Nov. 25, 1941. O. C. FERGUSON 2,264,264

SHIPPING CONTAINER

Filed March 30, 1940 3 Sheets-Sheet 1

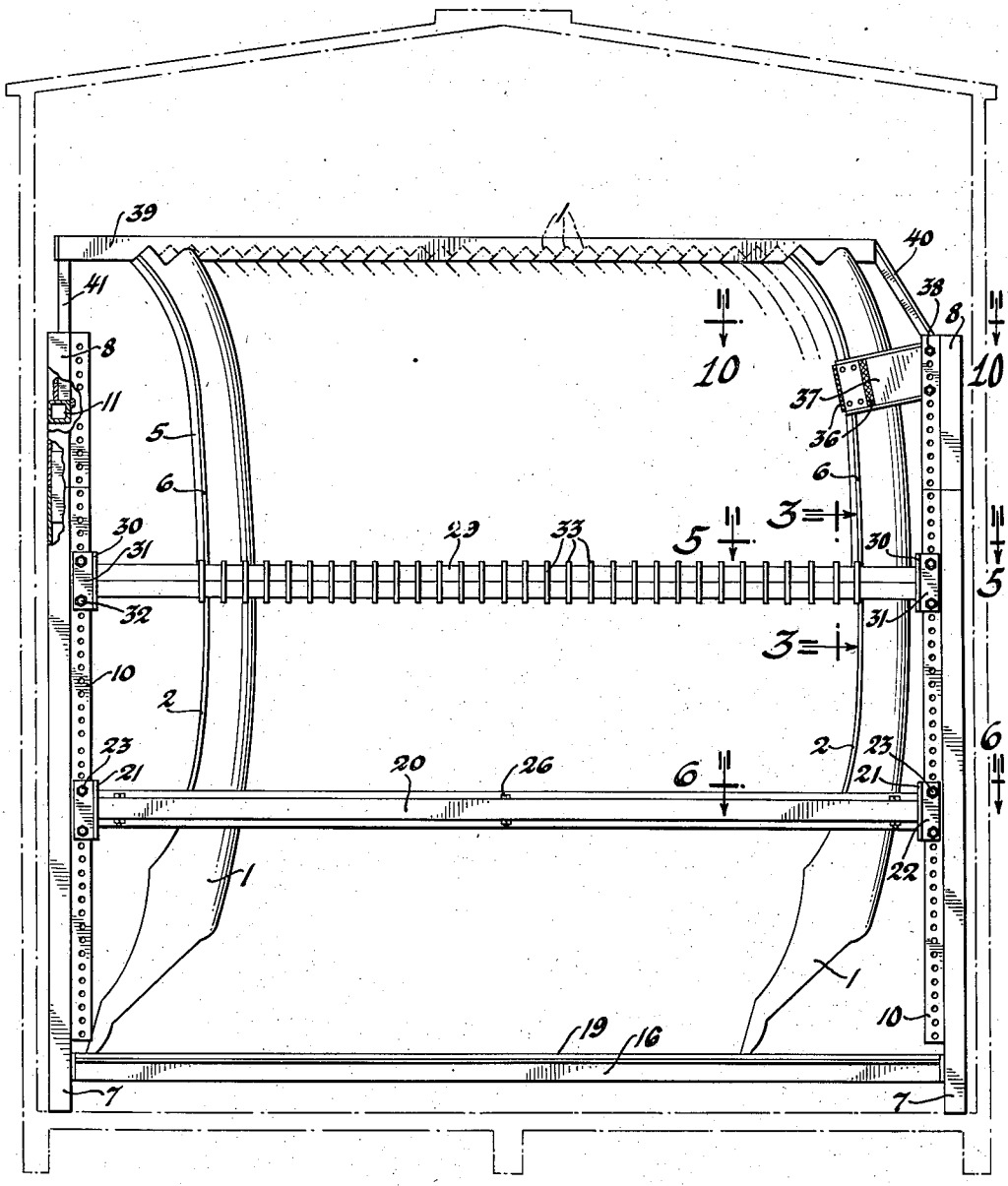


Fig. 1

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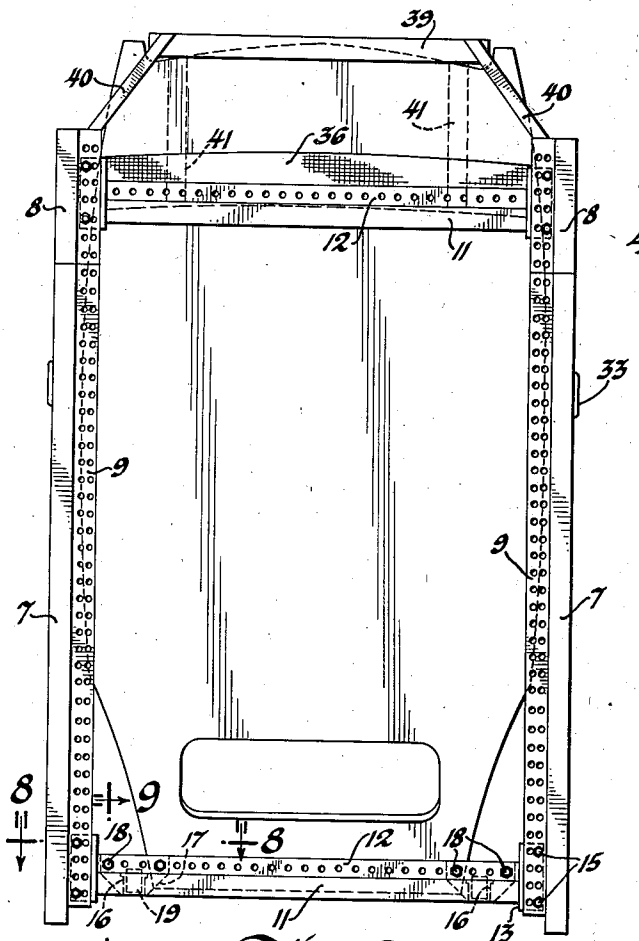


Fig. 2

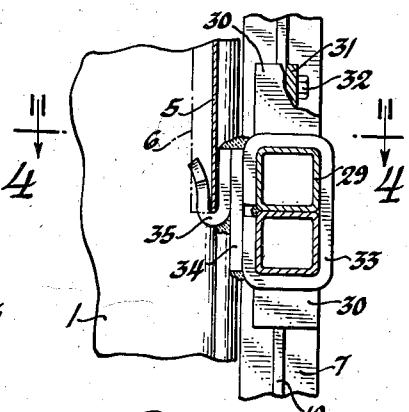


Fig. 3

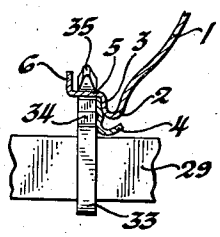


