Feb. 24, 1948. J. H. CRUICKSHANK 2,436,554

PALLET

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Fig. 1.

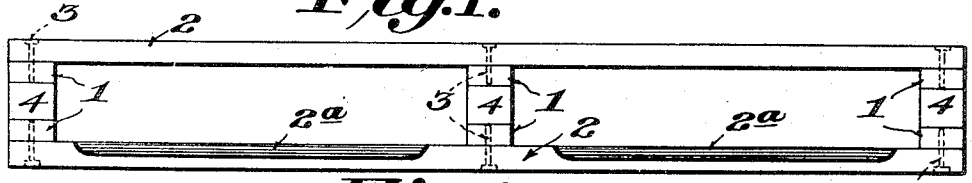

Fig. 2.

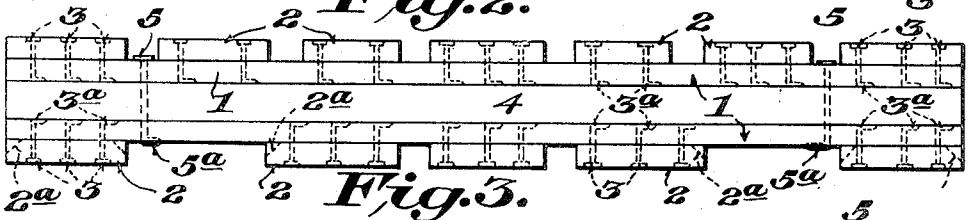

Fig. 3.

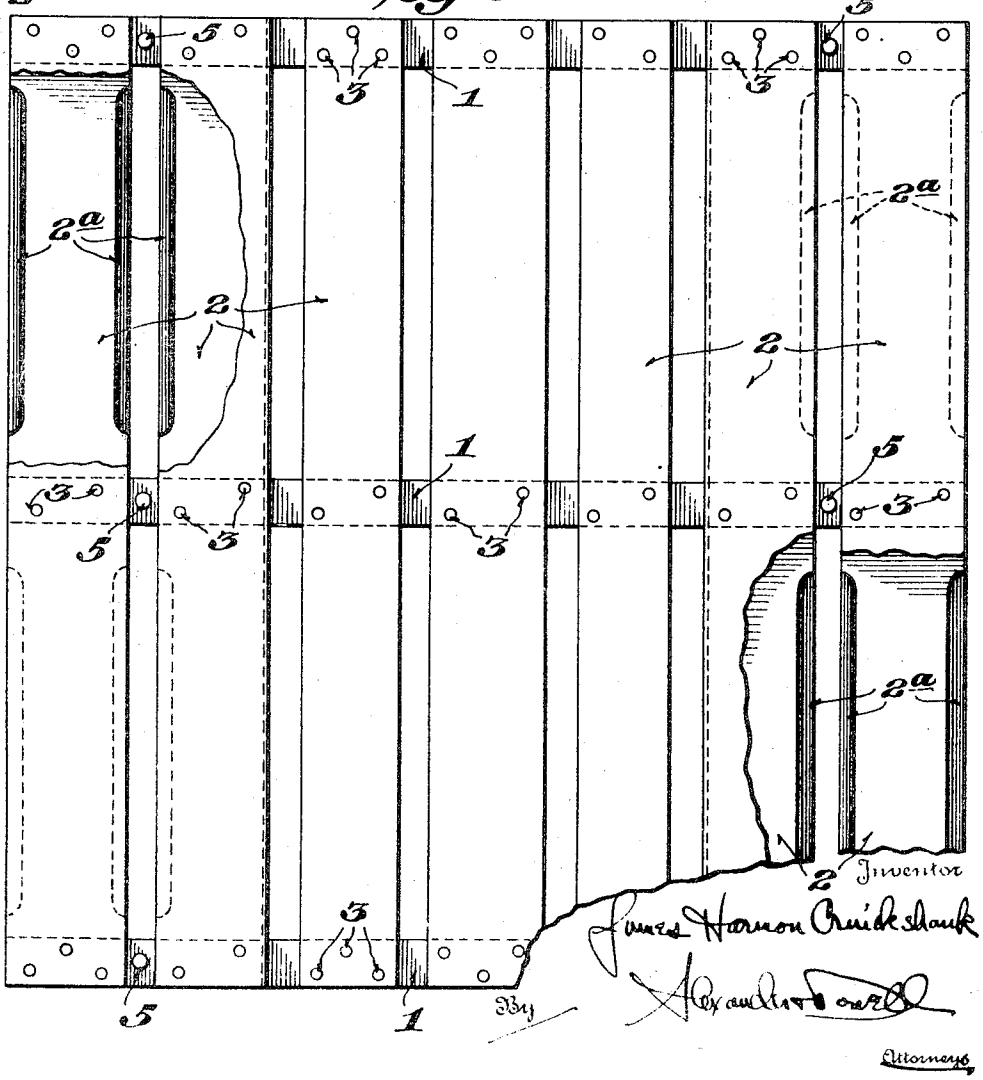

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Fig. 4.

