

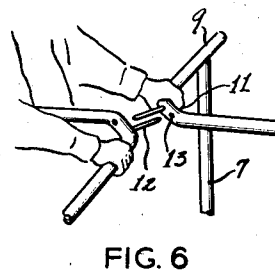
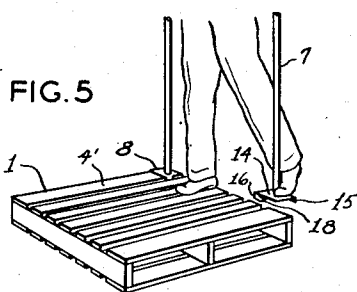
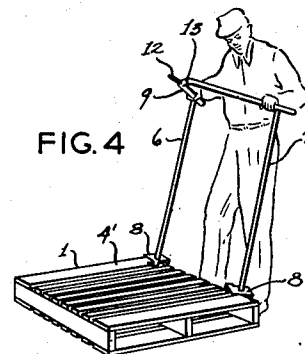
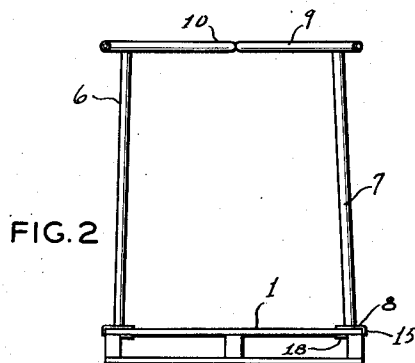
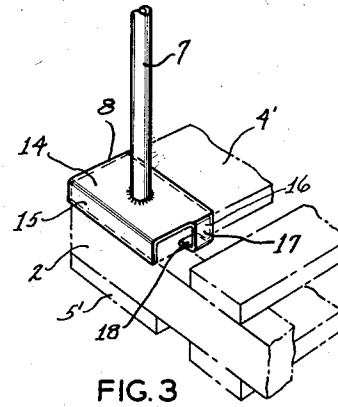
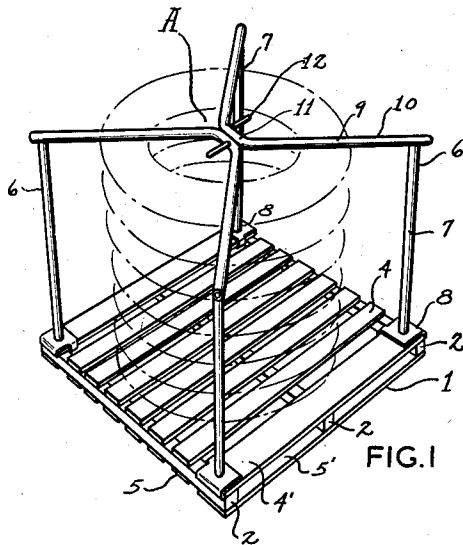
April 1, 1958

