Aug. 27, 1957 F. G. BRANDT 2,804,253

COMPOSITE PACKING CASE

Filed March 1, 1954 2 Sheets-Sheet 1

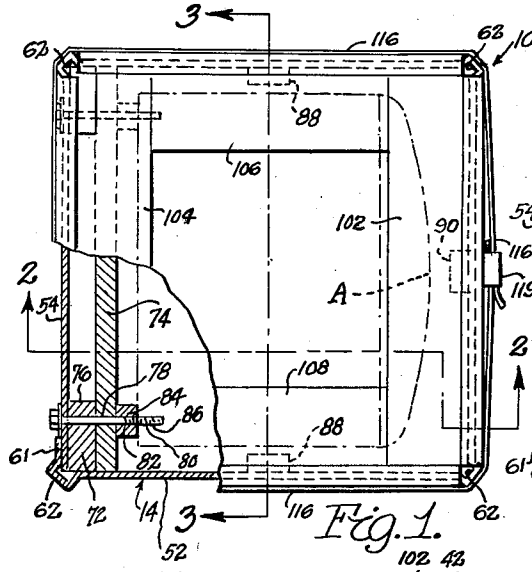

Fig. 1.

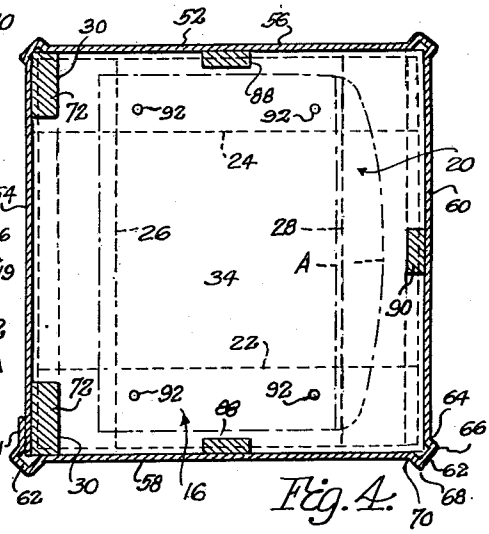

Fig. 4.

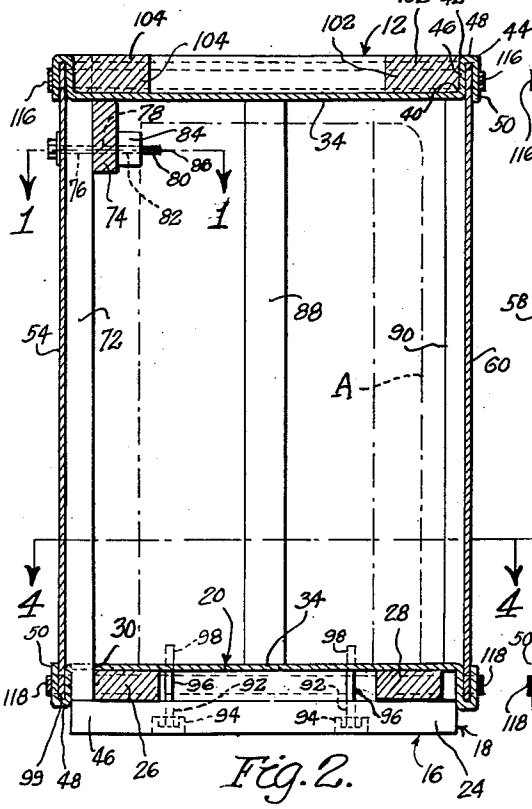

Fig. 2.

