

June 29, 1948.

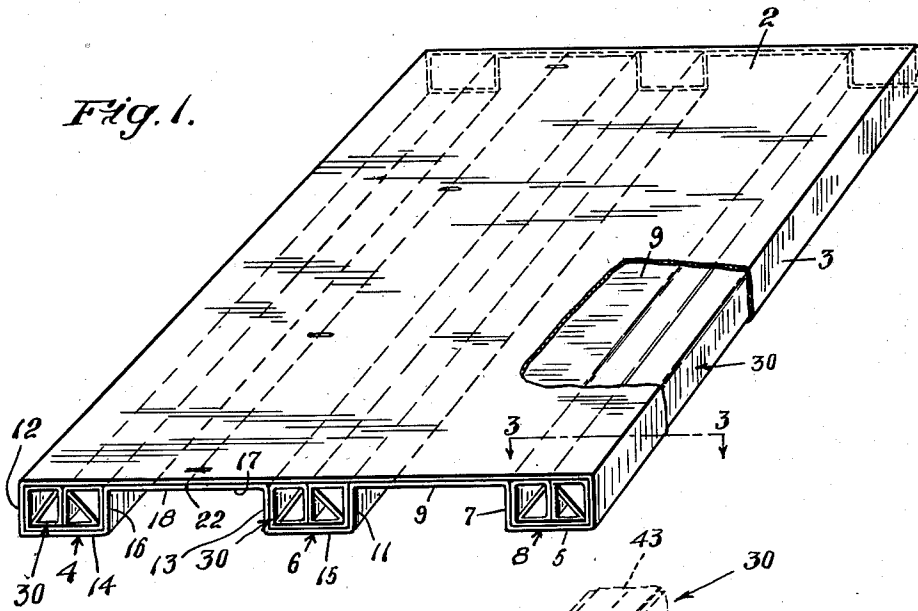
N. L. CAHNERS

2,444,183

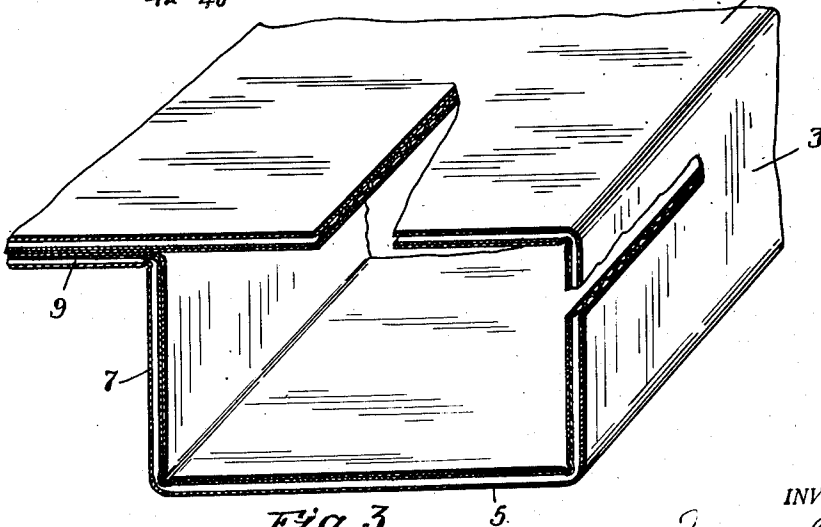
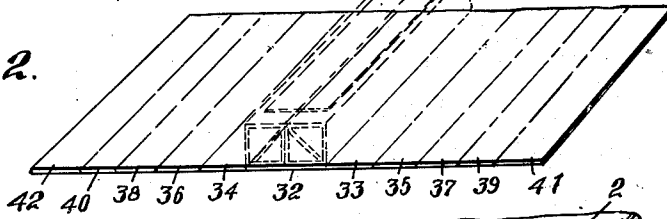
FIBERBOARD PORTABLE PLATFORM

Filed July 14, 1945

5 Sheets-Sheet 1



*Fig. 2.*



INVENTOR.

BY Norman L. Cahners  
Rowland V. Patuck

June 29, 1948.

