Oct. 19, 1943. E. F. SCHWELLER 2,332,016

REFRIGERATING APPARATUS

Filed Nov. 15, 1941 3 Sheets-Sheet 1

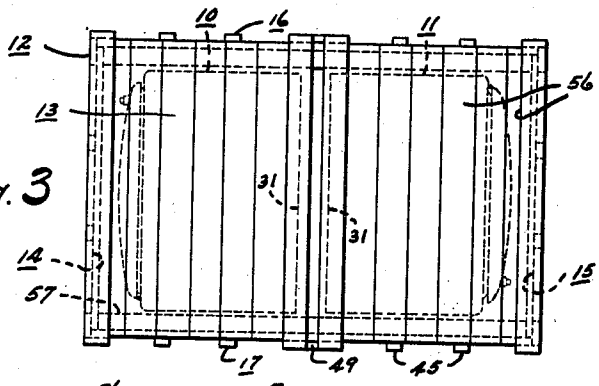


Fig. 3

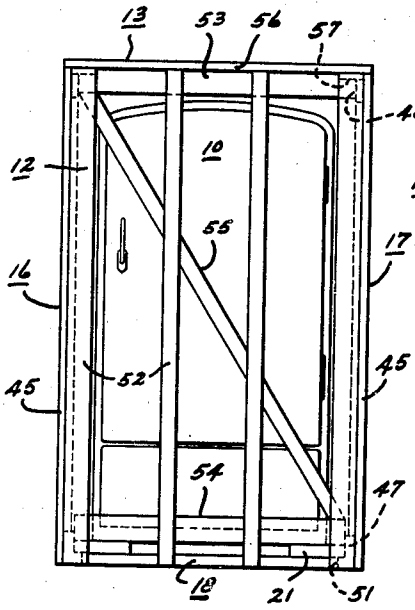


Fig. 2

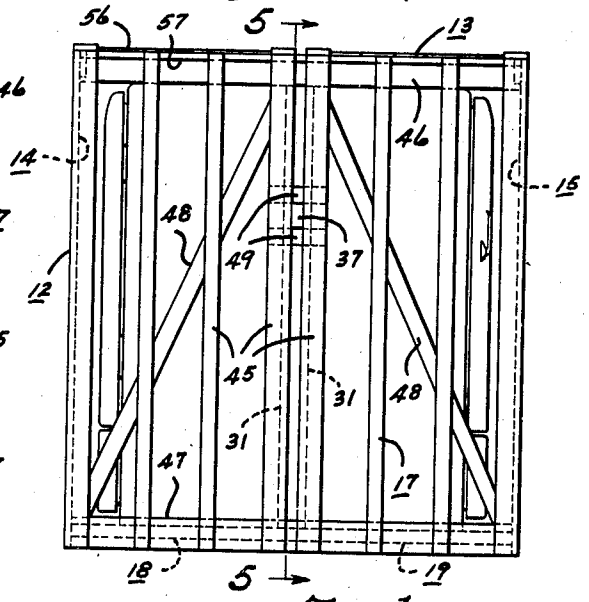


Fig. 1

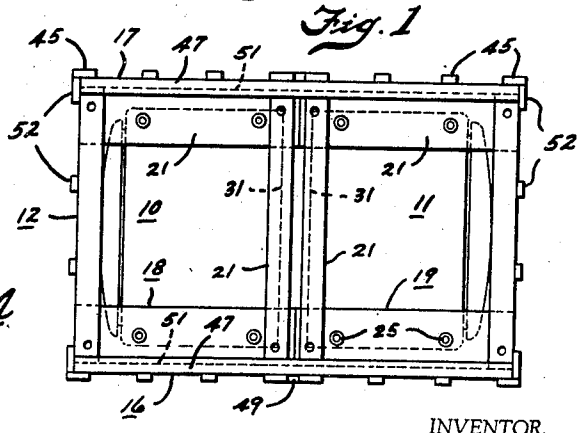


Fig. 4

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Filed Nov. 15, 1941 3 Sheets-Sheet 2

