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[54] **SHIPPING CONTAINER**
18 Claims, 16 Drawing Figs.

[52] U.S. Cl..... **220/1.5,**

220/4, 220/81, 220/84

[51] Int. Cl..... **B65j 1/02,**

B65d 7/42, B65d 7/14

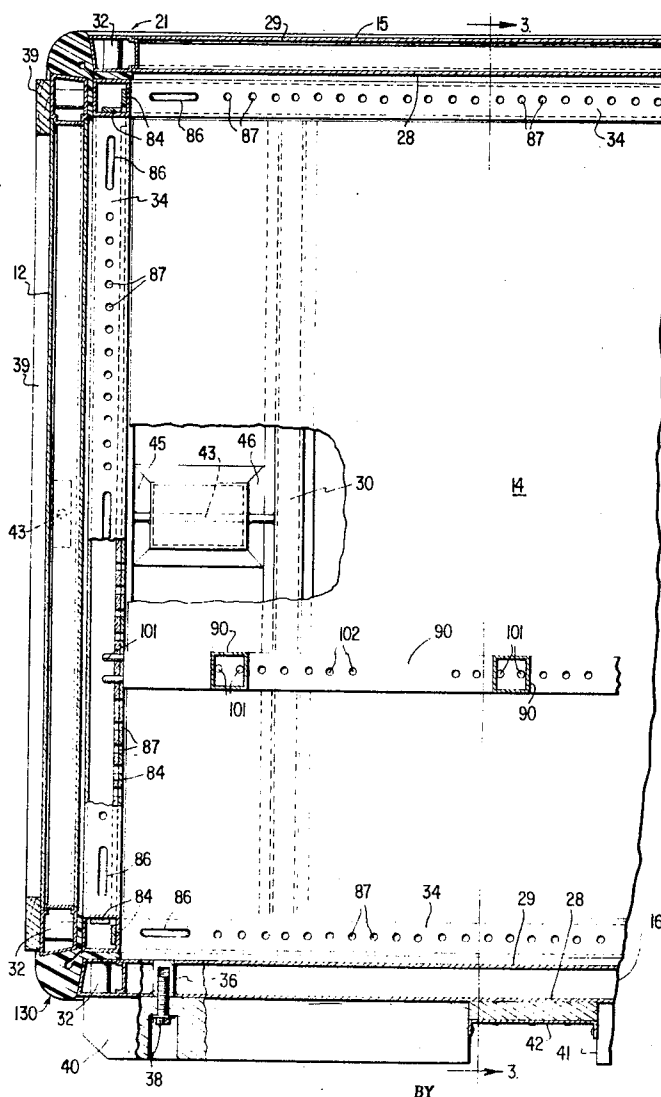
[50] Field of Search..... **220/1.5, 4,**
81, 84, 85K; 206/46 (Mach); 312/(Inquired)

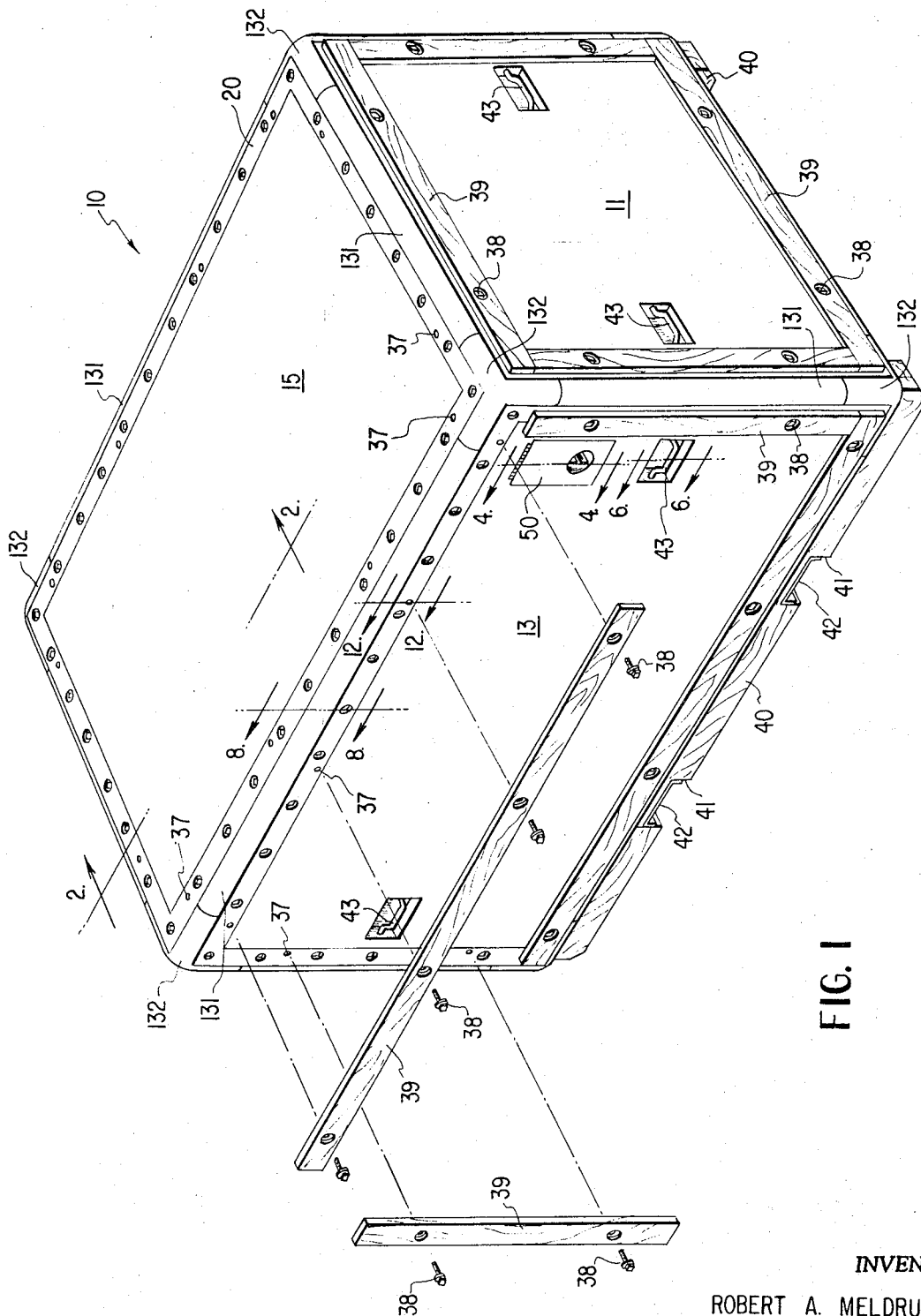
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ABSTRACT: A universal high-strength shipping container having its wall panels supported adjacent their peripheral edges by a parallelepiped skeleton metal frame within the container. The frame is constructed from a plurality of elongated structural members rigidly welded at the corners of the container only, and the wall panels are each removably secured along their edges to the adjacent structural members of the frame. The container may be employed in any orientation, and includes improved means for securing the wall panels in tamper proof, hermetically sealed relation on the frame.



