Oct. 1, 1968 E. P. BUCKO 3,403,777

CRATE FOR SHIPPING GLASS AND LIKE FRANGIBLE MATERIALS

Filed Feb. 9, 1967 2 Sheets-Sheet 1

Fig. 1

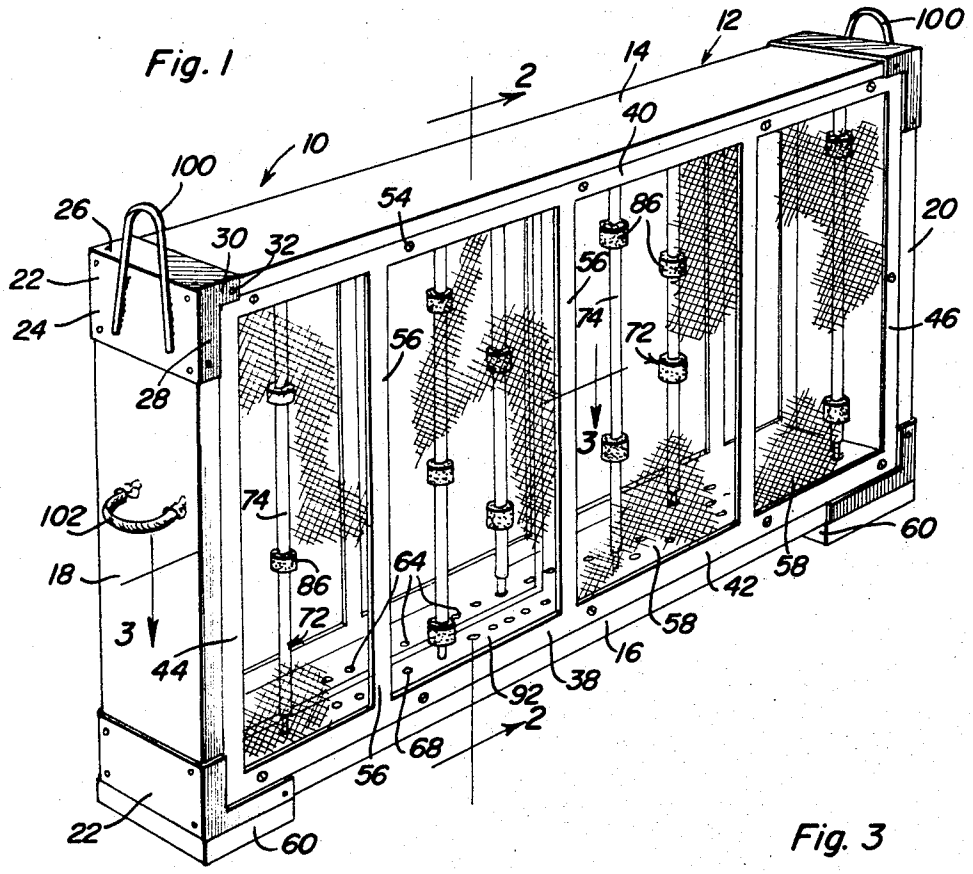


Fig. 3

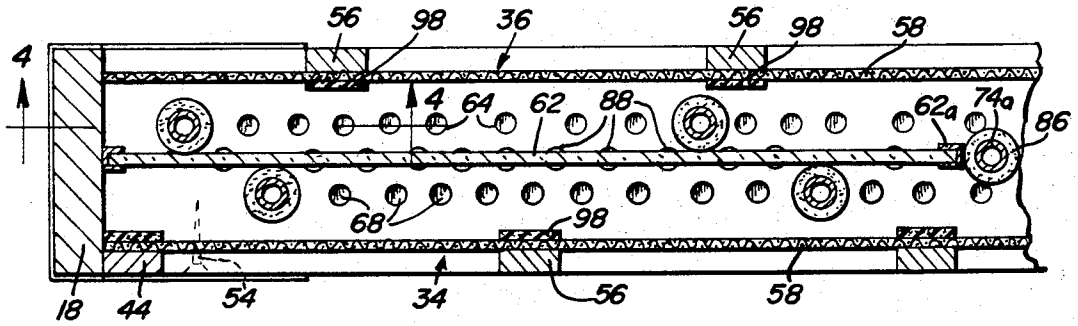
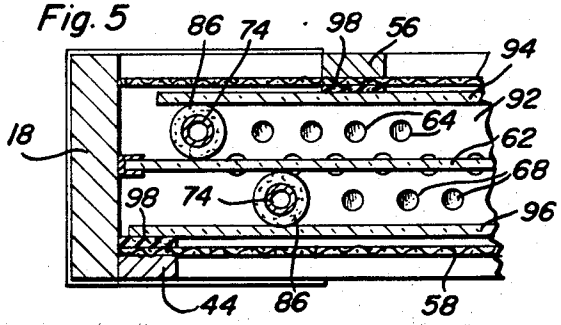


