Oct. 24, 1950 C. C. WALES 2,526,716

BOTTLE CRATE

Filed Dec. 14, 1944 4 Sheets-Sheet 1

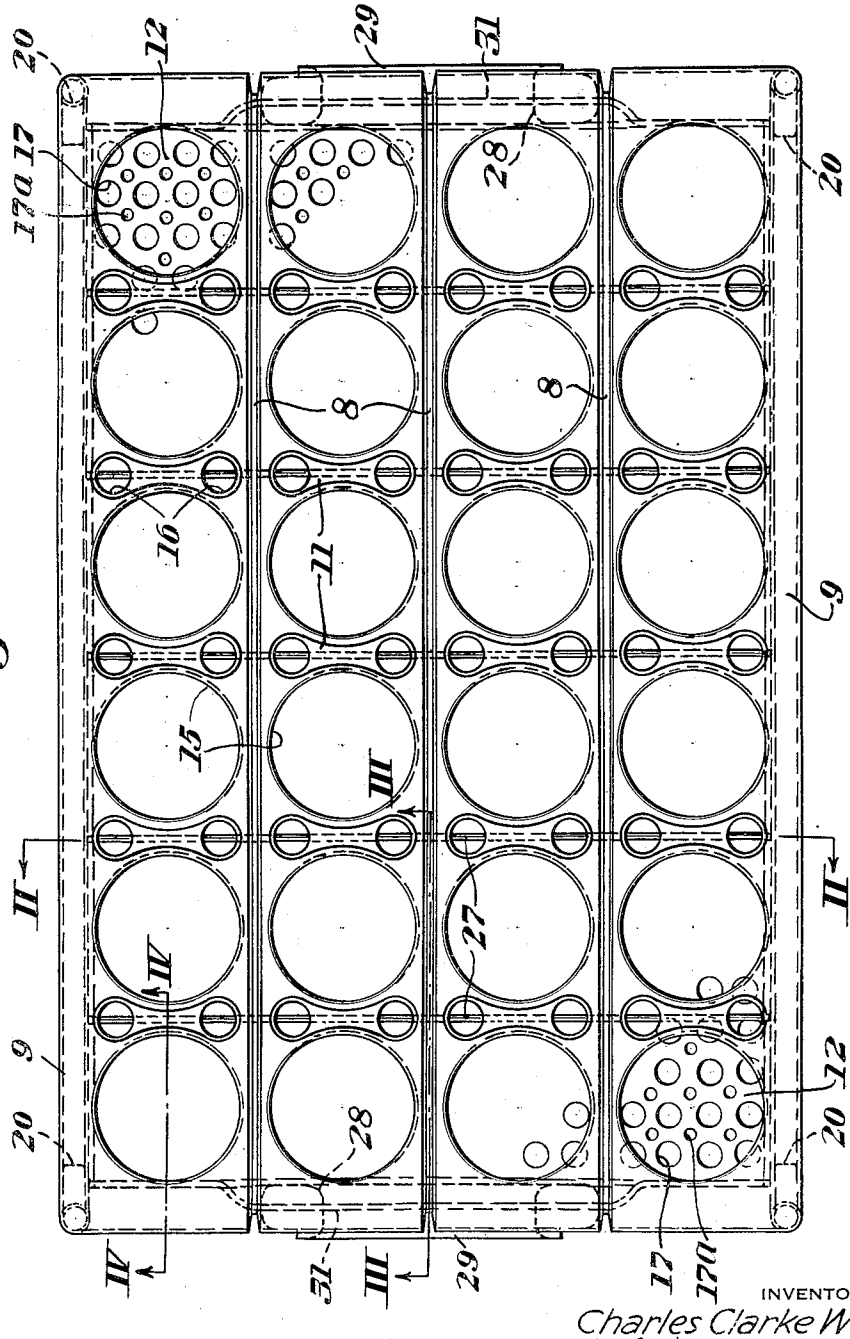


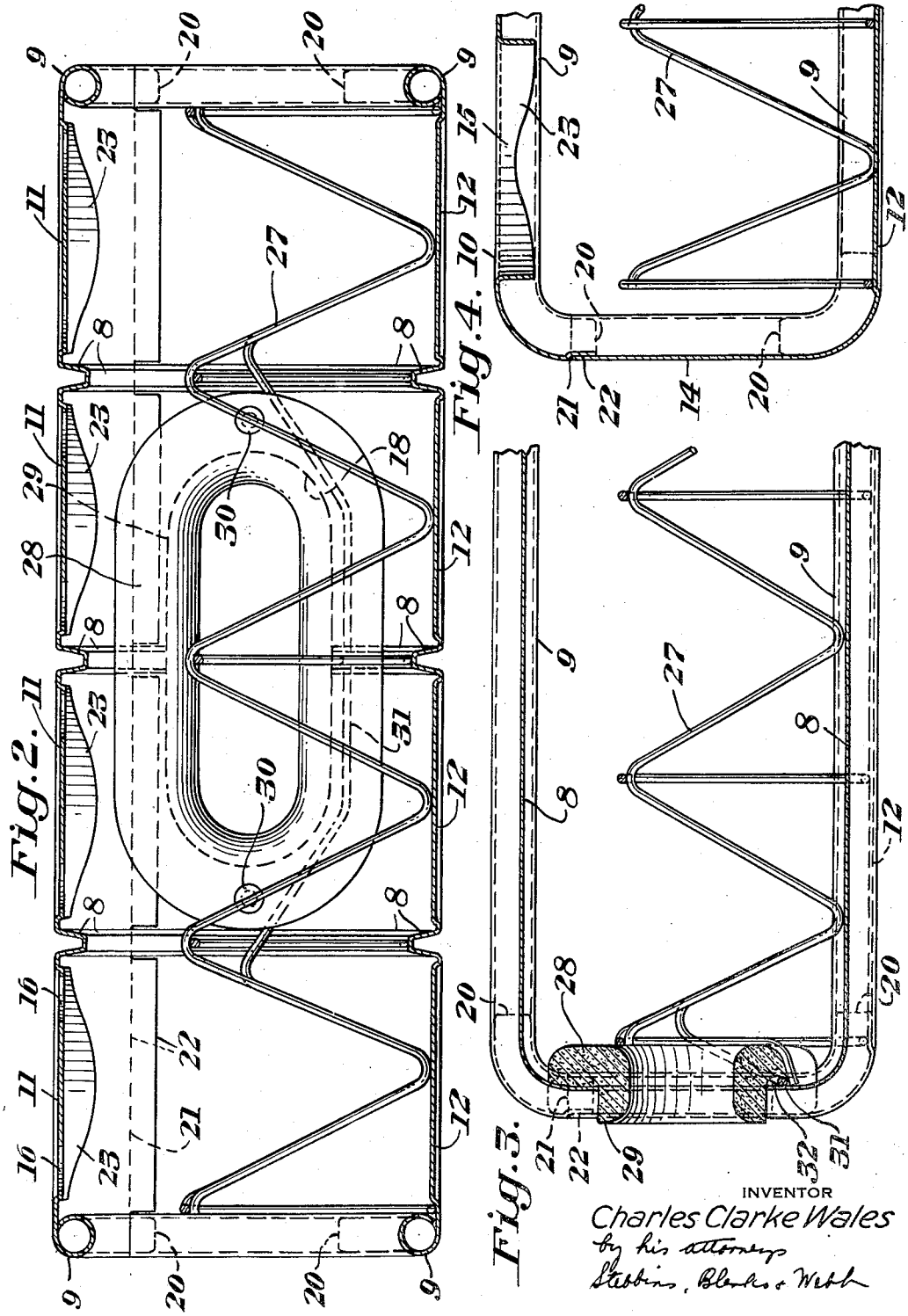
Fig. 1.

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BOTTLE CRATE

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Oct. 24, 1950 C. C. WALES 2,526,716

BOTTLE CRATE

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Fig. 5.

