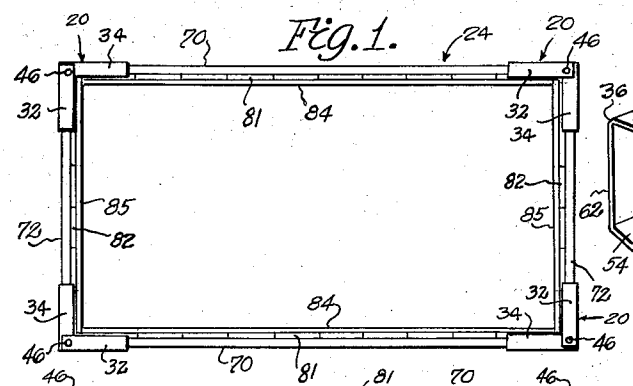
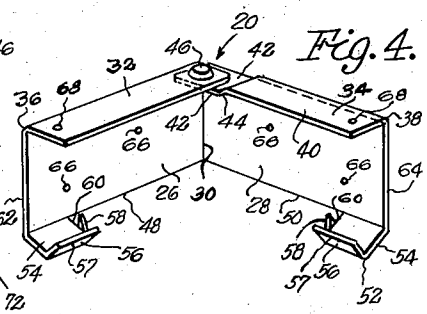
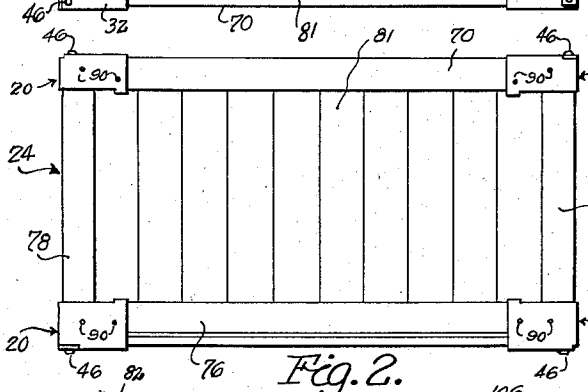
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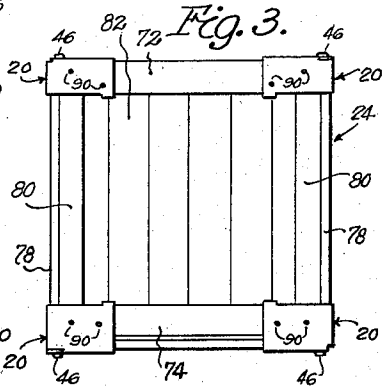
CORNER BRACE FOR CRATES AND BOXES

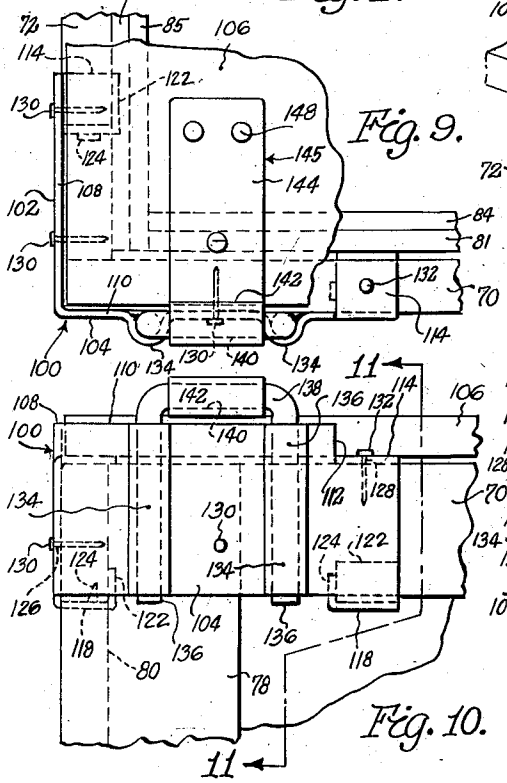
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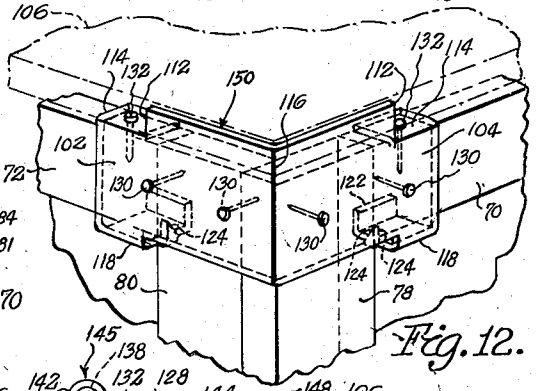


