July 1, 1941. W. W. ROBINSON 2,247,620

BOTTLE CRATE

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Fig. 1.

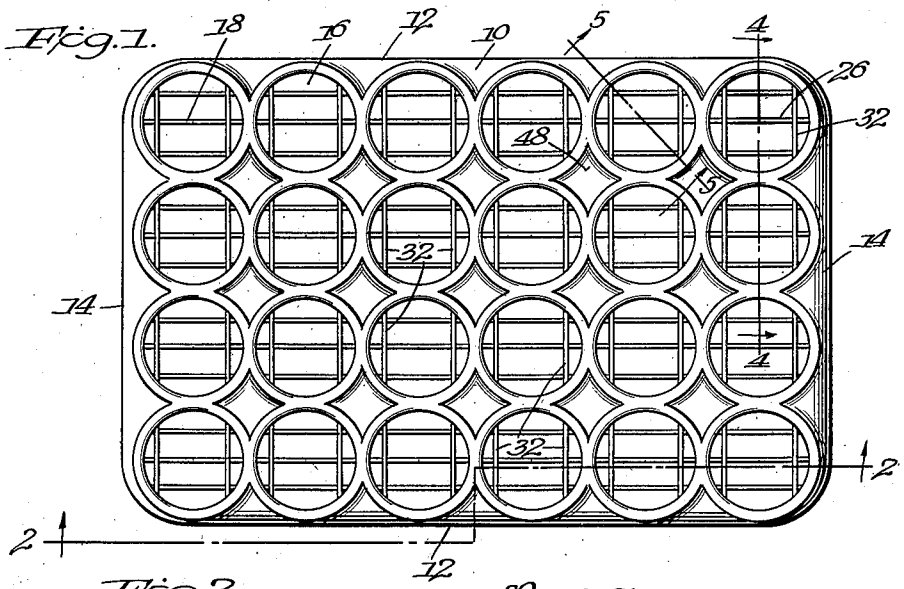


Fig. 2.

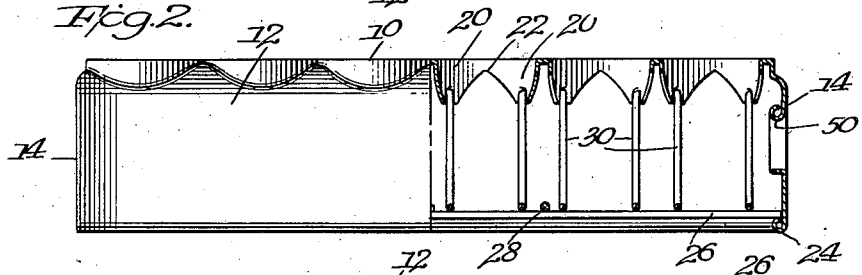
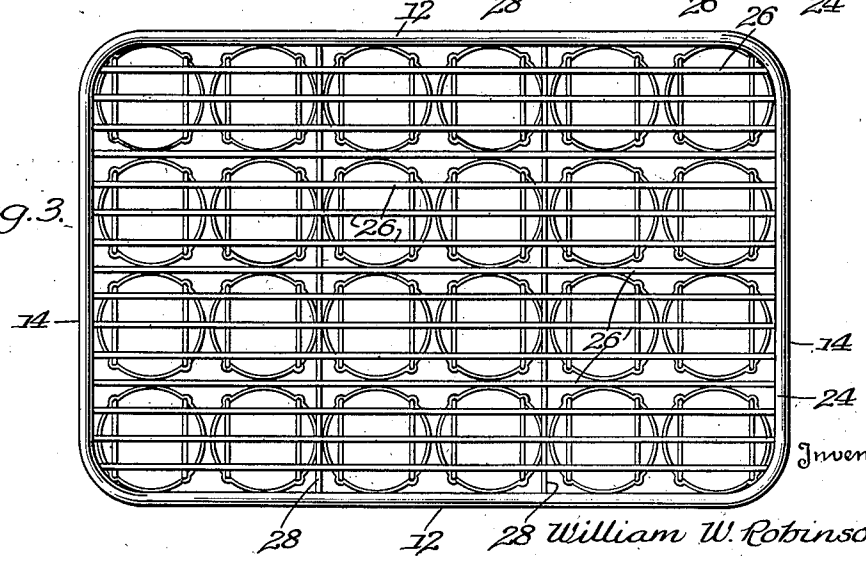


Fig. 3.



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BOTTLE CRATE

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Fig. 4.

