Aug. 9, 1966 H. S. CLOYD 3,265,240

COLLAPSIBLE CONTAINER

Filed July 10, 1964 3 Sheets-Sheet 1

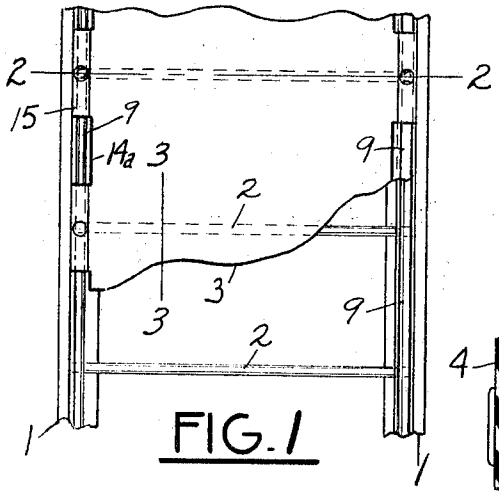


FIG. 1

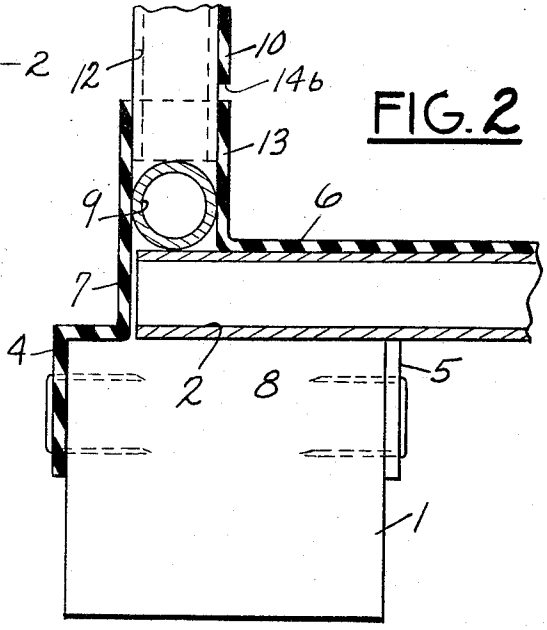


FIG. 2

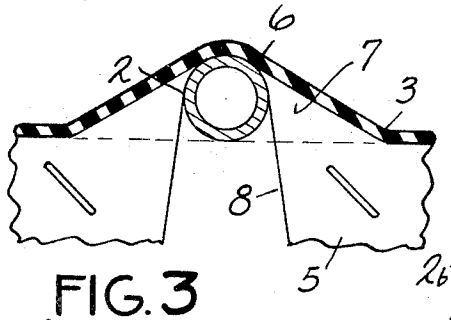


FIG. 3

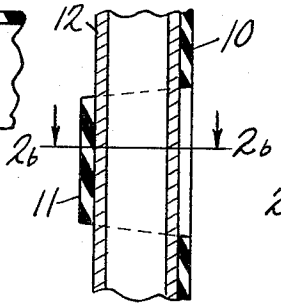


FIG. 2a