N. L. CAHNERS

2,444,183

FIBERBOARD PORTABLE PLATFORM

Filed July 14, 1945

5 Sheets-Sheet 2

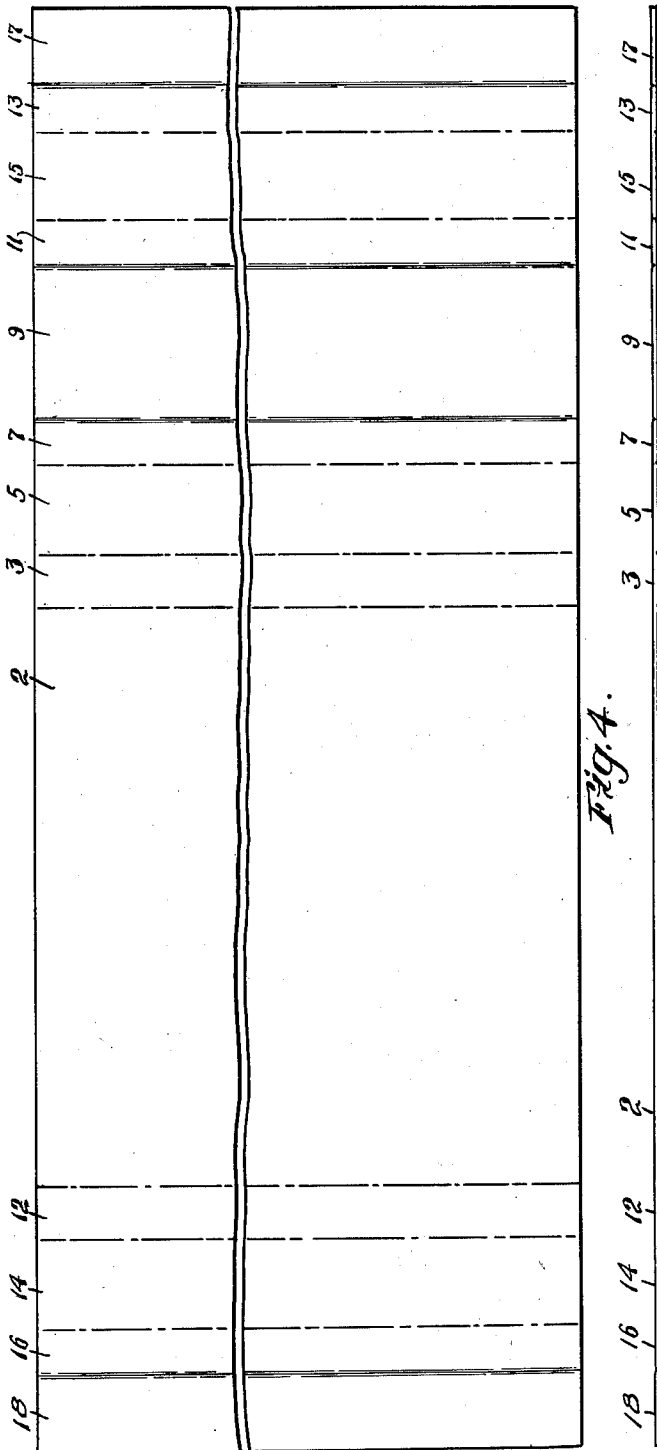


Fig. 4.

Fig. 5.

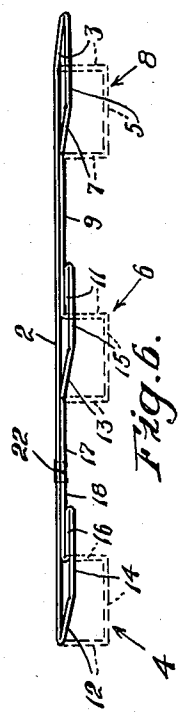


Fig. 6.

INVENTOR.

Norman L. Cahners  
Rowland V. Patrick

BY

June 29, 1948.

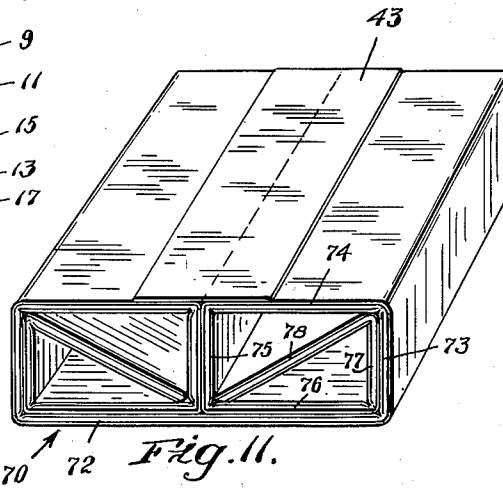
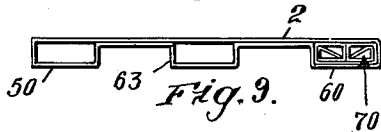
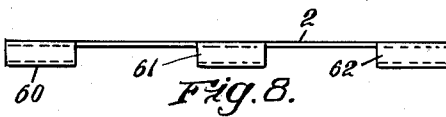
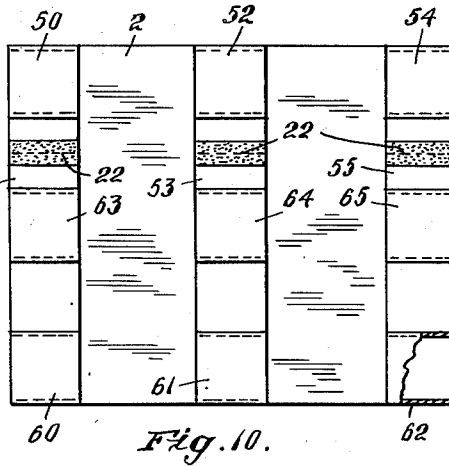
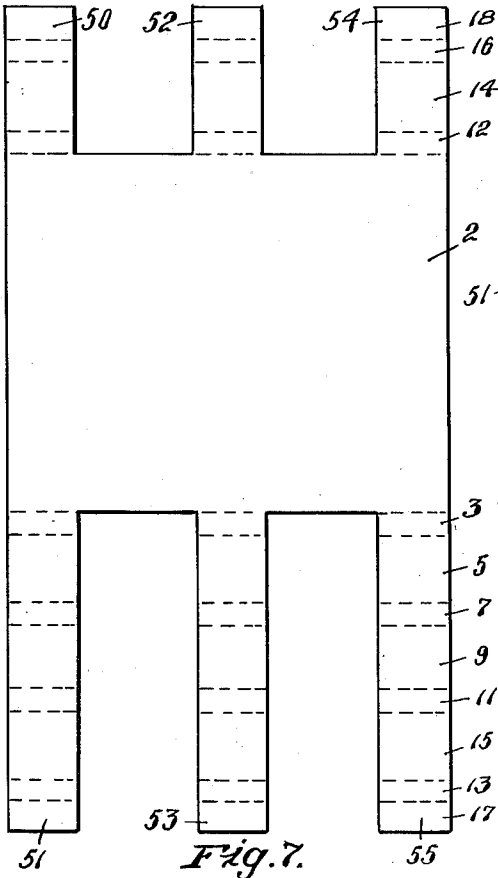
N. L. CAHNERS

