United States Patent

Feddersen et al.

[15] **3,672,529**

[45] **June 27, 1972**

[54] CARGO CONTAINER

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[22] Filed: **Nov. 14, 1969**

[21] Appl. No.: **876,654**

[52] **U.S. Cl.** **220/1.5,** 16/179, 49/197, 220/34, 220/38, 220/84, 292/281

[51] **Int. Cl.** **B65d 87/00**

[58] **Field of Search** 312/215, 286, 263, 264, 352, 312/333; 220/1.5, 38, 34, 84; 160/113, 117, 118, 206, 207, 213; 292/281; 49/197, 201, 202; 16/179

[56] **References Cited**

UNITED STATES PATENTS

1,273,838	7/1918	Fairhurst	160/118 UX
1,854,125	4/1932	Faber	292/281 UX
2,200,277	5/1940	Howie	220/1.5 X
2,909,220	10/1959	Zimmerman	160/213
3,260,561	7/1966	Traktman	312/264
3,221,803	12/1965	Lambert	160/206
3,240,545	3/1966	Rulf	312/264
3,419,164	12/1968	O'Neill	220/1.5 X
2,241,884	5/1941	Noble	220/38 X
3,386,605	6/1968	La Font	220/1.5
3,405,835	10/1968	Eby	220/4 R
3,406,855	10/1968	McKechnie	220/1.5
3,456,829	7/1969	Glassmeyer	220/84 X
3,456,830	7/1969	Golder	220/84 X
3,561,633	2/1971	Morrison et al.	220/1.5

FOREIGN PATENTS OR APPLICATIONS

233,101	3/1961	Australia	220/38

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[57] **ABSTRACT**

A container for transporting goods by airplane comprises a top wall, a bottom wall, and a pair of opposed side walls all bounded by rigid framework and cooperating to define a pair of openings which are respectively closed by stowable door structures, each of the door structures including a pair of door brackets pivotally mounted on the top wall framework and two hingedly interconnected door panels one of which is slidably mounted on the door brackets, the door structures being movable between a closed position completely closing the openings and a stowed position folded atop the container, and two latch assemblies on each door structure for holding it in the closed position; adjustable shelves are mounted on the framework within the container.

38 Claims, 39 Drawing Figures

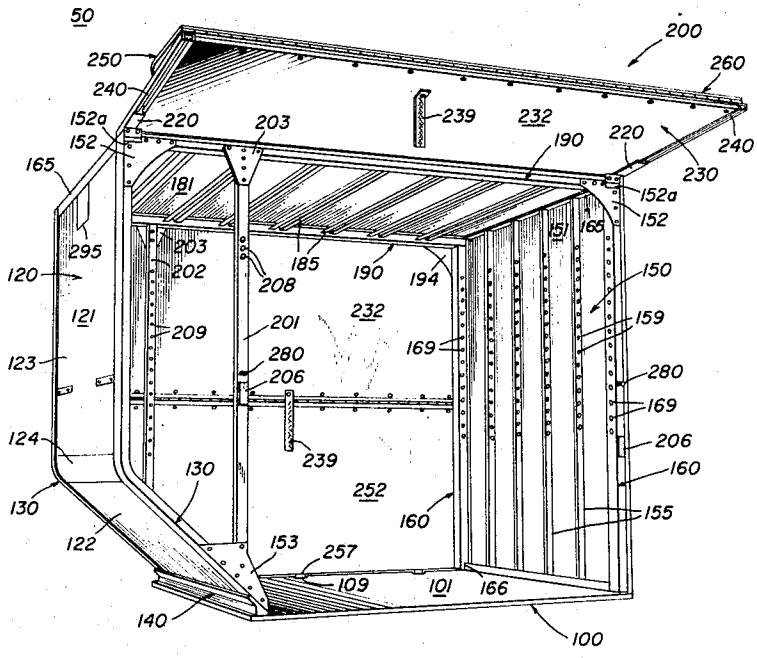
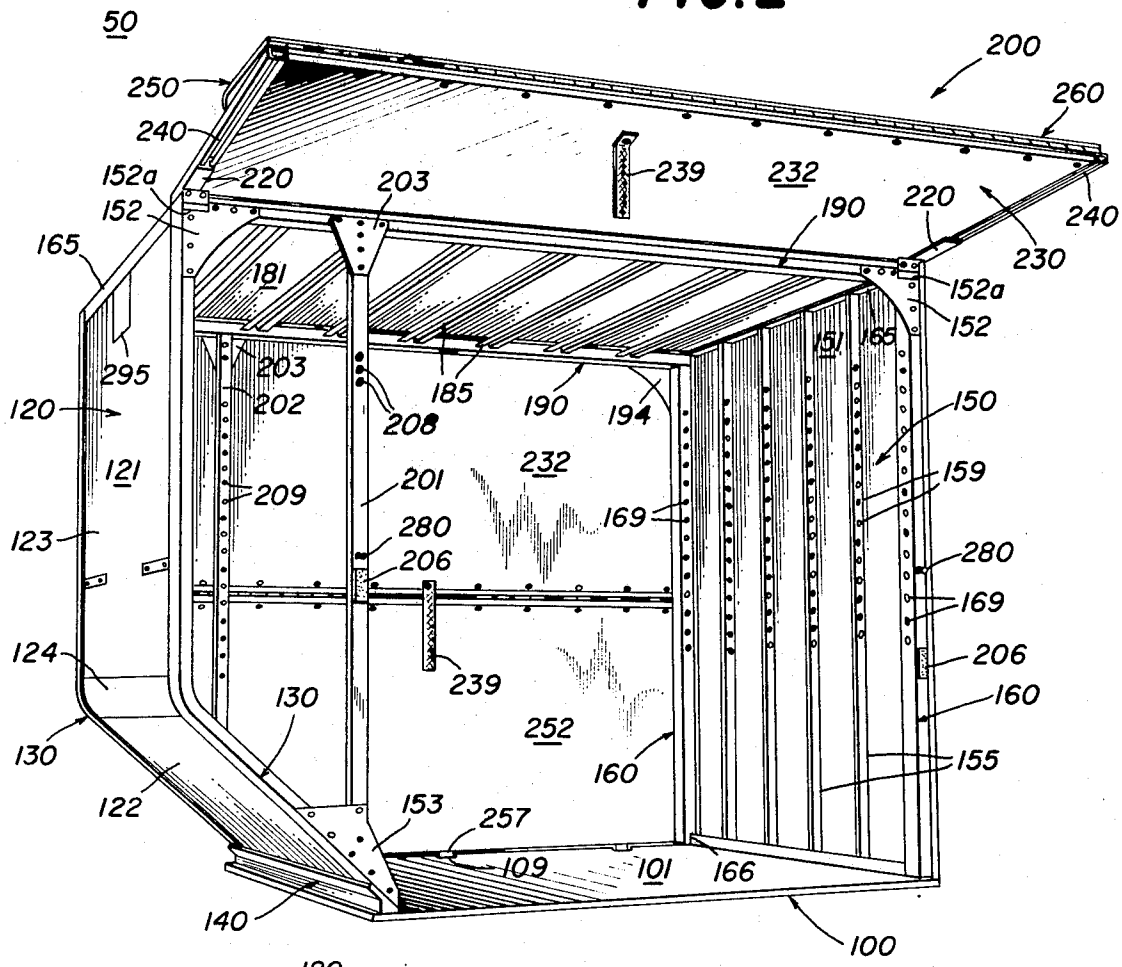


FIG. 2



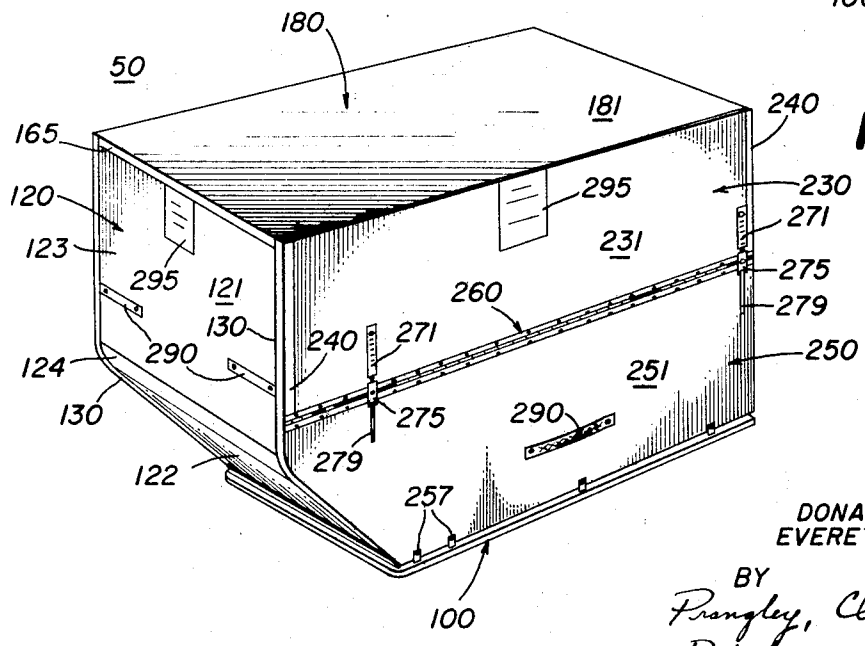


FIG. 1

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EVERETT L. MARKOWSKI

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Pringley, Clayton, Mullin,
Dithmar & Vogel ATTYS.