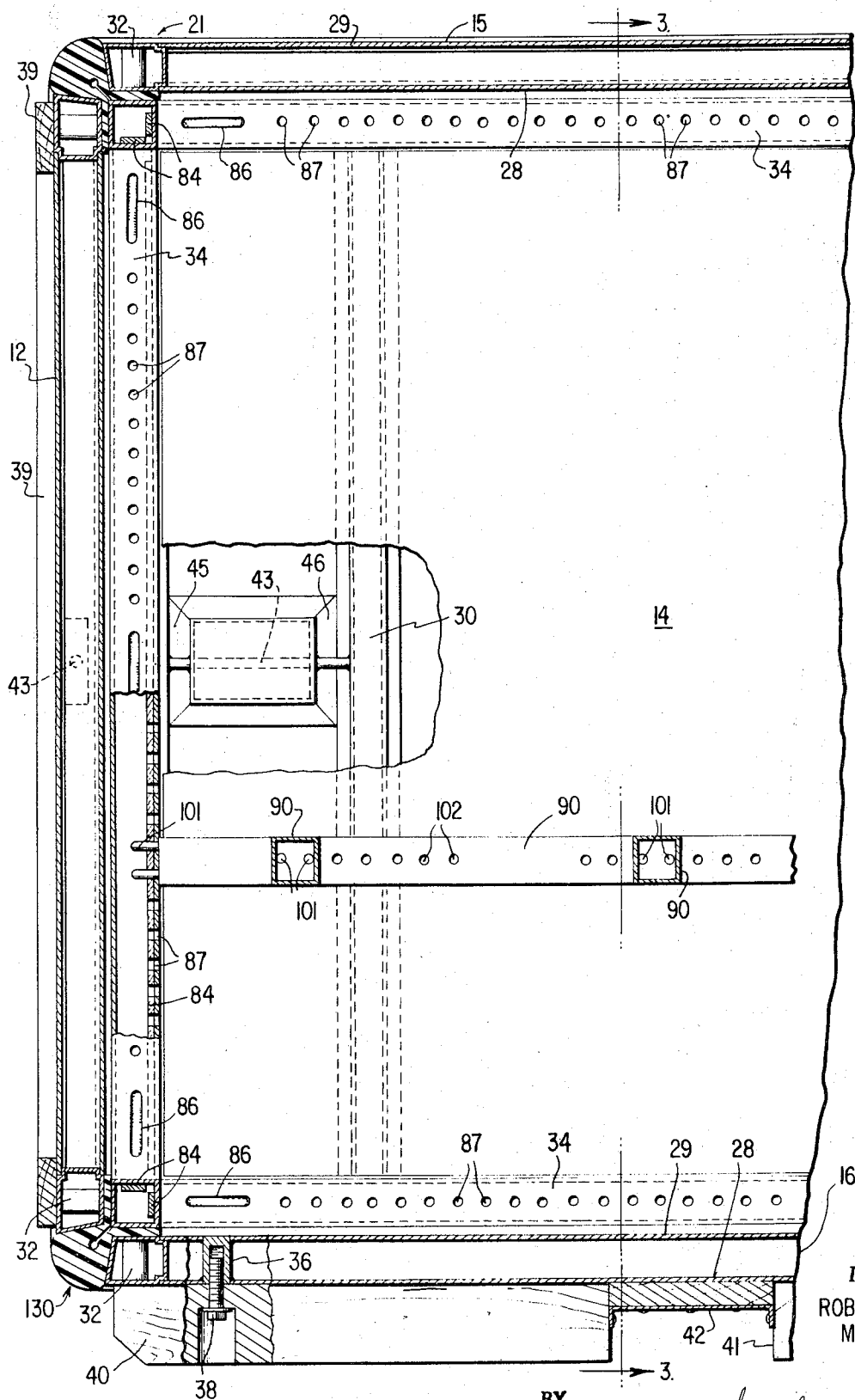


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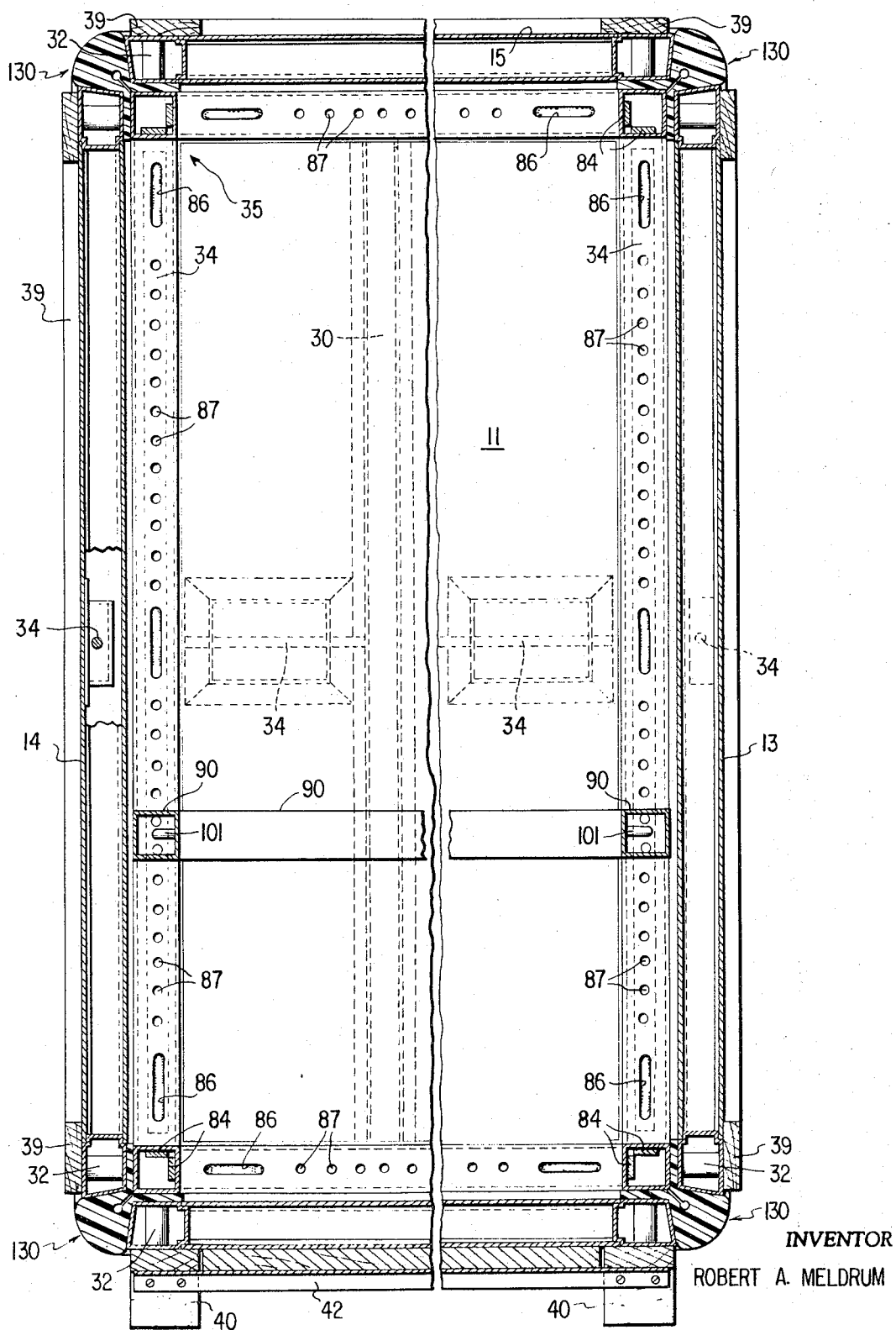
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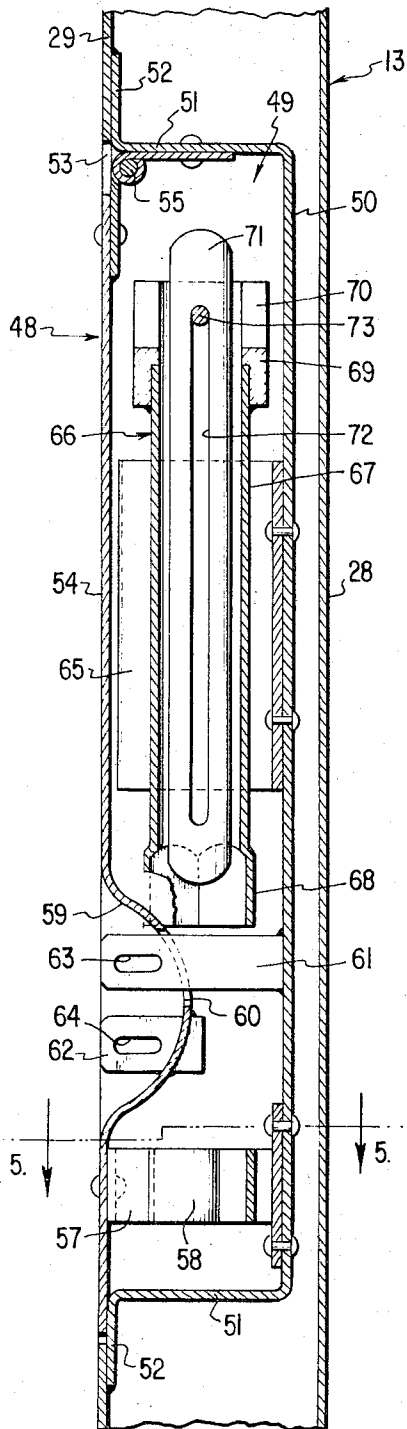


