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2,777,597

STACKABLE TOTE BOX CONSTRUCTION

Filed June 1, 1955

2 Sheets-Sheet 1

Fig. 1

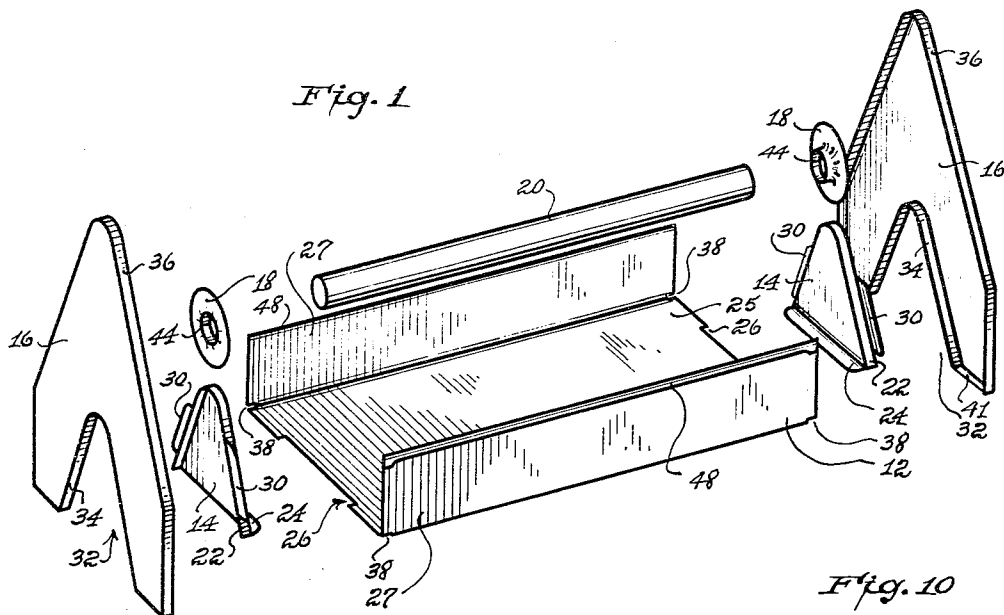


Fig. 10

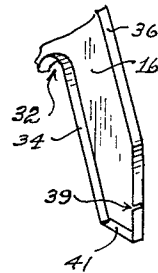
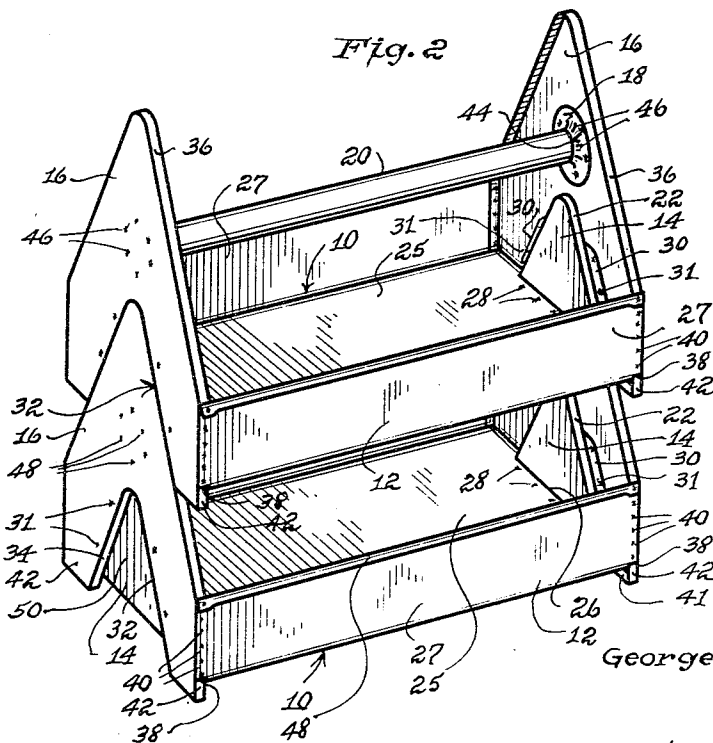