Fig. 4

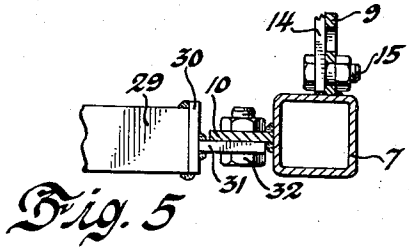


Fig. 5

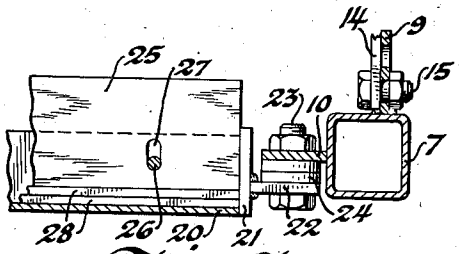


Fig. 7

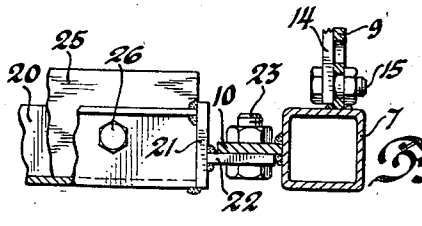


Fig. 6

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SHIPPING CONTAINER

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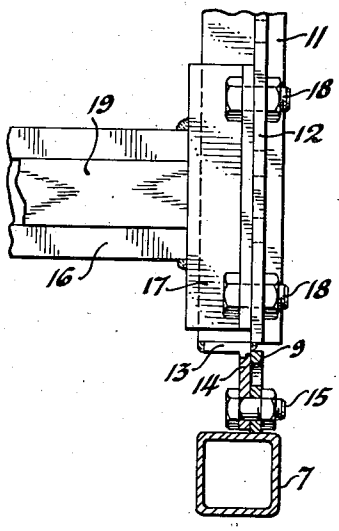