FIG. 3

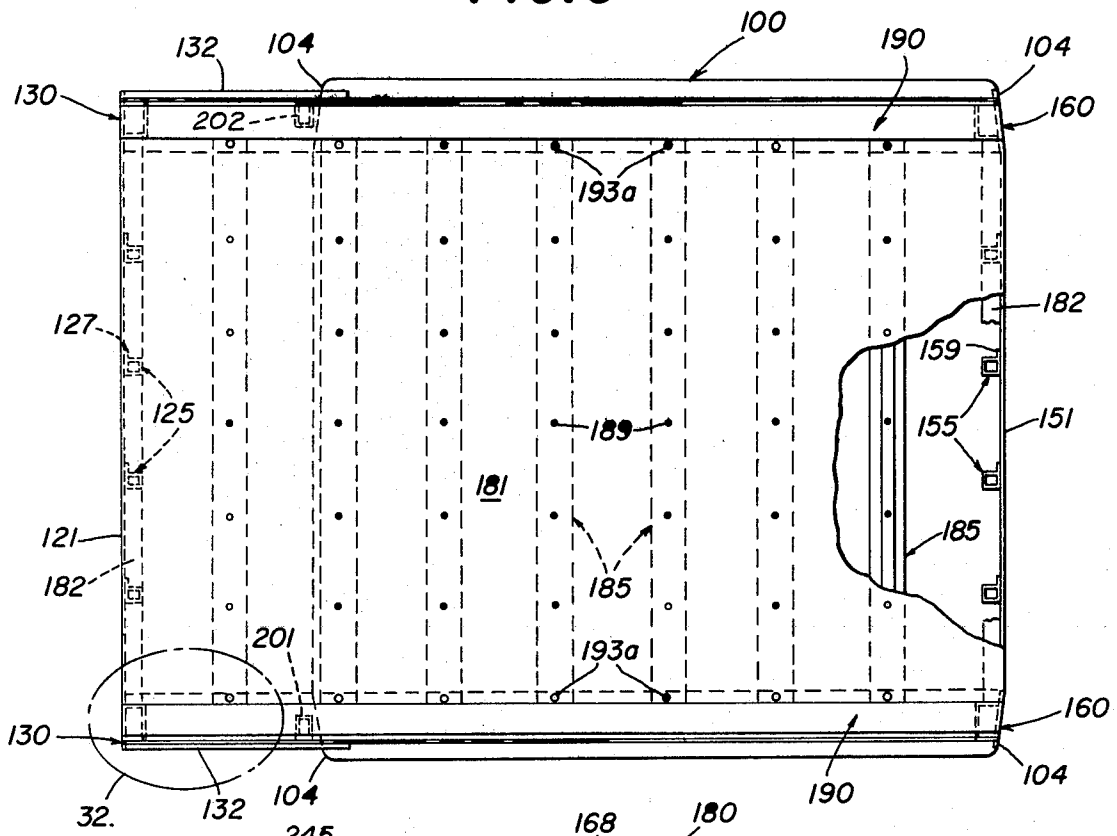

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FIG. 4

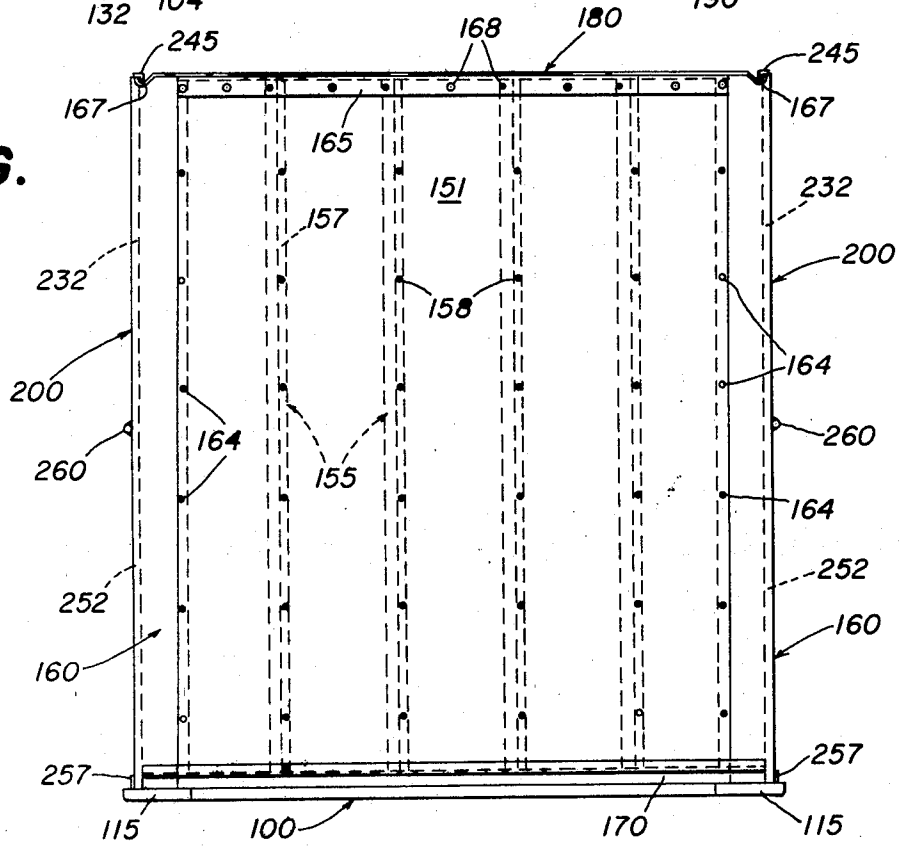

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FIG. 5

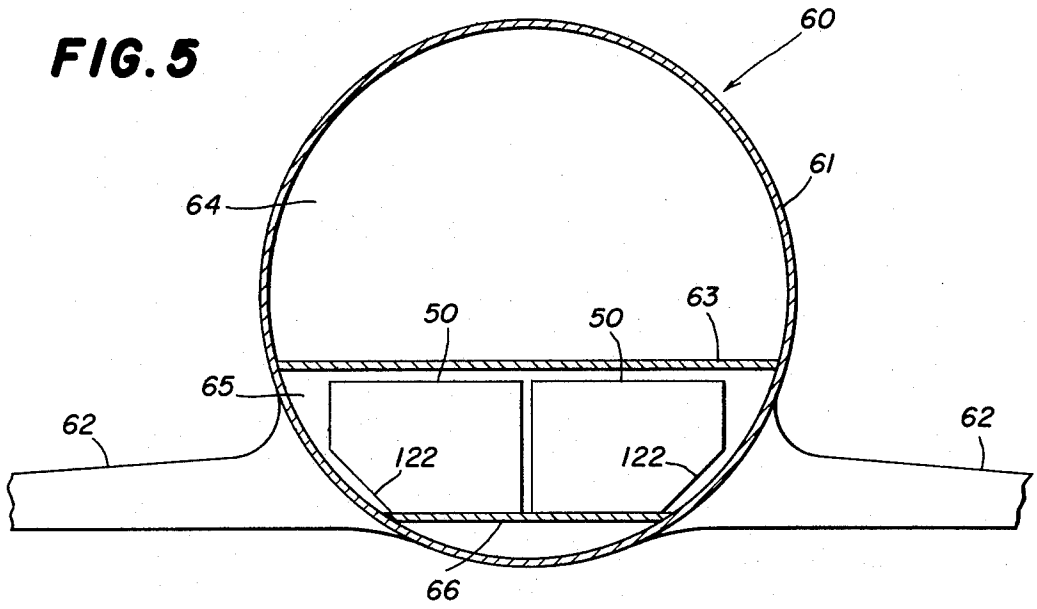


FIG. 6

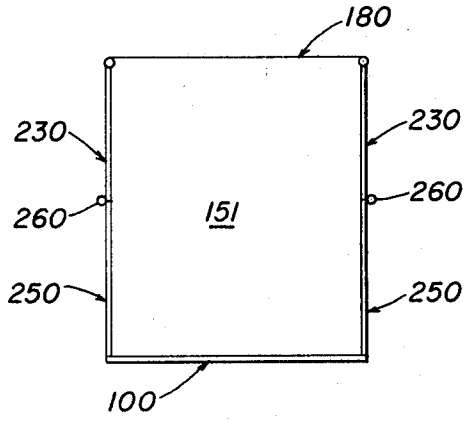


FIG. 7

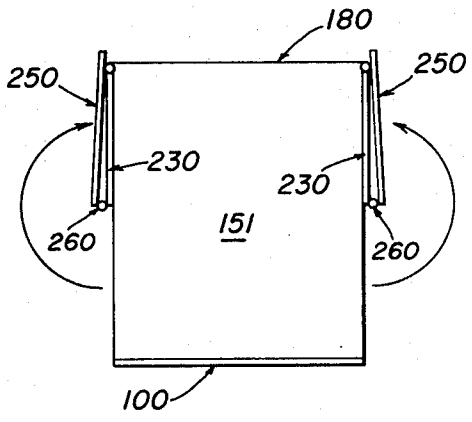


FIG. 8

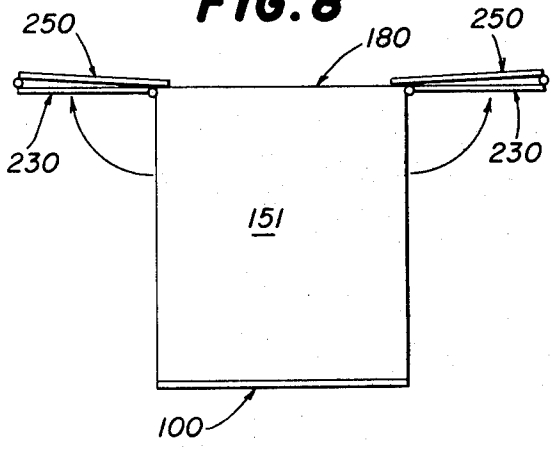


FIG. 9

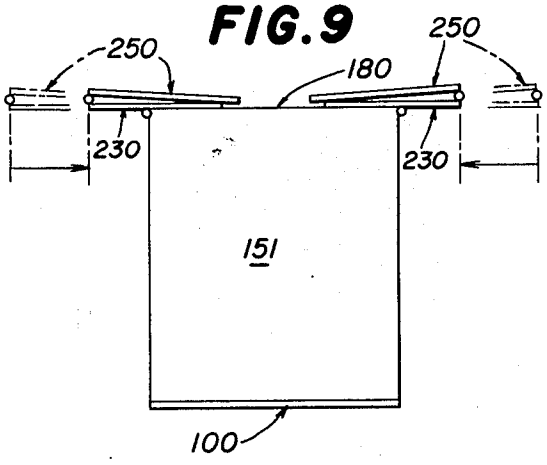
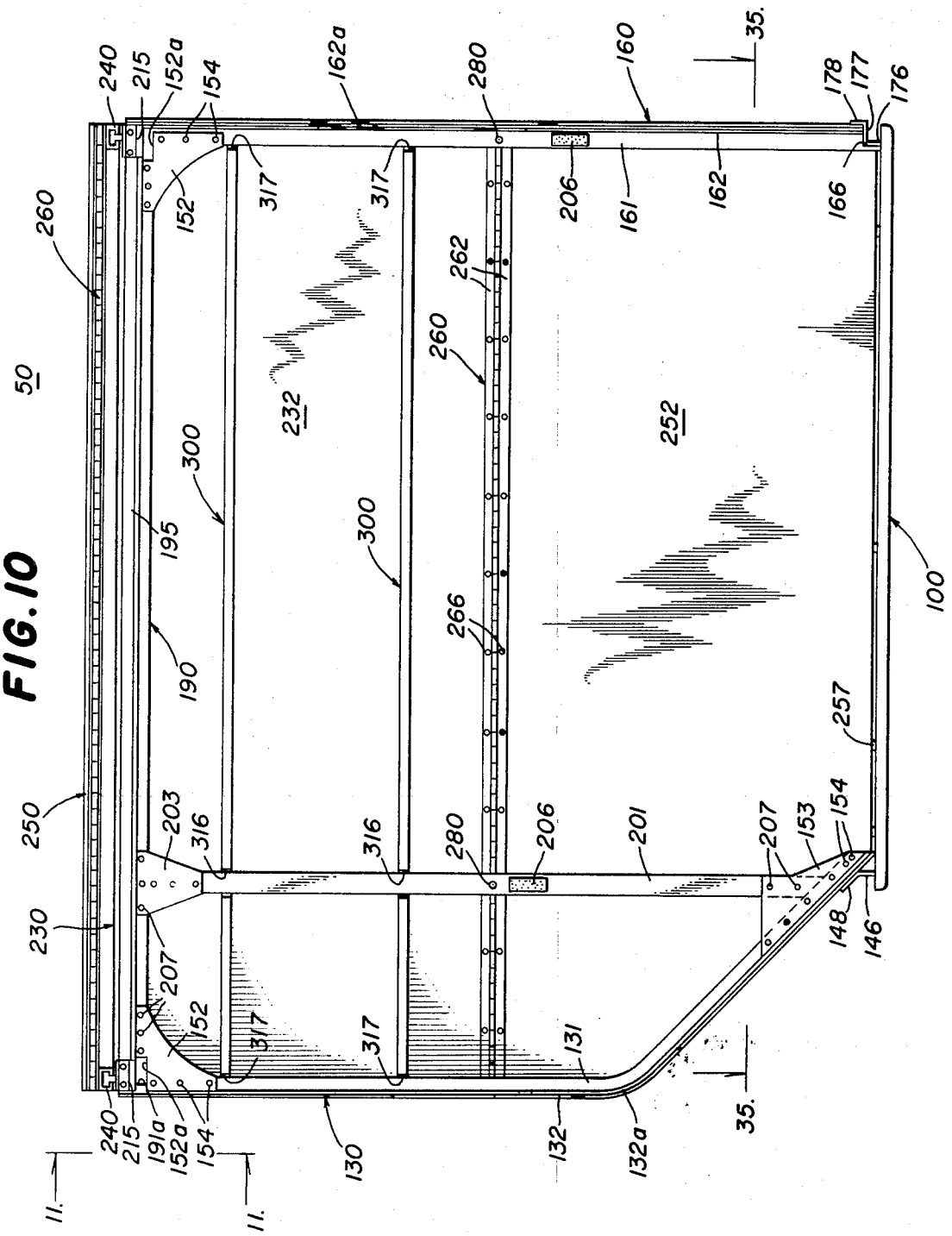


FIG. 10


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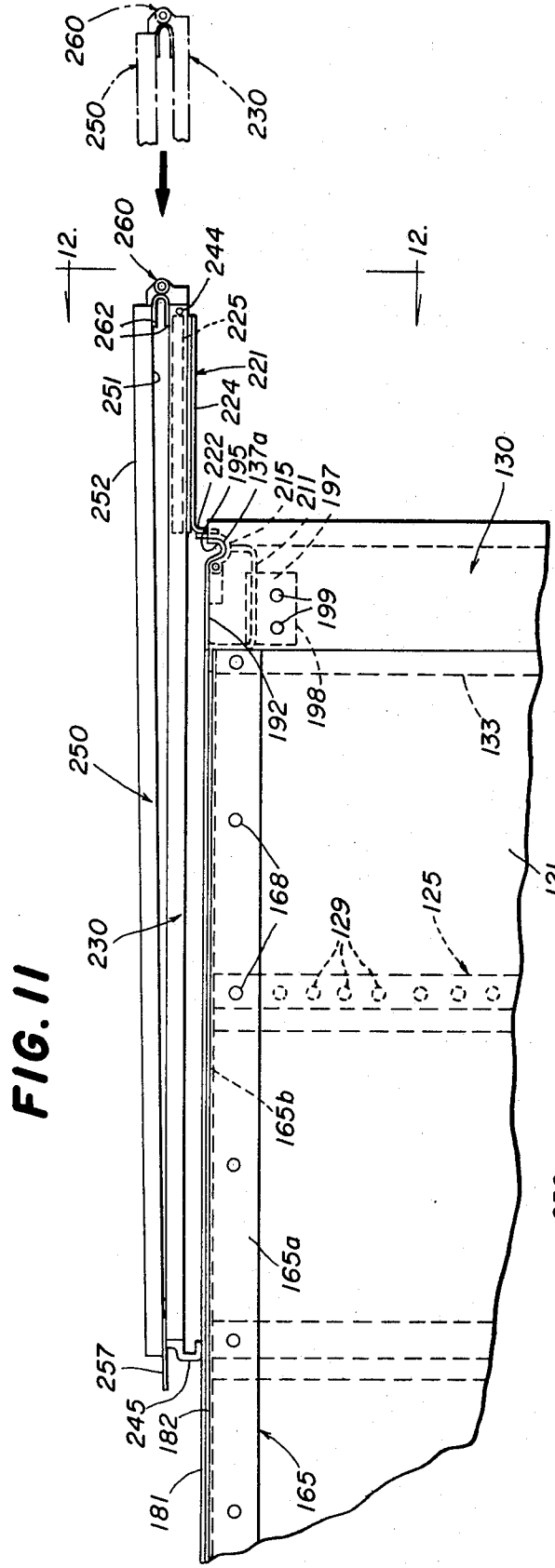


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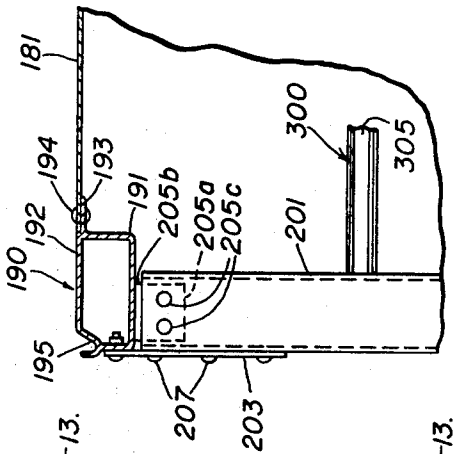


FIG. 13

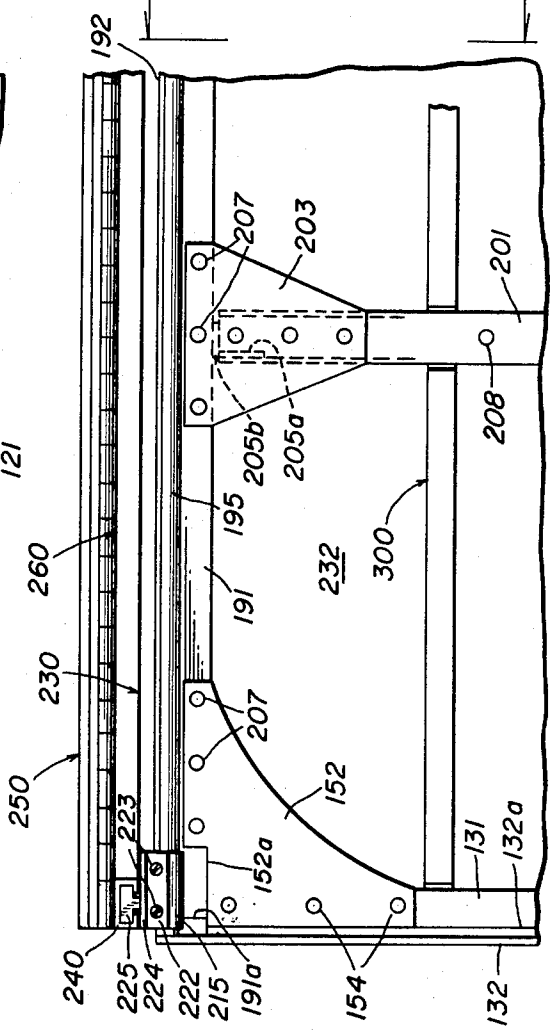


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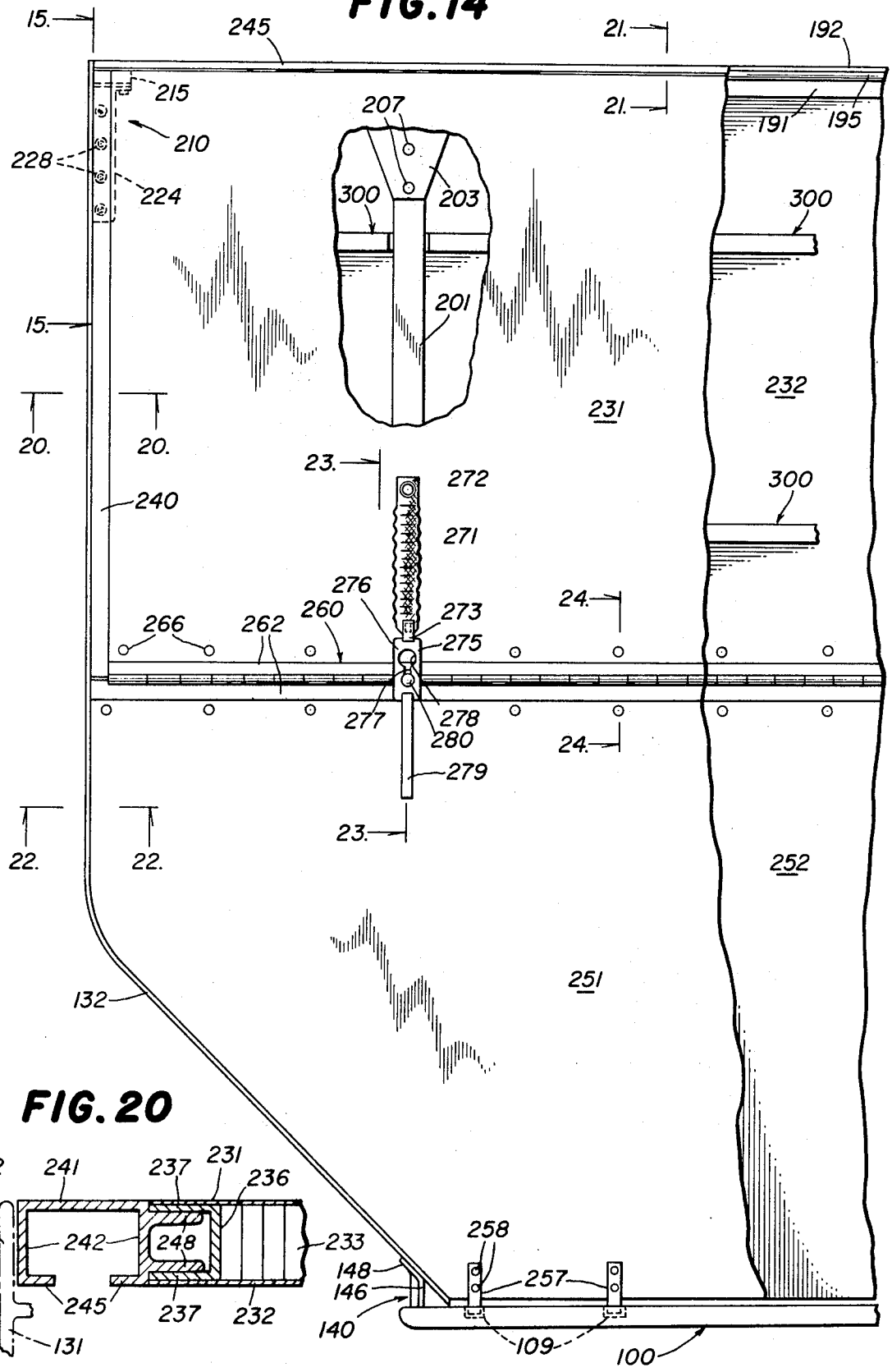

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FIG. 20

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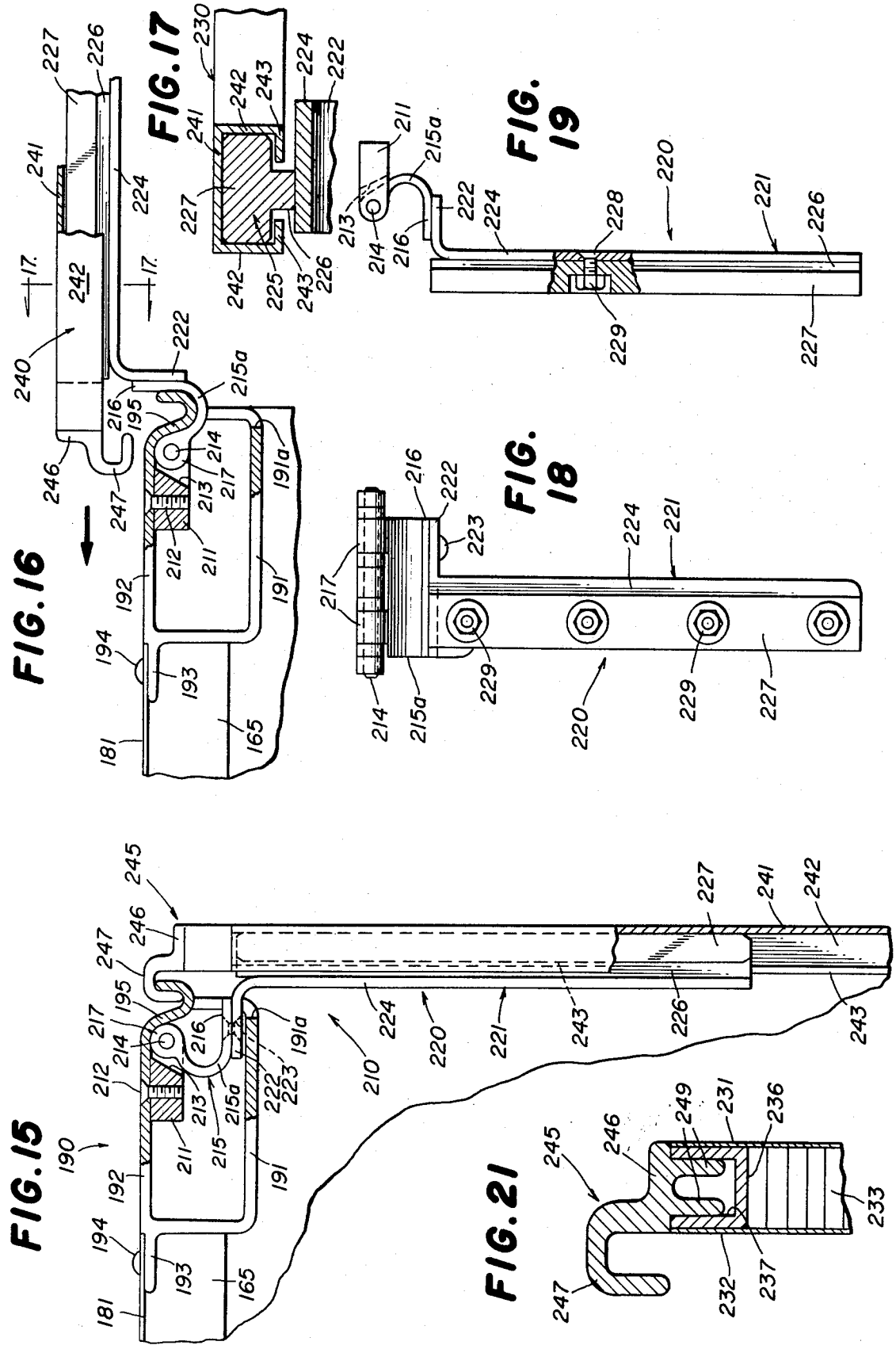