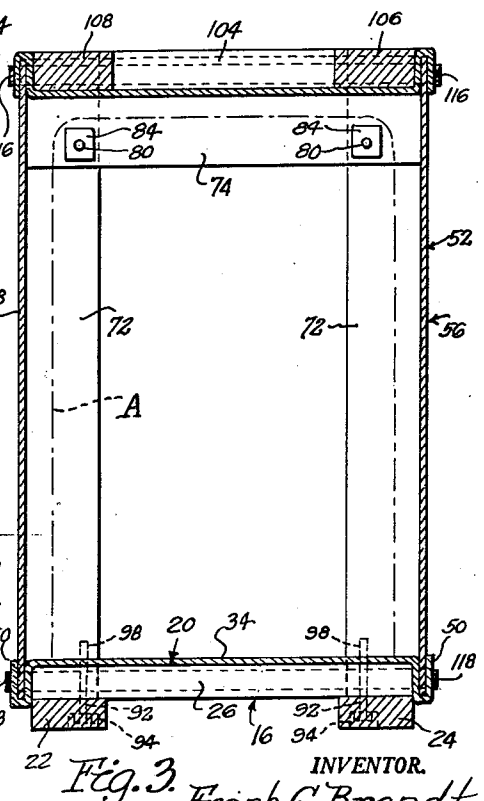

Fig. 3.

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COMPOSITE PACKING CASE

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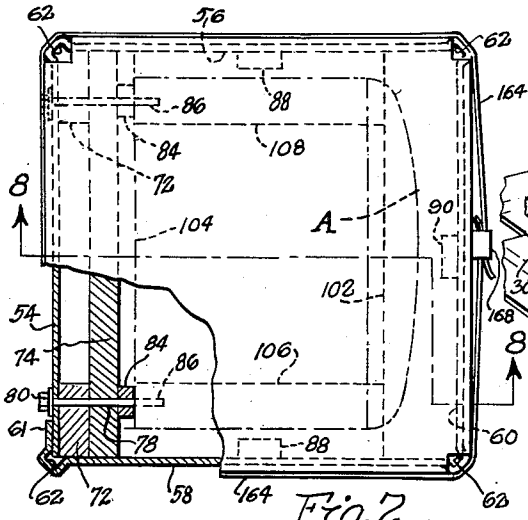

Fig. 7.

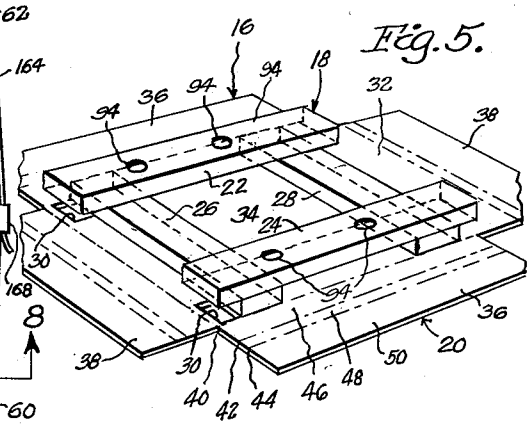

Fig. 5.

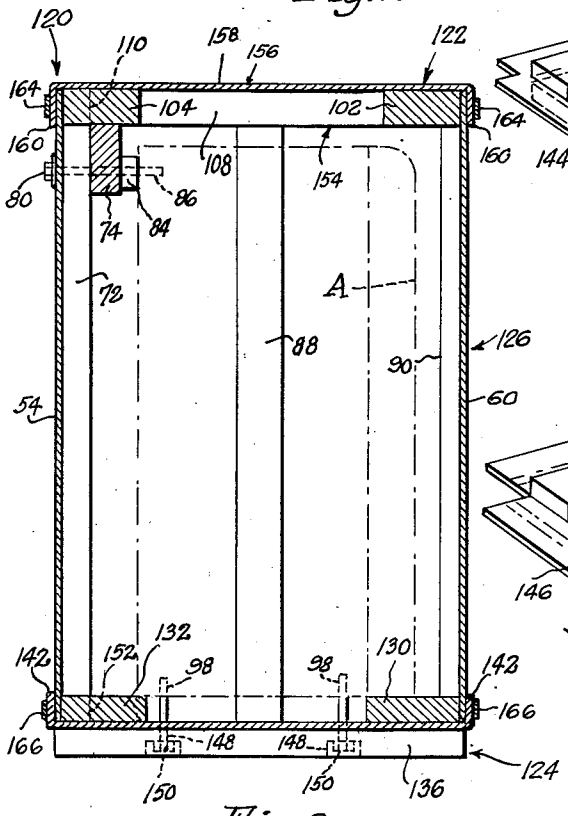

Fig. 8.