FIG. 4

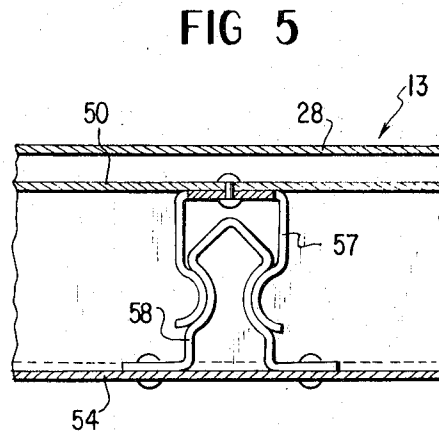


FIG 5

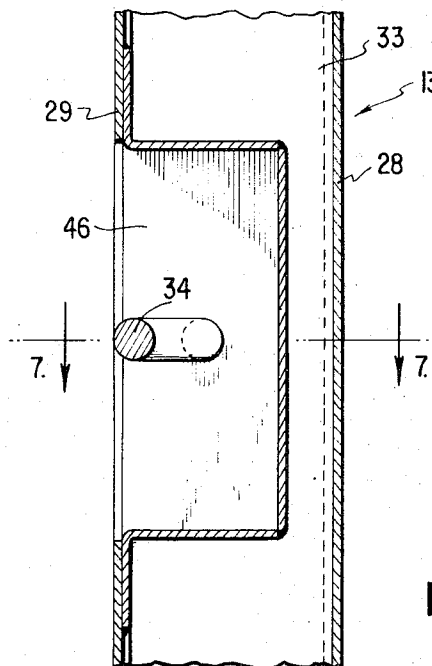


FIG. 6

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FIG. 7

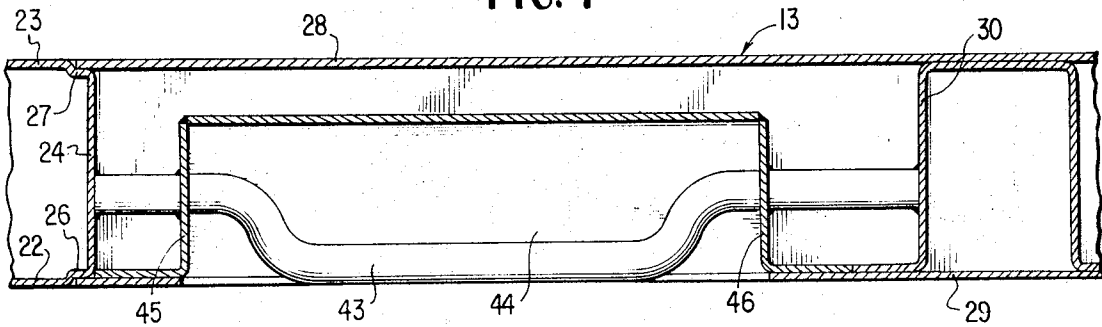


FIG. 8

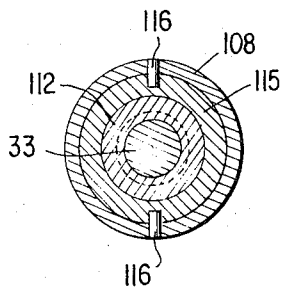
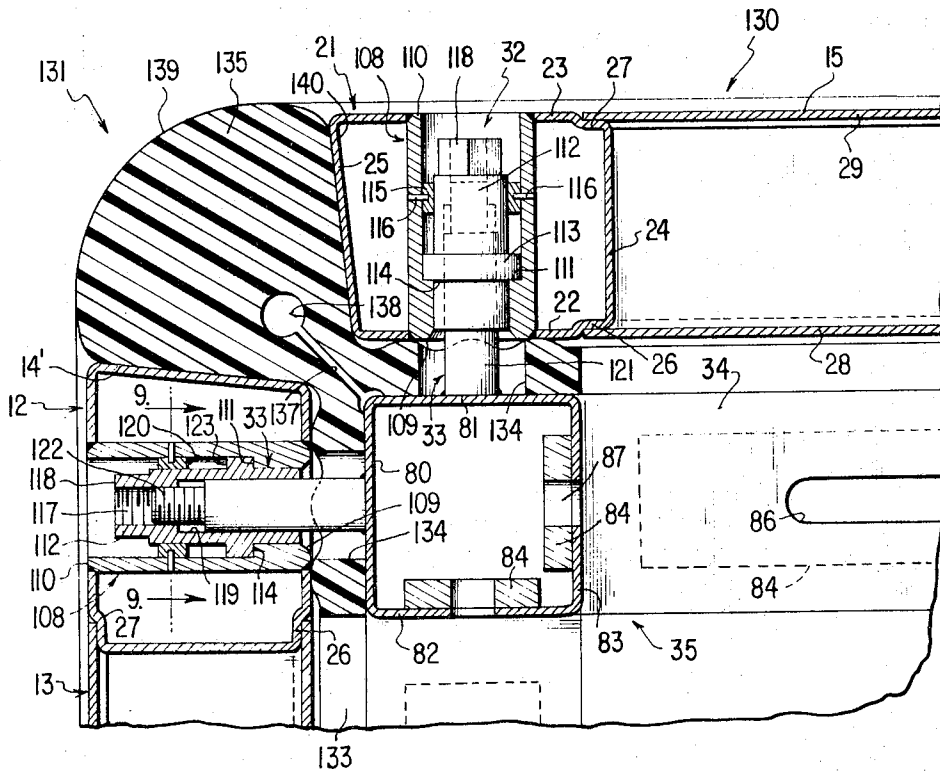


