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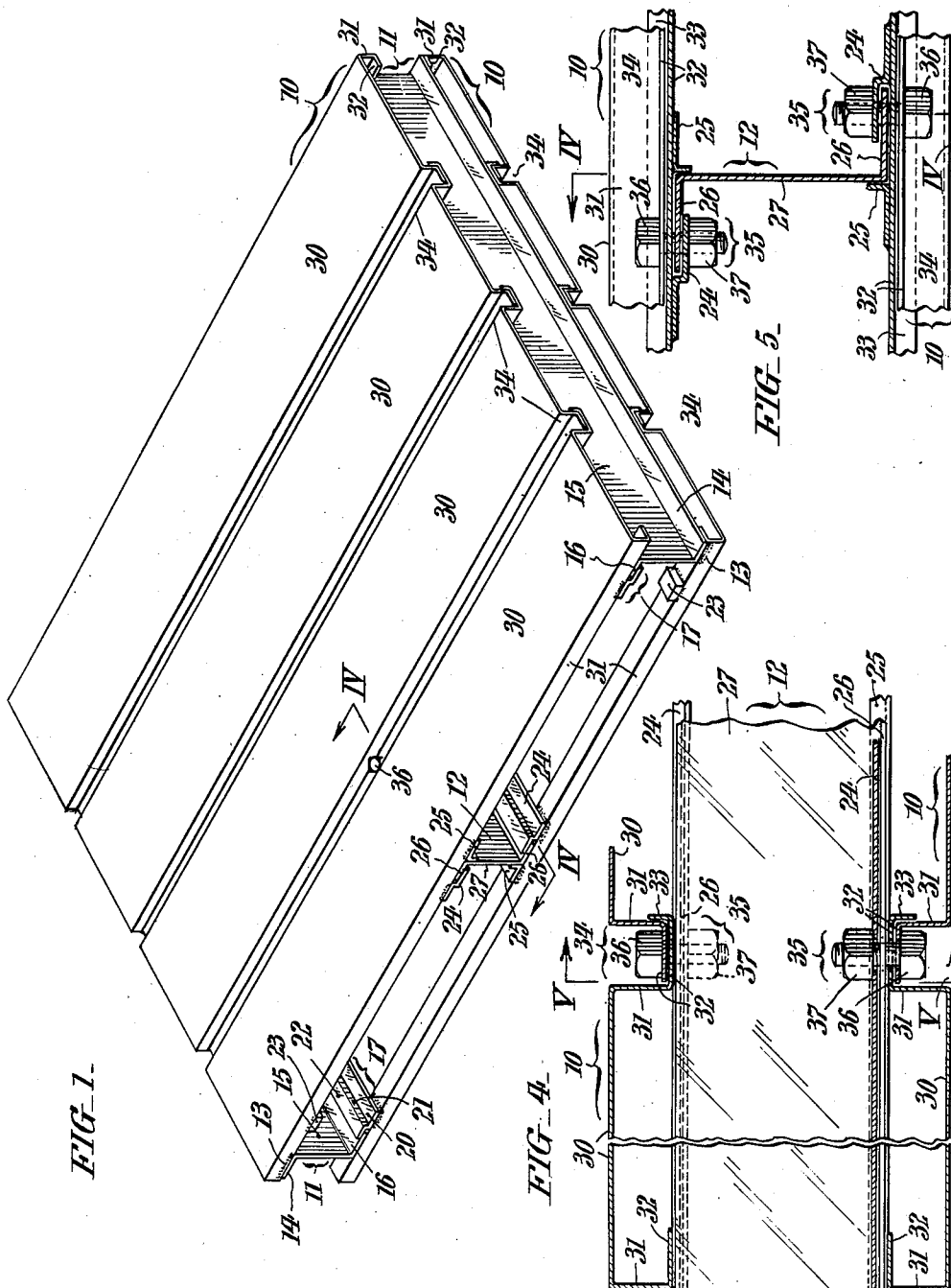
L. F. ASHFORD