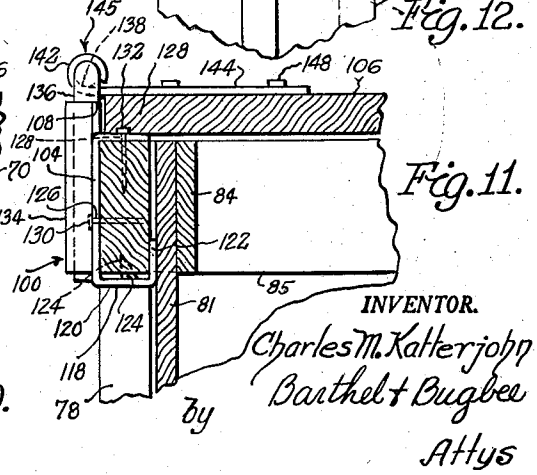












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CORNER BRACE FOR CRATES AND BOXES

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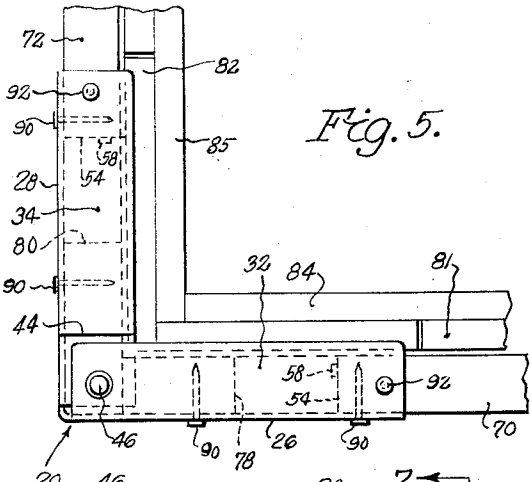


Fig. 5.

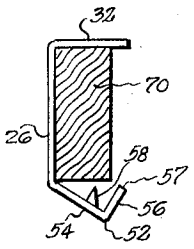


Fig. 8.

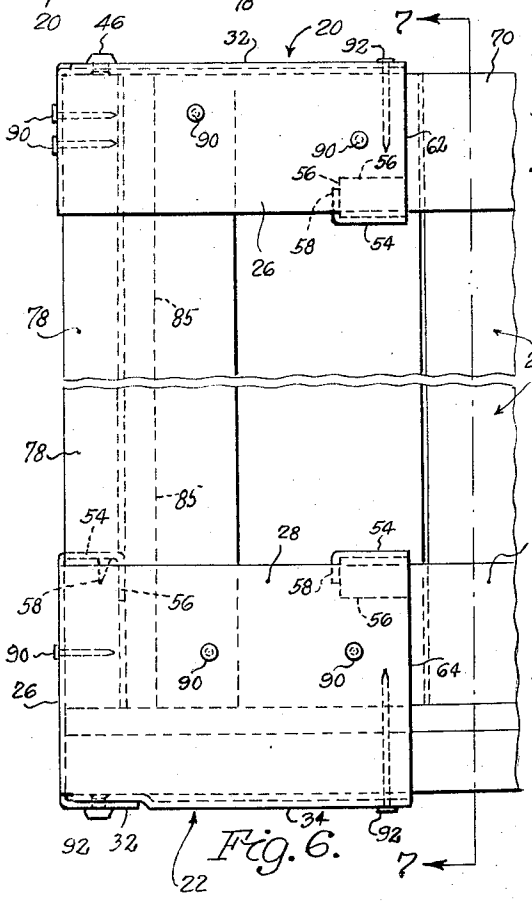


Fig. 6.

