

July 7, 1959

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2,893,588

PALLET AND SHIPPING CONTAINER

Filed July 1, 1955

4 Sheets-Sheet 1

FIG. 1

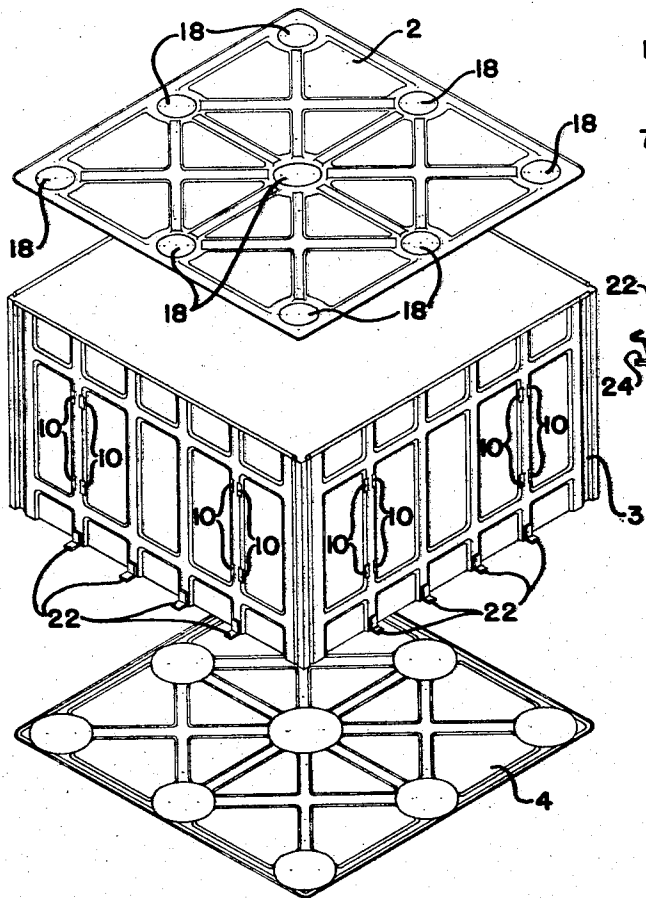


FIG. 2

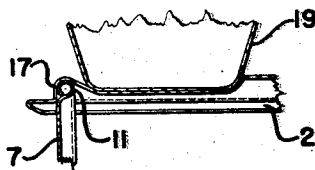


FIG. 3

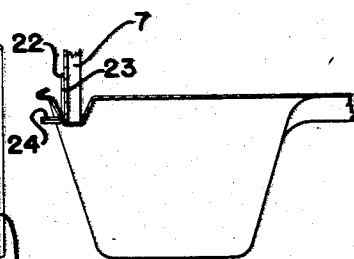


FIG. 4

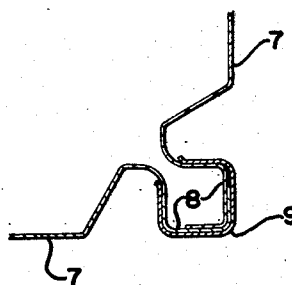
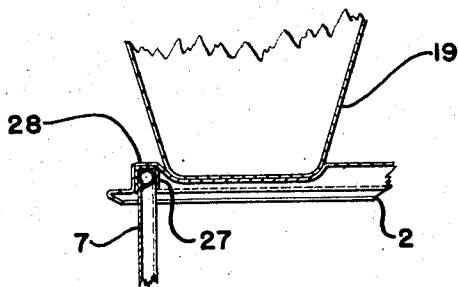


FIG. 5



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FIG. 6.