2,640,669

PALLET

Filed March 2, 1950

3 Sheets-Sheet 1



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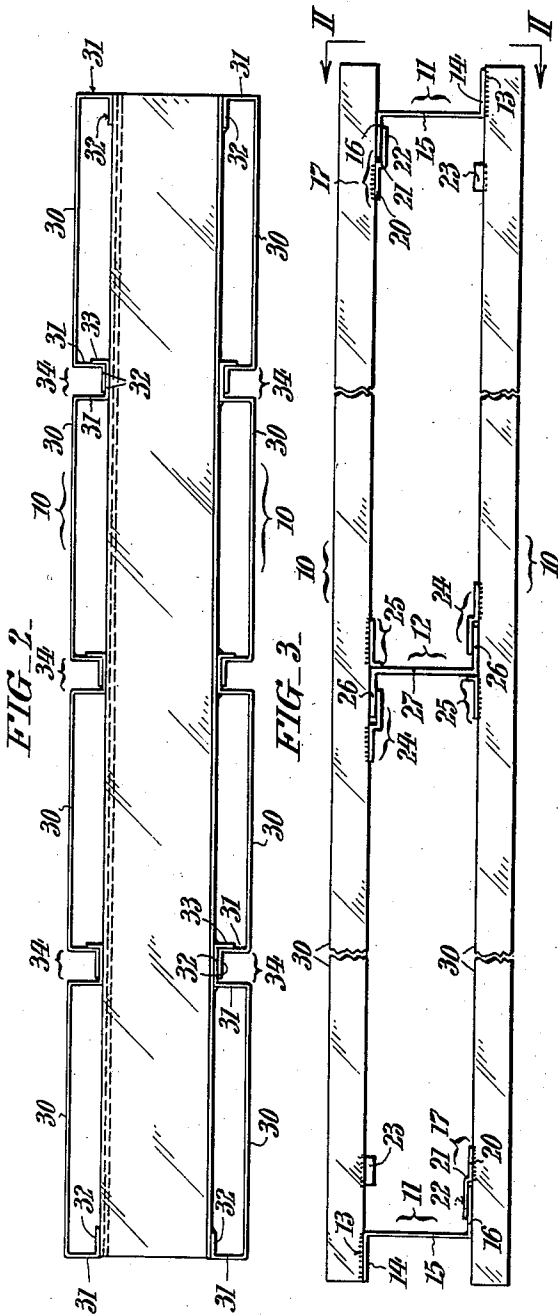
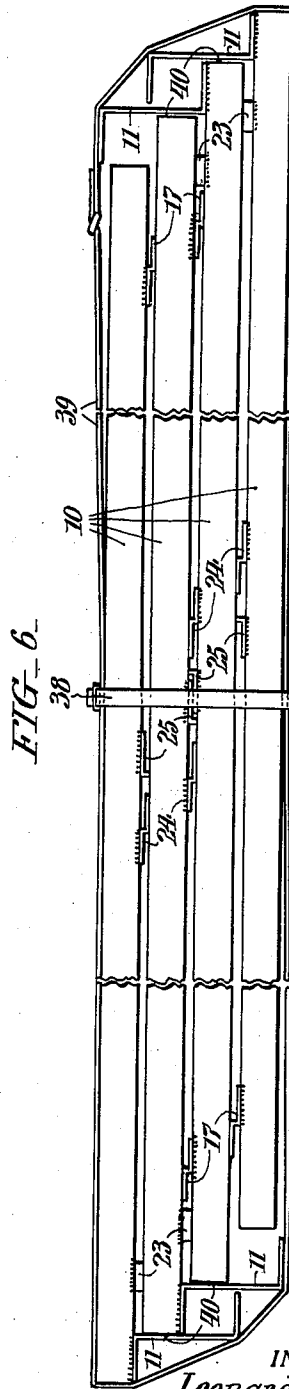
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3 Sheets-Sheet 2