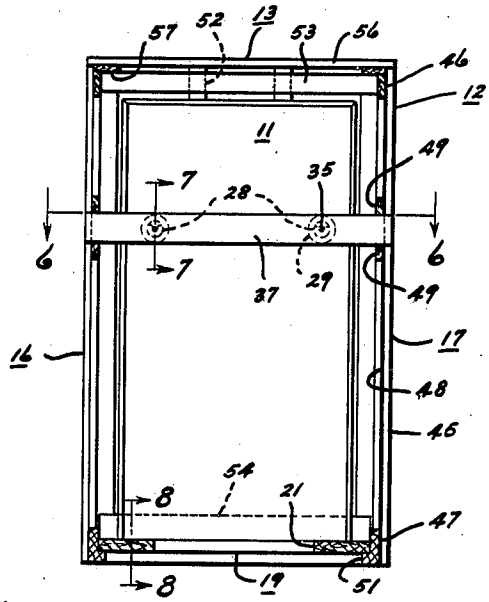


Fig. 5

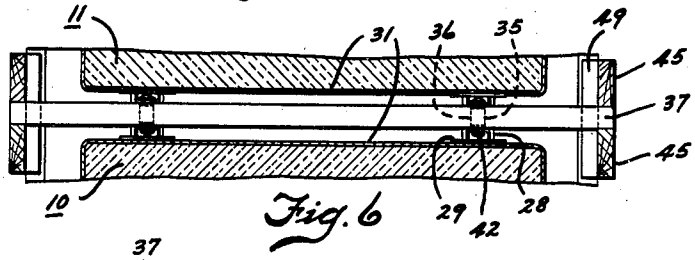


Fig. 6

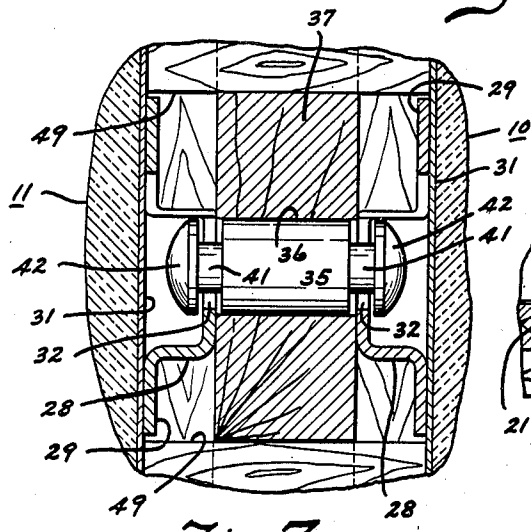


Fig. 7

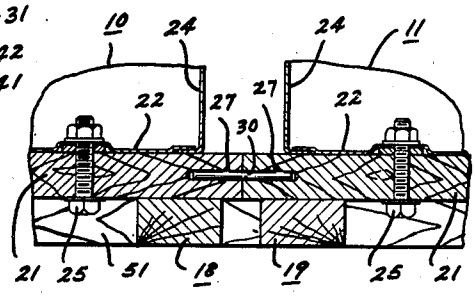


Fig. 8

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REFRIGERATING APPARATUS

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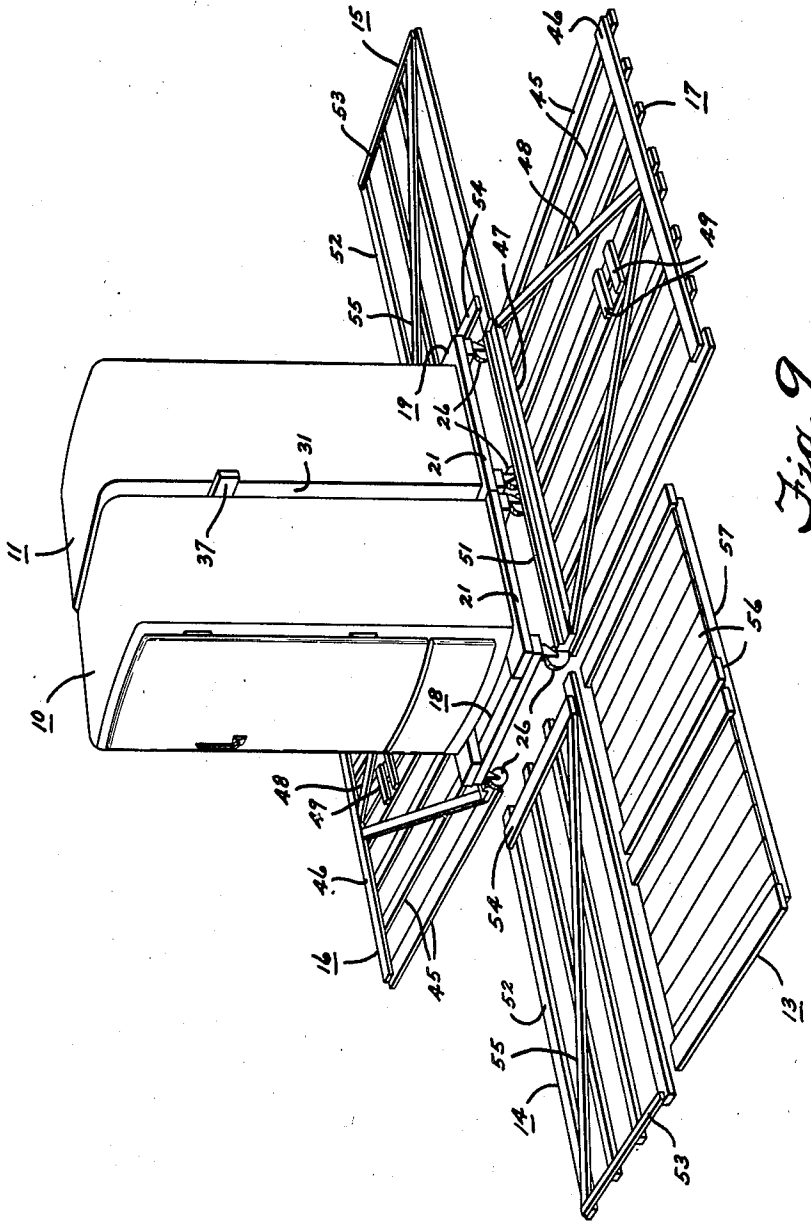


Fig. 9

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UNITED STATES PATENT OFFICE

2,332,016

REFRIGERATING APPARATUS

Edmund F. Schweller, Dayton, Ohio, assignor to General Motors Corporation, Dayton, Ohio, a corporation of Delaware

Application November 15, 1941, Serial No. 419,342

8 Claims. (Cl. 217—43)

This invention relates to shipping crates for refrigerators.

In recent years, household refrigerator cabinets have been provided with outer metal panels or shells having highly finished surfaces that must be protected during shipment of the cabinets from the manufacturer to the dealer or retailer. For example, the metal cabinet outer walls or shells usually have a porcelain enamel coating or surface which is brittle and must be protected from becoming chipped or damaged upon striking other objects during shipping of the cabinets. I am aware of the fact that these cabinets have heretofore each been packed in an individual shipping crate for shipment from the factory. This individual packing or crating has been necessitated by the weight of the refrigerator being so great that ordinarily only one refrigerator cabinet could be handled and moved by two men. Thus, it has been a rather expensive proposition to the manufacture to provide for individual crating of refrigerator cabinets due to the number of crate parts required to be stocked for various sizes of cabinets and due to the large inventory such parts create. More recently, however, the weight of medium size household refrigerator cabinets has been greatly reduced by the elimination of heavy frames, etc., from the cabinets and by minimizing and making parts of the refrigerating system, mounted in the cabinets, smaller. By this method, the present day so-called medium size household refrigerator weighs only about half as much as the same size refrigerator weighed a few years ago. Therefore, two men could now very readily handle and move two of these crated household refrigerators at the same time if some means were provided for rigidly securing the crates together so that they could be tilted, raised and carted away simultaneously with one another by an ordinary lift truck. In order to render handling and moving of two refrigerator cabinets feasible, I contemplate the shipping of two cabinets in a single crate.