2,444,183

FIBERBOARD PORTABLE PLATFORM

Filed July 14, 1945

5 Sheets-Sheet 3



INVENTOR.

BY *Norman L. Cahners*  
*Rowland V. Patucke*

June 29, 1948.

N. L. CAHNERS

2,444,183

FIBERBOARD PORTABLE PLATFORM

Filed July 14, 1945

5 Sheets-Sheet 4

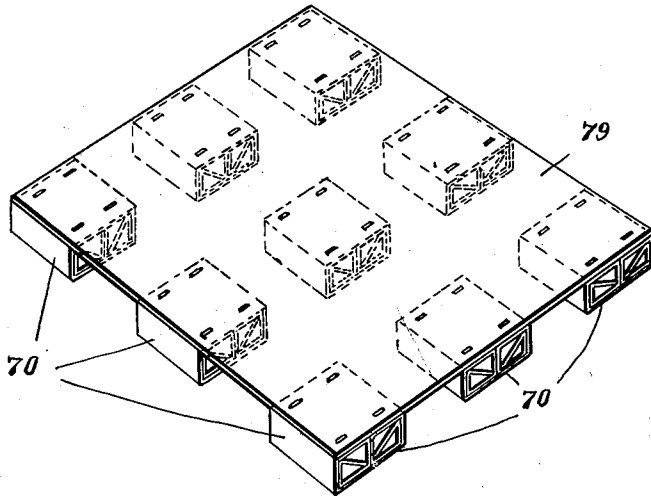


Fig. 12.

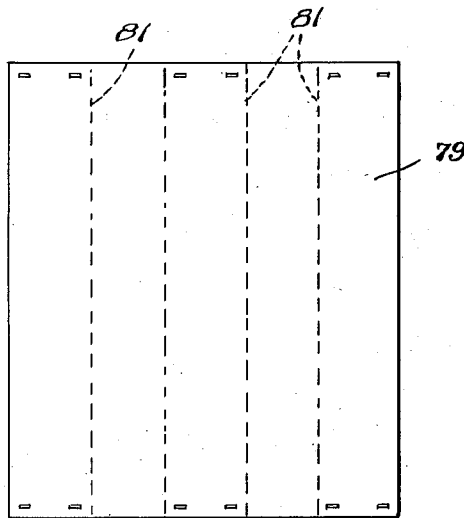


Fig. 13.

INVENTOR  
*Norman L. Cahners*  
BY *Roland V. Natuck*

June 29, 1948.

N. L. CAHNERS

2,444,183

FIBERBOARD PORTABLE PLATFORM

Filed July 14, 1945

5 Sheets-Sheet 5

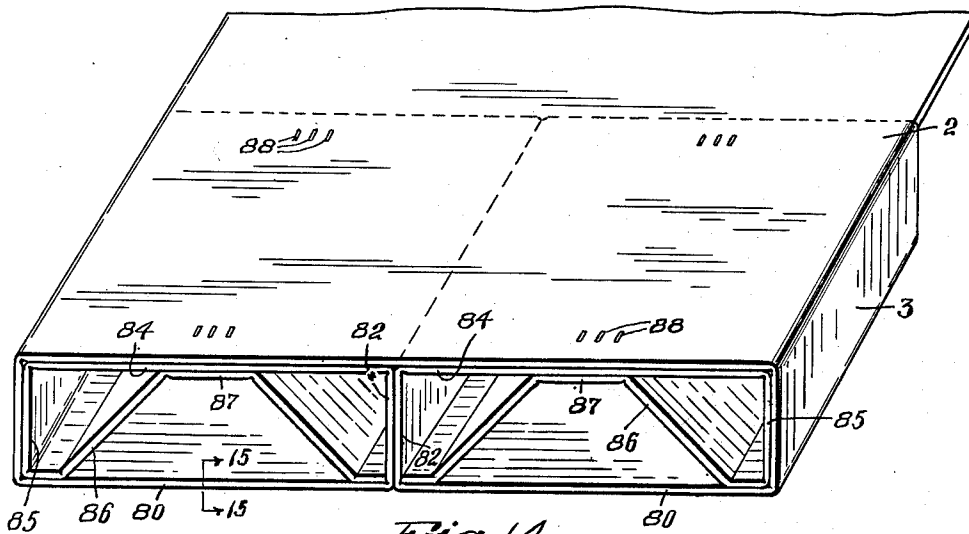


Fig. 14.