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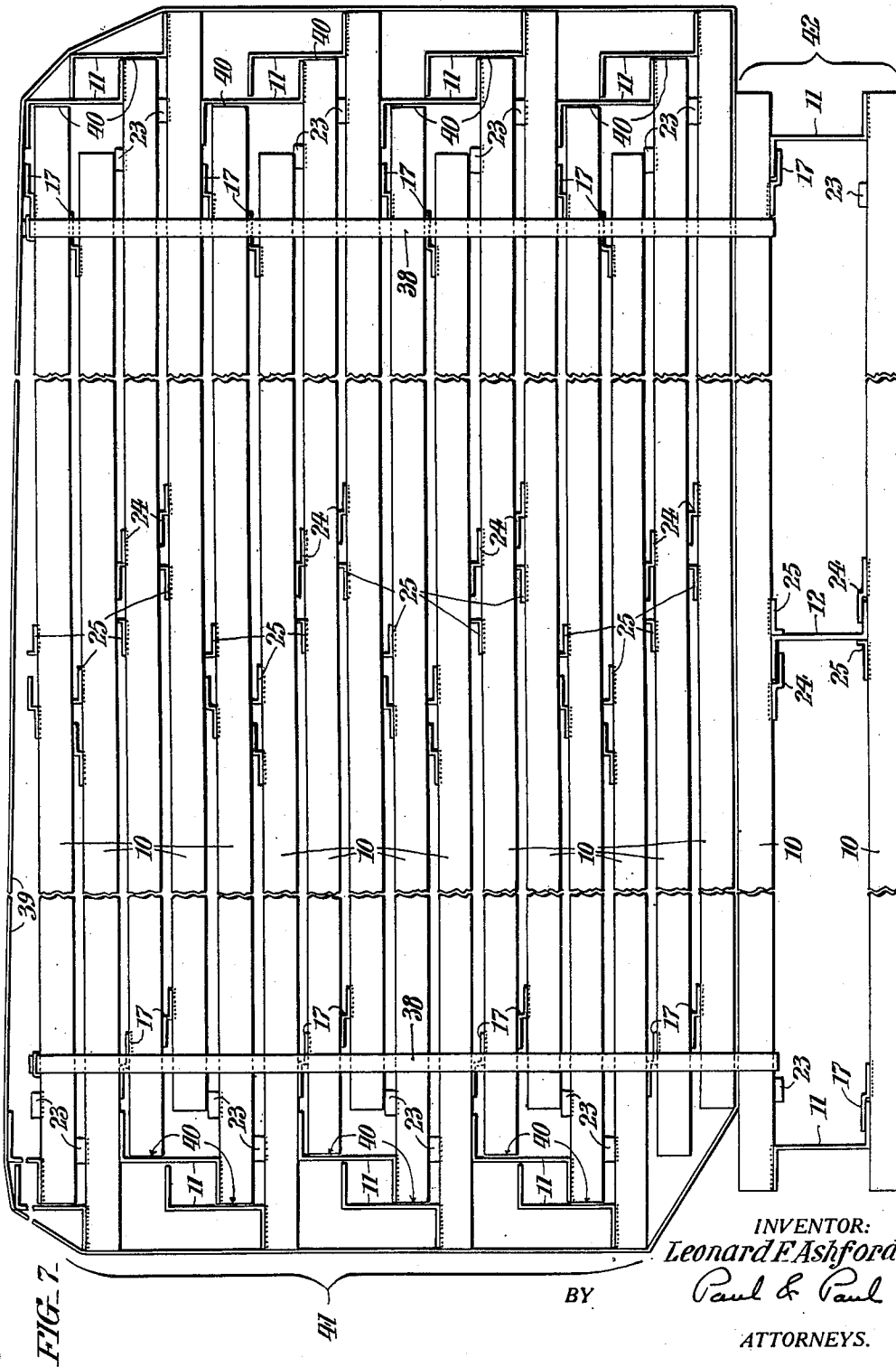
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3 Sheets-Sheet 3



UNITED STATES PATENT OFFICE

2,640,669

PALLET

Leonard F. Ashford, Philadelphia, Pa.

Application March 2, 1950, Serial No. 147,321

8 Claims. (Cl. 248-120)

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This invention relates to a pallet of the type useful as a load supporting platform, capable of being carried by a lifting device such as a fork lift truck, and more particularly concerns a pallet of a character suitable for knocking down into separate sections for storage in nested arrangement for economy of space in shipping.

It has previously been proposed to construct pallets having foldable or collapsible load supporting elements useful for storing the pallets in confined spaces such as railroad cars for shipping. Prior patentees have also suggested the provision of pallets consisting of a pair of substantially identical top and bottom sections which are capable of being taken apart and assembled in nested arrangement for shipping. In providing pallets of such character, a basic difficulty has been encountered in incorporating the requisite strength into a pallet light enough in weight for convenient handling. The load supporting sections of the devices of the prior art have been complex and expensive to manufacture, and even the complex pallets are relatively weak with the result that early deformation or breakage occurs in service. Considerable labor has also been involved in taking apart such pallets for nesting and in putting the nested sections together for use as pallets. The knock-down pallets of the prior art are also troublesome in that nested pallets are rather easily displaced when struck from the side, and tend to shift or come apart during shipment.