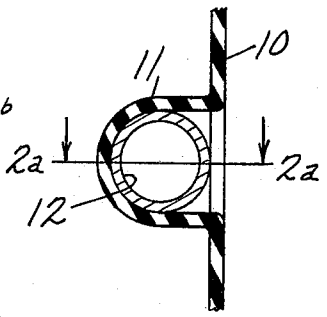


FIG. 2b

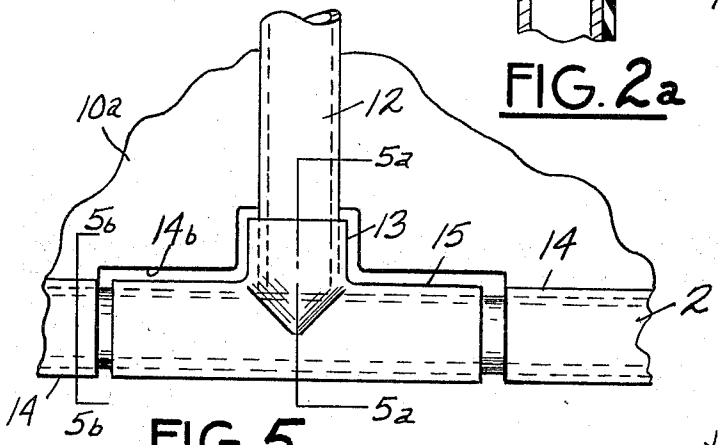


FIG. 5

INVENTOR.
Harold S Cloyd
BY
Ralph Hammar
Attorney

Aug. 9, 1966 H. S. CLOYD 3,265,240

COLLAPSIBLE CONTAINER

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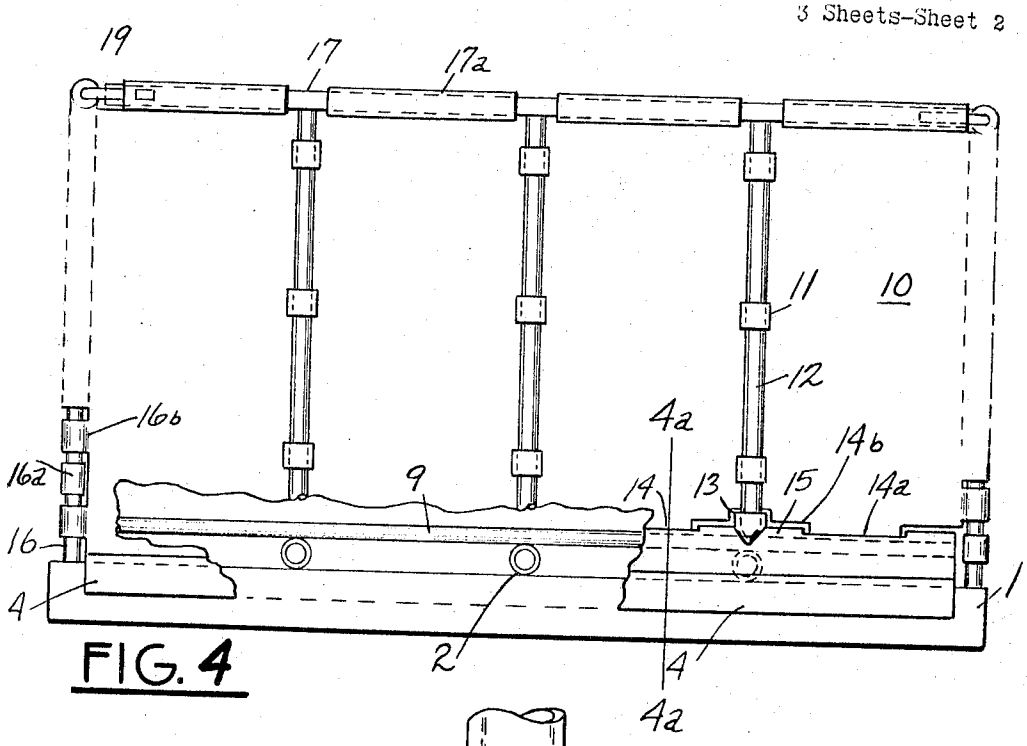


