United States Patent

Colas

[15] **3,675,596**

[45] **July 11, 1972**

[54] LOAD-CARRYING PALLET

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[73] Assignee: **Cegedur GP,** Paris, France

[22] Filed: **May 11, 1970**

[21] Appl. No.: **48,710**

Related U.S. Application Data

[62] Division of Ser. No. 779,740, Nov. 29, 1968, Pat. No. 362,869.

[52] **U.S. Cl.** **108/51**

[51] **Int. Cl.** **B65d 19/00**

[58] **Field of Search** ..... 108/51, 52, 57, 58; 206/60 A

[56] **References Cited**

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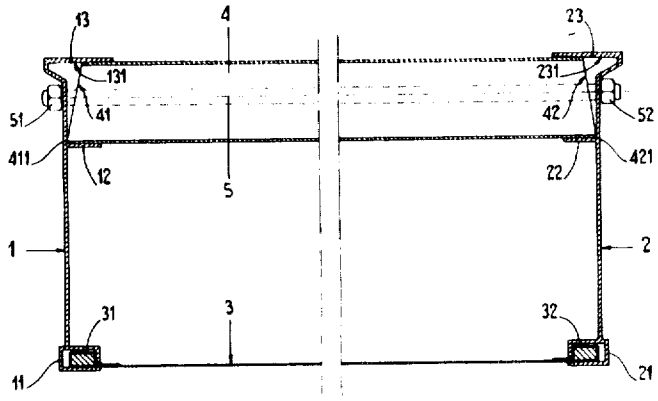
Primary Examiner—Donald A. Griffin

Attorney—McDougall, Hersh, Scott and Ladd

[57] **ABSTRACT**

A pallet for supporting materials comprising a pair of end sections of similar construction formed of a vertically disposed end plate, a pair of flanges extending inwardly substantially perpendicularly from the upper end portion of the end plate in vertically spaced apart parallel relation and a slideway in the form of a tubular section on the lower end portion of each of the end plates, a panel dimensioned for its ends to be received between the respective flanged pairs of the end plates and a base plate extending across the pallet with the ends of the base plate received in engagement within the slideways and means for securing the elements in their assembled relationship to form the pallet.