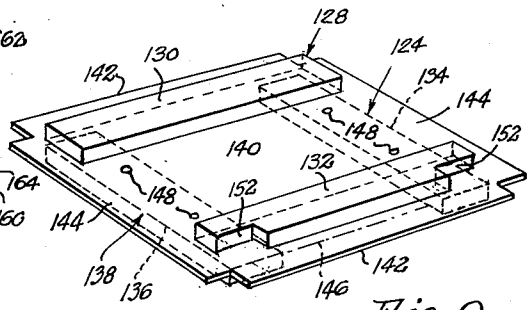

Fig. 9.

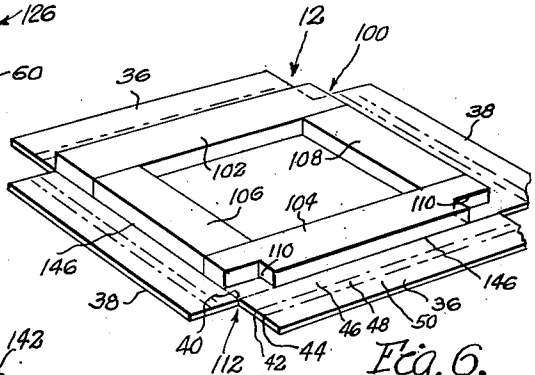

Fig. 6.

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2,804,253

COMPOSITE PACKING CASE

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Application March 1, 1954, Serial No. 413,242

8 Claims. (Cl. 229—23)

This invention relates to packing cases and, in particular, to composite packing cases constructed of fiberboard and wood or other reinforcing members, or using corrugated board.

One object of this invention is to provide a composite packing case composed of fiberboard with elongated reinforcing members of wood or other satisfactory material wherein the article, furniture or appliance to be packed therein, such as a refrigerator, stove, freezer, water heater, radio or television set, ironer, washing machine or the like may be firmly bolted or otherwise clamped to a composite base, surrounded by a wrap-around side unit which interfits with the base, and may then be closed in by a top unit which interfits with the side unit.

Another object is to provide a composite packing case of the foregoing character which is composed principally of three separate interlocking units, namely, a bottom unit which supports the article to be packed, a wrap-around side unit, and a top unit, the bottom and top units interfitting with the side unit, these three principal components being capable of being manufactured, shipped and stored separately in a disassembled flat condition, occupying a minimum of space, yet being capable of rapid assembly substantially without the use of nails and with the use of a minimum of other fasteners.

Another object is to provide a composite packing case of the foregoing character which is light yet exceptionally strong and capable of adequately protecting an article such as a refrigerator or one of the above-mentioned other articles or appliances, without damage during shipment or storage, regardless of whether the article and its packing case are placed upright or in a horizontal position or stacked in multiple tiers, one tier upon the other up to as many as four or five tiers without damage to the articles so packed, shipped or stored.

Another object is to provide a composite packing case of the foregoing character which is cheap in cost and light in weight but adequately rigid to protect the article packed therein without twisting or swerving, yet which employs a minimum of stiffening members of wood or other suitable material, and is composed principally of fiberboard, or of corrugated board.

Another object is to provide a composite packing case of the foregoing character wherein the top and bottom units interfit with the wrap-around side unit in such a manner that during the packing operation the former may be secured to the latter by steel straps in a rapid, efficient and satisfactory manner.

Another object is to provide a composite packing case of the foregoing character wherein the bottom unit is provided with a frame of wood or other suitable material to which the article, such as a refrigerator, may be securely bolted so as to be substantially inseparable therefrom during shipment or storage.

Another object is to provide a composite packing case, as set forth in the object immediately preceding, wherein

a wrap-around side unit interfits with the bottom unit and is provided with a spaced pair of vertical back slats connected to each other near their upper ends by a cross slat through which bolts are inserted into the back of the refrigerator or other article, after which the top unit is inserted in the top opening, the three units being then preferably clamped together by steel straps or the like, thereby securely fastening the article both to the bottom unit and to the side unit in a safe and secure manner, yet permitting rapid disassembly and unpacking by cutting the clamping straps and removing the bolts, or by cutting the binding wire, if used.

