firmly self-centered and yet is adapted to allow for variation in the dimensions of members of individual sides of the crate to some extent. In order to further facilitate rapid setting up of the crate, I form the crate sides as sections of a wire-bound mat which can be quickly folded to set up the crate sides. Often with this type of construction, the side cleats have of necessity been relatively narrow, due to the fact that the sides were offset the entire width of the cleats. In my construction the cleats may be relatively much wider, thus providing a much more rugged and durable crate.

It is, therefore, an object of my invention to provide a crate suitable for the shipment of heavy articles such as stoves, motors, etc., which can be completely assembled in a short space of time and which is, nevertheless, sufficiently strong and rigid for the purpose intended.

It is another object of my invention to provide such a shipping crate which is especially adapted for crating articles on a production line basis in that preformed crate sections can be located in such a manner that rapid assemblage of the crate can be accomplished by following a predetermined sequence of steps.

It is still another object of my invention to provide such a shipping crate in which the crate sides are interlocked with each other and with both of the crate ends.

It is a further object of my invention to provide such a shipping crate in which the crate sides are interlocked with each other by interlocking members which tend to center said sides and

which maintain adjacent sides offset from each other.

It is a still further object of my invention to provide such a shipping crate in which the crate sides are interlocked with each other by interlocking members which maintain adjacent sides of the crate offset from each other but which permit slight variations in the amount of such offset to compensate for dimensional irregularities in the members in contact with each other.

It is still another object of my invention to provide a shipping crate in which the crate sides are formed by folding a wire-bound mat or blank into set up position, said mat including members which interlock to resist strongly both lateral collapsing forces and vertical shearing forces exerted on the sides.

It is a further object of my invention to provide a shipping crate in which the crate sides are formed by folding a wire-bound mat or blank into set up position wherein the amount of offset of adjacent sides does not limit the width of the interlocking side cleats.

These and other objects and advantages of my invention will become apparent from the following detailed description taken in conjunction with the attached drawings in which:

Figure 1 illustrates the manner of crating an article for shipment in accordance with the teaching of my invention;

Figure 2 is an exploded isometric view of a crate construction in accordance with the teaching of my invention;

Figure 3 is an elevational view, broken away in part, of the foldable wire-bound mat or blank which forms the crate sides, said mat being shown as laid out flat;

Figure 4 is a view similar to that of Figure 3, but after the crate sides have been offset alternately preparatory to folding of the mat;

Figure 5 is a plan view of the bottom of the crate, i. e., looking upward at the crate from below;

Figure 6 is a sectional view taken on line VI—VI of Figure 5;

Figure 7 is a sectional view taken on line VII—VII of Figure 5; and

Figure 8 is a view looking from he inside of the crate toward a corner thereof and shows members of adjacent sides of the crate partially interlocked according to my invention.

While I have selected the foregoing illustrations as disclosing a practical embodiment of my invention, it is to be understood that these illustrations are merely representative and are not intended to confine the scope of my invention to the exact size and overall shape of the crate shown in the drawings.

The crate shown in the drawings is a type suitable for shipping articles which should be maintained in an upright position during shipment. Any article which has a base of its own, such as a stove or an upright motor, is generally required to be shipped in such a manner. Accordingly, my crate includes a base or bottom member 10 to which the article being shipped is securely fastened.

The crate bottom 10 is of substantial strength, such strength being secured by positioning relatively sturdy slats 11 crosswise with respect to relatively sturdy cleats 12. As can be observed from Figure 2 of the drawings, the ends of slats 11 rest upon cleats 12 and are substantially flush with the outermost edges of the cleats 12. Slats 11 and cleats 12 are secured together in a suitable manner, as by nails. While the ends of slats 11 are substantially flush with the outermost edges of cleats 12, the ends of the cleats extend beyond the outermost edges of the slats 11 and this arrangement is provided for a purpose that will be further explained later in this specification.