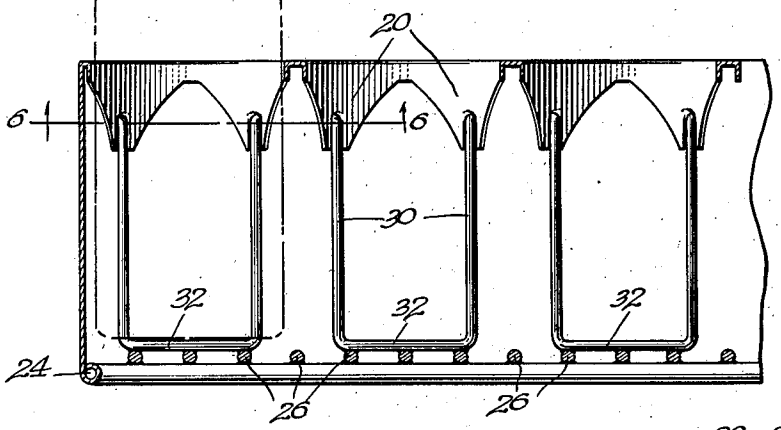


Fig. 5.

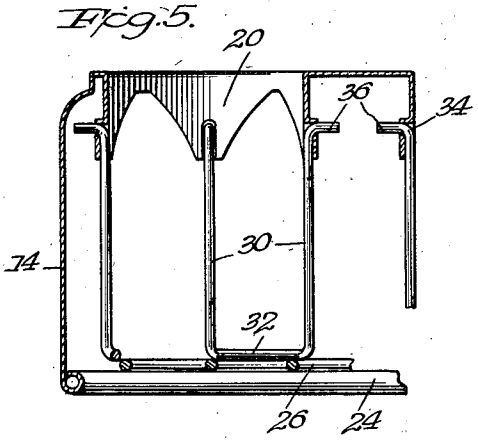
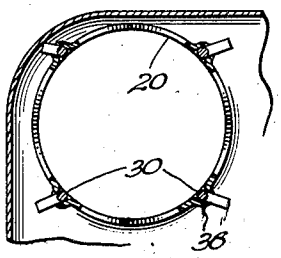


Fig. 6.



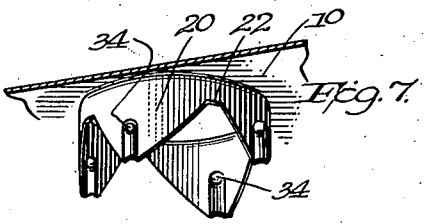


Fig. 7.

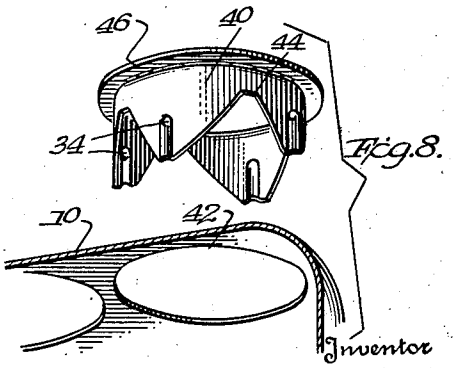


Fig. 8.

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BOTTLE CRATE

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Fig. 9.

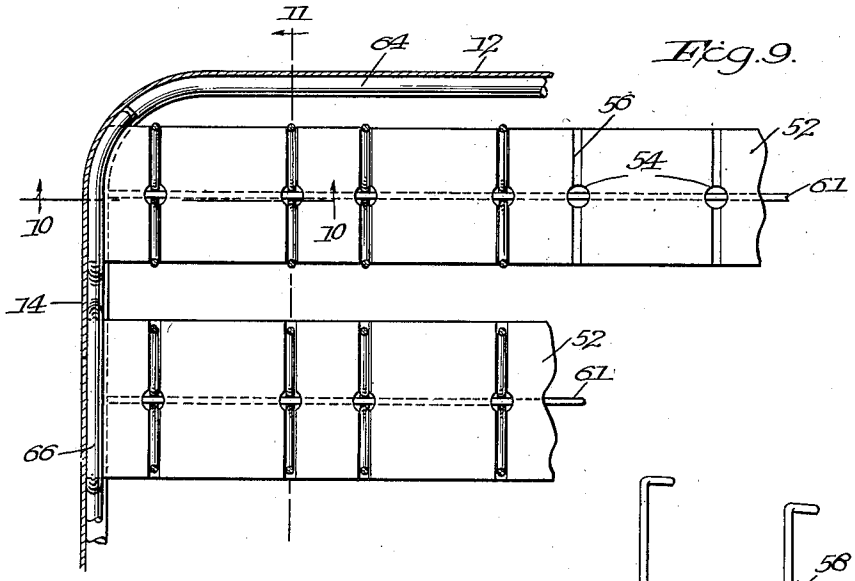
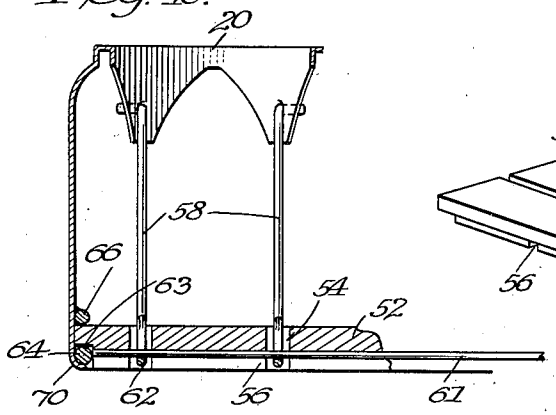