Another object is to provide a composite packing case of the foregoing character wherein the top unit is also provided with a frame of wood or other suitable material which is preferably notched out to receive the upper ends of the back slats so as to further unite the top and side units and wherein the cross slat interconnecting the back slats near their tops and a front slat disposed opposite the back slat prevent pushing in of the top unit by other articles stacked on top of the article so packed.

Another object is to provide a composite packing case of the foregoing character wherein sufficient space is left between the sides of the article and the inner surfaces of the sides of the side unit for the insertion of padding of fiberboard or other suitable material, so as to still further protect the article packed therein from crushing or denting.

Another object is to provide a composite packing case of the foregoing character wherein the bottom unit is provided with a framework of mutually perpendicular members which are on two different levels so as to provide space beneath the upper-level members and between the lower-level members perpendicular thereto for the insertion of the forks of so-called fork trucks commonly used in shipping terminals and warehouses for transporting, stacking or arranging the packed articles in such terminals or warehouses, or in shipping vehicles, such as freight cars, trucks, semi-trailers, transport aircraft or ships.

Other objects and advantages of the invention will become apparent during the course of the following description of the accompanying drawings, wherein:

Figure 1 is a top plan view, partly in horizontal section, along the line 1—1 in Figure 2, of a composite packing case, according to one form of the invention, with an article such as a refrigerator mounted therein;

Figure 2 is a central vertical section taken along the line 2—2 in Figure 1;

Figure 3 is a central vertical cross-section taken along the line 3—3 in Figure 1, in a plane at right angles to the section plane of Figure 2;

Figure 4 is a horizontal section taken along the line 4—4 in Figure 2, shown upside down showing the base unit construction;

Figure 5 is a perspective view of a bottom unit used in the packing case of Figures 1 to 4 inclusive, with the side flaps of the fiberboard liner flat;

Figure 6 is an inverted perspective view of a top unit used in the packing case of Figures 1 to 4 inclusive, with the side flaps of the fiberboard liner likewise flat before folding;

Figure 7 is a top plan view of a modified composite packing case generally similar to the packing case of Figures 1 to 5 inclusive also partly in similar horizontal section, but with slightly altered top and bottom units;

Figure 8 is a central vertical section taken along the line 8—8 in Figure 7; and

Figure 9 is an inverted perspective view of the slightly

modified top unit or a bottom unit used in the modified packing case of Figures 7 and 8.

Referring to the drawings in detail, Figures 1 to 6 inclusive show a composite packing case, generally designated **10**, consisting principally of three main units, namely, a top unit, generally designated **12**, a wrap-around side unit, generally designated **14**, and a bottom unit, generally designated **16**, these three units interfitting with one another during the packing operation. These three units are composed mainly of fiberboard, corrugated fiberboard or similar paper or other fibrous sheet material, strengthened by a minimum of slats of wood or other suitable material placed at strategic locations where they will exert the utmost strengthening effect at the minimum of cost and complexity, as described below.

The bottom unit **16** (shown upside down in Figure 5) consists generally of a reinforcing frame **18** and a liner **20** stapled or otherwise secured to one another, preferably with the aid of glue. The bottom frame **18** consists of a pair of spaced parallel lower cleats **22** and **24** having upper cleats **26** and **28** superimposed upon them slightly inward from their ends and secured to one another by staples or by other suitable fasteners, such as bolts, screws, nails or the like. Adjacent and beside the ends of the back upper cleat the liner **20** is provided with a pair of laterally-spaced rectangular holes **30** through which pass the lower ends of back slats of the side unit **14**, as described below. The lower cleats **22**, **24** and the upper cleats **26**, **28** are on two different levels, thereby providing a space **32** between the cleats **22** and **24** for receiving the forks of a fork truck.