It is accordingly an object of this invention to provide a durable light-weight pallet of a character capable of being knocked down and stored in nested arrangement for shipment. Another object is to provide a strong pallet capable of being knocked down and reassembled in a minimum time with minimum labor. Still another object of the invention is to provide a knock-down pallet having substantially identical sections capable of being stored in nested arrangement and substantially unaffected by external sidewise forces. Other objects and advantages of the invention, including those derived from simplicity and economy of manufacture will be apparent hereinafter.

In summary, the invention comprises a pallet of a character suitable for knocking down into separate sections for storage in nested arrangement, having a pair of decks and side supports therefor, anchoring means attached to both said decks, and a removable connecting member adapted to engage the anchoring means to hold the decks together.

Of the appended drawings:

Fig. 1 represents a view in perspective of a pallet representing one embodiment of the invention;

Fig. 2 represents a side view of the same, taken as indicated by the lines and arrows II—II which appear in Fig. 3;

Fig. 3 represents a front view of the same;

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Fig. 4 represents a sectional view taken as indicated by the lines and arrows IV—IV which appear in Fig. 1;

Fig. 5 represents a sectional view taken as indicated by the lines and arrows V—V which appear in Fig. 4;

Fig. 6 represents a side elevation showing four pallet sections stored in nested arrangement; and

Fig. 7 represents a side elevation of a plurality of such pallet sections nested in another arrangement and mounted on an assembled pallet.

Having reference particularly to Figs. 1-5 of the drawings, the pallet structure representing one embodiment of the invention includes a pair of decks 10 spaced apart from one another by support beams 11 and a connecting beam 12, both desirably in the form of Z beams. Support beams 11 are each attached to a single deck 10, as by welds 13, and have horizontal attached flanges 14, integral vertical webs 15, and integral horizontal inwardly extending free flanges 16. The support beams 11 are preferably substantially identical while connecting beam 12 is desirably a strong beam of heavier construction than support beams 11.

Attached to each deck 10 and positioned for reception of and engagement with flanges 16 are support engaging means in the form of outer step strips 17 each having a base strip 20, a riser element 21, and a horizontal retainer strip 22, forming together with the adjacent face of deck 10 a channel defining a recess having a substantially rectangular cross section and open at one end for reception of free flange 16. Each support engaging means is accordingly adapted to engage the support beam of the deck opposite the deck to which the support engaging means is attached.

Also attached to each deck 10 and spaced along the inner surface of deck 10 from the juncture between the support beam 11 and deck 10 are support pieces in the form of blocks 23, having purposes further to be explained.

Each deck 10 is further provided with attached anchoring means for reception and engagement of connecting beam 12. The anchoring means consists of an intermediate step strip 24 preferably similar to outer step strip 17 and an abutment stop 25 spaced apart from the intermediate step strip 24, both members 24 and 25 being attached to decks 10 as by welding. Each intermediate step strip 24 in combination with the attached deck 10 presents a channel defining a recess having a substantially rectangular cross section for accommodation of connecting beam flange 26 while abutment stop 25 engages the connecting beam web 27 adjacent connecting beam flange 26 thereby preventing longitudinally disposed connecting beam 12 from moving in a lateral direction relative to deck 10. The connecting beam flanges 26 engage the anchoring means attached to both decks 10. The connecting beam 12 is effective when positioned in the

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aforesaid anchoring means to hold the respective decks 10 together and to prevent substantial lateral movement of one deck relative to the other. Connecting beam 12 is capable of being slid longitudinally and thereby withdrawn from the anchoring means for separation of the respective identical deck sections each of which includes a deck 10 together with attachments as previously described.

The support engaging means exemplified by outer step strips 17 and the support beam 11 are preferably spaced substantially equally from the connecting-piece receiving member including intermediate step strip 24 and abutment stop 25.

Decks 10 consist of individual laterally extending plate sections 30 having side flanges 31 and extension flanges 32 parallel to the plate sections 30. At the side edges of the pallet the extension flanges 32 are turned back and disposed under the plate section 30 while the other extension flanges 32 extend beyond plate section 30 and lap the corresponding extension flanges 32 of the adjacent plate sections 30. Integral with and extending normally of alternate extension flanges 32 are intumed flanges 33 which engage the corresponding side flanges 31 attached to the adjacent plate section 30. By reason of this structure the deck 10 has laterally extending deck reinforcing channels 34. These, particularly in combination with longitudinally extending support beams 11 and connecting beam 12 impart structural strength and rigidity to the assembled pallet and permit the construction of a light weight durable pallet.

