

[54] **ADJUSTABLE PALLET**

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[51] Int. Cl. **B65d 19/18**

[58] Field of Search **108/51-58**

[56] **References Cited**

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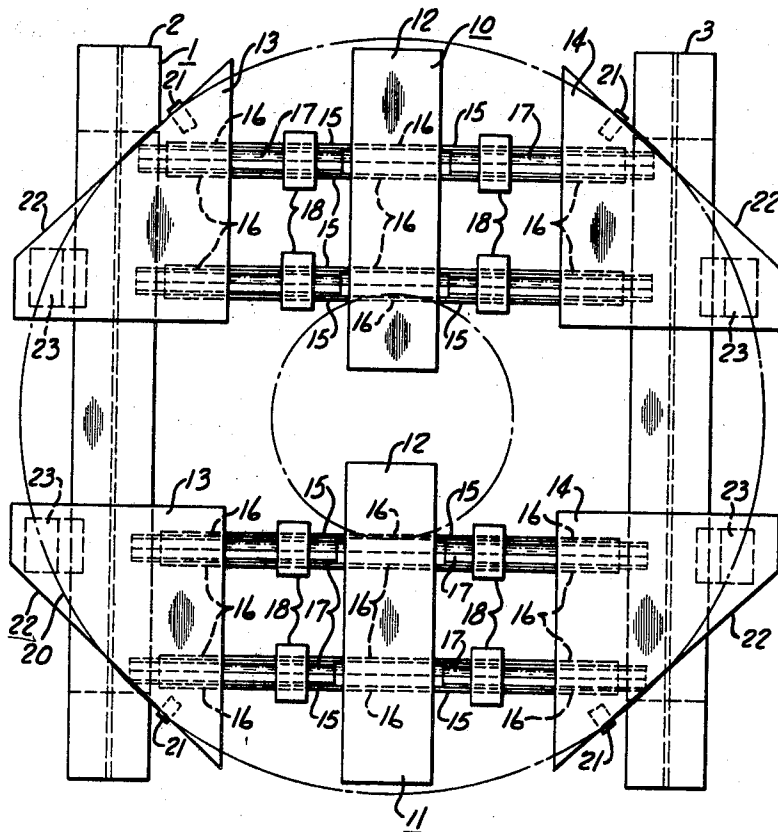
