Jan. 7, 1964 E. H. COLLINS 3,116,847

KNOCKDOWN CONTAINER

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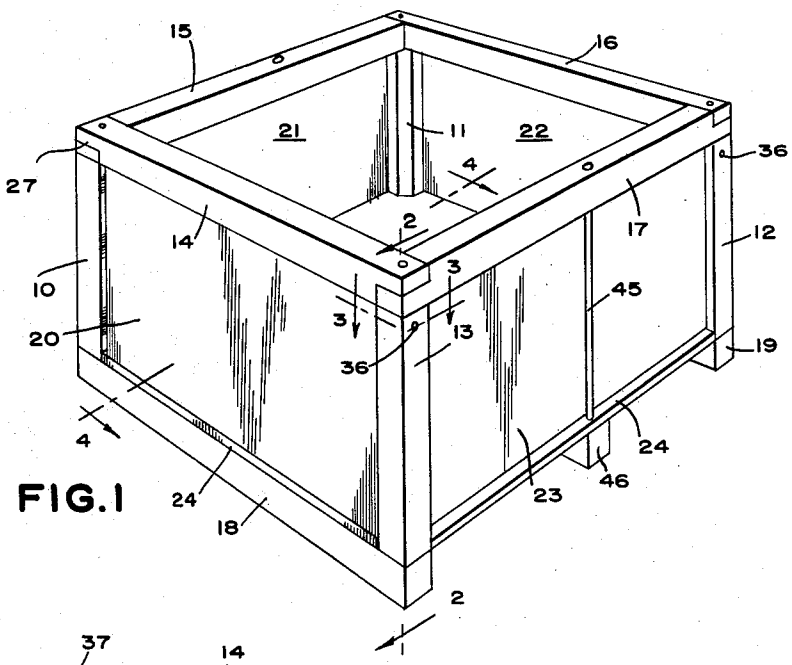