Fig. 10.



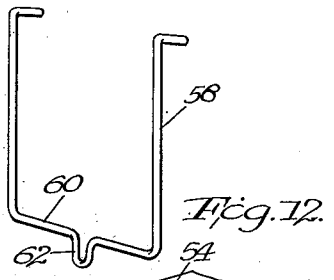
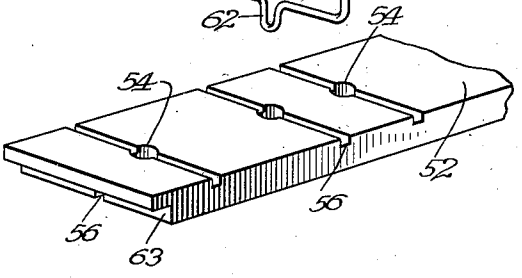


Fig. 12.



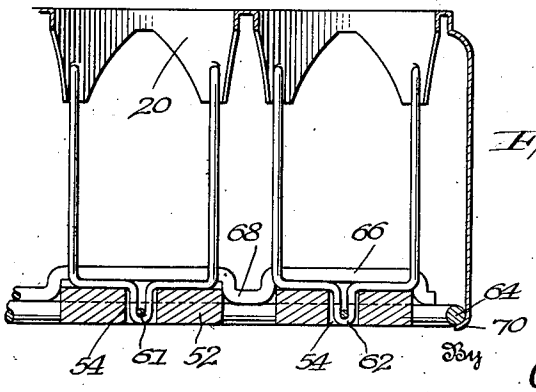


Fig. 11.

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BOTTLE CRATE

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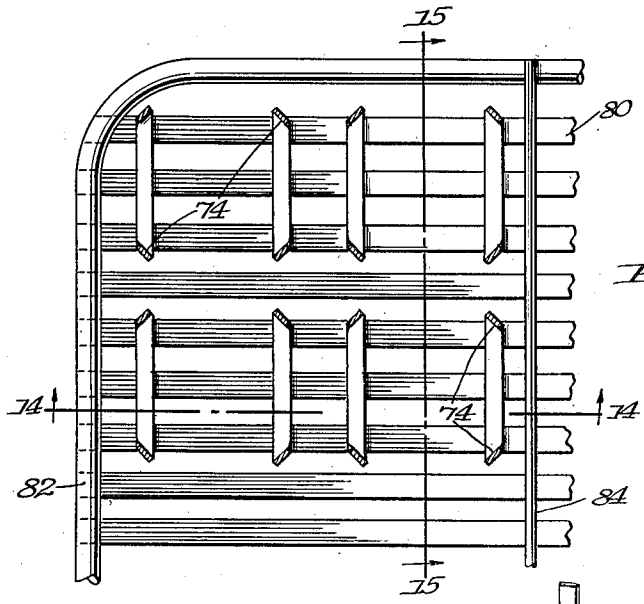


Fig. 13.

Fig. 14.