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FIG. 21

FIG. 23

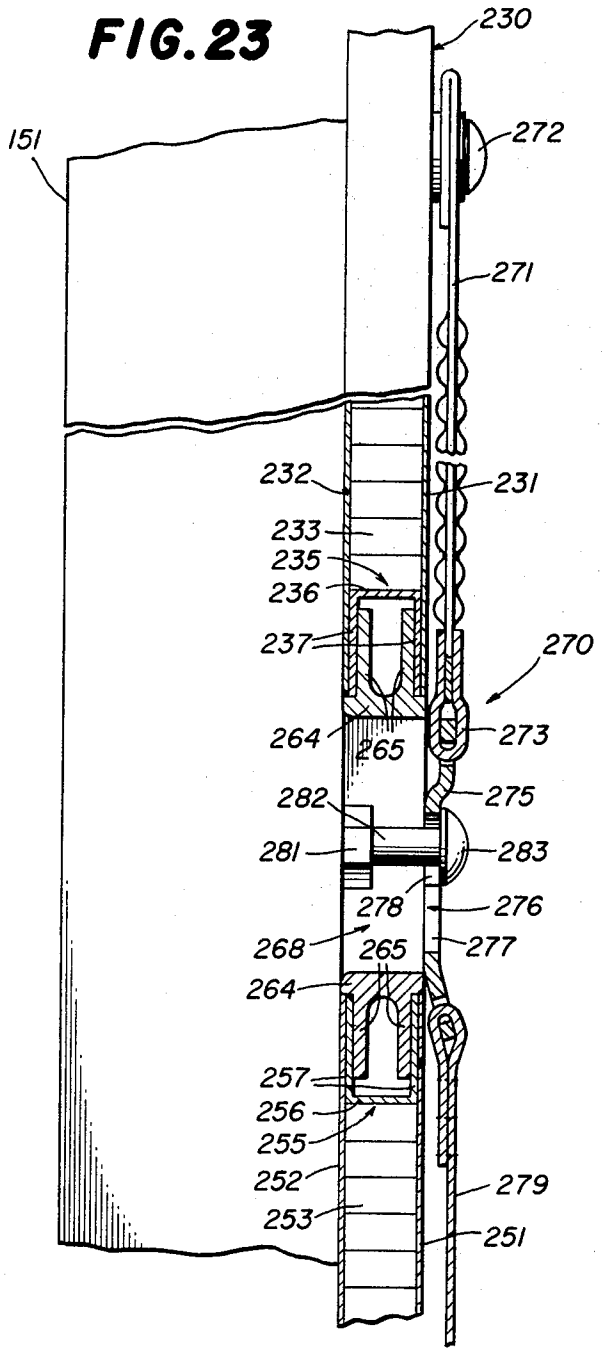


FIG. 24

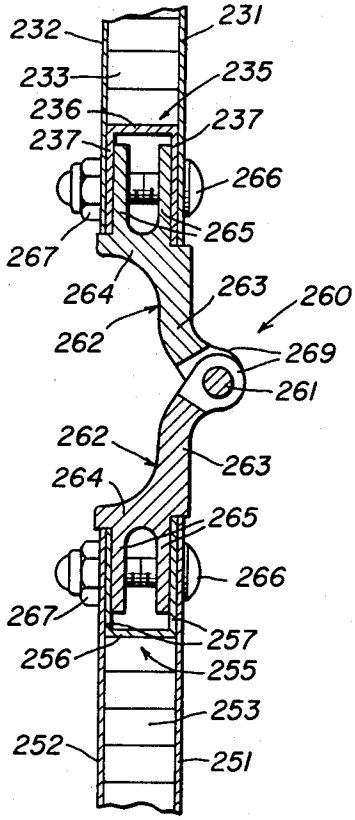


FIG. 22

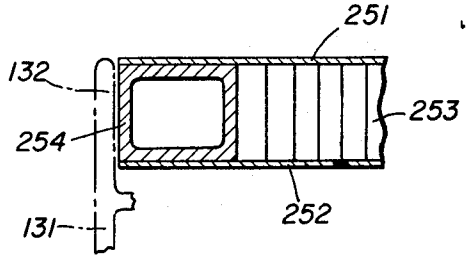
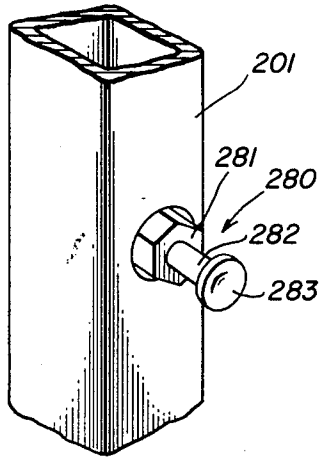


FIG. 25



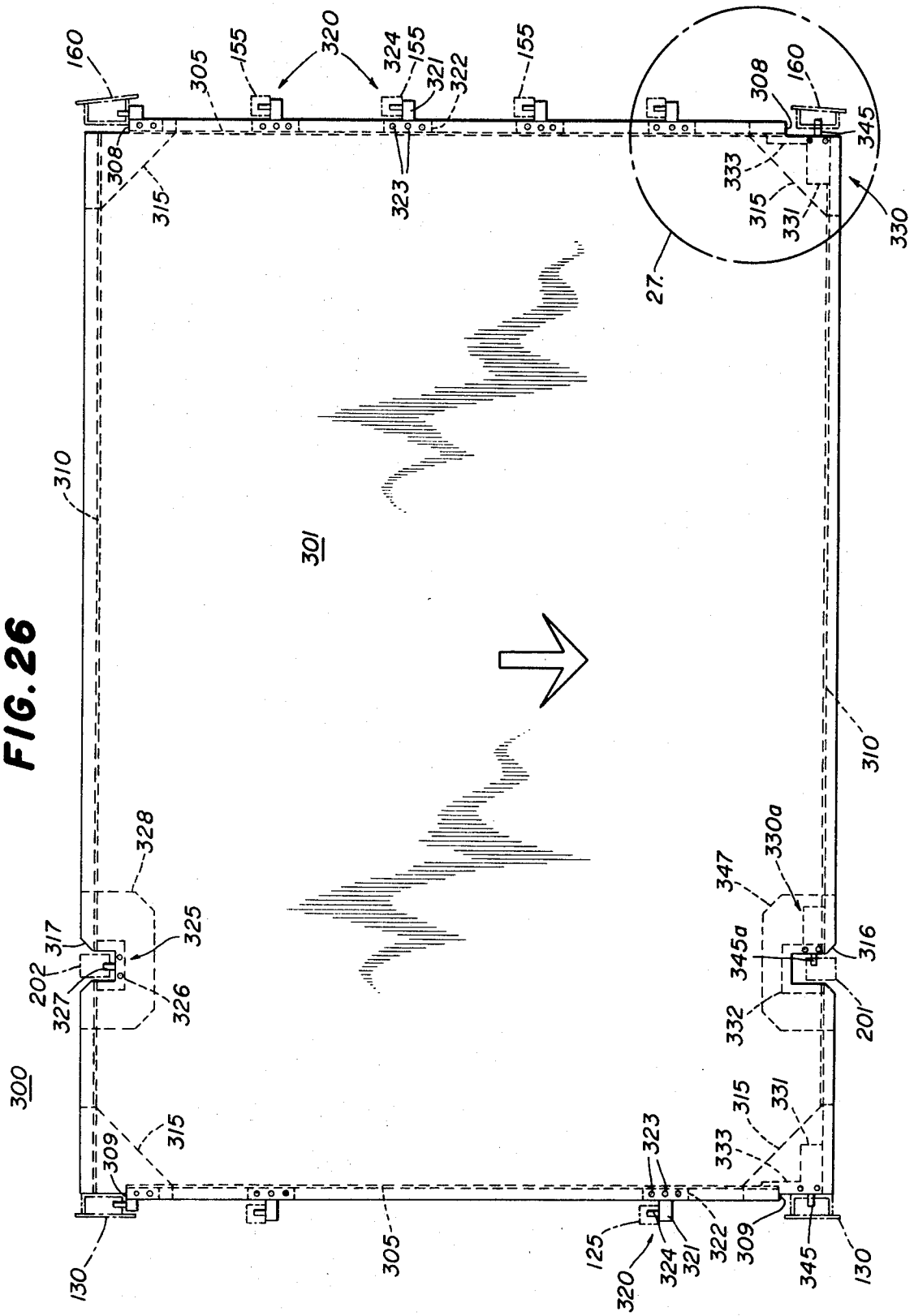

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FIG. 26

FIG. 28

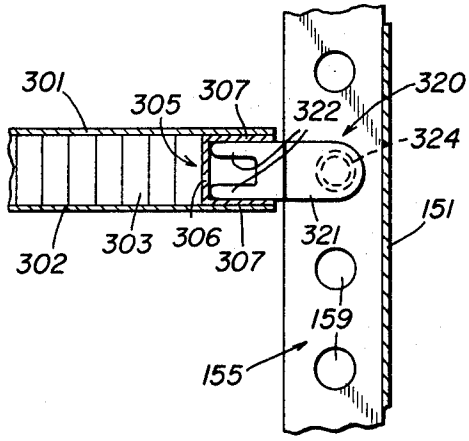


FIG. 27

FIG. 29

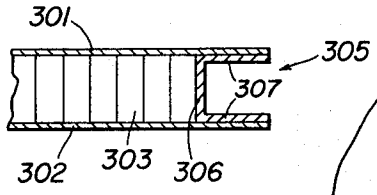


FIG. 30

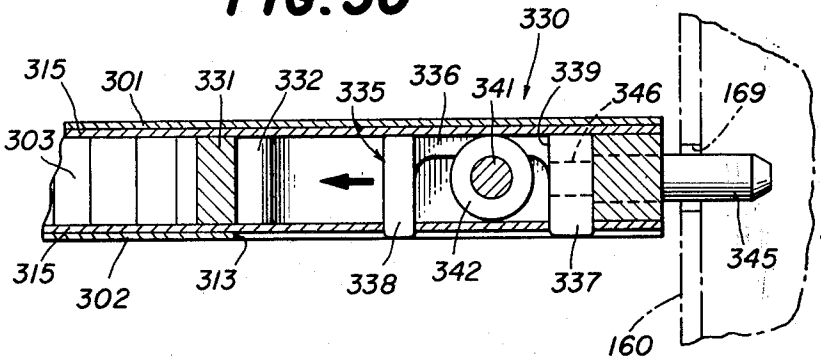


FIG. 31

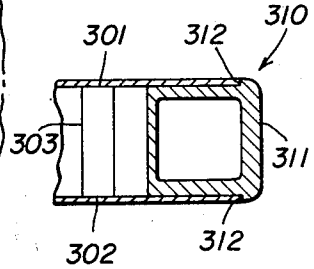


FIG. 32

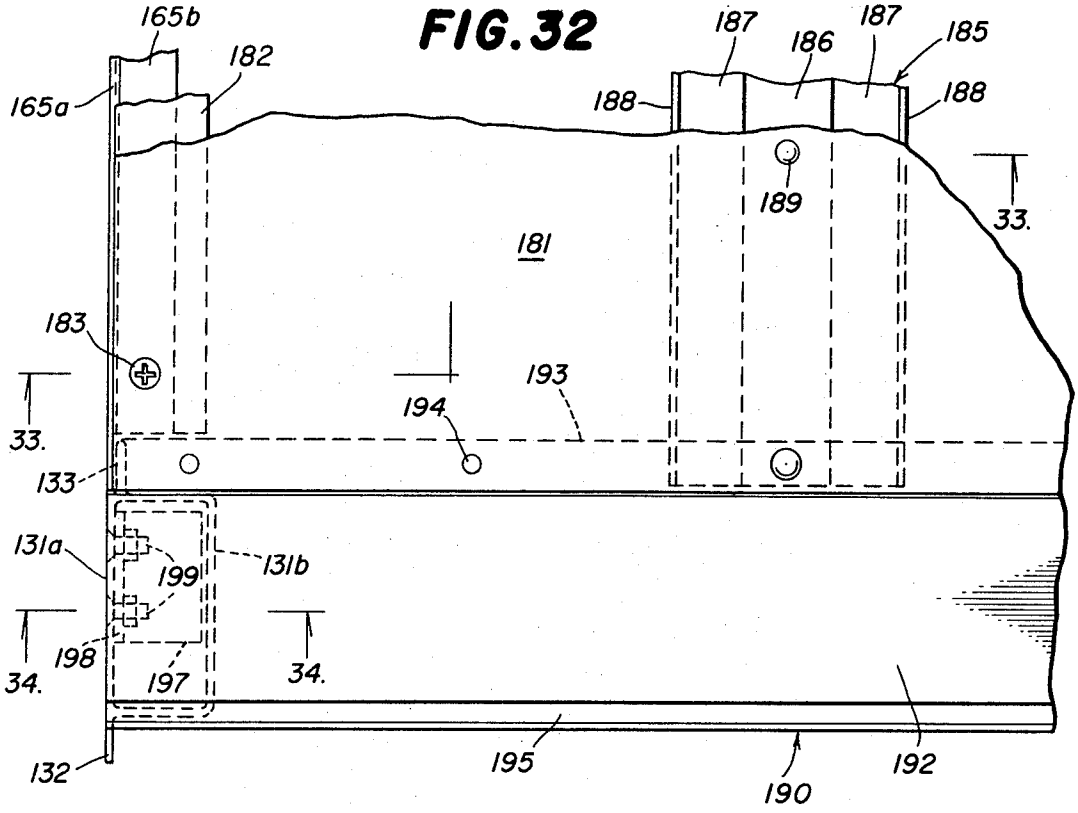
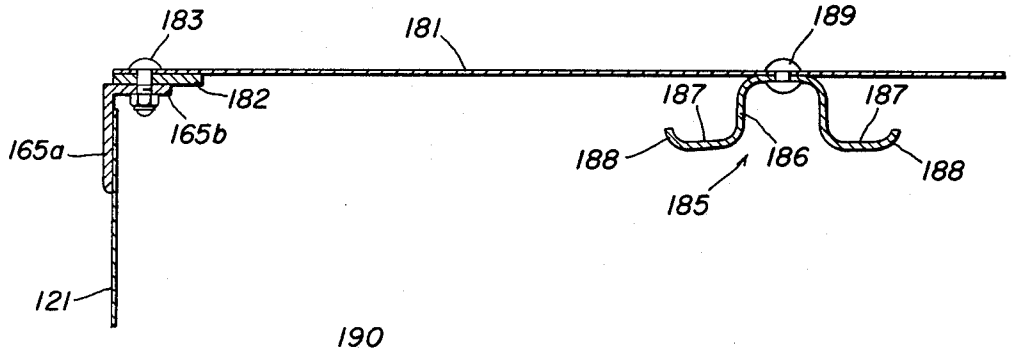


FIG. 33



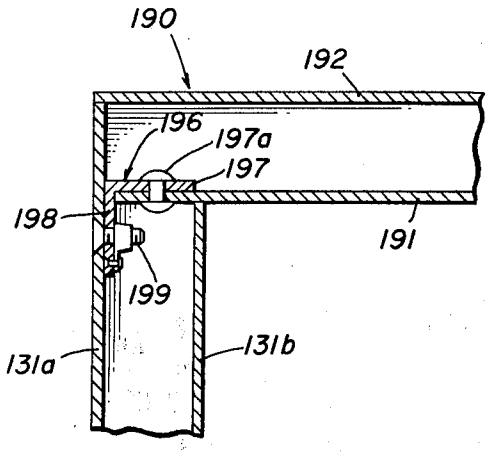


FIG. 34

FIG. 35

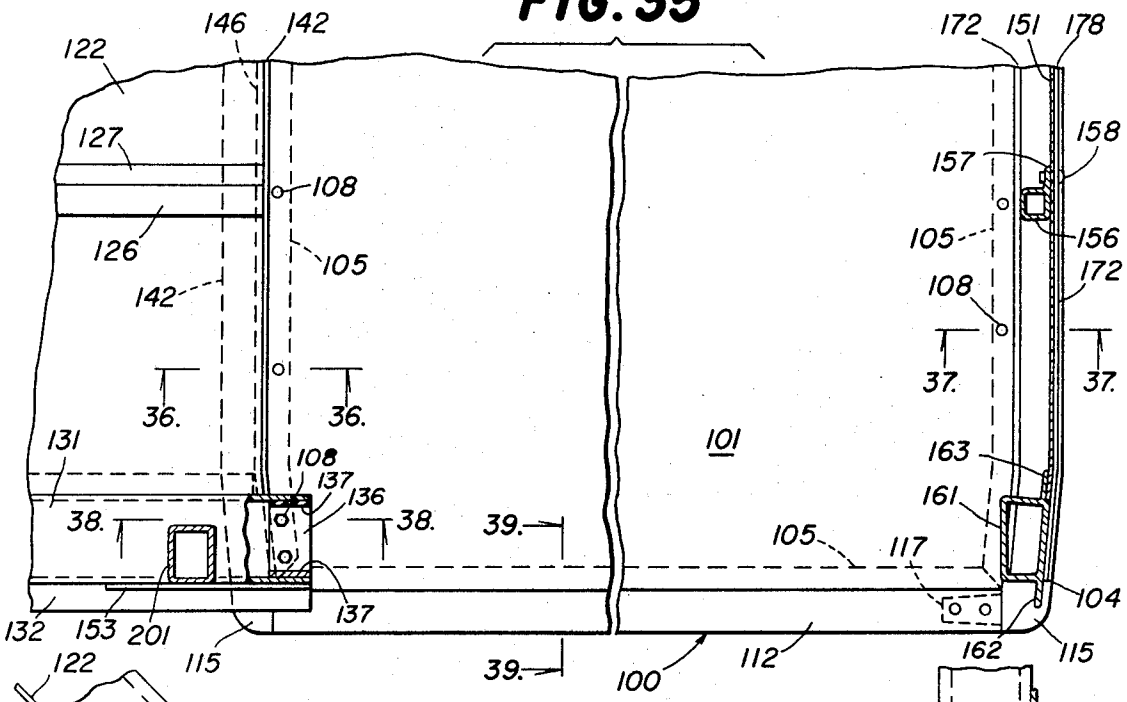


FIG. 36

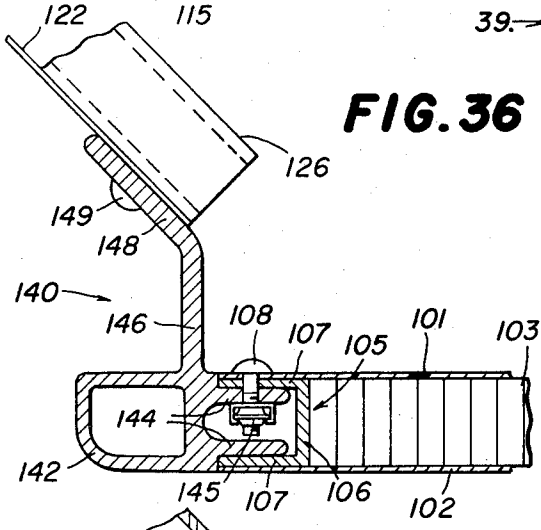


FIG. 37

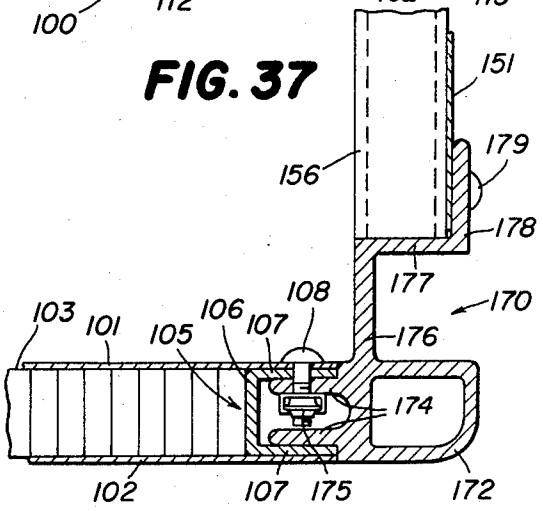


FIG. 38

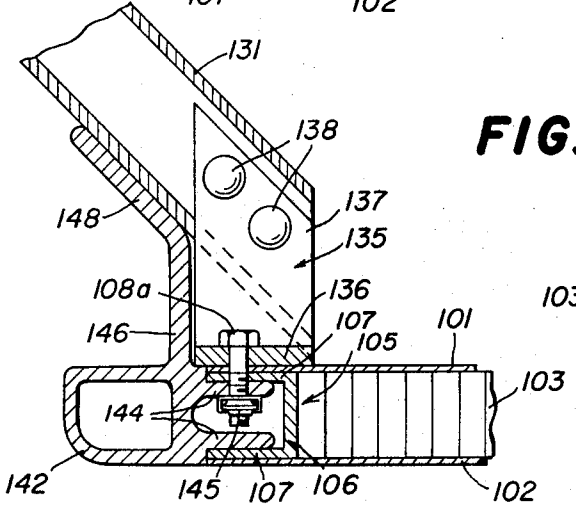
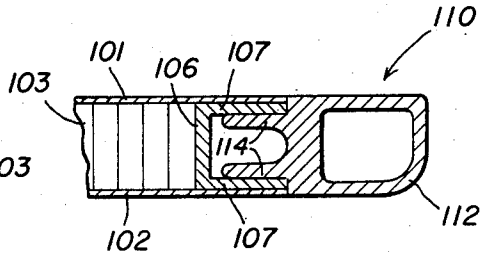


FIG. 39



CARGO CONTAINER

This invention is directed to a container for use in an airplane, the container being constructed to be lightweight and compact, yet durable.

