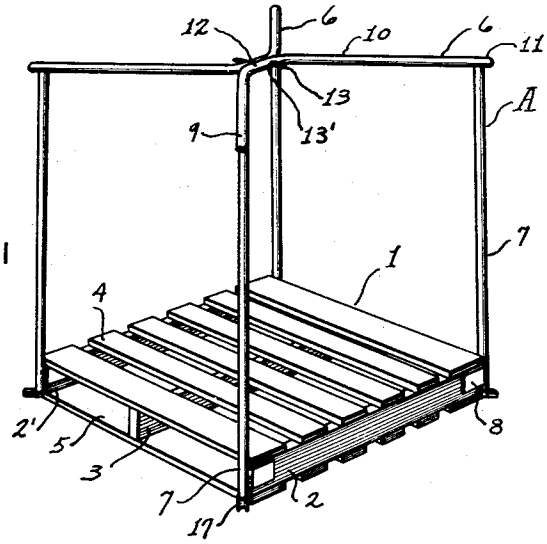
June 28, 1960 T. N. DE PEW ET AL 2,942,826

PALLET TIERING FRAMES

Filed March 10, 1958 2 Sheets-Sheet 1

FIG. 1



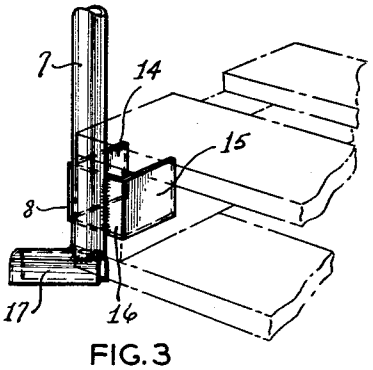


FIG. 3

FIG. 2

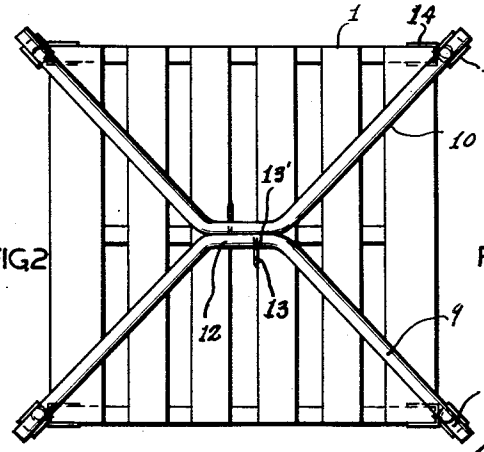
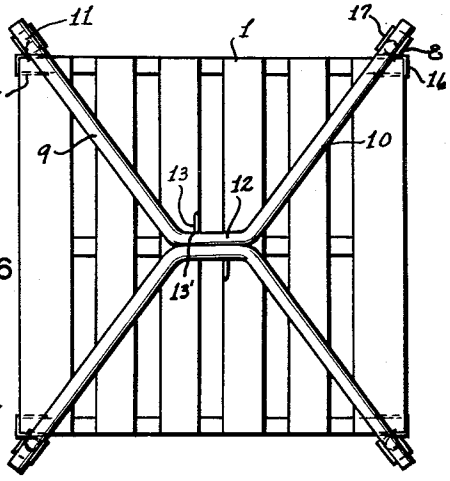