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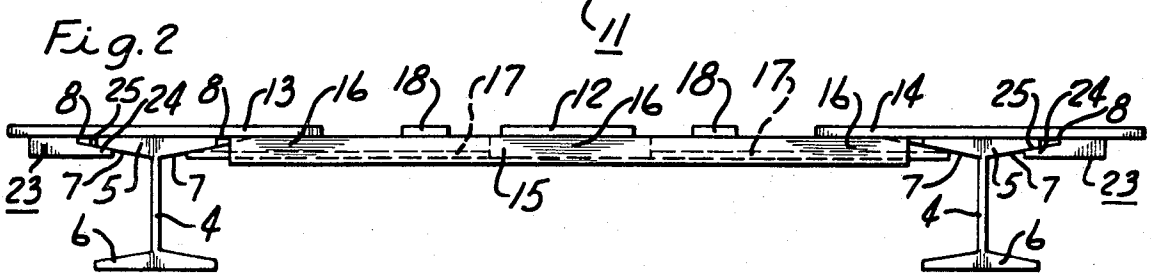
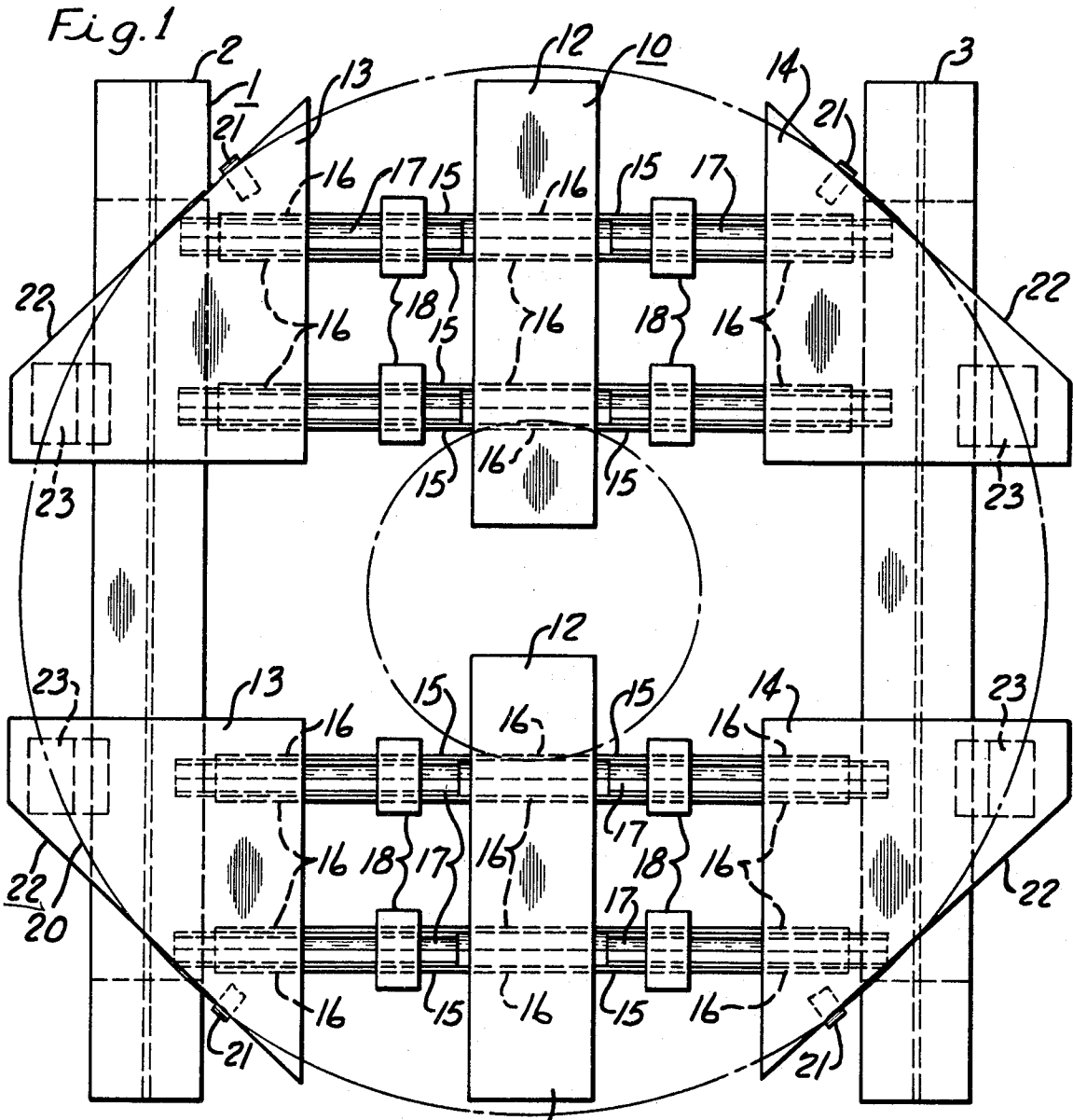
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[57] **ABSTRACT**