It is an important object of the present invention to provide in a container having a top wall and a bottom wall and a pair of opposed side walls all cooperating to define a door-receiving opening, a door structure comprising a door bracket pivotally mounted on the container adjacent to the door-receiving opening, and a door panel shaped complementary to the opening and slidably mounted on the door bracket and movable between an extended condition and a retracted condition thereon, the door bracket being movable between a closed position wherein the door panel is disposed within the door-receiving opening and substantially normal to an adjacent wall of the container and an open position wherein the door panel is disposed outside of the container and substantially parallel to the adjacent wall thereof, the door structure having a closed position wherein the door bracket is in the closed position thereof and the door panel is in the extended condition thereof whereby the door structure completely closes the door-receiving opening, the door structure having a stowed position wherein the door bracket is in the open position thereof and the door panel is in the retracted condition thereof whereby the door structure is completely removed from the door-receiving opening and the door panel is stowed alongside the adjacent one of the container walls substantially parallel thereto.

In connection with the foregoing object, yet another object of this invention is to provide a door structure of the type set forth wherein the door bracket has a first track member thereon and the door panel has a second track member thereon cooperating with the first track member for slidably mounting the door panel on the door bracket.

In connection with the foregoing object, still another object of this invention is to provide a door structure of the type set forth and further including an abutment flange carried by the adjacent one of the container walls and disposed adjacent to the opening and contacting the door bracket in the open position thereon for limiting the pivotal movement thereof in the opening direction.

In connection with the foregoing object, it is yet another object of this invention to provide a door structure of the type set forth which includes a hook member carried by the door panel adjacent to the top wall and engageable in the flange when the door bracket is in the closed position thereof and the door panel is in the extended condition thereof for supporting the door panel and limiting the sliding movement thereof in the extending direction.

It is another object of this invention to provide a door structure of the type set forth which further includes a retaining member carried by the door panel and engageable with the container when the door structure is in the closed position thereof for preventing pivotal movement thereof, and resilient latch structure carried by the door panel and engageable with the container for holding the door panel in the extended condition thereof to hold the retaining member in engagement with the container, whereby the retaining member cooperates with the latch structure to hold the door structure in the closed position thereof.

In connection with the foregoing object, another object of this invention is to provide a door structure of the type set forth including a keeper structure mounted on the container and extending through a complementary opening in the door panel when the door structure is in the closed position thereof to maintain the door panel in the extended condition thereof, and a latch mechanism resiliently mounted on the outer surface of the door panel and movable into and out of engagement with the keeper structure when the door structure is in a closed position thereof.

In connection with the foregoing objects, it is a further object of this invention to provide a door structure of the type set forth which includes a first door panel shaped complementary to a portion of the door-receiving opening and slidably mounted on the door bracket and movable between an extended condition and a retracted condition thereon, and a second door panel shaped complementary to the remaining portion of the door-receiving opening and hingedly connected to the first door panel and being pivotally movable between a first position substantially in alignment with the first door panel and a second position overlying the first door panel and substantially parallel thereto, the second door panel being in the second position thereof when the door structure is in the stowed position thereof whereby the door panels are stowed alongside the adjacent one of the container walls substantially parallel thereto.

It is another object of this invention to provide a container comprising a top wall and a bottom wall and a pair of opposed side walls all cooperating to define an opening into the container, a plurality of shelf support members mounted on the container and each disposed substantially normal to one of the walls and each having a plurality of aligned spaced apertures therein, a shelf insertable into the container in a predetermined direction through the opening therein and having a mounted position substantially parallel to the one wall with an edge of the shelf disposed toward the opening, a fixed pin carried by the shelf on another edge thereof and disposed in use adjacent to one of the support members and insertable into a selected one of the apertures therein, a movable pin carried by the shelf on an edge other than the another edge and disposed in use adjacent to another of the support members and movable into a selected one of the apertures therein, the movable pin having a retracted position wherein it is disposed out of the apertures of the adjacent support member and an extended position wherein it is disposed in one of the apertures therein, the fixed pin and the movable pin in the extended position thereof having the longitudinal axes thereof angularly disposed with respect to each other, the shelf with the movable pin in the retracted position thereof being insertable into the container in the predetermined direction through the opening to insert the fixed pin into the selected one of the apertures in the associated support member to place the shelf in the mounted position thereof, the movable pin thereafter being movable from the retracted position thereof into the extended position thereof and into the one aperture in the associated member fixedly to lock the shelf in the mounted position thereof upon the support members within the container.

In connection with the foregoing object, still another object of this invention is to provide a container of the type set forth having a substantially rectangular top wall and including at least four shelf support members respectively disposed adjacent to the edges of the top wall, the shelf including a movable pin carried by the shelf on the front edge thereof and disposed in use adjacent to an associated one of the support members and movable into a selected one of the apertures therein and at least three fixed pins respectively carried by the shelf on the other edges thereof and respectively disposed in use adjacent to associated ones of the support members and respectively insertable into selected ones of the apertures therein.

In connection with the foregoing object, a still further object of this invention is to provide a shelf of the type set forth adapted for use in a container of the type set forth.

It is another object of this invention to provide in a container having a top wall and a bottom wall and a pair of opposed side walls all cooperating to define a pair of door-receiving openings at the opposite ends of the container, two door structures of the type set forth for respectively closing the door-receiving openings.

Yet another object of this invention is to provide a container comprising a generally rectangular base panel including a generally rectangular body of lightweight material having a rigid frame extending substantially around the periphery thereof and secured thereto, two elongated base-connecting frame members respectively disposed adjacent to opposed sides of the base panel and secured to the base panel frame, two side panels of lightweight material, the margins of the side

panels disposed toward the base panel being spaced therefrom and respectively secured to the base-connecting frame members, four elongated corner-connecting frame members respectively disposed adjacent to the generally upstanding margins of the side panels and secured thereto, a generally rectangular top panel of lightweight material, opposed margins of the top panel being disposed toward the adjacent margins of the side panels and spaced therefrom, two elongated side-top connecting frame members respectively disposed between the adjacent margins of the side panels and the top panel and respectively secured thereto, two elongated end-top connecting frame members respectively disposed along the front and rear margins of the top panel and secured thereto, the front and rear portions of the base panel frame and the associated ones of the corner connecting frame members and the end-top connecting frame members cooperating to provide openings into the container at the two ends thereof.

The invention, both as to its organization and method of operation, together with further objects and advantages thereof will best be understood with reference to the following specification taken in connection with the accompanying drawings in which:

FIG. 1 is a perspective view of a container constructed in accordance with and embodying the principles of the present invention with the door structure shown in the closed position;

FIG. 2 is an enlarged perspective view of the container as shown in FIG. 1 with one of the door structures in the open position;

FIG. 3 is an enlarged top plan view of the container as shown in FIG. 1;

FIG. 4 is a side elevational view of the right-hand or inboard side of the container shown in FIG. 3;

FIG. 5 is a fragmented sectional view of an airplane fuselage showing two cargo containers according to the present invention in place in the cargo compartment;

FIG. 6 to FIG. 9, inclusive, are diagrammatic views of the container according to the present invention, respectively showing the several stages in moving the door structures from the closed position to the folded stowed position thereof;

FIG. 10 is an enlarged front elevational view of the cargo container shown in FIG. 1 with the front door structure in the stowed position;

FIG. 11 is an enlarged fragmentary view of the stowed door structure taken along the line 11—11 in FIG. 10;

FIG. 12 is a fragmentary view of the stowed door structure taken along the line 12—12 in FIG. 11;

FIG. 13 is a fragmentary view in partial section of the top wall front end frame member taken along the line 13—13 in FIG. 12;

FIG. 14 is an enlarged fragmentary front elevational view of the container shown in FIG. 1 with the door structure partially broken away to show the interior of the container;

FIG. 15 is a further enlarged fragmentary view in partial section taken along the line 15—15 in FIG. 14 and showing the door bracket assembly;

FIG. 16 is a fragmentary view in partial section of the door bracket of FIG. 15 shown in the open position thereof;

FIG. 17 is an enlarged fragmentary sectional view of the door structure track members taken along the line 17—17 in FIG. 16;

FIG. 18 is a front elevational view of the door bracket assembly of FIG. 15;

FIG. 19 is a side elevational view of the door bracket assembly of FIG. 18 as viewed from the right-hand side thereof;

FIG. 20 is an enlarged fragmentary sectional view of the door panel slide channel taken along the line 20—20 in FIG. 14;

FIG. 21 is an enlarged fragmentary sectional view of the upper door panel hook member taken along the line 21—21 in FIG. 14;

FIG. 22 is an enlarged fragmentary sectional view of the lower door panel closeout spacer taken along the line 22—22 in FIG. 14;

FIG. 23 is an enlarged fragmentary view in partial section of the door latch structure taken along the line 23—23 in FIG. 14;

FIG. 24 is a fragmentary sectional view of the door panel hinge taken along the line 24—24 in FIG. 14;

FIG. 25 is a fragmentary perspective view of one of the auxiliary frame members showing the door latch keeper stud;

FIG. 26 is a top plan view of a shelf for use in the container of FIG. 1;

FIG. 27 is an enlarged fragmentary view of the portion of the shelf designated by the numeral 27 in FIG. 26, with part of the shelf top wall broken away to show one of the movable mounting pin assemblies;

FIG. 28 is a fragmentary view in partial section taken along the line 28—28 in FIG. 27 and showing one of the fixed shelf mounting pins;

FIG. 29 is a fragmentary sectional view of the shelf spacer structure taken along the line 29—29 in FIG. 27;

FIG. 30 is an enlarged fragmentary sectional view of one of the movable shelf mounting pin assemblies taken along the line 30—30 in FIG. 27;

FIG. 31 is a fragmentary sectional view of the shelf front edge closure member taken along the line 31—31 in FIG. 27;

FIG. 32 is an enlarged fragmentary view of the portion of the top wall of the container designated by the numeral 32 in FIG. 3;

FIG. 33 is a fragmentary sectional view of the top wall of the container taken along the line 33—33 in FIG. 32;

FIG. 34 is a fragmentary sectional view of the union of the top and corner frame members taken along the line 34—34 in FIG. 32;

FIG. 35 is a fragmentary view in partial section taken along the line 35—35 in FIG. 10;

FIG. 36 is an enlarged fragmentary sectional view of the outboard side-base frame connecting member taken along the line 36—36 in FIG. 35;

FIG. 37 is an enlarged fragmentary sectional view of the inboard side-base connecting frame member taken along the line 37—37 in FIG. 35;

FIG. 38 is an enlarged fragmentary sectional view of the outboard side-base connecting frame member and a portion of the outboard front corner frame member taken along the line 38—38 in FIG. 35;

FIG. 39 is an enlarged fragmentary sectional view of the bottom wall front closure member taken along the line 39—39 in FIG. 35.

Referring now to the drawings and particularly to FIGS. 1 and 5 thereof, there is illustrated a cargo container 50 made in accordance with and embodying the principles of the present invention. The cargo container 50 is adapted for use in an aircraft, generally designated by the numeral 60, which has the usual parts such as a fuselage 61 and wings 62, with a longitudinally-extending upper deck 63 disposed slightly below the midline of the aircraft 60 thus to define a passenger compartment 64 in the space above the deck 63. Spaced well below the deck 63 and extending substantially parallel thereto is a lower deck 66 cooperating with the upper deck 63 and the fuselage 61 to define a cargo and/or baggage compartment 65 between the decks 63 and 66. In use, there will preferably be provided two rows of cargo containers 50 (or baggage containers, as the case may be) in side-by-side relationship and disposed along the length of the fuselage 61. As will be understood more fully hereinafter, a portion of one side wall in each of the containers 50 is slanted to more nearly conform to the outline of the fuselage 61 so that as much of the cargo compartment 65 as possible may be utilized.

The cargo container 50 according to this invention comprises a generally box-like structure including a substantially rectangular bottom panel 100, a substantially rectangular top panel 180 disposed parallel to the bottom panel 100, and two opposed upstanding side panels 120 and 150 all cooperating to define a pair of door-receiving openings into the container 50 at the front and rear ends thereof. Each of these openings is

closed by a foldable overhead door structure **200** for completely closing the container **50**. One or more shelves **300** may be mounted within the container **50** parallel to the bottom panel **100**. Throughout this specification, in describing the orientation of the various parts of the container **50**, the right-hand side as viewed in FIG. **10** will be referred to as the inboard side, the left-hand side as viewed in FIG. **10** will be referred to as the outboard side, the closed end as viewed in FIG. **10** will be referred to as the rear end, and the open end as viewed in FIG. **10** will be referred to as the front end, this terminology relating to the orientation of the container **50** with respect to the airplane **60**.

Referring now to FIGS. **1**, **2**, and **35** to **39**, the details of construction of the cargo container **50** will be described. The cargo container **50** comprises a base panel, generally designated by the numeral **100**, including a pair of spaced-apart substantially rectangular sheet metal walls **101** and **102** extending generally parallel to each other. Disposed between the walls **101** and **102** is a filler **103** in the form of a body of rigid cellular construction, preferably formed of aluminum having a honeycomb structure, the filler **103** being secured to the walls **101** and **102** by means of a sheet of epoxy. Disposed between the metal walls **101** and **102** at the margins thereof and extending around the periphery of the filler **103** is a rigid frame or spacer structure, generally designated by the numeral **105**, in the form of an elongated channel having a substantially U-shaped cross section with a bight **106** carrying a pair of flanges **107**, with the bight **106** disposed inwardly of the base panel **100** and abutting against the filler **103**. Preferably, for the sake of minimizing its weight and maximizing its strength and simplifying its manufacture, the spacer structure **105** is formed of an aluminum extrusion. The spacer structure **105** lends rigidity to the base panel **100** and, in addition, provides a means for attaching the base panel **100** to other parts of the cargo container **50** as will be described more fully hereinafter. Disposed around the margin of the base panel **100** and extending through the walls **101** and **102** thereof and through the flanges **107** of the spacer structure **105** is a plurality of holes through which suitable fastening means such as screws and bolts may be passed for use in connecting other parts of the cargo container **50** to the base panel **100**. While the opposite side edges of the base panel **100** are substantially parallel along most of their length, they converge slightly at the front and rear ends thereof as at **104**. Similarly, the front and rear edges of the base panel **100** are parallel along most of their length, but converge slightly at the inboard and outboard ends thereof to meet the adjacent converging side edges. Thus, the corners of the base panel form obtuse internal angles rather than right angles as indicated for example, in FIG. **3**.

There are provided along the front and rear edges of the base panel **100**, base closure members, generally designated by the numeral **110**, and also preferably formed of aluminum extrusions. The front and rear closure members **110** are identical in construction and, therefore, only one will be described. Referring to FIG. **39** of the drawings, the closure member **110** comprises an elongated hollow tubular member conforming in contour to the adjacent base panel edge and including a body portion **112**, substantially rectangular in cross section. Extending outwardly from one wall of the body portion **112** is a pair of attachment flanges **114**. In use, the attachment flanges **114** are inserted between the flanges **107** of the adjacent spacer structure **105** so that the body portion **112** of the closure member abuts against the base panel walls **101** and **102**. The attachment flanges **114** are provided with a plurality of openings therethrough aligned with the openings in the adjacent margin of the base panel **100**, whereby the closure member **110** may be securely fastened to the base panel **100** by means of suitable fasteners such as screws or bolts **108**. Respectively attached to the opposite ends of each of the closure members **110** are a pair of base corner closure members **115**, each comprising a hollow, substantially pie-shaped member adapted to fit snugly against an adjacent end of the associated closure member **110** and each having a pair of attachment flanges **117** insertable into the body portion **112** of the associated closure member **110** for attachment thereto by means of suitable fasteners. It will be noted that the base panel walls **101** and **102**, the filler **103**, the spacers **105**, and the closure members **110** and **115** are all permanently secured together to form a single base panel unit.

The outboard side panel **120** comprises a flat substantially rectangular sheet-metal wall **121** bent to form an upwardly and outwardly slanted bottom portion **122** and a substantially vertical upstanding top portion **123**. There is preferably provided along the crease between the lower portion **122** and the upper portion **123** a sheet metal bumper strip **124** which is preferably riveted to the outer surface of the side panel **121**. Disposed along the inner surface of the sheet-metal wall **121** is a plurality of generally upstanding stiffening frame members or ribs **125**, each extending substantially the entire length of the sheet-metal wall **121** and bent to conform to the contour thereof. Each of the stiffening ribs **125** comprises a tubular body portion **126** substantially rectangular in cross section and an attachment flange **127** extending outwardly from the body portion **126** in alignment with one wall thereof and integral therewith. The stiffening ribs **125** are secured to the sheet-metal wall **121** by means of a plurality of rivets **128** which are passed through complementary openings in the sheet-metal wall **121** and the attachment flanges **127**. The forward walls of the tubular body portions **126** are each provided with a plurality of vertically aligned and spaced-apart holes **129**, the purpose of which will be explained hereinafter.