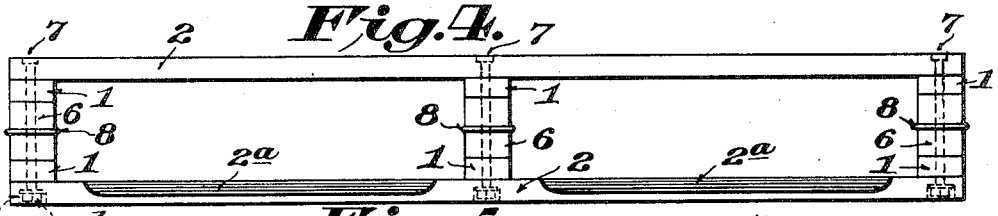

Fig. 5.

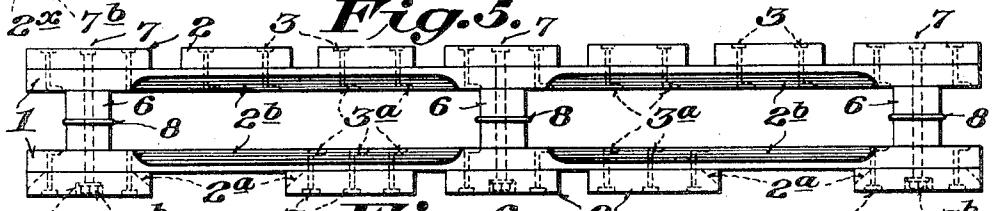

Fig. 6.