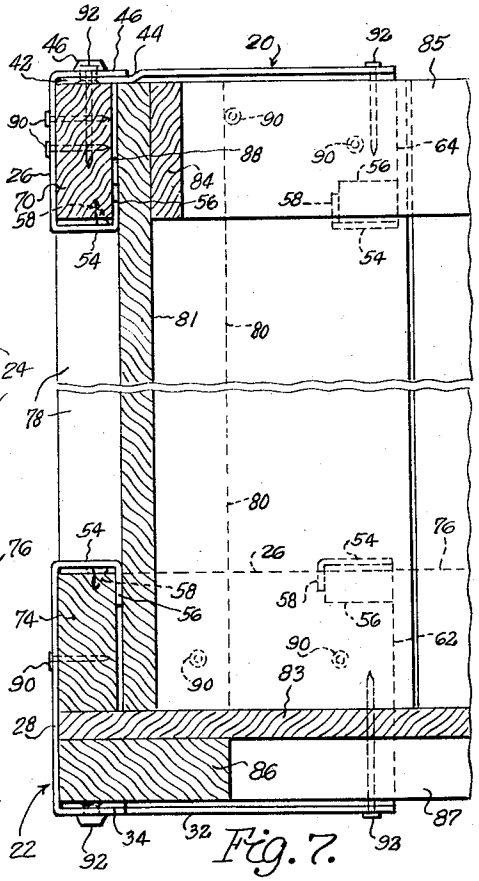


Fig. 7.

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CORNER BRACE FOR CRATES AND BOXES

Charles M. Katterjohn, Henderson, Ky.

Application November 10, 1954, Serial No. 467,957

1 Claim. (Cl. 217—69)

This invention relates to hardware and, in particular, to crate and box hardware.

One object of this invention is to provide a corner brace for crates, boxes and box-trucks, which is quickly and easily applied to the crate or box, yet which will not become accidentally dislodged or detached during subsequent use.

Another object is to provide a corner brace for crates, boxes and box trucks which is inexpensively stamped out of sheet metal and which is adapted to fit different sizes of containers, particularly those made of wood or having wood framing to which the corner brace is attached.

Another object is to provide a corner brace for crates, boxes and box-trucks, having provision for including a hinge for hinging the corner of the crate or box to the body thereof, this corner brace having the foregoing features for preventing dislodgement and detachment.

Other objects and advantages of the invention will become apparent during the course of the following description of the accompanying drawings, wherein:

Figure 1 is a top plan view of a crate equipped with a corner brace according to one form of the present invention;

Figure 2 is a side elevation of the crate of Figure 1 so equipped;

Figure 3 is an end elevation of the crate of Figure 1 so equipped;

Figure 4 is an inside perspective view of the corner brace used in the crate of Figures 1 to 3 inclusive;

Figure 5 is an enlarged fragmentary top plan view of the lower left-hand corner of Figure 1, showing the manner of attaching the corner brace thereof;

Figure 6 is an enlarged fragmentary end elevation of the left-hand side of Figure 3, showing the manner of attaching the upper and lower corner braces;

Figure 7 is a vertical section taken along the line 7—7 in Figure 6;

Figure 8 is a left-hand end elevation of the corner brace of Figure 4, after it has been applied to a crate frame member (shown in cross-section) but before bending to secure it;

Figure 9 is a fragmentary top plan view similar to Figure 5, but showing a combination corner brace and hinge, according to another form of the invention;

Figure 10 is a fragmentary side elevation of the corner brace shown in Figure 9;

Figure 11 is a vertical section taken along the line 11—11 in Figure 10; and

Figure 12 is an outside perspective view of a further modified corner brace, according to another form of the invention, attached to a crate.

Hitherto, corner braces have been used on crates, boxes, box trucks and similar containers for the purpose of holding the crates together and preventing them from coming apart during shipment or handling. Such corner braces as have hitherto been used have employed nails driven horizontally into the sides of the box or into the

frame of the crate. While these are preferable to no brace at all, nevertheless, the nails work their way out under rough handling during shipment or other conditions of use.

The present invention provides a corner brace which is formed from sheet metal or other suitable sheet material, and in which the lower edges of the corner brace are provided with inwardly-extending portions of L-shaped cross-section preferably having prongs thereon bent downward or upward so as to be applicable to the corner of the crate without interference from the upstanding inner end of the L-shaped portion as the corner brace is pushed onto the corner of the crate. After the corner brace is in position, the L-shaped portions are forced upward, as by hammering or by the use of a suitable tool, so that the L-shaped portion extends beneath the crate frame member while the upstanding projection at its inner end moves upward into the space between the crate frame member and the side panel material of the crate, while the prong, if used, bites into the wood of the crate frame member.

The action of the L-shaped portion of the corner brace subsequently prevents withdrawal of the corner brace either accidentally or intentionally, despite very rough handling or intentional attempts at pilfering. Moreover, the corner brace of this invention provides for the insertion of nails or other fasteners in directions at right angles to one another on each side of the corner brace, which is flanged at its upper edges to permit the insertion of fasteners so directed.