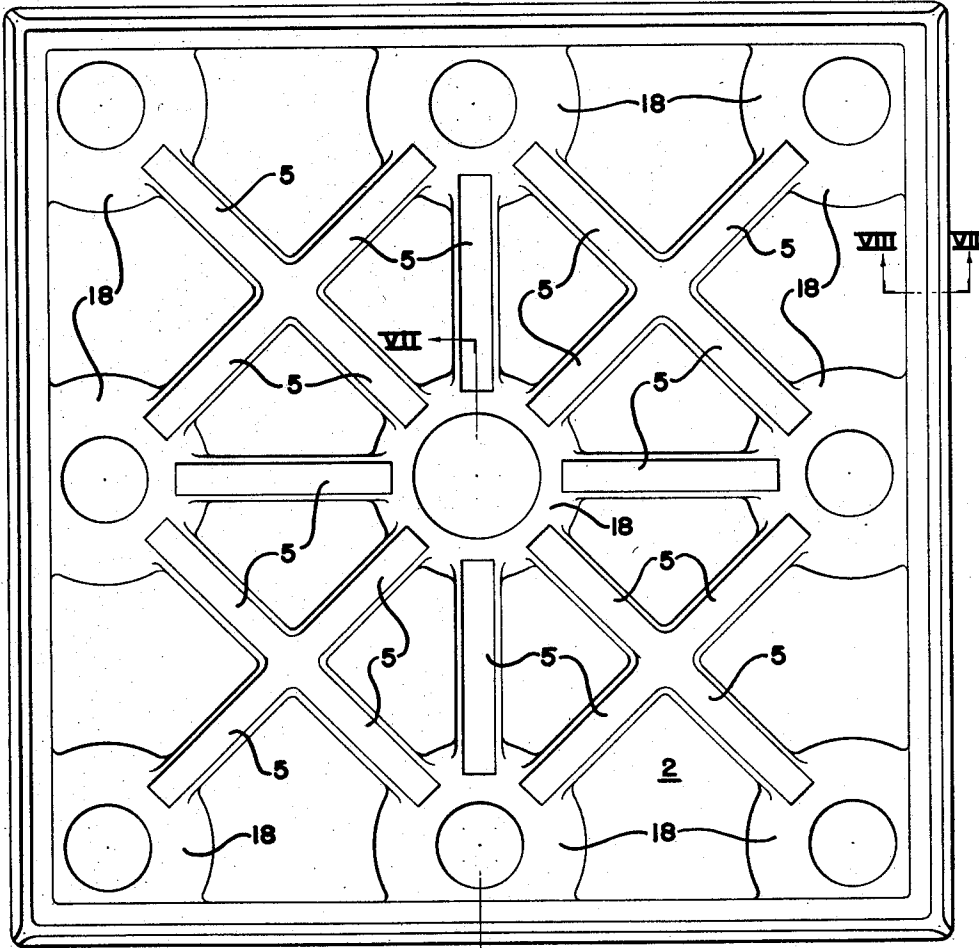


FIG 7

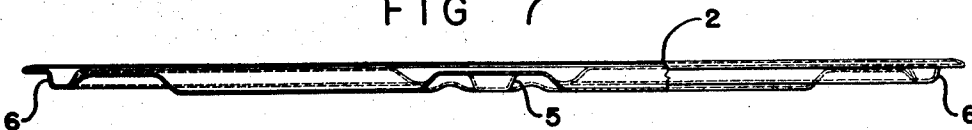
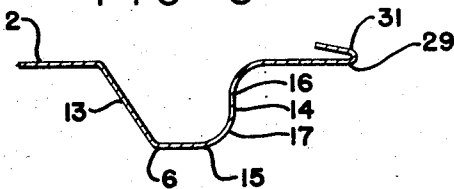


FIG 8



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FIG. 9

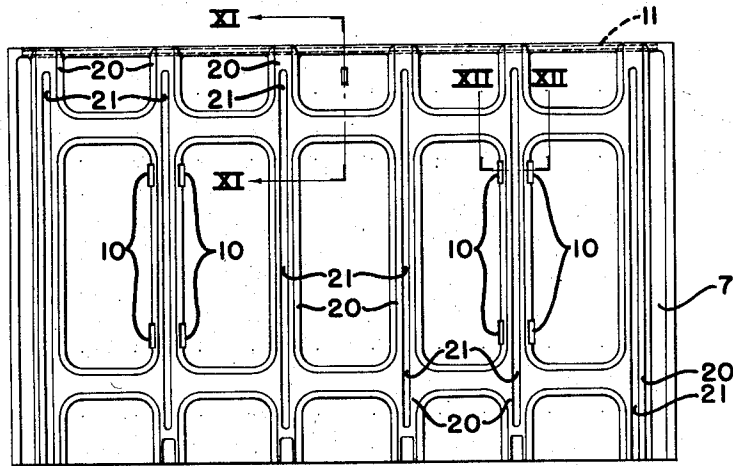


FIG. 10

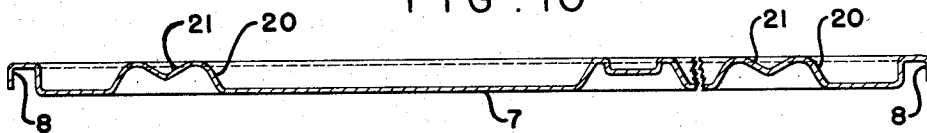


FIG. 11.