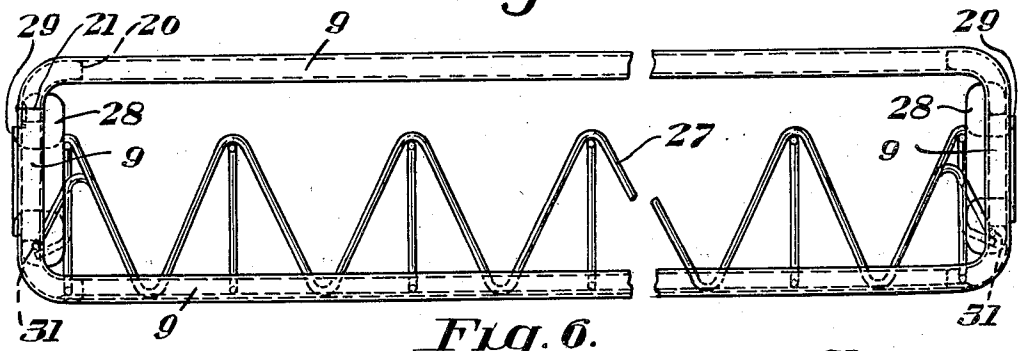


Fig. 6.

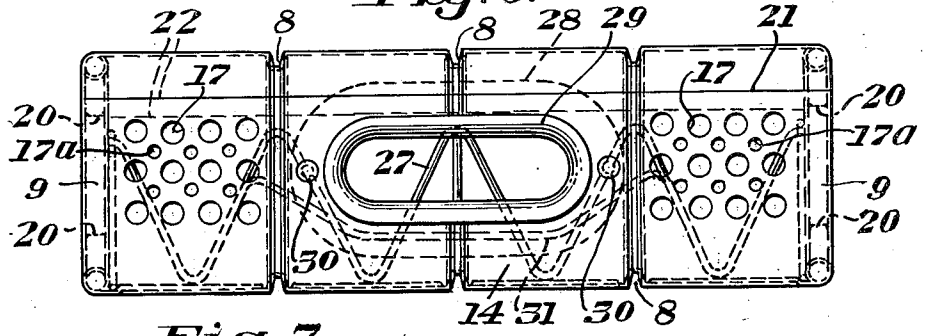


Fig. 7.

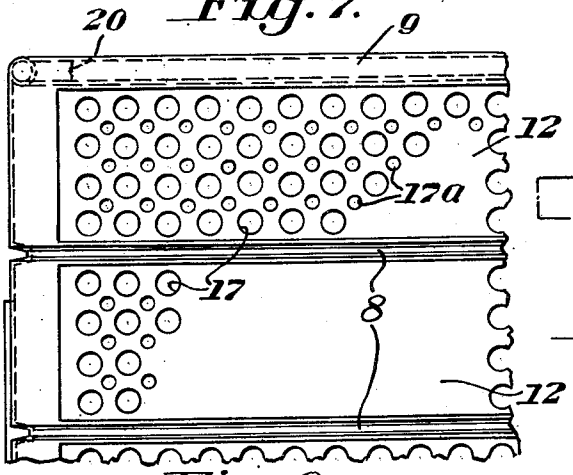


Fig. 8.

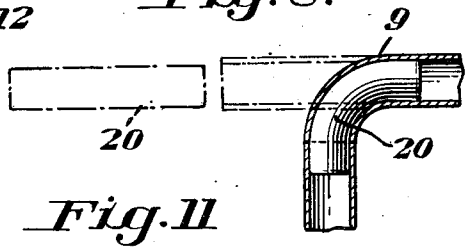


Fig. 9.



Fig. 10.

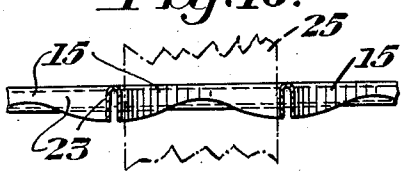
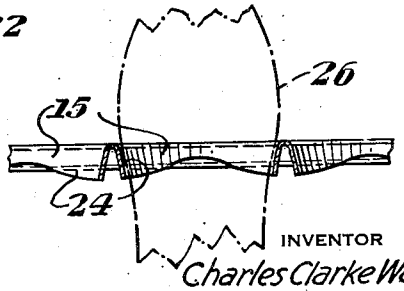


Fig. 11



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Oct. 24, 1950 C. C. WALES 2,526,716