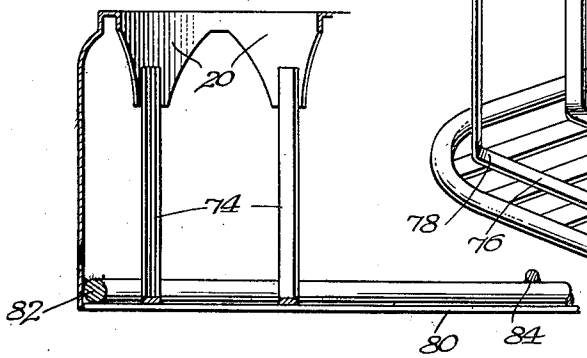
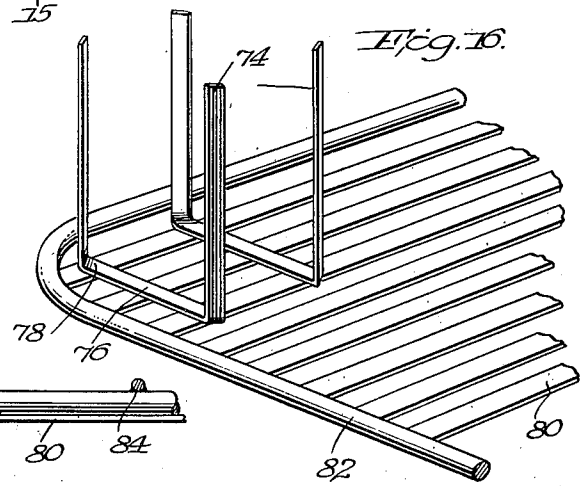


Fig. 16.



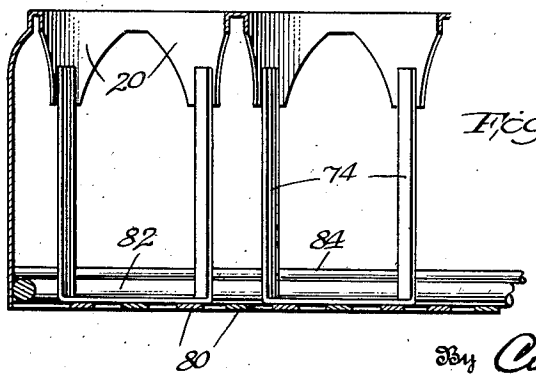


Fig. 15.

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Patented July 1, 1941

2,247,620

UNITED STATES PATENT OFFICE

2,247,620

BOTTLE CRATE

William W. Robinson, Chattanooga, Tenn., assignor to Cumberland Case Company, Chattanooga, Tenn., a corporation of Tennessee

Application January 18, 1938, Serial No. 185,616

4 Claims. (Cl. 220—21)

The present invention relates to a bottle crate adapted to conveniently receive a plurality of bottles for transporting the same to and from the location where they are to be sold. The particular construction of the crate disclosed herein is for bottles of the type now used for packaging soft drinks, beer, milk and the like.

A principal object of the invention is to provide such a bottle crate which is characterized by the simplicity and cheapness of its construction, yet which will be sufficiently rugged to withstand hard wear without becoming damaged.

A further object of the invention is to provide such a crate or case into which the bottles can be quickly inserted, and which will firmly carry the bottles during transportation without the bottles moving in the compartments which receive them, thus avoiding breakage of the bottles and reducing undesirable noise to a minimum.

The invention as disclosed in the application comprises an outside casing or shell having a perforated top plate defining the openings to the bottle receiving compartments, the latter being formed by a simple arrangement of wires or rods in such fashion that the bottles are intimately embraced and retained in position. Crates of the present invention are so constructed that they can be conveniently stacked one upon another during transportation or while in storage, without danger or damage to the bottles.

As will appear from the description of the invention, the various elements forming the crate are so assembled that no sharp edges are presented to the bottles during the loading or unloading of the crate, and the simplicity of the construction makes possible easy cleaning of the same. While the construction permits the bottles to be held separate from one another when positioned in the crate, it is so designed that maximum capacity is provided while at the same time employing only a minimum number of elements in fabricating the crate.

The elements of the apparatus which support the bottles are formed in skeleton fashion which not only permits the contents of the bottles to be inspected when they are in the crates, but also permits air or any cooling fluid to circulate around the bottles when in position in the crates, if desired, in order to keep the contents of the bottles cool during storage or transportation.

Furthermore, the skeleton-like construction of the crate is such that the bottles may be cleaned or sterilized while in position in the crates.

In the drawings, which are illustrative of several preferred forms of the invention and which are in no sense restrictive:

Figure 1 is a top plan view of a preferred form of a crate of the present invention.

Figure 2 is a side elevational view, partly in section, of the crate shown in Figure 1.

Figure 3 is a bottom elevation of the type of crate shown in Figure 1.

Figure 4 is an enlarged sectional view of an end of the crate taken along the line 4—4 of Figure 1.

Figure 5 is a similar enlarged view of a part of the crate, taken along line 5—5 of Figure 1.

Figure 6 is a horizontal sectional view of one of the bottle compartments, taken along the line 6—6 of Figure 4.

Figure 7 is an enlarged perspective view of the bottle guiding opening in the top plate of the crate.

Figure 8 is a similar perspective view of a modified construction of the bottle guiding opening in the top plate of the crate.