To restrain the connecting beam 12 from sliding longitudinally of the assembled pallet, extension flanges 32 and corresponding connecting beam flanges 26 have aligned apertures for accommodation of bolts 35, see Figs. 4 and 5. Heads 36 of bolts 35 fit in between the side flanges 31 with their tops below the surfaces of plate sections 30. Bolts 35 are secured in place by means of nuts 37. Generally the existing friction between connecting beam flanges 26 and the associated engaging means 24 and 25 is sufficient to hold the connecting beam 12 in place and in such instances bolts 35 need not be provided.

Having reference particularly to Fig. 6, the pallet sections previously described are conveniently nested in groups each consisting of four pallet sections. In each group the two lowermost pallet sections are nested back to front and have their attached support beams 11 extending upwardly at one end of the nest. The two uppermost pallet sections are also nested back to front and have their support beams 11 extending downwardly at the opposite end of the nest. The two intermediate pallet sections are nested front to front. Blocks 23, step strips 17 and 24, and abutment stop 25 preferably extend an equal distance above the surfaces of decks 10 and provide firm support for the adjacent pallet sections. Blocks 23 serve as supports for the upperlying pallet sections thereby minimizing the chances of damage to the step strips 17 and 24 and to abutment stops 25. To this end the distance from the far edge of block 23 to the vertical web 15 of adjacent support beam 11 is preferably less than the distance from the upper free edge of horizontal projection strip 22 to the adjacent end edge of the attached deck 10.

The four nested pallet sections of Fig. 6 are held together by strap 38 which is disposed centrally under tension and in line with the overlapping abutment stop strips 25. The abutment

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stop strips 25 have thicknesses of substantially half the distance between decks 10 and provide a rigid center reinforcing strip cooperating with the tensioned strap 38 to hold the pallets securely and to minimize shifting of the pallets in transit. Strap 39 is disposed around the pallet sections under tension at right angles to strap 38.

The side support beams 11 serve as shields which prevent the exertion of external sidewise forces on the free ends 40 of decks 10. Such forces which would otherwise urge the pallet sections apart and place undue strain on strap 39, are transmitted through the central adjacent abutment stops 25 for equalization among all the pallet sections of the group. To this end the abutment stops are adapted to fit closely when the pallet sections are nested front to front, and the height of each vertical web 15 is preferably more than twice the thickness of deck 10 including the additional thickness attributable to block 23 and outer step strip 17.

Referring now to Fig. 7 of the drawings, it will be apparent that it is unnecessary to invert alternate pairs of pallets in forming a nest of pallet sections. In this modified nesting arrangement each support beam 11 extends upwardly of the deck 10 to which it is attached and the pallet sections are nested front to back to any desired height sufficient for close accommodation in the available shipping space. In Fig. 7 the nest 41, bound by tensioned straps 38 and 39, is supported on an assembled pallet 42 with the straps 38 disposed beneath the upper deck 10 of pallet 42 and securing nest 41 to pallet 42. In such arrangement the entire assembly is conveniently placed in a box car by means of a fork lift truck and is removed with like conveyance upon arrival at its destination.

The deck connecting beams 12 of the pallets are conveniently fitted together, with flanges overlapping, for nesting in a separate group. The nested connecting beams 12 may be bound together by means of straps and transported in a box car together with the nested pallet sections.

Desirably the decks 10, side support beams 11, connecting beam 12, side step strip 17, intermediate step strip 24 and abutment stop 25 consist of metal sheets and plates, preferably sheets and plates of a light strong metal such as aluminum.

While I have shown and described in detail one embodiment of my invention, it will be apparent to those skilled in the art that various changes may be made in the form of the device, that equivalent elements may be substituted for those specifically illustrated in the accompanying drawings, and that certain features of the invention may be used to advantage independently of the use of other features, all within the spirit and scope of the invention as defined in the annexed claims.

I claim:

1. A pallet comprising longitudinally extending rigid support members, top and bottom decks separably spaced apart by said rigid support members to provide space intermediate the decks for inserting a lifting element such as the fork of a lift truck, opposed anchoring means affixed to each of said decks intermediate said side supports, and a deck connecting beam free of fixed attachment to either deck and extending between said decks and constructed for sliding engagement with and sliding disengagement from said anchoring means without changing the relative positions of said decks, and effective when en-

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gaged with said anchoring means to hold the decks together.