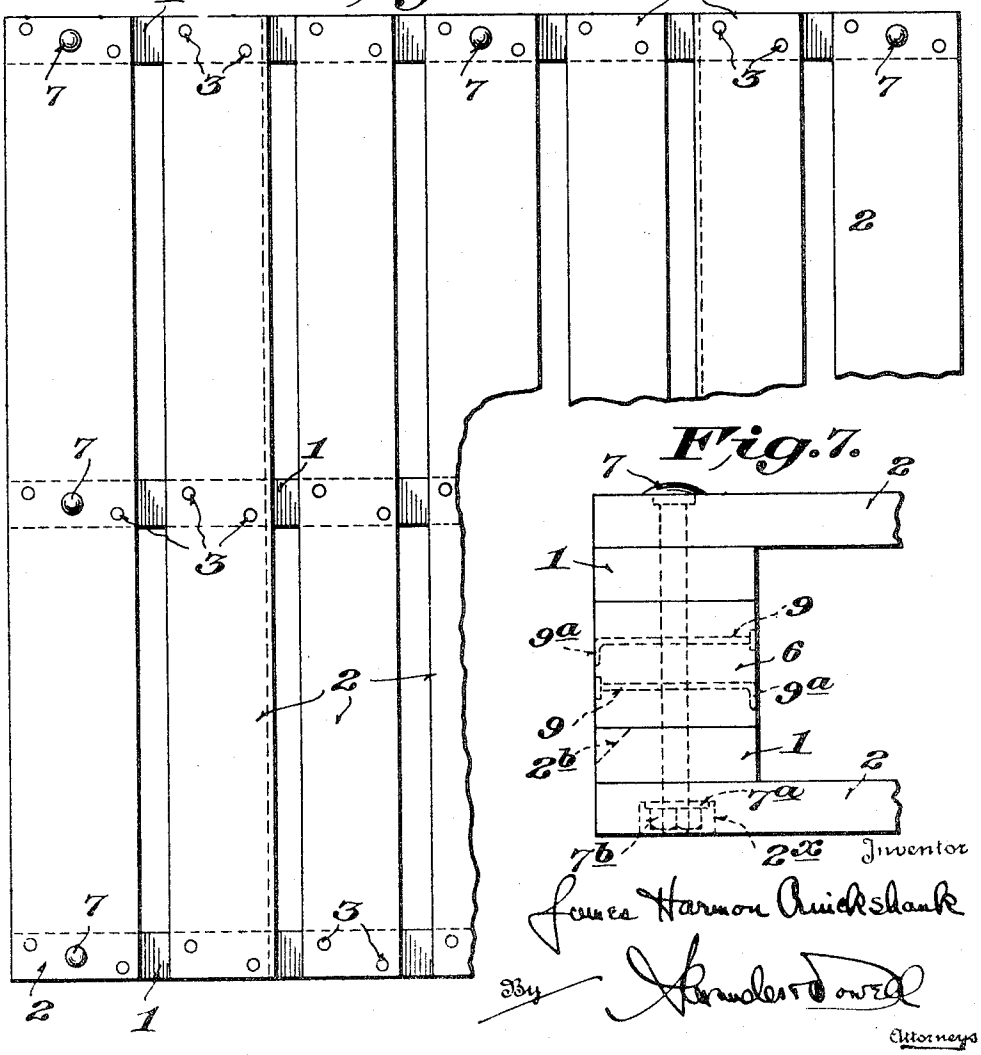

Fig. 7.

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Fig. 8.

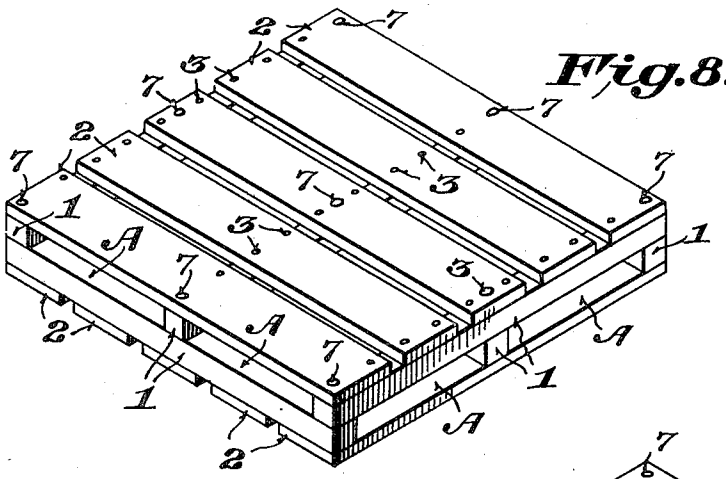

Fig. 9.

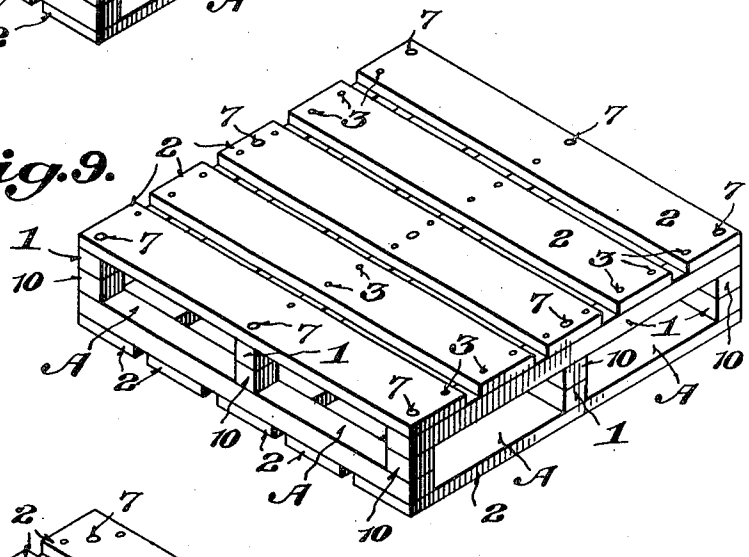

Fig. 10.

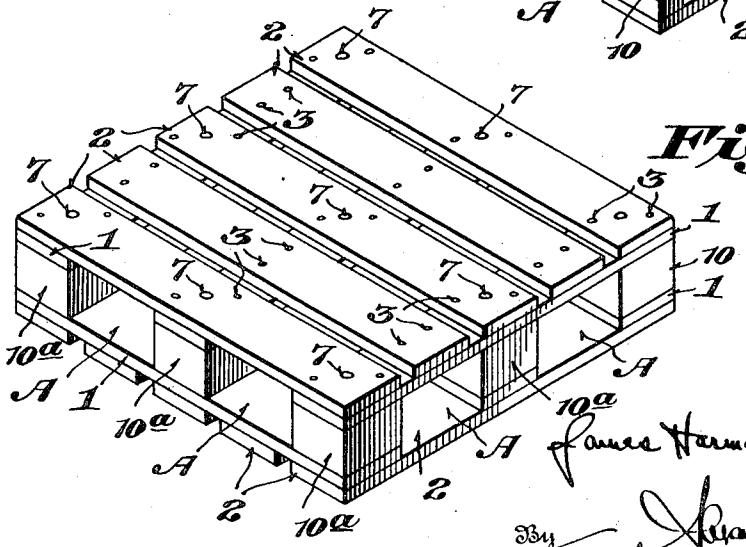

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Fig. 11.