A plurality of substantially vertical sides 13, 14, 15 and 16 are supported by and attached to the crate bottom 10. As can be observed from Figures 2 and 3 of the drawings, each of these crate sides consists of cleats extending lengthwise of the side, these cleats being substantially horizontal in the crate shown in the drawings, and slats secured to said cleats in a suitable manner, such as by being stapled thereto. For example, the crate side 13 includes horizontal top and bottom cleats 17 and 18 and an intermediate horizontal cleat 19 positioned midway between said top and bottom cleats. A plurality of upright slats 20 are attached to said horizontal cleats, the ends of said slats being substantially flush with the upper surface of the top cleat 17 and the lower surface of the bottom cleat 18, respectively. Similarly, the adjacent crate side 16 includes horizontal top and bottom cleats 21 and 22 and a horizontal cleat 23 positioned midway between said top and bottom cleats. A pair of substantially upright slats 24 and a pair of diagonal bracing slats 25 are attached to said horizontal cleats. The ends of the slats 24 and 25 are substantially flush with the upper edge of top cleat 21 and the lower edge of bottom cleat 22, respectively. The use of diagonal bracing slats instead of having all of the upright slats vertical, is of course, optional, but it is preferable to employ such diagonal slats when the crate sides are of substantial length. As is illustrated in Figure 2 of the drawings, when the diagonal bracing slats 25 are employed, the upright slats 24 are best placed adjacent each corner of the crate. Since crate side 15 is identical to crate side 13, and crate side 14 is identical to crate side 16, no detailed description of the crate sides 14 and 15 is deemed necessary.

The crate top 26 consists of a plurality of relatively sturdy cleats 27 which are secured in cross-wise relationship to a plurality of slats 28. As can be observed from Figure 2 of the drawings, the ends of the cleats 27 project beyond the outermost lateral edges of the slats 28. The ends of the slats 28, however, are flush with the outermost lateral edges of the cleats 27. Since I have illustrated a type of crate which is to be maintained in an upright position during shipment, I employ slats in the top which are less sturdy than slats 11 of the crate bottom. In other words, the crate top does not have to carry the weight of the article being shipped and for this reason, need not be made as sturdy as the crate bottom. Naturally, and depending upon the particular requirement, the crate top could be made as sturdy as necessary and more sturdy slats could be used in place of the slats 28.

From an observation of Figure 2 of the drawings, it is seen that adjacent sides of the crate are alternately offset from each other vertically with the result that crate sides 13 and 15 appear raised with respect to crate sides 14 and 16 or, to put it another way, crate sides 14 and 16 appear to be lowered with respect to crate sides 13 and 15. This positioning of the crate sides is achieved in the following manner.

Each crate side is, at least initially, a section

of a wire-bound mat or blank designated generally by the numeral 29 in Figures 3 and 4 of the drawings. When the mat 29 is laid out flat, the individual crate sides are positioned in longitudinal alignment with their longitudinally extending cleats also in longitudinal alignment. The crate sides are foldably secured together by a plurality of flexible wire binders 30, 31 and 32 which are attached to the outer surfaces of the sides by means such as staples 33. As can be observed from Figure 2 of the drawings, the wire binders extend along the outer side surfaces opposite the horizontal cleats of each side. For example, for side 13, wire binder 30 is opposite cleat 17, wire binder 31 is opposite cleat 19 and wire binder 32 is opposite cleat 18.

Each of the horizontally extending side cleats has its ends notched to form a centrally positioned generally rectangular recess at each end of the cleat and opening laterally thereof. When the wire-bound mat 29 is laid out flat as shown in Figure 3 of the drawings, these recesses are positioned in directly opposing relation. Notice, for example, recesses 34 and 35 shown in Figure 3 of the drawings. When it is desired to set up wire-bound mat 29, adjacent sections of this mat, i. e., the crate sides, are offset alternately from each other to move the formerly opposing grooves out of alignment. After this is accomplished, the mat 29 can be readily folded to set up the crate sides.