FIG. 4

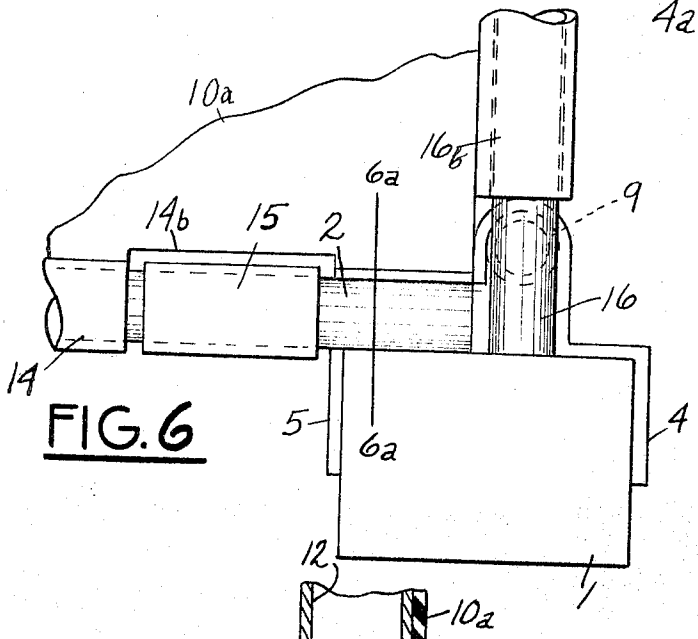


FIG. 6

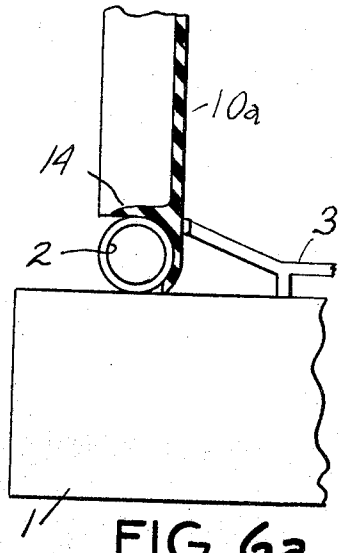


FIG. 6a

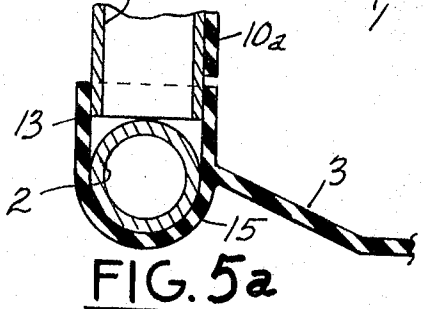


FIG. 5a

INVENTOR.
Harold S Cloyd
BY Ralph Hammas
Attorney

Aug. 9, 1966 H. S. CLOYD 3,265,240

COLLAPSIBLE CONTAINER

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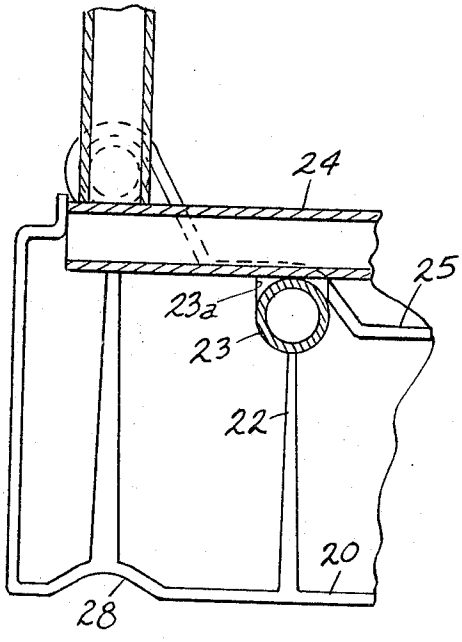