FIG. 6



4

4

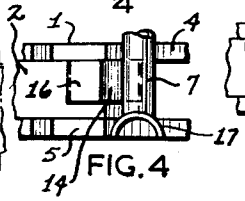


FIG. 4

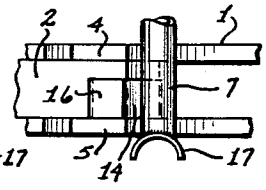


FIG. 5

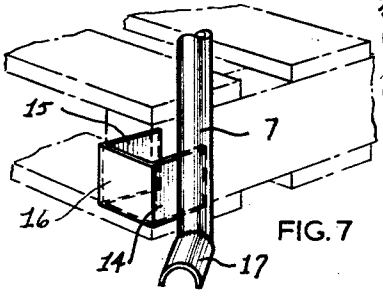


FIG. 7

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PALLET TIERING FRAMES

Filed March 10, 1958 2 Sheets-Sheet 2

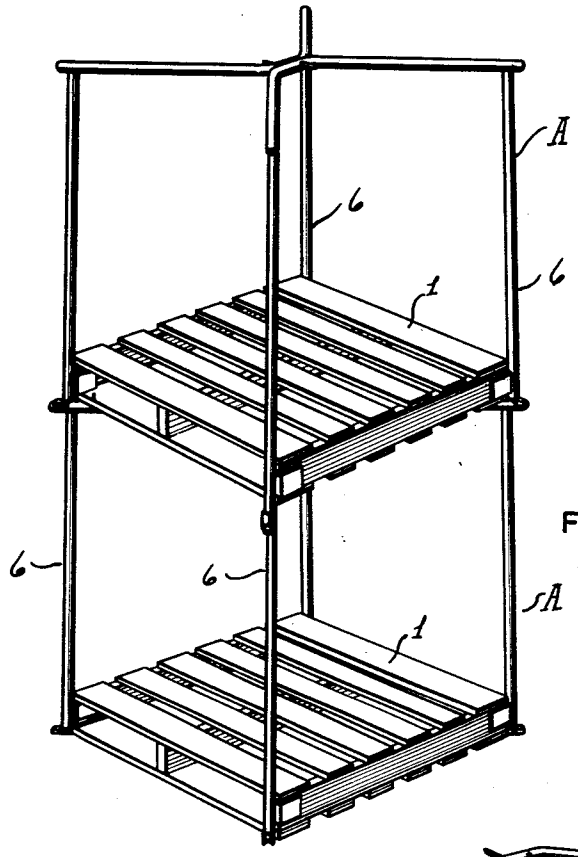


FIG. 8

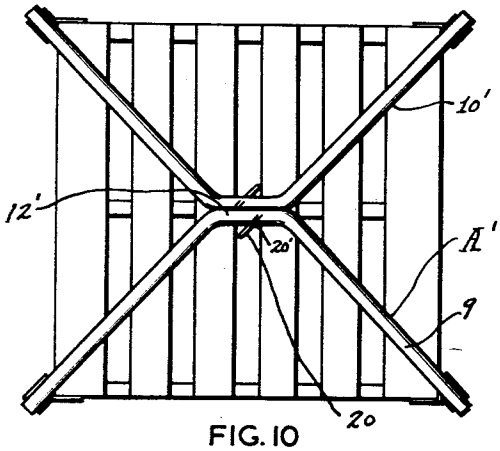


FIG. 10

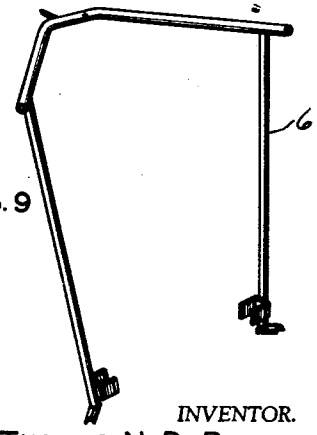


FIG. 9

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United States Patent Office 2,942,826 Patented June 28, 1960

2,942,826

PALLET TIERING FRAMES

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Filed Mar. 10, 1958, Ser. No. 720,461

5 Claims. (Cl. 248—120)

This invention relates in general to pallet tiering frames and, more particularly, to frames of such character with uprights located outside the load-bearing area of the pallets. This application is a continuation-in-part of our co-pending applications Serial Nos. 420,948, filed April 5, 1954, now Patent No. 2,828,932, dated April 1, 1958, and Serial No. 548,097, filed November 21, 1955, both being entitled "Pallet Tiering Frames," now Patent No. 2,828,933, dated April 1, 1958.