An object of my invention is to provide an improved method of and crate for shipping refrigerator cabinets.

Another object of my invention is to provide a crate for shipping two refrigerators as a unitary structure therein to thereby reduce the manufacturer's inventory to a minimum.

A further object of my invention is to provide means whereby two refrigerator cabinets can be locked against movement relative to one another within a single shipping crate and against movement relative to the crate.

In carrying out the foregoing objects, it is a still further and more specific object of my invention to crate refrigerator cabinets for shipment in such a manner that the refrigerators will conserve storage space in a warehouse and space in a railway car during shipping thereof.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings, wherein a preferred form of the present invention is clearly shown.

In the drawings:

Fig. 1 is a side view of a shipping crate structure showing two refrigerator cabinets locked together therein by means constructed in accordance with my invention;

Fig. 2 is an end view of the structure shown in Fig. 1;

Fig. 3 is a top view of the structure shown in Fig. 1;

Fig. 4 is a bottom view of the structure shown in Fig. 1;

Fig. 5 is a sectional view of the structure taken on the line 5—5 of Fig. 1 and showing the means for locking the refrigerator cabinets together in the crate;

Fig. 6 is a fragmentary sectional view of the cabinet locking means and is taken on the line 6—6 of Fig. 5;

Fig. 7 is an enlarged fragmentary sectional view taken on line 7—7 of Fig. 5 showing the refrigerator cabinet locking means in detail;

Fig. 8 is an enlarged fragmentary sectional view taken on the line 8—8 of Fig. 5 showing the cabinets bolted to their supporting bases; and

Fig. 9 is a perspective view of the two refrigerator cabinets disposed in back-to-back relationship and showing parts of the crate therefor lying on the floor adjacent the cabinets preparatory to being assembled together.

Referring to the drawings, for illustrating the present invention, I have shown in Figs. 1 to 4 two refrigerator cabinets, 10 and 11, disposed within a single shipping crate generally represented by the reference character 12. The shipping crate 12 comprises a top wall 13, end walls 14 and 15, side walls 16 and 17, and a bottom wall formed by two base members 18 and 19. Each wall of the crate is formed of a plurality of wood pieces or slats nailed together, and all walls of the crate are also nailed to one another to form a rigid rectangular shaped shipping con-

tainer. Each member 18 and 19 includes a heavy wood piece 21 having their ends overlapped and nailed to one another to form sides of a base for supporting a refrigerator cabinet thereon. The base members 18 and 19 are placed under the cabinet 10 or 11 at the time the skeleton cabinet is started down the production assembly line or track. Each cabinet 10 and 11 includes metal gusset plates 22 secured to the leg or lower metal apron 24 at the corner thereof (see Fig. 8), and suitable bolts 25 passing through these gusset plates, washers and through the wood pieces 21 rigidly clamp the cabinets 10 and 11 to the base members 18 and 19 respectively. As the cabinets 10 and 11, fully assembled with a closed refrigerating system mounted therein, come off the production track, casters 26 (see Fig. 9) are placed in suitable holes provided in the wood pieces 21 at each corner of the base members 18 and 19. These casters 26 serve to facilitate handling and moving around of the cabinets for crating purposes, prior to shipment or storage thereof. Each cabinet 10 and 11 includes a pair of horizontally spaced apart sheet metal boss members 28 having a flanged portion 29 welded or otherwise rigidly secured to the metal cabinet back wall 31. These boss members each have a slot 32 cut therein for a purpose to be hereinafter described. As the cabinets 10 and 11 leave the production track, mounted on or secured to the base members 18 and 19 respectively, the casters 26 are placed under the base members and the cabinets are moved or rolled into back-to-back relationship with one another with the base members abutting each other. End portions of wood pieces 21 of the base members 18 and 19 which abut against one another when the cabinets are moved into back-to-back relationship, as shown in Fig. 8 of the drawings, are provided with registering horizontally disposed bores 27. The bores 27 form aligned registering openings for receiving a metal or wood peg 30 which serves as a dowel pin to rigidly secure the base members against vertical movement relative to one another. Dowel pins 30 may be placed in the bores or openings 27 of one base member and the portion thereof projecting outwardly from the one base member may be moved or slid into the bores or openings 27 of the other base member at the time the members 18 and 19 are moved into abutting relation with one another. Since the base members 18 and 19 are secured against horizontal and vertical movement relative to one another after other crate parts are assembled together by other means as will be hereinafter more fully described, the use of the dowel pins 30 may not be necessary and for this reason they may, if desired, be omitted. The boss members 28 on the back wall of cabinets 10 and 11 register with one another and studs 35 located within suitable openings 36 provided in a wood bar element 37 are brought into association with the oppositely disposed boss members 28. Each stud 35 has a neck portion 41 and a head portion 42 at each end thereof. Upon inserting the bar 37 intermediate the backs of cabinets 10 and 11, the neck portion 41 of studs 35, carried by bar 37, may be fitted into the slots 32 of boss members 28 with the head portions 42 of studs 35 disposed in the socket part of the members 28. Bar element 37 holds the studs 35 in place and provides a rigid means extending outwardly from the side walls of cabinets 10 and 11 and the projecting ends of the bar element may be received by side walls of the crate in a manner and for the purpose to be presently described. The bar element 37 and its associated studs 35 being so located thereby form a rigid connection between the cabinets 10 and 11 and prevent relative movement therebetween (see Figs. 6 and 7). Cabinets 10 and 11 being rigidly interlocked in back-to-back relationship, as described and as shown in Fig. 9 of the drawings, are now ready to be crated in a single crate.