T. N. DE PEW ET AL
PALLET TIERING FRAMES

2,828,933

Filed Nov. 21, 1955

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

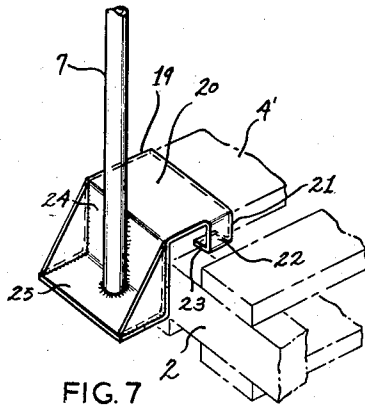


FIG. 7

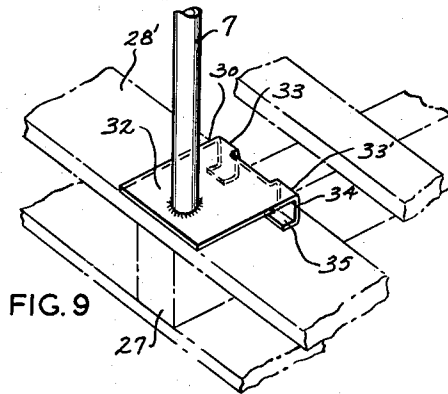


FIG. 9

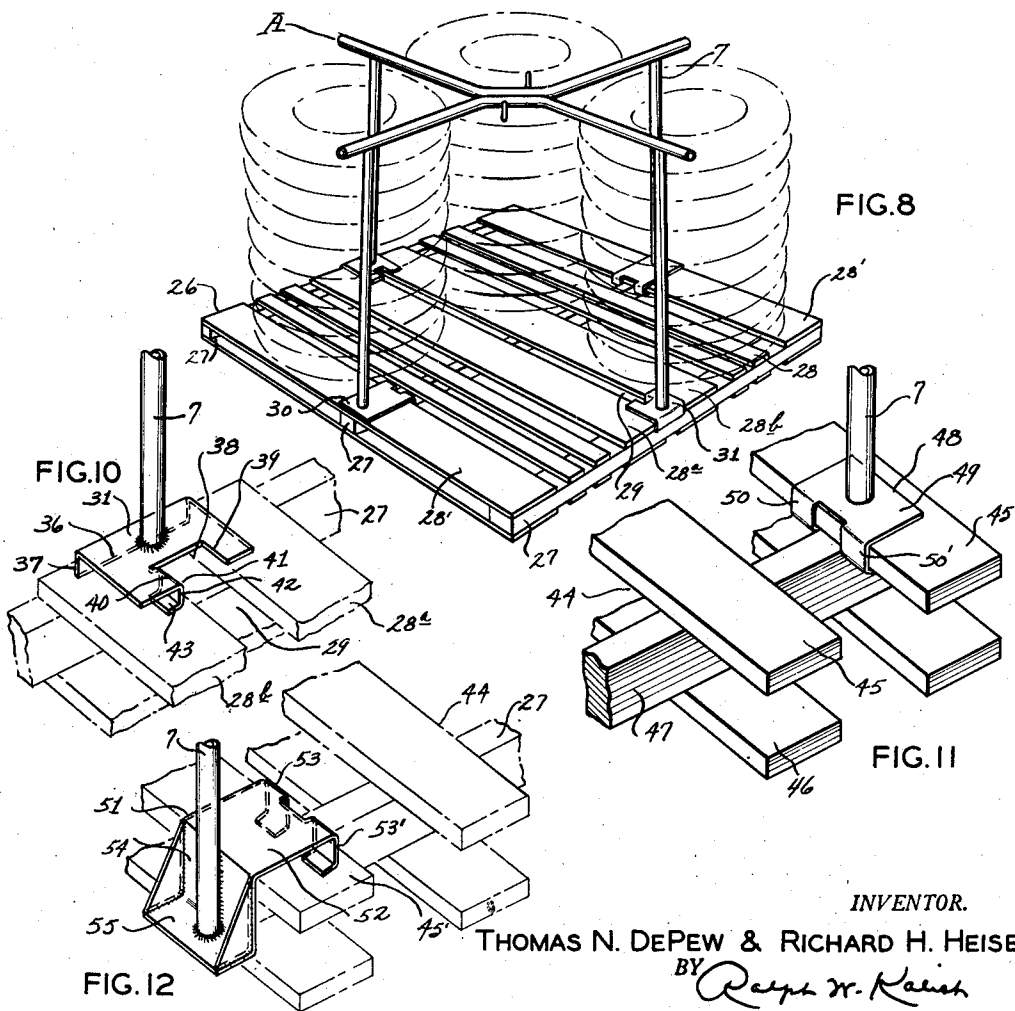


FIG. 8

FIG. 10

FIG. 11

FIG. 12

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2,828,933

PALLET TIERING FRAMES

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Application November 21, 1955, Serial No. 548,097

10 Claims. (Cl. 248—120)

This invention relates in general to pallet tiering frames and, more particularly, to frames of such character equipped with foot members for positive snap-on engagement with pallets. This application is a continuation-in-part of our co-pending application, Serial No. 420,948, filed April 5, 1954, for Pallet Tiering Frames.

It is an object of this invention to provide a pallet tiering frame having means for snap-fitting engagement upon the pallet whereby the frame is rendered stable in position, not requiring the use of tools for application and removal of the frame, nor in any way modifying the construction of the pallet.