FIG. 9

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FIG. 10

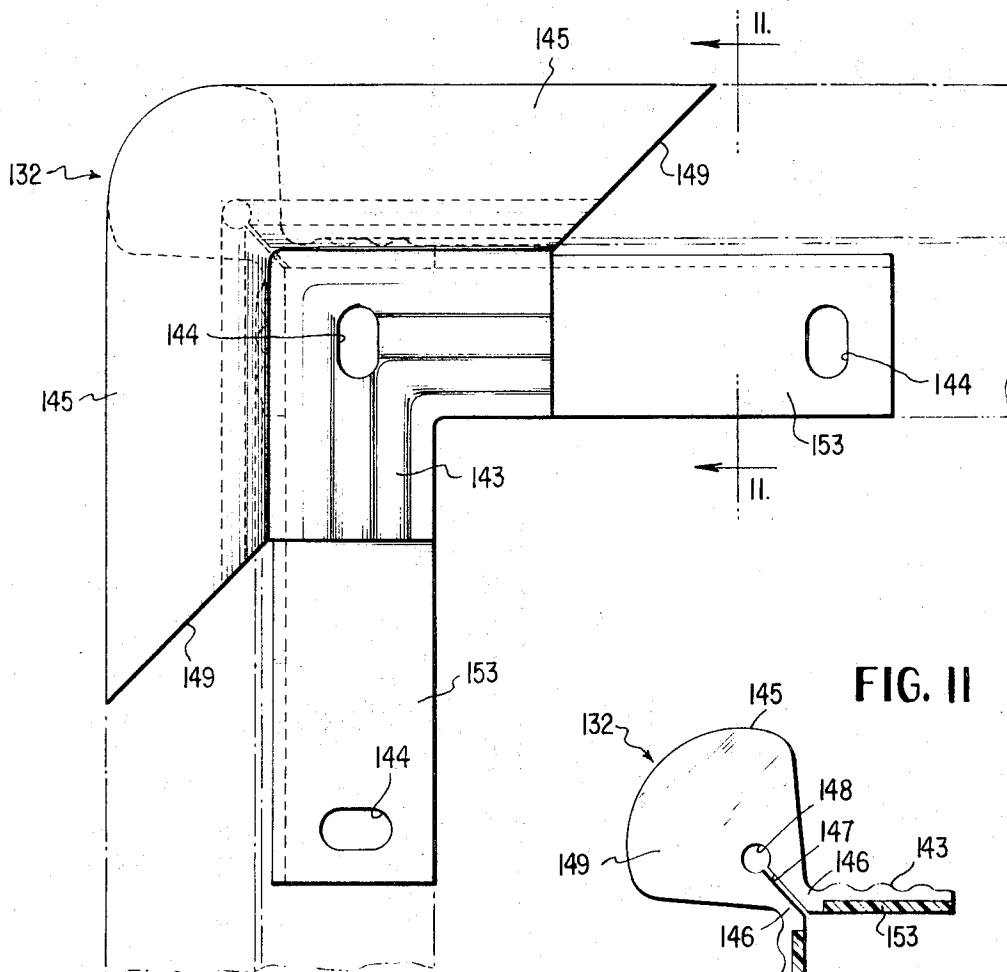


FIG. 11

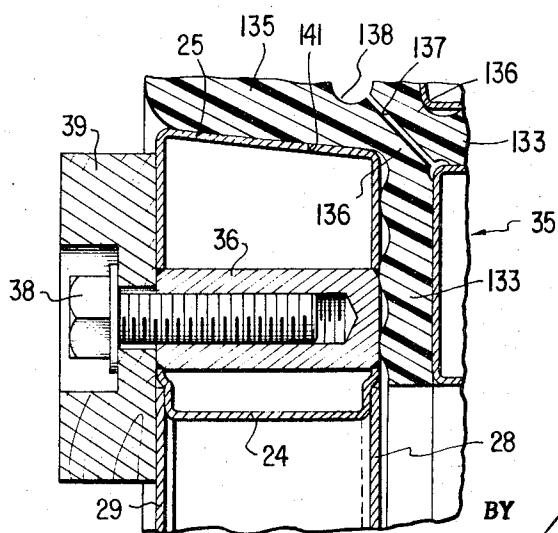
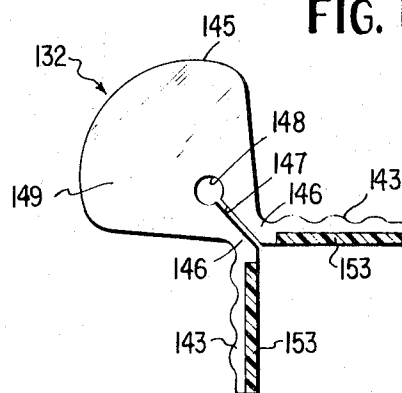


FIG. 12

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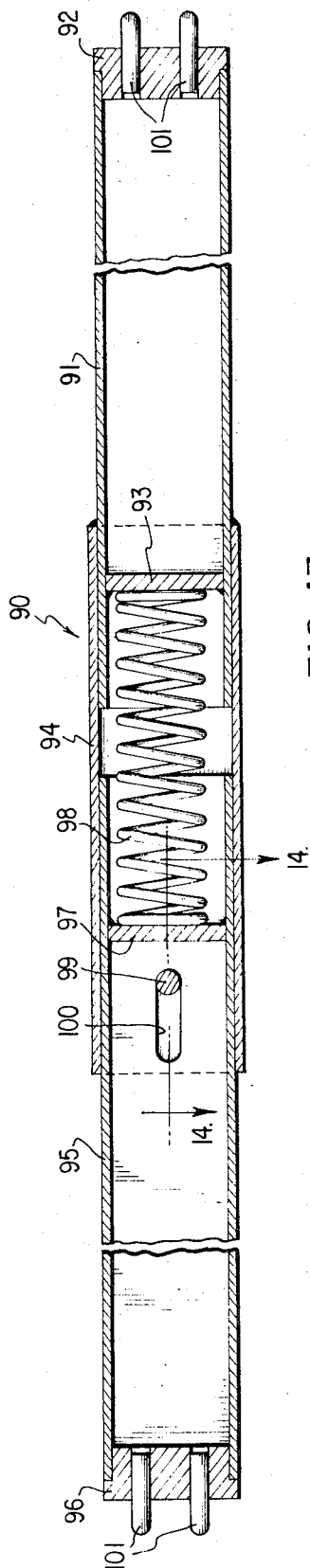


FIG. 13

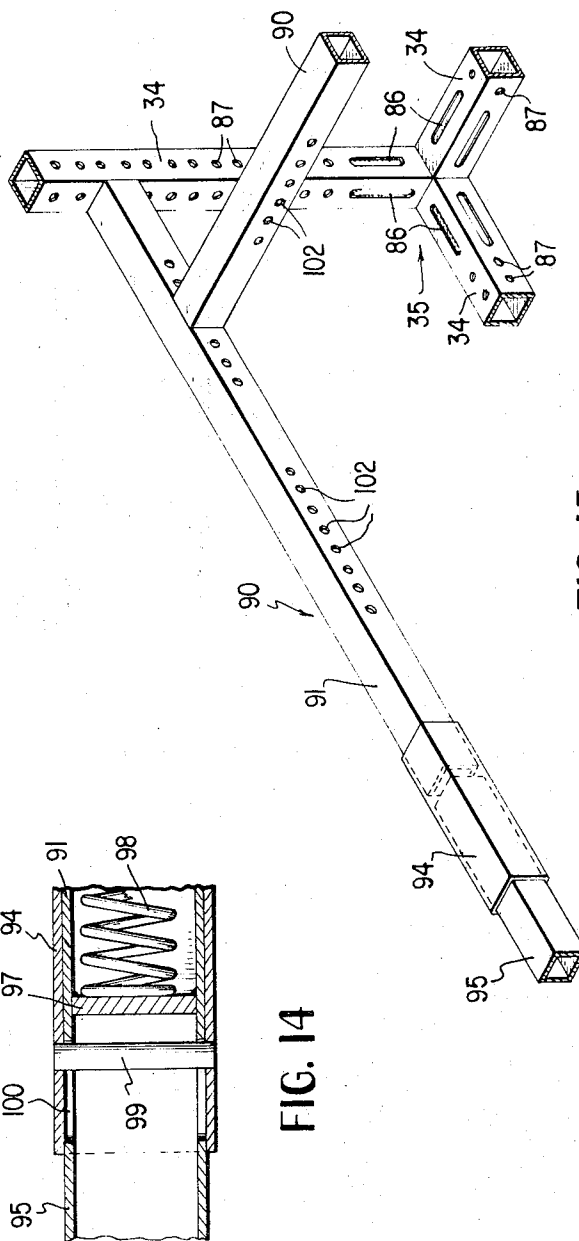


FIG. 14

FIG. 15

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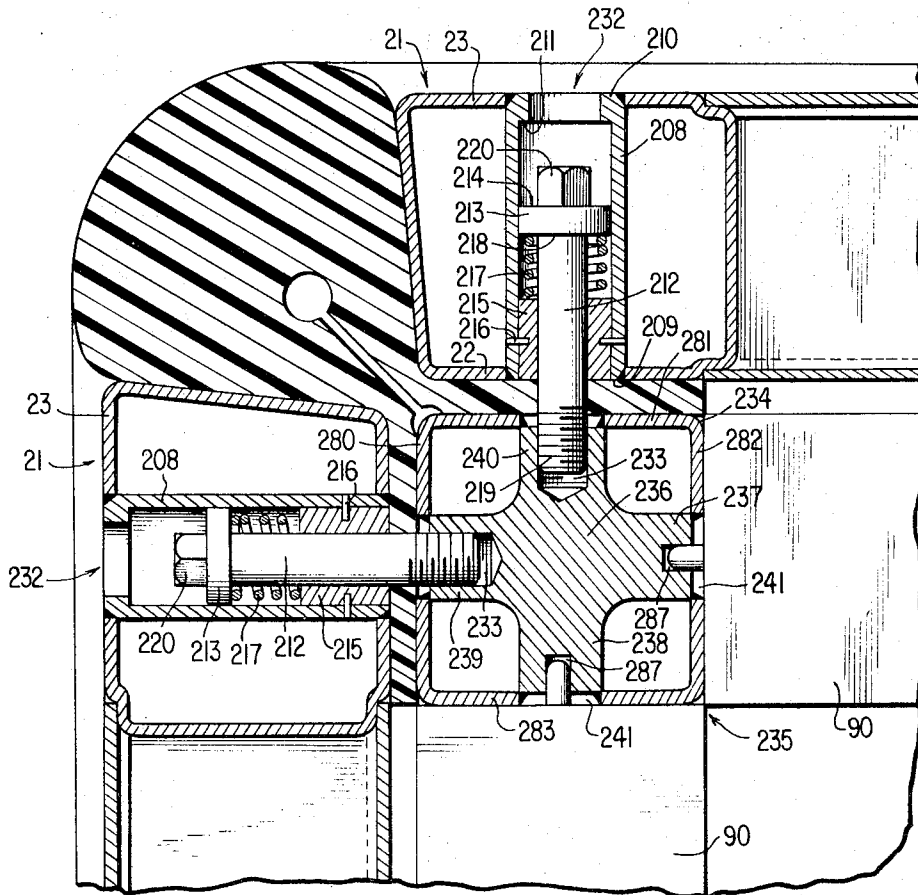


FIG. 16

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SHIPPING CONTAINER

This invention relates to prefabricated shipping containers, and more particularly to an improved high strength universal shipping container having wall panels removably mounted on a rigid skeleton framework wholly contained within the container.