Respectively disposed along the front and rear edges of the side panel wall **121** are a pair of elongated, substantially upstanding corner frame members **130**, each of the frame members **130** extending the entire length of the side panel wall **121** and bent to conform to the contour thereof. The corner frame members **130** are substantially mirror images of each other and only the front one will be described. The frame member **130** includes a tubular body portion **131** substantially rectangular in cross section and having an outboard side wall **131*a*** and an inboard side wall **131*b***. Integral with the body portion **131** and extending outwardly therefrom in alignment with the outboard side wall **131*a*** thereof is a door-receiving flange **132**, and integral with and extending from the rear wall of the body portion **131** substantially normal thereto and toward the opposite end of the container is an attachment flange **133**, each of the flanges **132** and **133** extending the entire length of the corner frame member **130**. There is preferably also provided an abutment flange **132*a*** substantially L-shaped in cross section and extending forwardly of the body portion **131** and outwardly toward the door-receiving flange **132**. The attachment flange **133** is offset inwardly of the body portion **131** a short distance substantially equal to the thickness of the side panel wall **121**, the adjacent margin of the side panel wall **121** overlying the attachment flange **133** and abutting against the body portion **131** of the corner frame member **130**, the outer surface of the side panel wall **121** being flush with the outer surface of the outboard side wall **131*a*** of the body portion **131**. The attachment flange **133** is secured to the overlying margin of the side panel wall **121** by aligned, vertically spaced openings therethrough for receiving suitable fastening means, such as rivets, to attach the corner frame member **130** to the side panel wall **121**. The upper edge of the outer side wall **131*a*** of the corner frame member **130** carries a substantially U-shaped notch **137*a*** therein adjacent to the door-receiving flange **132** for a purpose which will be described hereinafter. Each of the corner frame members **130** is provided with a plurality of vertically aligned spaced-apart openings **139** in the body portion **131** thereof, the rear one of the corner frame members **130** having the openings **139** provided in the front wall of the body portion **131** and the forward one of the corner frame members **130** having the openings **139** provided in the inboard side wall **131*b*** thereof, all for a purpose to be explained hereinafter.

Attached to the bottom end of each of the corner frame members **130** is a substantially U-shaped attachment bracket **135** having a bight **136** carrying a pair of upstanding flanges **137**. The flanges **137** are disposed within the lower end of the adjacent body portion **131** of the corner frame member **130** and are respectively fastened to the front and rear walls thereof by means of rivets **138**.

A side-base connecting frame member, generally designated by the numeral **140**, is provided along the bottom edge of the outboard side panel **120**. The side-base connecting frame member **140** comprises an elongated tubular body portion **142** substantially rectangular in cross section and having a pair of attachment flanges **144** extending outwardly from one wall thereof substantially normal thereto. Integral with the body portion **142** and extending vertical upwardly therefrom is an upstanding flange **146** carrying at the upper end thereof an outwardly and upwardly inclined attachment flange **148**. The attachment flange **148** overlies the bottom margin of the side panel wall **121** and is secured thereto by a plurality of rivets **149**, alternate ones of the rivets **149** preferably being aligned with the stiffening ribs **125** and extending therethrough for securely fastening the stiffening ribs **125**, the side panel wall **121** and the side-base connecting frame member **140** together as a single structural unit. The opposite ends of the side-base connecting frame member **140** extend outwardly beyond the adjacent margins of the side panel wall **121**, whereby the attachment flange **148** overlies bottom ends of the outer side walls **131***a* of the corner frame members **130** and is secured thereto by means of rivets.

In use, the attachment flanges **144** of the side-base connecting frame member **140** are inserted between the flanges **107** of the adjacent base panel spacer **105** so that the outer edges of the flanges **107** and of the base panel walls **101** and **102** abut against the body portion **142** of the side-base connecting frame member **140**. A plurality of screws **108** are disposed through complementary openings in the base panel walls **101** and **102**, the spacer flanges **107** and the attachment flanges **144** for securely fastening the side-base connecting frame member **140** to the adjacent edge of the base panel **100**. The screws **108** are preferably arranged in groups of three, with the center screw of each group of three extending downwardly through the top wall **101** of the base panel **100** and the other screws (not shown) of each group of three extending upwardly through the bottom wall **102** of the base panel **100**, the latter screws perferably being of the flathead counter-sunk variety so as to present a smooth flush surface along the bottom of the base panel **100**. The screws **108** are preferably engaged in corresponding nuts **145** which are permanently attached to the inner surfaces of the attachment flanges **144** of the side-base connecting frame member **140**. The U-shaped attachment bracket **135** is disposed closely adjacent to the inner surface of the upstanding flange **146** of the side-base connecting frame member **140**, with the bight **136** disposed upon and parallel to the adjacent margin of the base panel wall **101**. Suitable fasteners such as bolts **108***a* are disposed in complementary openings in the bight **136**, the base panel wall **101**, the spacer flange **107** and the attachment flange **144** and are engaged with nuts **145** attached to the inner surface of the attachment flange **144** for securely joining together the attachment bracket **135**, the base panel **100** and the side-base connecting frame member **140**.

The inboard side panel, generally designated by the numeral **150**, comprises a flat upstanding substantially rectangular sheet-metal wall **151** disposed substantially parallel to the upper portion **123** of the outboard side panel wall **121**. Disposed along the inner surface of the sheet-metal wall **151** is a plurality of elongated upstanding stiffening frame members or ribs **155**, each extending substantially the entire length of the sheet-metal wall **151**. Each of the stiffening ribs **155** comprises a tubular body portion **156** substantially rectangular in cross section and an attachment flange **157** extending outwardly from the body portion **156** in alignment with one wall thereof and integral therewith. The stiffening frame members **155** are secured to the sheet-metal wall **151** by means of a plurality of rivets **158** which are passed through complementary openings in the sheet-metal wall **151** and the attachment flanges **157**. The forward walls of the tubular body portions **156** are each provided with a plurality of vertically aligned and spaced-apart holes **159**, the purpose of which will be explained hereinafter.

Respectively disposed along the front and rear margins of the side panel wall **151** are a pair of elongated upstanding corner frame members **160**, each of the corner frame members **160** extending the entire length of the side panel wall **151**. The corner frame members **160** are mirror images of each other and only the front one will be described. The corner frame member **160** comprises a tubular body portion **161** quadrangular in cross section with an inboard side wall **161***a* disposed substantially parallel to the adjacent angled corner edges **104** of the base panel **100** and an outboard side wall **161***b* substantially parallel to the side panel wall **151**. Integral with the inboard wall **161***a* of the body portion **161** and extending outwardly therefrom in alignment therewith is a door-receiving flange **162**, and integral with and extending outwardly from the rear wall of the body portion **161** substantially parallel to the outboard side wall **161***b* thereof is an attachment flange **163**, each of the flanges **162** and **163** extending vertically the entire length of the corner frame member **160**. There is also preferably provided an abutment flange **162***a*, substantially L-shaped in cross section, and similar in structure to the abutment flange **132***a* on the corner frame member **130** and disposed as indicated in FIG. **27**. The attachment flange **163** is offset inwardly of the inboard side wall **161***a* a short distance substantially equal to the thickness of the side panel wall **151**, the adjacent margin of the side panel wall **151** overlying the attachment flange **163** and abutting against the inboard side wall **161***a* of the corner frame member **160**, the outer surface of the side panel wall **151** being flush with the outer surface of the wall **161***a* of the corner frame member **160**. The attachment flanges **163** and the overlying margins of the side panel wall **151** have a plurality of aligned, vertically spaced openings therethrough for receiving suitable fastening means, preferably rivets, to attach the corner frame members **160** to the side panel wall **151**. The upper edge of the inboard side wall **161***a* of the corner frame member **160** carries a substantially U-shaped notch **167***a* therein adjacent to the door-receiving flange **162** for a purpose to be described hereinafter. Each of the corner frame members **160** is provided with a plurality of vertically aligned spaced-apart openings **169** in the body portion **161** thereof, the rear one of the corner frame members **160** having the openings **169** provided in the front wall of the body portion **161**, and the forward one of the corner frame members **160** having the openings **169** provided in the outboard side wall **161***b* of the body portion **161**, all for a purpose to be explained hereinafter. The lower ends of the body portions **161** of each of the corner frame members **160** has the inboard side wall **161***a* thereof cut away to form a recess or shoulder **166**, the purpose of which will be explained hereinafter.

A side-base connecting frame member, generally designated by the numeral **170**, is provided along the bottom edge of the inboard side panel **150**, the side-base connecting frame member **170** comprising an elongated tubular body portion **172** substantially rectangular in cross section and having a pair of attachment flanges **174** extending outwardly from one wall thereof substantially normal thereto. Integral with the body portion **172** and extending vertically upwardly therefrom is an upstanding flange **176** carrying at the upper end thereof a support flange **177** extending outwardly therefrom substantially normal thereto. Integral with the outer end of the support flange **177** and extending upwardly therefrom substantially normal thereto is an attachment flange **179**. The side-base connecting frame member **170** is disposed in use directly beneath the bottom edge of the side panel **150**, with the bottom edges of the side panel wall **151** and the stiffening frame members **155** resting upon the support flange **177** and with the

shoulder portions **166** of the corner frame members **160** seated upon the support flange **177** and against the upstanding flange **176**. In this position, the attachment flange **178** overlies the outer surface of the bottom margin of the side panel wall **151** and is secured thereto by a plurality of rivets **179** which are passed through complementary aligned openings in the attachment flange **178**, alternate ones of the rivets **179** preferably being aligned with the stiffening ribs **155** and extending therethrough for securely fastening the side panel wall **151** and the stiffening ribs **155** and the corner frame members together as a single structural unit.

In use, the attachment flanges **174** on the side-base connecting frame member **170** are inserted between the flanges **107** of the adjacent base panel spacer **105** so that the outer edges of the flanges **107** and the base panel walls **101** and **102** abut against the body portion **172** of the side-base connecting frame member **170** to form flush surfaces therewith. A plurality of screws **108** are disposed through complementary openings in the base panel walls **101** and **102**, the spacer flanges **107** and the attachment flanges **174** for securely fastening the side-base connecting frame member **170** to the adjacent edges of the base panel **100**. The screws **108** are preferably arranged in groups of three in the same manner as described with respect to the side-base connecting frame member **140**, above, and are similarly engaged in corresponding nuts as described above.

The body portions **142** and **172** of the side-base connecting frame members **140** and **170** respectively each have the opposite ends thereof abutting against the adjacent corner closure members **115** and cooperate therewith and with the closure members **110** to form a continuous tubular bumper strip extending around the periphery of the base panel **100** to protect the base panel **100** and to assist in mounting the cargo container **50** in an aircraft as will be described more fully hereinafter. The outer surfaces of the closure members **110** and **115** and body portions **142** and **172** of the side-base connecting frame members **140** and **170** are all substantially identical in cross section so as to present a continuous flush outer surface for the bumper strip around the base panel **100**.

Respectively disposed along the upper margins of the side panels **120** and **150** are a pair of side-top right-angle frame members **165** each comprising a pair of legs **165*a*** and **165*b***, the leg **165*a*** being longer than the leg **165*b*** and extending a short distance beyond the opposite ends thereof. In use, the leg **165*a*** is attached to the upper margin of the adjacent side panel wall along the outer surface thereof by a plurality of horizontally aligned rivets **168**, with the leg **165*b*** disposed a short distance above the upper edge of the adjacent side panel wall and extending inwardly thereof.

The side-top right-angle frame members **165** extend substantially the entire length of the side panel walls **121** and **151** between the associated corner frame members **130** or **160**, with the ends of the legs **165*a*** abutting against the body portions **131** or **161** of the associated corner frame members and with the ends of the legs **165*b*** respectively abutting against the inner ends of the attachment flanges **133** or **163** of the corner frame members.

Referring now to FIGS. **3** and **32** to **34** of the drawings, the top panel **180** of the container **50** will be described hereinafter. The top panel **180** comprises a flat substantially rectangular sheet-metal wall **181** disposed substantially parallel to the bottom panel **100**. The opposite side margins of the top panel wall **181** respectively overlie the flanges **165*b*** of the angle frame members **165** and are respectively spaced therefrom by a pair of flat, elongated edge bars **182**. The top panel wall **181** is securely fastened to the angle frame members **165** by a plurality of fastening means **183** which extend through complementary aligned openings through the margins of the top panel wall **181**, the edge bars **182** and the angle frame member flanges **165*b***. Preferably, the fastening means **183** may comprise screws or bolts engageable with nuts on the inner surface of the angle member flanges **165*b***. A plurality of elongated stiffening frame members **185** are provided along the inner surface of the top panel wall **181**, the stiffening frame members **185** extending substantially parallel to the side panels **120** and **150** from the front edge to the rear edge of the top panel wall **181**. Each of the stiffening frame members **185** comprises an elongated channel, the cross section of which includes a U-shaped central portion **186**, a pair of side flanges **187** respectively extending outwardly from the sides of the U-shaped portion **186** and respectively carrying at the outer edges thereof a pair of upturned flanges **188**, the stiffening frame members **185** being disposed in use with the bight of the U-shaped portion **186** abutting against the inner surface of the top panel wall **181** and secured thereto by rivets **189**.

Respectively disposed along the front and rear edges of the top panel wall **181** are a pair of end-top frame members, generally designated by the numeral **190**, and each extending the entire length of the top panel wall **181** from the side panel wall **121** to the side panel wall **151**. Each of the end-top frame members **190** comprises an elongated tubular body portion **191** substantially rectangular in cross section. Integral with the body portion **191** and extending outwardly from the rear wall thereof substantially normal thereto is an attachment flange **193**. The adjacent margin of the top panel wall **181** overlaps the attachment flange **193** with the edge of the top panel wall **181** abutting against the body portion **191** and with the outer surface of the top panel wall **181** being flush with the top outer surface **192** of the body portion **191**. The top panel wall **181** is preferably secured to the attachment flanges **193** by a plurality of rivets **194**. The top front corner of the body portion **191** is provided with a substantially U-shaped abutment flange **195**, with the bight of the "U" being integral with the upper edge of the forward wall of the body portion **191**, one flange of the "U" extending upwardly toward and being integral with the top wall **192** of the body portion **191** and the other flange of the "U" extending upwardly and outwardly beyond the front wall of the body portion **191**. The end-top frame member **190** is disposed in use above the upper ends of the adjacent corner frame members **130** and **160**. Referring to FIG. **34** of the drawing, the upper end of the inner portion of the corner frame member **131** is cut away, whereby the outer side wall **131*a*** extends upwardly beyond the inner side wall **131*b***. Similarly, the bottom wall of the body portion **191** of the end-top frame **190** is cut away at the opposite ends thereof whereby the top wall of the body portion **191** extends outwardly a slight distance beyond the ends of the bottom wall of the body portion **191**. Thus, the frame member **190** may be disposed atop the corner frame member **130** with the bottom wall of the body portion **191** resting on the upper edge of the inner side wall **131*b*** and with the end of the top wall of body portion **191** resting upon the upper edge of the outer side wall **131*a***. In this position, the opposite ends of the U-shaped flange **195** will respectively rest in the notches **137*a*** and **167*a*** in the corner frame members **130** and **160**. A right-angle attachment bracket **196** is provided at the outer ends of the end-top frame member **190**, the angle bracket **196** having a horizontal flange **197** overlying the bottom wall of the body portion **191** and attached thereto by rivets **197*a*** and a downwardly vertically extending flange **198** abutting against the inner surface of the outer side wall **131*a*** parallel thereto. The flange **198** is secured to the outer side wall **131*a*** by suitable fastening means such as screws or bolts. In like manner, the inboard ends (not shown) of the top frame members **190** is secured to the corner frame members **160** by identical attachment brackets **196**.

A pair of gusset plates **152** are respectively provided at the upper corners of the container **50** at each end thereof. Referring, for example, to FIGS. **2** and **12** of the drawings, each of the gusset plates **152** is substantially triangular in outline having one leg thereof overlying the forward wall of the adjacent corner frame member **130** or **160** and secured thereto by three rivets **154**. Another leg of the gusset plate **152** is secured to the forward wall of the end-top frame **190** by means of three screws or bolts **207**. At the upper corner of each of the gusset plates **152** between the attachment legs thereof is a

recess or notch 152*a*, the purpose of which will be described hereinafter. At the bottom end of each of the corner frame members 130 is provided another pair of gusset plates 153, also generally triangular in outline. One of the gusset plates 153 of each pair has one edge thereof overlying the front wall of the body portion 131 of the adjacent corner frame member 130 substantially parallel thereto and secured thereto by means of a plurality of rivets. The other one of each pair of the gusset plates 153 has one edge thereof overlying the rear wall of the body portion 131 of the adjacent corner frame member 130 substantially parallel thereto and secured thereto by means of a plurality of rivets.

It will be noted that the side panel wall 121, the corner frame members 130, the side-base connecting frame member 140, the adjacent one of the side-top right-angle frame members 165, the gusset plates 153 and the adjacent one of the gusset plates 152 are all permanently riveted together into a single outboard side panel unit. Similarly, the side panel wall 151, the corner frame members 160, the side-base connecting frame member 170, the adjacent one of the side-top right-angle frame members 165 and the adjacent ones of the gusset plates 152 are all permanently riveted together into a single inboard side panel unit. In like manner, the top panel wall 181 is permanently riveted to the stiffening frame members 185 and the end-top connecting frame members 190 to form a single top panel unit.

The container 50 is also provided with a pair of auxiliary reinforcing frame members 201 and 202, the frame member 201 being disposed adjacent to the forward end of the container 50 and the frame member 202 being disposed at the rear end thereof. Each of the frame members 201 and 202 comprises an elongated upstanding tubular member substantially rectangular in cross section. The bottom end of each of the frame members 201 and 202 is disposed between the adjacent pair of gusset plates 153 and is secured thereto by suitable fastening means such as screws or bolts 207. At the upper ends of each of the frame members 201 and 202 there is provided a generally triangular gusset plate 203 attached to the outer wall thereof by means of screws or bolts, the upper edge of each of the gusset plates 203 respectively overlying the outer walls of the adjacent end-top frame members 190 and secured thereto by screws or bolts. The auxiliary frame member 201 is provided along the inboard side thereof (right-hand side as viewed in FIGS. 2 and 12) with a plurality of vertically aligned and spaced-apart openings 208 and the auxiliary frame member 202 is similarly provided along the forward wall thereof with a plurality of vertically aligned spaced-apart openings 209. Preferably, the openings 208 are equal in number to the openings 209 and to the openings 129, 139, 159 and 169 in the other frame members, with corresponding ones of the openings in the various frame members being in horizontal alignment with each other. The forward wall of the auxiliary frame member 201 and the forward wall of the front one of the corner frame members 160 are each provided with a small cushion 206 preferably formed of a resilient material such as sponge rubber. Similarly, identical cushions (not shown) are provided on the rear walls of the frame members 202 and the rear one of the frame members 160.