Figure 9 is a horizontal sectional view of a part of a modified form of crate.

Figure 10 is a vertical sectional view of the modification of Figure 9, taken along the line 10—10 of Figure 9.

Figure 11 is a similar vertical sectional view of this modification, taken along the line 11—11 of Figure 9.

Figure 12 is a perspective view of one of the bottom wooden plates of this modification, having associated therewith one of the elements for forming the bottle pockets.

Figure 13 is a view similar to Figure 9 of a further modification of the invention.

Figure 14 is a vertical sectional view of the modification of Figure 13, taken along the line 14—14 of Figure 13.

Figure 15 is a similar vertical sectional view of this modification, taken along the line 15—15 of Figure 13.

Figure 16 is a perspective view of the bottom grill of this modification, showing associated therewith a modified form of bottle pocket forming elements.

Referring to Figures 1 through 3, the crate is mounted within a one-piece enclosing casing of thin yet strong metal, comprising a top plate 10, side walls 12 and end walls 14. While it is most convenient from the standpoint of economy to form the top, sides and ends of the crate from a single piece of metal by stamping the same into a box-like construction with the bottom open, if necessary, the sides and ends may be made from one sheet of metal, and the top made from a

separate sheet of metal, the top being secured to the sides in any suitable fashion as by welding.

Extending throughout the top **10**, are a plurality of bottle guiding openings **16**, these openings leading to the bottle supporting pockets, and there may be any convenient number of openings and pockets as desired. In the described embodiment, twenty-four openings and pockets are disclosed to receive two dozen bottles.

At the time the metal casing is being stamped from a single sheet of metal, or during a step of the fabricating method after the stamping operation, the bottle guiding pockets **16** are formed in the top plate **10** of the casing. These openings may be formed in any convenient fashion, but the preferred manner is to form four radially extending slits from the center of each opening, the slits being a quadrant's distance apart, and then bend the sector-shaped sections of metal formed by the slits downwardly into the interior of the casing, as shown in Figure 2, to form four downwardly extending tongues **20**, the sides of said tongues tapering downwardly and inwardly toward their lower ends. The inner surfaces of the tongues are formed to correspond with the shape of the bottles, in this instance cylindrical. In order to eliminate any sharp edges on the upper face of the crate, during the formation of these bottle guiding openings, the metal is forced downwardly into the crate from the upper surface thereof throughout diameters greater than the diameters of the slit portions of the top, so that the outer or upper edge **22** of each slit, as shown in Figure 2, is spaced from the upper surface **10** of the crate. The downwardly extending tongues **20** not only serve to guide the bottles into their pockets, but also form securing means for the elements of the bottle pocket skeleton construction as hereinafter described.

The lower end of the sides and ends **12** and **14** of the casing may be rolled upwardly and inwardly to form a rigid bead **24**, or a separate wire of relatively heavy gauge and of the same shape as the outline of the crate may be welded within the lower end of the case to form a support for the bottle pocket skeleton construction as hereinafter described.

Extending throughout the length of the crate, at the lower end thereof, is a bottom comprising a plurality of spaced longitudinal supporting bars or rods **26**, these rods being welded at their ends to the casing above the bead **24** or to the upper side of the supporting wire which may take the place of the bead in an alternative form of the invention. There should be sufficient of these longitudinally extending wires or rods **26**, and they should be spaced in such even fashion, that the bottles may be supported thereon without the possibility of any bottle or edge thereof extending through the grill-like work formed by the rods.

In order to make the skeleton pocket-forming arrangement more rigid, any number of transverse rods **28** may be provided, said rods extending across the lower end of the casing from one side to the other at right angles to the longitudinal rods, and being welded at their ends to the casing or the bead **24**. In order to make the construction even more rigid, each of the rods **28** may be welded to each of the longitudinal rods **26** at points where said rods intersect one another. With this arrangement, the longitudinal rods **26** form a bottom support for the bottles, and said bottles are supported against any lateral movement by the tongues **20**.

In order to further facilitate the convenience of insertion and removal of the bottles from their supporting pockets, and to firmly hold them in place therein, a plurality of pocket forming wires or rods are provided, each of said rods having upright members **30** and a connecting cross member **32**, the upright members and the cross member being formed from a single rod of metal bent into substantially U-shape, the connecting cross member of the U resting on the upper surfaces of the longitudinal rods **26**, and being secured thereto in any appropriate manner, as by welding. As best shown in Figures 5 and 7, each tongue **20** has an aperture **34** extending therethrough, and the upper ends of the uprights **30** of each U-shaped rod are bent outwardly of the bottle pockets through an angle of substantially 90° to form hooked ends **36**, each end being adapted to be passed through the aperture **34** in its respective tongue. The metal of the tongue below each aperture **34** is bent outwardly to form a concave channel on the inner wall of each tongue extending from the aperture therein to the lower end of the tongue. Referring to Figure 5, this channel is of sufficient depth to completely house the upright **30** of the pocket-forming rod therein, so that the wall of each pocket is straight from the upper surface of the casing down to the bottom of the pocket.