The bottom liner **20** consists of a cross-shaped panel of fiberboard or the like having a central rectangular panel **34**, the outer dimensions of which are substantially the same as the outer dimensions of the top frame **18**, and which is provided with triply-folded side flaps **36** and similarly folded end flaps **38** which during packing are folded along inner, intermediate and outer fold lines **40**, **42** and **44** respectively, shown in the thus designated chain lines in Figure 5. Portions of certain of the corners of the flaps **36** and **38** in Figure 5 have been cut away in order to conserve space. The flaps **36** and **38** are thus subdivided along the fold lines **42** and **44** into inner, intermediate and outer portions **46**, **48** and **50** respectively.

The wrap-around side unit **14** (Figures 1 to 4 inclusive) consists preferably of a single sheet, generally designated **52**, which is in turn subdivided into a back panel **54**, parallel side panels **56** and **58**, and a front panel **60**. The panels **54**, **56**, **58** and **60** are separated from one another by flattened corner portions **62** formed on quadruple fold lines **64**, **66**, **68** and **70** respectively (Figure 4). The side panel **58** has an edge flap **61** overlapping the back panel **54** at the rearward edge thereof. Secured as by stapling to the inside of the back panel **54** are two laterally-spaced parallel back slats **72** which extend from the upper side of the bottom unit **16** to and through the top unit **12** with their lower ends resting upon cleats **22** and **24** of the bottom unit **16** and seated in the notches **30** of the cross cleat **26**. The back slats **72** near but slightly below their upper ends are interconnected by a cross slat **74** which extends between inner sides of the side panels **56** (Figure 1). The back slats **72** and cross slat **74** are drilled with aligned holes **76** and **78** for the passage of bolts **80** which likewise pass through holes **82** in spacing blocks **84** (Figure 1) before they enter threaded connections **86** in the back of the packed article A near the top thereof (Figure 2), the threaded portions **86** being specially provided in the article A for this purpose. Optional additional side slats **88** are stapled or otherwise secured to the inner sides of the side panels **56** and a front slat **90** is stapled or otherwise secured to the inside of the front panel **60**.

Four bolt holes **92** are drilled through the frame **18** of the bottom unit **16** in a rectangular arrangement. The bolt holes **92** at their lower ends are counterbored as at **94** to receive the heads of upwardly-extending bolts **96** which are either screwed into threaded portions **98** in the bottom of the refrigerator or other article A, or through unthreaded holes **98** and surmounted by a nut (not shown). In this manner, the article A is bolted firmly to the base unit **16** in a way analogous to the bolting of the back of the article A to the side unit **14** by the bolts **80**.

The top unit **12** shown in inverted position in Figure 6 consists of a top frame **100** of rectangular form with side cleats **102** and **104** and end cleats **106** and **108** inserted between them in substantially the same plane and secured by staples or other suitable fasteners, preferably aided by glue. The side cleat **104** is provided with spaced notches **110** for receiving the upper ends of the back slats **72** so as to interlock therewith. The top unit **12** like the bottom unit **16** is provided with a cross-shaped liner **112** of paperboard or other suitable sheet material, this having flaps which are reversely folded in the same way and hence bear the same reference numerals as the liner **20** of the bottom unit **16**. The liner **112** is also similarly stapled to its top frame **100**.

In the use of the invention, to pack an article A, such as a refrigerator, in the packing case **10**, the article A is placed on its side and the bottom unit **16** bolted thereto in the manner described above by inserting the bolts **96** through the holes **92** into the holes **98** in the bottom of the refrigerator or other article A, the reinforcing frame **18** being placed on the outside and the central panel **34** of the liner **20** inside. The inner portions **46** of the flaps **36** and **38** are then folded downward along the side of the sides of the frame **18** (Figures 2 and 5) along the inner fold lines **40**, then bent into a U-shaped formation along the fold lines **42** and **44** to provide the intermediate flap portion **48** and the outer flap portion **50**. The article A and the bottom unit **16** thus attached to it are then tilted back into an upright position resting on the bottom frame **18**.