Fig. 15.

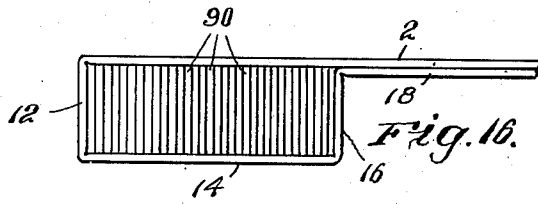


Fig. 16.

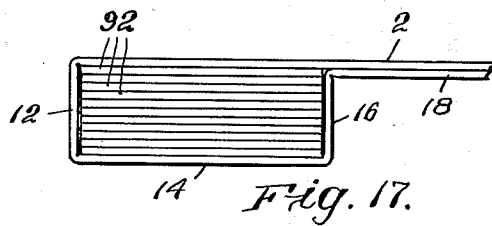


Fig. 17.

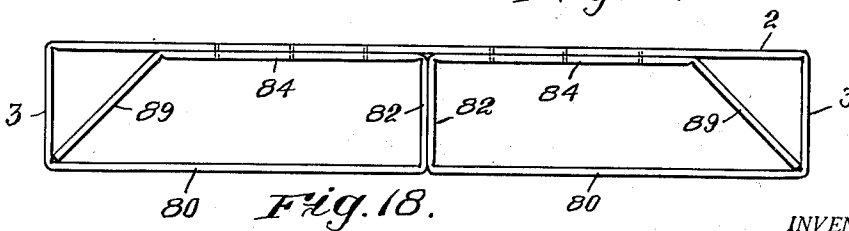


Fig. 18.

INVENTOR.

BY Norman L. Cahners  
Rowland V. Lutck

# UNITED STATES PATENT OFFICE

2,444,183

## FIBERBOARD PORTABLE PLATFORM

Norman L. Cahners, Newton, Mass.

Application July 14, 1945, Serial No. 605,059

20 Claims. (Cl. 248—120)

1

This invention relates to portable platforms adapted for use in lift truck operations and generally referred to as skids or pallets.

Such platforms have found considerable use in the storage and transportation of goods. The saving in labor handling is considerable where goods may be palletized and shipped through with the pallet to their destination. A drawback to their use in through transportation however, particularly in common carrier transportation, is that the platforms are carried by common carriers at Interstate Commerce Commission rates for the palletized commodity, just as any shipping package or crate. The platform therefore contributes a considerable part of the shipping cost because of its own weight and, in carload lots, involves expensive space consumption. Typical wooden and steel platforms weigh 100 pounds or more.

A second disadvantage in present day platforms is the problem of return of "empties." Either the platforms are "one use" platforms so that their entire value must be absorbed as a shipping or other overhead cost, or else attention and consideration must be given to their return shipment. Since the cost of wooden platforms runs as high as six dollars apiece, and of steel platforms at least double that figure, single use involves an item of considerable consequence, while unloaded return shipment is a nuisance and an added cost.

It is a primary object of this invention to provide portable platforms that are light in weight so that their transportation cost will be practically negligible.

It is a further object of this invention to provide highly inexpensive platforms having adequate strengths to handle all but extremely heavy or otherwise unusual commodities, and the small cost of which will justify their one-shipment use.

It is a further object of this invention to provide platforms which can be supplied in knock-down form for ready assembly by the user or disassembly for return shipment.

It is a further specific object of this invention to provide lightweight platforms made of fiberboard having adequate strengths to handle average loads.

It is a further object of this invention to provide fiberboard blanks scored for folding into assembled form to produce two-way or to produce four-way platforms.

It is a further object of this invention to provide one-piece fiberboard blanks scored for folding to form two-way platforms or four-way platforms.

It is a further object of this invention to provide cooperating fiberboard components each of

2

which may be sold in substantially flat form for storage in such form; to be folded and assembled into two-way platforms or four-way platforms when used.

Other objects of the invention will be referred to in the course of the following descriptions of typical platforms of my invention and further advantages will become apparent in the light of these descriptions.