A dimensionally adjustable knockdown pallet for supporting during transport and storage loads of various sizes that may be strapped to the pallet. Two I-beam base members support at least two load bearing deck sections positioned transversely on the I-beam base members. Interlocking means is provided between each of the I-beam base members and the ends of the load bearing deck sections to detachably secure the ends of each of the deck sections at any selected position along the length of the I-beam base members, the position selected dependent upon the size of the load to be placed on the pallet.

8 Claims, 6 Drawing Figures





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Fig. 5

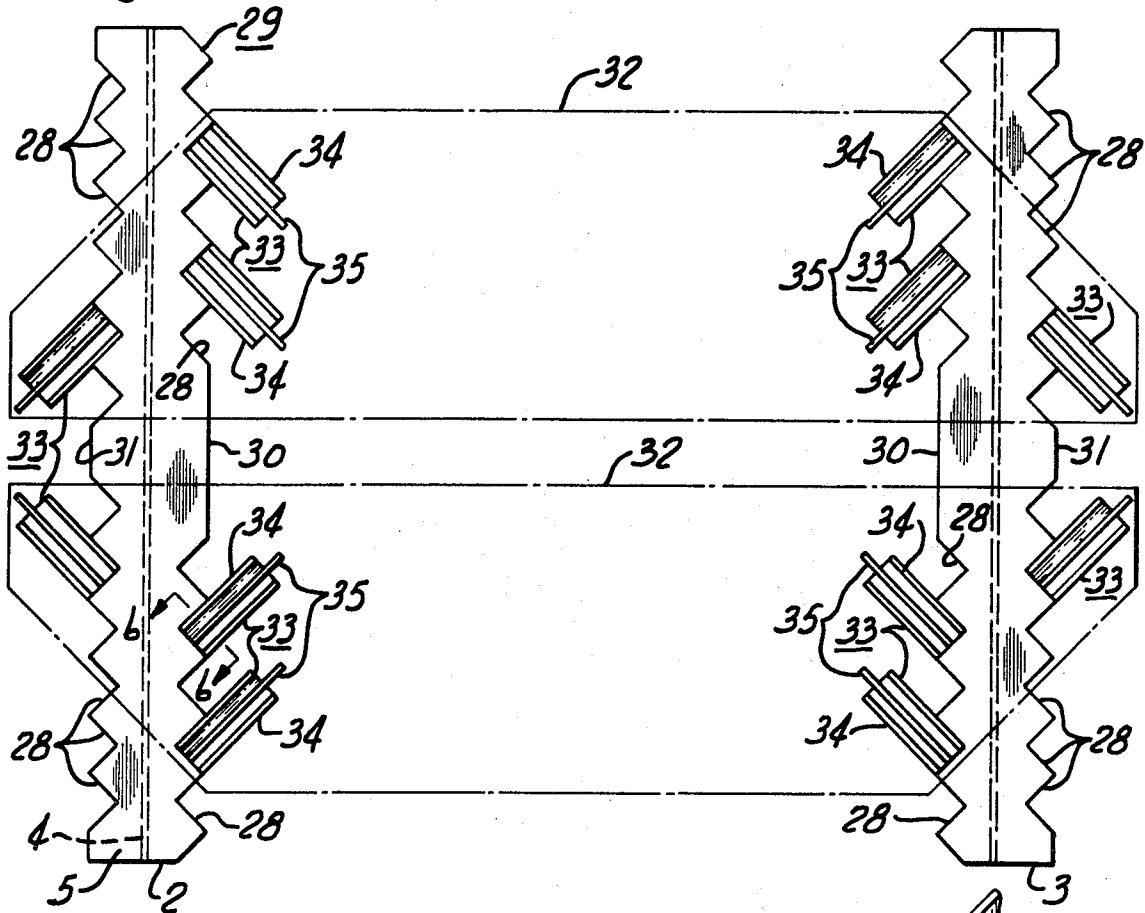


Fig. 6

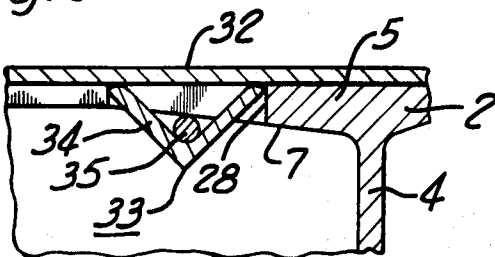


Fig. 4

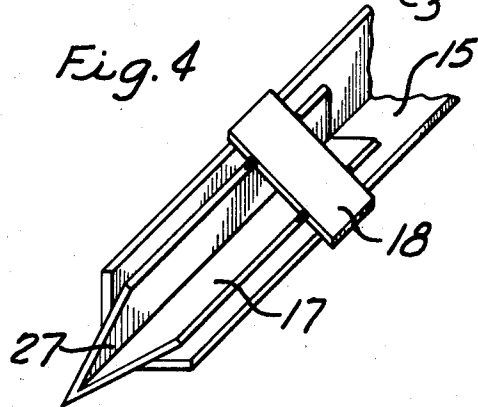
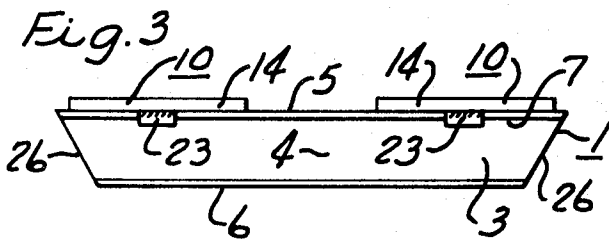


Fig. 3



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ADJUSTABLE PALLET

BACKGROUND OF THE INVENTION

This invention relates generally to supports and is particularly directed to the construction of a pallet used for supporting a load during shipping or storage (Class 248, subclass 119) and capable of being adjusted according to load size and conveniently collapsed for shipment when not in use (Class 108, subclass 54 and 56).

One of the principal features that have been desired through the years in a pallet for the purpose of supporting loads for shipment or storage is that it be adjustable to accommodate different sizes of loads so that the need for several different sizes of pallets for such purposes be eliminated. At the same time, it has also been desired to provide a pallet that is readily collapsible to provide for minimal space in return shipment and subsequent useage.

Examples of such adjustable pallets are found in U.S. Pat. Nos. 2,739,776 (248-120); 2,377,911 (248-120); and 2,909,349 (248-120). The adjustable pallets shown in these patents are adjustable to be extended or retracted in a manner to accommodate various sizes of loads to be supported thereon. However, no means is provided to render them completely collapsible for return shipment in the sense of being reduced to a size for convenient shipment other than the minimum size adjustment that can be made by the pallet for purposes of load carrying.