The side unit **14** is then applied to the back of article A with the lower edge of its back panel **54** inserted in the trough **99** between the inner and outer flaps **46** and **50**. The side and front panels **56**, **58** and **60** are then bent at right angles at their corners **62** and their lower edges likewise inserted in their respective troughs **99** while substantially at the same time the rear flap **61** is overlapped with the back panel **54** (Figures 1 and 4) and their lower edges inserted in their respective troughs **99**. The flap **61** and back panel **54** at their overlapped locations are then secured to one another by staples driven through their overlapped portions into the adjacent back slat **72**.

The top unit **12**, with its various flaps **36** and **38** reversely folded in the manner described in connection with the mounting of the bottom unit **16**, is then lowered into position upon the upper edges of the panels **54**, **56**, **58** and **60** of the side unit **14** with these panels entering the troughs **99** between the inner and outer flaps **46** and **50**. The top unit **12** is of course inverted relatively to the bottom unit **16**, so that the top frame **100** is uppermost just as the bottom frame **18** of the bottom unit **16** is lowermost. The central panel **34** of the liner **112**, which is the same as the bottom liner **20**, as stated above, and its adjacent notched cleat **104** come to rest upon the cross slat **74** so that the top unit **12** cannot be pushed inward any further, since its side and front edges are supported by the upper ends of the side slats **88** and front slat **90** respectively (Figures 2 and 3). With the outer flaps **50** pressed firmly against their respective lower and upper edge portions of the panels **54**, **56**, **58** and **60** of the side unit **14**, upper and lower binding straps **116** and **118** are stretched around them and are secured in their stretched positions by the usual clips or clamps **119**. Binding wire may be used instead of these straps.

The packed article is then ready for shipment, and is unpacked at its destination by reversing the foregoing procedure. Meanwhile it can be stacked or laid on its back or sides in any desired manner without injury to

the article. If the article is a refrigerator, which in its usual form has a heat exchanger extending vertically up the back wall thereof, this heat exchanger is safely accommodated in the space provided for it by the back slats **72**, cross slat **74** and spacing blocks **84**, without danger of damage when the packing case **10** containing the article A is laid on its back. For additional security, the upper and lower ends of the back slats **72** are nailed horizontally into their respective cleats **104** and **26** within the notches thereof, so that the upper and lower units **12** and **16** are additionally tied together in this manner. These nails (not shown), however, are supplementary to the steel straps **116** and **118** and are applied by the purchaser of the packing case **10** at the time of packing his refrigerator or other article A.

The modified packing case, generally designated **120**, shown in Figures 7, 8 and 9, is generally similar to the packing case **10** of Figures 1 to 6 inclusive, differing therefrom in the construction of its top and bottom units **122** and **124** respectively, the side unit **126** being substantially the same as the side unit **14**. The bottom unit **124** (Figure 9) consists of a rectangular framework **128** composed of side cleats **130** and **132** having their ends superimposed upon end cleats **134** and **136** respectively, with a paperboard liner **138** sandwiched between them, and the whole interconnected by staples or other suitable fasteners, with or without the aid of glue. The paperboard liner **138** is of cross-shaped outline with a central rectangular portion **140** of approximately the size of the outside of the bottom frame **128** and with side flaps **142** and end flaps **144** projecting from the edges thereof. The liner **138** is scored as at **146** along this line approximately at the outside of the bottom frame **128**, and the flaps **142** and **144** folded upward therealong so that they lie outside the lower edges of the panels **54**, **56**, **58** and **60** of the side unit **126** (Figure 8) when these are superimposed upon the base unit **124**. The cleats **134** and **138** are provided with counterbored bolt holes **148** through which bolts **150** are inserted and threaded into the same threaded portions **98** or through the frame portions of the article or appliance A and sumounted by threaded nuts. The back slats **72** at their lower ends are received in notches **152** in the back cleat **132** in order to interlock the side and bottom units **126** and **124** during packing, as described above in connection with the form of the invention shown in Figures 1 to 6 inclusive.

The top unit **122** is generally similar to the top unit **12** except that its flaps are folded singly and not doubly and reversely as in Figure 6. The top unit **122** therefore has a frame **154** of wood or other suitable material inside its respective liner **156**, the frame **154** being of the same construction as the top frame **100** of Figure 6, and similarly notched as at **110** to receive the upper ends of the back slats **72**. The liner **156** has a central portion **158** and edge flaps **160** and **162** (Figures 7 and 8) which are folded down outside the upper edges of the panels of the side unit **126** in an inverted manner to the flaps **142** and **144**.