Another object of this invention is to provide a pallet tiering frame having a foot member associated with each post which is adapted for fitted, gripping engagement with portions of the pallet, whereby accidental dislodgement of the frame is prevented.

It is a further object of this invention to provide a frame of the type stated which may be utilized with varying foot members so as to engage pallets at the corners or at points midway their sides.

Another object of this invention is to provide a frame of the stated character which permits ready-four-way accessibility to the pallet for disposition thereon, or transfer therefrom, of material or articles, without disturbance of any part of the stacked assembly.

A further object is to provide a pallet tiering frame having unique foot construction, which may be adapted for use with any size, or type pallet; which may be fabricated most economically; and which is durable and reliable in usage.

These and other detailed objects are obtained by the structure illustrated in the accompanying drawings (two sheets) in which—

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 side elevation of the tiering frame in mounted position.

Figure 3 is an enlarged perspective view of a foot portion of the frame as engaged on a pallet.

Figures 4, 5 and 6 are fragmentary perspective views showing steps in sequence for mounting the frame upon a pallet.

Figure 7 is an enlarged perspective view of another form of foot member for pallet tiering frames of the present invention.

Figure 8 is a perspective view of a pallet tiering frame having another form of foot construction made in accordance with and embodying the present invention; showing the frame as mounted on a pallet for quadrant stacking arrangement.

Figures 9 and 10 are enlarged fragmentary perspective views of the foot members on the opposite posts of the frame units shown in Figure 8.

Figure 11 is an enlarged perspective view of another

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form of foot member for pallet tiering frames of the present invention for use with inset stringer pallets.

Figure 12 is an enlarged perspective view of a still further form of foot member for pallet tiering frames of the present invention for use with inset stringer pallets.

In the drawings, 1 designates a conventional pallet having parallel stringers 2, and upper and lower decks or platforms comprised of spaced boards 4, 5, respectively in axially normally relationship to the stringers 2, and being suitably secured thereto, as by nails, with the outer or end boards 4', 5', of said decks being of increased width. The end surfaces of boards 4, 4', 5, 5', are flush with the outwardly presented side faces of the outer stringers 2. Provided for application upon pallet 1 is a tiering frame, generally indicated A, comprising a pair of identical component units 6. Each unit 6 includes a pair of posts 7 for disposition of adjacent corners of pallet. And at the lower end of each post 7 there is rigidly secured, as by welding, a foot member 8. At the upper end of each post 7 there is secured the outer end portion of a leg 9 of a generally V-shaped upper element 10, which may be of tubular stock, disposed in planar parallel relation to pallet 1. At their other or inner ends legs 9 of each element 10 are continuous with a short, intermediate portion 11, axially parallel to stringers 2, to give its respective element 10 a flattened or blunt-nosed character. Rigidly mounted in the intermediate portions 11 of elements 10 is a relatively long pin 12, projecting toward the opposite side of pallet 1 to that upon which its respective unit 6 is mounted, and provided adjacent each pin 12 is an axially parallel aperture 13 of comparable diameter to pin 12 for snugly receiving same of the opposite unit. Since the component units 6 of frame A are identical, the pin 12 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 inter-engaged in their upper elements 10 for mutual reinforcement to complete formation of frame A and firmly establish same for supporting loads.

Each foot member 8 comprises a main plate portion 14 having a length substantially equivalent to the width of deck boards 4' for flatwise disposition on the upper end surface thereof; and along its end which normally overlies the outer edge of the proximate end of deck board 4' is turned down to form a flange 15 for abutment against the outwardly presented end face of such deck board 4'. On its inwardly directed side, plate portion 14 is formed to present a locking toe 16 spaced inwardly from flange 15 a distance substantially equal to the thickness of the adjacent stringer 2 (see Figure 3) and comprising a downwardly extending section 17 lying in a plane perpendicular to that of flange 15 and at the lower end thereof is bent backwardly and under plate 14 to define a distal section 18. The constituents of toe 16 are sized for gripping deck board 4' and distal section 18 is presented at an angle to section 17 greater than 90° so that a range of thickness of deck boards may be accommodated. With foot members 8 in engaged position on pallet 1, frame units 6 will be secure against inadvertent displacement. The inner side of deck board 4' is received within locking toe 16 which thereby prevents unauthorized outward sidewise movement of foot members 8. With flange 15 abutting against the end surfaces of deck boards 4', accidental inward movement of units 6 is inhibited. Furthermore, locking toes 16 on the outwardly directed edge of distal sections 18 abut against the inner surfaces of the adjacent stringer (Figure 3) beneath deck boards 4' and thus preclude undesired outward-endwise movement of units 6. It should be noted that the locking toes 16 on one unit 6 will be in mutual confronting relationship (Figure 1).