Fig. 2



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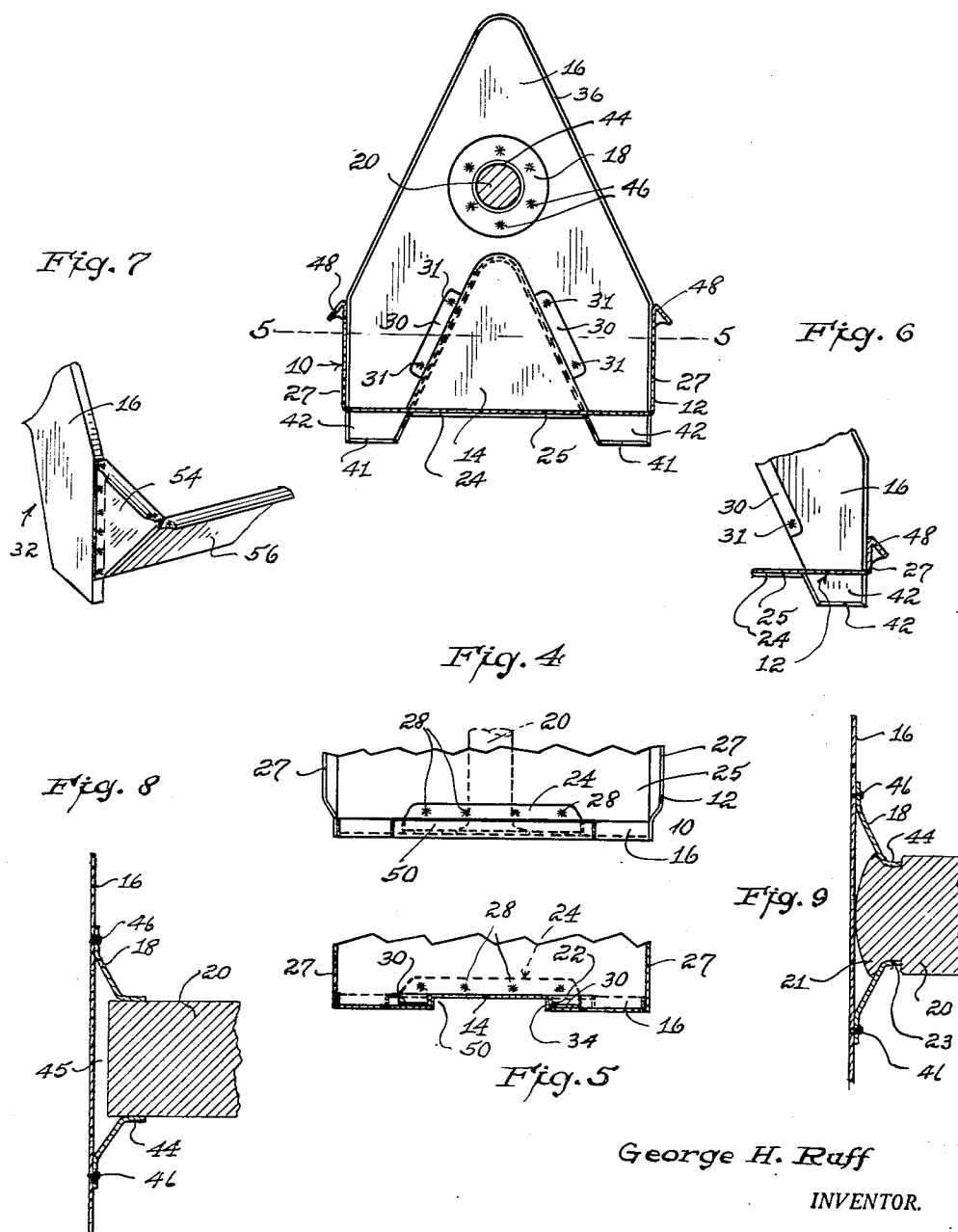
2,777,597

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2 Sheets-Sheet 2

Fig. 3



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1

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STACKABLE TOTE BOX CONSTRUCTION

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11 Claims. (Cl. 220—4)

This invention relates to containers commonly known as tote boxes for containing mechanical parts or other materials for transportation or storage.