BOTTLE CRATE

Filed Dec. 14, 1944 4 Sheets-Sheet 4

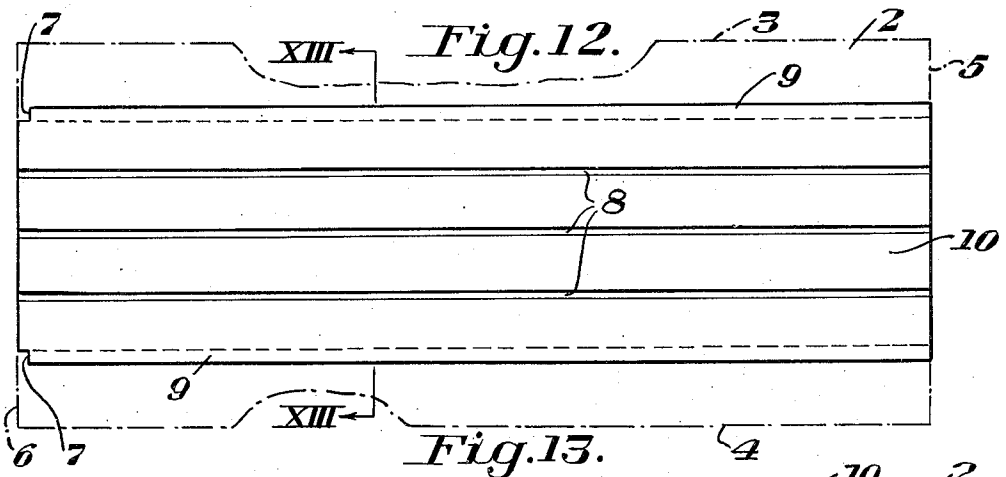


Fig.12.

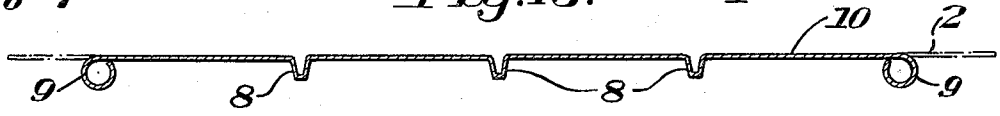


Fig.13.

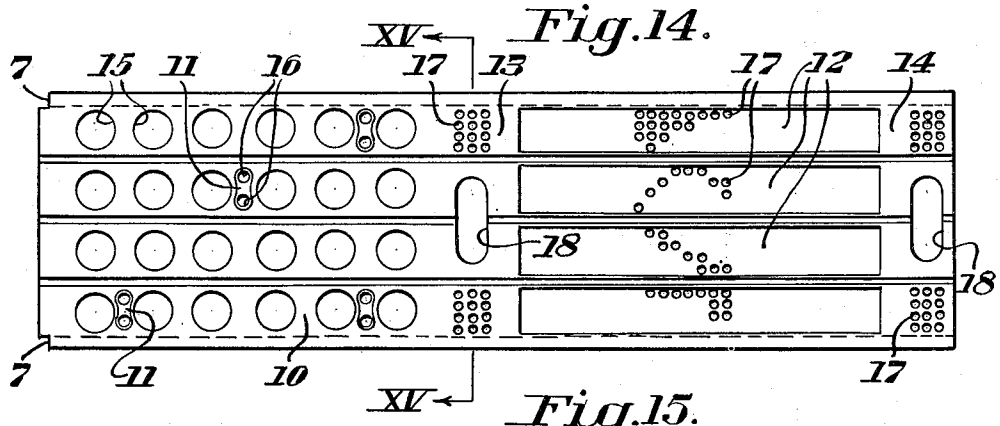


Fig.14.



Fig.15.

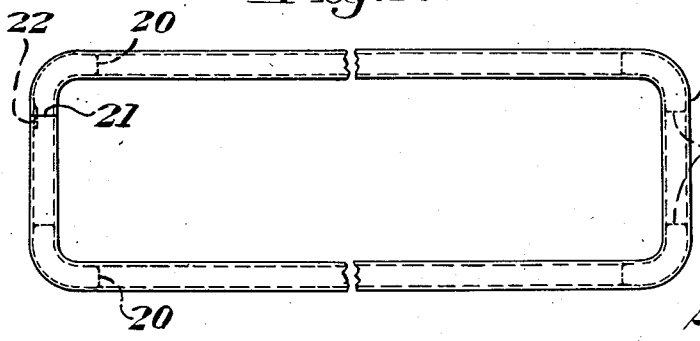


Fig.16.