The use of the modified packing case **120** in packing an article A, such as a refrigerator, follows a similar procedure to that described above in connection with Figures 1 to 6 inclusive. The bottom unit **124** is bolted to the bottom of the refrigerator or other article A while the latter is on its side, by inserting the bolts **150** in the holes **148**. The article, with the bottom unit **124** attached, is then placed upright and the side unit **126** wrapped around the article A after its back slats **72** and cross slat **74** have been bolted by the bolts **80** to the portion **86** of the article A. The top unit **122** is then lowered into position and its flaps **160** and **162** folded down against the outside of the side unit **126** while the frame **154** fits inside it (Figure 8). The back slats **72** are then preferably nailed into their respective notches **152** by horizontal nails passing through their lower end portions into the bottom cleat **132**. Similar nailing is optionally done to secure the upper ends of the back flaps **72** in the notches **110** of the cleat **104** thereof, thus interlocking the top, bottom and side units **122**, **124** and **126**. Steel binding straps **164** and **166** similar to the binding straps **116** and **118** of Figure 2 are then stretched around the top and bottom units **122** and **124** respectively so as to firmly clamp the upper and lower end portions of the packing case **120** together. The overlapped ends of the straps **164** and **166** are then locked to one another by clips or clamps **168** (Figure 7) and the packed article is ready for shipment. Binding wire may be used instead of these straps. In all places herein where the term "fiberboard" is used, it will be understood that the use of corrugated board is also included.

It will be evident that in place of notching the cleats **132** and **130** as at **152** in Figure 9 to receive the back slats **72** and front slat **90**, the upper cleats **130** and **132** may be displaced inward as were the cleats **26** and **28** in Figure 5 for the same reason.

What I claim is:

1. A composite packing case, comprising a bottom unit including a frame having secured thereto a liner of sheet material with flaps adapted to extend upwardly from the edges thereof, means on said bottom unit frame for securing said bottom unit to the article packed in said packing case, a top unit including a frame having secured thereto a liner of sheet material with flaps adapted to extend downwardly from the edges thereof, a side structure including a sheet member having front, back and side walls with the upper and lower edges thereof disposed between the respective edge flaps and frames of said units, said side structure having laterally-spaced vertically-disposed back slats secured to said back wall and a cross slat secured between the upper portions of said back slats, the lower ends of said back slats being disposed in overlapping engagement with said bottom unit frame, and means on said cross slat for securing said side structure to the article packed in said packing case.

2. A composite packing case, comprising a bottom unit including a frame having secured thereto a liner of sheet material with flaps adapted to extend upwardly from the edges thereof, a top unit including a frame having secured thereto a liner of sheet material with flaps adapted to extend downwardly from the edges thereof, a side structure including a sheet member having front, back and side walls with the upper and lower edges thereof disposed between the respective edge flaps and frames of said units, said side structure having laterally-spaced vertically-disposed back slats secured to said back wall and a cross slat secured between the upper portions of said back slats, and means on said cross slat for securing said side structure to the article packed in said packing case, said top unit frame having recesses therein receiving the upper end portions of said back slats.

3. A composite packing case, comprising a bottom unit including a frame having secured thereto a liner of sheet material with flaps adapted to extend upwardly from the edges thereof, a top unit including a frame having secured thereto a liner of sheet material with flaps adapted to extend downwardly from the edges thereof, a side structure including a sheet member having front, back and side walls with the upper and lower edges thereof disposed between the respective edge flaps and frames of said units, said side structure having laterally-spaced vertically-disposed back slats secured to said back wall and a cross slat secured between the upper portions of said back slats, and means on said cross slat for securing said side structure to the article packed in said packing case, said bottom unit frame having a lower pair of side members and an upper pair of side members superimposed thereon, one of said upper side members having recesses therein receiving the lower end portions of said back slats.