With reference now being made to Figures 4, 5 and 6,

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the method of mounting tiering frames A upon pallet 1 will be described. One of the companion units 6 is presented to the pallet 1 and one foot member 8 thereof is engaged by slipping of its locking toe 16 into gripping relationship with a deck board 4'. Units 6 are fabricated so that the distance between the lower ends of their respective posts 7 will be slightly greater when the units are dismounted than when applied to pallets. Consequently, as shown in Figure 5, the assembler must force the lower end of the still disengaged post 7 inwardly so as to permit its locking toe 16 to be brought into alignment with the opening between the adjacent deck board 4' and the next immediate deck board 4 to allow it to be moved therethrough and be sprung into locking engagement upon deck board 4' when pressure is released by the assembler. Sufficient pressure may be exerted by the assembler's foot. Thus, as mounted, posts 7 will be slightly stressed and hence, through the resulting outward urging assure tight engagement of their foot members 8 upon the pallet. With the one unit 6 thus in position, the same will remain unsupportedly upright during the completion of the assembly. The assembler will next present the other unit 6 to the mounted one so as to engage pins 12 of each unit within the respectively aligned openings 13 (see Figure 6). After the two units 6 are mutually engaged, the other or second unit 6 will be secured upon pallet 1 by engagement of its foot members 8 in the same manner as hereinabove described with respect to the first one to be mounted so as to present frame A in fully installed condition (Figures 1 and 2). Pins 12 are of such length as to project substantially beyond the intermediate portion of the other unit 6 so that any untoward mutual rocking of units 6 after the same are mounted will not cause disengagement of pins 12, then reliably securing units 6 together.

To disassemble or demount tiering frame A from pallet 1, a procedure reverse to that for mounting is followed wherein the foot members 8 of one unit 6 are first disengaged from pallet 1 with the application of inward pressure against one post 7 to free the respective locking toe 16 from engagement. Next the pins 12 are removed from their associated openings 13 and subsequent thereto the remaining unit 6 is removed by the same technique.

As shown in Figure 2, each post 7 at its lower, welded end, is cut on a slight bias so that the same will cant slightly toward the opposed post 7 of the other unit 6. Such mutual inward sloping of posts 7 provides a further rigidifying factor by rendering frame A resistant to the normally outwardly directed forces of merchandise tightly packed upon the pallet. Furthermore, when a series of pallets are arranged in tiered relationship, the inward canting of posts 7 prevent the normal twisting effect developed upon posts 1 are perpendicular to the horizontal and thereby insure a rigid completely sturdy tiering. The joined, upper elements 10 cooperate to provide a strong top to frame A which is capable of resisting buckling under superimposed loads. Therefore, in stacking, the next pallet is placed upon the top of the frame A immediately thereunder and tiers comprising at least four pallet and frame units can be effected.

Posts 7 are presented for location at each corner of pallet 1 providing maximum access therebetween for the placing upon, and removal from, pallet 1 of material or articles in a manner which will not interfere or disturb material stored on other pallets in the tier. Articles damaged by compressive loads, such as automobile and truck tires, stored on pallets 1 are protected by frame A from the force developed by the weight of materials stored thereabove. In the case of truck tires of this character, it has been found that a pile eight high will not cause injury to the lower ones. Thus, frame A may be of such height as to receive therein this number of tires. Using the present invention, a stack assembly of four pallets having a total of thirty-two tires can be accommodated in the amount of floor space as was previously required for

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but eight tires. The resultant economy in warehouse space is most apparent.