When assembled, the front ones of the frame members 130, 160 and 190 cooperate with each other and with the front edge of the base panel 100 to define a front access opening into the container 50. Similarly, the rear ones of the frame members 130, 160 and 190 cooperate with each other and with the rear edge of the base panel 100 to define a rear access opening into the container 50. These access openings are respectively closed by a pair of door structures or assemblies, each generally designated by the numeral 200 and being mirror images of each other, wherefore only one of these door assemblies will be described in detail.

Referring now to FIGS. 10 to 25 of the drawings, a pair of door bracket assemblies, generally designated by the numeral 210, are respectively provided on the end-top frame members 190 adjacent to the opposite ends thereof. Since the door bracket assemblies 210 are mirror images of each other only the outboard one will be described in detail. Each of the door bracket assemblies 210 includes a mounting block 211 disposed on the inner surface of the top wall of the body portion 191 and is secured thereto by a screw 212. The outboard side of the mounting block 211 has a recessed portion 213 at the front end thereof in which is mounted a pivot pin 214. A generally U-shaped pivot member 215 is mounted on the pivot pin 214, the pivot member 215 having a bight 215*a* and a flange 216 and a pair of eyelets 217, the pivot pin 214 being disposed through the eyelets 217 for pivotal mounting thereof. Connected to the flange 216 of the pivot member 215 is a slide or track member, generally designated by the numeral 220, the slide member 220 comprising an angle bracket 221 having an elongated arm 224 and a short attachment arm 222 connected to the flange 216 of the pivot member 215 by means of rivets 223. Mounted on the outer surface of the arm 224 and substantially coterminous therewith is a solid rail 225 substantially T-shaped in cross section having a stem 226 and a cross bar 227. The rail 225 is attached to the arm 224 by means of a plurality of screws 228 extending therethrough and through the stem 226 and being engageable with nuts 229 recessed in the outer surface of the cross bar 227.

The door bracket assembly 220 has a normal closed position as shown in FIG. 15 wherein the arm 224 extends vertically downwardly from the pivot member 215, the pivot member 215 and the attachment flange 222 of the angle bracket 221 being disposed within the body portion 191 of the end-top frame member 190, an opening 191*a* being provided in the front wall of the body portion 191 for this purpose, access to the opening 191*a* being provided by the notch 152*a* in the gusset plate 152. In this position, the bight 215*a* of the pivot member 215 is disposed generally rearwardly with the flange 216 and the eyelets 217 being disposed generally forwardly thereof, as is shown in FIG. 15. From the closed position illustrated in FIG. 15, the door bracket assembly 220 may be pivotally moved counterclockwise as viewed in FIG. 15 on the pivot pin 214 to an open position wherein the elongated arm 224 is disposed substantially parallel to the top panel wall 181 as illustrated in FIG. 16. In the open position shown in FIG. 16, the pivot member 215 is in contact with the lower surface of the U-shaped flange 195 on the end-top connecting frame member 190. The complementary shapes of the flange 195 and the pivot member 215 allow the flange 195 to nest snugly within the pivot member 215 when the door bracket assembly is in the open position thereof whereby the flange 195 serves as a stop to restrain the outward pivotal movement of the door bracket assembly 220 in the opening direction. It will of course be understood that the inboard one of the door bracket assemblies 220 is similarly constructed and operates in an identical fashion.

Slidably mounted on the door bracket assemblies 220 is an upper door panel, generally designated by the numeral 230, and comprising a pair of flat substantially rectangular sheet-metal walls 231 and 232 extending generally parallel to each other and dimensioned to completely cover the upper portion of the adjacent access opening into the container 50. Disposed between the walls 321 and 232 is a filler 233 in the form of a body of rigid cellular construction preferably formed of aluminum having a honeycomb structure, the filler 233 being secured to the walls 231 and 232 by means of a sheet of epoxy (see FIGS. 23 and 24). Disposed between the walls 231 and 232 at the margins thereof and extending around the periphery of the filler 233 is a rigid frame or spacer structure, generally designated by the numeral 235, in the form of an elongated channel having a substantially U-shaped cross section with a bight 236 carrying a pair of flanges 237, with the bight 236 disposed inwardly of the door panel 230 and abutting against the filler 233. The spacer structure 235 is substantially similar in construction and function to the spacer structure 105 in the base panel 100.

Respectively disposed along the inboard and outboard edges of the upper door panel 230 and extending the length

thereof is a pair of elongated slide or track channels, generally designated by the numeral **240**, and being mirror images of each other, wherefore only the outboard one will be described in detail. Referring to FIG. **20** of the drawings, the slide channel **240** has a body portion generally C-shaped in cross section and including a bight **241** and a pair of side flanges **242**, each of the side flanges **242** being integral at one end thereof with the bight **241** and carrying at the other end thereof a short retaining flange **243**, the retaining flanges **243** extending toward each other and substantially parallel to the bight **241**. The inboard one of the side flanges **242** is provided with a pair of attachment flanges **248** extending therefrom substantially normal thereto. In use, the attachment flanges **248** are inserted between the flanges **237** of the adjacent spacer **235** so that the adjacent edges of the flanges **237** and of the door panel walls **231** and **232** abut against the slide channel inboard side flange **242**, with the outer surfaces of the walls **231** and **232** respectively being flush with the outer surfaces of the bight **241** and the inboard retaining flange **243** of the slide channel **240**. The slide channels **240** are each secured to the adjacent edge of the door panel **230** by means of a plurality of rivets extending through the door panel walls **231** and **232**, the spacer flanges **237** and the side channel attachment flanges **248**. Disposed through the outer one of the side flanges **242** adjacent to the lower end of each of the slide channels **240** is a stop pin **244**, the function of which will be described hereinafter. It will be understood that the inboard one of the slide channels **240** is suitably constructed.

Disposed along the upper edge of the upper door panel **230** is a hook or support member **245** extending along the entire length of the door panel **230** from the inboard edge to the outboard edge thereof. Referring to FIG. **21** of the drawings, the hook member **245** includes a body portion **246** having a generally inverted-U-shaped neck or hook **247** integral with an extending upwardly from the upper surface thereof. Extending downwardly from the lower surface of the body portion **246** is a pair of attachment legs or flanges **249** disposed in use between the flanges **237** of the adjacent door panel spacer **235**, with the upper edges of the spacer flanges **237** and the door panel walls **231** and **232** abutting against the body portion **246** of the hook member **245**. The hook member **245** is secured to the adjacent edge of the door panel **230** by means of a plurality of rivets which are passed through the door panel walls **231** and **232**, the spacer flanges **237** and the hook member attachment flanges **249**. It should be noted that the hook member **245** does not have the cross section shown in FIG. **21** along the entire length thereof. While the body portion **246** and hook member **247** extend the entire length of the door panel **230** and overlie the top edges of the slide channels **240**, the attachment flanges **249** extend only as far as the inner ends of the attachment flanges **248** on the slide channels **240**.

As can be seen from FIGS. **15** to **17**, the slide channels **240** are each shaped complementary to the rails **225** on the door bracket assemblies **220** and are adapted to be fitted thereover for slidable engagement therewith. Thus, the upper door panel **230** may be slidably moved along the cooperating slide or truck members **225** and **240** between an extended condition as shown in phantom in FIG. **11** and a retracted condition as shown in solid lines in FIG. **11** all as will be described further hereinafter. Sliding movement of the door panel **230** in the retracting direction is limited by the engagement of the stop pins **244** in the slide channels **240** with the lower ends of the rails **225** as indicated in FIG. **11**. Sliding movement of the door panel **230** in the extending direction is limited by engagement by the hook **247** with the slide bracket **221** when the door bracket assembly **220** is in the fully opened position as shown in FIG. **16** or by engagement of the hook **247** in the U-shaped flange **195** when door bracket assembly **220** is in the closed position as shown in FIG. **15**.

It is a significant feature of this invention, that when the door bracket assemblies **220** are in the open positions thereof the elongated arms **224** and the attached rails **225** are disposed a short distance above the top panel wall **181** and substantially parallel thereto. Thus, when the door bracket assemblies **220** are in the open positions thereof, the movement of the upper door panel **230** in the retracting direction along the track members **225** and **240** will serve to slide the top door panel **230** into a position overlying the top panel **180** substantially parallel thereto for convenient stowage of the door panel **230** to facilitate loading and unloading of the container **50**. For this purpose, the dimensions of the door bracket assemblies **220** are such that the vertical distance between the top panel wall **181** and the elongated arm **224** in the open position of the door bracket assemblies **220** is just sufficient to allow free movement of the door panel **230** above the top panel **180**.

There is also provided a lower door panel, generally designated by the numeral **250**, and conforming in outline to the lower portion of the adjacent access opening into the container **50**. The lower door panel **250** includes a pair of spaced-apart flat sheet-metal walls **251** and **252** extending generally parallel to each other. Disposed between the walls **251** and **252** is a filler **253** in the form of a body of rigid cellular construction, preferably formed of aluminum having a honeycomb structure, the filler **253** being secured to the walls **251** and **252** by means of a sheet of epoxy (see FIGS. **23** and **24**). Disposed between the metal walls **251** and **252** along the upper margin thereof is a rigid frame or spacer structure generally designated by the numeral **255** in the form of an elongated channel having a substantially U-shaped cross section with a bight **256** carrying a pair of flanges **257**, the bight **256** being disposed inwardly of the door panel **250** and abutting against the upper edge of the filler **253**. The spacer structure **255** is substantially the same in construction and function as the spacer **235** in the upper door panel **230**. Disposed between the metal walls **251** and **252** along the side and bottom margins thereof is a tubular spacer structure **254** substantially rectangular in cross section. The spacer **254** is inserted between the walls **251** and **252** with one end thereof abutting against the filler **253** and the opposite end thereof being flush with the adjacent edges of the walls **251** and **252**. The spacer **254** is secured to the door panel **250** by means of a plurality of rivets. There is provided along the bottom margin of the lower door panel **250** a plurality of retaining tabs **257**, each comprising a thin strip of metal secured to the bottom panel walls **251** and **252** by means of screws or bolts **258** and extending downwardly beyond the bottom edge of the door panel **250** and respectively engageable in the slots **109** in the base panel **100** as will be described more fully hereinafter.

The upper end of the lower door panel **250** is pivotally connected to the lower end of the upper door panel **230** by means of a hinge structure, generally designated by the numeral **260**, and being of the piano-hinge variety. The hinge structure **260**, comprises a hinge pin **261** on which are pivotally mounted a pair of hinge plates **262**. Each of the hinge plates **262** includes a pivot leg **263** having at one end thereof a foot portion **264**, the foot portion **264** carrying a pair of attachment flanges **265** extending outwardly therefrom. At the other end of each of the pivot legs **263** is a plurality of eyelets **269**. In use, the eyelets **269** on each of the hinge plates **262** are aligned with each other with the hinge pin **261** disposed therethrough for providing pivotal movement of the hinge plates **262** with respect to each other. The attachment flanges **265** of one of the hinge plates **262** is inserted between the flanges **237** on the spacer **235** of the upper door panel **230** while the attachment flanges **265** of the other of the hinge plates **262** is inserted between the flanges **257** of the spacer **255** of the bottom door panel **250**. The door panels **230** and **250** are respectively secured to the associated ones of the hinge plates **262** by means of a plurality of bolts **266** extending through the associated door panel walls, spacer flanges, and hinge plate attachment flanges and engaging with nuts **267** on the inner surfaces of the door panels. While the lower one of the hinge plates **262** extends the entire length of the upper margin of the door panel **250**, the upper one of the door hinge plates **262** extends only as far as the inner ends of the slide channels **240** on the upper door panel **230** as can be seen from FIG. **14**.

The lower door panel 250 is pivotally movable on the hinge structure 260 through an arc of at least 180°. When the door bracket assemblies 220 are in the closed positions thereof as indicated in FIG. 15, the lower door panel 250 is movable between a closed position extending downwardly from the upper door panel 230 substantially in alignment therewith as indicated, for example, in FIG. 14 and an open or folded position disposed alongside the upper door panel 230 substantially parallel thereto as indicated, for example in FIG. 11. In moving from the closed position to the open or folded position thereof, the lower door panel 250 is swung in the direction of the arrows in FIG. 7 (outwardly toward the viewer in FIG. 14). This folding relationship between the upper and lower door panels 240 and 250 allows the door structure 200 to be fully opened in a relatively small end clearance space, whereby it may be possible to open the container 50 in the cramped quarters of an aircraft cargo compartment or in the airport cargo handling facilities should this become necessary.

Referring now to FIGS. 1, 14, 23 and 25 of the drawings, a pair of latch mechanisms generally designated by the numeral 270 are provided on the door structure 200. Each of the latch mechanisms 270 includes an elastic strap 271 secured at one end thereof to the outer surface of the upper door panel 230 by means of a suitable mounting member 272 such as a rivet. Preferably, the strap 271 hangs downwardly from the mounting member 272 and carries at the lower end thereof a latch plate 275, the latch plate 275 having an opening therethrough at the upper end thereof through which is received an attachment strip 273, the ends of which are preferably stitched to the lower end of the elastic strap 271. The latch plate 275 is provided with a keyhole-shaped opening 276 therethrough having a generally circular enlarged upper portion 278 communicating with a narrow lower portion or slot 277. Attached to the lower end of the latch plate 275 is a handle strap 279.

Each of the latch mechanisms 270 is designed to cooperate with a corresponding keeper, generally designated by the numeral 280, and securely fastened to the container 50. Preferably, one of the keepers 280 is mounted on the front surface of the reinforcing strut 201 and the other of the keepers 280 is mounted on the front wall of the front corner frame member 160 as indicated in Fig. 2. Each of the keepers 280 includes a generally hexagonal stock or body portion 281 having a relatively small diameter cylindrical shaft extending outwardly therefrom and coaxial therewith, the outer end of the shaft 282 having an enlarged diameter rounded head 283 thereon. Preferably, the stock 281 is threadedly engaged with the corresponding strut 201 or frame member 160. The head 283 has a diameter only slightly less than the diameter of the opening 278 in the latch plate 275, while the shaft 282 has a diameter slightly less than the width of the slot 277 in the latch plate 275. A pair of openings 268 are provided through the hinge structure 260 for accommodating the keeper studs 280 therethrough when the door structure 200 is closed as indicated in Fig. 23. When the door structure is closed and in the position indicated in FIG. 23, the keeper studs 280 are extended through the openings 268 in the hinge structure 260. Normally, in the relaxed condition thereof, the elastic strap 271 will maintain the latch plate 275 above the keeper studs 280. Thus, by appropriate tensioning of the elastic strap 271, the latch plate 275 is lowered to allow the head 283 of the keeper 280 to extend through the opening 278 in the latch plate 275. Upon subsequent release of the latch mechanism 270, the tension in the strap 271 will pull the latch plate 275 upwardly engaging the shaft 282 of the keeper 280 in the slot 277 of the latch plate 275, thereby preventing accidental disengagement of the latch 275 from the keeper 280 since the diameter of the head 383 is too great to allow it to pass through the slot 277.

The operation of the door structure 200 will now be described. The door structure 200 is movable between a closed position illustrated in FIGS. 1 and 14 of the drawings wherein it completely closes the adjacent door-receiving opening, and a folded stowed position atop the container 50 as illustrated in FIGS. 10 and 11 of the drawings. In the closed position, the door bracket assemblies 220 are in the closed positions thereof (see FIG. 15), the upper door panel 230 is in the extended condition thereof and the lower door panel 250 is in the closed or unfolded position thereof. In this position, the hook 247 on the hook member 245 is an engagement in the U-shaped flange 195 on the end-top frame member 190, whereby the weight of the door panels 230 and 250 is supported by the end-top frame member 190. Also, the retaining tabs 257 are inserted in the corresponding slots 109 in the base panel 100 and the latch keeper studs 280 are disposed through the openings 268 in the hinge structure 260. When the latch mechanism 275 is in engagement with the keeper 280 as indicated in FIG. 14, the door structure 200 is securely locked in its closed position. The door panels are maintained in the door-receiving opening with the keeper studs 280 extending therethrough by means of the latch mechanism, thus preventing outward movement of the door bracket assemblies 220 and preventing slidable movement of the upper door panel 230. The retaining tabs 257 engage with the bottom panel 100 to prevent pivotal movement of the bottom panel 100 on the hinge structure 260, which movement is also retarded by the latch plates 275. Further, the side margins of the door panels 230 and 250 lie within the recesses formed by the door-receiving flanges 132 and 162 on the corner frame members 130 and 160 and respectively abut against the abutment flanges 132*a* and 162*a* thereof. Thus, inward pivotal movement of the door panels is restrained and a flush outer surface is presented at the ends of the container 50.

In order to move the door structure 200 from the closed position thereof to the folded stowed position thereof, the latch mechanisms 270 are first disengaged from the corresponding keepers 280. Thus freed, the hinge structure 260 may be moved slightly outwardly from the door-receiving opening sufficiently to disengage it from the keeper studs 280. As can be seen from FIG. 23, only a slight outward movement of the hinge structure 260 is required to effect such disengagement. Thus disengaged, the upper door panel 230 may be slid upwardly along the tracks 225 and 240 a slight distance sufficient to completely disengage the retaining tabs 257 from the slots 109 in the base panel 100. Then the lower door panel 250 may be swung upwardly outwardly as indicated by the arrows in FIG. 7 until it lies alongside and substantially parallel to the upper door panel 230. For this purpose a handle strap 295 is preferably affixed to the outer surface of the lower door panel wall 251. When the door structure 200 is in the position shown in FIG. 7, the folded door panels 230 and 250 are swung upwardly outwardly as indicated by the arrows in FIG. 8 until the door bracket assemblies 220 are in the fully opened position indicated in FIGS. 8 and 16. The upper door panel 230 is then slid back along the slide rails 225 into the stowed position above the top panel 180 of the container 50 as indicated by the arrows in FIG. 9. In the fully stowed position, shown in FIG. 11, the stop pins 244 in the door panel slide 240 abut against the lower ends of the slide rails 225 and prevent further sliding movement of the door panel 230 in the retracting direction, and the folded door panels will extend outwardly beyond the front edge of the container 50 a short distance substantially equal to the length of the slide rail 225.