In Figure 7 the tongues **20** are shown bent downwardly from the top plate **10**, the tongues being integral with said top plate.

Where the hooked end **36** of the upright portion of the bent pocket-forming rod **30** extends through its opening **34**, it may be welded or secured in any other suitable manner to provide a rigid construction.

Referring to Figures 1, 2, 3, 5 and 6, it will be noted that only two of the U-shaped rods are necessary to completely form the bottle receiving pocket in association with the tongues **20** and the longitudinal bottom rods **26**, the rods being so formed that their upright portions are a quadrant's distance apart in vertical alignment with the points of the tongues **20**, so that an upright rod is provided on four sides of the bottle being supported.

The bottle pockets are formed without the need of any intermediate horizontal rods or members so that the bottles may be quickly registered with the openings **16** and permitted to drop into their pockets without the possibility of the lower ends of the bottles catching on or in any way engaging any part of the structure which would prevent or delay their complete seating in their pocket. Were it necessary to provide horizontal cross rods in forming the pockets at any point above the lower ends thereof, it is quite likely, and has been found to be the case in the past, that the bottles engage these cross members, thus preventing their complete insertion. The truth of this will be seen when it is considered that under the conditions in which these crates are filled, it is necessary to very rapidly align and insert the bottles into their pockets. For instance, it may be that the bottles are inserted into crates just as they come from a bottle filling machine, and as these machines now operate very rapidly, the attendant filling the crates must likewise work with some speed in order to prevent a number of bottles from accumulating uncrated.

Referring to Figure 4, it will be noted that the

bottle receiving pockets are relatively shallow, although they are of sufficient depth to prevent a bottle dropping from the compartments in case the crate is tilted or disposed in condition other than being flat on its bottom. The bottle receiving pockets may be of increased depth as desired, depending on the type of bottle being transported, but I have found it convenient to have the pockets of such depth that they extend substantially half way of the length of the bottle being carried.

In assembling the crate, the sides, ends and top fabricated as by stamping operations, from a single sheet of metal. In this, or in a subsequent operation, the radially extending slits are formed in the top plate 10 of the casing, and the tongues 20 are bent downwardly to provide the bottle guiding openings as previously described.

The longitudinal rods or wires 26 and the transverse supporting rods 28 are then assembled within the casing above the bead 24 thereof, and are welded to the casing as previously described in the proper spaced relation as disclosed in the drawings. The U-shaped pocket forming rods, having previously been bent to the form shown in the drawings, are then inserted down into the casing through the bottle guiding openings until their connecting cross members are supported on the longitudinal rods 26, and the hooked ends 36 of said members are then inserted through the openings 34 in the tongues 20, after which said hooked ends are welded therein and the cross connecting members 32 are welded to the upper surfaces of the longitudinal rods 26.

If a separate supporting ring is used in place of the inwardly turned bead 24, the longitudinal and transverse rods 26 and 28 may be assembled thereto in proper spaced relation, as previously described, and secured by welding, after which this preformed assembly may be inserted into the lower end of the casing and welded thereto, this step being followed by the insertion of the U-shaped members as previously described. If this practice is followed, the lower end of the casing will not be bent into a bead, if at all, until after the above assembly is inserted. The bottle guiding tongues may be carried by a collar formed from a separate blank 40 as shown in Figure 8 and inserted into openings in the upper plate 10 of the metal casing if desired, as shown in Figure 8. In this embodiment, the tongues are formed from a circular disc by forming the radial slits therein as previously described, and bending tongues formed by said slits downwardly until the outer and upper ends of the slits 44 are disposed at points below the upper flange 46 of the disc, after which the tongues are inserted into the openings 42 in the top plate of the casing, and the flange 46 of the collar is welded to the surface 10 of the casing.

Referring to Figure 1, it will be noted that substantially diamond-shaped areas 48 exist between the opening 16 after said openings are formed. If it is desired to further lighten the crate and if the metal from which the casing thereof is fabricated is sufficiently rigid, the metal defining these diamond shaped areas 48 may be removed.

In the ends 14 of the casing, suitable openings 50 may be formed, as shown in Figure 2, the metal surrounding said openings being bent inwardly and upwardly in the form of a rolled bead providing a convenient hand hold for use in lifting the crate.