One of the principal objects of the present invention is to provide a tote box of relatively light metal construction which is light and inexpensive, but being very rigid and strong due to the formation and the means of joining together of the component parts comprising the assembled box.

Another object of this invention is to provide a tote box of the character mentioned in which all the parts comprising the box are of simple formation which can easily be stamped from metal sheet and rigidly joined together to form a rigid receptacle capable of supporting a relatively heavy load of material.

A further object of the invention is to provide a tote box of the character mentioned with a stiff lifting rod rigidly attached to the end members by novel means through which the rod substantially increases the strength and rigidity of the tote box, this rod being secured to the end members above the load of material in the box so that the loaded box can be lifted and carried manually or mechanically without contact with the material in the box.

A still further, and important, object of this invention is to provide a tote box of novel interlocking construction which not only facilitates the stacking of a number of the boxes on top of each other with means for automatically aligning the boxes in vertical rows for supplying work places with parts or forming portable storage bins for parts or other materials, but also renders a stack of the loaded or filled boxes more secure against being accidentally knocked over or disarranged than is possible with previous interlocking constructions of which I am aware.

Other objects and advantages of my improved tote box construction will be apparent from the following specification and reference to the accompanying drawings forming a part thereof, in which

Fig. 1 is an exploded perspective view showing the separate parts or members of one embodiment of my improved tote box;

Fig. 2 is a perspective view of a pair of the complete tote boxes stacked one upon the other;

Fig. 3 is a transverse section through one of the tote boxes shown in Fig. 2;

Fig. 4 is a bottom plan view of one of the boxes shown in Fig. 2, and also in Fig. 3;

Fig. 5 is a plan sectional view at one end of the box taken on the line 5—5 of Fig. 3;

Fig. 6 is a detail sectional view showing a modified construction of the container portion of the tote box;

Fig. 7 is a detail sectional view showing another modified form of the box structure; and

Fig. 8 is a detail sectional view showing the lifting rod in position for being secured to the box end members;

Fig. 9 is a similar detail view showing one form of

2

device for rigidly securing the ends of the rod to the box end members; and

Fig. 10 is a fragmentary view of one of the end members of the tote box showing a modified detail.

Referring to the drawings in which like reference numerals designate like parts or elements in the several views, my improved tote box, designated generally by the numeral 10, is formed from a number of parts stamped from relatively thin metal sheet as illustrated in Fig. 1. These parts include a channel member 12, open at both ends, a pair of identical end supporting members 14, a pair of identical end members 16, and a pair of identical handle rod supporting escutcheons 18. The other member or part of the tote box structure is a handle or lifting rod 20 preferably made of wood or other suitable strong and compressible non-metallic material.

Each of the end supporting members 14 is pressed into an inverted V-shaped form with an outwardly extending, integral flange 22 projecting perpendicularly from its tapered edges and an inwardly extending flange 24 projecting perpendicularly from its bottom. The floor 25 of the channel member 12 is provided at each end with a rectilinear notch 26 of a width sufficient to receive the base end of one of the end supporting members 14, and when in assembled relation the transverse flange 24 of one of the members 14 fits under the floor 25 of the channel member 12 at the end of the notch 26 with the outer edge of the flange 22 substantially flush with the ends of the vertical walls 27 of the member 12. In this position the flange 24 is rigidly secured to the floor 25 of the member 12 by welding, riveting or other suitable means, as indicated at 28 in Fig. 2. Each of the members 14 is also provided with opposed, laterally projecting and integral flanges 30 adapted for attachment to one of the end members 16, by welding, riveting or other suitable means, as indicated at 31.

