Nov. 10, 1964 E. G. MONFORT 3,156,370

KNOCKDOWN BULK CONTAINER

Filed Jan. 22, 1962 2 Sheets-Sheet 1

FIG. 1

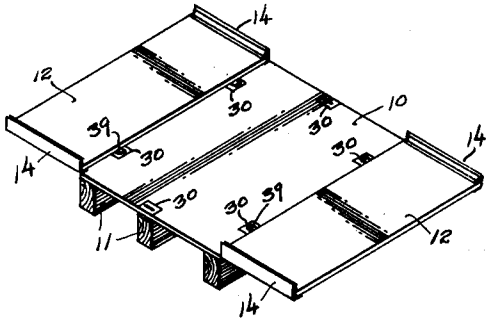


FIG. 2

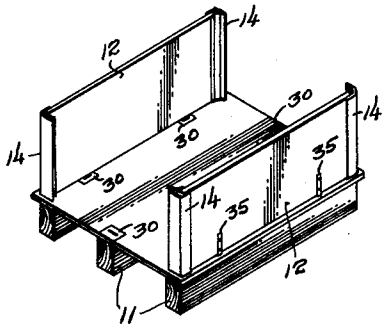


FIG. 3

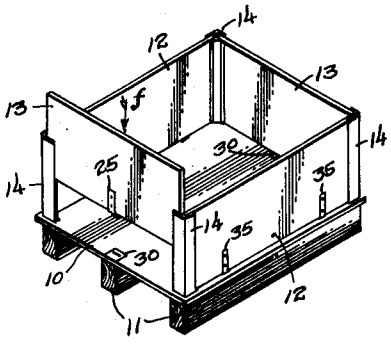


FIG. 4

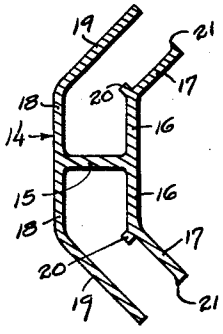
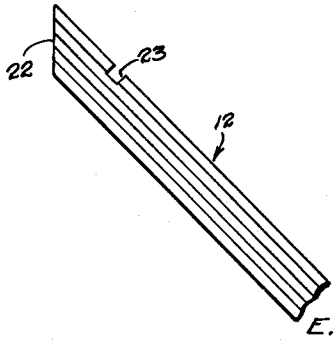


FIG. 5



INVENTOR.
E. GRANT MONFORT

BY Barnes & Seed

ATTORNEYS

Nov. 10, 1964 E. G. MONFORT 3,156,370

KNOCKDOWN BULK CONTAINER

Filed Jan. 22, 1962 2 Sheets-Sheet 2

FIG. 6

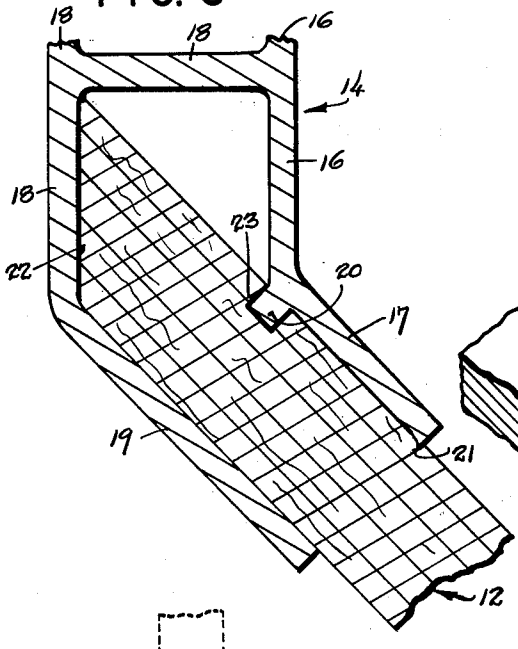
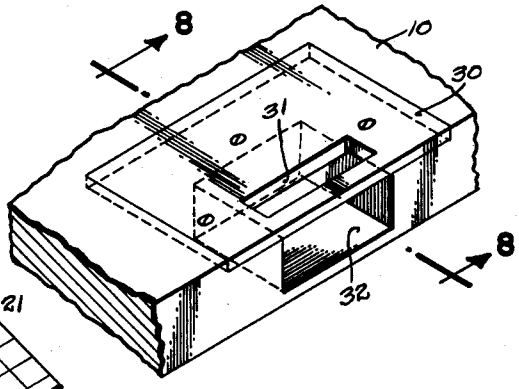