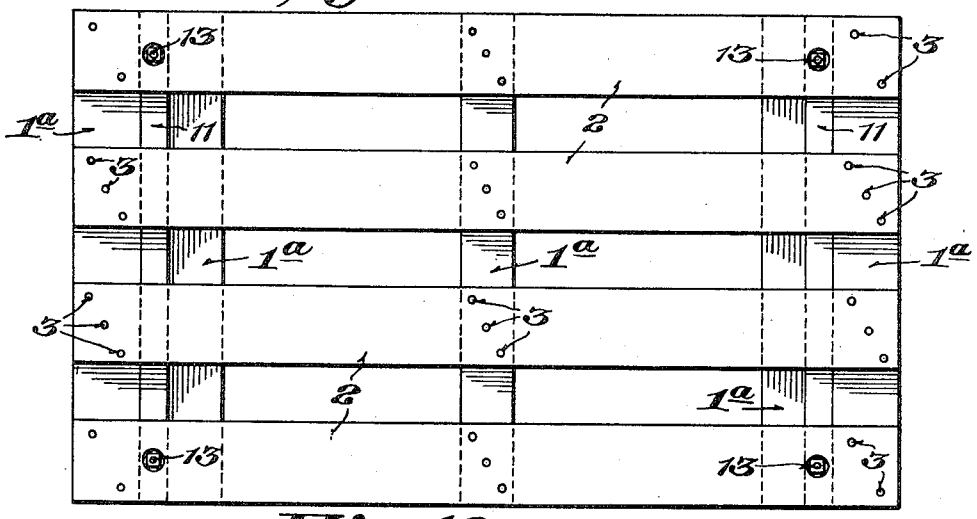


Fig. 12.

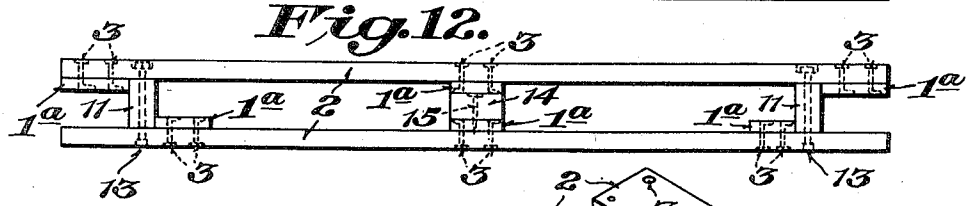


Fig. 13.

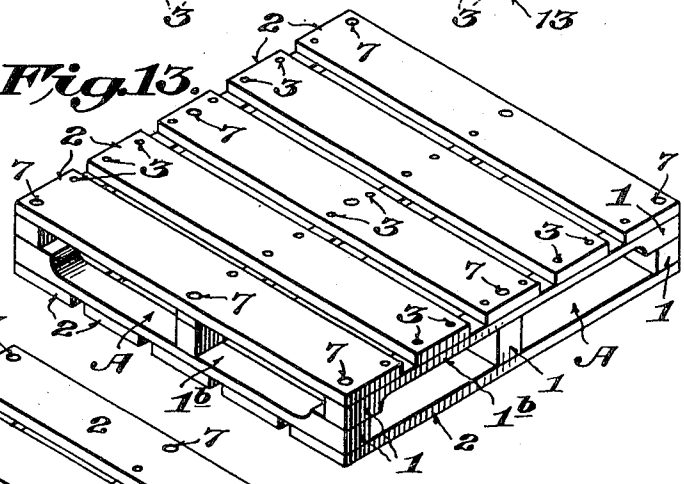
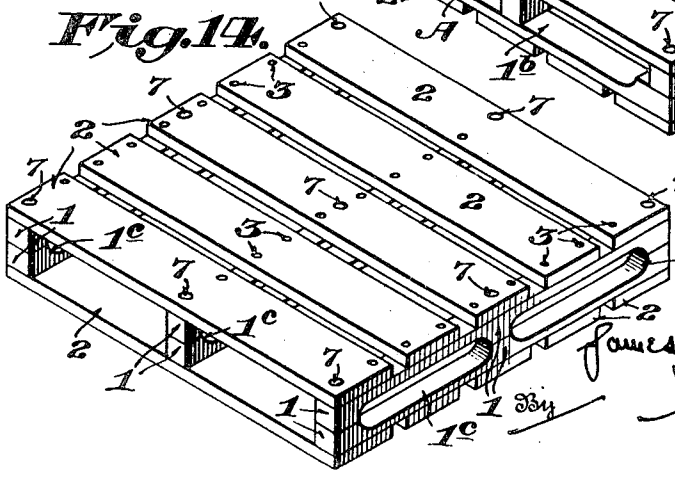


Fig. 14.