FIG. 1

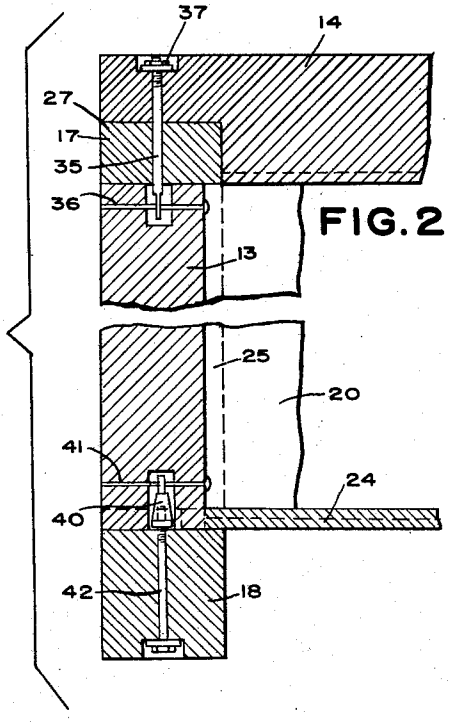

FIG. 2

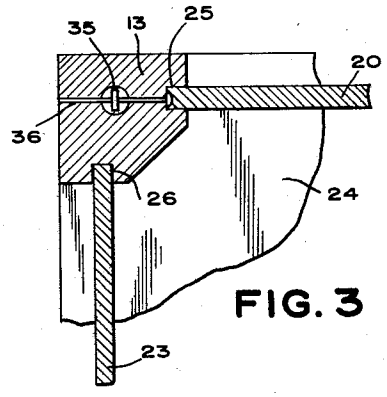

FIG. 3

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FIG. 4

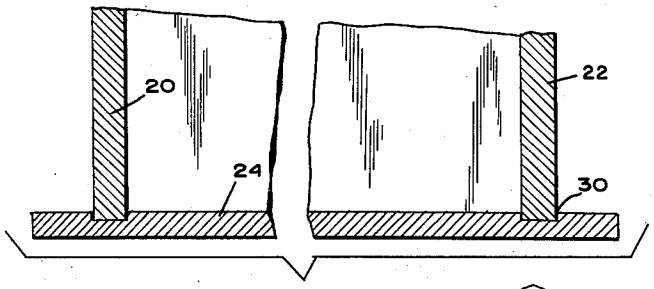


FIG. 6

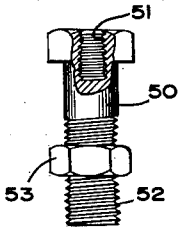


FIG. 5

FIG. 7

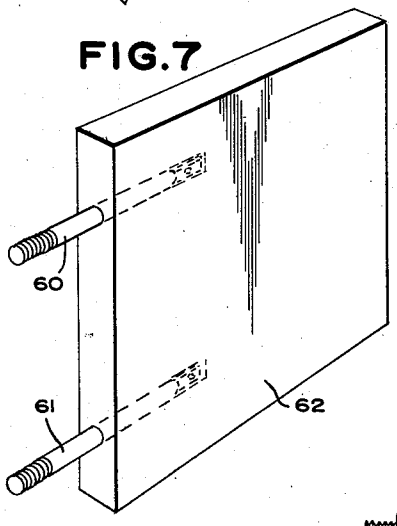


FIG. 9

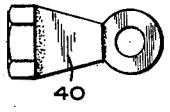


FIG. 8

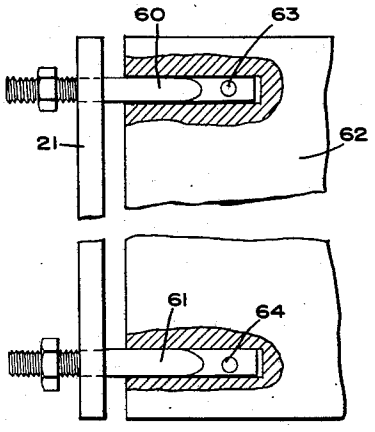
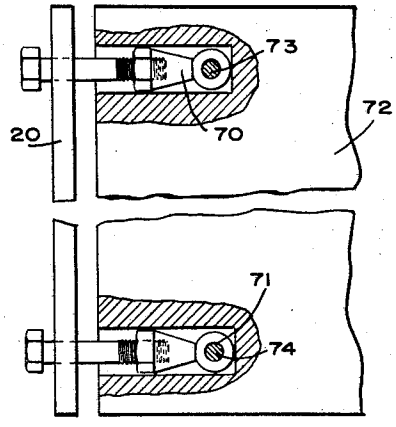


FIG. 10



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United States Patent Office 3,116,847 Patented Jan. 7, 1964

3,116,847

KNOCKDOWN CONTAINER

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Filed June 26, 1961, Ser. No. 119,367
3 Claims. (Cl. 217—12)

The present invention relates to container constructions and more particularly to so-called bin boxes adapted to contain quantities of loose items in shipment or storage.

Material handling techniques as they are now being used for modern-day manufacturing, storage and transportation, are requiring the use of bulk containers, sometimes referred to as bin boxes. In order that the bin boxes may be used to the most advantage, they should be extremely rugged, economical to manufacture, and demountable or collapsible. Therefore, a simple yet strong container preferably made of wood and designed to be easily and quickly assembled or disassembled is desired.

It is a principal object of the present invention to provide an improved form of bin box that is extremely simple yet rugged.

A very important object of the invention is to provide a simple, rugged form of bin box or container that is demountable or collapsible such that it may be easily and quickly disassembled for storage or transportation and again quickly reassembled for further use.