FIG. 7



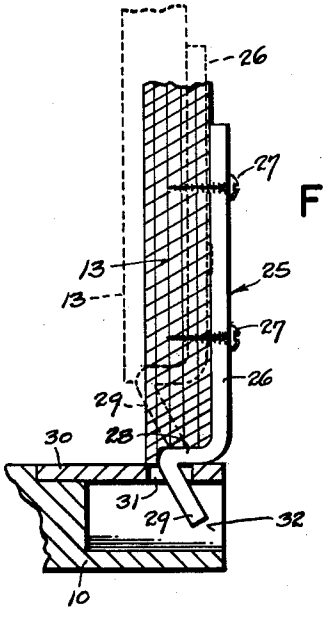
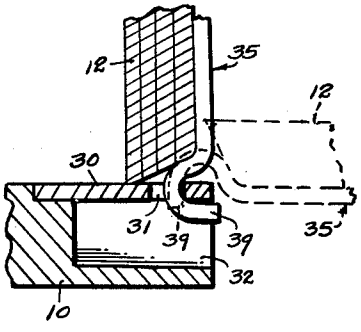


FIG. 8

FIG. 9



INVENTOR.
E. GRANT MONFORT

BY Barnes & Seed
ATTORNEYS

United States Patent Office 3,156,370 Patented Nov. 10, 1964

3,156,370

KNOCKDOWN BULK CONTAINER

Earl Grant Monfort, Ellensburg, Wash., assignor to Winthrop Enterprises, a limited partnership

Filed Jan. 22, 1962, Ser. No. 168,320
8 Claims. (Cl. 217—15)

This invention relates to bulk containers, and as one of its objects aims to provide a rigid container of strong and durable construction having its component walls connected one to another by corner posts of advanced design, and one in which said corner posts and other employed hardware adapts the container, where desired, to use as a knockdown structure capable of being assembled and disassembled with unusual ease and expedition.

It is another and important object to provide a container in which said corner posts are formed as metal extrusions, and interlock with the walls in a new and advanced manner which most effectively resists any tendency of the walls to rack.

As a further object still the invention aims to provide a new and advanced method for performing the assembly and disassembly of the parts of a knockdown bulk container.

With the foregoing and other objects and advantages in view and which will appear and be understood in the course of the following description and claims, the invention consists in the novel construction and in the adaptation and combination of parts, and in the method of assembling and disassembling said parts, hereinafter described and claimed.

In the accompanying drawings:

FIGURES 1, 2 and 3 are somewhat schematic perspective views illustrating a bulk container of the knockdown character constructed in accordance with the preferred teachings of the present invention at three successive stages of assembly.

FIG. 4 is a horizontal sectional view of one of the corner posts used in the present container, with the scale enlarged from that employed in the preceding views.

FIG. 5 is a fragmentary edge elevational view of one wall-forming panel of the container.

FIG. 6 is a fragmentary horizontal sectional view drawn to a scale enlarged from that of FIGS. 4 and 5 to illustrate a corner post and panel in assembled condition.

FIG. 7 is a fragmentary perspective view portraying one of several socket plates carried by the bottom wall of the container and used in the present invention as mating complements of catch fastenings carried by the four side wall panels.

FIG. 8 is a fragmentary vertical sectional view through a set of said catch-and-socket fastenings applied to each of two opposite wall panels of the container, and indicating by broken and full lines the manner in which said two opposite wall panels of the container are sprung inwardly as steps incident to fastening said walls to the bottom wall; and

FIG. 9 is a fragmentary vertical sectional view through a set of a slightly modified form of said catch-and-socket fastenings which are applied to the other two opposite wall panels of the container and likewise indicating by full and broken lines the manner in which said two wall panels are swung from the position shown in FIG. 1 into the position shown in FIG. 2 as steps incident to hooking the catches in the mating sockets.

Referring to said drawings, there is provided a pallet of rectangular plan configuration designated by the numeral 10. This pallet serves as a floor for the container and gives foundation support to four wall-forming side panels which are each desirably composed of plywood. The pallet has cleats 11 secured to its underside so as to

elevate the pallet and accommodate the same to the fork arms of a lift truck.

The advancements of the present invention reside in the structure and adaptation of fittings which act in combination with the side panels and with the bottom panel for detachably connecting the side panels one with another and with the bottom panel, and in the method of manipulating the side panels so as to make the connection. For purposes of distinction two opposite said side panels are designated by 12. The other two opposite panels are designated by 13.