12 Claims, 7 Drawing Figures



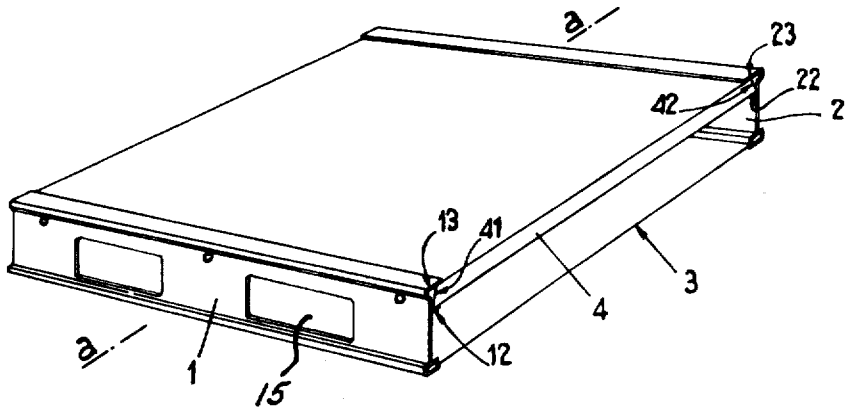


FIG. 1

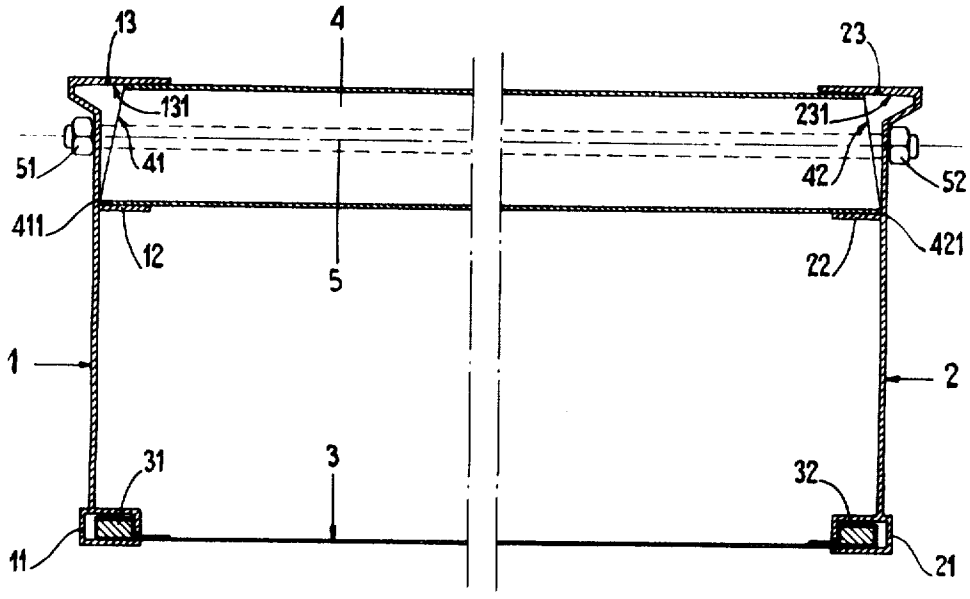


FIG. 2

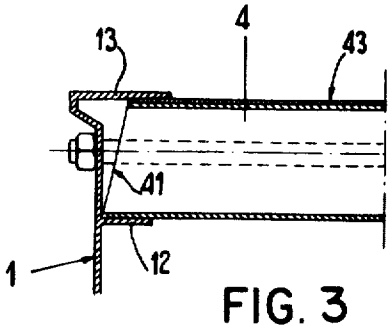


FIG. 3



FIG. 4

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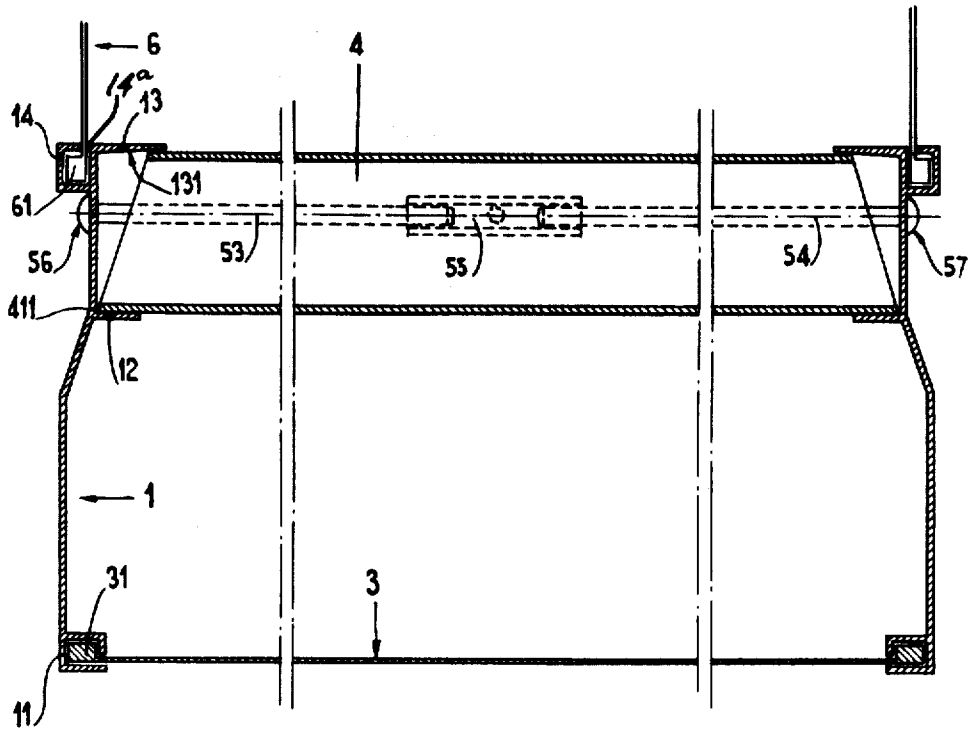

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14a
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14
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FIG. 5