In accordance with the invention, the bin box is comprised of a demountable framework formed of corner uprights and upper and lower stringers. Each of the corner uprights is provided with a threaded fastener axially inserted and secured at the respective ends thereof and removable fastener means is adapted to cooperate with the respective threaded fasteners to secure the corner uprights and upper and lower stringers in the assembled framework relation. Side wall panel members are provided to be retained between the respective pairs of opposing corner upright and stringer members when they are assembled. A floor wall member is supported on the upper surfaces of the lower stringer members before insertion of the side wall members, thus forming a bin box in the assembled relation. By removing the removable fastener means, the entire structure may be quickly disassembled. The opposing surface of the corner uprights are provided with longitudinal grooves within which the side wall panels are retained. Also, if desired, the under surface of each upper stringer member may be provided with a longitudinal groove to retain and reinforce the associated side wall panel member and, in addition, the upper surface of the floor wall member may be routed to form grooves for retaining the associated side wall members. No nails, screws, or other fastener is required to hold the side panels in place. For additional strength, the corner joints of the upper and lower stringers may be formed to be interlocked and overlapping.

Further objects, features and the attending advantages of the invention will be apparent with reference to the following specification and drawings, in which:

FIG. 1 is a perspective of the assembled bin box of the invention;

FIG. 2 is a fragmentary section through one corner upright of the bin box on the line 2—2 of FIG. 1;

FIG. 3 is a fragmentary section on the line 3—3 of FIG. 1;

FIG. 4 is a fragmentary section on the line 4—4 of FIG. 1;

FIG. 5 is a detail of a threaded fastener element as may be used in the demountable construction;

FIG. 6 is a detail of another form of threaded fastener that may be used when applying a top to the bin box of the invention;

FIG. 7 is a perspective view of a panel element embodying the demountable fastening arrangement of the invention;

FIG. 8 is a fragmentary view of an assembly of the panel element of FIG. 7 with another structural element;

FIG. 9 is a detail of another form of threaded fastener element that may be embedded in a wooden structural member, and

FIG. 10 is a fragmentary view of a wooden structure of panel member with the fastener element of FIG. 9 and assembled to another structural element.

Referring now to FIGS. 1–4 of the drawings, the bin box is provided with a demountable framework having corner upright members 10, 11, 12 and 13 interconnected by upper stringer members 14, 15, 16 and 17, and lower stringer members 18 and 19. The lower stringer members are sometimes referred to as skid elements, and provide surfaces for supporting the bin box as it may be moved or slid over a floor surface or the like and to provide access for the lifting arms of a forklift truck. In the assembled relation, a plurality of side wall panel members, such as panels 20, 21, 22 and 23 are retained between the opposing surfaces of the corner uprights 10–13, the upper stringers 14–17 and a floor panel 24. The floor panel 24 is supported on the upper surface of the lower stringers 18 and 19 as more clearly shown by FIG. 2 of the drawings.

In order to provide a maximum of strength for the bin box structure, each of the side wall panels 20–23 is retained in longitudinal grooves of the opposing surfaces of the corner uprights 10–13, such as the grooves 25 and 26 most clearly shown by FIG. 3 of the drawings. In addition, the upper longitudinal stringers 14–17 may be provided with longitudinal grooves on their under surfaces that oppose the floor panel 24 to provide further reinforcement for the side panels 20–23 in the assembled relation. It will be noted, as most clearly shown by FIGS. 1 and 2 of the drawings, that the upper stringers 14–17 are shaped at their respective adjoining ends to provide interlocked overlapping joints such as generally indicated at 27. Also, as shown by FIG. 4 of the drawings, the floor panel 24 may be provided with longitudinal grooves 30 on its upper surface to receive respective ones of the side panels 20–23 to provide still further reinforcement for the assembled bin box structure. It should, of course, be understood that the use of the grooves such as shown at 25, 26 and 30 and for the underside of the upper stringers 14–17, may be dispensed with where the utmost in strength is not required, and that various combinations of the grooves may be used without departing from the spirit of the invention. Further, the use of the overlapping interlocking joints may be omitted for some forms of the invention where maximum strength is not required.