Frame A is relatively light weight and is self-contained, there being no loose, associated parts, so that reliable application on pallet 1 is readily accomplished by a single workman without the use of tools. There is no positive engagement between frame A and the pallet immediately thereabove, since the latter is merely restingly disposed thereon. Consequently, the use of frame A does not necessitate modification of pallets in any manner, such as by securing thereto appliances for cooperation with parts of the frame as is common with stacking structures heretofore known. It is, of course, obvious that frames A can be dimensioned for use with any size or type pallet. Furthermore, in view of the identical construction of units 6, there is no problem as to replacement.

As described above, plate portions 14 of foot members 8 are fixed to the lower ends of posts 7, so that the latter will be located within the surface area of the pallets, whereby less than the full extent thereof will, perforce, be available for storage purposes. With a considerable number of articles to be stacked, this diminution of the storage area is not a matter of great moment. However, should it be desired that the entire pallet area be made accessible, another form of foot member 19 may be provided for use with tiering frame A in lieu of foot members 8. Each foot member 19 comprises a main plate portion 20 having on its inwardly directed side a locking toe 21, with a downwardly extending section 22 and a turned under distal section 23; said plate portion 20 and locking toe 21 being substantially identical in construction to the plate portion 14 and locking toe 16, respectively, of foot member 8, above described. Depending from the outer end of plate 20, being that end which overlies the end edge of the proximate deck board 4', is a flange 24 which extends the length of said plate 20 and downwardly beyond deck board 4'. Said flange 24 at its lower end is turned outwardly in the formation of a base shoulder 25. Posts 7 are welded at their lower ends to the upper face of shoulders 25 and along the confronting portion of their side faces to flanges 24, all as may best be seen in Figure 7. Thus, with this type foot construction, posts 7 are located outwardly of, or beyond, the pallet area so that the same is unrestricted thereby. Foot members 19 are mounted upon pallets 1 in the same manner as foot members 8 as hereinabove set forth.

Pallet tiering frames A may also be provided with a foot construction for posts 7 to mount same at points substantially intermediate the sides of each pallet as distinguished from the corners thereof, and as shown in Figure 8. With tiering frames A installed in this fashion on pallets, posts 7 will cooperate to delineate quarter storage sections of so-called quadrants of the pallet. This arrangement will also permit facile entry to the entire pallet load area from any corner of the pallet and thus obviate the necessity of moving a fork lift truck or other load-handling agent about the pallet so as to properly address the goods to be removed or the portion of the pallet to be loaded. However, this disposition of pallet tiering frame A is accomplished only with particularly constructed pallets 26, which comprise parallel stringers 27 and upper and lower decks, each of which are formed of a plurality of spaced deck boards 28 with those at the ends, designated 28', being relatively widened, and there being a pair of widened center boards 28^a, 28^b separated by a space 29 through which passes the transverse center line or pallet 26. At the lower end of the posts 7 of each tiering frame 6 will be fixed a different foot member 30, 31 for engagement upon pallet 26. Foot member 30, as shown in Figure 9, comprises a flat plate portion 32 for disposition upon the upper surface of the outer deck boards 28' at their mid point and on their inner edge integrally include a pair of spaced locking toes 33, 33' each having a depending section and a lower returningly

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bent distal section, respectively, 34, 35, for engaging the inner side of deck board 28'; said locking toes 33, 33' being structurally the same as locking toe 16, above described, in connection with foot member 8. Said locking toes 33, 33' are spaced apart a distance substantially equal to the thickness of the adjacent intermediate stringer 27 so that the same will straddle said stringer with portions of each abutting against opposite side faces of said stringer. Foot member 31 on the other post 7 of the same unit 6 is provided with a main flat portion 36 having a length preferably as great as the combined widths of central deck boards 28^a and 28^b and the intervening space 29, and will be disposed on the upper end portions of said boards. Along its outer edge, plate portion 36 is provided with a relatively short, depending flange 37 for an abutment against the outer end faces of the central deck boards 28^a, 28^b. Centrally of its inner edge, foot member 31 includes a recess 38 equal in width to the space 29 and defined by parallel side edges 39, 40. Formed on edge 40 of recess 38 is a locking toe 41 having a downwardly bent section 42 and inwardly turned distal section 43 for grippingly engaging the inner edge of center deck board 28^b; locking toe 41 being of similar construction to locking toe 16 above described.