In Figures 9 through 12, a modification of the invention is disclosed wherein the bottoms of the bottle supporting pockets are formed by spaced wooden plates or boards 52. These boards form relatively yieldable bottom plates for the pockets, so that if the bottles are dropped violently therein there will be no danger of shattering or chipping the bottles. The boards 52 are positioned in the lower portion of the crate extending longitudinally thereof between the ends 14 of the casing. Each of the boards is provided along its longitudinal center line with a plurality of properly spaced apertures 54 extending through the width of the boards, and each board is provided with a transversely extending slot 56 in its upper surface to receive portions of the pocket forming elements as hereinafter described. Successive pairs of apertures 54 and slots 56 are positioned beneath successive bottle guiding openings in the top plate of the casing a distance apart equal to the widths of said openings.

Extending along the longitudinal center line of each board 52, and in the lower face thereof, is a groove 56, said groove connecting with each of the openings 54.

The vertically extending bottle pocket forming elements 58 are U-shaped, and are identical with those described in connection with the principal embodiments of the invention, for instance, as shown in Figure 4, except that their connecting cross members 60 are provided with a small U-shaped downwardly extending portion 62, which is small enough to pass through the opening 54. In assembling the pocket forming elements to the bottom boards, the U-shaped portions 62 of said elements are inserted downwardly through the openings 54 until they lie in the longitudinal channel 56, after which a retaining rod 61 is threaded throughout the length of each board, passing through the U-shaped portions 62 of the pocket forming elements, and retaining them in position, the connecting cross members 60 of said elements lying in the transverse grooves 56 so that they are flush with the upper surface of the boards.

The ends of each board are cut away transversely across their lower surface as at 63 to form a ledge for supporting the boards in the casing.

The assembly described above including the boards and the pocket forming elements are assembled together as previously described, and then this assembly is laid upon a substantially rectangular wire 64 which is of a configuration adapting it to be disposed within the lower end of the casing, accurately fitting the inner wall of said casing as shown in Figures 9 and 10. The wire 64 is received beneath the ledges 63 of the boards. Before the assembly is inserted into the casing from the lower end thereof, spacing rods 66 are welded to the interior of each end of the casing as shown in Figures 9, 10 and 11. These spacing rods extend only across the ends of the casing, and are bent downwardly into substantially U-shape as at 68 in Figure 11, the downwardly bent portions being of proper length to accurately space the boards 52 from one another. The U-shaped spacing portions 68 are disposed between adjacent boards 52 as shown in Figure 11 when the bottle pocket forming assembly is inserted into the lower part of the casing. When said assembly is inserted, as shown in Figures 10 and 11, the lower edges of the sides and ends of the casing are flanged inwardly around the wire 64 as shown at 70, to hold the assembly in place. It will be understood that the spacing rod 66 is welded or in similar fashion secured to the interior of the casing at the desired position, and if

necessary, the wire **64** may also be welded in place, thus rigidly holding the pocket forming assembly in place.

As shown in Figures 10 and 11, the upper ends of the pocket forming elements **58** may be bent outwardly and retained in apertures extending through the tongues **20** in the manner identical with that described in connection with Figure 5. However, if desired, in this modification, the channels in the tongues **20** may be omitted.

In the modification of the invention of Figures 13 to 16, the bottle pocket forming elements **74** are flat strips of metal bent into substantially U-shape, in such fashion that their surfaces at their upper ends lie substantially in the inner surface of the cylinder formed by the tongues **20**. These elements are formed from a flat strip of metal, and their upwardly extending portions are bent from their cross connecting member **76** at an angle as shown at **78** in Figure 16.

The bottom of the crate in this form of the invention is provided by a plurality of longitudinally extending flat strips of metal **80** which are welded at their ends to a substantially rectangular wire **82** which is of configuration adapting it for insertion within the lower end of the casing of the crate, to accurately fit the inner walls thereof as will be understood. When the bottom has been formed by welding the longitudinal strips **80** to the lower side of the wire **82**, the pocket forming elements **74** are then welded to the upper surfaces of the rods **80** in proper position as shown throughout the figures, after which this assembly is inserted into the lower end of the casing as shown in Figures 14 and 15, with the upper ends of the pocket forming elements extending above the lower ends of the tongues **20**, after which the wire **82** is welded to the inner surface of the crate. The upper ends of the pocket forming elements **74** are then subsequently welded to the inner surfaces of the tongues **20**, or if desired, openings may be provided through the tongues similar to the openings **34** of Figure 7, but of proper shape to receive this modified form of pocket forming elements, and the upper ends of said elements may be bent through apertures in the tongues in the manner heretofore described. However, it is preferred to merely weld the upper ends of the pocket forming elements to the interior surfaces of the tongues **20**. To give the pocket forming assembly of Figure 16 increased rigidity, as many transverse strengthening rods **84** as desired may be welded at their ends across the upper side of the bottom wire **82**. After the pocket forming assembly is inserted and the wire **82** welded to the casing, the lower edges of the casing may be flanged inwardly below the wire **82** if convenient.