In order to enable the bin box of the invention to be readily assembled and disassembled, thus providing a demountable structure, each of the corner uprights 10–13 is provided with fastener elements axially embedded and secured in their respective ends. FIG. 2 of the drawings shows two different forms of fastener elements that may be optionally used in accordance with the invention. A male type of threaded fastener element 35 is shown to be embedded axially in the corner upright and secured therein by means of a pin 36 whose head bears on the bottom surface of the groove formed in the upright for subsequent engagement by the edge of the side panel 20. The invention is not limited to the particular element for securing the threaded fastener 35 to the corner post 13, and it should be understood that a tapered pin providing desirable wedging action or an entirely different type of fastening arrangement may be used to secure the threaded fastener in the embedded relation to the corner post. In-

stead of the male type of threaded fastener 35, a female type of threaded fastener 40 may be axially embedded and secured within the corner post by means of the pin 41 similar to the pin 36 and installed in a like fashion. Inasmuch as the pins 36 and 41 will be maintained in their assembled positions by the side panels bearing against them, their outer ends need not be headed, in which event they wil be readily removable upon disassembly of the structure. Either or both of these types of threaded fasteners 35 or 40 may be optionally used, but it is believed that the male type of threaded fastener 35 would be preferable since it facilitates the assemblage of the horizontal stringers, such as stringers 14 and 15 having apertures to receive the extended threaded end of the threaded fastener 35. This assembled relation is clearly shown in FIG. 2 and a threaded nut or other element 37 may be secured to the threaded fastener 35 to maintain the horizontal stringers and corner uprights in the assembled relation. When the female type of threaded fastener 40 is used, a bolt fastener element 42 is threaded through the aperture of the stringer, such as the stringer 18, to engage the female fastener 40 and thus secure the bin box in the assembled relation.

To provide additional reinforcement for the bin structure and to cooperate with overhead handling equipment, tie rods such as the tie rod 45 may be passed through some or all of the upper stringers, such as stringers 15 and 17, through the floor member 24 and through an opposed longitudinal skid or stringer 46 which may be secured to the underside of the floor 24. Where tie rods 45 are desired on all four sides of the bin, they will also extend through the stringers 14 and 16 and their respective skid-like stringers 18 and 19. FIGS. 5 and 9 of the drawings are detailed views of the male fastener element 35 and the female fastener element 40, respectively, which have been shown and described in connection with FIG. 2 of the drawings.

Referring again to FIG. 1 of the drawings, the floor panel 24 was described as being supported on the upper surfaces of the lower stringers 18, 19. If desired, the floor panel may be provided with suitable apertures at its respective corners to receive the threaded extensions of the corner upright fasteners such as fasteners 35, so as to secure the floor panel between the lower stringers and the corner uprights. When the floor panel is not secured by the fasteners as just described, it may be provided with cut-out corners to clear the corner uprights and in such an arrangement the panel 24 is supported solely between the lower stringers 18, 19 and the side panels 20–23, as shown.

If it should be desired to place a top panel (not shown) on the bin box to fully enclose the same, the fastening nuts, such as the fastener 37, may be replaced with a special form of fastening nut 50, such as shown in FIG. 6 of the drawings. The fastener nut 50 is provided with an internally-threaded portion 51 adapted to be threaded onto the threaded end of the male fastener 35 and is further provided with a male threaded extension 52 to be passed through suitable apertures of the top panel (not shown). With the top panel in place the threaded element or nut 53 may be applied to the threaded end 52 of the fastener 50 to thereby secure the top panel in position.

Reference has previously been made to the use of grooves, such as grooves 25, 26 and 30, for reinforcing the side panels to the box framework in the assembled relation. In place of the grooves, the panels may be secured by means of either male threaded fastener elements 60, 61 embedded and secured in the wall panel 62 (FIGS. 7 and 8 of the drawings) or by female fastener elements 70 and 71 embedded and secured in the panel 72 (FIG. 10 of the drawings). The fastener elements 60, 61 or 70, 71 may be secured to the respective panels 62 or 72 by means of pins 63, 64 or 73, 74, much in the same manner as that previously described for the threaded fasteners 35 or 40 embedded in the corner uprights of the box frame. The panel securing arrangements of FIGS. 7, 8 and 10 of the drawings may also be used to secure divider panels (not shown) within the structure, in which case the panels 62 or 72 would function as divider panels or walls, and the fastening elements would pass through associated panel wall surfaces such as selected ones of the side wall panels 20–23 of the box shown in FIG. 1 of the drawings.