The fittings which function to connect the side panels 12 to the side panels 13 are post-like members designated generally by 14. These posts have an overall height corresponding to the height of the side panels, and are applied at each of the four corners. Composed desirably of aluminum and formed by preference as the product of an extrusion process, the posts in cross section present a web 15 extending as a median spanner between generally parallel interior and exterior walls which are otherwise unattached, and have the wings which extend in opposite directions outwardly from said web each made angular so as to divide each wing into an inner and an outer planar section. For the interior wings these inner and outer sections are denoted by 16 and 17, and for the exterior wings are denoted by 18 and 19. The inner said sections each lie perpendicular to the web, and the angularity as between each outer section and its parent inner section is 45°. By such token there is provided an angularity of 90° between the outer sections of the wings which lie at one side and those which lie at the other side of the web.

The spacing between the free wing sections 17 and 19 approximates the thickness of the container's side and end panels, and this thickness will be determined by the size of the container, varying say from ⅜" to ¾". Protruding into the channel which is defined between the outer sections of the interior and the exterior wings, each interior wing provides a key-forming rib 20 and a terminal lip 21, located at the inner and outer limit, respectively, of its outer free section 17. The key 20 protrudes in a fairly substantial degree into the channel and has a rectangular shape. Lip 21 produces a substantial knife edge and protrudes into the channel in only a very minor degree. In applying the corner posts to the side panels of the container, ends of the panels are preformed to fit the channels, with the end edge cut on the bias, as at 22, and with a key-way 23 cut along the inner face to accommodate the key 20. Such key 20 is given minor tolerance within said mating key-way. The knife-edged lip 21 is forcefuly made to cut a tight-fitting groove by the act of pressing the corner fittings onto the panels. The purpose is to introduce an abutment stop precluding bulk material contained in the container from "working" under the wing section 17.

The fittings which function to connect the side panels to the bottom panel are made in two forms and are in the nature of catch-and-keeper combinations. The catch component of each set is permanently attached to the concerned side panel 12 or 13, as the case may be, and the keeper component is permanently attached to the floor panel. In the instance of the two panels 13, a single catch 25 is provided, located at a point central to the length of the panel. Two or more catches 35 are desirably provided for each of the two other side panels 12, spaced apart at intervals of the length.

The catch 25 (see FIG. 8) is formed so as to provide a mounting leg 26 drilled to accommodate anchoring screws 27. The catch proper lies at the lower end of the leg and comprises an inturned horizontal foot 28 with a depending terminal hooking toe 29 extending diagonally outwardly therefrom at a moderately steep angle, say

60° from the vertical. The foot is mortised into the panel so that its underside lies flush with or moderately above the bottom edge of the panel. The two catches **25** and **35** differ only in the shape of the hooking toe and in the instance of the catches **35** (see FIG. 9) this toe, designated by **39**, is turned outwardly parallel, or approximately parallel, with the foot and is spaced therefrom a distance moderately greater than the thickness of a respective keeper plate **30** with which each catch co-acts.

The keeper plate **30** has a longitudinal slot **31** therein and is mortised into the top face of the bottom panel above a pocket **32** routed from such panel. The length of the hooking toe **29** is appreciably greater than the thickness of the plate **30**, and the placement of such keeper plate in establishing registration of its slot **31** with either the catch **29** or the catch **39**, as the case may be, locates the front wall of the slot somewhat to the rear of the forward extremity of the hooking toe. For inserting the toe **39** of the catch **35** into the slot of its keeper plate it is necessary that the panel **12** to which the catch is secured be swung through an approximate 90° arc from the position of FIG. 1 into the position of FIG. 2. For inserting the toe **29** of the catch **25** into the slot of its keeper it is necessary that the panel **13** to which the catch is secured be sprung rearwardly in the transverse vertical plane of the catch coincident with a lowering movement of the panel, as shown by the direction arrow *f* of FIG. 3, lips **21** cut their own groove and in addition action is shown in FIG. 8.

With the catch-and-keeper hardware having been applied, the procedure in assembling the container is to first mount on each end of each side panel **12** a respective one of the four corner posts. The two side panels **12** are placed upon the floor panel **10** in the manner shown in FIG. 1, hooking the catches into the keepers, and such side panels are then swung upwardly to occupy the upright positions shown in FIG. 2, and namely with each said side panel lying perpendicular to the floor panel. The two side panels **13** are now placed in position across the open ends of the container, resting by the bottom edge upon the top ends of the corner posts with the keyways of the panels registering with the keys **20** of the open co-planar channels of the corner posts. Pressing these panels downwardly as shown by the direction arrow *f* of FIG. 3, lips **21** cut their own groove and in addition to the above-described primary function complement the keys **20** in giving stability to the assembled container.