It will be apparent that I have provided a crate construction which departs radically from the constructions previously used, and one which is of pronounced simplicity, yet which is rugged enough to withstand the hard usage to which these crates are subjected. In each modification of the invention, the bottle receiving pockets are so designed that no projection or transverse supporting member is provided to catch the lower edge of the bottle and prevent it from completely dropping into its pocket. The pockets are so formed that they support the bottle at a sufficient number of points to insure that it will not move around and be damaged during loading or transportation of the crates. In each instance, the pocket formation is sufficiently flexible to provide some yielding movement if the bottles are forced with considerable pressure against the walls of the pockets.

It will also be apparent that while the bottles are held in place without the likelihood of falling out, nevertheless, a minimum amount of material is used in forming the crate. While the overall height of the crate of this invention is relatively short, this does not prevent the crates from being stacked one upon another. In each embodiment of the invention, it will be noted that the parts forming the bottom of the crate are close enough together to permit the crate to be stacked on the tops of the bottles in the crate below. The shortening of the height of the crate is advantageous from the standpoint of economy of material and weight, and also permits an increased area of the sides of the bottle to be visible for inspection.

It will be apparent that various modifications of the constructions shown herein may be made without departing from the range of the invention. Particularly, the constructions described may be modified as necessary to receive different types of bottles.

I claim:

1. A bottle crate comprising a casing having a top plate of metal, said casing having a bottom formed of a plurality of parallel rods spaced from said top plate and rigidly secured at their ends to said casing, said top plate having a plurality of bottle guiding openings therein, a plurality of metal tongues extending downwardly from said plate into the interior of said casing from each of said openings, and a pair of bottle pocket forming elements associated with each of said openings, said elements comprising a pair of upright members attached at their lower ends by a connecting member, said connecting members extending transversely of the parallel rods of said base and being rigidly secured thereto, the upper end of each of the upright members of said pocket forming elements being rigidly secured to one of said tongues.

2. A bottle crate comprising a casing having a top plate of metal, said casing having a bottom formed of a plurality of parallel rods spaced from said top plate and rigidly secured at their ends to said casing, said top plate having a plurality of bottle guiding openings therein, a plurality of metal tongues extending downwardly from said plate into the interior of said casing from each of said openings, and a pair of bottle pocket forming elements associated with each of said openings, said elements comprising a pair of vertical flat metal strips attached at their lower ends by a flat horizontal connecting metal strip, the flat sides of said upright strips which face the bottle pockets lying in planes substantially tangential to the cylindrical portion of a bottle when the latter is received in said pockets, said connecting strips extending transversely of the parallel rods of said base and being welded thereto, the upper end of each of the vertical strips of said pocket forming elements being welded to one of said tongues.

3. A bottle crate comprising a casing having a top plate of metal, said casing having a bottom formed of a plurality of parallel rods spaced from said top plate and rigidly secured at their ends to said casing, said top plate having a plurality of bottle guiding openings therein, each of said openings having a bottle guiding collar inserted therein and secured to said plate, said collars having a plurality of metal tongues which extend downwardly from said plate into the interior of said casing, and a pair of bottle pocket forming

elements associated with each of said openings, said elements comprising a pair of upright members attached at their lower ends by a connecting member, said connecting members extending transversely of the parallel rods of said base and being rigidly secured thereto, the upper end of each of the upright members of said pocket forming elements being rigidly secured to one of said tongues.

4. A bottle crate comprising a casing having a top plate of metal, said casing having a bottom formed of a plurality of parallel rods spaced from said top plate and rigidly secured at their ends to said casing, said top plate having a plurality of bottle guiding openings therein, a plurality of metal tongues extending downwardly from said plate into the interior of said casing from each of said openings, each of said tongues having an aperture therethrough, and a pair of bottle pocket forming elements associated with each of said openings, said elements comprising a pair of upright members attached at their lower ends by a connecting member, said connecting members extending transversely of the parallel rods of said base and being rigidly secured thereto, the upper end of each of the upright members of said pocket forming elements being bent outwardly of the pockets to extend through the aperture in one of said tongues to secure said elements to said tongues.

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