It is an object of this invention to provide a pallet tiering frame comprised of a pair of identical sections having means for readily detachable, snap-fitting engagement upon the stringers of a pallet, whereby the uprights will be disposed beyond the periphery of the pallet, so that said pallet tiering frame may be engaged upon a pallet after the same has been fully loaded.

Another object of this invention is to provide a pallet tiering frame of the type stated which may be readily adapted to present the uprights either adjacent the sides or the ends of the pallet in order to selectedly permit unobstructed load-handling along the sides or the ends of the pallet.

It is an additional object of the present invention to provide pallet tiering frames of the type stated having normally inwardly biased uprights whereby the same in operative position will be stressed for stabilizing engagement upon a pallet.

It is a further object of the present invention to provide pallet tiering frames which incorporate novel means for transmitting the load imposed upon one frame to the uprights of the underlying frame or frames in the particular tier.

It is a still further object of the present invention to provide pallet tiering frames which may be adapted for use with any size or type pallet; which may be fabricated most economically; and which are durable and reliable in usage.

Other objects and details of the invention will be apparent from the following description, when read in connection with the accompanying drawings wherein:

Figure 1 is a perspective view of a pallet tiering frame constructed in accordance with and embodying the present invention showing the frame in mounted disposition on a pallet.

Figure 2 is a top plan view.

Figure 3 is an enlarged, fragmentary perspective view of the foot portion of an upright of the frame illustrated in Figure 1.

Figure 4 is a horizontal view taken along the line 4—4 of Figure 2.

Figure 5 is a horizontal view taken substantially along the line 4—4 of Figure 4 showing the foot portion in lowered position.

Figure 6 is a plan view of a pallet tiering frame constructed in accordance with and embodying the present invention, illustrating the same in mounted position upon a pallet, wherein the uprights are disposed adjacent the pallet sides.

Figure 7 is an enlarged perspective view of the foot portion of an upright of the tiering frame illustrated in Figure 5.

Figure 8 is a perspective view of tiering frames of the present invention showing the same in pallet tiering relation.

Figure 9 is a perspective view of a pallet tiering frame unit in unmounted or detached condition.

Figure 10 is a plan view of a pallet tiering frame of the present invention having another form of interlocking means.

In the drawings, 1 designates a conventional storage pallet having parallel side or outer stringers 2, 2' and a central or inner stringer 3, and upper and lower decks or platforms comprised of spaced, parallel boards 4, 5 respectively, in axially normal relationship to stringers 2, 2', 3, and being suitably secured thereto, as by nails. It is to be pointed out that pallet 1 is not considered a part of the present invention, but is merely representative of storage pallets in general, and although being illustrated as of the double-deck, flush stringer type, may, if desired, be of single-deck design, as well as having either flush or inset stringers.

Provided for detachable installation upon pallet 1 is a tiering frame, indicated A, comprising a pair of identical component units 6. Each unit 6 includes a pair of posts or uprights 7 for disposition proximate adjacent corners of pallet 1; there being at the lower end portion of each post 7 a stringer-engaging foot member 8. Secured to the upper end of each post 7 is the outer end portion of a leg 9 of a generally U-shaped top member 10 being fabricated preferably of pipe stock and disposed in planar-parallel relation to pallet 1. At their outer ends, each leg projects a short distance beyond the point of securement to the associated upright 7 to provide a bearing extension 11, and at their inner ends, each leg 9 is continuous with an intermediate connecting section 12 having fixed therein a relatively long pin 13 projecting toward the opposite side of pallet 1 to that upon which the related unit 6 is mounted, that is, in substantially axially parallel relationship to deckboards 4, 5. Provided adjacent each pin 13 is an axially parallel aperture 14 of comparable diameter to pin 13 for snugly receiving the pin of the opposite unit. Since the component units 6 of frame A are identical, the pin 13 of one unit will be aligned with the aperture 13' of the other unit when said units are mounted on pallet 1, whereby the same may be interengaged in their top members 10 with abutment between the respective connecting sections 12 for mutual reinforcement to complete formation of frame A and firmly establish same for load support.