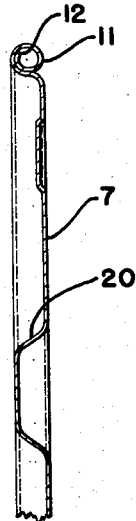
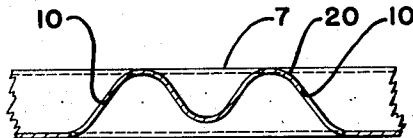


FIG. 12.



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FIG. 13.

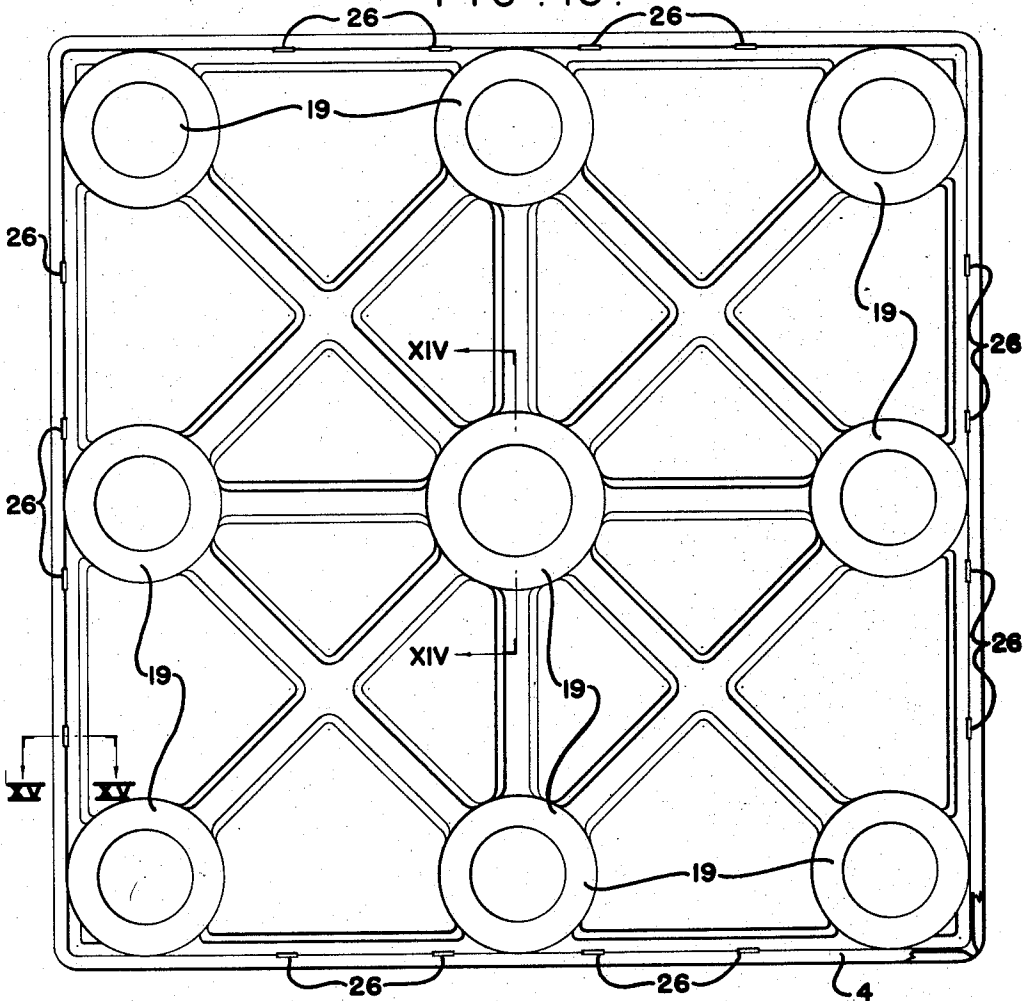
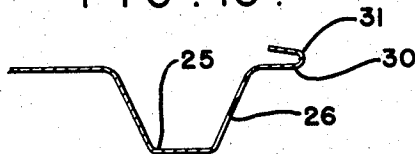


FIG. 14.