In mounting tiering frames A equipped with foot members 30, 31 upon pallets 26, foot member 30 of the first unit 6 to be mounted is first engaged centrally upon one outer deck board 28' and then the opposite foot member 31 is engaged upon the center deck boards 28^a, 28^b by the application of inward pressure on the related post 7 to pass locking toe 41 through space 29 and permit same to be sprung into engaged relationship upon center deck board 28^b upon the release of such pressure. Pins 12 of the two units 6 are then engaged in their respective apertures 13 and the other unit 6 is then mounted in the same manner on pallet 26.

With pallets of the inset stringer variety, such as indicated at 44 in Figure 11, which comprise a plurality of spaced upper and lower deck boards 45, 46, respectively, secured to the customary parallel stringers 47 the outer ones of which are spaced inwardly or inset from outer ends of the deck boards, another foot member 48 may be utilized in place of foot members 8 to mount posts of unit 6 at the corner of such pallets. Each such foot member 48 includes a main plate portion 49 for disposition upon the upper face of outer, upper deck boards 45' and having on their inward edges a pair of locking toes 50, 50' spaced apart a distance equal to the thickness of the outer adjacent stringer 47 for engaging the inner edge portions of deck boards 45', straddling the outer stringers 47 and abutting same on their inner or confronting portions. With this construction it will be seen that posts 7 are welded to plate portion 49 and hence, when in mounted position, will be located within the area defined by the pallets.

Should it be desirable that posts 7 be presented outwardly of pallets 44 so as to render the entire area thereof available for storage, a further form of foot member 51 may be utilized, as shown in Figure 12. Foot members 51 each comprise a flat plate portion 52 for disposition upon the upper surface of the outer deck boards 45', having on their inwardly directed edges a pair of spaced locking toes 53, 53', similar in all respects to toes 50, 50' above described; and on its opposite outer edge having a flange 54 abutting against the end face of the adjacent stringer 47 and at its lower end being turned outwardly to form a base shoulder 55. Posts 7 are welded at their lower ends to the upper face of base shoulder 55 and along their lower side face to flange 54; said posts 7 being thereby thus located outside the area of the pallet, and permitting the full surface to be usable.

Thus, the foot members of the present invention are adapted for snap-on, positive engagement upon portions of the pallet so as to render tiering frame A reliable and

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steady in mounted position. Such foot members are uniquely designed to coact with the engaging portions of the pallets so as to prevent accidental dislodgement therefrom. Additionally, the foot members of this invention readily accommodate pallets of varying types and constructions, as clearly demonstrated, so that tiering frames A are adapted for universal utilization.

Of particular importance is the fact that the pallet tiering frames A can support stacked assemblies thereof above without necessitating a careful precise alignment of the load elements. The unique construction of said frames allows a constituent of the stacked assembly to be placed on the upper portion of the frame immediately therebelow in such manner as to be obviously supported, without regard to the disposition of constituents in the lower portion of the assembly.

Another noteworthy feature of the frame of this invention is the resistance thereof to twisting or distortion under load. The upper portion provides a cross bracing which rigidifies such frames and effectively counters any turning moments created by unaligned load elements.

It is apparent that frames A are disposed for use with standard pallets and hence have general application. Thus, special pallets are not required and the standard pallets used are not in any way altered whereby the same are available for normal usage without the frames, if desired.

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 comprising a pair of identical sections, each section comprising a pair of spaced posts and a top member, said posts being secured in their upper end portions to the top member, means separably securing the top members together, a foot member provided on the lower end of each post for mounting said sections upon a pallet, each foot member having a plate portion, and at least one locking toe depending from said plate portion releasably engaging a pallet and comprising a flange normal to said plate portion and a distal section at the lower end of the flange turned inwardly beneath said plate portion, each post of each section being resilient for compressive, inwardly directed movement with respect to the top member, the locking toe being located inwardly of the related post.