The above and other objects of the invention are attained in the structures shown in the accompanying drawings in which:

Fig. 1 is an isometric view of a preferred form of platform constructed in accordance with my invention;

Fig. 2 is a partial isometric detail of one of the components of the platform shown in Fig. 1 but in unfolded sheet form, illustrating how that component is folded to the form shown in dotted lines and as utilized in the construction in Fig. 1;

Fig. 3 is an enlarged partial cross-sectional view taken along the lines 3—3 of Fig. 1;

Fig. 4 is a plan view in unfolded sheet form, broken away centrally, of another of the components utilized in the construction of Fig. 1;

Fig. 5 is an elevation of the sheet shown in Fig. 4;

Fig. 6 is an elevation of the component of Figs. 4 and 5 folded to assembly form but with certain portions thereof in a collapsed state to provide a substantially flat component and showing in dotted lines the component set up for assembly with components of the type shown in Fig. 2;

Fig. 7 is a modified form of blank adapted to provide a four-way platform;

Fig. 8 is a side elevation of the blank of Fig. 7 when folded to assembly position;

Fig. 9 is an end elevation of the device shown in Fig. 8;

Fig. 10 is a bottom plan of the device shown in Figs. 8 and 9;

Fig. 11 is a modified form of the component shown in Fig. 2;

Fig. 12 is a perspective view of a further modified form of my invention;

Fig. 13 is a plan of a still further modified form of my invention;

Fig. 14 is a partial isometric view of another modification;

Fig. 15 is a detail of the construction utilized in the form shown in Fig. 14;

Figs. 16 and 17 are details showing further modifications; and

Fig. 18 is an end elevation of a further modification.

3

The structure shown in Fig. 1 comprises a materials handling platform constructed essentially from four fiberboard sheet components. The primary component is a large fiberboard sheet having a central panel 2, adapted to form the elevated platform of the device, and having lateral extensions which are suitably scored to permit them to be folded under the platform 2 to provide a series of three hollow sleeves 4, 6 and 8 extending in parallel relation longitudinally of the structure and defining therebetween two passageways for lift truck fork entry. The hollow sleeves 4, 6 and 8 are reinforced by the insertion therein of three substantially identical hollow trussed reinforcing elements 30, each of which is formed from a single fiberboard sheet as illustrated in the broken-away Figure 2.

Preferably the four essential components are formed of corrugated fiberboard, in which case the primary fiberboard component is cut in such manner that the corrugations thereof will extend laterally of the elevated platform 2 and, as shown in Fig. 3, will extend vertically of all upright sections of the sleeves 4, 6 and 8.

For the purposes of further clarity, the primary component utilized in the construction of the platform shown in Fig. 1 is shown in blank sheet form in Figs. 4 and 5. This sheet shows the central panel 2 and lateral extensions on each side thereof. The lateral extension of one side is divided by scores into a side panel 3, a bottom face panel 5 (for sleeve 6), an inner upright portion 7 (for sleeve 8), an under-panel 9, side and bottom face panels 11, 13 and 15, respectively, for forming sleeve 6, and a terminal panel 17.

The lateral extension at the other side of panel 2 includes panels identical with panels 3, 5, 7 and 17, which have been referenced 12, 14, 16 and 18, respectively, for forming sleeve 4.

The fiberboard sheet of Fig. 4 is scored in the manner shown in Fig. 5 to permit ready folding thereof to the form shown in Fig. 1 and in dotted lines in Fig. 6. As thus folded, the two longitudinal edge portions of the sheet are brought into abutting relation at joint 22 where they are suitably stapled or otherwise fastened to central panel 2.

Elements 30 are then inserted in the formed sleeves 4, 6 and 8.

The reinforcing elements 30 are each formed from a single sheet of fiberboard of the same length as panel 2, and of a width suitable for folding into the form shown in dotted lines in Fig. 2, to provide a rectangular reinforcing element of dimensions such that it will just fit into any of the sleeves 4, 6 or 8. The sheet of fiberboard includes a central panel 32 with laterally extending panels 33, 35, 37, 39 and 41 on one side and respectively identical panels 34, 36, 38, 40 and 42 on the other extension, each of the panels being separated by a suitable score as shown in Fig. 2 so that the panels may be folded to the form shown in dotted lines in Fig. 2 with panels 33, 34 and 37, 38, forming upright sections, with panels 35, 36 forming horizontal top panels, panels 39 and 40 forming internal bottom panels and panels 41, 42 forming internal truss elements extending in opposite diagonal directions as shown. The reinforcing elements 30 may and preferably are fastened in folded position prior to sliding insertion into sleeves 4, 6 and 8, although this is not essential. Such fastening can be accomplished by application of a flat fastening element 43 such as of gummed paper tape.

Where the fiberboard sheet 30 is made of cor-

4

rugated fiberboard, as is preferred, the sheet is cut and scored in such manner that the corrugations will run vertically of the upright sections 33, 37 and 34, 38.

Upon completion of assembly to the form shown in Fig. 1, it will be seen that the elevated platform 2 is supported by a series of three supporting members, each of which comprises six corrugated fiberboard uprights internally trussed against lateral sway by panels 41 and 42.

A structure thus built has been found to have almost unbelievable load capacity. Utilizing  $\frac{1}{8}$  inch corrugated fiberboard a device having overall dimensions of about 35 x 45½ inches has been found capable of sustaining a load of three tons. Furthermore, the rigidity of the platform 2 when lifted by a lift truck is most surprising.