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UNITED STATES PATENT OFFICE

2,526,716

BOTTLE CRATE

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Application December 14, 1944, Serial No. 568,105

7 Claims. (Cl. 220—21)

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This invention relates to bottle crates and the manufacture thereof. It relates especially to crates for the handling and truck transportation of groups of bottles such, for example, as those used for the dispensing of beverages. The invention further relates to an improved method of making bottle crates.

My improved bottle crate has a number of important advantages and represents an advance over crates heretofore employed. My crate preferably comprises a body of sheet material; I prefer to employ sheet metal although plastic or other appropriate sheet material may be employed. I desirably form a crate body by bending or forming a sheet into generally tubular form and connecting the ends of the sheet together. It is desirable that the tubular body be of generally rectangular shape. The tubular body is disposed with its axis horizontal so that the body forms the top, bottom and two opposed sides of the crate. The remaining two sides are open, these corresponding to the open ends of the tube.

The top of the crate body is perforated to provide bottle receiving opening means therein. Ordinarily individual bottle receiving openings will be provided in the top of the body and these will be arranged in rows to accommodate the desired number of bottles in closely spaced relationship in the fashion in which bottles are usually arranged in crates. The top of the crate body may, however, have less openings than the number of bottles to be carried, the opening or openings being large enough to receive more than one bottle. The sheet out of which the crate body is formed is also preferably additionally perforated to reduce its weight. Perforations in the bottom of the crate body also promote drainage from the crate of liquid such as melted ice.

A bottle cell unit is preferably introduced into the crate body to receive bottles placed in the crate through the opening or openings in the top. Any suitable bottle cell unit may be employed. Desirably the cell unit has cells arranged in rows in usual fashion to accommodate the number of bottles to be carried by the crate. Ordinarily bottle crates are designed to accommodate two dozen bottles arranged in four rows of six bottles each but the number and arrangement of the bottles may be varied as desired.

I preferably provide a finger receiving opening in at least one of the closed sides of the crate to facilitate its handling. Ordinarily such openings will be provided in both of the closed sides of the crate. Desirably a handle member is applied to

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each finger receiving opening to provide a surface of desirable shape and area adapted to be partially gripped by the fingers when the crate is lifted. I find it of advantage to hold the bottle cell unit in place in the crate body by means of the handle members.

The sheet out of which the crate body is formed is desirably longitudinally ribbed for strength. It also desirably has its longitudinal edges beaded for safety and additional strength and to facilitate handling. I preferably rib and bead an elongated sheet and then bend the sheet into tubular form. I prefer to cut out the corners at at least one end of the sheet and bead the edges in longitudinal alignment with the cut out corners. This enables the ends of the beads to abut and the intermediate end portions of the sheet to overlap when the sheet is bent into tubular form.

I preferably introduce strengthening rods into the beads at the sheet edges and bend such rods when the sheet is bent into tubular form, the bending of the rods maintaining them in place and the bent rods strengthening the corners of the crate body when a generally rectangular tubular body is formed.

I also preferably turn the material of the sheet at the edges of the bottle receiving openings out of the plane of the top of the crate body to form bottle guides. These assist in guiding the bottles into the cells of the bottle cell unit and may also more or less snugly embrace the body portions of the bottles when they are in place in the crate. For bottles having flaring or non-cylindrical body portions I desirably provide flanges about the bottle receiving opening which are disposed at an acute angle to the top of the crate body so as to lie along the surfaces of the bodies of the bottles when they are in place in the crate.

Other details, objects and advantages of the invention will become apparent as the following description of certain present preferred embodiments thereof and of a present preferred method of practicing the same proceeds.