The foot member 8 at the lower end of each post 7 constitutes a generally U-shaped bracket, fabricated of suitable sheet stock, comprising parallel side plates 14, 15 and an interconnecting web 16 in planar perpendicular relation to side plates 14, 15. The foot members 8 of the posts of each unit open toward each other for embracing the opposite end portions of the intervening side stringer 2, 2', as the case may be. In engaged position on a stringer 2 or 2', the web 16 of a foot member 8 will abut on its inner face against the end face of the stringer, with side plates 14, 15 presented respectively adjacent the onter and inner side faces of the related stringer. The distance between side plates 14, 15 should desirably be such as to abut against the confronting portions of the stringer, but contact is not requisite to provide stability of the units 6 laterally of the associated stringer. The height of foot members 8 is less than the space between the upper face of the lower deckboards 5 and the under face of the upper deckboards 4 to permit vertical slidability with respect to the related stringer for purposes

presently appearing, as well as to conduce to facile engagement and disengagement of foot members 8.

With the construction shown in Figure 1, the lower end portions of post 7 are secured, as by welding, to the outer faces of webs 16 of the associated foot member 8, whereby the posts 7 of the two units 6 will be aligned with the adjacent ends of the side stringers 2, 2' and hence disposed beyond the end margins of pallet 1, whereby the sides of pallet 1 are unobstructed, being open their entire length for unimpeded movement thereacross of loads to and from pallet 1. Furthermore, with posts 7 being presented beyond, or outwardly of, the periphery of pallet 1, the full surface area thereof is available for load-receiving purposes, being undiminshed by any portion of pallet tiering frame A.

With respect to the form of the present invention illustrated in Figures 5 and 6, it will be seen that posts 7 may, if desired, be secured to the outer face of side plate 14 of the related foot member 8 whereby posts 7 will be presented beyond the outer side face of the associated stringers so as to present the end margins of pallet 1 in unrestricted fashion for end loading and load-removal.

Posts 7 of each unit are resilient about their point of securement to their respective top member 10 for relative movability in a substantially horizontal direction and are biased toward each other or inwardly of the end edges of the pallet, as may best be seen in Figure 8. Thus, to mount a tiering frame unit 6 upon a pallet it is necessary to apply outwardly directed pressure against the posts 7 to force same away from each other, beyond the pallet end edges in order to present their foot members 8 for engagement upon the ends of the side stringers 2, 2'; with foot members being snapped, or sprung, into engagement upon the stringers upon release of the outwardly directed pressure on posts 7. Said posts are hence stressed when in operative position whereby a snug, surface-abutting contact is established between the web 16 of foot members 8 and the end faces of the side stringers, rendering component units 6 sturdy and resistant to displacement.

Each post 7 at its lower extremity, spacedly below its respective foot member 8, carries a short, downwardly opening, concave bearing member 17, which is axially perpendicular to its related post 7 and axially parallel to, and substantially coextensive with, the bearing extension 11 adjacent the upper end of said post 7. Each bearing member 17 is formed on a slightly greater radius than that of the pipe stock from which bearing extensions 11 and, hence, top members 10 are fabricated.

Referring to Figure 8, it will be noted that when pallets 1 are tiered by use of the present invention, the bearing member 17 of an upper pallet tiering frame will seat upon the proximate bearing extension 11 of the pallet tiering frame immediately therebeneath, with the slightly increased radius of bearing member 17 assuring the formation of a firm joint. Thus, in effect, the bearing members 17 constitute a socket for reception of bearing extensions 11. The load supported by the posts 7 of an upper pallet tiering frame will be transmitted to the underlying frame or frames through the interengagement of bearing members 17 and bearing extensions 11. Therefore, the various tiering frames A used for a particular tier of pallets will be effectively interconnected to form a stable, unitary support system.