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Patented Feb. 24, 1948 2,436,554

UNITED STATES PATENT OFFICE

2,436,554

PALLET

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Application July 6, 1944, Serial No. 543,657

7 Claims. (Cl. 248—120)

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This invention is an improvement in pallets adapted to be used in warehouses or the like in connection with lift trucks, for storing thereon packaged goods, said pallets being customarily superimposed in tiers, each pallet resting directly on the load carried by the underlying pallet.

The present invention is an improvement upon the pallet shown and described in my U. S. Letters Patent No. 2,297,347, issued September 29, 1942, which patent discloses a pallet comprising superimposed sections, each section comprising spaced parallel cleats, cross-boards connecting the cleats, and nails of greater lengths than the thickness of the boards and cleats of each section passing therethrough, the ends of the nails being clinched under the cleats of the section, and means such as clinched nails, bolts, riveted rods, or the like connecting the cleats of the superimposed sections together.

In the patented construction, openings for receiving or accommodating the lifting fingers of the lift truck were provided in the opposite ends of the pallet, the height of said openings being determined by the combined thicknesses of the superimposed cleats of the section; and thus in order to provide holes of sufficient height to receive the lifting fingers it was necessary to utilize cleats in each section of substantial thickness. Consequently the clinched nails which connected the cross-boards to the cleats of each section were necessarily of sufficient length to extend through the boards and the cleats with sufficient allowance to permit same to be clinched, and hence said nails were necessarily of such diameter that, where certain woods and especially hardwoods were used to form the cleats, the nails during insertion would often split the cleats, rendering same useless and requiring replacement.

One object of the present invention therefore is to provide a pallet formed of superimposed sections, each section comprising spaced parallel relatively thin cleats, cross-boards connecting said cleats, and nails of greater length than the thickness of the boards and cleats of each section passing therethrough, the ends of the nails being clenched over the cleats; spacing strips interposed between and coextensive with the faces of the superimposed cleats of the sections, and means connecting the superimposed sections and spacing strips together, said arrangement providing the desired height for the openings at the ends of the pallet between the parallel cleats, and the provision of the spacing strips between the superimposed cleats permitting the use of cleats in

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each section of considerably less thickness, without sacrificing strength, and also permitting the use of shorter and thinner nails for connecting the boards and cleats of each section together, thus preventing the nails, when driven through the boards and cleats, from splitting the boards or cleats especially when made of hardwoods. The cleats of the sections are secured together by means of clinched nails, bolts, riveted rods or the like passing through the cleats and the spacing strips, or passing through the cleats, spacing strips, and the boards at the corners of the pallet, such construction utilizing spacer strips interposed between the pallet.

Another object of the invention is to provide a similar pallet construction, utilizing spacing blocks, instead of the above mentioned spacing strips, the blocks being interposed between the cleats of the sections at the ends and centers of the cleats respectively, said blocks being either of wood, metal, or other suitable material, and the means for connecting the sections together similarly passing through the cleats and blocks, or through the boards, cleats, and blocks; such construction providing openings for the lifting fingers of the lift truck at all four sides of the pallet instead of only at the opposite ends thereof. Said construction thus not only effects a saving in the size and diameter of the nails used in connecting the boards to the cleats of the sections, but also provides for the requisite height of the openings at each, or all four sides of the pallet to accommodate the lifting fingers. This also saves material and weight.

Another further object of the invention is to provide a pallet somewhat similar to that disclosed in my aforesaid Patent No. 2,297,347 but in which the cleats and boards of the superimposed sections are disposed at right angles to each other, thus providing openings for the lifting fingers of the lifting truck at all four sides of the pallet and save material and weight.

A still further object of the invention is to provide a construction similar to that described in the preceding paragraph but having spacing blocks interposed between the cleat sections at the ends and centers thereof so as to provide for the necessary height of the openings at the four sides of the pallet to accommodate the lifting fingers when relatively thin cleats are used, said blocks being of such height that the cleats of the sections may be made of relatively thin woods, especially hard woods, necessitating use of nails, which secure the boards to the cleats of the sections, of relatively small diameter but suffi-

ciently long to permit the nails to be clinched under the cleats as above described.