FIG. 9

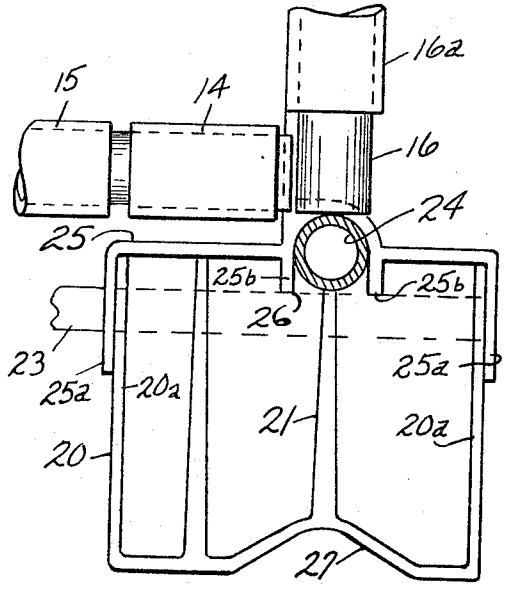


FIG. 8

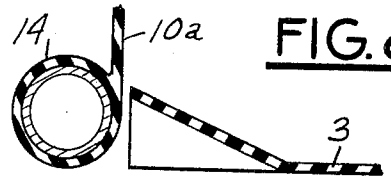


FIG. 5b

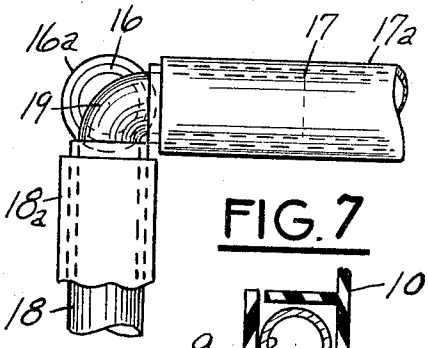


FIG. 7

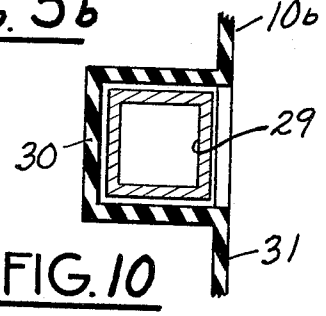


FIG. 10

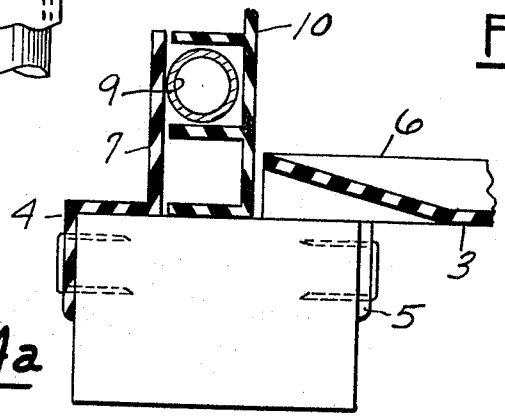


FIG. 4a

INVENTOR.
BY Harold S Cloyd
Ralph Hammar
Attorney

United States Patent Office 3,265,240 Patented August 9, 1966

3,265,240

COLLAPSIBLE CONTAINER

Harold S. Cloyd, Erie, Pa., assignor to Nosco Plastics, Incorporated, Erie, Pa., a corporation of Pennsylvania

Filed July 10, 1964, Ser. No. 381,673
9 Claims. (Cl. 220—84)

This invention is a collapsible container for use in pallet storage and handling of fruit, vegetables and the like having bottom, side and end walls of plastic and a supporting frame of metal tubing, thereby obtaining a longer life than the currently used wood containers.

In the drawings, FIG. 1 is a top plan view, partly broken away, of the bottom wall of the container, FIG. 2 is a section on line 2—2 of FIG. 1, FIG. 2*a* is a section on line 2*a*—2*a* of FIG. 2*b*, FIG. 2*b* is a section on line 2*b*—2*b* of FIG. 2*a*, FIG. 3 is a section on line 3—3 of FIG. 1, FIG. 4 is a side elevation of the container, FIG. 4*a* is a section on line 4*a*—4*a* of FIG. 4, FIG. 5 is a fragmentary view of an end of the container, FIG. 5*a* is a section on line 5*a*—5*a* of FIG. 5, FIG. 5*b* is a section on line 5*b*—5*b* of FIG. 5, FIG. 6 is an end elevation of a corner of the container, FIG. 6*a* is a section on line 6*a*—6*a* of FIG. 6, FIG. 7 is a top plan view of a corner of the container, FIG. 8 is an end view of a modification having a plastic skid substituted for the wood skid, FIG. 9 is a fragmentary side view of one of the skids, and FIG. 10 is a view similar to FIG. 2*b* of a modification using square tubing.

In a preferred form, the bottom of the container has two longitudinally extending wood skids **1** on which rest a plurality of cross tubes **2** spaced in accordance with the required load carrying capacity. Extending over the skids **1** and cross tubes **2** is a molded plastic bottom wall **3** having flanges **4** overlapping and stapled to the outside of the skids **1** and having integral ribs **5** stapled to the inside of the skids. As shown in FIG. 2, the cross tubes **2** terminate short of the outer edge of the skids **1**. The cross tubes extend through ribs **6** on the bottom wall **3** and the ends of the cross tubes **2** are blocked by walls **7** at the ends of the ribs **6**. The ribs **5** have suitable notches **8** for the cross tubes. When the bottom wall **3** is stapled to the skids with the cross tubes **2** in place, a rigid structural member is obtained in which the load is carried primarily by the skids and tubes and only to a limited extent by the plastic wall **3**.