The bottom end of each of the end members 16 is provided with a relatively large inverted V-shaped notch 32 transversely centered between its outer edges and having a contour substantially corresponding to that of the members 14. Another flange 34, formed integrally with and perpendicular to the wall of the member 16, projects inwardly to fit within the flange 22 of the member 14. The width of the flange 34 is slightly less than that of the flange 22, so that when assembled the vertical wall surface of the end member 16 will abut the flange 30 to be rigidly secured thereto as above mentioned. The corners of the channel member 12 may be provided with short longitudinal slits 38 into which integral flanges 36 extending about the outer edges of the members 16 are fitted with the end members 16 disposed transversely between the vertical walls 27 of the body member 12. The walls are then welded or otherwise rigidly secured to the flange 36, as indicated at 40. If desired, the V-shaped notches 32 may be of sufficient vertical length so that when the members 16 are secured to the walls 27 the lower ends of the members 16 they will project below the floor 25 to form supporting legs 42, as clearly shown in Fig. 2. As shown in Fig. 10, the flange 36 may be provided with transverse slits 39 on opposite sides of the end member 16 to fit over the edge of the floor 25 and the slits 38 consequently omitted. The bottom space between the flanges 34 and 36 may be closed by a transverse flange 41.

The escutcheons 18 which are welded or otherwise rigidly secured to the inner upper wall surfaces of the end members 16, as indicated at 46, are formed of relatively thin metal with integral socket portions 44 to receive the ends of the compressible rod 20, leaving a space 45 between each end of the rod, as shown in Fig. 8. The walls of the socket portions 44 are then ham-

mered into the rod 20 all around by means of a special tool (not shown) thereby forming an outwardly rounded head 21 and a neck 23 in each end of the rod with the sockets 44, as shown in Fig. 9.

The upper edges of the vertical walls 27 of the body member 12 are preferably outwardly turned to form longitudinal reinforcing flanges 48.

When the parts of the tote box 10 are assembled and secured together a recess 50 (Fig. 2) of inverted V-shape is formed in each of the end members 16, each of the recesses having an open bottom in registry with the notch 26, and also open outwardly, the outer wall surfaces of the supporting members 14 forming the inner walls of the two recesses. Each of the V-shaped recesses forms a close fitting seat to receive the top portion of one of the correspondingly V-shaped end members 16, so that any number of tote boxes placed one upon another will be positioned and maintained in precise alignment vertically, longitudinally and laterally of the boxes. The complementary V-shaped formations of any two of the boxes will positively guide the top box to a vertically and longitudinally aligned position on and into interlocking engagement with the lower of the two boxes. The complementary V-shaped formations prevent relative lateral movement of any pair of boxes. Abutment of the inner edge of the flange 36, of the end member 16, against the outer wall surface of the end supporting member 14 prevents relative longitudinal movement of the boxes. Thus, the boxes are positively interlocked against relative displacement in either horizontal direction.

With the construction described any desired number of tote boxes filled with materials can be arranged in vertical stacks to function as portable storage bins.

The end supporting members 14 actually form portions of the end walls of the box 10. The interfitting flanges 22 and 36, of the members 14 and 16, respectively, not only serve to form the recess 50 in each end of the box to receive the upper ends of the members 16 of another box in stacking a number of boxes, but the members 14, when rigidly secured to the end members in the manner described add strength and rigidity to the end members. Also, as already mentioned, the rod 20, due to the special manner in which it is attached to the end members greatly increases the rigidity and strength of the tote box 10.

Although the tote box described contemplates the provision of notches 26 in the ends of the floor 25 of the channel member 12 or a slit 38 in the end of the floor at each corner, or a slit 39 in each of the opposed flanges 36, in order to permit the inner walls of the end members 16 to be brought into abutment with the ends of the floor when the end members are secured to the inner surfaces of the walls 27 of the channel member, as described, the flanges 36 can be welded or riveted to the outer surfaces of the end portions of the walls 27 thereby permitting the end members to be brought into abutment with the ends of the floor 25 without the necessity of slits either in the floor 25 or the flanges 36. If desired, the notches 26 can also be dispensed with by reversing the flanges 34 and 36 of the end members 16 and attaching the end supporting members 14 to the outer surfaces of the members 16, so that it will not be necessary to fit them into notches 26. Moreover, if desired, the recesses 50 can be pressed into the walls of the end members 16, thereby dispensing with the interfitting flanges 22 of the members 14 and the flanges 34 around the V-shaped notch 32 in the members 16. The foregoing structural expedients are not illustrated for the reason that they would not materially affect the details of our improved tote box construction.