2. A pallet comprising a pair of longitudinally extending side supports, top and bottom decks each attached to only one of said side supports and free of permanent attachment to the other side support, each deck being attached to a different side support and spaced apart thereby to provide space intermediate the decks for inserting a lifting element such as the fork of a lift truck, opposed anchoring means forming recesses on said decks intermediate said side supports, and a deck connecting piece extending between said decks and having flanges for sliding reception in said recesses and effective when engaged in said recesses to hold the decks together, said deck connecting piece being removable from said recesses by straight line sliding motion, effecting disengagement of said decks from one another.

3. In a pallet having a pair of longitudinally extending side supports and top and bottom decks each attached to only one of said side supports and free of the side support attached to the other deck, said decks being spaced apart by said side supports to provide free space between said decks, opposed anchoring means including fixed flange means forming recesses and abutment stops spaced from the recesses on said decks intermediate said side supports, a deck connecting piece in the form of Z beam extending between said decks, said Z beam having flanges constructed to fit slidably into and out of said recesses and a web adjacent both said abutment stops when the flanges of the Z beam are positioned in said recesses, said Z beam when engaged with the deck in said recesses being effective to hold the decks together and to prevent substantial lateral movement of one deck relative to the other.

4. A pallet member of a character capable of being stored in nested arrangement with a plurality of identical pallet members and of being removably connected to an identical pallet member to form a rigid pallet, comprising a deck; a longitudinally extending side support in the form of a Z beam having a lower flange fixed to said deck, a web extending upwardly from said deck and a free upper flange extending laterally of said web; support engaging means adapted to engage the side support of an identical pallet member, said support engaging means comprising a strip fixed to the deck along a line spaced apart from said lower flange and having an attached strip flange raised above the deck and extending laterally in the same direction as the upper flange of said Z beam; and a connecting-piece anchoring member attached to said deck along a line intermediate said side support and said support engaging means.

5. A pallet section of the character capable of storing in nested relation with substantially identical pallet sections and of connecting to a substantially identical pallet section to form a rigid pallet, comprising a deck, a side beam attached at one side to one face of said deck, beam engaging means in the form of a recessed strip attached to the other side of said face of said deck along a line substantially parallel to said side beam, a support piece in the form of a block attached to said face of the deck adjacent said side beam, and a connecting-piece receiving member in the form of a recessed strip and adjacent stop piece spaced apart from said strip to receive and retain a deck connecting piece, said connecting piece receiving member being at-

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tached to said face of the deck intermediate the beam engaging means and the block, and said block serving to support a substantially identical pallet section when the pallet sections are nested in back to front relation.

6. A pallet section of the character capable of storing in nested relation with substantially identical pallet sections and of connecting to a substantially identical pallet section to form a rigid pallet, comprising a deck, a side beam attached at one side to one face of said deck, beam engaging means in the form of a recessed strip attached to the other side of said face of said deck along a line substantially parallel to said side beam, and a connecting-piece receiving member in the form of another recessed strip and adjacent stop piece spaced apart from said strip to receive and retain a deck connecting piece, said connecting piece receiving member being intermediate the side beam and beam engaging means and attached to said face of said deck, and said recessed strips and stop piece extending substantially equal distances above said deck thereby providing firm support for a substantially identical pallet section when stored in nested relation.

7. A three part pallet of a character suitable for knocking down into separate sections for storage in a nested arrangement, comprising a pair of substantially identical top and bottom pallet sections each having a deck, a longitudinally extending side support piece attached to one side of one face of said deck, support engaging means attached to the opposite side of said face of said deck, said support engaging means including a flange offset from said deck to provide a recess for receiving a matching support piece, anchoring means attached to said face of said deck providing a longitudinal recess intermediate said side support and said support engaging means, and a removable connecting piece in the form of a flanged structural member constructed to interfit removably with said anchoring means to attach the decks together, said flanged structural member being removable from said decks without changing the relative positions of said decks.

8. A pallet section of the character capable of storing in nested relation with substantially identical pallet sections and of connecting to a substantially identical pallet section to form a rigid pallet, comprising a deck, a side beam attached at one side to one face of said deck, beam engaging means in the form of a strip attached to the other side of said face of said deck and offset from said deck to form a recess disposed along a line substantially parallel to said side beam, a connecting piece receiving member in the form of another strip offset from said face of said deck to form a recess, and an adjacent stop piece spaced apart from said other offset strip to receive and retain a deck connecting piece, said connecting piece receiving member being intermediate the side beam and beam engaging means and attached to said deck.

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