Each side wall 16 and 17 of the shipping crate 12 comprises spaced apart vertical slats 45 nailed to upper and lower horizontal pieces 46 and 47 respectively. These side walls also comprise angularly disposed strengthening wood pieces 48 to which the slats 45 are nailed. Wood strips 49 secured to the two middle vertical slats 45 are horizontally disposed and vertically spaced apart to provide an opening which is adapted to receive the ends of bar 37 in a manner and for the purpose to be presently described. The bottom horizontal piece 47 of the crate side walls 16 and 17 has an inwardly directed shoulder 51 formed thereon which shoulder is adapted to fit under the side rail piece 21 of the base members 18 and 19 upon assembly of the crate. End walls 14 and 15 of the crate comprise several spaced apart vertical slats 52 nailed to upper and lower horizontal pieces 53 and 54 respectively and also comprise an angularly disposed strengthening wood piece 55. The lower end pieces 54 of the crate end walls 14 and 15 are so located and arranged as to rest upon the end portions of the side rail pieces 21 of the base members 18 and 19. The crate top wall 13 includes a plurality of abutted cross pieces 56 secured to side rails 57 and the abutted wood pieces 56 form a substantially closed cover or lid for the crate to protect the tops of the cabinets 10 and 11.

The cabinets 10 and 11 upon leaving the production line are moved or rolled upon the casters 26 into back-to-back relationship with one another to prepare them for storage in a warehouse or for shipment. After locating the dowel pins 30 within openings 27, the bar element 37, carrying the studs 35, is lowered into position between the cabinets 10 and 11 with the studs 35 interlocking with the boss members 28 on both cabinets, as shown in Figs. 5, 6 and 7 of the drawings. The bar 37 and its associated studs 35 form a rigid connection between the cabinets 10 and 11 and prevent movement thereof horizontally away from one another and sidewise of one another. In this locked together position of cabinets 10 and 11, their supporting bases 18 and 19 abut against one another, as shown in Fig. 8 of the drawings. The cabinets 10 and 11 are now ready to be crated and the crate side walls 16 and 17 are moved into a vertical position with the opening formed by the intermediate slats 45 and strips 49 of the side walls straddling or receiving the end positions of the cross bar 37 projecting outwardly of the sides of the cabinets. In this assembled position of the crate side walls 16 and 17, the shoulder 51 on the lower horizontal piece 47 of each side wall 16 and 17 is nailed to the side rail pieces 21 of one base member 18 and the other end portion of piece 47 is nailed to the side rail piece 21 of the other base member 19. Thus, the base members 18 and 19, in addition to being held in abutting relationship by the bar 37 and its associated studs interlocked with the cabinets 10 and 11, are also secured to one another by virtue of nailing the one portion of side walls 16 and 17 to the one member 18 and nailing the other portion of the side walls to the other member 19.