Referring to the drawings in detail, Figures 4 to 8 inclusive show upper and lower corner braces, generally designated **20** and **22** respectively, adapted to be attached to the upper and lower corners of a crate or box, generally designated **24**, either with or without casters or supporting wheels. The upper and lower corner braces **20** and **22** are of similar construction, and are designated by different reference numerals because of their slightly different dimensions, but a single description will suffice for both and similar reference numerals designate similar parts.

The corner brace **20** or **22** is formed from sheet metal or other suitable sheet material, and consists of a pair of side plates **26** and **28** bent at right angles to one another along the corner line **30**. Integral with the side plates **26** and **28** are horizontal flanges **32** and **34** respectively, bent inwardly from the upper edges **36** and **38** respectively substantially at right angles thereto and extending along the edges **36** and **38**. One of the flanges, such as the flange **32**, is substantially straight and flat throughout its length, whereas the other flange, such as the flange **34**, has its major portion **40** disposed on the same level and in the same plane as the flange **32**, with an offset or downwardly-bent portion **42** separated from the portion **40** by a kink, bend or shoulder **44**. This arrangement places the upper surfaces of the edge flanges **32** and **34** on the same level, and they are joined to one another at their crossing point by being drilled to receive a fastener **46**, such as a rivet.

Projecting inwardly from the opposite longitudinal edges **48** and **50** respectively of the side plates **26** and **28** are downwardly-inclined L-shaped locking portions **52** consisting of arms **54** and tongues **56** bent at right angles to one another, the arm **54** preferably having a sharp V-shaped prong **58** bent upward from one of its edges **60**. The locking projections **52** are preferably located near the outer ends **62** and **64** respectively of the side plates **26** and **28** where they will exert their maximum leverage or grip upon the crate **24**. Holes **66** and **68** are provided in the sides **26** and **28** and flanges **32** and **34** respectively to receive nails or other fasteners driven in at right angles to one another in three different directions when the corner brace **20** is applied to the crate **24**.

The container 24 may be a crate, box, box truck or the like, the invention being applicable to all of these types of containers. For purposes of illustration, a slat-panel crate has been chosen. The crate 24 is conventional and its details are beyond the scope of the present invention. It consists of upper side rails 70 and 72 respectively and lower side rails 74 and 76 respectively constituting border rails which are interconnected by vertical corner rails 78 and 80 arranged with their sides perpendicular to one another. The space between the framework thus formed is filled by side slats 81 and 82 respectively, and a bottom 83 (Figure 7). Rail cleats 84, 85 are provided inside the crate near its upper edge and side bottom runners 86 and 87 are provided beneath the bottom 83.

To install the invention, the corner brace 20, in the position shown in Figures 4 and 8, is pushed against the corner of the crate 24, with its side plates 26 and 28 pressed against the border rails 74 and 76, is downwardly-bent L-shaped projections 52 having been inclined sufficiently (Figure 8) so that the upper edges 57 clear the lower edge of the rails 70 and 72. The arm 54 of the locking projection 52 is of substantially the same width as the thickness of the rail 70 or 72 so that when a hammer or compressing tool is applied to force the inclined arm 54 into parallelism with the upper edge flange 32 or 34, the tongue 56 will slip upward into the crack 88 between the rail 70 or 72 and the slats 82 or 84 (Figure 7). While this is occurring, the prong 58 penetrates the lower side of the rail 70 or 72, further locking the assembly in position (Figure 7). Nails or other fasteners 90 and 92 respectively are driven into the rails 70 or 72, as the case may be, through the holes 66 and 68, so that the nails securing each side plate 26 or 28 and its corresponding edge flange 32 or 34 are perpendicular to one another (Figure 7) so as to provide an interlocking grip upon the border rails 70 or 72.

The lower corner brace 22, being of the same construction but of slightly greater width to additionally accommodate the bottom runners 86 and 87 (Figure 7) is installed in a similar manner to the installation of the corner brace 20 described above, except that its position is inverted. Consequently, the locking projections 52 of the corner brace 22 are uppermost instead of underneath, and consequently engage the upper edges of the bottom rails 74 and 76.