As illustrated in Figures 5 and 8, the bearing member 17 of a pallet tiering frame A in the upper part of a tier will be located beneath the bottom face of the associated pallet 1 for disposition upon the underlying bearing extension 11 as the load upon such upper frame A will have forced the related post 7 downwardly; such downward movement being brought about by the downward sliding of foot members 8 along the ends of side stringers 2, 2'. In connection with the pallet tiering frame on the lowermost pallet of the tier, which latter rests firmly upon the floor or other support surface, it is to be seen that the bottom edges of its bearing members 17 will rest upon such support surface; thus the bottom edges of the said bearing members 17 and the bottom face of the lowermost pallet will be coplanar, with the respective foot members 8 embracing the ends of the adjacent stringers at points relatively elevated above those at which the foot members 8 of the upper pallet tiering frames engage the respective stringers. It is manifest that the height of foot members 8 must be less than the distance between the upper and lower deckboards to permit the requisite vertical shiftability for proper positionment of the associated bearing member 17 for either engagement with the underlying bearing extensions 11, or edgewise abutment upon the floor, as the case may be. More specifically, the combined height of a foot member 8 and its related bearing member 17 must not exceed the distance between the upper and lower deckboards so that the foot members 8 may be shifted at least through a distance equal to the height of the bearing member 17, thereby assuring necessary range of adjustability.

From the foregoing, the installation of pallet tiering frames of the present invention upon pallets should be most evident but, for clarity, it will be observed that one component unit 6 will be snappingly engaged upon a pallet in the manner above described, thereon, the companion component 6 will be interengaged in its top member 10 by means of pins 13 and apertures 13' to the already pallet-engaged unit, and subsequent to such engagement the foot portions of the companion unit will then be sprung into operative position, on the opposite stringer. As brought out hereinabove, by the unique construction presented herein the full surface areas of pallets are available to receive the loads, and the coaction of bearing members 17 and bearing extensions 11 serve to tie the frames A in a tier into a sturdy, integrated structure, with stabilizing load-distribution, and resisting relative lateral movement of the post 7.

Referring to Figure 10, a modified type of top member 10' for the units of a pallet tiering frame A' of the character described above, is shown, having legs 9' and a connecting portion 12', which are similar in all respects to the top member 10 of frame A. Fixed in the connecting portion 12' of each top member 10' and extending therefrom for reception within a complementary aperture 20' in the other top member 10' is a pin 20, the axis of which is non-parallel to the axis of the deckboards of pallet 1. By this arrangement, the top members 10', when engaged, will be resistant to parting through any directly outward forces, such as might be developed through superimposed loads, since such forces would only cause the pins to become more tightly received within their respective apertures 20. Thus, to effect disengagement, a twisting and outward force would be required.

It should be understood that changes and modifications in the formation, construction, arrangement, and combination of the several parts of the pallet tiering frames may be made and substituted for these herein shown and described without departing from the nature and principle of our invention.

Having thus described our invention, what we claim and desire to secure by Letters Patent is:

1. A tiering frame adapted for use with storage pallets having a plurality of spaced apart upper and lower deckboards secured upon axially parallel stringers and comprising a pair of sections, each section comprising a pair of spaced posts and a top member interconnecting the tops of the posts, said posts being adapted to be located outwardly of the load-bearing surface of the pallet means separably securing the top members together, a generally U-shaped bracket mounted on the lower portion of each post for releasably embracingly engaging the proximate end face and inner and outer side end portions of the adjacent stringer between the upper and lower deck-

boards, each of said posts of each section being resilient for expansive outwardly directed movement with respect to the respective top member for presenting the associated bracket for retaining engagement with the stringer.