Thus the base members 18 and 19 are rigidly secured to one another against relative movement and for this reason it is obvious that the dowel pins 30 may, if desired, be omitted. The crate end walls 14 and 15 are next moved into vertical positions and into association with the ends of the side walls 16 and 17. Association of end walls 14 and 15 with the device is such that the lower end pieces 54 thereof rest upon the ends of the side rails 21 of the base members 18 and 19. The end slats 52 of each end wall 14 and 15 may be nailed to the ends of rails 21 of the base members 18 and 19 and may be nailed along a vertical line by passing nails through the end slats 45 of the crate side walls 16 and 17 into the end slats 52 of the end walls. Top 13 of the crate is then placed in position over the cabinets 10 and 11 whereby it rests on the top edges of the crate end and side walls 14, 15, 16 and 17. This top 13 is secured to the crate by nailing the top ends of slats 45 and 52 of the crate side and end walls thereto. A rectangular enclosure is thereby formed by the crate walls in which the refrigerator cabinets 10 and 11 are rigidly disposed. The crate walls lock the base members 18 and 19 to one another and, by securing the end portions of bar 37 to the intermediate slats 49 and/or to the pieces 49 of the crate side walls by screws or the like, the upper portions of cabinets 10 and 11 are likewise locked to one another and to an upper portion of the crate device. Thus, a unitary structure is formed wherein a rigid connection or means between the cabinets is provided for preventing relative movement therebetween within the crate and wherein the connecting means includes means cooperating therewith and secured to the crate for preventing movement of the cabinets relative to the crate. If desired, a paper or the like protecting hood or cover may be placed over the cabinets 10 and 11 prior to crating same in the manner described. The casters 26 are preferably removed from the crate structure prior to shipment thereof or prior to moving the structure to a warehouse for storage.

From the foregoing, it will be apparent that I have provided an improved method of and device for shipping two refrigerator cabinets in a single shipping crate. My improvement eliminates the number of side and end crate walls necessarily carried in stock when cabinets are shipped in separate crates and thereby reduce the manufacturer's inventory to a minimum. The present crate reduces the cost of shipping refrigerator cabinets and virtually compels the distributor or dealer to order such cabinets in multiples of two each, which is more desirable. My improved crate is particularly applicable to shipping small refrigerators, and by shipping two of them together in a single crate, a larger shipping package is provided which necessitates and insures more careful handling during transportation from the manufacturer to the dealer. The improved crate structure is readily assembled and disassembled, and when the walls thereof are secured together, a rigid unitary structure is provided which prevents walls thereof from moving relative to one another upon tilting and lifting the structure at one side and/or at the corners thereof.

While the form of embodiment of the invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. In a device of the character described comprising in combination, a crate including a top wall, end and side walls and two base members forming the bottom wall thereof, a plurality of cabinets within said crate, one of said cabinets being detachably secured to one of said base members and the other cabinet being detachably secured to the other base member, a portion of each side wall and an end wall of said crate being secured to one of said base members and another portion of each side wall and the other end wall thereof being secured to the other of said base members, means forming a rigid connection between said cabinets beyond said base members for preventing relative movement therebetween within said crate, and said means including means cooperating with said rigid connection and being secured to said crate side walls for preventing movement of said cabinets relative to the crate.

2. In a device of the character described comprising in combination, a crate including a top wall, end and side walls and two base members forming the bottom wall thereof, a plurality of cabinets within said crate, one of said cabinets being detachably secured to one of said base members and the other cabinet being detachably secured to the other base member, a portion of each side wall and an end wall of said crate being secured to one of said base members and another portion of each side wall and the other end wall thereof being secured to the other of said base members, means forming a rigid connection between said cabinets beyond said base members for preventing relative movement therebetween within said crate, said means including means cooperating with said rigid connection and having end portions extending beyond the side walls of said cabinets, and one of said end portions of said second named means being secured to one side wall of said crate and the other end portion thereof being secured to the other side wall of said crate for preventing movement of said cabinets relative to the crate.