FIG. 15.



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2,893,588

## PALLET AND SHIPPING CONTAINER

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Application July 1, 1955, Serial No. 519,534

2 Claims. (Cl. 220-4)

This invention relates to a pallet and shipping container and more particularly to a drawn sheet material pallet and to a shipping container having such a pallet as the bottom or base of the container and also having a body and a cover or top, the parts being adapted to be held together by suitable fastening means, such, for example, as bands or wires.

This application covers improvements over the invention of my copending application Serial No. 443,050, filed July 13, 1954. The general type of container and the purpose for which it is used are the same in both cases. While the container of my said copending application is satisfactory, experience has shown that it can be importantly improved and accomplish unprecedented results if reconstructed as explained below.

Since the general type of container is fully disclosed in my said copending application I shall herein devote the explanation to the improvements which I have devised, which improvements greatly strengthen the container and enhance its utility in important respects.

My container comprises an open-topped body and a top of drawn sheet material adapted to be applied over the top rim of the body. Normally the components of my container will be made of drawn sheet metal but with the development of the art of plastics it is at least possible that the container might be made out of plastic sheet material formed in the same way as sheet metal is formed or by any of the conventional methods of forming plastics. In my improved container the top has formed therein spaced apart localized downwardly dished areas to receive feet of an object disposed upon the container so that the sheet material of said areas is subjected to tension due to the mass of the object. This is in contradistinction to the top disclosed in my said copending application in which the areas adapted to receive feet of an object disposed upon the container were formed upwardly. I have found that when said areas are downwardly dished and an object is disposed atop the container with feet of the object through which the weight of the object is transmitted to the container disposed in the downwardly dished areas such areas are subjected to tension rather than to compression as is the case when the areas are formed upwardly. The downwardly dished areas greatly increase the strength of the container and the weight which can be disposed atop it without undesirable deformation.

My shipping container preferably comprises a bottom having spaced apart downwardly projecting feet for supporting the container together with an open-topped body adapted to be disposed atop the bottom and a top of

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drawn sheet material adapted to be applied over the top rim of the body, the top having formed therein spaced apart localized downwardly dished areas in the same arrangement as the feet to receive feet of a similar container disposed upon the container. The container top preferably has a generally peripherally extending downwardly open container body rim receiving channel to receive the top rim of the body. In a preferred form the top has a largely generally planar body portion at least largely surrounded by a downwardly open container body rim receiving channel, the channel having a generally downwardly and inwardly inclined inner wall and an outer wall at least a portion of which extends substantially perpendicular to the general plane of the body portion. Such formation of the outer wall of the channel has improved cooperation with the top rim of the body, maintaining such top rim in proper position with the body substantially exactly vertical, thereby increasing the strength and load carrying capacity of the container. The channel of the shipping container top preferably has a wall forming the top of the downwardly open channel and the outer wall of the channel curving outwardly and downwardly from the top of the channel to a zone at which the wall is substantially perpendicular to the general plane of the body portion.

My shipping container preferably comprises a body of sheet material having a top rim formed as a curled bead of the material of the body and a top of sheet material applied to the body, the top having a generally peripherally extending downwardly open channel for receiving the bead at the top rim of the body, the channel having a generally downwardly and inwardly inclined inner wall and an outer wall at least a portion of which extends substantially perpendicular to the general plane of the top. Preferably the outer wall curves outwardly and downwardly from the top of the channel to a zone at which the wall is substantially perpendicular to the general plane of the top with the curved portion of the wall substantially fitting the bead. Such a structure has important advantages. The bead at the top rim of the container body greatly strengthens and stiffens the container and forms a complementary element cooperating in improved manner with the top rim of the body to form a strong container with well fitting elements. The bead also eliminates a hazard to workmen working with the container as it conceals the edge of the sheet material which may be sharp, particularly if the sheet material has been sheared.