Fig. 5



Edward P. Bucko
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

Oct. 1, 1968 E. P. BUCKO 3,403,777

CRATE FOR SHIPPING GLASS AND LIKE FRANGIBLE MATERIALS

Filed Feb. 9, 1967 2 Sheets-Sheet 2

Fig. 2

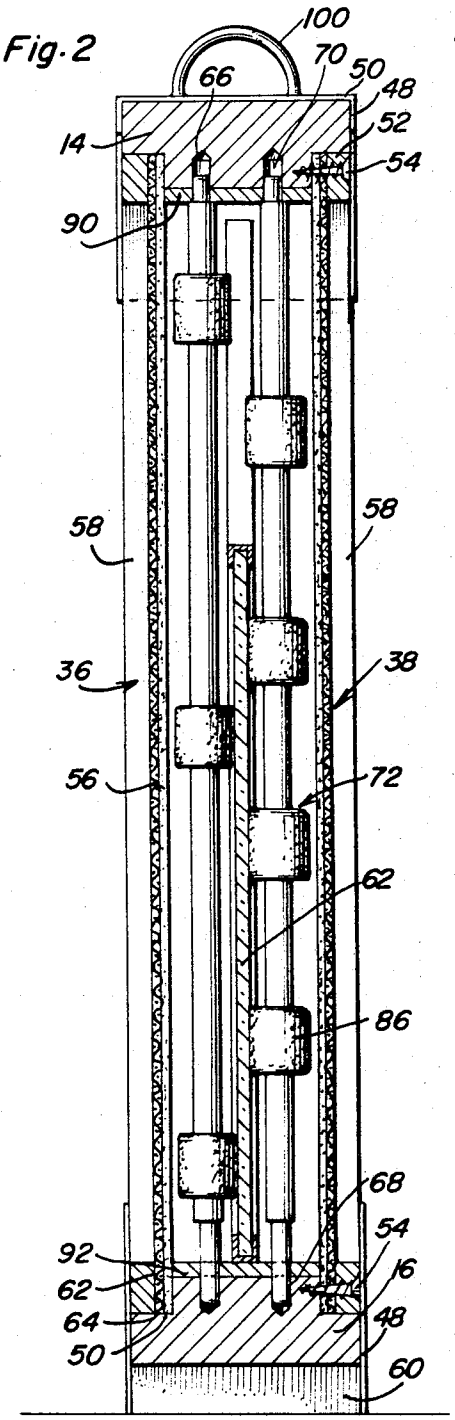
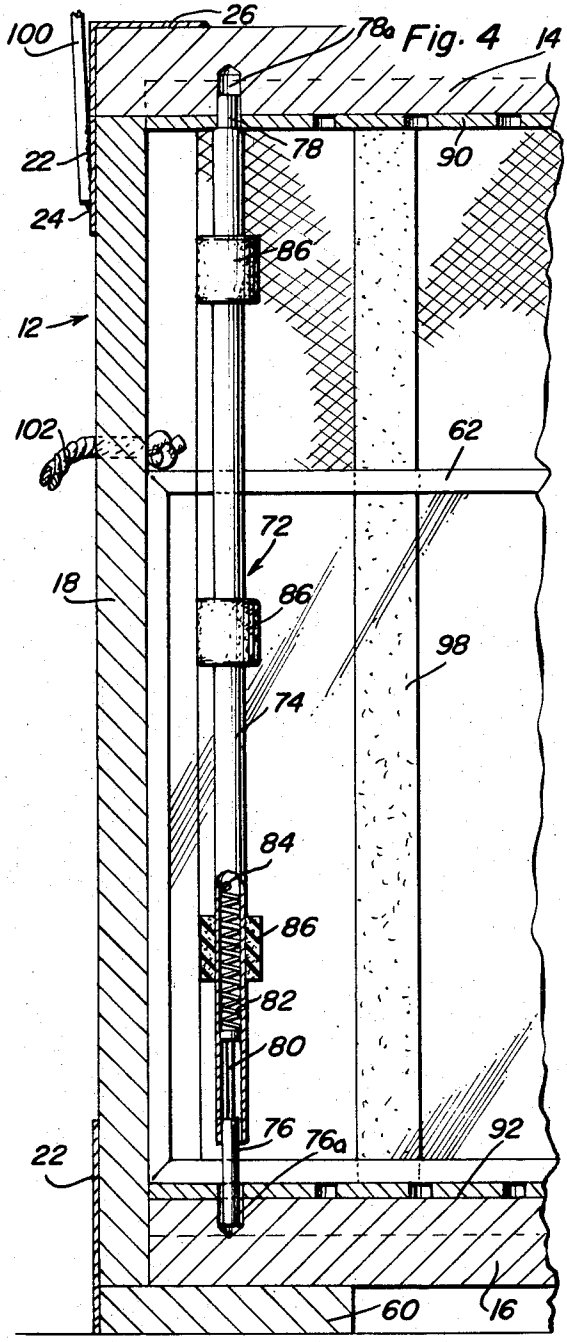