On the other hand, pallets have been constructed to be readily collapsible into a dimensional size much smaller than their capable load carrying size but not readily adjustable in length and width to accommodate various load sizes. Examples of such pallets are to be found in U.S. Pat. Nos. 2,930,560 (248-120); 3,022,028 (248-23); and 3,094,950 (108-56).

The art of pallet construction has succeeded to a point where provision has been made for a pallet that is both dimensionally adjustable and collapsible to a size smaller than its minimum adjusted load carrying size but such pallets are provided with only selectively fixed positioning in adjusting for load size in combination with a complex structural device for purposes of collapsing the pallet for return shipment making it inconvenient for quick and efficient collapsing. As a result these pallets have not withstood the test of commercial feasibility and success. Also, the means used to provide for dimensional adjustment have readily required repair service or subsequent use of a supplemental tool because of the rough treatment received by pallets when placed in use causing damage to the adjustment devices used in the pallet construction. Examples of such pallets are U.S. Pat. No. 2,643,081 (248-120) and my own prior U.S. Pat. No. 2,405,535 (245-120).

SUMMARY OF THE INVENTION

The principal object of this invention is the provision of a pallet which is dimensionally adjustable to any selected size within a range of load sizes while at the same time can be readily knocked down into various pieces for return shipment, the adjustment and knockdown being accomplished with nothing more than possibly the use of a tapping hammer.

The pallet is constructed so as to eliminate incremental dimensional adjustment found in the prior art and

provide a pallet that is dimensionally adjustable to any and all load sizes within a given range of load sizes. Also the pallet is constructed in a manner to eliminate adjustment securing devices that easily become broken or damaged due to rough treatment of the pallet during use and provide a means for detachably securing the various pieces comprising the pallet unit which can readily withstand abusive treatment without damage so that the pallet can be maintained in service over a long period.

Another object of this invention is the provision of a pallet comprising a minimum of pieces generally consisting of two I-beam base members upon which load bearing deck sections are positioned transversely on the I-beam base members. Interlocking means are provided adjacent to the ends of each of the deck sections for detachable securance to the I-beam base members.