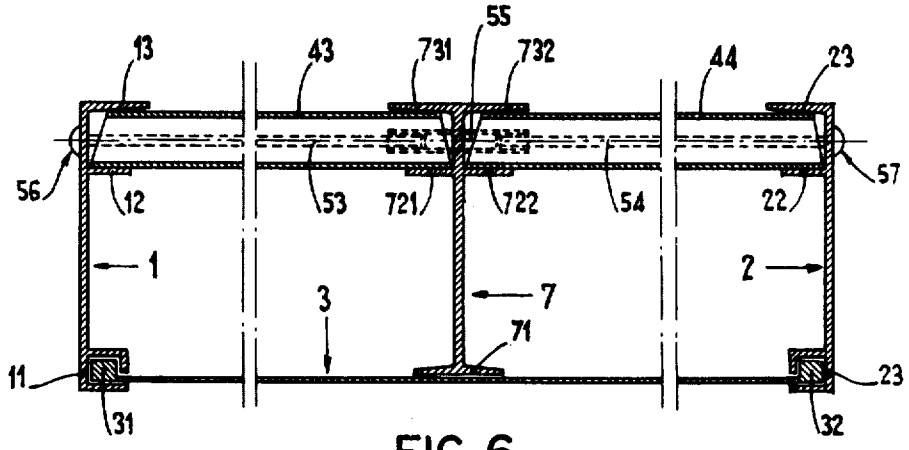

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FIG. 6

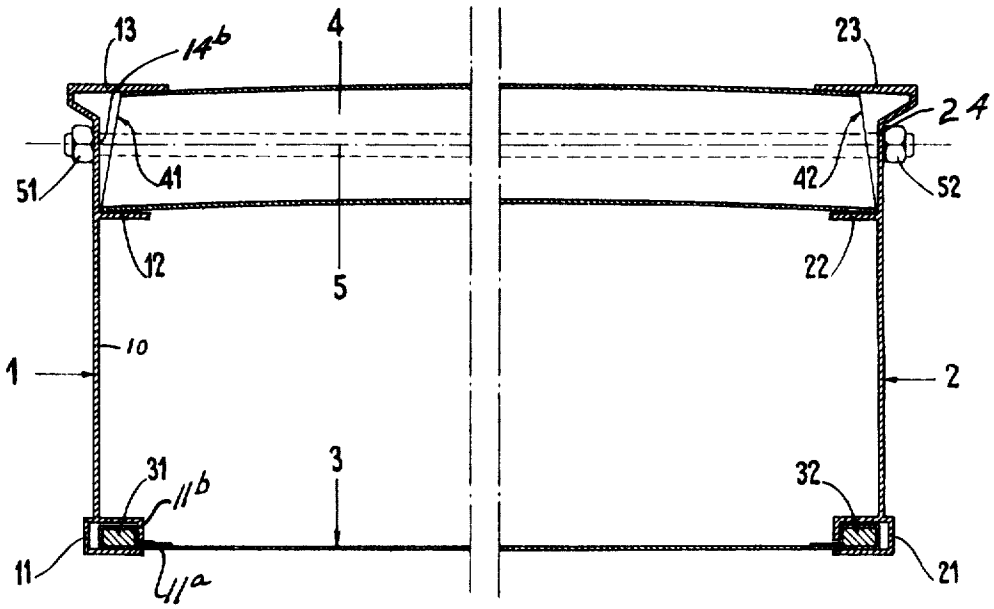


FIG. 7

LOAD-CARRYING PALLET

This application is a division of my copending application Ser. No. 779,740, filed Nov. 29, 1968, now U.S. Pat. No. 362869, and entitled "Load-Carrying Pallet".

This application relates to a pallet for use in the handling of materials.

The common form of pallet is formulated of planks of wood which are nailed together to form an elevated load-carrying platform in which the elevation relative to the ground enables the forks of a lift truck to pass through the openings into the area beneath the platform for raising the pallet.

This type of pallet is heavy in that a wooden pallet of 1.20 × 0.80 meters will weigh about 50 kg. Inevitably, some looseness occurs at the joints as the boards or planks tend to rot and/or warp. Finally, such wooden pallets involve a definite fire hazard.

Pallets have also been fabricated of steel or of aluminum alloy with the same construction used to manufacture wooden pallets. Although such pallets are lighter and stronger, they are nevertheless heavy and expensive.

It is an object of this invention to produce a pallet which has the advantages of being light in weight, inexpensive and easy to handle.

These and other objects and advantages of this invention will hereinafter appear and for purposes of illustration, but not of limitation, embodiments of the invention are shown in the accompanying drawings in which

FIG. 1 is a perspective elevational view of a pallet embodying the features of this invention;

FIG. 2 is a sectional elevational view taken along the line A—A of FIG. 1;

FIG. 3 is a sectional elevational view in greater detail of a portion of the upper corner of the pallet shown in FIG. 1;

FIG. 4 is a sectional view of the end of the thin base plate;

FIG. 5 is a sectional view through a pallet equipped with sling means;

FIG. 6 is a sectional view through a modification in a pallet of large surface area having an intermediate support section; and

FIG. 7 is a sectional elevational view of a modification of the pallet illustrated in FIG. 2.

More specifically, the material-handling pallet of this invention comprises two end sections 1 and 2, a thin base or bottom plate 3 and paneling 4 held together in the assembled relationship by a tie rod 5.