The concept of containerized freight for long distance shipping has recently met with phenomenal success. However, the containerized freight concept has been implemented primarily in the field of very large, rigid containers of the approximate size of present highway truck bodies which can either be stacked within the hold of a ship or transported overland by rail or truck, and little has been done to provide an acceptable shipping container of intermediate size suitable for use either independently or in combination with larger containers for the shipping of goods either by surface or air. Accordingly, a primary object of the present invention is to provide such an intermediate size, high-strength shipping container.

Another object is to provide an improved high-strength shipping container which is universal in construction and whose walls are individually removable to permit loading and/or unloading of the container therethrough.

Another object is to provide such a container which may be utilized in any discreet orientation whereby any wall of the container may serve as the bottom, top, or sidewall, as desired.

Another object is to provide such a container having improved sealing means.

Another object of the invention is to provide such a container which is essentially tamper proof.

Another object of the invention is to provide such a container having improved means for securing individual articles in the container.

Another object is to provide such a container employing a rigid skeleton frame wholly within the container, which frame may be employed to support articles packaged in the container.

Another object of the invention is to provide such an improved container having a maximum carrying capacity to tare weight ratio.

Another object is to provide a basic construction for a shipping container which readily lends itself to the production of containers of any desired size.

In the attainment of the foregoing and other objects, an important feature of the invention resides in providing a rigid, welded skeleton frame made up of a plurality of elongated structural members secured in right-angled relation at the corners of the container only to define the essentially parallelepiped configuration of the container. A plurality of threaded fastener elements are located on each of the structural members at spaced intervals along the length thereof in two longitudinal rows, with the rows cooperating to define a substantially rectangular array extending around the periphery of each side of the frame in position to engage cooperating threaded fastener members mounted along the peripheral edge of the respective wall panels to removably support the panels on the frame. An improved sealing means provides a hermetic seal between the frame and the respective wall panels, and each of the wall panels are provided with means for mounting removable skids so that the container may be employed in any desired orientation to accommodate a particular article or group of articles to be packaged therein.

Other objects and advantages of the invention will become apparent from the following specification, taken with the drawings, in which:

FIG. 1 is a partially exploded, perspective view of a shipping container according to the present invention;

FIG. 2 is an enlarged, fragmentary sectional view taken on line 2-2 of FIG. 1, with parts broken away to more clearly disclose other parts;

FIG. 3 is a sectional view taken on line 3-3 of FIG. 2;

FIG. 4 is an enlarged, fragmentary sectional view taken on line 4-4 of FIG. 1 and illustrating a compartment within one of the side panels;

FIG. 5 is a fragmentary sectional view taken on line 5-5 of FIG. 4 and illustrating the spring clip fastener for the door of the compartment;

FIG. 6 is an enlarged, fragmentary sectional view taken on line 6-6 of FIG. 1 and illustrating the container lifting handle;

FIG. 7 is a fragmentary sectional view taken on line 7-7 of FIG. 6;

FIG. 8 is an enlarged, fragmentary sectional view taken on line 8-8 of FIG. 1 and illustrating the structure for joining the side panels to the rigid frame;

FIG. 9 is an enlarged, sectional view taken on line 9-9 of FIG. 8;

FIG. 10 is an elevation view of the corner segment of the combined sealing gasket and resilient bumper;

FIG. 11 is a sectional view taken on line 11-11 of FIG. 10;

FIG. 12 is a fragmentary, sectional view taken on line 12-12 of FIG. 1;

FIG. 13 is a sectional view of a movable loading bar employed in the container;

FIG. 14 is a fragmentary, sectional view taken on line 14-14 of FIG. 13;

FIG. 15 is a fragmentary, perspective view illustrating the manner of use of the loading bars on the rigid frame; and

FIG. 16 is an enlarged, fragmentary sectional view similar to FIG. 8, and illustrating an alternate embodiment of the invention.

Referring now to the drawings in detail, a substantially rectangular parallelepiped shipping container according to the present invention is indicated generally by the reference numeral 10, and includes six wall panels, each removably mounted on a rigid skeleton frame. Although the container is of universal construction and therefore may be used in various orientations, for convenience of description the wall panels will sometimes be referred to herein as end panels, side panels, and top and bottom panels, all is illustrated in FIG. 1. Thus, the container comprises two identical end panels 11, 12, identical side panels 13, 14, a top panel 15, and a bottom panel 16. The basic construction of all the wall panels is similar and will be described in detail only with respect to one panel, with identical reference numerals being employed to designate corresponding parts of the remaining wall panels. Structural differences in the respective panels will thereafter be described in detail.

The respective walls each comprise a generally rectangular frame 20 defining the peripheral edge of the panel. Frame 20 is made up of elongated structural shapes rigidly welded in right-angled relation at the corners of the panels, with the structural shapes preferably being in the form of tubular extrusions 21. Referring to FIG. 8, the extrusions 21 are generally rectangular in cross section, and include inner and outer walls 22, 23, respectively, joined by webs 24 and 25. Webs 25 define the peripheral edges of the respective panels, and are inclined slightly with respect to webs 24 so that the peripheral edges of adjacent wall panels mounted on the container define a slightly acute angle as will be more fully explained hereinbelow. Walls 22 and 23 are formed with inwardly directed shoulders 26, 27, respectively, along their inner edge to provide a seat for the peripheral edges of inner and outer cover sheets 28, 29, respectively, the cover sheets are welded continuously around their periphery to the shoulders 26, 27, to provide a smooth, hermetically sealed joint with the structural shapes 21. Generally U-shaped rib members 30 (see FIGS. 2 and 7) may be positioned between the cover sheets 28, 29, at spaced intervals as desired, and welded to the cover sheets and the structural shapes 21 to provide strength and rigidity to the panels. If desired, the void space between the sheets 28 and 29 may be filled with an insulating material such as a foamed plastic.

A plurality of openings are formed in the rectangular frame 20, at spaced intervals therearound, and fastener elements 32 (again referring to FIG. 8) are mounted one in each of the openings in position to threadably engage cooperating threaded fasteners elements 33 fixed along the individual structural elements 34 of a substantially rectangular paral-

lelepipid skeleton frame 35. The detailed construction of the fastener elements 32 and of the frame 35, as well as an alternate construction thereof, will be more fully described hereinbelow.

A plurality of threaded sleeves 36 (see FIG. 12) are welded in openings in the walls 23 of each of the structural members 21, at spaced intervals therealong, with sleeves 36 having an outwardly directed open end 37 positioned to receive a threaded bolt 38 to releasably secure a wooden rub board 39 on the surface of the panels. As indicated in FIGS. 1 and 3, the rub boards 39 overlie the fasteners 32 to thereby act as a deterrent against pilferage and to provide protection for the sides of the crate during handling. When desired, the rub boards 39 may be omitted from the bottom panel, and replaced by heavy skid boards 40 having longitudinally spaced notches 41 formed therein, with an inverted metal channel 42 secured in the notches to provide means for lifting the container with a conventional fork lift truck. Also, if desired, the rub boards may be omitted from the top panel where damage to the top of the crate during transit or handling appears unlikely, although the omission of the rub boards on any panel greatly reduces the effectiveness of the rub boards as a deterrent against pilferage.