In the accompanying drawings I have shown certain present preferred embodiments of the invention and have illustrated a present preferred method of practicing the same, in which

Figure 1 is a plan view of a bottle crate;

Figure 2 is a vertical transverse cross sectional view to enlarged scale taken on the line II—II of Figure 1;

Figure 3 is a fragmentary vertical longitudinal cross sectional view to enlarged scale taken on the line III—III of Figure 1;

Figure 4 is a fragmentary vertical longitudinal

cross sectional view to enlarged scale taken on the line IV—IV of Figure 1;

Figure 5 is an elevational view with a portion cut away of the crate shown in Figure 1 as viewed from an open side thereof;

Figure 6 is an elevational view of the crate as viewed from a closed side thereof;

Figure 7 is a fragmentary bottom plan view of the crate;

Figure 8 is a fragmentary detail view illustrating the strengthening of a corner of the crate body;

Figure 9 is a fragmentary transverse cross sectional view of the crate top;

Figure 10 is a fragmentary longitudinal cross sectional view of the crate top showing the relationship between a bottle receiving opening and a cylindrical-bodied bottle received therein;

Figure 11 is a view similar to Figure 10 but showing a bottle receiving opening with a downwardly and inwardly inclined peripheral flange cooperating with a bottle having a flared body;

Figure 12 is a plan view of a ribbed and beaded blank with corners at one end cut away adapted for the fabrication of a bottle crate body, the original flat blank being indicated by chain lines;

Figure 13 is a transverse cross sectional view to enlarged scale taken on the line XIII—XIII of Figure 12;

Figure 14 is a view similar to Figure 12 but showing the blank perforated and otherwise die-formed;

Figure 15 is a transverse cross sectional view to enlarged scale taken on the line XV—XV of Figure 14; and

Figure 16 is an elevational view with a portion cut away of the bottle crate body as viewed from an open side thereof before application of the bottle cell unit and the handle members of the crate.

I shall describe the preferred method of making the bottle crate and the bottle crate body in connection with description of certain forms of the crate. I provide an elongated rectangular sheet, and for the purpose of illustration I shall describe the sheet as being of metal. The sheet in its original flat form is indicated at 2 in Figure 12 where the chain lines 3 and 4 indicate the longitudinal edges of the flat sheet before it is subjected to working. The end edges of the original flat sheet are indicated at 5 and 6. The sheet first has its corners at at least one end thereof cut away leaving rectangular corner incisions as indicated at 7. I prefer to cut away the corners at one end only of the sheet as this ordinarily suffices. The flat sheet with the corners cut away is then passed through a forming mill which forms in it three spaced apart downwardly projecting longitudinally extending ribs 8 and forms at the longitudinal edges inwardly curled downwardly projecting hollow beads 9. This forming of the sheet to make the ribs 8 and beads 9 is preferably effected by passing the sheet longitudinally through a cold forming mill. The beads 9 are shorter than the central portion of the sheet by a distance equal to the longitudinal depth of the incisions 7. The ribbed and beaded, but otherwise flat, sheet is designated 10 in Figures 12 and 13.

The sheet 10 is next stamped to deform and perforate it as shown in Figures 14 and 15. A series of both longitudinally and transversely spaced depressed panels 11 (see Figures 1 and 14) is formed in the portion of the sheet adjacent one end thereof and extending from a point slightly removed from that end to a point somewhat less than half way along the sheet. An elongated depressed panel 12 is formed adjacent but removed a short distance from the opposite end of the sheet in each of the four longitudinally extending spaces between the ribs 8 and beads 9. Between the portion of the sheet containing the panels 11 and the portion of the sheet containing the panels 12 is an unpanelled transverse zone 13. Between the portion of the sheet containing the panels 12 and the adjacent end of the sheet is an unpanelled transverse zone 14. The portion of the sheet containing the panels 11 is ultimately to be disposed at the top of the crate, the portion containing the panels 12 is ultimately to be disposed at the bottom of the crate and the zones 13 and 14 are ultimately to be disposed at the opposed closed sides of the crate.