Fig. 8

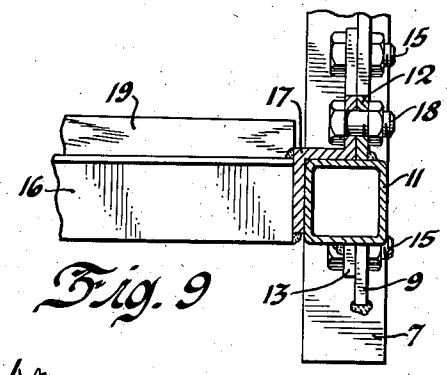


Fig. 9

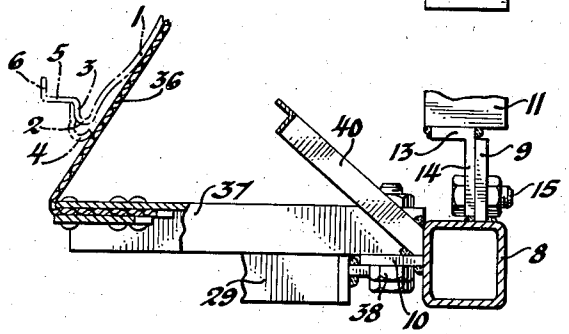


Fig. 10

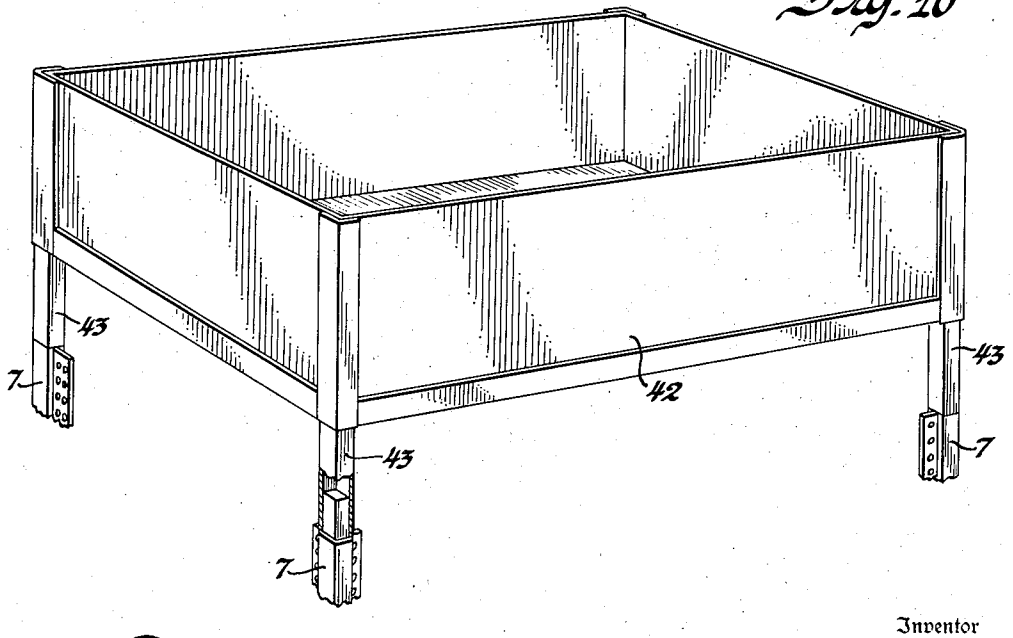


Fig. 11

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Patented Nov. 25, 1941

2,264,264

UNITED STATES PATENT OFFICE

2,264,264

SHIPPING CONTAINER

Otto C. Ferguson, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Application March 30, 1940, Serial No. 326,838

11 Claims. (Cl. 211—13)

This invention has to do with the handling, storage and transportation of parts, and its primary object is to provide an improved container which is adjustable in size to fit different loads. The container has been devised for use especially in the manufacture of automobile bodies where the practice is to form stamped body panels in press shops removed from the final assembly plants. Instead of handling each formed panel individually in storage and transit, cost and space can be saved with less likelihood of injury, if a group of panels is handled as a unit within a suitable container, the size of which is dependent upon practical considerations of weight and limitations of freight car loading space. The group of panels can remain in the container from the time the panels are taken out of the press until they are joined with other panels at final assembly.