Another object of this invention is the provision of interlocking means in a pallet construction that permits the pallet to be readily adjusted to carry a wide range of load sizes as well as to be readily knocked down for return shipment. The locking means may take the form of channel members secured to the undersurfaces of the deck sections adjacent the ends thereof which are adapted to receive interlock members, which when extended from the channel members may be caused to engage by wedging action of the undersurfaces of the upper structural flange of each of the I-beam base members.

Included in the interlocking means is a flange member secured at each end of the deck sections and in substantially opposite opposed relation to each of the interlock members and adapted to engage the upper structural flange of the I-base members, that is, the flange position opposite to that position engaged by a corresponding interlock member. Upon disengagement of the interlock members from the undersurface of the flange, the deck sections may be removed from the I-beam base members for storage during nonuse or return shipment. The I-beam base members and deck sections comprising the pallet of any complete unit are readily interchangeable with the same pieces of another pallet unit so that it is not necessary that, upon disassembling or collapsing for return shipment, the same previously assembled pieces be retained together for latter assembly.

Other objects and advantages appear hereinafter in the following description and claims.

The accompanying drawings show, for the purpose of exemplification without limiting the invention or the claims thereto, certain practical embodiments illustrating the principles of this invention wherein:

FIG. 1 is a plan view of the assembled pallet comprising this invention adjusted to support the load represented by the dotted line.

FIG. 2 is a front elevation of the pallet of FIG. 1.

FIG. 3 is a side elevation of the pallet of FIG. 1.

FIG. 4 is a perspective view partly cut away showing a portion of the preferred form of the interlocking means of the pallet comprising this invention.

FIG. 5 is a plan view of a modified form of the pallet comprising this invention.

FIG. 6 is a sectional view of a portion of the interlocking means taken along the line 6-6 in FIG. 5.

Referring now to FIGS. 1 through 3, the dimensionally adjustable knockdown pallet 1 comprising this invention may be made of steel, aluminum or high strength plastic material and comprises a pair of identical I-beam base members 2 and 3 which consist of the web portion 4 and the upper structural flange 5 and the lower structural flange 6. As can be seen in FIG. 2, the structural flanges 5 and 6 are provided with an incline sloping undersurface as indicated at 7 which slope from the web 4 to the outer edges 8 of the structural flange. The structure of these I-beam base members 2 and 3 are quite well known and are readily available from the steel industry or could be produced by the plastic industry.

The pallet 1 is provided with two deck sections 10 and 11 which are substantially identical. Each of the load bearing deck sections 10 and 11 is provided with central deck plate 12 and end deck plates 13 and 14. Each of the deck plates 12, 13 and 14 are secured in spaced relation as shown in FIG. 1 by means of the angle members 15 which are standard structural angles which are commonly found produced both in steel and plastic. Two such angle members 15 are provided for each deck section 10 and 11 and are secured to the respective deck plates 12, 13 and 14 as indicated at 16. Any means of attachment may be used, the most suitable means being by welding at the points indicated at 16. Thus, the central deck plates 12 are secured across the central portion of each of the pairs of angle members 15 whereas the end plates 13 and 14 are secured to the ends of the pairs of channel members.

The angle members 15 are general V-shaped configurations for purposes of strength in connection with each deck section and also for providing a channel which interlocking means in the form of the interlock member 17 may be slidably positioned. The interlock member 17 in each end of the angle members 15 are provided to slidably move within the angle members 15 and to be extended therefrom to engage the undersurface 7 of the I-beam base members 2 and 3. It should be noted that each of the interlock members 17 are sufficient that they are incapable of being readily removed from each of the channel members 16 due to the positioning of the end deck plates 13 and 14 and the central deck plate 12 of each of the deck sections 10 and 11. Thus, none of the interlock members 17 will be lost or misplaced from the deck sections 10 and 11 when the pallet 1 is placed in use or collapsed for return shipment.