It will be noted that in the stowed position thereof, the door structure 200 occupies a space which extends vertically only a slight distance above the top panel of the container 50, this distance not exceeding 6 inches in the preferred embodiment of this invention. Further, it will be noted that the entire opening operation of the door structure 220 requires no more than this 6 inch clearance above the container and a space in front of the container slightly greater than the height of one of the door panels. Thus, the door structure 200 may be opened even when the container 50 is in place in the cargo compartment of an airplane, while at the same time the container 50 is nearly completely occupying the available space in the cargo compartment.

For moving the door structure **200** from its folded stowed position back to the closed position thereof, the opening steps described above are simply performed in reverse order. First of all, the upper door panel **230** is slid outwardly along the slide rails **225** to the fully extended condition thereof. For this purpose a handle strap **239** is preferably provided on the inner surface of the upper door panel wall **232** adjacent to the lower edge thereof. Next, the door panels are lowered by downward pivotal movement of the door bracket assemblies **220** to the closed positions thereof. The lower door panel **250** is then swung down until it again is substantially in alignment with the upper door panel **230**. By sliding the upper door panel a short distance upwardly along the slide rails **225**, the retaining tabs **257** may be inserted in the slots **209** in the base panel **109** and the door panels may then be released and will go back into the door-receiving opening with the door keepers extending through the openings **268** in the hinge structure **260**. The latch mechanisms **270** may then be engaged with the keepers **280** to lock the door structure **200** in the closed configuration thereof. It will, of course, be understood that the door structure at the rear of the container is similar in construction and identical in operation to the front door structure just described.

There may also be provided in the container **50** a plurality of shelves **300**, two of which have been shown in place in FIGS. **10** and **14** of the drawings. Referring to FIGS. **26** to **31** of the drawings, each shelf **300** comprises a pair of spaced-apart substantially rectangular sheet-metal walls **301** and **302** extending generally parallel to each other. Disposed between the walls **301** and **302** is a filler **303** in the form of a body of rigid cellular construction preferably formed of aluminum having a honeycomb structure. The filler **303** being secured to the walls **301** and **302** by means of a sheet of epoxy. The inboard side margins of the shelf walls **301** and **302** are recessed at the front and rear ends thereof to respectively form a pair of notches or shoulders **308**. Similarly, the outboard side margins of the shelf walls **301** and **302** are recessed at the front and rear ends thereof to form a pair of notches or shoulders **309**. There are also respectively provided in the front and rear margins of the shelf walls **301** and **302** a pair of substantially rectangular slots **316** and **317** for accommodating the reinforcing struts **201** and **202** as will be described more fully hereinafter. Disposed between the metal walls **301** and **302** at the inboard and outboard side margins thereof is a rigid frame or spacer structure, generally designated by the numeral **305**, in the form of an elongated channel having a substantially U-shaped cross section with a bight **306** carrying a pair of flanges **307**, with the bight **306** disposed inwardly of the shelf **300** and abutting against the filler **303**. Disposed between the walls **301** and **302** along the front and rear margins thereof is a frame or spacer structure generally designated by the numeral **310**, in the form of an elongated tube substantially rectangular in cross section. The spacer **310** has an outer wall **311** having a thickness somewhat greater than the thickness of the remaining walls thereof and extending upwardly and downwardly slightly beyond the upper and lower walls of the spacer **310** to define therewith a pair of shoulders **312**. The spacer **310** is inserted between the shelf walls **301** and **302** with the shoulders **312** respectively abutting thereagainst and with the inner wall of spacer **310** abutting against the filler **303**. The spacers **310** are preferably secured to the shelf **300** by means of a plurality of rivets (not shown).

The shelf **300** is provided along the inboard and outboard margins thereof with a plurality of fixed mounting members, generally designated by the numeral **320**, the preferred embodiment having four of the mounting members **320** disposed along the inboard margin thereof and three such mounting members on the outboard margin as shown in FIG. **26**. Each of the fixed mounting members **320** includes a solid generally rectangular pin block **321** carrying at one end thereof a pair of elongated attachment flanges **322** extending outwardly a substantial distance beyond the front and rear sides of the pin block **321**. In use, the attachment flanges **322** are inserted between the flanges **307** of the adjacent shelf spacer **305** and are secured thereto by means of a plurality of rivets **323**, preferably three in number. When so fastened to the shelf **300**, the pin block **321** of the mounting member **320** extends outwardly beyond the adjacent edge of the shelf walls **301** and **302** substantially normal thereto. Each of the pin blocks **321** carries a cylindrical mounting pin **324** extending rearwardly therefrom substantially normal thereto, and having a diameter slightly less than the diameter of the holes in the frame members **130** and **160**, and the stiffening ribs **125** and **155**. Another fixed mounting member **325** is carried by the shelf **300** along the rear margin thereof, the mounting member **325** including a generally U-shaped pin block **326** shaped in conformity with and disposed around the rectangular slot **317** in the rear margin of the shelf **300**. Preferably, the pin block **326** comprises a channel member substantially U-shaped in cross section and carrying a pair of attachment flanges (not shown) for insertion between the flanges **307** of the adjacent shelf spacer **305** and attachment thereto by means of rivets in a manner similar to the attachment of the fixed mounting members **320**. The bight portion of the U-shaped pin block **326** carries a cylindrical pin **327** thereon extending outwardly therefrom substantially normal thereto into the slot **317** and having a diameter slightly less than the diameter of the openings **209** in the supporting strut **202**. There is also provided a pair of generally U-shaped flat reinforcing gusset plates **328** disposed about the U-shaped pin block **326**, the gusset plates **328** preferably being disposed respectively along the inner surfaces of the shelf walls **301** and **302** with the outer margins thereof being respectively disposed between the adjacent shelf wall and the adjacent flange **307** of the spacer **305**.

There is also provided along the front edge of the shelf **300** a plurality of movable or locking mounting members, generally designated by the numeral **330**, the mounting members **330** preferably being two in number and being respectively disposed at the front corners of the shelf **301**. Each of the mounting members **330** includes a generally rectangular hollow pin block **331** disposed between the shelf walls **301** and **302**, the pin block **331** having one wall thereof disposed toward the front of the shelf **300** and abutting the inner surface of the bight **306** of the adjacent spacer **305** and having another wall thereof disposed toward the adjacent side of the shelf **300** and being substantially flush with the adjacent side edges of the shelf walls **301** and **302**. Integral with the pin block **331** and extending rearwardly thereof in alignment with the outer side wall thereof is a closure leg **333**, the closure leg **333** extending beyond the end of the front shoulder **308** in the shelf walls and abutting the inner surface of the bight **306** of the adjacent side spacer **305** and serving to completely close the space between the shelf walls **301** and **302** in the area of the shoulder **308**. The pin block **331** is secured in position between the shelf walls **301** and **302** by means of rivets **323** extending therethrough. There is carried within the hollow of the pin block **331** a generally U-shaped movable carriage **335** having a horizontally extending bight portion **336** carrying at the opposite sides thereof a pair of vertically downwardly extending legs **337** and **338**. The forward edge of the bight portion **336** has a recessed portion **339** therein between the legs **337** and **338**. The carriage **335** is freely movable within the pin block **331** sliding along the adjacent portion of the inner surface of the shelf wall **302**. A locking member **340** is provided for limiting the side-to-side motion of the movable carriage **335**, the locking member **340** comprising an elongated cylindrical shaft **341** extending outwardly through a complementary opening in the front wall of the pin block **331** and the bight portion **306** of the adjacent spacer **305**. The shaft **341** carries an enlarged circular head on the inner end thereof having a thickness corresponding to the depth of the recessed portion **339** in the carriage **335** for engagement therewith. Disposed about the shaft **341** between the head **342** and the front wall of the pin block **331** is a coil spring **343** engaging the head portion **342** for resiliently urging the locking member **340** in-

wardly toward and against the movable carriage **335**. Connected to the outer leg **337** of the movable carriage **335** and extending outwardly therefrom substantially normal thereto is a cylindrical pin **345**, the pin **345** extending through a complementary opening in the outer side wall of the pin block **331** and therebeyond. The pin **345** has a diameter slightly less than the diameter of the openings **139** and **159** in the adjacent corner frame members **130** and **150**, the inner end of the pin **345** having a reduced diameter portion **346** threaded for engagement with the leg **337** of the movable carriage **335**.

In use, the movable carriages **335** are held against the rear walls of the pin blocks **331** under the urging of the coil springs **343**. There is preferably provided in the bottom shelf wall **302** a pair of openings (not shown) at the front corners thereof for affording access to the movable carriages **335** of the locking members **330**. In operation, for moving the carriage **335** from the position shown in FIG. **27** where the pin **345** is fully extended outwardly beyond the pin block **331** to a retracted position where the pin **345** is withdrawn into the pin block **331**, it is first necessary to move the locking member **340** forwardly against the urging of the coil spring **343** and out of the recess **339** in the carriage **335**. Then the carriage **335** may be slid sideways in the direction of the arrow in FIG. **27** until the pin block **331** is disposed completely to the left of the locking member head **342** as viewed in FIG. **27**. In this position, the pin **345** will be completely withdrawn into the pin block **331**, whereupon the locking member **340** may be released, the head **342** then engaging against the pin **345** and the outer surface of the movable member leg **337** for preventing accidental movement of the movable member **335** back to the extended position thereof.

An additional movable mounting or locking member **330*a*** is preferably provided adjacent to the inboard edge of the slot **316** in the forward margin of the shelf **300**, the movable mounting member **330*a*** being substantially similar to the mounting members **330** and being oriented with the pin **345*a*** thereof directed toward the outboard side of the container **50**. However, in place of the closure leg **333**, the mounting member **330*a*** is provided with a U-shaped attachment bracket **332** substantially identical to the pin block **326** of the mounting member **325** and surrounding the slot **316**, the attachment bracket **332** being secured to the movable mounting member **330*a*** and to the adjacent portion of the spacer **305** by means of rivets. The pin **345*a*** of the movable mounting member **330*a*** extends into the slot **316** when in its extended condition and has a diameter slightly smaller than the diameter of the openings **208** in the reinforcing strut **201**. An opening (not shown) is provided in the bottom shelf wall **302** for affording access to the movable carriage and locking member of the mounting member **330*a***. A pair of gusset or reinforcing plates **347**, identical in construction to the gusset plates **328** are preferably provided about the slot **316** on the inner surfaces of the shelf walls **301** and **302**, with the forward margins of the plates **347** being respectively disposed between the adjacent one of the walls **301** and **302** and the associated flange **307** of the spacer **305**. Similarly, four pairs of generally triangular reinforcing or gusset plates **315** are provided at each corner of the shelf **300** between the walls **301** and **302** thereof, the outer margins of the plates **315** being disposed between the spacer flanges **307** and the adjacent shelf walls **301** and **302**.

In operation, pins **345** of each of the movable mounting members **330** and **330*a*** are locked in the retracted positions thereof and the shelf **300** is then inserted into the container **50** through the forward door-receiving opening thereof, the shelf **300** preferably being tilted at an angle to the base panel **100** and inserted between the reinforcing strut **201** and the forward frame member **160**. Once behind the reinforcing strut **201**, the shelf **300** is moved to a horizontal position substantially parallel to the bottom panel **100** with the reinforcing struts **201** and **202** being respectively disposed in the slots **316** and **317** in the front and rear margins of the shelf **300**. The shelf **300** is then vertically moved to the desired height with the fixed mounting members **320** and **325** thereof in alignment with the corresponding openings in the frame members and stiffening ribs of the container **50**. Then, the shelf may be moved rearwardly in the direction opposite to the arrow in FIG. **26** so that the pins **324** and **327** of the fixed mounting members **320** and **325** will be inserted into the corresponding ones of the openings in the container frame members and ribs. More particularly, the forward three inboard mounting pins **324** will be inserted into corresponding ones of the openings **159** in the stiffening ribs **155** with the rearmost one of the inboard mounting pins **324** being disposed in the corresponding opening **169** in the rear one of the corner frame members **160**; the forward two outboard mounting pins **324** are respectively inserted into corresponding ones of the openings **129** in the stiffening ribs **125** with the rearmost one of the outboard mounting pins **324** being inserted in the aligned opening **139** in the rear one of the corner frame members **130**; the mounting pin **327** is inserted into the corresponding opening **208** in the reinforcing strut **202**. In this position, the pins **345** and **345*a*** of the movable mounting members **330** and **330*a*** will be in alignment with the corresponding ones of the openings **139**, **169** and **208** in the corner frame members **130** and **160** and reinforcing strut **201**, respectively. Each of the movable pins **345** and **345*a*** may then be moved to the fully extended positions thereof whereupon they will be inserted into the corresponding openings of the adjacent frame members and reinforcing strut.

At this point, the shelf **300** will be securely locked in position within the container **50**, the movable locking members **330** and **330*a*** serving to prevent accidental disengagement of the fixed mounting members **320** and **325** from their corresponding support members by preventing forward movement of the shelf **300** in the direction of the arrow in FIG. **26**. For adjusting the position of the shelf **300** in the container **50**, it is only necessary to move each of the movable locking members **330** and **330*a*** into the fully retracted position thereof, thus permitting forward movement of the shelf **300** in the direction of the arrow in FIG. **26**. The shelf **300** may then be moved a short distance in this direction sufficiently to disengage the fixed mounting members **320** and **325** whereupon the shelf may be moved vertically to another desired position.

The shelf mounting openings in the various frame members and stiffening ribs may, if desired, extend all the way to the top thereof for mounting the shelf **300** in a position closely adjacent to the top panel **180** of the container **50**. In this manner, the shelf **300** may be moved out of the way when not in use without necessitating its complete removal from the container **50**.

In the preferred embodiment of the invention, there may also be provided a pair of handle straps **290** on the outer surface of each of the side panels **120** and **150** to assist in moving the container **50** about. Further, there is preferably provided a plurality of destination placards **295** on which information regarding the contents and/or destination of the container **50** may be indicated.

In use, the cargo containers **50** may be brought to the entrance of the airplane **60** and moved onto a ball transfer mat consisting of a multiplicity of balls defining a ball-bearing surface. The containers **50** are moved on the ball-bearing surface so as to orient them and align them into two longitudinally extending side-by-side rows, the sloping portion **122** of the side panel **120** of each of the containers generally conforming to the curvature of airplane fuselage **61**. Because the containers **50** are moved on a ball transfer mat, the fact that the bottom wall **102** of the base panel **100** presents a flush surface is highly desirable as there are no obstructions to free movement of the containers. There will normally be provided a plurality of locking mechanisms (not shown) on the lower deck **66** of the aircraft **60**, each including a locking arm or finger which may be swiveled from a disengaging position to a position where it is disposed over the body portions **142** and **172** of the side-base connecting frame members **140** and **170** and abutting against the upright flanges **146** and **176**, respectively, thereof in a well-known manner. The locking arms may then

be tightened against the side-base connecting frame members to hold the cargo container **50** in place. When the airplane **60** reaches its destination, the locking mechanisms may be disengaged from the containers **50**, which are then rolled out of the airplane and brought to a convenient location in the airport. If desired, means may be provided on the container **50** for attaching ropes or cables for securing the container in place in an aircraft.

It is a significant feature of the present invention that the container **50** includes a number of structural units which may be easily assembled in the field. In preforming such assembly, the inboard and outboard side panel units are first fastened to the base panel unit and then the top panel unit is fastened to the upper edges of the side panel units. Preferably, the upper door panels **230** will have been fixed in position on the rails **225** of the door bracket assemblies **220** and the door stops **244** will have been permanently mounted in the door panel slide channels **240** whereby the door panel **230** and the door bracket assemblies **220** form a single structural unit. This structural unit is next attached to the top panel unit at the opposite ends of the container **50**. Next, the hinge structures **260** may be attached to the upper door panels **230** and the lower door panel **250** may then be respectively mounted on the hinge structures **260**. The reinforcing struts **201** and **202** may be attached in place either prior to or after the mounting of the desired number of shelves **300** in the container **50** for completing the assembly thereof.

It will be noted, there has been provided a cargo container **50** of simple economical and lightweight yet durable construction conveniently shaped to make the most efficient use of the space available in a cargo compartment of an aircraft. Further, the container **50** is simple to operate, requiring only a few simple movements. Significantly, a unique door structure **200** has been provided which may be completely opened and stowed above the top wall of the container with only a 6 inch clearance thereabove. In addition, easily adjustable shelf structures **300** have been provided for mounting within the container **50**.

Preferably, the container **50** is constructed primarily of aluminum with the frame members and spacers comprising aluminum extrusions and with the panel walls comprising aluminum sheets. Further, the container **50** is so constructed that substantially flush surfaces are presented along the outside of the container **50** to prevent snagging against other containers or miscellaneous objects within the aircraft and further to facilitate water runoff when the container is exposed to the elements.

A significant advantage of the container **50** according to this invention is the construction therein of a group of prefabricated subassembly units. More particularly, the container **50** is comprised primarily of a base panel unit, an inboard side panel unit, an outboard side panel unit, a top panel unit, two door structure units, and any number of shelf units, all of which may be connected together by means of easily removable fastening members such as screws and nuts and bolts. There are a number of desirable ramifications of this feature. For example, if one of the panel units becomes damaged at a place far removed from the point of manufacture the user merely notifies the manufacturing facility and asks that the appropriate structural unit which has been damaged be shipped immediately to the place where it is needed. Since the various structural units are relatively small and flat they consume only a small amount of space which facilitates their shipment upon very short notice. Also the cargo container **50** may be shipped by the manufacturer in a knocked-down or disassembled condition thereby using less space in transit and accordingly reducing the manufacturer's shipping costs.

While there has been described what are at present considered to be the preferred embodiment of the invention, it will be understood that various modifications may be made therein and it is intended to cover in the appended claims all such modifications as fall within the true spirit and scope of the invention.

What is claimed is:

1. In a container having a top wall and a bottom wall and a pair of opposed side walls all cooperating to define a door-receiving opening, a door structure comprising a door bracket pivotally mounted on the container adjacent to the door-receiving opening, and a door panel shaped complementary to the opening and slidably mounted on said door bracket and movable between an extended condition and a retracted condition thereon, said door bracket being movable between a closed position wherein said door panel is disposed within the door-receiving opening and substantially normal to an adjacent wall of the container and an open position wherein said door panel is disposed outside of the container and substantially parallel to the adjacent wall thereof, said door structure having a closed position wherein said door bracket is in the closed position thereof and said door panel is in the extended condition thereof whereby said door structure completely closes the door-receiving opening, said door structure having a stowed position wherein said door bracket is in the open position thereof and said door panel is in the retracted condition thereof whereby said door structure is completely removed from the door-receiving opening and said door panel is stowed alongside the adjacent one of the container walls substantially parallel thereto.

2. The door structure set forth in claim **1**, wherein said door structure includes a pair of said door brackets pivotable about a common axis and respectively disposed adjacent to opposite edges of said door panel.