In the use of the crate 24, thus equipped with the corner braces 20 and 22, rough handling does not dislodge the nails or cause the opposite sides of the corner brace to spring apart, as in the ordinary plain corner braces, because of the locking effects of the locking projections 52 at the opposite ends of the corner braces engaging behind the rails 70 and 72 in the cracks 83 between them and the slats 81 or 82. The same is true of the action of the lower corner braces 22.

The modified corner brace and hinge, generally designated 100, of Figures 9 to 11 inclusive, is adapted for use with crates or other containers having hinged lids. The corner brace 100 includes side plates 102 and 104 arranged at right angles to one another and of a height greater than the widths of the top rails 70 and 72 by the thickness of the lid 106, so that the upper edges 108 and 110 come approximately flush with the upper surface of the lid 108. Adjacent the free ends of the side plates 102 and 104, the latter are notched out at their upper corners 112 to provide downwardly bent tabs 114 which have a similar purpose to the edge flanges 32 and 34 of the corner brace 20 of Figure 4, but occur only at the outer or free ends of the side plates 102 and 104. These are bent perpendicularly to one another at the fold line 116.

The lower edge of each side plate 102 and 104 is provided with an L-shaped locking projection 118 similar to the locking projection 52 of Figure 4 and similarly provided with an inclined portion 120 which later becomes horizontal during assembly, an upwardly-bent end

portion 122 analogous to the upwardly-bent end portion 56, and a prong 124 similar to and for the same purpose as the prong 58. Holes 126 and 128 are provided for fasteners 130 and 132, such as nails. The side plate 104 which extends along the side rail 70 at the rear of the crate 24 is provided with a pair of spaced parallel grooved semi-cylindrical projecting portions 134 formed by rolling or in any other suitable manner, these being of approximately U-shaped or semi-cylindrical cross-section to receive the parallel side arms 136 of a hinge bracket 138 of U-shaped form having a bridge or connecting portion 140 serving as a pivot rod upon which the bent-over eye portion 142 of a hinge leaf or strap 144 is pivotally mounted. The hinge bracket 138 and hinge strap 144 together form a hinge, generally designated 146. The side arms 136 of the hinge bracket 138 are preferably welded into the recesses formed by the semi-cylindrical portions 134 in order to secure the two parts firmly together. The hinge strap 144 is suitably drilled to receive fasteners 148 by which it is secured to the lid 106.

The modified corner brace, generally designated 150, shown in Figure 12 is of similar construction to the hinge corner brace 100 of Figures 9 to 11 inclusive, except that the semi-cylindrical projections 134 and the hinge portions 138 and 144 associated with them, constituting the hinges 146, are omitted. The corner brace 100, however, is used at the rearward corners of the crate where the hinges are normally installed, whereas the corner braces 150 are mounted at the forward corners of the crate where no hinges are used. The installation of the hinge corner braces 100 and corner braces 150 is similar to that described in connection with the corner brace 20 of Figure 4, hence no repetition thereof is deemed necessary.

The crates, boxes and trucks on which the corner braces of the present invention are to be used are intended to be used by manufacturing plants and others for material handling, for continuous and repeated use for from five to ten years. They are not intended to be used as mere one-trip shipping boxes. The corner braces of the present invention greatly prolong the service life of the crates, boxes or trucks on which they are used and render them suitable for many shipments or trips, in contrast to unprotected crates or boxes which often have no value except as one-trip shipping containers, for example, the crates in which refrigerators, radio, television sets and the like are shipped and which are discarded after being used only once for that purpose.

What I claim is:

A corner brace for the corners of an approximately rectangular container having border rails disposed outside and secured to its side walls, said brace comprising an angle member of sheet material having mutually perpendicular side plates adapted to engage the outer faces of said border rails, said side plates meeting one another at a common corner edge and having upper and lower side edges thereon, upper edge flanges projecting inwardly from the upper side edges of said side plates and adapted to extend substantially entirely across the upper faces of the border rails, the ends of said upper edge flanges nearest said common corner edge engaging one another and being firmly secured to one another at their place of engagement, and lower edge arms projecting inwardly from the lower edges of said side plates near the ends thereof remote from said common corner edge and disposed approximately perpendicular to said side plates, said arms being adapted to extend entirely across the lower faces of the border rails, said flanges and arms being adapted to grippingly engage the upper and lower faces respectively of the border rails in substantially parallel relationship, each of said arms at its inner end having an upstanding anchoring tongue thereon disposed approximately perpendicular thereto and adapted to penetrate between the border rails and adjacent side walls

of the container, said arms having upstanding prongs extending upwardly above the level of said arms.

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