As previously stated, one of the advantages of this invention is that the complete platform may be sold and shipped in knock-down sheet form, the fiberboard sheets having been suitably scored as shown to permit their ready folding and assembly, and requiring no further labor except stapling, gumming, or otherwise fastening the primary component in the folded position.

In fact, if desired, the folding of the primary component may be done by a manufacturer and then the sleeves 4, 6 and 8 may be collapsed to the position shown in dotted lines in Fig. 6 for shipment in substantially flat form along with accompanying three fiberboard reinforcing elements 30 in sheet form. The components may be stored in this flat form until ready for assembly and use. Economy in storage space is thus secured.

The platform may be almost as readily disassembled for the purpose of return, if desired.

The platform previously described is adapted for what is known in the art as two-way operation, that is, lift truck fork entry is provided only on two sides of the structure.

Figs. 7 through 11, inclusive, illustrate a modified form of device designed for four-way entry but embodying other of the features hereinbefore described with reference to the device of Figs. 1 through 6. This modified form of device has a substantially similar primary component, shown in Fig. 7, and formed of fiberboard, preferably corrugated. It includes a central panel 2 but the laterally extending panels 3, 5, 7, 9, 11, 15, 13 and 17 and 12, 14, 16 and 18, instead of extending throughout the longitudinal extent of the component are cut away as shown in Fig. 7 so that they form on each side three laterally extending sleeve-forming portions 50, 52 and 54, and 51, 53 and 55, respectively. When this blank is suitably scored, as shown, and folded, it provides a folded component as shown in Fig. 10, provided on its under surface with nine sleeve-like units 50, 52 and 54, 60, 61 and 62, and 63, 64 and 65, which are shown slightly more elongated than those of Fig. 1. The end panels 17 and 18 are gummed in abutting relation in each case at 22.

For the purpose of reinforcing the nine sleeves, reinforcing elements 70 (Fig. 11) are utilized. The units 70, shown in Fig. 11, each comprises a single fiberboard sheet having a base portion 72 and lateral extensions identical on both sides, including successively a side upright 73, a top section 74, an inside upright 75, an inside bottom section 76, a second outer upright 77, and a truss 78.

As in the case of the reinforcing element of Fig. 2, the supporting member of Fig. 11 may be

fastened in folded position by application of a tape 43 or other fastening means.

Nine of such units may then be slidably inserted in the sleeve units to provide a four-way structure for lift truck fork entry on any one of the four sides of the structure, as shown in Figs. 8 and 9. Or, if the sleeves 51, 53, 55, 50, 52, 54 are modified in dimensions, units 30 may be used instead of units 70.

The four-way structures may be sold in knocked-down or partially completed but collapsed condition as in the case of the two-way device of Figs. 1 to 6.

Figs. 12 and 13 show further modifications of the device wherein the elevated platform instead of being integral with the sleeve portions is separate therefrom and comprises an individual flat sheet without lateral extensions. In this modification, in order to provide sufficient strength, the reinforcing elements are preferably the units 70 so that there are provided the same number of upright sections, that is, six, for each supporting member as in Fig. 1. Nine of these units may be fastened to the under surface of the platform 79 of the device of Fig. 12, either adhesively or by stapling, to provide a four-way platform. If desired, instead of all facing in one direction as shown in Fig. 12, the supporting members may be staggered in direction where that is found to be desirable.

Fig. 13 illustrates a two-way platform built on the principle of a single top separate panel 79 and three reinforcing elements 81 of the type shown in Fig. 11 each made from a single corrugated fiberboard sheet but of a length sufficient so that each supporting member extends the full length of the platform.

Fig. 14 illustrates a pallet constructed wholly from a single one-piece sheet of fiberboard, suitably scored for folding to the form shown. This single sheet of fiberboard again includes an elevated platform section 2, and a side portion 3. The next panel 80, however, extends inwardly beneath panel 2 to the longitudinal median, and then is folded upwardly to form an upright 82, back across the top to form an underface 84, down on the outer side to form another upright 85 and then the end panel is formed into a double truss element 86, a flat upper central portion 87 thereof being stapled, as by staples 88, through and through to the fiberboard sections 2 and 84.

An extension on the other side of the central panel 2 of the device of Fig. 14 provides an identical supporting member for the other side of the platform. In this case lift truck fork entry is provided above the panels 80 and in the passageways formed by the trusses 86. In order to provide sufficient strength in the device of Fig. 14, it is desirable to use double-faced corrugated fiberboard of the type illustrated in Fig. 15. Such fiberboard may of course be used in making any of the other elements heretofore described.

Depending upon whether the extensions forming the supporting members of Fig. 14 extend the complete longitudinal extent of platform 2, as in the case of the device of Figs. 1 to 6 hereof, or are cut away longitudinally as in the case of the device of Figs. 7 to 10, the structure of Fig. 14 will provide a two-way or a four-way pallet.