Other minor objects of the invention will be hereinafter set forth.

I will explain the invention with reference to the accompanying drawings, which illustrate several practical embodiments thereof, to enable others familiar with the art to adopt and use the same; and will summarize in the claims, the novel features of construction, and novel combinations of parts for which protection is desired.

In said drawings:

Fig. 1 is an end view of one form of my novel pallet shown in Fig. 3, showing the openings for the lifting fingers of the lift truck, and showing the spacing strips coextensive with the cleats and interposed between the cleats of the superimposed pallet sections.

Fig. 2 is a side view of the pallet shown in Fig. 3.

Fig. 3 is a top plan view of the pallet shown in Figs. 1 and 2, with the top boards partly broken away.

Fig. 4 is an end view of the modified pallet shown in Fig. 6, showing the use of spacing blocks between the cleats of the sections, instead of the spacing strips shown in Fig. 1.

Fig. 5 is a side view of the pallet shown in Fig. 6, showing the openings for the lifting fingers provided therein by the spacing blocks.

Fig. 6 is a top plan view of the modified pallet, utilizing spacing blocks, shown in Figs. 4 and 5.

Fig. 7 is an enlarged detail view, showing a modified spacing block disposed between the cleats of the sections, so as to provide openings at the four sides of the pallet.

Fig. 8 is a perspective view of a further modified pallet, having openings for the lifting fingers at all four sides of the pallet.

Fig. 9 is a perspective view of a still further modification of a pallet, having opening at all four sides.

Fig. 10 is a perspective view of a still further modification, having openings at all four sides of the pallet.

Fig. 11 is a plan view of a further modified pallet.

Fig. 12 is an end view of the pallet shown in Fig. 11.

Fig. 13 is a perspective view of a further modified pallet.

Fig. 14 is a perspective view of a still further modified pallet.

As shown in Figs. 1–3, the pallet is generally of the form shown in my U. S. Letters Patent No. 2,297,347, issued September 29, 1942, the same consisting of superimposed pallet sections of identical construction, each section consisting of spaced parallel cleats 1 connected by cross-boards 2 secured together by means of nails 3 of such length that when driven through the boards and cleats they may be clinched as at 3*a*, Fig. 2, over the inner faces of the cleats 1 to securely connect boards to the cleats together as disclosed in my aforesaid patent.

In order however to maintain the diameter and length of nails 3 at a minimum so as to prevent splitting of the boards and cleats when made of certain woods but especially hardwoods, the cleats 1 in the present construction are made of less thickness than in my aforesaid patent; and in order to provide the necessary height of the openings between the opposed faces of the pallet which receive the lifting fingers of the lift truck, I provide spacing strips 4, Figs. 1 and 2, between

the cleats of the superimposed pallet sections, said spacing strips 4 being of selected thickness. The superimposed cleats 1 and spacing strips 4 are secured together by any desired means as disclosed in my aforesaid patent, the particular means shown in the present application consisting of relatively heavy long nails 5 disposed adjacent each end of each of the cleats 1 of the superimposed sections, said nails passing through the cleats 1 and spacing strips 4 and being clinched as at 5*a*, Fig. 2, to securely bind the parts 1 and 4 together, thereby increasing the rigidity of the cleats by reason of the laminated structure, and the clinched nails forming a simple, inexpensive and efficient means of securing the parts together while providing the requisite strength.

In Figs. 1–3 the spacing strips 4 are coextensive in length and width with the said cleats 1; and in this modification openings would be provided at each end of the pallet between the boards of the sections, to receive the lifting fingers of the lift truck, the strips 4 determining to a large extent the spacing between the opposed faces of boards 2 of the pallet. In order to facilitate entry of the lifting fingers of the lift truck into said openings, without ripping or otherwise mutilating or damaging the adjacent boards, the inner faces of the lowermost boards 2 may be beveled as at 2*a*, Figs. 1, 2, 3, at each longitudinal edge, and also the corresponding edges of the uppermost boards may be similarly beveled as at 2*b*, if desired, as indicated in Fig. 5.