Each of the interlock members 17 is provided with a deck plate 18 near the rearward extent of each of the interlock members. The purpose of this deck plate 18 is twofold. First, the deck plate 18 provides a means for readily extending each of the interlock members 17 to engage the undersurface 7 of the respective I-beams 2 and 3. Also, the deck plate 18 is convenient for removing of each of the interlock members 17 from disengaged position from the undersurface 7 of the respective I-beam members 2 and 3. Thus, the deck plates 18 may be lightly tapped by means of a hammer or other such instruments for engagement and disengagement of the interlock members from the I-beam base members 2 and 3.

Secondly, the deck plates 18 being of the same horizontal level as all the other deck plates 12, 13 and

14, will receive the weight of the load 20 as the other deck plate. With the weight of the load 20 on the interlock deck plate 18, further assurances are obtained that the interlock members 17 remained in their engaged position on the I-beam base members 2 and 3 when the load 20 is placed upon the pallet 1 and strapped into position by means of, for example, the metal strap shown in part at 21 in FIG. 1.

As can be seen from FIG. 1, the pallet 1 comprising extension is highly suitable for cylindrically shaped loads of varying diametrical width. Each of the end deck plates 13 and 14 are diagonally shaped as indicated at 22 for the purposes of supporting such type of loads as indicated at 20 such as steel or other such coils. Also the edges 22 provide a convenient means for strapping the load 20 to the pallet 1 by using the strapping 21. This configuration of including edge 22 of the deck plates 13 and 14 aids in assuring a snug strapping engagement of the pallet with the load 20, the strapping 21 being tangent with the load 20 as shown in FIG. 1.

The interlock means of the pallet comprising this invention also include the flange members 23, one of which is secured adjacent the outer extremity of each of the end plates 13 and 14 as indicated in FIG. 1 and 2. The flange members 23 are provided with an extended portion 24 which has an innersloping surface 25 for the purpose of slidably engaging the outwardly extended undersurface 7 of the upper flange 5 of each of the I-beam base members 2 and 3. Upon disengagement of all of the interlock members 17 from the I-beam base members 2 and 3, the deck sections 10 can be easily shifted relative to the I-beam members to readily disengage the extended portion 24 from beneath the upper flange member 5 for complete collapsing of the pallet. Upon complete disengagement of the interlock members 17, the collapsed pallet will then consist of the two deck sections 10 and the two I-beam base members 2 and 3 which in their disassembled arrangement can be properly stacked for return shipment for reuse as a pallet taking up a minimum space for such return shipment.

Reference is made now to FIG. 3 wherein there is shown the ends of the I-beam base members 2 and 3 may be cut preferably at a diagonal indicated at 26 to prevent snagging of the pallet 1 when being placed to maneuver on a work surface area such as in a warehouse or on a truck or railroad car bed.

Referring now to FIG. 4 there is shown in perspective form the arrangement of the channel members 15 and the interlock members 17. The interlock member 17 are readily slidable in the channel member 15 as clearly indicated and are V-shaped in configuration to provide for ease in operation of the interlock member 17 within the channel member 17 as well as to give rigidity to the assembled deck section 10. Also, the forward end of each of the interlock members 17 is provided with a incline surface 27 which corresponds to the inclined surface 7 of the upper flange 5 of each of the I-beam base members 2 and 3 for proper engagement therewith.

Also, it is within the concept of the present invention that the interlock members 17 be of such light gauge metal in construction that they are capable of slightly flexing upon being engaged against the undersurface 7

of the I-beam base members in order to create a condition of tension to insure that securance is maintained by the interlock members 17, so positioned, while the pallet is in use.

The pallet construction shown in FIGS. 1 through 4 is preferably made of metal, particularly structural steel or aluminum alloy, in order to insure its durability and long use over a longer period of time than that capable of pallets presently being used such as the conventional wooden pallets.

Reference is now made to FIGS. 5 and 6 where there is shown a modified form of the pallet comprising this invention. The principle of engagement and disengagement of the deck section of this modified form is in principle, substantially similar to that shown in the embodiment of FIGS. 1 through 4.

As shown in FIG. 5, the I-beam members 2 are the same as those shown in FIG. 1 except that the longitudinal edges of the upper flange are provided with the V-shaped recesses 28 for the substantial length of each of the longitudinal edges 30 and 31 of the upper flange 5. The deck sections 32 are shown in dotted line configuration in order to show in clearer detail the structure of the interlocking means generally indicated at 33.