Contemporaneously with the formation of the panels 11 and 12 the sheet is perforated by forming therein relatively large circular openings 15, other circular openings 16 of intermediate size and relatively small circular openings 17 and also relatively large elongated openings 18 with rounded ends. The openings 15 are bottle receiving openings and are arranged in four parallel rows of six openings each, the rows extending longitudinally of the sheet and being disposed in the elongated spaces between the ribs 8 and the beads 9. One of the panels 11 is disposed between each pair of longitudinally adjacent openings 15. Only a few of the panels 11 and openings 16 are shown in Figure 14 but it is to be understood that in the form illustrated there are altogether twenty such panels and forty such openings as shown in Figure 1. The openings 16 are formed in the panels 11, two such openings in each panel, one adjacent each end of the panel. The panels 11 impart strength to the structure and the openings 16 render it light in weight. Some of the relatively small openings 17 are disposed in the panels 12 at the portion of the sheet which is to form the bottom of the crate and other of the openings 17 are disposed in the zones 13 and 14 which are to form the closed sides of the crate. The openings 17 are for the purpose of reducing the weight of the crate. Only a few of such openings are shown in Figure 14 but it is to be understood that they extend throughout the bottom and closed sides of the crate. Desirably the openings 17 have still smaller openings 17a disposed therebetween as shown in Figures 1, 6 and 7 but due to the small scale of Figure 14 the openings 17a are omitted in that figure. The elongated openings 18 are finger receiving openings to facilitate handling of the crate. They are disposed respectively in the zones 13 and 14 above referred to.

After the ribbed and beaded sheet has been stamped and perforated as just explained, it is bent into generally tubular form. Preferably the sheet is bent into generally rectangular tubular form to provide a crate body designated by reference numeral 19 in Figure 16. The bottle receiving openings 15 are disposed at the top of the crate body, the panels 12 are disposed at the bottom and the zones 13 and 14 are disposed at the closed sides. The other two sides are open. Instead of bending the sheet sharply at the corners it is preferably bent gradually so that the corners are radiused. Before the sheet is bent strengthening rods 20 (Figure 16) are introduced into the hollow beads 9 and disposed at the portions of such beads which are to be bent; i. e., the

portions which are to be at the corners of the crate body. When the sheet is bent the beads and the contained strengthening rods **20** are bent together, the strengthening rods finally assuming the shape of elbows as shown in Figure 16. The fact that they are thus bent and are disposed at the corners of the crate body results in their remaining in place at such corners where they protect and strengthen the hollow beads **9**.

When the sheet has been bent to form the hollow rectangular crate body as described, the ends of the beads **9** abut at **21** (Figure 16) while the central portions of the sheet overlap and are welded together at **22**. Thus is formed a crate body of rugged construction yet remarkably light weight.

The bottle receiving openings **15** are preferably flanged, i. e., the material of the sheet at the peripheries of those openings is formed out of the plane of the sheet at the top of the crate. This flanging of the bottle receiving openings is preferably effected contemporaneously with the stamping of the sheet as above explained. The flanges at the edges of the bottle receiving openings preferably extending downwardly or toward the inside of the crate and may extend perpendicular to the plane of the openings as shown at **23** in Figures 9 and 10 or may be inclined downwardly and inwardly as shown at **24** in Figure 11. The perpendicular flanges **23** are employed when bottles of conventional shape with cylindrical body portions are to be handled. The downwardly and inwardly inclined flanges **24** are employed when bottles having flared body portions are to be handled. In Figure 10 a portion of a conventional bottle with a cylindrical body is shown at **25** while in Figure 11 a portion of a bottle having a flared body portion is shown at **26**.

The crate body has been completely described. There is adapted to be introduced into the body a bottle cell unit which may be of any desired construction. One form of bottle cell unit which may be employed is shown in the drawings and is designated by reference numeral **27**. This cell unit comprises crossed zig-zag wires welded together and forming individual bottle cells. The bottle cell unit shown is of known construction and I make no claim it per se. The wire bottle cell unit is of advantage since it effectively positions the bottles, is light in weight and may easily be introduced into the crate body. It is introduced into the crate body through an open side thereof and is positioned with the respective bottle cells directly underneath the bottle receiving openings **15**. It is then suitably held in that position. This may be accomplished in various ways; I prefer to hold the bottle cell unit in place by handle members which are disposed in the finger receiving openings **18** at the opposed closed sides of the crate body. I provide handle members adapted to fit within the openings **18**, each comprising a body portion **28** and a flange **29**. The body portion **28** of each handle member is adapted to be disposed inside the crate body with the flange **29** projecting outwardly through the finger receiving opening. The handle members are then fastened in place by rivets **30** (Figure 6) each passing through a side of the crate body and through the body portion **28** of the handle member disposed at that side of the crate body. The handle members may be made of any suitable material such, for example, as plastic, and are preferably light in weight and smooth to the touch. The openings therethrough are each of

such size and shape as to easily receive the four fingers of a man's hand.