While the hollow trussed reinforcing elements of Fig. 2 herein described provide admirable reinforcing elements for the sleeve type of structure shown in Figs. 1 to 6 and 7 to 10, respectively, particularly because of their light weight and minimum material use, certain objects of the in-

vention can be attained by utilizing in the sleeves instead of the reinforcing elements 30, other reinforcing elements, for example, a series of properly shaped fiberboard uprights 90 placed in face-to-face relation as shown in Fig. 16 and sufficient in number to completely fill each of the hollow sleeves. These sheets 90 may be adhered to one another prior to insertion, if desired, by a suitable adhesive or in other manner. If the sheets 90 are of corrugated fiberboard, it is preferable that the corrugations thereof extend vertically of the platform, as is the preferred structure in the case of the other forms of the invention heretofore described.

Another example of a reinforcing insert is illustrated in Fig. 17 wherein fiberboard sheets 92 are inserted in face-to-face relation but run horizontally instead of vertically of the platform.

Fig. 18 shows another form of pallet made from a single piece of fiberboard similar to the device of Fig. 14. Here, however, the panels 3 and 80 continue into uprights 82 and underfaces 84 and then into trusses 89 instead of into the elements 85 and 86 of the device of Fig. 14. The form of device of Fig. 18 has limited use because the spans of underfaces 84 cannot be made very extensive without sacrifice in strength and it is necessary to maintain uprights 82, 82 in face-to-face relation in order to prevent lateral sway. In general, in all of the devices of this invention it is desirable to limit the span between uprights to as great a degree as is consistent with adequate span to permit entry of conventional 4" width lift truck forks at suitably spaced intervals.

It will be understood that the device of Fig. 18 may be made either as a two-way or a four-way platform in accordance with principles hereinbefore explained.

When devices of this invention are likely to be exposed to outdoor weather conditions, it may be advisable and it is within the contemplation of the invention to treat a portion or all of the fiberboard elements to render them waterproof or water-resistant as by the application thereto or impregnation thereof of water-repellent materials of types known to the art, such as resins, natural or synthetic rubbers, inorganic silicates, bituminous materials, coal tar or other pitches, or insolubilized glues.

It will be understood that staples, adhesives, gummed paper tapes or other fastening means may be placed at points other than those shown in the drawings in order to maintain the components in assembled condition. For instance, with respect to Fig. 1 the sleeves 4, 6 and 8 should be so fastened as to prevent their separating downwardly from panel 2. This can be done by interposing adhesive at suitable points between underfaces 9, 17 and 18 and panel 2 or by folding gummed tape over their edges.

I claim:

1. A portable materials handling accessory adapted for use in lift truck operations comprising a fiberboard sheet platform and a plurality of spaced fiberboard supporting members elevating said platform and defining therebetween passageways for lift truck fork entry beneath said platform, each of said supporting members comprising a single sheet of corrugated fiberboard folded into an open-ended hollow trussed rectangular unit presenting at least four upright sections having the corrugations thereof extending vertically thereof and two sections extending obliquely between said upright sections.

2. A fiberboard blank adapted for use in con-



7

structing a portable materials handling lift truck accessory comprising a sheet of fiberboard having a central panel adapted to form an elevated platform and a plurality of longitudinally spaced side portions integral with said central panel extending laterally from at least one side of said central panel, each of said side portions having a series of laterally spaced scores to divide said portions into a side panel, a bottom face panel, another side panel and an end panel whereby said side portions may be folded along said scores under said central panel with surfaces of said end panels in face to face relation with said central panel, to provide a plurality of hollow longitudinally spaced sleeves extending longitudinally beneath said central panel.

3. A portable materials handling accessory adapted for use in lift truck operations consisting essentially of a single fiberboard sheet having a central panel forming an elevated platform and having side portions integral with said central panel folded under said panel to provide a plurality of hollow sleeves extending beneath said platform and defining passageways for lift truck fork entry beneath said platform and fiberboard trusses integral with said sleeves disposed internally of said sleeves to reinforce said sleeves against lateral sway.

4. A flat fiberboard blank adapted to be folded into a portable materials handling lift truck accessory consisting essentially of a one-piece fiberboard sheet having a central panel adapted to form an elevated platform and side portions integral with said central panel, each of said side portions having a series of spaced scores to divide said portions into a side panel, a bottom face panel, another side panel and an end panel whereby each of said side portions may be folded along said scores under said central panel with the side and bottom panels thereof forming a hollow sleeve extending beneath said central panel, and the end panel thereof forming an internal truss for said sleeve.

5. A portable materials handling accessory adapted for use in lift truck operations comprising a platform adapted to receive a load upon its upper surface and a plurality of rigid paperboard supporting members disposed beneath and elevating said platform and defining on four sides of said platform openings of greater width than height leading to intersecting passageways for four-way lift truck entry beneath said platform, each of said supporting members comprising paperboard stock wound into a rigid unit presenting vertically and horizontally extending portions constituted of convolutions of said paperboard stock disposed in face-to-face relation.

6. A portable materials handling accessory as claimed in claim 5 wherein each of said members comprises a corrugated paperboard sheet wound into a rigid unit presenting vertically and horizontally extending portions constituted of a plurality of convolutions of said corrugated sheet disposed in face-to-face relation, with the corrugations of the corrugated sheet extending normal to the plane of said platform in said vertically extending portions.