The interlocking means 33 in each case generally comprises a V-shaped channeled section 34 which is secured to the undersurface of each of the deck sections 32 by any suitable means, such as, welding.

The channel members 34 are secured to the underside of the deck section 32 in a diagonal manner in order to fit squared in a corresponding V-shaped recess 28 as shown in FIG. 5 as well as FIG. 6.

In order to interlock the deck section 32 to any selected of the corresponding V-shaped recesses 28, the rod members 35 are utilized in a manner that they are driven or extended forward under the flange 5 as clearly shown in FIG. 6. Thus, the forward end of the rod members 35 engage the undersurface 7 of the upper flange 5 of each of the I-beam base members 2 and 3. In order to disengage the deck sections 32 from the I-beam base members 2 and 3, each of the rods 35 is withdrawn from under the upper flange 5 of the I-beam base members in order that the deck sections can be readily removed from the latter.

By providing a series of V-shaped recesses 28 along the edges 30 and 31 of the I-beam base members 2 and 3, each of the deck sections 32 may be selectively positioned along the I-beam base members, to position the deck sections relative one to another, in a manner dependent upon the size of the load to be placed on the pallet 29. From the foregoing, it is readily apparent that the pallet comprising this invention is readily adjustable to any selective size within a range of load sizes to provide a supporting structure for supporting loads during storage or transport. By the same token, the pallet can be readily knocked down in order to four major sections, to wit, the I-beam base members and two deck sections for purposes of return shipment, only requiring a minimum of space requirement for such purposes. The pallet is so constructed as to be variably adjustable within a range of load sizes to any dimensional size imaginable.

I claim:

1. A dimensionally adjustable knockdown pallet for supporting during transport and storage loads of various sizes comprising a pair of I-beam base members, a pair of load bearing deck sections positioned transversely on said I-beam base members, each of said deck sections comprising a plurality of deck plates, upwardly open channel members secured underneath each deck section to hold said deck plates in fixed relation, the end deck plates of said deck sections overlying said I-beam base members with said channel members aligned transversely relative to the longitudinal extent of said I-beam base members, an upwardly open channel interlock member slidably positioned in each of said upwardly open channel members and adapted to be extended therefrom and engage the undersurface of the upper structural flange of said I-beam base members to detachably secure said deck section ends at any selected point along the longitudinal extent of said I-beam base members.

2. The pallet of claim 1 characterized by at least one flange member secured underneath said deck section ends in oppositely opposed relation to a corresponding interlock member to embrace the underside of the upper structural flange of said I-beam base members, said flange members in opposed cooperative relationship with said interlock members to detachably secure said deck sections at any selected point along the longitudinal extent of said I-beam base members.

3. The pallet of claim 1 characterized in that said channel members and said interlock members are upwardly open V-shaped angular sections.

4. The pallet of claim 1 characterized by additional deck plates secured at the rearward extent of each of said interlock members and engaged by the load to maintain said interlock members in engaged position against said upper flange undersurfaces.

5. The pallet of claim 1 characterized by sloped flange I-beam base members having structural flanges with an inclined surface sloping toward the outer edges of said flanges, said interlock members provided with an inclined surface at their forward extent to cooperatively engage the inclined surface of said upper structural flange inclined surface for interlocking wedged engagement therewith.

6. The pallet of claim 1 characterized by at least two elongated upwardly open channel members secured in spaced relation underneath each of said deck sections.

7. The pallet of claim 1 characterized by rod interlock members slidably positioned in each of said upwardly open channel members in lieu of said channel interlock members and adapted to be extended from said channel members and engage the undersurface of the upper structural flange of said I-beam base members to detachably secure said deck sections at any selected point along the longitudinal extent of said I-beam base members.

8. The pallet of claim 1 characterized in that said end deck plates of said deck sections are provided with a diagonal edge suitably adapted to be aligned to tangentially match the outside dimension of a cylindrical load for strapping the latter to said pallet.

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