Fig. 4



Edward P. Bucko
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

United States Patent Office

3,403,777

Patented Oct. 1, 1968

3,403,777

CRATE FOR SHIPPING GLASS AND LIKE FRANGIBLE MATERIALS

Edward P. Bucko, P.O. Box 5, Great Falls, Mont. 59401

Filed Feb. 9, 1967, Ser. No. 614,963

8 Claims. (Cl. 206—62)

ABSTRACT OF THE DISCLOSURE

A crate for glass panels or the like including a plurality of removably mounted vertical panel stabilizing rods engaged between upper and lower members. The rods are selectively orientated so as to, through resilient sleeves mounted thereon, engage the opposite faces of a glass panel as well as one or both edges thereof as might be required so as to effect a stabilization of the glass panel. The upper and lower members include holes which receive the ends of the rods, one end of each rod being telescopic for facilitating the mounting thereof in the corresponding holes. Side walls are also provided on the crate for enclosing the stabilized glass panels with the side walls also acting, in conjunction with an adjacent row of rods, to stabilize a sheet or panel of glass or the like.

This invention generally appertains to improvements in crates for the storing, shipping and the like handling of a sheet, panel and/or the like formed of glass, plastic and similar frangible materials and more particularly relates to a novel returnable shipping crate for safely shipping and transporting sheets or panels, formed from glass, plastic or like frangible materials, and constitutes novel improvements over my prior Patent No. 2,950,001, issued Aug. 23, 1960.

In my prior patent, a returnable glass shipping crate is disclosed wherein the crate is constructed so as to be packed and shipped to a destination at which it is unpacked. The crate essentially comprises a container having side walls and two opposing end walls, each of the latter being constructed of a plurality of transverse slots and a plurality of longitudinal slots which intersect the transverse slots with rails being secured on the edges of a glass panel and slidable in the slots for positioning the panel within the container. Anchoring means or keepers are provided for locating the rails in position in the slots so that the rails, which encompass the edges of a glass panel, are securely locked or clamped within the slots and prevented from movement therein. The side and end walls, which form the container, are adapted to receive front and back imperforate panels.

While such shipping crate has been satisfactory in use, it has been found that the same is unduly structurally complicated and requires the expenditure of time in the placement of the glass panels in the crate, that the crate is not readily adaptable for use in shipping a plurality of panels of varying and differing sizes and shapes and that, without the rigid front and back panels, the secured glass panels are not protected and yet, with such front and back panels it is impossible for the contents of the crate to be inspected during shipment and upon delivery of the crate without removal thereof.

Accordingly, an important object of the present invention is to provide an improved crate construction, which does not have any of the drawbacks attendant with my prior patented crate construction and which can be used to protectively ship any number of various dimensioned glass panels or the like, with the panels being securely and positively held between opposing wall frame members of the container by simple clamping means that can be installed without the use of any fasteners and without any carpenter materials, or the use of any skilled

labor and whereby the contents of the container will be exposed, the container being provided with reticulated front and back walls, so that the glass panels or the like packed in the container can be inspected prior to shipment and inspected by the consumer, upon delivery, without disturbing any of the panels or unpacking the container or crate.

Another important object of the present invention is to provide an extremely simple, sturdy, efficient and effective shipping and storing crate for panels, sheets and the like, which are formed from frangible materials, with easily insertable and releasable cooperative clamping means being provided for clamping the panels in position within the crate and between opposing walls or frame members thereof.