Each of the end panels 11, 12, and the side panels 13, 14, are provided with a pair of lifting handles 43 rigidly welded within recesses 44 in the outer cover sheet 29. Handle 43 is in the shape of an elongated round bar having its central portion deformed outwardly, with the opposing ends extending through the end walls 45, 46, to be rigidly welded one to the web 24 of the adjacent structural member 21 and the other to a rib 30 within the panel. The recess 44 is defined by continuously welded metal sheet structure welded to the outer cover sheet 29 and having the end walls 45, 46 welded to the handle 43 to lend support to the handle while maintaining the water tight integrity of the panel.

A special tool and document compartment 48 is formed in the side panel 13, and comprises a generally rectangular, shallow pan-shaped metal container 49 having a bottom wall 50 supported by substantially perpendicular sidewalls 51 which terminate in an outwardly directed flange 52 securely welded to the cover sheet 29 adjacent the periphery of a rectangular opening 53 therein. A thin metal plate closure, or door 54 is pivotally mounted, as by hinge 55, to the upper wall 51 of the compartment 49 to cover the compartment. A spring clip 57 carried on the inner surface of door 54 resiliently engages a detent member 58 mounted on the bottom wall 50 of the pan-shaped container to releasably retain the door in the closed position. A shallow, dish-shaped depression 59 is formed in the closure panel adjacent the bottom edge thereof, and an elongated slot 60 is formed in the depression in position to fit over an elongated post 61 rigidly welded to the bottom panel 50. A second post member 62 is rigidly welded to the closure 54 within depression 59 and projects outwardly therefrom in substantially parallel space relation to the post 61. An opening 63 is formed in post 61, and a similar opening 64 is formed in post 62 to receive a conventional wire seal, not shown, with the seal being protected against accidental breakage within the depression 59. A spring clip 65 is mounted on the bottom wall 50 to releasably retain a socket wrench or opening tool 66 for removing or installing bolts 38 or fasteners 32.

Wrench 66 comprises an elongated tubular body 67 having a thin-walled female socket 68 at one end and an enlarging coupling block 69 rigidly welded to its other end. Coupling 69 has a transverse slot 70 formed therein and an elongated, rod-shaped handle 71 having a longitudinally extending slot 72 formed therein is pivotally supported on a pin 73 mounted in the coupling and extending transversely to the slot 70. As can be seen from FIG. 4, the handle 71 may be stored in telescoping relation within the tubular body 67 or extended and pivoted about pin 73 within slot 70 to act as a handle for applying torque through the socket 68 to a headed fastener.

The individual structural elements 34 of the rigid, skeleton frame 35, illustrated in FIGS. 2, 3, 8 and 15, are each of

similar construction and accordingly only one will be described in detail, with identical reference numerals being employed to indicate corresponding parts of the several elements. Preferably, the structural elements 34 are tubular extrusions of rectangular cross section, with the four sidewalls being oriented parallel to four wall panels of the container. The outwardly directed sidewalls, 80, 81, each have rigidly fixed thereon a row of threaded fastener elements in the form of studs 33, with the respective studs projecting perpendicularly from its supporting walls. The inwardly directed walls 82, 83, respectively, are reinforced by elongated metal bars 84, 85, positioned within the tubular extrusions rigidly welded thereto around the periphery of elongated slots formed in the respective walls 82, 83, as indicated at 86. A longitudinally extending row of spaced apertures 87 are formed in each of the walls 82, 83, and the respective associated reinforcing bars 84, 85. Thus, with the structural elements 34 being rigidly joined in perpendicular arrangement at the corners of the crate, the six open sides of the skeleton frame each have a row of openings 87 extending around their inner periphery and a substantially rectangular array of studs 33 projecting outwardly therefrom adjacent the outer periphery thereof.

The openings 87 provide support for adjustable loading bars 90 which may be positioned between parallel structural elements 34 along any side panel of the container. As best seen in FIGS. 2 and 13-15, the loading bars 90 each comprise a first elongated substantially rectangular tubular body 91 having one end closed by a metallic plug 92 rigidly welded therein and a disc 93 welded therein in spaced relation to the other end thereof. A tubular sleeve 94 telescopically receives and is rigidly secured to the end of tubular body 91 opposite the plug 92. A second rectangular tubular body 95, similar to body 91, has one end closed by a metallic plug 96 rigidly welded therein, and a metal plate 97 welded therein in spaced relation to its other end. The tubular body 95 is telescopically received within the open end of sleeve 94, with the metal disc 93 and 97 opposing one another and with a coil spring 98 compressed therebetween. Tubular body 95 is retained in telescoping relation within the sleeve 94 by a pin 99 supported by and extending transversely through the sleeve 94, with the pin extending through the elongated slots 100 in the sleeve 95 to permit limited telescoping movement of the tubular body 95 within the sleeve 100 in opposition to the face of the coil spring 98. The metal plugs 92 and 96 each have a pair of axially extending pins 101 projecting outwardly therefrom in position to be received in adjacent openings 87 within the structural members 34.

The loading bars 90 are installed within the container by placing one pair of the pins 101 in the desired position in one of the structural members 34, then compressing the spring 98 and inserting the other pair of pins 101 in the corresponding pair of openings 87 in the opposing row of openings to releasably retain the loading bar in closely spaced relation to the adjacent wall panel of the container. As indicated in FIG. 15, the tubular bodies 91 and 95 also have a plurality of spaced openings 102 formed in one sidewall thereof in position to receive the supporting pins 101 of a similar loading bar. Thus, three or more loading bars may be used in conjunction with one another to cooperatively provide a supporting platform, or bracing for articles packaged within the shipping container.

Referring now to FIGS. 8 and 9, it is seen that the fasteners 32 each comprise a sleeve 108 having its inner or outer ends 109, 110 welded to the web 22, 23, respectively. Sleeve 108 has a longitudinal bore extending completely therethrough and a counterbore extending therein from the end 110 thereof to define a radial shoulder 111. A cylindrical shaft, or captive nut 112, having a radially extending annular collar 113 integrally formed on its outer surfaces is rotatably mounted within the sleeve 108, with the lower radial face 114 of the collar overlying the shoulder 111 to prevent movement of the shaft completely through the sleeve. An annular ring 115, having an inner diameter substantially equal to the diameter of

shaft 112 and an outer diameter substantially equal to the diameter of the counterbore of sleeve 108, is positioned within the counterbore and retained therein by a pair of pins 116. Ring 115 is spaced axially along sleeve 108 from the shoulder 111 a distance sufficient to permit substantial axial relative movement of the shaft 112 within the sleeve 108 while retaining the shaft against complete removal therefrom.

The shaft 112 has a threaded bore 117 formed therein, from the end 118, thereof, with a smooth walled counterbore 119 extending from the other end to define a radial shoulder 120 in predetermined, spaced relation to the end 118. A square head 124 is formed on the outer surface of shaft 117, adjacent end 118, to receive the square socket 68 of wrench 66.

The studs 33 each have a cylindrical body portion 121 of a diameter substantially equal to the diameter of counterbore 119, and a smaller diameter threaded segment 122 adjacent its free end, with the threads thereon adapted to be received within the threaded bore 117. A radial shoulder 123 is formed at the junction between body portion 121 and threaded portion 122, with shoulder 123 being adapted to engage shoulder 122 to limit the extent to which shaft 112 may be threaded onto the stud 33 and thereby limit the compression force applied to the sealing gasket. The spacing between the collar 113 and the ring 115 is sufficient to permit shaft 112 to be completely threaded onto or off of the stud 33 without movement of the associated wall panel. Thus, although a large number of fasteners 32 and studs 33 are employed to secure a single wall panel onto the frame 35, the individual fasteners may be completely secured or loosened individually.

A combination resilient bumper and sealing gasket element 130 provides a hermetic seal for the joint between the respective wall panels and the skeleton frame, and simultaneously provides a resilient shock-absorbing bumper for the peripheral edges of the container. The bumper-gasket element 130 is a unitary structure assembled from a plurality of elongated, extruded legs 131 extending one along each of the structural elements 34 of frame 35, with the respective legs 131 being joined in right angled relation at the corners of the crate by a molded corner element 132. The respective bumper-gasket legs 131 comprise a pair of identical flanges 133 disposed at right angles with respect to one another and are adapted to overlie the walls 80, 81, of the respective structural elements 34. A plurality of openings 134 are formed in the flanges 133 in position to fit over and surround each of the studs 33 as indicated in FIG. 8, or to receive the threaded shaft of the fastener illustrated in FIG. 16. The respective flanges 133 have their contiguous edges joined to an enlarged bumper, or body portion 135 by a relatively thin, flexible web 136. The webs 136 are separated by a narrow slot 137 extending into body 135 and terminates in an enlarged hollow core 138 to permit the flanges 134 to be manually separated sufficiently to install the openings 134 over the studs 33.