3. In a device of the character described comprising in combination, a crate including a top wall, end and side walls and two base members forming the bottom wall thereof, a cabinet detachably secured to each base member, said cabinets being disposed in back-to-back relation within said crate, a portion of each side wall and an end wall of said crate being secured to one of said base members and another portion of each side wall and the other end wall thereof being secured to the other of said base members, means forming a rigid connection between the backs of said cabinets upwardly of said base members for preventing relative movement of the cabinets within said crate, and said means including means cooperating with said rigid connection and being secured to said crate side walls for preventing movement of said cabinets relative to the crate.

4. In a device of the character described comprising in combination, a crate including a top wall, end and side walls and two base members forming the bottom wall thereof, a cabinet detachably secured to each base member, said cabinets being disposed in back-to-back relation within said crate, a portion of each side wall and an end wall of said crate being secured to one of said base members and another portion of each side wall and the other end wall thereof being secured to the other of said base members, means forming a rigid connection between the

backs of said cabinets upwardly of said base members for preventing relative movement of the cabinets within said crate, said means including means extending between the backs of said cabinets and cooperating with said rigid connection, said second named means having end portions projecting beyond the side walls of said cabinets, and one end portion of said second named means being secured to one side wall of said crate and the other end portion thereof being secured to the other side wall of said crate for preventing movement of said cabinets relative to the crate.

5. In a device of the character described comprising in combination, a crate including a top wall, end and side walls and two base members forming the bottom wall thereof, a cabinet detachably secured to each of said base members and disposed within said crate, a portion of each side wall and an end wall of said crate being secured to one of said base members and another portion of each side wall and the other end wall thereof being secured to the other of said base members for preventing movement of said base members and the lower part of said cabinets relative to one another, means forming a rigid connection between the upper part of said cabinets for preventing relative movement between the upper portions of said cabinets within said crate, and said means including a bar-like member attached to said rigid connection and extending outwardly from the sides of said cabinets, said bar member having its ends secured to the side walls of said crate for preventing movement of said cabinets relative thereto.

6. In a device of the character described comprising in combination, a crate including a top wall, end and side walls and two base members forming the bottom wall thereof, a cabinet detachably secured to each of said base members and disposed in back-to-back relation within said crate, a portion of each side wall and an end wall of said crate being secured to one of said base members and another portion of each side wall and the other end wall thereof being secured to the other of said base members for preventing movement of said base members and the lower part of said cabinets relative to one another, spaced apart studs detachably secured to the back wall of each cabinet at the upper portions thereof for preventing relative movement therebetween within said crate, and a bar-like member fitting over the spaced apart studs and extending outwardly from the sides of said cabinets, said bar member having one of its ends secured to one side wall of said crate and having its other end secured to the other side wall of said crate for preventing movement of said cabinets relative to the crate.

7. In a device of the character described comprising in combination, a crate including a top wall, upright side walls and two base members forming the bottom wall thereof, a plurality of cabinets within said crate, one of said cabinets being supported on one of said base members and the other of said cabinets being supported on the other of said base members, at least two opposed upright walls of said crate having a portion thereof secured to each of said base members, means engaging and forming a rigid connection between said cabinets for preventing relative movement therebetween within said crate, and said means including means cooperating with said rigid connection and secured to each of said two opposed upright crate walls beyond said base members for preventing movement of the cabinets relative to the crate.

8. In a device of the character described comprising in combination, a crate including a top wall, narrow end walls, relatively wide side walls and two base members forming the bottom wall thereof, a plurality of cabinets within said crate, one of said cabinets being supported on one of said base members and the other of said cabinets being supported on the other of said base members, each side wall of said crate having a portion thereof secured to each of said base members, means engaging and forming a rigid connection between said cabinets for preventing relative movement therebetween within said crate, and said means including means cooperating with said rigid connection and secured to each of said side walls of said crate beyond said base members for preventing movement of the cabinets relative to the crate.

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