For heavy duty use I provide a shipping container body made of generally upstanding sheet material having a top rim, preferably formed as a curled bead of the material of the body, and a downwardly open reinforcing member of generally U-shaped cross section fitting down over the top rim. The reinforcing member may be spot-welded or otherwise fastened to the body. While I prefer to employ the reinforcing member with a body having a beaded top rim, such reinforcing member may be applied to a body not having a beaded top rim and when so applied performs the dual function of strengthening the body and concealing the edge of the sheet material. Preferably the top of the container has a generally peripherally extending downwardly open channel for receiving the top rim of the body, the channel preferably being shaped to substantially fit the reinforcing member.

My shipping container may comprise a pallet-like bottom having an upwardly open peripheral channel for receiving the bottom rim of a container body and a body adapted to have its bottom rim received in the channel, the outer wall of the channel having openings therethrough at intervals therealong and the body having outward projections adjacent its bottom rim adapted to pass through the openings to maintain the bottom rim of the body in the channel. The openings in the outerwall of the channel are preferably in the form of generally horizontally elongated slits and the projections on the body are preferably generally L-shaped clips of sheet material fastened to the body with one leg of each clip projecting outwardly generally in a horizontal plane and adapted to pass through one of the slits in the body. The openings and projections are of great advantage and utility when the top or cover has been removed from the container and the pallet or base of the container with the body or side walls thereon is handled, as in an industrial plant. There is a tendency for the container body to work itself out of the channel in the pallet or bottom, which tendency is overcome by the projections on the body entering the openings in the pallet. If the projections are of relatively great extent the body may be applied to the pallet one panel at a time but the projections may be made short enough so that the panels may first be assembled to form the body after which the body may be dropped in place in the channel of the pallet, the material being sprung sufficiently to permit the projections to enter the openings.

I also provide a shipping container body comprising panel means of sheet material adapted to have the end edges thereof joined to form a peripherally continuous body, the panel means having at the end edges thereof formations interfittable by relative movement of such edges into juxtaposition generally in a plane substantially normal to the panel means, and a locking device maintaining said formations in interfitting relationship. Such a structure has the advantage that so-called "belly bands", i.e., bands passing horizontally about the body of the container to maintain the integrity of the body, are rendered unnecessary. The panel means may consist of a single panel bent into peripherally closed form with its opposite ends interfitted and locked together, but I normally prefer to employ a plurality of generally planar panels each of which is locked to each of its neighbors. The formations in the end edges of the panel means are preferably channel-like formations interfittable by relative movement of the edges in a plane substantially normal to the panel means into position with a portion of one thereof within another thereof, and the locking device is preferably slidable generally in a direction normal to said plane into position embracing the interfitted edge formations maintaining the same in interfitting relationship.

My shipping container may comprise an element, which may be the top or bottom of the container (preferably both), which comprises a unitary generally planar sheet material member having formed therein a generally peripheral channel for receiving a rim of a container body and having a generally outwardly extending flange outside the channel, the extremity of the flange being turned back to provide a generally U-shaped edge formation. In a preferred structure the extremity of the flange is turned back generally toward the channel at the face of the flange relatively remote from the bottom of the channel. That provision materially strengthens and stiffens the element and also eliminates the hazard incident to a projecting raw edge.

I further provide a shipping container element comprising a generally planar drawn sheet material panel containing a strengthening embossing projecting at one face of the panel and a reverse embossing in the first mentioned embossing but of less depth than the first mentioned embossing and projecting therefrom in the direction opposite the direction in which the first mentioned embossing extends from the panel. That feature contributes impor-

tantly to the strength and stiffness of the element and hence of the container as a whole.

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

In the accompanying drawings I have shown certain present preferred embodiments of the invention in which

Figure 1 is an exploded view of a container adapted for shipping and storage of articles, the container having a base or bottom in the form of a pallet, an intermediate body or side wall and a surmounting top or cover, the three elements of the container being shown somewhat spaced apart in the figure;

Figure 2 is a fragmentary vertical cross-sectional view to enlarged scale showing the interfitting of the body and top of the container and the stacking of a similar container atop the container;

Figure 3 is a fragmentary vertical cross-sectional view to enlarged scale showing the interfitting of the bottom of the container body and the container bottom or pallet;

Figure 4 is a fragmentary horizontal cross-sectional view to enlarged scale showing the interfitting of two of the body panels at a corner of the container and the locking of the panels together;