4. A composite packing case, comprising a bottom unit including a frame having secured thereto a liner of sheet material with flaps adapted to extend upwardly from the

edges thereof, a top unit including a frame having secured thereto a liner of sheet material with flaps adapted to extend downwardly from the edges thereof, a side structure including a sheet member having front, back and side walls with the upper and lower edges thereof disposed between the respective edge flaps and frames of said units, said side structure having laterally-spaced vertically-disposed back slats secured to said back wall and a cross slat secured between the upper portions of said back slats, and means on said cross slat for securing said side structure to the article packed in said packing case, said bottom unit frame having a lower pair of side members and an upper pair of side members superimposed thereon, one of said upper side members having recesses therein receiving the lower end portions of said back slats, the lower ends of said back slats resting upon the lower side members.

5. A composite packing case, comprising a bottom unit including a frame having secured thereto a liner of sheet material with flaps adapted to extend upwardly from the edges thereof, a top unit including a frame having secured thereto a liner of sheet material with flaps adapted to extend downwardly from the edges thereof, a side structure including a sheet member having front, back and side walls with the upper and lower edges thereof disposed between the respective edge flaps and frames of said units, said side structure having laterally-spaced vertically-disposed back slats secured to said back wall and a cross slat secured between the upper portions of said back slats, and means on said cross slat for securing said side structure to the article packed in said packing case, said cross slat being spaced below the upper edge of said sheet member, and said top unit being disposed in the space above said cross slat and resting thereon substantially flush with said upper edge of said sheet member.

6. A composite packing case, comprising a bottom unit including a frame having secured thereto a liner of sheet material with flaps adapted to extend upwardly from the edges thereof, a top unit including a frame having secured thereto a liner of sheet material with flaps adapted to extend downwardly from the edges thereof, a side structure including a sheet member having front, back and side walls with the upper and lower edges thereof disposed between the respective edge flaps and frames of said units, said side structure having laterally-spaced vertically-disposed back slats secured to said back wall and a cross slat secured between the upper portions of said back slats, and means on said cross slat for securing said side structure to the article packed in said packing case, said side structure also having a front slat secured to the front wall of said sheet member with the upper end thereof spaced below the upper edge of said front wall, said cross slat being spaced below the upper edge of said sheet member, and said top unit being disposed in the space above said cross slat and front slat and resting thereon substantially flush with said upper edge of said sheet member.

7. A composite packing case, comprising a bottom unit including a frame having secured thereto a liner of sheet material with flaps adapted to extend upwardly from the edges thereof, a top unit including a frame having secured thereto a liner of sheet material with flaps adapted to extend downwardly from the edges thereof, a side structure including a sheet member having front, back and side walls with the upper and lower edges thereof disposed between the respective edge flaps and frames of said units, said side structure having laterally-spaced vertically-disposed back slats secured to said back wall and a cross slat secured between the upper portions of said back slats, and means on said cross slat for securing said side structure to the article packed in said packing case, said top unit frame having spaced parallel side members and end members disposed transversely thereto in the space therebetween in substantially the same plane as said side members, said cross slat being spaced below the upper edge of said sheet member, and said top unit being disposed in the space above said cross slat and resting thereon substantially flush with said upper edge of said sheet member.

8. A composite packing case, comprising a bottom unit including a frame having secured thereto a liner of sheet material with flaps adapted to extend upwardly from the edges thereof, a top unit including a frame having secured thereto a liner of sheet material with flaps adapted to extend downwardly from the edges thereof, a side structure including a sheet member having front, back and side walls with the upper and lower edges thereof disposed between the respective edge flaps and frames of said units, said side structure having laterally-spaced vertically-disposed back slats secured to said back wall and a cross slat secured between the upper portions of said back slats, and means on said cross slat for securing said side structure to the article packed in said packing case, said top unit frame having spaced parallel side members and end members disposed transversely thereto in the space therebetween in substantially the same plane as said side members, said side structure also having a front slat secured to the front wall of said sheet member with the upper end thereof spaced below the upper edge of said front wall, said cross slat being spaced below the upper edge of said sheet member, and said top unit being disposed in the space above said cross slat and front slat and resting thereon substantially flush with said upper edge of said sheet member.

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