2. A tiering frame as described in claim 1 wherein the posts of each section extend downwardly and outwardly from their respective points of securement to the top member.

3. A tiering frame as described in claim 1 wherein a flange extends perpendicularly downwardly from an edge of the plate portion.

4. A tiering frame as described in claim 3 wherein the flange depends from an edge of the plate portion at right angles to the flange of the locking toe.

5. A tiering frame as described in claim 3 wherein an outwardly turned base shoulder is provided at the lower end of the flange, the related post being secured in its lower end portion to said base shoulder and the flange.

6. A tiering frame as described in claim 1 wherein a pair of spaced apart locking toes depend from said plate portion.

7. A tiering frame as described in claim 6 wherein a flange depends downwardly from an edge of the plate portion in opposed relationship to the pair of locking toes.

8. In combination with a storage pallet having a plurality of spaced apart parallel deckboards secured upon

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axially parallel stringers, of a tiering frame comprising a pair of identical sections, each section comprising a pair of spaced posts and a top member, means separably securing the top members together, a foot member provided on the lower end of each post mounting said sections upon the pallet, each foot member having a plate portion disposed flatwise upon the surface of a deck board of the pallet, at least one locking toe depending downwardly from said plate portion comprising a flange abutting against the inner side face of the associated deckboard nad a distal section at the lower end of the flange turned inwardly beneath the deckboard releasably engaging same, each post of each section being resilient and biased outwardly with respect to the top member, each locking toe being located inwardly of the associated post whereby the said locking toes will resist the outward urging of the posts under their bias.

9. In combination with a storage pallet having a plurality of spaced apart parallel deckboards secured to axially parallel stringers and having a pair of center deckboards separated by a space through which passes one center line of the pallet and having end deckboards, of a tiering frame comprising a pair of identical sections, each section comprising a pair of spaced vertical posts and a top member secured at its outer ends to the upper end portions of said posts above said pallet and in parallel relation thereto, means separately securing the top members of said sections together, a foot member provided on the lower end of each post mounting said sections upon the pallet, one of said foot members having a plate portion disposed upon surface portions at one end of said center deckboards for bridging the intervening space, a flange depending from the outer end edge of said plate portion abutting the outer end surfaces of said center deckboards, said plate portion being provided on its inner edge portion with a recess aligned with the space between the center deckboards, a locking toe depending from one edge of said recess extending into said space and releasably engaging one of said center deckboards, said locking toe comprising a flange portion abutting against the inner, space-confronting edge of one of said center deckboards and a distal portion at the lower end of said flange portion turned inwardly beneath said center deckboard, the other of said foot members comprising a plate portion disposed flatwise on the upper surface of

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one of said end deckboards, a pair of spaced apart locking toes depending from an edge of the plate portion of said other foot member, each locking toe comprising a flange portion abutting the inner side edge of said end deckboard and a distal section at the lower end of each flange turned inwardly beneath said end deckboard, the posts of each section being resilient and biased outwardly with respect to the top member, the edge of said plate portions from which the respective locking toes depend being located inwardly of the related post whereby the said locking toes will resist the outward bias of the posts.

10. A tiering frame adapted for use with storage pallets comprising a pair of identical sections, each section comprising a pair of spaced vertical posts and a top member, said posts being secured at their upper ends to the top member, means separably securing the top members, together a foot member provided on the lower end of each post for mounting said sections upon a pallet, one of said foot members having a plate portion, a flange depending from one edge of said plate portion, said plate portion being provided on its edge opposite the edge from the flange with a recess extending toward said flange, a locking toe depending from one edge of said recess and comprising a flange portion normal to said plate portion and a distal section at the lower end of said flange portion turned inwardly beneath said plate portion, the other of said foot members comprising a plate portion, and a pair of spaced apart locking toes depending from an edge of said plate portion of said other foot member, each locking toe comprising a flange portion perpendicularly to the plate portion and a distal section at the lower end of each flange portion turned inwardly beneath the said plate portion, each post of each section being resilient for compressive inwardly directed movement toward each other, the edge of said plate portions of said foot members from which the associated locking toes depend being located inwardly of the related post.

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