As this folding takes place, the cleat ends interlock by virtue of the lateral and end opening of the cleat end recesses to hold the cleat sides in final offset relationship. Reference to Figure 8 of the drawings will illustrate how this takes place. The cleat recesses there shown are the recesses 34 and 35 shown in Figures 3 and 4 of the drawings. As is further shown in Figure 4 of the drawings, recess 34 has moved vertically downward from cleat recess 35. When mat 29 is folded, an upper projecting cleat end portion or tongue 36 engages in the opposed cleat recess 35 and a lower projecting cleat end portion or tongue 37 engages in its opposed cleat recess 34 to form a slidable pivot for crate sides 14 and 15. The recesses 34 and 35 are preferably of somewhat greater height than tongues 36 and 37 so that the amount of offset between crate sides 14 and 15 can be varied slightly, if required, to compensate for irregularities in the dimensions of the members of the sides of the crate. Furthermore, since the ends of the cleats are similarly shaped, when they interlock with each other they will tend to center the sides. This will also be readily apparent from Figures 3, 4 and 8 of the drawings.

Again referring to Figure 8 of the drawings, it will be observed that cleat 38 has a lower tongue 39 of approximately the same size as upper tongue 36 thereof, each tongue having a height or width somewhat less than one-third of the width of the body portion 40 of the cleat. Similarly, cleat 41 has an upper tongue 42 of approximately the same size as the other tongues and somewhat less than one-third the width of body portion 43 of cleat 41. Depending upon the tightness of the assembly, upper tongue 36 of cleat 38 and lower tongue 37 of cleat 41 may or may not abut the ends of the recesses 35 and 34 respectively. In any event, the amount of space between these parts will be sufficiently small so that, should the crate sides tend to shift laterally inward, the tongues would readily engage the ends of their respective recesses to prevent further relative

shifting. This relation between adjacent interlocking ends will be termed "in horizontal interlocking proximity." This interlocking is particularly valuable in the intermediate portion of the sides where the top and bottom have little lateral influence, and the intermediate horizontal cleats, as for example cleat 23, will resist any inward pressure centrally of side 16 (Figure 2) due to the support by the end of cleat 19 of side 13 and the end of the corresponding cleat of side 15. Likewise, the height of recesses 34 and 35 is preferably only slightly greater than the height of tongues 37 and 36 so that after a small amount of relative vertical shifting in either direction, one or two of the surfaces of the recesses and tongues would readily engage to prevent further relative shifting. The ends of interlocking cleats are thus "in vertical interlocking proximity" also. For example, if side 14 shifted downwardly with respect to side 15, the upper surface of recess 34 would engage the lower surface of recess 35 and further shearing of sides 14 and 15 would be strongly resisted. Such a shearing force might be created in lifting the crate by grasping sides 13 and 15. As seen in Figures 4 and 8 in the illustrated embodiment, the sides 14 and 15, for example, need be offset less than one-third the height of the body portions of the cleats before interlocking can be accomplished, and by modification of the size or position of the recesses, any desired size cleat could be used. Thus the cleats can be substantially wider, and the width of the cleats is not limited by the distance the sides are to be offset.

The flexible wire binders 30, 31 and 32 are sufficiently flexible to permit the amount of initial offset of the crate sides shown in Figure 4 of the drawings. After the crate sides have been so offset and after they are folded into the position shown in Figure 2 of the drawings, the ends of the flexible binders are looped together and drawn up tightly as is indicated at 44 in Figures 2 and 5. Of course, when the crate sides are initially offset as shown in Figure 4 of the drawings, the flexible binders are angled at each line of offset. This causes the flexible binders to extend at an angle to the horizontal at the corners of the crate as is indicated at 45 in Figure 2 of the drawings. When the flexible binders are tightened to secure the crate sides together, these binders will pull up on the depressed sides to lock said sides against downward movement. As has been previously described, tongue 37 on cleat 41 of crate side 15 interlocks with recess 34 of cleat 38 of crate side 14, and similarly, tongue 36 interlocks with recess 35. Since crate side 14 is a depressed side, the flexible binders 30, 31 and 32 urge said side upward with the result that this side is firmly locked against vertical movement by these binders and by the tongues of cleats of the sides adjacent thereto, as well as by the tongues of side 14 and the tongues of the adjacent sides. The same is true of the other depressed side 16. For the raised crate sides 13 and 15, the wire binders 30, 31 and 32 urge these sides downward with the tongues of cleats thereof bearing downward against the tongues of cleats of the depressed sides. Hence, the raised sides are likewise doubly locked against vertical shifting.