Although the fastener arrangements of the invention have been particularly described in connection with their use in demountable bin box constructions, it should be obvious that these fastening arrangements may be used in all forms of demountable wooden structures. For example, the panel fastening arrangements described above in connection with FIGS. 7, 8 and 10 of the drawings may be used for securing any type of wooden panel, wall member or structural element to another wall member or structural element.

Various modifications will occur to those skilled in the art within the spirit of the invention and the scope of the appended claims.

What is claimed is:

1. A collapsible bin box comprising, a demountable framework having respective corner uprights interconnected by upper and lower stringers in the assembled relation, each of said uprights having a threaded fastener axially inserted and secured therein at its upper and lower ends respectively, removable fastener means engaging the respective threaded fastener means for each respective end of said uprights, a floor wall supported on the upper surfaces of said lower stringers and having an upper surface containing marginal grooves, said floor wall containing notches receiving the corner uprights respectively, each of said uprights having longitudinal grooves on their opposing surfaces in the assembled relation, each of said upper stringers having a longitudinal groove on its surface opposing the lower stringer in the assembled relation, and a plurality of side wall members, a respective one of said side wall members being retained within a floor wall groove, within a groove of one of said upper stringers and within grooves of a pair of said corner uprights in the assembled relation, said threaded fastener and removable fastener means maintaining said floor wall, side walls, stringers and uprights in assembled relationship.

2. A collapsible bin box comprising, a demountable framework having respective corner uprights interconnected by upper and lower stringers in the assembled relation, the adjoining ends of the upper stringers at the corner uprights being shaped to form respective interlocking overlapping joints with each other, each of said uprights having a threaded fastener axially inserted and sceured therein at its upper and lower ends respectively, removable fastener means engaging the respective threaded fastener means for each respective end of said uprights, a floor wall supported on the upper surfaces of said lower stringers, said floor wall containing notches receiving said corner uprights respectively, each of said uprights having longitudinal grooves on their opposing surfaces in the assembled relation, each of said upper stringers having a longitudinal groove on its surface opposing the lower stringer in the assembled relation, said floor wall having longitudinal grooves on its upper surface in opposing positions to the longitudinal grooves of the upper stringers in the assembled relation, and a plurality of side wall members, a respective one of said side wall members being received in one of said floor wall grooves, a groove in one of said upper stringers and grooves in a pair of said corner uprights in the assembled relation, said threaded fastener and removable fastener means maintaining said floor wall, side walls, stringers and uprights in assembled relationship.

3. A collapsible bin box comprising, a demountable framework having respective corner uprights interconnected by upper and lower stringers in the assembled re-

lation, the adjoining ends of the upper stringers at the corner uprights being shaped to form respective interlocking overlapping joints with each other, each of said uprights having a threaded fastener axially inserted and secured therein to extend from the upper and lower ends thereof, each of said stringers having an aperture at its respective ends for reeciving the threaded fastener of the associated corner uprights, removable fastener means engaging the respective threaded fastener means for each respective end of said uprights, a floor wall supported on the upper surfaces of said lower stringers, said floor wall containing notches receiving said corner uprights respectively, each of said uprights having longitudinal grooves on their opposing surfaces in the assembled relation, each of said upper stringers having a longitudinal groove on its surface opposing the lower stringer in the assembled relation, said floor wall having longitudinal grooves on its upper surface in opposing positions to the longitudinal

grooves of the upper stringers in the assembled relation, and a plurality of side wall members, a respective one of said side wall members being received in one of said floor wall grooves, a groove in one of said upper stringers and grooves in a pair of said corner uprights in the assembled relation, said threaded fastener and removable fastener means maintaining said floor wall, side walls, stringers and uprights in assembled relationship.

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