Figure 5 is a view similar to Figure 2 showing a modified construction adapted for heavy duty use;

Figure 6 is an inverted plan view of the container top or cover;

Figure 7 is a view partly in central vertical cross section on the line VII—VII of Figure 6 and partly in elevation;

Figure 8 is a fragmentary cross-sectional view to enlarged scale on the line VIII—VIII of Figure 6;

Figure 9 is a face view of one of the panels of the side wall or body of the container;

Figure 10 is a bottom plan view of the panel shown in Figure 9;

Figure 11 is a fragmentary vertical cross-sectional view to enlarged scale taken on the line XI—XI of Figure 9;

Figure 12 is a fragmentary horizontal cross-sectional view to enlarged scale taken on the line XII—XII of Figure 9;

Figure 13 is a plan view of the bottom of the container or pallet;

Figure 14 is a view partly in central vertical cross section on the line XIV—XIV of Figure 13 and partly in elevation; and

Figure 15 is a fragmentary vertical cross-sectional view taken on the line XV—XV of Figure 13.

Referring now more particularly to the drawings, the container comprises a top or cover designated generally by reference numeral 2, a body or side wall portion designated generally by reference numeral 3 and a bottom or pallet designated generally by reference numeral 4. Each of the members or elements 2, 3 and 4 of the container is made out of sheet material, preferably sheet metal, which material is drawn or die-formed as shown and to be described.

The top or cover 2 has strengthening ribs 5 formed therein and also has a generally peripherally extending channel 6 for receiving the top rim of the body 3, the channel 6 being downwardly open when the top 2 is applied to the body 3. The body 3 is in the form shown made up of four panels 7 each having at each of its end edges a channel-like formation 8. When the panels 7 are assembled to form the container body 3 the channel-like formations 8 are interfitted by relative movement of the end edges of the panels in a plane substantially normal to the panels into position with a portion of one of the channel-like formations 8 within another thereof as shown in Figure 4. Thereupon a locking device 9 in the form of a slit tube of generally square cross section with three rounded corners and a longitudinal slit at the fourth corner is applied to the interfitted channels by sliding the tube 9 onto the interfitted channels lengthwise thereof whereby the panels are locked together. In a

container body having four panels there are four corners and a tube 9 is utilized at each of the four corners whereby the integrity of the container body is maintained. This makes it possible to dispense with circumferential "belly bands" which heretofore have been employed extending horizontally about the body to maintain its integrity, although I show in the drawings slits 10 in the side wall panels for receiving encircling bands if for any reason it should be desired to use such bands.

The upper edge of each of the panels 7 is in the form of a curled bead as shown at 11, except at each end edge of the panel where one of the channels 8 is formed. In each panel the bead 11 extends as close as possible to each of the channels 8 without interfering with application of the locking tube 9. The curled bead 11 greatly strengthens the panels and also eliminates the hazard to workmen of a raw edge of the sheet material. As shown in Figure 11 the raw edge 12 is hidden within the curled bead 11.

The downwardly open generally circumferential channel 6 of the top 2 has the shape shown in Figure 8, although the channel is inverted in that figure. The channel 6 has a generally downwardly and inwardly inclined inner wall 13 and an outer wall 14 at least a portion of which extends substantially perpendicular to the general plane of the top. In the form shown the wall 14 forms at 15 the top of the downwardly open channel and at 16 the outer wall of the channel and curves outwardly and downwardly at 17 from the top 15 of the channel to the zone 16 at which the wall is substantially perpendicular to the general plane of the top. The curved portion 17 of the channel has the same curvature as the bead 11 at the top of the side wall panel so that the bead fits snugly in the curved portion 17 of the channel as shown in Figure 2. The vertical portion 16 of the channel bears horizontally against the outside of the bead, the result being a well fitting strong and stiff connection between the body and top of the container.

The top 2 also has spaced apart localized downwardly dished areas 18 to receive feet of an object disposed upon the container. The areas 18 are in the same arrangement and have the same spacing as the feet 19 of the bottom or pallet so that as shown in Figure 2 the containers may be stacked upon one another with the feet 19 of each container disposed within the downwardly dished areas 18 of the top of the container below. The downward dishing or inward drawing of the areas 18 insures that when the top 2 of the container is placed under stress by the setting down upon it of a similar container whose feet 19 are disposed in the dished areas 18 the entire top 2 including the dished areas 18 is in tension which would not be the case if the areas 18 were formed upwardly. By dishing the areas 18 downwardly I provide a much stronger structure and can even somewhat reduce the gauge of the material of which the top is made. There is a minimum of deformation of the top and the container as a whole maintains its integrity to a greater degree than with upwardly formed areas to receive the feet of another container set down upon the top of the container.