At opposite ends of the cross tubes are longitudinal tubes **9** which extend almost the full length of the skids **1**. Side walls **10** extend the full length of the skids and have external loops **11** for vertical tubes **12**, the lower ends of which rest on the longitudinal tubes **9**. The lower ends of the tubes **12** are received in sockets **13** integral with the bottom wall **3**. The side walls have knuckles **14** (FIG. 5*b*) and the bottom wall has a knuckle **15** integral with each of the sockets **13** providing in conjunction with the longitudinal tubes **9** and vertical tubes **12** a connection between the side walls and the bottom wall. In assembly, the knuckles **14** of the side walls **10** are inserted through openings **14***a* in the bottom wall bringing the knuckles **14** into alignment with the knuckles **15**. Notches **14***b* in the side walls clear the knuckles **15** and sockets **13**. The tubes **9** are then slid endwise into the knuckles **14, 15**, locking the side walls in place. The vertical tubes **12** are then dropped through the loops **11** into the sockets **13**.

The end panels **10***a* are substantially the same as the side panels, differing primarily in size. FIGS. 5 and 5*a* show a socket **13** in the bottom wall **3** receiving the lower end of a vertical tube **12** and one of the knuckles **15** on the bottom wall for the cross tube **2**. FIGS. 5, 5*b* and 6 show the knuckles **14** at the lower end of the end wall **10***a*. The knuckles **14** at the ends of the end wall **10***a* are open on one side as shown in FIG. 6*a* while the balance of the knuckles **14** are complete tubes as shown in FIG. 5*b*. In the side wall **10**, all of the knuckles **14** are open on one side as shown in FIG. 4*a*. In assembly, the knuckles **14** of the end walls **10***a* are inserted between the knuckles **15** on the bottom wall and the cross tubes **2** are slid endwise through the knuckles.

At the corners, the end and side walls have interfitting aligned knuckles **16***a*, **16***b* receiving vertical corner tubes **16**, the lower ends of which rest on the skids **1**. The vertical corner tubes **16** block longitudinal sliding of the tubes **9** and also block crosswise sliding of the cross tubes **2** at the extreme ends of the bottom wall as shown in FIG. 6. The assembly is completed by inserting tubes **17** and **18** in knuckles **17***a*, **18***a* at the upper edge of the side and end walls and locking the tubes in place by right angle corner members **19**. The tubes **17, 18** are assembled in sequence. The final tube to be assembled must have provisions for telescoping to permit insertion of the final corner member **19**. After the final corner member **19** is in place, the final tube is extended and pinned in place. At the corners, the knuckles **17***a* and **18***a* are preferably open on the outer side so the corner members **19** may be slid axially into position along either tube **17** or **18**.

When the assembly is complete, the entire load is carried on the frame consisting of metal tubes **2, 9, 12, 16, 17, 18** and the plastic panels merely serve as curtain walls. The tubes **2** on the bottom wall are assembled as a unit on the skids **1**. The other tubes are inserted into the sockets and knuckles during the course of assembly. The container can be shipped knocked down and after use can be dismantled for storage.

In the modification of FIGS. 8 and 9, plastic skids **20** are substituted for the wood skids **1**. These plastic skids **20** have a plurality of longitudinal stiffening ribs **21** and also notches **23***a* for cross tubes **23** and cross ribs **22** underlying the cross tubes **23**. The cross tubes **23** correspond to the tubes **2**. The bottom wall **25** which corresponds to the bottom wall **3** fits over the upper edges of the skids **20** and has sockets **26** for the longitudinal tubes **24**.

On the under side, the skids **20** have longitudinal grooves **27** and transverse grooves **28** which receive the upper side and end edges of an underlying container when containers are stacked. In other respects, the construction is the same.

Square tubing such as shown at **29** in FIG. 10 may be substituted throughout by making appropriate changes in the knuckles or loops. In FIG. 10, which corresponds to FIG. 2*b*, the vertical tube **29** fits in a square loop **30** in side wall **31**. The square tubing provides better load carrying surfaces.

In FIGS. 8 and 9, the depending flanges **25***a* of the bottom wall telescope over the upstanding flanges **20***a* on the skid, providing a box frame construction. Depending ribs **25***b* on the under side of the bottom wall straddle the longitudinal tube **24** and hold it in position.

What is claimed as new is:

1. In combination, a plurality of longitudinal skids, cross tubes resting on the skids, a plastic bottom wall overlying the skids and tubes and fixed to the skids, the bottom wall and the skids having cooperating formations forming recesses confining the tubes.

2. In a crate, a plurality of longitudinal skids, cross tubes resting on the skids, a bottom wall on the cross tubes and fixed to the skids and having means engaging the cross tubes for holding the cross tubes in place, a longitudinal tube above one of the skids resting on the cross tubes, a side wall, the bottom wall and side wall having interfitting knuckles for receiving the longitudinal tube.