Containers of fixed dimension having their component parts welded together can be used for panels of standard size, but since the size of the parts are changed from time to time, as for example with yearly model revisions, fixed dimension containers soon become obsolete. On the other hand, a container having its structural parts detachably joined together with provision for adjustment of size to fit the panels, can be used indefinitely and for various types of panels, and furthermore, can be returned to the press shop knocked down so as to save storage space and transportation costs. It was with these things in mind that the structure forming the present subject matter was developed.

A detail explanation will be given with reference to the accompanying drawings, wherein Figure 1 is a side elevation showing a container fitted within a freight car and loaded with body roof panels; Figure 2 is an end elevation of a loaded container; Figure 3 is a section taken on line 3—3 of Figure 1; Figure 4 is a detail view looking in the direction of the arrows on line 4—4 of Figure 3; Figures 5 and 6 are detailed sectional views taken on lines 5—5 and 6—6, respectively, of Figure 1; Figure 7 is a view similar to Figure 6 but illustrating the addition of spacer shims for regulating transverse dimension of the container side members; Figures 8 and 9 are sectional views taken, respectively, on lines 8—8 and 9—9 of Figure 2; Figure 10 is a view looking in the direction of the arrows on line 10—10 of Figure 1 and Figure 11 is a perspective view showing a supplementary loading tray which may be superposed upon the container.

As before indicated the container is intended to be used for loading various types and sizes of panels and for the sake of illustration the drawings show only a roof panel suitable for a two door sedan or coach body. As at present constructed metal roofs formed from a single sheet of metal extend from the front windshield pillars to the top of the luggage compartment in the rear wall of the body. As illustrated in the drawings, the roof panel 1 is arched both longitudinally and transversely and along each side edge is provided with a bead 2 having an inturned flange 3. Welded to the underside of the flange 3 is a drip trough 4 which extends from the front of the roof panel to a point just beyond the region overlying the rearmost side window of the body. At the door opening and beyond the flange 3 is a dependent extension 5 which terminates in an inturned flange 6 and provides a ledge against which the top of the door closes. Advantage is taken of the door ledge for suspending the roof panel in the crate since this is a part which is least likely to suffer serious injury by reason of the load transmitted therethrough.

The adjustable container in which a number of such roof panels are to be loaded consists essentially of vertical corner posts and suitable longitudinal and transverse tie bars interconnecting the posts and detachably and adjustably connected thereto. Each vertical corner post is preferably formed in two or more sections nested together, the post shown in the drawing consisting of a lower or primary section 7 and an upper or supplementary section 8. Each section for convenience is formed of a square section tube on adjacent angularly related faces of which are welded lateral flanges 9 and 10 extending in the direction of the post. The flange 9 is provided with two rows of vertically spaced bolt receiving openings while flange 10 is shown as having a single row of vertically spaced bolt receiving openings. Extending transversely between the posts at each end of the container assembly are a pair of vertically spaced tie bars 11 which are identical in structure and interchangeable with each other. These end members 11 are also illustrated as being formed of square section tubing and each has welded on its upper face an upstanding flange 12 containing a series of transversely spaced perforations or bolt openings. Welded on each end of the tube 11 is a vertical plate 13 from which projects an outwardly extending flange 14 having a pair of vertically spaced bolt receiving openings which are adapted

to be brought into alignment with selected openings in the post flange 9. Fastening bolts 15 passing through the aligned openings detachably secure the parts together and by proper selection and alignment of the bolt openings in the cooperating overlapping parts, both vertical and transverse relative adjustments can be effected between the transverse tie members and vertical corner posts.