The body or bumper portion 135 has the approximate cross-sectional shape of a quarter of a circle, with the outer, rounded surface 139 presenting a smooth rounded edge for the container projecting outwardly slightly past the outer surface of the adjacent panels. The adjoining faces 140, 141, are inclined toward one another at a slightly acute angle substantially corresponding to the angle between webs 25 of adjacent wall panels of the container. As can be seen from FIG. 8, when the wall panels are mounted on the frame to clamp the webs 133 between the inner face of the panels and the structural elements 34 of frame 35, the body 135 will be cammed outwardly slightly and firmly supported by the abutting webs 25 to provide an effective, resilient bumper for the edges of the container. This camming action also assists in forming and maintaining a seal for the container.

As illustrated in FIGS. 10 and 11, the molded corner segment 132 of the bumper-gasket assembly comprises an integrally molded joint structure for joining three of the elongated bumper-gasket legs 131 in right-angled relation to form a continuous water tight seal around the corner of each of the adjacent panels and to form a continuous resilient bumper

around the corner of the container. Thus, the molded corner segment 132 comprises three right-angle-shaped flange elements 143 adapted to be permanently bonded to and form a continuation of adjacent flange elements 133. To this end, the right-angled flange elements 143 each include a pair of relatively thin extensions 153 adapted to underlie a portion of the adjacent flange 133 to reinforce the bonded joints therebetween. Openings 144 formed in the webs 143 and 153 are adapted to overlie studs adjacent the corner of the container. The flanges 143 are joined by webs 146 to the bumper body portion 145 which is adapted to be permanently bonded along the beveled end 149 to the end of adjacent bumper body portions 135. Webs 146 are separated by a narrow space 147 extending into body 145 and terminating in an enlarged opening or cam 148. Thus, a unitary bonded bumper-gasket assembly is provided to form a hermetic seal around each of the wall panels of the container and a continuous resilient bumper around all edges and corners of the assembled container.

Referring now to FIG. 16 of the drawings, an alternate embodiment of the invention will be described in detail. In this alternate embodiment, the individual elongated structural members 234 of the rigid skeleton frame 235 are rectangular tubular members, and each are reinforced by an elongated, rigid bar 236 supported coaxially therein. The bar 236 is preferably an extruded metal member having a generally X-shaped cross section, with its four legs 237, 238, 239, and 240 being perpendicular to one another and dimensioned to fit snugly within structural member 234. The sidewalls of the rectangular tubular structural member 234 are secured to the reinforcing bar 236 at spaced intervals along the length thereof by welding around the inner periphery of openings 241. A longitudinally extending row of spaced apertures 287 are formed in each of the walls 282, 283 of structural member 234, with the apertures 287 extending into the legs 237 and 238 of bar 236. The apertures 287 are positioned to receive the pins 101 of loading bars 90 as previously described hereinabove.

To support the container wall panels on the frame 235, the outwardly directed walls 280, 281 and the associated legs 239, 240, each have a row of threaded fasteners, or bores 233 formed therein, with the axis of the bores 233 extending perpendicular to the associated sidewall of the structural member. The bores 233 terminate within the extruded bar 236 at a predetermined depth to limit the clamping force which may be applied to the bumper gasket, as will be more fully explained hereinbelow. Thus, as in the previously described embodiment, with the structural elements 234 rigidly joined in perpendicular arrangement at the corners of the crate, the six open sides of the skeleton frame each have a row of openings 287 extending around their inner periphery and a substantially rectangular array of threaded fasteners in the form of bores 233 projecting inwardly therefrom adjacent the outer periphery thereof.

To secure the wall panels onto the frame 235, fasteners elements 232 are rigidly supported, as by welding, in apertures in the frame 21 at spaced intervals therearound, with the fastener elements being positioned to be axially aligned with the threaded bores 233 when the wall panels are mounted on the skeleton frame. The fasteners 232 each comprise a sleeve 208 having its inner and outer ends 209, 210, welded to the webs 22, 23, respectively. Sleeve 208 has a longitudinal bore extending completely therethrough, with a counterbore extending therein from the end 210 thereof to define a radial shoulder 211. A cylindrical shaft, or captive bolt 212 having a radially extending annular collar 213 integrally formed on its outer surface is rotatably mounted within the sleeve 208, with the outer radial face 214 of the collar underlying the shoulder 211 to prevent movement of the shaft completely through the sleeve. An annular ring 215 having an inner diameter substantially equal to the diameter of shaft 212 and an outer diameter substantially equal to the diameter of the counterbore in sleeve 208, is positioned within the counterbore and retained therein by a pair of pins 216. Ring 215 is spaced axially along sleeve 208 from the shoulder 211 a distance sufficient to per-

mit substantial axial relative movement of the shaft 212 within sleeve 208 while retaining the shaft against complete removal therefrom. A coil spring 217 is positioned between ring 215 and the inner radial face 218 of annular collar 213 to resiliently urge the shaft 212 outwardly toward wall 23 to normally seat face 214 on shoulder 211. In this normal position, shaft 212 is almost wholly stored within the sleeve 208.

The shaft 212 has a threaded end portion 219 adapted to project outwardly from sleeve 208 upon compression of coil spring 217 and be received within the threaded bore 233. A square head 220 is formed on the outer end of the shaft 212 opposite the end 219, to receive the square socket 68 of wrench 66.

By providing a fixed, predetermined depth of the bores 233, a positive stop is provided to limit the threaded engagement between the threaded bore 233 and the threaded end 219 of shaft 212. Thus, the extent to which the coil spring 217 is compressed, and therefore the compressive force applied to the flanges 133 of the resilient bumper gasket is limited. The extent of this threaded engagement and the possible axial movement of shaft 212 within sleeve 208 is such that the individual fasteners may be completely secured or loosened independently of the other fastener elements.

While the resilient bumper-gasket 131 described hereinabove may be employed with the embodiment of the invention illustrated in FIG. 16, it is not necessary that the openings 134, 144, in the gasket legs be elongated in the manner illustrated in FIG. 10, as the gasket legs do not have to be spread apart to fit over the studs in this embodiment. Similarly, if desired, the narrow slot 137 and hollow core 138 may be eliminated from the bumper-gasket employed with this embodiment of the invention.

From the above detailed description, it can be appreciated that the shipping container according to this invention is truly universal in that it can be employed in any orientation for the shipment of articles such as household furniture, electronic equipment, machinery, or even bulk material. When employed to package and ship heavy or fragile articles which must be carefully positioned and secured within the container, the construction of the container greatly facilitates the packaging procedure. For example, to package an article such as a large piece of electronic equipment, the combination bumper-gasket is positioned on the skeleton frame and the wall panel which is to be employed as the bottom panel of the crate is then mounted on the frame and tightened in position by the special wrench 66 to firmly clamp the flange portion of the bumper-gasket between the panel and the frame. Any necessary base supports, platforms, or the like, required to support the equipment are then positioned on the bottom structural elements 34 of the frame 35, and the equipment is then positioned within the skeleton frame through any of the open walls, using loading bars 90 as necessary to brace or support the article or articles packaged. Thus, heavy loads may be supported by the rigid frame structure so that concentrated loads are not applied to the wall panels.

Loading bars 90 may also be employed to support movable shelves or platforms within the container when it is desired to separate articles into layers within the container. Once the articles are positioned and adequately secured within the skeleton frame, the remaining wall panels may be secured on the frame to completely hermetically seal the articles within the container. If desired, of course, one or more of the side panels and/or the top panel may be secured in place before the container is filled, with the advantage of leaving the panels off being to provide access for securing and bracing articles from all sides of the container. Conversely, any number of wall panels may be removed to facilitate unloading of the container.