In Figs. 4, 5, 6 and 7, a modification is disclosed in which the superimposed sections of the pallet each comprise cleats 1 connected together by cross-boards 2 in the manner described in connection with Figs. 1–3, the lower and/or upper boards being beveled as at 2*a*—2*b* as hereinbefore described. However, in this modification, instead of utilizing spacing strips 4 which are coextensive with the cleats 1, spacing blocks 6 are provided, same being made of wood, metal or any other desired material, said blocks 6 being disposed between the cleats 1 of the sections at each end thereof and at the centers thereof, said blocks 6 having bores through which pass the bolts 7 or other securing means which connect the superimposed sections of the cleats together. Bolts 7 have flattened heads and have shanks passing through the boards 2, the cleats 1, and spacing blocks 6, as shown in Figs. 4–7, said bolts terminating within recessess 2*x* in the opposite board 2, and carrying washers 7*a* and nuts 7*b* housed in said recesses 2*x*, so that there will be no projecting portions of the bolts 7 at the faces of the pallet which would injure the cargo carried or stored thereon. Where the blocks 6 are made of wood, the same may be reinforced against splitting or breaking by means of wire wrappings 8, Figs. 4 and 5, at their centers to reinforce same, or nails 9 (Fig. 7) of greater length than the width of the blocks 6 driven therethrough parallel with the boards 2 but offset from the bolts 7, said nails 9 having their outer ends extending through the blocks 6 and clinched as at 9*a* (Fig. 7).

The above construction shown in Figs. 4–7 inclusive provides a pallet consisting of superimposed sections arranged so that openings for the lifting fingers of the lift truck are provided on all four sides of the pallet, in order to facilitate entry of the lifting fingers into the openings at any side or end of the pallet and also to save weight and materials. The edges of the boards 2 of the upper pallet section may be beveled as

at 2b in a manner similar to the beveled portions 2a, Fig. 4, and for the same purpose, the openings at the side of the pallet, Fig. 5, being of less height than the openings at the ends of the pallet, Fig. 4, due to the combined thickness of the cleats 1.

In Fig. 8 a further modification is shown, comprising a sectionalized pallet, each section consisting of cleats 1 connected by cross-boards 2 secured thereto by clinched nails 3 as in the previous modifications; but in this modification the cleats 1 of the lower section are disposed at right angles to the cleats 1 of the upper sections, thus providing openings A at all four sides of the pallet adapted to receive the lifting fingers of the lift truck, the openings each being of height equal to the thickness of the cleat sections. In this modification the cleat sections 1 of the superimposed sections are connected together at their corners by means of bolts 7, as in Figs. 4–7, said bolts passing through the boards 2, cleats 1, and carrying nuts housed in recesses 2x in the opposite board 2 in the manner shown in Figs. 4, 5 and 7. This arrangement provides an inexpensive and efficient method for forming a pallet having openings at all four sides thereof.

In Fig. 9 a further modified form of pallet is shown, same being of the same general construction as in Fig. 8; but in this modification, in order to increase the height of the openings A at the four sides of the pallet, spacing blocks 10 are provided interposed between the cleats 1 at their ends and centers through which blocks 10 the bolts 7 likewise pass, in the manner disclosed in Figs. 4, 5 and 7. The height of the blocks 10 and the thickness of the cleat sections 1 determine the height of the openings A at all four sides of the pallet. If desired, these blocks 10 may be likewise reinforced by wire wrappings 8 (Figs. 4 and 5), or by clinched nails 9 (Fig. 7).

Where the cleats 1 in Fig. 9 are made of hardwood, the same may be of less thickness than normal, as indicated in Fig. 10, and the height of the blocks 10a (Fig. 10) increased over that shown in Fig. 9, thus providing the desired height of the openings A. The construction shown in Fig. 10 however is otherwise similar to that shown in Fig. 9. Obviously the inner faces of the boards 2 at the openings A in Figs. 8–10 may be beveled as at 2a or 2b in the same manner above described in connection with the preceding figures.

Figs. 11 and 12 show a modification of the pallet shown in Figs. 1 to 3, the pallet consisting of superimposed pallet sections, each section comprising spaced cleats 1a connected together by cross-boards 2 by means of clinched nails 3; but in this modification the end cleats 1a of the two sections, while extending in the same direction, are spaced apart a distance equal to the width of the stringers 11 which are disposed therebetween, more particularly as shown in Fig. 12, flat headed bolts 13 passing through the boards 2 and through bores in the stringers 11 and having nuts housed in recesses in the outer faces of the boards 2, as shown. Between the intermediate opposed cleat 1a, a filler strip 14 is placed, the filler strip being secured to one of the cleats 1a by means of nails 15. By reason of the use of clinched nails securing the cleats and boards together the number of necessary bolts 13 is maintained at a minimum, and hence the number of recesses for receiving the nuts of said bolts is maintained at a minimum so as not to unduly weaken the pallet.