In addition to the longitudinal tie bars or side members connecting the corner posts and previously referred to, it is proposed to employ a set of longitudinally extending rails at the bottom of the container and for convenience these may be detachably connected to the lowermost set of cross members 11 at the ends of the container. These lower longitudinal rails as shown at 16 are of channel section with the channels opening upwardly and each rail has welded to each of its ends a Z-sectioned mounting plate 17 (see Figure 9), the horizontal shelf of which rests on the upper face of an adjacent end member 11 with fastening bolts 18 extending through aligned openings in the vertical flange of the plate 17 and flange 12. These transversely spaced longitudinal lower rails 16 are spaced above the floor as best seen in Figure 1 and permit the insertion thereunder of the elevating platform of a lift truck or dolly for carrying the crates into and out of the freight car or to and from storage locations. They can also be used as load carrying members for certain types of panels, as for example the body floor panel, in which case a wooden runner 19 is inserted in the open channel to provide a bearing support. If desired the wooden bearing may have a series of spaced transverse notches cut in the upper surface thereof to provide sockets for the reception of the lower edges of the panels to be placed thereon.

The longitudinal tie bars at each side of the container also consist of a pair of rails spaced apart vertically. The lower rail 20 of each set of side members is an inwardly opening channel having welded at each end a mounting plate 21 from which projects outwardly an attachment flange 22 having a pair of vertically spaced bolt openings for alignment with selected openings in the post flange 10 with bolts 23 passing through the aligned openings for detachably connecting the parts. By proper selection of bolt openings in the post flange 10, the side rail 20 may be mounted at the desired vertical height. It may also be spaced transversely from its companion rail 20 in the opposite side of the container, to various distances by placing the flange 22 on either the inside or the outside of the flange 10 and by the additional use in either event, of one or more spacer shims 24 as shown for example in Figure 7. Whatever the spacing required by reason of the width of the panel to be loaded in the container, the rails 20 in addition to tying the corner post together also serve as retainers for the loaded panels against sidewise shifting. To avoid metal to metal contact between the metal rail and the metal panels a wooden filler strip 25 is inserted within the inwardly opening channel of each rail and is held in place by a series of fastening bolts 26. A still further adjustment for width can be obtained by enabling the filler block 25 to be located at different distances within the channel. Accordingly in Figure 7 the filler block 25 is shown with an elongated opening 27 to receive the anchor pin 26 for allowing relative adjustment within the limits of the elongated hole. Instead of relying simply on frictional contact of the parts to maintain the filler rail 25 in projected position, one or more shim strips 28 may be interposed between the rail and the base of the channel 20. As will be apparent the various combinations mentioned will afford a wide range of transverse adjustment for the accommodation of different types of panels.

The uppermost of the side tie bars in the case of roof panels, constitute the load supporting members and accordingly, each bar for utmost strength is formed of a pair of square section tubes welded together into an integral rail indicated at 29. At opposite ends the rails 29 have mounting plates 30 welded thereto, each with a projecting flange 31 to be secured by bolts 32 to the post side flange 10. Here again the selection of proper bolt openings in the post flange 10 will enable the rail 29 to be set at a proper vertical height. Relative transverse adjustment may be afforded through the use of suitable spacer shims associated with the fastening bolts 32. For suspending the roof panels on the load carrying rails 29, each rail carries a series of hooks, shown in the drawings as being slidable lengthwise of the rail for the proper disposition of the succeeding panels in whatever spaced relation is called for. Each hook assembly is illustrated as including a closed loop 33 embracing the rail 29 with a spacer plate 34 and an upwardly opening and flaring hook member 35 welded thereto. Within the hook the lower edge of the door ledge 5 is inserted and with the flanges 3 and 6 lying on opposite sides of the hook a secure mounting connection is afforded. The spacing of the parts eliminates likelihood of the drip trough 4 being smashed by accidental sidewise displacement of the panel. The distribution of weight is such that there will be a tendency for the suspended roof panel to swing on its supporting hooks in a clockwise direction as viewed in Figure 1. Use is made of this tendency to stabilize the load and avoid possible injury, by the provision of a panel abutment near the upper end of the container in the form of a flexible strap 36 of fabric or the like, which extends across the container for engagement by the endmost panel in conformity to the shape of the roof surface and is attached at opposite ends to mounting brackets 37 secured to adjacent post flanges 10 by fastening bolts 38.

As a precaution against any of the roof panels bouncing out of the suspension hooks 35 during handling of the container a rectangular frame 39 is positioned above the loaded panels and is provided at one end with dependent legs 40 which may be bolted or otherwise secured to the corner posts and at its opposite end with dependent legs 41 illustrated as being fastened to an adjacent upper end member 11.