After the crate sides have been set up in the manner just described, the crate top 26 is placed in position with the ends of cleats 27 resting upon the upper surfaces of the top cleats 38 and 21 of cleat sides 14 and 16. The thickness of these cleats 27 is such that, so positioned, they will al-

low the top surfaces of slats 28 to rest flush with the upper surfaces of the top cleats 38 and 21 of cleat sides 14 and 16 with slats 28 abutting the lateral surfaces of cleats 17 and 41. Thus, since the outermost lateral surfaces of outer cleats 29 abut inner lateral surfaces of cleats 17 and 41, horizontal shifting of the crate top in any direction is prevented. The top surfaces of cleats 27 are substantially flush with the top surfaces of cleats 17 and 41. Thus positioned, the crate top 26 is nailed in place. From this it can be seen that the crate top is effectively interlocked with the crate sides.

To complete the crate, the assembled sides and top are placed in position on the crate bottom so that the corresponding bottom cleats 18 and 46 of the crate sides 13 and 15 rest upon the projecting end portions of crate bottom cleats 12. When the bottom cleats 18 and 46 of crate sides 13 and 15 are so positioned, the corresponding bottom cleats 47 and 22 of crate sides 14 and 16 will lie substantially against the outermost sides of the crate bottom cleats 12. The thickness of cleats 12 is illustrated as being somewhat greater than the amount of offset between adjacent sides. Thus, as best seen in Figures 5 and 7, the cleats 12 will project beneath the completely assembled crate and serve as runners, by virtue of which the crate may be easily slid over smooth surfaces in handling. If the cleats 12 were flush, there would be a danger that the ends of side slats would contact the surface and produce undesirable friction therewith, as well as a danger of injury to the slats, particularly since, in practice, the individual side slat ends often project considerably beneath the bottom side cleats. The elevation of slats 11, of course, facilitates handling of the crate. Figure 5 shows the crate bottom cleats 12 in lateral contact with the bottom cleats 47 and 22 of sides 14 and 16 throughout the entire length of said cleats. Also, it can be observed that the crate bottom cleats 12 extend beneath the bottom cleats 18 and 46 of crate sides 13 and 15. The crate bottom slats 11 are positioned so that there is a slat 11 in lateral contact with a bottom cleat of each of the crate sides 13 and 15, said lateral contact being throughout substantially the entire length of said cleats. The amount by which the ends of bottom cleats 12 project beyond the outermost bottom cleats 11 is substantially equal to the width of the bottom cleats 18 and 46 of crate sides 13 and 15 so that these bottom cleats are fully supported by the crate bottom cleats 12. As indicated in Figures 5 and 7, the crate bottom cleat may be secured to bottom cleats 18 and 46 of crate sides 13 and 15 by any suitable means, as for example, nails N.

Figure 6 of the drawings discloses the relationship between the crate bottom cleats and the bottom cleats of the crate sides in detail. As shown there, crate bottom cleat 12 extends under crate bottom slat 11 and beyond this slat an amount equal to the width of the bottom cleat 18 of crate side 13. Hence, this bottom cleat of the crate side 13 is snugly positioned on a ledge having as its surfaces the side surface 48 of slat 11 and the top surface 49 of cleat 12. These surfaces are identified in Figure 2 of the drawings and there is a similar ledge formation adjacent each corner of the crate bottom.

Figure 7 of the drawings illustrates in detail the lateral contact between the crate bottom cleats 12 and the bottom cleats 47 and 22 of crate sides 14 and 16. As can be observed from this figure, bottom cleat 47 of crate side 14 has its lower surface 50 offset upwardly from the lower surface 51 of crate bottom cleat 12. The side surface 52 of cleat 47 is abutted against the side surface 53 of cleat 12 and is also abutted against the end surface 54 of slat 11. This arrangement provides a firm mechanical interlock between the crate bottom and the crate sides. Lateral shifting of the crate bottom in any direction is resisted by the bottom cleats of the crate sides since, at substantially every point around the periphery of the crate bottom, there is a bottom cleat of a crate side in contact therewith, substantially in the same manner as with the top crate.