2. A tiering frame as described in claim 1 wherein each U-shaped bracket comprises a web portion for disposition, in operative position, on its inner face against the end face of the adjacent stringer and side plates for disposition on opposite sides of the adjacent stringer said web portion and said side plates being of less height than the engaged stringer whereby the same are vertically shiftable thereon between the deckboards, the U-shaped brackets of the posts of each section opening toward each other.

3. A tiering frame adapted for use with storage pallets having a plurality of spaced apart deckboards secured upon axially parallel stringers and comprising a pair of sections, each section comprising a pair of spaced posts and a top member interconnecting the tops of the posts, means separably securing the top members together, means mounted on the lower portion of each post for releasably engaging the proximate end portion of the adjacent stringer, said posts being located outwardly of the periphery of the pallet a bearing extension provided at the upper end of each post and projecting beyond the periphery of the pallet, and a bearing member provided at the lower end of each post for disposition beyond the periphery of the engaged pallet and being in axially parallel, aligned relationship with the bearing extension at the upper end of the related post for engagement upon the proximate bearing extension of an underlying frame whereby the adjacent posts will be in substantially axial alignment for effective load distribution.

4. A tiering frame adapted for use with storage pallets having a plurality of spaced apart deckboards secured upon axially parallel stringers and comprising a pair of sections, each section comprising a pair of spaced posts and a top member interconnecting the tops of the posts, means separably securing the top members together, means mounted on the lower portion of each post for releasably engaging the proximate end portion of the adjacent stringer, said posts being located outwardly of the pallet periphery a bearing extension provided at the upper end of each post and projecting beyond the periphery of the engaged pallet, each bearing extension being axially perpendicular to the related post and being of annular cross section, a bearing member fixed at the lower end of each post for extension outwardly of the periphery of the engaged pallet, each bearing extension being axially parallel and in aligned relationship with the bearing extension at the upper end of the related post, each bearing member having a downwardly opening concave face formed on a greater radius than that of the cross section of the bearing extensions for engagement upon the proximate bearing extension of an underlying frame whereby the adjacent post will be in substantial axial alignment for effective load distribution.

5. A tiering frame adapted for use with storage pallets having a plurality of spaced apart deckboards secured upon axially parallel stringers and comprising a pair of sections, each section comprising a pair of spaced posts and a top member interconnecting the tops of the posts, means separably securing the top members together, a generally U-shaped bracket mounted on the lower portion of each post for releasably engaging the proximate end portion of the adjacent stringer, each U-shaped bracket comprising a web portion for disposition against the end face of the adjacent stringer and a pair of side plates for disposition on opposite sides of the adjacent stringer, said web and said side plates being of less height than the engaged stringer whereby the same are vertically shiftable thereon between the deckboards each of said posts of each section being resilient for expansive outwardly directed movement with respect to the top member for disposition outwardly of, and beyond, the periphery of the engaged pallet for presenting the associated bracket for retaining engagement with the stringer, a bearing extension provided at the upper end of each post for extension beyond the periphery of the pallet, and a downwardly opening bearing member having a slightly greater cross section than the cross section of the bearing extension at the upper end of the post, said bearing member being provided at the lower end of each post, spacedly beneath the associated bracket for projection outwardly beyond the periphery of the engaged pallet, said bearing extension and bearing member on each post being axially parallel and vertically aligned for engagement upon the proximate bearing extension of an underlying frame whereby the adjacent post will be in substantially axial alignment for effective load distribution.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 2,942,826 June 28, 1960

Thomas N. De Pew et al.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 5, line 24, after "pallet" insert a comma; line 44, after "periphery" insert a comma; column 6, line 3, for "post" read -- posts --; line 35, after "engagement" insert -- of a bearing member --; line 36, for "post" read -- posts --.

Signed and sealed this 6th day of December 1960.

(SEAL)
Attest:

KARL H. AXLINE
Attesting Officer

ROBERT C. WATSON
Commissioner of Patents