Where the parts to be loaded are of relatively short length, as for example roof panels for coupe bodies, the suspension bars 29 and uppermost end bars 11 will be located at a lower vertical height than that illustrated, as will also the abutment strap 36 and top retainer frame 39, in which event the upper post sections 8 may be dispensed with. In order to take full advantage of freight car space for pay load there may be employed a tray, such as that shown at 42 in Figure 11, for superposition above the panel container. The tray will have dependent feet 43 at each corner for nesting engagement with the upper end of the corner posts 7 and within the tray may be

positioned suitable crates for miscellaneous parts. The various tie bars referred to heretofore may be employed with corner posts of shorter vertical height in case the parts to be shipped are of relatively small size, as for example door panels, cowls or the like, and which would be loaded on edge upon the bottom bar 16. For handling in storage and shipment several of the loaded containers of small size may be superposed one on top of the other with the corner posts nested together.

I claim:

1. A collapsible and adjustable load container adjustable to accommodate various sizes of articles to be contained therein, comprising a series of side and end members arranged in rectangular relation, vertical corner posts, means detachably connecting the end members to the posts in selective vertical and transverse positions of adjustment and means detachably connecting the side members to the corner posts in selective vertical and transverse positions of adjustment.

2. A collapsible container adjustable in size to accommodate the articles placed therein, including side and end members, corner posts at least certain of which have transversely spaced rows of vertically spaced bolt openings therein, fastening bolts detachably connecting the end members to the posts and passing through selected post openings to determine the vertical position of the end members and the transverse spacing of the posts and fastening bolts connecting the side members to the posts and passing through certain of a group of vertically spaced openings to locate the side members in selected vertical positions.

3. In a load enclosing container of the character described, corner posts, side and end members extending between the corner posts and detachable connections between the posts and members, said connections being so constructed and arranged as to enable positioning of the several bars and the posts in preselected relations as determined by the size of the load to be enclosed.

4. In a knock-down container having corner posts, a pair of post connector bars at each end and at each side spaced apart in the direction of the corner posts and means detachably connecting the posts and bars and being constructed and arranged to enable positioning of the corner posts and connector bars in selected locations relative to one another both laterally and lengthwise of the posts.

5. In a container having side, end and corner members, means detachably connecting each corner member to adjacent side and end members and comprising fastening bolts passing through aligned openings in the connected members, at least one of the members having a set of spaced openings for the selective reception of fastening bolts in locating the members in relative positions of adjustment.

6. In an adjustable container having side, end and corner members detachably joined together, fastening bolts passing through aligned openings in adjacent overlapping portions of the end and corner members for detachably interconnecting the same, at least one of the overlapping portions having more than one bolt opening for selective alignment with a complementary opening in its mating portion.

7. In an adjustable container of the character described, a pair of spaced side members, end members connecting the side members, and means for varying the spacing of the side members including overlapping portions associated with the end members, a fastening bolt passing through aligned openings in said overlapping portions and one of said portions having a series of bolt receiving openings for selective alignment with the bolt openings in the other portion.

8. In an adjustable container of the character described, a series of spaced corner posts, each having a pair of angularly related attachment portions, one of said portions having a row of vertically spaced bolt openings for selective connection with a longitudinal tie bar and the other portion having two rows of vertically spaced bolt openings for selective connection with a transverse tie bar.

9. In an adjustable container of the character described, a series of spaced corner posts, each having a pair of angularly related attachment portions, one of said portions having a row of vertically spaced bolt openings for selective connection with a longitudinal tie bar and the other portion having two rows of vertically spaced bolt openings for selective connection with a transverse tie bar, and spacer shims associated with certain connections for varying the adjustment thereof.

10. In an adjustable container having corner posts and tie bars extending between adjacent corner posts, means detachably connecting the bars and posts at selective points to adjust bar and post location, a load engaging facing member for one of the bars and an adjustable fastening connection between the facing member and its carrying bar for adjusting the location of the load engaging facing member in a transverse direction relative to the length of its carrying bar.

11. In a container for loading a succession of vertically disposed panels, a pair of side bars having spaced suspension devices for individually suspending the respective panels on opposite sides and at points off balance and intermediate the top and bottom of the panels, a flexible strap extending across the container in the path in which an endmost panel tends to swing due to its off balance and affording a locating bearing to maintain such panel in upright vertical position and means connected to opposite ends of the strap for locating the same.

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