3. The door structure set forth in claim **1**, wherein said door bracket is mounted on the top wall of the container, whereby said door panel is stowed above the top wall of the container when said door structure is in the stowed configuration thereof.

4. The door structure set forth in claim **1**, wherein said door panel is spaced only a short distance from the adjacent wall of the container when said door structure is in the stowed position thereof, whereby the clearance required alongside the adjacent wall for stowing said door structure is only slightly greater than the thickness of said door panel.

5. The door structure set forth in claim **1**, wherein said door panel includes a pair of spaced-apart substantially parallel walls and a body of rigid cellular construction disposed therebetween and spacer structure extending therearound for providing a strong yet lightweight construction for said door panel.

6. The door structure set forth in claim **1**, wherein one of said side walls has an upper portion extending generally parallel to the other of said side walls and a lower portion extending inwardly from said first portion toward the other of said side walls and said bottom wall.

7. In a container having a top wall and a bottom wall and a pair of opposed side walls all cooperating to define a door-receiving opening, a door structure comprising a door bracket pivotally mounted on the container adjacent to the door-receiving opening and having a first track member thereon, and a door panel shaped complementary to the door-receiving opening and having a second track member thereon cooperating with said first track member for slidably mounting said door panel on said door bracket for sliding movement between an extended condition and a retracted condition, said door bracket being movable between a closed position wherein said door panel is disposed within the door-receiving opening and substantially normal to an adjacent wall of the container and an open position wherein said door panel is disposed outside of the container and substantially parallel to the adjacent wall thereof, said door structure having a closed position wherein said door bracket is in the closed position thereof and said door panel is in the extended condition thereof whereby said door structure completely closes the door-receiving opening, said door structure having a stowed position wherein said door bracket is in the open position thereof and said door panel is in the retracted condition thereof whereby said door structure is completely removed from the door-receiving opening and said door panel is stowed

alongside the adjacent one of the container walls substantially parallel thereto.

8. The door structure set forth in claim 7, wherein said first track member is substantially T-shaped in cross section, and said second track member comprises a channel shaped member complementary to said first track member, said first track member being disposed within said second track member for slidably mounting said door panel on said door bracket.

9. The door structure set forth in claim 7, wherein said door structure includes a pair of said door brackets pivotable about a common axis and respectively disposed adjacent to opposite edges of said door panel, and a pair of second track members on said door panel respectively disposed along the opposite edges thereof for cooperation with said pair of door brackets.

10. In a container having a top wall and a bottom wall and a pair of opposed side walls all cooperating to define a door-receiving opening, a door structure comprising a door bracket pivotally mounted on the container adjacent to the door-receiving opening and having a first track member thereon, a door panel shaped complementary to the door-receiving opening and having a second track member thereon cooperating with said first track member for slidably mounting said door panel on said door bracket for sliding movement between an extended condition and a retracted condition, said door bracket being movable between a closed position wherein said door panel is disposed within the door-receiving opening and substantially normal to an adjacent wall of the container and an open position wherein said door panel is disposed outside of the container and substantially parallel to the adjacent wall thereof, and an abutment flange carried by the adjacent one of the container walls and disposed adjacent to the opening and contacting said door bracket in the open position thereof for limiting the pivotal movement thereof in the opening direction, said door structure having a closed position wherein said door bracket is in the closed position thereof and said door panel is in the extended condition thereof whereby said door structure completely closes the door-receiving opening, said door structure having a stowed position wherein said door bracket is in the open position thereof and said door panel is in the retracted condition thereof whereby said door structure is completely removed from the door-receiving opening and said door panel is stowed alongside the adjacent one of the container walls substantially parallel thereto.

11. The door structure set forth in claim 10, wherein said door bracket includes a pivot member shaped complementary to said abutment flange and pivotally mounted adjacent thereto, said flange nesting within said pivot member when said door bracket is in the open position thereof.

12. The door structure set forth in claim 10, wherein said door bracket is mounted on the top wall of the container.

13. In a container having a top wall and a bottom wall and a pair of opposed side walls all cooperating to define a door-receiving opening, a door structure comprising a door bracket pivotally mounted on the container adjacent to the door-receiving opening and having a first track member thereon, a door panel shaped complementary to the door-receiving opening and having a second track member thereon cooperating with said first track member for slidably mounting said door panel on said door bracket for sliding movement between an extended condition and a retracted condition, said door bracket being movable between a closed position wherein said door panel is disposed within the door-receiving opening and substantially normal to the top wall of the container and an open position wherein said door panel is disposed above the top wall of the container substantially parallel thereto, an abutment flange substantially U-shaped in cross section and carried by the top wall adjacent to the opening and contacting said door bracket in the open position thereof for limiting the pivotal movement thereof in the opening direction, and a hook member carried by said door panel adjacent to said top wall and engageable in said abutment flange when said door bracket is in the closed position thereof and said door panel is in the extended condition thereof for supporting said door panel and limiting the sliding movement thereof in the extending direction, said door structure having a closed position wherein said door bracket is in the closed position thereof and said door panel is in the extended condition thereof whereby said door structure is supported by said abutment flange and completely closes the door-receiving opening, said door structure having a stowed position wherein said door bracket is in the open position thereof and said door panel is in the retracted condition thereof whereby said door structure is completely removed from the door-receiving opening and said door panel is stowed above the top wall of the container substantially parallel thereto.

14. The door structure set forth in claim 13, wherein said hook member is mounted along the upper edge of said door panel.

15. The door structure set forth in claim 13, wherein said hook member is attached to the upper edge of said door panel and extends inwardly therefrom toward the container, whereby said hook member overlaps said abutment flange for engagement therein when said door structure is in the closed position thereof.

16. The door structure set forth in claim 13, and further including a stop member carried by said second track member adjacent to the lower end thereof, said stop member engaging said first track member when said door panel is in the retracted condition thereof for limiting the sliding movement thereof in the retracting direction.

17. The door structure set forth in claim 13, wherein said hook member abuts against said door bracket when said door panel is in the extended condition thereof and said door bracket is out of the closed position thereof for limiting the sliding movement of said door panel in the extending direction.

18. In a container having a top wall and a bottom wall and a pair of opposed side walls all cooperating to define a door-receiving opening, a door structure comprising a door bracket pivotally mounted on the container adjacent to the door-receiving opening, a door panel shaped complementary to the opening and slidably mounted on said door bracket and movable between an extended condition and a retracted condition thereon, said door bracket being movable between a closed position wherein said door panel is disposed within the door-receiving opening and substantially normal to an adjacent wall of the container and an open position wherein said door panel is disposed outside of the container and substantially parallel to the adjacent wall thereof, said door structure having a closed position wherein said door bracket is in the closed position thereof and said door panel is in the extended condition thereof whereby said door structure completely closes the door-receiving opening, said door structure having a stowed position wherein said door bracket is in the open position thereof and said door panel is in the retracted condition thereof whereby said door structure is completely removed from the door-receiving opening and said door panel is stowed alongside the adjacent one of the container walls substantially parallel thereto, a retaining member carried by said door panel and engageable with the container when said door structure is in the closed position thereof for preventing pivotal movement thereof, and resilient latch structure carried by said door panel and engageable with said container for holding said door panel in the extended condition thereof to hold said retaining member in engagement with the container, whereby said retaining member cooperates with said latch structure to hold said door structure in the closed position thereof.

19. The door structure set forth in claim 18, wherein said door structure includes a plurality of said retaining members carried by said door panel.

20. The door structure set forth in claim 18, wherein said door bracket is mounted on the top wall of the container, and said retaining member is disposed adjacent to the bottom edge of said door panel and is engageable with a complementary opening in the bottom wall of the container.

21. In a container having a top wall and a bottom wall and a pair of opposed side walls all cooperating to define a door-receiving opening, a door structure comprising a door bracket pivotally mounted on the container adjacent to the door-receiving opening, a door panel shaped complementary to the opening and slidably mounted on said door bracket and movable between an extended condition and a retracted condition thereon, said door bracket being movable between a closed position wherein said door panel is disposed within the door-receiving opening and substantially normal to an adjacent wall of the container and an open position wherein said door panel is disposed outside of the container and substantially parallel to the adjacent wall thereof, said door structure having a closed position wherein said door bracket is in the closed position thereof and said door panel is in the extended condition thereof whereby said door structure completely closes the door-receiving opening, said door structure having a stowed position wherein said door bracket is in the open position thereof and said door panel is in the retracted condition thereof whereby said door structure is completely removed from the door-receiving opening and said door panel is stowed alongside the adjacent one of the container walls substantially parallel thereto, a retaining member carried by said door panel and engageable with the container when said door structure is in the closed position thereof for preventing pivotal movement thereof, keeper structure mounted on the container and extending through a complementary opening in said door panel when said door structure is in the closed position thereof to maintain said door panel in the extended condition thereof, and a latch mechanism resiliently mounted on the outer surface of said door panel and movable into and out of engagement with said keeper structure when said door structure is in the closed position thereof, whereby said retaining member cooperates with said keeper structure and said latch mechanism to lock said door structure in the closed position thereof, and whereby said door structure may be quickly and easily latched and unlatched by appropriate tensioning and untensioning of said resilient latch mounting means.

22. The door structure set forth in claim **21**, wherein said keeper structure comprises a stud mounted on the container and extending outwardly therefrom.

23. The door structure set forth in claim **21**, wherein said latch mechanism includes, an elastic mounting strap attached at one end thereof to said door panel, and a latch member attached to the other end of said mounting strap.

24. The door structure set forth in claim **21**, wherein said keeper structure comprises a stud having an enlarged head at one end thereof and mounted at the other end thereof on said container, said latch mechanism including a latch member having a keyhole-shaped opening therein for receiving the head portion of said stud therethrough.

25. The door structure set forth in claim **21**, wherein said door structure includes two keeper structures mounted on the container, and two latch mechanisms respectively cooperating with said keeper structures for locking said door panel in the extended condition thereof.

26. In a container having a top wall and a bottom wall and a pair of opposed side walls all cooperating to define a door-receiving opening, a door structure comprising a door bracket pivotally mounted on the container adjacent to the door-receiving opening, a first door panel shaped complementary to a portion of the door-receiving opening and slidably mounted on said door bracket and movable between an extended condition and retracted condition thereon, said door bracket being movable between a closed position wherein said first door panel is disposed within the door-receiving opening and substantially normal to an adjacent wall of the container and an open position wherein said first door panel is disposed outside of the container and substantially parallel to the adjacent wall thereof, and a second door panel shaped complementary to the remaining portion of the door-receiving opening and hingedly connected to said first door panel and being pivotally movable between a first position substantially in alignment with said first door panel and a second position overlying said first door panel and substantially parallel thereto, said door structure having a closed position wherein said door bracket is in the closed position thereof and said first door panel is in the extended condition thereof and said second door panel is in the first position thereof whereby said door structure completely closes the door-receiving opening, said door structure having a folded stowed position wherein said door bracket is in the open position thereof and said first door panel is in the retracted condition thereof and said second door panel is in the second position thereof whereby said door structure is completely removed from the door-receiving opening and said door panels are stowed alongside the adjacent one of the container walls substantially parallel thereto.

27. The door structure set forth in claim **26**, wherein said door structure includes a pair of said door brackets pivotable about a common axis and respectively disposed adjacent to opposite edges of said first door panel.

28. The door structure set forth in claim **26**, wherein said door bracket is mounted on the top wall of the container and said first door panel is disposed in the upper portion of the door-receiving opening and said second door panel is disposed in the lower portion of the door-receiving opening when said door structure is in the closed position thereof.

29. The door structure set forth in claim **26**, wherein said door bracket is mounted on the top wall of the container, said first door panel being disposed in the upper portion of said door-receiving opening when said door structure is in the closed position thereof, and said first door panel being hingedly connected along the lower margin thereof to said second door panel.

30. The door structure set forth in claim **26**, wherein said first door panel is disposed only a slight distance from the adjacent one of said container walls when said door structure is in the stowed position thereof, whereby the clearance required alongside the adjacent wall for stowing said folded door structure is slightly greater than the combined thicknesses of said panel.

31. In a container having a top wall and a bottom wall and a pair of opposed side walls all cooperating to define a door-receiving opening, a door structure comprising a door bracket pivotally mounted on the container adjacent to the door-receiving opening and having a first track member thereon, a first door panel shaped complementary to a portion of the door-receiving opening and having a second track member thereon cooperating with said first track member for slidably mounting said first door panel on said door bracket for sliding movement between an extended condition and a retracted condition, said door bracket being movable between a closed position wherein said first door panel is disposed within the door-receiving opening and substantially normal to the top wall of the container and an open position wherein said first door panel is disposed above the top wall of the container substantially parallel thereto, a flange substantially U-shaped in cross section and carried by the top wall adjacent to the opening and contacting said door bracket in the open position thereof for limiting the pivotal movement thereof in the opening direction, a hook member carried by said first door panel adjacent to the top wall and engageable in said flange when said door bracket is in the closed position thereof and said first door panel is in the extended condition thereof for supporting said first door panel and limiting the sliding movement thereof in the extending direction, and a second door panel shaped complementary to the remaining portion of the door-receiving opening and hingedly connected to said first door panel and being pivotally movable between a first position substantially in alignment with said first door panel and a second position overlying said first door panel and substantially parallel thereto, said door structure having a closed position wherein said door bracket is in the closed position thereof and said first door panel is in the extended condition thereof and said second door panel is in the first position thereof whereby said door structure completely closes the door-receiving opening, said door structure having a folded stowed position wherein

said door bracket is in the open position thereof and said first door panel is in the retracted condition thereof and said second door panel is in the second position thereof whereby said door structure is completely removed from the door-receiving opening and said door panels are stowed above the top wall of the container substantially parallel thereto and to each other.

32. In a container having a top wall and a bottom wall and a pair of opposed side walls all cooperating to define a door-receiving opening, a door structure comprising a door bracket pivotally mounted on the container adjacent to the door-receiving opening, a first door panel shaped complementary to a portion of the door-receiving opening and slidably mounted on said door bracket and movable between an extended condition and retracted condition thereon, said door bracket being movable between a closed position wherein said first door panel is disposed within the door-receiving opening and substantially normal to an adjacent wall of the container and an open position wherein said first door panel is disposed outside of the container and substantially parallel to the adjacent wall thereof, a second door panel shaped complementary to the remaining portion of the door-receiving opening and hingedly connected to said first door panel and being pivotally movable between a first position substantially in alignment with said first door panel and a second position overlying said first door panel and substantially parallel thereto, said door structure having a closed position wherein said door bracket is in the closed position thereof and said first door panel is in the extended condition thereof and said second door panel is in the first position thereof whereby said door structure completely closes the door-receiving opening, said door structure having a folded stowed position wherein said door bracket is in the open position thereof and said first door panel is in the retracted condition thereof and said second door panel is in the second position thereof whereby said door structure is completely removed from the door-receiving opening and said panels are stowed alongside the adjacent one of the container walls substantially parallel thereto, a retaining member carried by said second door panel and engageable with the container when said door structure is in the closed position thereof for preventing pivotal movement thereof, keeper structure mounted on the container and extending through a complementary opening in the hinged connection between said first and second door panels when said door structure is in the closed position thereof for preventing sliding movement of said first door panel, and a latch mechanism resiliently mounted on the outer surface of one of said door panels and movable into and out of engagement with said keeper structure when said door structure is in the closed position thereof for holding said door structure in engagement with said keeper structure, whereby said retaining member cooperates with said keeper structure and said latch mechanism to hold said door structure in the closed position thereof.

33. The door structure set forth in claim 32, wherein said door bracket is mounted on the top wall of the container, said first door panel being disposed in the upper portion of the door-receiving opening and said second door panel being disposed in the lower portion of the door-receiving opening when said door structure is in the closed position thereof, said retaining member being disposed adjacent to the lower edge of said second door panel and engageable with a complementary opening in the bottom wall of the container.

34. The door structure set forth in claim 32, wherein said latch mechanism is mounted on said first door panel.

35. A container comprising a top wall and a bottom wall and a pair of opposed side walls all cooperating to define a pair of door-receiving openings at the opposite ends of the container, two door structures for respectively closing the door-receiving openings, each of said door structures including a door bracket pivotally mounted on the container adjacent to the door-receiving opening, and a door panel shaped complementary to the opening and slidably mounted on said door bracket and movable between an extended condition and a retracted condition thereon, each of said door brackets being movable between a closed position wherein the associated door panel is disposed within the adjacent door-receiving opening and substantially normal to an adjacent wall of the container and an open position wherein the associated door panel is disposed outside of the container and substantially parallel to the adjacent wall thereof, each of said door structures having a closed position wherein the associated door bracket is in the closed position thereof and the associated door panel is in the extended condition thereof whereby said door structure completely closes the adjacent door-receiving opening, each of said door structures having a stowed position wherein the associated door bracket is in the open position thereof and the associated door panel is in the retracted condition thereof whereby said door structure is completely removed from the adjacent door-receiving opening and said associated door panel is stowed alongside the adjacent one of the container walls substantially parallel thereto.

36. A container comprising a generally rectangular base panel including a generally rectangular body of lightweight material having a rigid frame extending substantially around the periphery thereof and secured thereto, two elongated base-connecting frame members each respectively disposed adjacent to opposed sides of said base panel and secured to said base panel frame, two side panels of lightweight material, the margins of said side panels disposed toward said base panel being spaced therefrom and respectively secured to said base-connecting frame members, four elongated corner-connecting frame members respectively disposed adjacent to the generally upstanding margins of said side panels and secured thereto, a generally rectangular top panel of lightweight material, opposed margins of said top panel being disposed toward the adjacent margins of said side panels and spaced therefrom, two elongated side-top connecting frame members respectively disposed between the adjacent margins of said side panels and said top panel and respectively secured thereto, two elongated end-top connecting frame members respectively disposed along the front and rear margins of said top panel and secured thereto, the front and rear portions of said base panel frame and the associated ones of said corner connecting frame members, said end-top connecting frame members cooperating to provide openings into said container at the two ends thereof, and a door structure mounted on one of said panels and pivotable and slidable with respect thereto between a closed position wherein said door completely closes one of said openings and an open position wherein said door structure is removed from said opening and stowed parallel to the exterior surface of one of said panels by pivoting and sliding said door structure with respect to the one of said panels.

37. The container set forth in claim 36, and further comprising a second door structure pivotally mounted on the container and respectively disposed in the other of said openings and shaped complementary thereto and being movable between a closed position completely closing the associated opening and a stowed position completely removed from the associated opening and disposed adjacent to one of said walls substantially parallel thereto.

38. The container set forth in claim 36, wherein one of said side panels includes an upper portion extending generally parallel to the other of said side panels and a lower portion extending from the lower end of said upper portion toward said other side panel and toward said base panel.

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