In Fig. 6 is shown a modified form of tote box construction in which the longitudinal walls 27 of the channel 12 are the same as shown in previous views except of lesser height, which is an advantage when a stack of the boxes are used to contain merchandise on display, for

example, in that the boxes will afford a more complete view of the contents.

In Fig. 7 is shown a further modified form of tote box 54 having flaring sides 56, which also has a special advantage in that articles may easily be removed from or placed in any individual box in a stack. Otherwise the general construction of the box is the same as illustrated in the previous views.

From the foregoing description it will be seen that I have provided a tote box of rigid, strong and inexpensive construction which can be made in small and large sizes, which can be used individually for transporting articles or materials, which can be used as utility kit boxes or stacked in interlocking vertical rows to provide portable bins for storing or displaying articles of various kinds and sizes. I have also provided interlocking features in such boxes which facilitate the stacking of numbers of the boxes one upon another and effectively secure the boxes in position in the stack.

Various changes in the details of construction of my improved tote box can be made without departing from the spirit and scope of my invention. Therefore, it should be understood that the embodiments of my invention shown and described are intended to be illustrative, only, and not restricted to such specific details of constructions.

I claim:

1. A tote box of the character described comprising, in combination, a rectilinear channel member formed with a floor and integral walls, and a pair of identical end members rigidly secured to and closing the ends of said channel member, the top portions of said end members being of inverted V-formation and the bottom portions of said end members having therein central V-shaped notches corresponding with the shape of the top portions for coengagement with corresponding formations of another identical tote box to facilitate longitudinal alignment of a pair of such boxes when stacked one upon the other; and said end members also being provided with complementary engaging means to facilitate lateral alignment of a pair of such tote boxes when stacked one upon the other.

2. A tote box of the character described comprising, in combination, a rectilinear channel member formed with a floor and integral walls, and a pair of identical end members rigidly secured to and closing the ends of said channel member, the top portions of said end members being of inverted V-formation and the bottom portions of said end members having therein central V-shaped recesses corresponding with the shape of the top portions and having flat vertical walls for coengagement with corresponding top end formations and end surfaces of another identical tote box to effect longitudinal and lateral alignment of a pair of such boxes when stacked one upon the other.

3. A tote box of the character described comprising, in combination, a rectilinear channel member formed with a floor and integral walls, a pair of identical end members rigidly secured to and partially closing the ends of said channel member, the top portions of said end members being of inverted V-formation and having perpendicular integral flanges projecting from their outer edges, the bottom portions of said end members having therein central V-shaped notches corresponding with the shape of the top portions and having perpendicular integral flanges projecting from their edges, and V-shaped end supporting members having perpendicular integral flanges in interfitting engagement with the flanges around said V-shaped notches, said end supporting members being rigidly secured to said end members, thereby providing V-shaped recesses open at the bottom and one side formed for coengagement with corresponding top end formations and end surfaces of another identical tote box to effect longitudinal and lateral alignment of a pair of such boxes when stacked one upon the other.

4. A tote box according to claim 1 and including a

5

pair of escutcheons rigidly secured to the upper inner walls of the end members, said escutcheons having opposed sockets and a stiff rod mounted with its end portions rigidly secured in said sockets.

5. A tote box according to claim 4 in which the rod is made of non-metallic compressible material and the walls of said sockets are forced into the rod, thereby forming a head and a reduced neck in said rod inside the walls of said sockets.

6. A tote box according to claim 1 in which the edges of the end members are rigidly secured to the sides of the integral walls of the channel member.

7. A tote box according to claim 1 in which the end members are secured to the end portions of the channel member by means of welding.

8. A tote box according to claim 1 in which the end members are secured to the end portions of the channel member by means of rivets.

9. A tote box according to claim 1 in which the lower

6

ends of the end members project below the floor of the channel member when in assembled relation therewith.

10. A tote box according to claim 3 in which the end supporting members are provided with integral fins projecting from its tapered edges for rigidly securing said members to the end members and are also provided with a single integral fin projecting from its bottom edge for rigidly securing said end supporting members to the floor of the channel member.

11. A tote box according to claim 3 and including rectilinear notches in the ends of the channel member in which the end supporting members are fitted.

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