Another important object of the present invention is to provide, in a shipping crate which has opposing spaced apart, parallel rigid frame members, a novel means for securing a glass or other type material sheet or panel in position between the members, such means including the provision of aligned sockets on the inner confronting faces of the members and rigid rod members having axially aligned opposing end portions, one of the end portions of the rod members being movable axially and being spring urged outwardly so as to clamp the rod members with their end portions seated in the sockets in the opposing faces of the opposing members and the rod members being provided with resilient sleeve elements circumposed thereon intermediate the end portions and adapted to clampingly bear against the opposing sides or faces of a glass panel.

Another important object of the present invention is to provide, in structural association with such rod members, front and rear reticulated panels, which cooperate with the resilient sleeve elements on the rod members by virtue of the provision of resilient pads or the like on the inner surfaces of the front and rear panels or walls for clampingly supporting a glass panel or the like.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a view in perspective of a shipping crate for glass panels or the like, the crate being constructed in accordance with the principles of the present invention;

FIGURE 2 is a vertical, cross-sectional view, taken substantially on line 2—2 of FIGURE 1;

FIGURE 3 is a longitudinal, horizontal sectional view, taken substantially on line 3—3 of FIGURE 1;

FIGURE 4 is a detailed, longitudinal vertical sectional view, on an enlarged scale taken substantially on line 4—4 of FIGURE 3 and illustrating in detail one of the rod members, and

FIGURE 5 is a fragmentary sectional view, similar to FIGURE 3, and illustrating the utilization of the front and rear reticulated panels for supporting frangible sheets or panels.

Referring now more particularly to the accompanying drawings, and initially to FIGURES 1–4 the shipping crate **10** is in the form of a container which has opposing top and bottom walls or frame members **14** and **16** that are made from rigid sturdy material, such as wood, such latter material being chosen from an economical and utilitarian standpoint. The frame members **14** and **16**, which constitute top and bottom walls, are substantially coextensive in length and are held in fixed spaced and parallel relationship by end walls **18** and **20**. The end walls **18** and **20** have their opposing ends in facial engagement or relation with the outer flat ends of the top and bottom walls. Right angular corner plates **22** are

provided to fasten the top, bottom and end walls or frame members together so as to form the rectangular framework which makes up the container **12**.

The corner plates **22** are preferably formed from sheet metal or the like thin but sturdy material and have angular flat sections **24** and **26**, with the section **24** having laterally inturned side flanges **28** and the section **26** having laterally inturned flanges **30**. The flanges **28** and **30** are fastened to the respective walls or frame members by fasteners, such as the screws **32**.

The crate is composed of front and back reticulated walls **34** and **36**. Each of the reticulated walls is formed of a rectangular open frame or framework **38**, including top and bottom bars **40** and **42** interconnected and rigidified by vertical end bars **44** and **46**. Each frame is fixed in an inset **48** formed in the opposing faces or sides of the frame members of the container, as shown in FIGURE 2, with the bars set in the inset **48** and bearing against the inner shoulders **50** and having their upper edges resting on the angular, lateral shoulders **52**. The bars are held in place by fasteners, such as the screws **54**, and the outer faces of the bars are disposed substantially coplanar with the outer faces or sides of the frame members **14**, **16**, **18** and **20** of the container **12**. The flanges **28** and **30** of the reinforcing angular corner plates terminate at the insets **48** so that the angular corner plates do not have to be removed to place in position and remove the front and back walls **34** and **36**.

The front and back walls **34** and **36** are formed of the rectangular open framework **38**, with vertical reinforcing bars **56** being provided between the longitudinal top and bottom bars **40** and **42** and being disposed in spaced parallel relation with the end bars **44** and **46**. Reticulated panel sections **58** are provided and are suitably attached to the inner faces of the bars which comprise the framework, the panels **58** being formed of open mesh sturdy wire which is in sheet form and extends entirely throughout the open framework so as to close off the framework and define therewith the front and back walls **34** and **36**, which are transparent by virtue of the screens or reticulated panels **58**.

The bottom frame member **16** is provided at its opposing ends with base blocks **60**, which support the bottom frame member **16** in a position raised above the ground surface, as shown in FIGURES 2 and 4, and the lower corner brackets or reinforcing corner plates enclose the edges of the blocks.