The above described construction lends itself admirably to expeditious crating of articles for shipment. Crate tops, bottoms and side mats can be preformed and placed on location prior to use. Generally, the crate bottoms will be piled at one location and the side mats and crate tops assembled to form hoods that are positioned at another location along a conveyor assembly line. This enables the packers to mount the articles to be shipped on the crate bottoms, attach them thereto, and let the attached article and crate bottom move forward to the next location where the sides and top, which have been assembled as a hood, which is lowered over the article, and connected to the crate bottom.

Figure 1 of the drawings illustrates such a sequence of operations. A conveyor 55 is illustrated, having a platform 56 and a plurality of conveyor rollers 57. The crate bottoms, with the articles being crated secured thereon, are pushed along the rollers 57 to the location where the crating is completed. Figure 1 shows a motor 58 secured by bolts 59 to the crate bottom 10. As the motor reaches the location shown in the right hand portion of Figure 1, the pre-assembled crate sides and top are lowered, as a hood, over the motor. As the crate sides and top are lowered, the packer is enabled to properly center the sides and top because the lower edges of the bottom cleats 47 and 22 of crate sides 14 and 16 reach the crate bottom 10 in advance of the lower cleats 18 and 46 of crate sides 13 and 15. The lower edges of bottom cleats 47 and 22 are thus leading edges while lower edges of bottom cleats 18 and 46 are trailing edges. Thus being able to utilize these leading edges for guiding action, the packer can very easily center the crate sides and top and quickly bring the bottom cleats 18 and 46 of crate sides 13 and 15 into position on the ledge surfaces adjacent each corner of the crate bottom. Once the crate sides and top are in position with respect to the crate bottom, the crate sides can be nailed to the crate bottom. Thereafter, if desired, the wire binders can be given a final tightening and the crated article pushed farther along the conveyer line.

A sequence of operations performed as above described minimizes the time required to effect crating of relatively heavy articles. With the crate sides and top set up as a hood, this hood can be quickly placed over the article and the provision of leading edges for guiding the hood into properly centered position prevents misalignment such as might cause one edge of the hood to go down between the conveyer rollers. Furthermore, the hood could be turned end for end prior to being lowered over the article and this will make no difference since opposite sides of the crate are identical.

These advantages are secured by constructing component parts of the crate in accordance with the teachings of my invention. Obviously, certain modifications can be made without departing from the spirit of my invention. Instead of employing rectangular recesses and rectangular tongues, as shown in Figure 8, the tongues could be modified to have a tapered cross section of gradually diminishing height along the length thereof as the ends of the cleats are approached. Such a structure would be slightly easier to assemble in interlocked relation, but might have somewhat less strength and rigidity than the structure of Figure 8. Since the rectangular recesses have a somewhat greater height than the interlocking tongues, a taper is unnecessary for satisfactory rapid assembly and for compensation for irregularities of dimensions of the sides.

Accordingly, while I have shown and described an embodiment of my invention, I wish it to be understood that I do not intend to be restricted solely thereto but that I intend to cover all modifications thereof which will be readily apparent to one skilled in the art and which come within the spirit and scope of my invention.

I claim as my invention:

1. A wire-bound shipping crate comprising a plurality of sides alternately vertically offset from each other to provide opposite pairs of raised and lowered crate sides, each of said sides having top and bottom cleats extending substantially the length of said side and each flush with the end of its respective side, and each of said cleats having a recess centrally of each cleat end to provide tongue portions adjacent said recess, the tongues of cleats of the lowered sides of said crate being positioned below the tongues of cleats of raised sides of said crate to maintain the respective sides offset from each other and prevent vertical shifting, at least one of said tongues having surfaces thereof in contact with surfaces of a recess throughout at least a portion of said surfaces to prevent said sides from shifting sideways, wire binders attached to and surrounding the crate sides, a crate bottom and a crate top having ledge surfaces provided adjacent opposite ends thereof, said ledge surfaces being in contact with the bottom cleats of the raised crate sides and top cleats of the lowered crate sides, respectively, to prevent horizontal shifting thereof.

2. A shipping container comprising a plurality of sides each including a plurality of cleats extending lengthwise of the side and each flush with the end of its respective side, and each of said cleats having vertically spaced tongues at each end thereof, and at least one laterally opening recess defined between the tongues at each end of said cleats, the tongues of cleats of adjacent sides of said container being in lateral contact with each other throughout at least a portion of the surfaces thereof to maintain said adjacent sides of said container vertically offset from each other, wire binders attached to and surrounding said container sides, and oppositely disposed container ends attached to said container sides.