7. A portable materials handling accessory adapted for use in lift truck operations comprising a platform adapted to receive a load upon its upper surface and a plurality of rigid paperboard supporting members secured beneath and elevating said platform, and defining openings of greater width than height for lift truck entry beneath said platform, each of said supporting members

8

comprising paperboard stock wound into a rigid unit constituted of connected convolutions of said wound paperboard, said convolutions being disposed in face-to-face relation throughout the unsecured peripheral extent of said wound unit.

8. A portable materials handling accessory as claimed in claim 7 wherein the rigid unit is tubular.

9. A portable materials handling accessory adapted for use in lift truck operations comprising a platform adapted to receive a load upon its upper surface and a plurality of rigid paperboard supporting members secured beneath and elevating said platform, and defining on four sides of said platform openings of greater width than height leading to intersecting passageways for lift truck entry beneath said platform, each of said supporting members comprising paperboard stock wound into a rigid unit constituted of connected convolutions of said wound paperboard, said convolutions being disposed in face-to-face relation throughout the unsecured peripheral extent of said wound unit.

10. A portable materials handling accessory as claimed in claim 9 wherein the passageways are open-bottomed.

11. A portable materials handling accessory adapted for use in lift truck operations comprising a platform adapted to receive a load upon its upper surface and a plurality of rigid paperboard supporting members disposed beneath and elevating said platform and defining openings of greater width than height for lift truck entry beneath said platform, each of said supporting members comprising paperboard stock wound into a rigid unit presenting vertically and horizontally extending portions constituted of convolutions of said paperboard stock disposed in face-to-face relation.

12. A portable materials handling accessory as claimed in claim 11, wherein the paperboard stock is corrugated paperboard and the corrugations of said paperboard extend longitudinally around the axes of the wound units.

13. A portable materials handling accessory adapted for use in lift truck operations comprising a platform and a plurality of paperboard supporting members disposed beneath and elevating said platform and defining openings for lift truck entry beneath said platform, said supporting members having bottom panels disposed parallel to said platform, upright panels extending normal to said platform and reinforcing elements extending obliquely with respect to said upright panels and across corners of said supporting members to brace said members against lateral collapse.

14. A portable materials handling accessory as claimed in claim 13 wherein said supporting members comprise corrugated paperboard and wherein the corrugations in the upright panels extend normal to the plane of the platform.

15. A portable materials handling accessory as claimed in claim 13 wherein each supporting member consists of a single integral folded sheet of paperboard.

16. A portable materials handling accessory adapted for use in lift truck operations comprising a platform and a plurality of spaced paperboard supporting members elevating said platform and defining therebetween passageways for lift truck fork entry beneath said platform, said supporting members comprising hollow paperboard sleeves and units of wound paperboard disposed internally of said sleeves and contact-

ing the walls of said sleeves to brace said walls against lateral collapse.

17. A portable materials handling accessory adapted for use in lift truck operations, comprising a platform and a plurality of spaced paperboard supporting members disposed beneath and elevating said platform and defining therebetween on four sides of said platform openings of greater width than height leading to intersecting passageways for four way lift truck entry beneath said platform, each of said supporting members comprising a flat horizontally-extending base-forming portion parallel to the plane of said platform and a unit of wound paperboard interposed between said platform and said base-forming portion.

18. A portable materials handling accessory adapted for use in lift truck operations comprising a paperboard sheet having a plane portion forming a platform and portions integral with said plane portion folded under said plane portion to provide a series of spaced tubular extensions and units of wound paperboard disposed internally of said extensions and contacting the walls thereof to brace said walls against lateral collapse.

19. A portable materials handling accessory as claimed in claim 18, wherein the wound units are tubular.

20. A portable materials handling accessory adapted for use in lift truck operations comprising a platform and a plurality of spaced paper-

board supporting members elevating said platform and defining therebetween passageways for lift truck entry beneath said platform, each of said supporting members comprising a single sheet of corrugated paperboard folded into an open-ended hollow trussed rectangular unit presenting upright sections having the corrugations thereof extending vertically thereof and at least one section of said sheet extending obliquely between said upright sections.

NORMAN L. CAHNERS.

#### REFERENCES CITED

The following references are of record in the file of this patent:

#### UNITED STATES PATENTS

Number	Name	Date
914,262	Friberg -----	Mar. 2, 1909
1,141,067	Lloyd -----	May 25, 1915
1,395,483	Denney -----	Nov. 1, 1921
1,508,898	Smith -----	Sept. 16, 1924
1,612,382	Lehman -----	Dec. 28, 1926
1,832,759	Bennett -----	Nov. 17, 1931
1,842,617	Lupton -----	Jan. 26, 1932
1,908,783	Pehrsson -----	May 16, 1933
1,931,458	Lang -----	Oct. 17, 1933
2,303,631	Grant -----	Dec. 1, 1942
2,328,397	Neuman -----	Aug. 31, 1943
2,372,055	Braun -----	Mar. 20, 1945
2,388,730	Fallert -----	Nov. 13, 1945