The panels 7 have strengthening embossings 20 projecting at the outer face of the panel and a reverse embossing 21 in each embossing 20 but of less depth than the embossing 20 and projecting therefrom inwardly or in the direction opposite the direction in which the embossing 20 extends from the panel. The reverse embossings 21 add considerable strength and stiffness to the panels and make possible the utilization of relatively thin sheet material for performance of a given duty.

Each of the panels 7 has welded thereto externally at the bottom thereof a series of spaced apart L-shaped clips 22 each of which in the form shown has a relatively long vertical arm 23 lying against and welded to the panel and a relatively short horizontal arm 24 projecting substantially horizontally outwardly of the panel at the bottom thereof. The pallet 4 has a peripheral up-

wardly open channel 25 having in its outer wall spaced apart generally elongated slits 26 which receive the horizontal arms 24 of the L-shaped clips 22 as shown in Figure 3 whereby to maintain the bottom rim of the body 3 in the channel 25 of the pallet. The provision of the clips and slits is of especial utility when the pallet 4 and body 3 are used without the top 2 and without any bands or other encircling means holding the body and pallet together. Under certain circumstances there may be a tendency for the bottom rim of the body 3 to move out of the channel 25 of the pallet; that tendency is counteracted by the interfitting of the clips 22 and the slits 26. When the horizontal arms 24 of the clips 22 are relatively long it may be necessary to apply the panels 7 to the pallet 4 individually, but the horizontal arms 24 may be made short enough so that the panels 7 may first be assembled to form the complete peripherally continuous body 3 and that body then applied to the pallet by somewhat springing the metal until the arms 24 enter the slits 26.

For heavy duty work a downwardly open reinforcing member 27 of generally U-shaped cross section may be fitted over the bead 11 at the top of each of the panels 7, and desirably each of the reinforcing members 27 is spot-welded to the bead at intervals. When the reinforcing members 27 are employed the peripheral channels of the top 2 may be shaped as shown at 28 in Figure 5 to conform to and fit tightly about the reinforcing member analogously to the shaping of the channel to fit the bead 11 as shown in Figure 2. The reinforcing members 27 add considerable strength and rigidity to the container.

Each of the top 2 and the pallet 4 has a generally outwardly extending flange outside the channel which receives the rim of the body. In the top the flange is designated 29 and in the pallet it is designated 30. In each case the flange is turned back to provide a generally U-shaped edge formation designated 31 and shown in Figures 8 and 15. In the form shown the flange is turned back generally toward the channel at the face of the flange relatively remote from the bottom of the channel. That feature further stiffens and strengthens the structure and reduces the danger to workmen because the raw edge does not project outwardly where it may cut the workmen's hands.

I have endeavored to confine the above description to the features of novelty and utility over the structure disclosed in my said copending application. For a general description of a shipping and storage container of the general type of that involved reference is made to the showing of said application.

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

I claim:

1. A shipping container comprising a pallet-like bottom having an upwardly open peripheral channel for receiving the bottom rim of a container body and a vertically ribbed body adapted to have its bottom rim received in said channel, the outer wall of the channel having openings therethrough at intervals therealong and the body having outwardly projecting feet adjacent its bottom rim substantially perpendicular to the body adapted to pass through said openings to maintain the bottom rim of the body in the channel, the feet being welded to the body at the vertical ribs thereof.

2. A shipping container comprising a pallet-like bottom having an upwardly open peripheral channel for receiving the bottom rim of a container body and a vertically ribbed body adapted to have its bottom rim received in said channel, the outer wall of the channel having generally horizontally elongated slits therethrough at intervals therealong and the body having generally L-shaped clips of sheet material fastened thereto at

the vertical ribs thereof with one leg of each clip projecting outwardly generally in a horizontal plane and adapted to pass through one of the slits in the body to maintain the bottom rim of the body in the channel.

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