After the side and top wall panels are firmly mounted on the skeleton frame, wooden rub boards 39 are mounted around the peripheral edges of the respective panels, again employing the special wrench 66 to tighten the bolts 38, with the rub boards covering the threaded fasteners to further secure the

container against pilferage. The rub boards extending around the periphery of the wall panels, in combination with the resilient bumper projecting outwardly from the contiguous edges of the wall panels, effectively protect the container against damage during handling or shipping. If skid boards are to be employed, they are, of course, installed before the container is filled. Once the rub boards are secured in position, the special wrench 66, along with any shipping documents, or the like, are placed in the document compartment 48 and sealed with a suitable wire seal.

While containers according to the present invention may be produced in any desired size, the invention is particularly well adapted for intermediate size containers, a plurality of which may be packaged in conventional highway truck bodies or in containers of the type presently in use in the shipment of "containerized freight." The external configuration of the container, which includes no outwardly projecting handles, fasteners, or the like, to interfere with stacking of the containers, enables a plurality of the containers to be stacked closely together without the likelihood of damage to one another during shipment. At the same time, the containers may be used individually, as in small air shipments or the like, with the recessed lifting handles providing convenient means for securing the container against movement in transit.

While I have disclosed preferred embodiments of my invention, I wish it understood that I do not intend to be restricted solely thereto, but that I do intend to include all embodiments thereof which would be apparent to one skilled in the art and which come within the spirit and scope of my invention.

I claim:

1. A universal high-strength material handling and shipping container comprising six rigid wall panels supported in substantially rectangular parallelepiped configuration by a rigid metal frame, said frame including an elongated structural member extending along each of the dihedral angles defined by said wall panels within the container, said elongated structural members being rigidly joined only at the corners of said container to define a universal skeleton frame contained wholly within the container and capable of supporting the container when oriented to position any of said wall panels to act as the bottom wall of said container, a plurality of threaded fasteners on each of said structural members at spaced intervals along the length thereof, said threaded fasteners on each said structural member being arranged in two longitudinal rows with the fasteners in one of said rows having their longitudinal axes extending substantially perpendicular to one adjacent wall and the fasteners of the other of said rows having their longitudinal axes extending substantially perpendicular to the other adjacent wall of the container, said rows of fasteners cooperating to define six substantially rectangular arrays of fasteners on said frame one adjacent the periphery of each wall panel of the container, cooperating threaded members for threadably engaging said fasteners to retain said panels on said frame, said threaded fasteners and said cooperating threaded members being capable of transferring loads in a direction perpendicular to their longitudinal axes to transfer bending loads from said structural members to said panels within the plane of the panels, said panels being removable individually to permit said container to be loaded and unloaded from any side thereof, and mounting means on at least selected ones of said elongated structural members of said frame for mounting load supporting members extending between two said structural members to support articles within said container on said structural members, said mounting means being independent of and spaced inwardly from said wall panels.

2. The container defined in claim 1 wherein said wall panels each comprise a rectangular peripheral frame defined by four elongated structural members rigidly welded together at the corners of the panel, an inner and an outer cover sheet welded around their periphery to said rectangular frame, and a plurality of openings formed in and extending through said rectangular frame at spaced intervals therearound, said

cooperating threaded members being mounted within said openings.

3. The container defined in claim 1 wherein said threaded fasteners comprise a plurality of threaded bores formed in said structural members at spaced intervals along the length thereof, and said cooperating threaded members comprise bolt means rotatably supported within openings in said wall panels at spaced intervals therearound in position for said bolt means to threadably engage said threaded bores.

4. The container defined in claim 2 further comprising rub board mounting means rigidly supported at spaced intervals around the outer surface of said rectangular frame, and elongated wooden rub boards removably supported on said rub board mounting means on at least selected ones of said panels, said rub boards overlying and concealing said fastener means and providing protection for said container against damage during handling.

5. The container defined in claim 4 further comprising skid boards mounted on the bottom panel of said container, said skid boards being secured to said panel through said rub board mounting means.

6. The container defined in claim 1 further comprising resilient bumper means supported between and projecting outwardly from the contiguous edges of said wall panels in position to receive and absorb impact loads applied at the edges of said container.

7. The container defined in claim 6 further comprising gasket means positioned between said structural members and said wall panels, said gasket means including a pair of elongated flanges of resilient material disposed in substantially right-angled relation to one another and integrally joined along one edge thereof to said bumper means.

8. The container defined in claim 1 wherein said mounting means comprises a plurality of openings formed in each of said structural members along an inner surface thereof whereby said load supporting members may be releasably supported adjacent and parallel to any of said wall panels.

9. In a material-handling container having at least two adjacent walls secured in angled relation adjacent their contiguous edges to an elongated structural member extending along said contiguous edges within said container, the improvement comprising sealing gasket means extending along the structural member and engaging the inner surface of said walls adjacent said contiguous edges to form a seal therewith, said gasket means including a pair of elongated flanges of resilient material disposed in substantially right-angled relation to one another when installed, and resilient bumper means integrally formed with said gasket means along one edge of each said flange, said bumper means being supported between said contiguous edges and projecting outwardly therefrom in position to receive and absorb impact loads applied at the edge of the container.

10. The material-handling container as defined in claim 9 wherein said bumper means has a generally triangular cross section with two faces thereof being disposed in substantially right-angled relation to one another in position to engage the peripheral edges of said adjacent wall panels, and the third face being outwardly convex to provide a smooth rounded corner for said container.

11. In a material-handling container as defined in claim 9 the further improvement wherein said container is of substantially rectangular parallelepiped configuration with the adjacent walls thereof being joined adjacent their respective contiguous edges to an elongated structural member extending therealong within said container, said sealing gasket means extending along each of said structural members and said resilient bumper means supported between and projecting

outwardly from adjacent contiguous edges of said walls along each edge of said container.

12. A universal, high-strength material-handling and shipping container of substantially rectangular parallelepiped configuration, said container comprising, in combination, six generally rectangular panels removably supported one on each side of a rigid welded metal frame to define the sides of the container, said frame including an elongated structural member extending adjacent each interior edge of said container with adjacent structural members being rigidly joined in right-angled relationship at the interior corners of the container, and a removable one-piece sealing gasket formed of a resilient, flexible material positioned on said frame and extending along each of said structural members to provide a seal along the periphery of each of said side panels.

13. The material-handling container as defined in claim 12 further comprising resilient bumper means on said sealing gasket and projecting outwardly therefrom between contiguous edges of adjacent panels to absorb impact loads applied along the edges of said crate.

14. In a material-handling container as defined in claim 13 the further improvement wherein said bumper means and said sealing gasket are formed as a unitary structure.

15. A universal high-strength material-handling and shipping container comprising wall panels removably supported in substantially rectangular parallelepiped configuration by a metal frame confined within the container enclosure, said frame including an elongated structural member extending along each of the dihedral angles defined by said wall panels, said structural members having their ends rigidly joined to define a universal skeleton frame, threaded captive fastener means mounting said wall panels on said frame, said fastener means connecting each said peripheral edge portion of each said wall panel to one of said structural members at spaced intervals therealong, whereby said structural members are reinforced against bending loads applied from within the container by two wall panels secured thereto at right angles to one another, and resilient molding means defining the peripheral edges of said container, said molding means including an elongated member extending along each said peripheral edge and having integrally molded thereon a pair of flanges disposed in substantially right-angled relation to one another and providing an interface between adjacent edges of said wall panels and said skeleton frame.

16. The container defined in claim 15 further comprising means on said internal skeleton frame for supporting telescoping loading bars extending between opposing structural members, said mounting means permitting small incremental adjustment of the position of the loading bars to compartmentize the container interior to any desired cubage and to provide support for articles within the container.

17. The container defined in claim 16 wherein said mounting means comprises a plurality of openings formed in the inner surface of each said structural member, said openings being positioned inward from the inner surface of said wall panels to provide mounting and securement of the bars independently of said wall panels.

18. The container defined in claim 17 wherein said wall panels each comprises inner and outer cover sheets providing smooth substantially continuous surfaces spaced apart by a peripheral frame to form a void between said inner and outer cover sheets for the containment of thermal insulating material, said frame being contoured to abut said container edge molding to prohibit direct contact of the wall panel outer surface with the container internal frame members to provide an enclosure possessing maximum resistance to thermal change.