Means are provided for supporting a glass sheet or panel, such as the panel **62** in a secure position parallel with and between the front and back reinforced and reticulated walls or panels **34** and **36** and perpendicular to the top and bottom frame members or walls **14** and **16** of the container of the crate **12**. Such means includes the provision of sockets **64** formed in the inner face of the lower or base member or wall **16** and aligned sockets **66** formed vertically in the inner face or surface of the top wall or upper frame member **14**. The sockets **64** and **66** are disposed in vertical alignment and the sockets are disposed in spaced apart relationship along the length of the frame members **14** and **16**. Thus, the sockets **64** are formed in one row and the sockets **66** are formed in an aligned row in the upper member **14**, so that the sockets **64** in the one row in the bottom member **16** are in alignment, vertically or axially speaking, with the sockets **66** in the row formation of the upper member **14**. Sockets **68** are formed in a row in the lower member **16** and a complemental row of sockets **70** is formed in the upper member **14**, the sockets **68** and **70** being in vertical alignment and the sockets being spaced apart lengthwise of the frame members, as shown in FIGURE 3. It is preferred, though not necessary, that the sockets **64** and **68** be in staggered relationship, while the sockets **66** and **70** are in the same staggered relationship.

In such a crate construction, a clamping means **72** is provided for clamping the glass panel **62** and holding it in position. In this respect, as shown more specifically in FIGURE 4, such means includes a rod member **74**, which is preferably tubular and has opposing end portions **76** and **78**, which are coaxially reduced. The end portion **76** terminates in a free extremity **76***a* and the end portion **78** terminates in a free extremity **78***a*, such extremities being adapted to be inserted in the sockets **64** and **66** and **68** and **70**, as shown in FIGURES 2 and 4.

Each of the rod members **74** is formed, therefor, with opposing end portions **78** and **76**, which are in axial alignment and constitute axial prolongations of the rod members. The end portion **76** is axially movable relative to the major body portion of the rod members **74**, as shown in FIGURE 4. The end portion **76** is slidably disposed within the tubular rod member and is provided with an inner plunger-like end portion **80**, which is structurally associated with an expansion spring **82** anchored on a transversely disposed pin **84** within the rod member to which the upper end of the spring is attached or the spring may merely abut or bear against the pin. The spring-urged retractable end portions **76** are provided so that the rod members can be inserted into and positioned between the frame members **14** and **16** and locked in place by having their opposing end portions locked in the aligned sockets, as shown in FIGURE 4, whereby the rod members are securely anchored between the frame members **14** and **16**.

The rod members are provided with resilient sleeves **86** which are circumposed thereon and which are held in frictional placement at selected and adjusted positions along the length of the rod members. The dimensions of the resilient sleeves may vary but, as shown in FIGURE 2, the sleeves are so formed and so disposed on the cooperating rod members, which clampingly engage the panels **62**, that the sleeves clampingly engage the opposing faces of the panel **62** and securely hold it between the frame members. It is not necessary that the panel be of a dimension to extend between the opposing frame members, since the resilient gripping action of the sleeves on the cooperating rod members will hold any size panels.

The rods are shown as hollow and tubular but may be solid and of any desired cross-sectional shape and the sleeves will have an axial bore complemental to the exterior shape of the rods and can be of any size or shape, from a widthwise and lengthwise standpoint.

In the instant, as for example the panel **62**, shown in FIGURE 3, where the panel does not extend the full length of the container, a rod member **74***a* is provided and is fitted, at its opposing ends in the row of sockets **88** formed in the inner faces of the frame members **14** and **16**, the rows **88** being interposed between the rows **64** and **68** in the member **16** and the cooperating rows of sockets **66** and **70** formed in the frame member **14**. The sleeves **86** on the rod members **74***a* are adapted to engage the free end **62***a* of the panel **62**, which end may, as in the instance of the panel **62** shown in FIGURE 3, have a channel frame on it, though such is merely attendant with the formation of the panel **62** and is not necessary for the anchoring of a glass panel in position.

The inner faces or surfaces of the frame members **14** and **16** are provided with metal liners or plates **90** and **92**, which have apertures aligned with the sockets, the purpose of the liners being to prevent wear on the inner faces of the frame members **14** and **16**.

In the instance of FIGURE 5, additional panels **94** and **96** may be secured between the rod members in the sockets **64**, **66** and **68**, **70**, with the panels being clamped between the sleeves on such rod members and resilient ribs or resilient pads **98** which are formed on the inner faces of the bars **56** and suitably fixed thereto and extend substantially the full axial extent or height thereof, as shown in FIGURE 5.

It can be appreciated that many variations may be created and that a plurality of panels or plates, which are formed of glass, plastic or any other type of frangible

material, may be securely anchored within the crate by virtue of the placement of the rod members **74** in accordance with the dimensions, shapes and numbers of the panels.