It is believed that the invention will have been clearly understood from the foregoing detailed description of my now-preferred illustrated embodiment. Changes in the details of construction may be resorted to without departing from the spirit of the invention and it is accordingly my intention that no limitations be implied and that the hereto annexed claims be given the broadest interpretation to which the employed language fairly admits.

What I claim, is:

1. In a container having a rectangular floor panel and for each of its four side walls employing a respective wood panel resting upon the floor panel along a related margin of the floor panel, structure for joining adjacent ends of the meeting side panels one to another comprising, for each of the four corners of the container: an extruded metal corner post formed to present two outwardly opening vertical channels disposed at substantial right angles to one another and with each channel having a width corresponding to the thickness of the related side panel so as to receive the end edge of the latter as a tongue therein, each said channel along at least one of its side walls having a protruding vertical key made integral with the wall and arranged to register with a mating key-way cut in the panel, the transverse vertical plane in which said key lies being spaced inwardly both from the free end of the channel wall to which it is attached and the channel wall which lies opposite thereto.

2. Structure according to claim 1 in which the metal extrusions forming said corner posts have a web extending as a median spanner between paralleling interior and exterior walls, and wherein outer sections of said interior and exterior walls between which the channels proper are defined connect with the spanner web by inner wall sections placed angular to the outer wall sections in planes at right angles to the median plane occupied by the web.

3. Structure according to claim 1 in which the metal extrusions forming said corner posts have a web extending as a median spanner between paralleling interior and exterior walls, and wherein each interior wall is divided into an outer and an inner section with the two inner sections lying in a common plane at right angles to the median plane occupied by the web, the keys being integral with the interior walls of the post at the approximate juncture between inner and outer sections thereof.

4. In a container having a rectangular floor panel and for each of its four sides employing a respective wood panel resting upon the floor panel along a related margin of the floor panel, structure for joining the meeting side and end walls one to another comprising, for each of the four corners of the container: an extruded metal corner post formed to present two outwardly opening vertical channels disposed at substantial right angles to one another and with each channel having a width corresponding to the thickness of the related wall panel so as to receive the end edge of the latter as a tongue therein, each said channel at the extreme free end of its inner wall having a vertical knife-edged lip protruding into the channel and acting to cut a mating groove in the inner face of the tongue responsive to the act of forcing the tongue downwardly into the channel in a direction endwise to the lip.

5. Structure as recited in claim 4 in which the corner posts are provided along the inner wall of each channel with a key spaced inwardly from and paralleling said knife-edged lip to register with a mating key-way precut in the inner face of the tongue and serving to guide the knife-edge lip in its cutting action, the transverse vertical plane in which said key lies being removed a substantial distance from the free end of the channel's outer wall.

6. A knockdown container having a rectangular floor panel and for its four sides employing a respective planar wood panel resting upon the floor along the related edge of the latter, and having said side panels detachably connected one to another and to the floor panel, the connections between the several side panels comprising respective corner posts each presenting two vertical channels disposed at 90° angles to one another and each formed as the mating complement of a related end edge of a panel to provide a tongue-and-groove fit therewith, the connections between the floor panel and said side panels comprising catch-and-keeper sets of which one component of each set is secured to a side panel and the other component to the floor panel, said catch-and-keeper components being so formed and positioned that the component carried by at least two of said side walls lying opposite one another can be engaged and disengaged with the related component carried by the floor panel only by springing the side panel to deform the same laterally from its normal planar condition.

7. Structure according to claim 6, the catch component being carried by the side wall and providing an inturned horizontal foot with a depending toe directed outwardly and downwardly at an angle steeply inclined from the vertical, the keeper component being carried by the floor panel and providing a slot into which said toe is hooked, the fore-and-aft width of the slot being less than the overall fore-and-aft span of the toe.

8. Given a knockdown container in which side-wall panels are joined one to another by corner posts presenting vertical channels with which end edges of the side

panels receive a tongue-and-groove fit, the method of detachably joining the side panel to a panel which forms a floor for the container, comprising applying to the side panel at a point intermediate its ends a catch having a hooking toe depending below the bottom edge of the panel and directed outwardly and downwardly at an angle steeply inclined from the vertical, applying to the floor panel a keeper complement of said catch presenting a slot to receive the hooking toe offset laterally a moderate distance from a position whereat said toe will enter the slot upon sliding the side panel downwardly

in said channels, and establishing the necessary registration between toe and slot by springing the side panel laterally coincident with said downward slide motion.

References Cited in the file of this patent

UNITED STATES PATENTS

1,044,251	Safely	Nov. 12, 1912
2,388,297	Slaughter	Nov. 6, 1945

FOREIGN PATENTS

808,492	Great Britain	Feb. 4, 1959