3. In a crate, a plurality of longitudinal skids, cross tubes resting on the skids, a bottom wall on the cross tubes and fixed to the skids and having means engaging the cross tubes for holding the cross tubes in place, a longitudinal tube above one of the skids resting on the cross tubes, a side wall, the bottom wall and side wall having interfitting knuckles for receiving the longitudinal tube, and end wall, interfitting knuckles on the bottom wall and end wall receiving one of the cross tubes, the end and side walls having interfitting vertical knuckles, a vertical tube received in the vertical knuckles with its lower end in load transmitting relation to one of the skids and having a portion opposite an end of at least one of the cross and longitudinal tubes to block endwise movement thereof.

4. In combination, a plurality of longitudinal skids, each skid being of channel cross section with upstanding longitudinallly extending flanges, a bottom wall overlying the flanges, said bottom wall having depending flanges straddling each of the skids, cross tubes between the bottom wall and the flanges, the flanges and bottom wall having cooperating formations defining recesses confining the tubes.

5. In combination, a plurality of longitudinal skids, each skid being of channel cross section with upstanding longitudinally extending flanges, notches in the upper edges of the flanges receiving cross tubes, and a bottom wall fixed to the skids and overlying the tubes and the notches in the upper edges of the flanges and cooperating with the notches to hold the cross tubes in place.

6. In a crate, a plurality of longitudinal skids, cross tubes resting on the skids, a bottom wall on the cross tubes and fixed to the skids and having means engaging the cross tubes for holding the cross tubes in place, a longitudinal tube above one of the skids resting on the cross tubes, a side wall, the bottom wall and the lower edge of the side wall having interfitting knuckles for receiving the longitudinal tube, the side wall having knuckles at its upper edge for receiving another longitudinal tube, vertical load carrying tubes extending between the longitudinal tubes, and loops in the side walls for holding the vertical tubes.

7. The construction of claim 6 in which the knuckles of the bottom wall have sockets receiving the lower ends of the vertical tubes.

8. In a crate, a plurality of longitudinal skids, cross tubes resting on the skids, a bottom wall fixed to the skids and overlying the cross tubes, a longitudinal tube above one of the skids resting on the cross tubes, a side wall, the bottom wall and side wall having interfitting knuckles for receiving the longitudinal tube, the side wall having knuckles at its upper edge for receiving another longitudinal tube, vertical load carrying tubes extending between the longitudinal tubes, and loops in the side walls for holding the vertical tubes, an end wall, the end wall and bottom wall having interfitting knuckles receiving one of the cross tubes, the end wall having knuckles at its upper edge receiving a cross tube, vertical tubes extending in load carrying relation between the cross tubes associated with the end wall, the side and end walls having interfitting knuckles along a vertical edge, a vertical load carrying tube in said last mentioned knuckles, and a corner means connecting the tubes at the upper edges of the side and end walls.

9. In a crate, a plurality of longitudinal skids, cross tubes resting on the skids, a bottom wall overlying the skids and tubes and fixed to the skids, the bottom wall and the skids having cooperating formations forming recesses confining the tubes, a longitudinal tube above each of the skids resting on the cross tubes, a side wall above and associated with each longitudinal tube, the bottom wall and each side wall having interfitting knuckles for receiving the associated longitudinal tube, each side wall having knuckles at its upper edge for receiving another longitudinal tube, vertical load carrying tubes extending between the longitudinal tubes, loops in the side walls for holding the vertical tubes, an end wall at each end of the crate, each end wall and bottom wall having interfitting knuckles receiving one of the cross tubes, each end wall having knuckles at its upper edge receiving a cross tube, vertical tubes extending in load carrying relation between the cross tubes associated with the end wall, the side and end walls having interfitting knuckles along the vertical edges forming the corners of the crate, a vertical load carrying tube in said last mentioned knuckles at each corner of the crate, said vertical corner tubes having lower ends resting on the skids and having portions opposite an end of at least one of the cross and longitudinal tubes to block endwise movement thereof, and a corner means connecting the tubes at the upper edges of the side and end walls.

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THERON E. CONDON, *Primary Examiner.*

RAPHAEL H. SCHWARTZ, *Examiner.*