In this modification only the four bolts 13 need be removed in order to make repairs. In fact the majority of repairs may be made without removing any of the bolts 13, and most repairs can be made by unskilled labor using ordinary tools. The depth of the openings at the ends of the pallet is controlled by the height of stringers 11. The pallets made according to Figs. 11 and 12 permit use of the common well known rope slings without injury thereto as well as use of bar slings and fittings with which larger docks are equipped.

The pallet, thus constructed, has great shock absorbing qualities and has much greater strength and longer life than ordinary bolted pallets. When the pallet is lifted by any kind of sling the cleats will distribute the strains over the ends of all the upper boards 2 of the pallet, instead of the strain being concentrated at the four outer corners of the outside boards 2, thus saving much breakage and many repairs.

In Fig. 13 a further modification of the type of pallet shown in Fig. 8 is illustrated, the cleats 1 of the upper and lower sections being disposed at right angles to each other, and the boards 2 of the sections being secured by clinched nails 3 to the cleats as in Fig. 8. In this modification (Fig. 13) however, the cleats 1 are thinned throughout the major portions of their lengths, as shown at 1b, thereby increasing the height of the openings A at the four side faces of the pallet which receive the lift fingers of the lifting truck without materially weakening the pallet, said construction obviating the necessity of utilizing spacing blocks or strips between the superimposed pallet sections.

In Fig. 14 a further modification is shown, in which the cleat sections 1 of the superimposed pallet sections extend in the same direction so as to contact in the finished pallet, the cleat sections being connected together by boards 2, as in Fig. 13, said boards 2 being secured to the cleat sections 1 by means of clinched nails 3, as in Fig. 13. In this modification the opposed cleats 1 are provided with cut-out portions 1c, as shown, to provide openings at the sides as well as the ends of the pallet adapted to receive the lift fingers of the lifting truck, thereby providing a four-way pallet.

In both Figs. 13 and 14 the superimposed pallet sections are secured together by bolts 7 passing through the ends and centers of the cleats, as in Fig. 9.

I do not limit my invention to the exact forms shown in the drawings, for obviously changes may be made therein within the scope of the claims.

I claim:

1. A pallet, comprising opposed superimposed sections; each section comprising spaced parallel cleats, cross-boards connecting said cleats, and nails of greater length than thickness of the boards and cleats passing therethrough, the ends of the nails being clinched over the cleats; the cleats of one section being disposed normal to the cleats of the other section to provide openings between the sections at each side face of the pallet; and means connecting the cleats together.

2. A pallet, comprising opposed superimposed sections; each section comprising spaced parallel cleats, cross-boards connecting said cleats, and nails of greater length than thickness of the boards and cleats passing therethrough, the ends of the nails being clinched over the cleats; the cleats of one section being disposed normal to the

cleats of the other section to provide openings between the sections at each side face of the pallet; spacing members interposed between the cleats of the sections; and means connecting the cleats and spacing members together.

3. A pallet, comprising opposed superimposed sections; each section comprising spaced parallel cleats, cross-boards connecting said cleats; the cleats of one section being disposed normal to the cleats of the other section to provide openings between the sections at each side face of the pallet; and means for connecting the cleats of the sections together.

4. A pallet, comprising opposed superimposed sections; each section comprising spaced parallel cleats, cross-boards connecting said cleats; spacing members interposed between the cleats of the sections; the cleats of one section being disposed normal to the cleats of the other section to provide openings between the sections at each side face of the pallet, and means connecting the cleats and spacing members together.

5. In a pallet as set forth in claim 4, said spacing members comprising blocks disposed adjacent the corners and centers of the sections through which the connecting means pass.

6. A pallet, comprising opposed superimposed sections; each section comprising spaced parallel cleats, cross-boards connecting said cleats, and nails of greater length than thickness of the boards and cleats passing therethrough, the ends of the nails being clinched over the cleats; spacing members interposed between the cleats of the sections; and means connecting the cleats and spacing members together, said cleats of one section being disposed normal to the cleats of the other section; and said spacing members comprising blocks disposed adjacent the corners and centers of the sections through which the connecting means pass, thereby providing openings between the sections at each side face of the pallet.

7. A pallet including a plurality of spaced parallel base members disposed in a plane, a plurality of spaced parallel load-supporting members disposed perpendicularly to the base members and in a plane which is spaced from and parallel with the plane in which the base members are located, a plurality of spaced parallel beam members engaging the inner faces of the base members and disposed in perpendicular relation to the base members, a plurality of spaced parallel beam members engaging the inner faces of the load-supporting members and disposed in perpendicular relation thereto, and spacer blocks interposed between and engaging the beam members to form a structure which has lift fork-receiving openings in all sides thereof.

JAMES HARMON CRUICKSHANK.

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

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