The important factors are the provision of the sockets in the confronting faces of the cooperating and opposing frame members and the rod members **74** which have at least one axially movable end portion which is spring urged outwardly, either from an inside socketed relation or an exterior sleeve relation, so that the rod members are locked within the sockets in the desired relationship whereby the resilient sleeves **86**, which are circumposed on the rod members, cooperate to clampingly engage the opposing sides and, if necessary, ends of a panel or plate, as exemplarily shown in FIGURES 2 and 3. Furthermore, the front and rear walls **34** and **36** can be utilized, by virtue of the resilient pads **98** to support panels, such as panels **94** and **96**, in cooperation with the sleeves on the outermost side rod members **74**.

The front and rear walls of the container **12** are open or transparent, by virtue of the reticulated panel constructions **58**, so that the interior contents of the crate can be examined during transportation and can be inspected by the recipient or purchaser at the destination point without removing the front and rear walls to determine if any of the panels have become cracked or broken.

The upper corner plates, as shown in FIGURE 1, are provided with U-shaped metallic hooks or straps **100** so that hoisting lines may be attached thereto to raise and lower the crate and the end frame members **18** and **20** may be provided with rope handles **102**, as shown in FIGURES 1 and 4, whereby the crate may be slid on the base blocks **60** along a supporting surface.

It can be appreciated that it is a simple matter to position glass or other frangible material, panels, plates or the like with or without edge frame constructions or just plain sheets of glass, within the crate by disposing the same vertically between the top and bottom frame members or walls **14** and **16** and then anchoring them in position by a judicious placement of the anchoring or clamping rigid rod members **74** so that the resilient sleeves **86** thereon engage the opposing faces of the panels and hold the panels in secured vertical positions, with the ends of the panels being held by the end walls and a rod or by a pair of rods, depending upon the length of the panels. Any possible arrangement can be realized depending upon the dimensions of the panels or sheets. This can be appreciated, in one exemplary instance, from a consideration of FIGURE 5.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A storing and shipping crate for flat panels comprising upper and lower generally horizontally orientated members vertically spaced from each other for the accommodation of one or more vertically orientated panels therebetween positioned on and supported by the lower member, vertical support wall means extending between and engaged with the upper and lower members, a plurality of vertically elongated rods retained in openings on the inner opposed surfaces of said members, and means releasably securing said rods vertically between the upper and lower members in both longitudinal and lateral spaced relation to each other within the lateral confines of said upper and lower members, said rods defining at least two rows for engagement with the opposed faces and the stabilizing accommodation of a vertically orientated panel located laterally therebetween.

2. The crate of claim **1** including means for releasably securing at least one of said rods vertically between the upper and lower members and laterally between the two rows of rods for stabilizing engagement with at least one vertical edge of a received panel.

3. The crate of claim **2** including resiliently compressible sleeves on said rods for compressive engagement against a received panel, and through the resilient nature of the sleeves, the accommodation of panels of varying thicknesses.

4. The crate of claim **3** including side walls between said upper and lower horizontally orientated members and in engagement with the lateral edges of said members, said side walls including inwardly directed resiliently compressible pads for cooperation with adjacently located rods in the compressive retention of panels of varying thicknesses therebetween.

5. The crate of claim **4** wherein said walls are reticulated to expose internally mounted panels, said walls including vertical reinforcing bars upon which said resilient pads are mounted.

6. The crate of claim **1** including side walls between said upper and lower horizontally orientated members and in engagement with the lateral edges of said members, said side walls including inwardly directed resiliently compressible pads for cooperation with adjacently located rods in the compressive retention of panels of varying thicknesses therebetween.

7. The crate of claim **6** including means for releasably securing at least one of said rods vertically between the upper and lower members and laterally between the two rows of rods for stabilizing engagement with at least one vertical edge of a received panel.

8. The crate of claim **6** including resiliently compressible sleeves on said rods for compressive engagement against a received panel, and through the resilient nature of the sleeves, the accommodation of panels of varying thicknesses.

References Cited

UNITED STATES PATENTS

1,746,470	2/1930	Hennessey	206—60
2,034,205	3/1936	Quirk et al.	217—20
2,087,044	7/1937	Reiners	217—64
2,221,283	11/1940	Derman	217—70
2,608,420	8/1952	Eck	248—356
2,792,252	5/1957	Ernest	206—60
2,950,001	8/1960	Bucko	206—1
3,233,753	2/1966	Rich	214—10.5

WILLIAM T. DIXSON, JR., *Primary Examiner.*