3. A shipping container comprising a plurality of alternately offset sides surrounded by flexible binders, each of said sides including longitudinally extending cleats and each flush with the end of its respective side, and each of said cleats having central recesses at the ends thereof, and pairs of tongues defined by said recesses in contact with similar tongues at the ends of similarly positioned cleats of adjacent sides of said container to maintain said adjacent sides adjustably offset from each other in a direction substantially transverse to the longitudinal axes of said cleats, oppositely positioned container ends, and means securing said container ends to said container sides, one of said container ends being substantially flush with corresponding ends of opposed groups of container sides and other container end being substantially flush with one group of opposite ends of the container sides and spaced from the other group for ease in movement of the crate.

4. A shipping container comprising a plurality of alternately offset sides surrounded by flexible binders, each of said sides including longitudinally extending cleats and each flush with the end of its respective side and each of said cleats having centrally recessed end portions thereon in contact with recessed end portions on the ends of similarly positioned cleats of adjacent sides of said container to maintain adjacent sides of the container offset from each other in a direction substantially transverse to the longitudinal axes of said cleats, and oppositely disposed container end members connected to said container sides.

5. In a shipping container having a plurality of sides each including similarly positioned longitudinally extending cleats each flush with the end of its respective side, means for maintaining adjacent sides of said container offset from each other in a direction substantially transverse to the longitudinal axes of said cleats, said means comprising spaced tongues positioned at the ends of each of said cleats, at least one of the tongues at the ends of each of the cleats of adjacent sides of said container being in lateral contact with a corresponding tongue on an adjacent cleat throughout at least a portion of the lateral surfaces on said tongues, said tongues being spaced to permit reduction in the amount of offset between adjacent sides of said container, and flexible binders attached to and laterally encircling the sides of said container, said binders also being offset at the edges of adjacent sides to urge the laterally engaging surfaces of said tongues into contact with each other.

6. In a shipping container having a plurality of substantially vertical sides, each including similarly positioned horizontally extending top and bottom cleats each flush with the end of its respective side, means for maintaining adjacent sides of said container vertically offset from each other, said means comprising pairs of vertically spaced tongues at each of the ends of said cleats, each pair of tongues defining a slot therebetween and said tongues being positioned adjacent the upper and lower edges of said cleats, the tongues of the top and bottom cleats of one set of container sides being positioned below the tongues of the top and bottom cleats of another set of container sides with the tongues and slots of said one set of sides being interlocked with those of said another set of sides and the surfaces of said interlocked tongues being, at least in part, in contact with each other to maintain adjacent container sides offset vertically from each other, and flexible binders attached to and surrounding the sides of said container, said binders urging said surfaces into interlocked contact with each other.

7. A wire-bound shipping crate comprising a plurality of sides alternately vertically offset from each other to provide opposite pairs of raised and lowered crate sides, each of said sides having top, bottom and intermediate cleats ex-

tending substantially the length of said side and each flush with the end of its respective side, and each of said cleats having a pair of spaced projecting tongues and a central recess defined by the tongues at the end thereof, the tongues of cleats of the lowered sides of said crate being positioned below the tongues of cleats of raised sides of said crate to maintain the respective sides offset from each other and prevent vertical shifting in either direction, one of said respective tongues of each pair having a vertical surface thereof in interlocking proximity to a vertical surface of an adjacent recess throughout at least a portion of said surface to prevent said sides from shifting sideways and to support the sides against collapsing forces especially centrally thereof by virtue of said intermediate cleats being so interlocked.

8. In a container of the type described having a plurality of sides each including longitudinally extending cleats each flush with the end of its respective side, a cleat construction comprising a body portion extending substantially the length

of the container side, end portions projecting laterally from said body portion to form spaced terminal tongues defining recesses therebetween of substantially the dimension of said tongues, said recesses being accessible to the tongues of corresponding cleat ends of adjacent sides so that adjacent sides may be interlocked, with the bottoms of said recesses in interlocking proximity to the tongue lateral surfaces of an adjacent cleat to prevent substantial sidewise relative shifting of the sides.

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