The bottle cell unit has at each end a wire portion **31** adapted when the cell unit is in place and the handle members are applied to be held down and against the side of the crate by being received within a recess **32** of the corresponding handle member. Thus when the bottle cell unit is put in place and the handle members are applied the handle members hold the cell unit in fixed position within the crate body. The cell unit may be removed by removing the rivets **30** and the handle members held thereby.

While I have shown and described certain present preferred embodiments of the invention and have illustrated a present preferred method of practicing the same, it is to be distinctly understood that the invention is not limited thereto but may be otherwise variously embodied and practiced within the scope of the following claims.

I claim:

1. A bottle crate having a body formed out of a metal sheet bent into substantially tubular form, having generally parallel ribs extending peripherally of the body, the body having substantially flat portions forming the top, bottom and two opposed sides of the crate, the top having bottle receiving openings therein arranged in rows, the rib being disposed between rows of said openings.

2. A bottle crate having a body formed out of a metal sheet bent into substantially tubular form, having generally parallel ribs extending peripherally of the body, the body having substantially flat portions forming the top, bottom and two opposed sides of the crate, the top having bottle receiving openings therein arranged in rows, the ribs being disposed between rows of said openings, the bottom having panels pressed out of the general plane of the bottom, the panels being disposed between ribs and directly beneath rows of said openings.

3. A bottle crate having a body formed out of a metal sheet bent into substantially tubular form, having generally parallel ribs extending peripherally of the body, the body having substantially flat portions forming the top, bottom and two opposed sides of the crate, the top having bottle receiving openings therein arranged in rows, the ribs being disposed between rows of said openings, the bottom having panels pressed out of the general plane of the bottom, the panels being disposed between ribs and directly beneath rows of said openings, the body having beads extending peripherally thereof at the edges thereof.

4. A bottle crate having a body formed out of a metal sheet bent into substantially tubular form, having generally parallel ribs extending peripherally of the body, the body having substantially flat portions forming the top, bottom and two opposed sides of the crate, the top having bottle receiving openings therein arranged in rows, the ribs being disposed between rows of said openings, and a bottle cell unit positioned within the body and having bottle cells respectively disposed directly beneath the respective bottle receiving openings in the top of the body.

5. A bottle crate having a body formed out of a metal sheet bent into substantially tubular form, the body having substantially flat portions forming the top, bottom and two opposed sides of the crate, the top having bottle receiving openings therein, finger openings in said two opposed sides of the crate, a bottle cell unit positioned within the body and having bottle cells

respectively disposed directly beneath the respective bottle receiving openings in the top of the body and handle members fitted into the finger openings holding the bottle cell unit in position in the body.

6. A bottle crate having a body formed out of a metal sheet bent into substantially tubular form, the body having substantially flat portions forming the top, bottom and two opposed sides of the crate, the top having bottle receiving openings therein, the bottom having upwardly pressed panels each disposed directly beneath a plurality of bottle receiving openings in the top of the body, and a bottle cell unit positioned within the body and having bottle cells respectively disposed directly beneath the respective bottle receiving openings in the top of the body, the bottle cell unit being supported upon said panels.

7. A bottle crate having a body formed out of a metal sheet bent into substantially tubular form, having generally parallel ribs extending peripherally of the body and also having beads extending peripherally of the body at the edges thereof, the body having substantially flat portions forming the top, bottom and two opposed sides of the crate, the top having bottle receiving openings therein arranged in rows, the ribs being disposed between rows of said openings, the bottom having upwardly pressed panels disposed between ribs and directly beneath rows of bottle receiving openings, a bottle cell unit positioned within the body and having bottle cells respectively disposed directly beneath the respective bottle receiving openings in the top of the body, the bottle cell unit being supported upon said panels, finger openings in said two opposed sides of the crate and handle members fitted into the finger openings holding the bottle cell unit in position in the body.

CHARLES CLARKE WALES.

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