End sections 1 and 2 are identical and arranged at opposite ends of the pallet in facing relation. End section 1 comprises a vertically disposed plate 10 of rectangular shape dimensioned to have a width corresponding to the width of the pallet and a height corresponding to the height of the top panel 4 from the base sheet 3. The end plate 10 is formed with a tubular section 11 at its lower end with a slot 11^a through the inner wall 11^b communicating with the interior of the tubular section. The tubular section may be of rectangular or other polygonal shape and dimensioned to extend through the length of the end plate 10. The end plate 10 is formed with a pair of horizontally disposed lower and upper flanges 12 and 13 extending inwardly from the upper portion of the plate in vertically spaced apart relation corresponding to the height of the panel 4. The end section 2 is formed of the same elements including plate 20, tubular section 21 and flanges 22 and 23.

The base plate 3 is a flat plate dimensioned to correspond to the length and width of the pallet with enlarged tubular members 31 and 32 on the ends of the base plate shaped to correspond to the tubular sections 11 and 21 on the end plates 10 and 20 but of lesser cross-section for receipt of the tubular members 31 and 32 within the tubular sections 11 and 21 when in the assembled relationship, with the adjacent portions of the base plate extending through the slot openings 11^a.

The paneling 4 can be made up of sections or planks which are separate one from the other or of a panel formed of sheet metal, wood, or plastics, with or without corrugations. The paneling 4 is dimensioned to have a length corresponding to the length of the pallet and a height corresponding to the distance between the upper and lower flanges 12–13, 22–23 with the ends 41 and 42 preferably, though not essentially, tapered to define a trapezoidal member with the base of larger dimension at the bottom. The paneling can be formed with or without stiffening ribs.

The various components described can be formed of the same material or of different materials whereby the combinations possible become numerous. Suitable structural materials of which the elements are formed include metals and their alloys, plastics (with or without reinforcement), wood or wooden laminates, and the like. The end sections 10 and 20 can be formed of plastic extrusions, plastic moldings or the like processes capable of producing endless lengths of such shaped products.

In assembly, the tubular end sections 31 and 32 of the base plate 3 are introduced into the receiving tubular sections 11 and 21 at the lower ends of the end plates 10 and 20. Thereafter the ends of the panel 4 are positioned with the end 41 between the flanges 12 and 13 and the end 42 between the flanges 22 and 23. The components can be secured in this arrangement by suitable fastening means, such as by welding, bonding, screwing, riveting and the like, but it is preferred to effect the assembled relationship by the use of one or more tie rods 5. The tie rods 5 are dimensioned to have a length greater than the distance between the end sections for passage through aligned openings 14^b and 24 in the end plates within the area between the flanges but preferably nearer the upper flanges. The ends of the tie rod extending through the aligned openings are threaded for threaded engagement by nut members 51 and 52 which can be tightened onto the through-extending portions of the tie rods to tighten the end plates onto the panel 4 to effect the assembled relation.

When use is made of a panel 4 of trapezoidal shape, the end sections will first engage the panel at its lower edges to define pivot points 411 and 421 whereby further tightening of the nut members 51 and 52 will tend to rock the end sections for rotation about their respective pivot points with corresponding tensioning of the base plate 3.

As illustrated in FIG. 1, the end plates are provided with openings 15 of rectangular shape immediately below the flange 12 to enable the forks of the lift truck to be displaced therethrough in position to engage the underside of the plank 4 for lifting the pallet.

By way of modification, the lower face 131 and 231 of the upper flange 13 and 23 can be formed with a slight taper, as effected by a decrease in cross-section towards the free end, for camming engagement with the panel portion displaced therebetween responsive to the tightening of the nut members 51 and 52.

The reinforcing tubular end sections 31 and 32 on the ends of the base plate can be formed in various ways. They can be fabricated during rolling of the sheet by the use of a roll mill having cylinders provided with corresponding grooves. Instead, they may be joined to the ends of the base plate by welding or they may be formed integrally with the base plate by suitable metal folding or shaping operations with the interior filled, as with a plastic material which can be foamed or cast in situ.

A platform plate 43 can be laid on the upper surface of the panel 4 and secured at its ends between the panel and the upper flanges 13 and 23. The platform plate, when used, can be a smooth continuous flat panel dimensioned to correspond to the length and width of the pallet and the platform can be grooved, corrugated and the like for strengthening purposes.

As illustrated in the modification shown in FIG. 5, the pallet can be formed with a device to enable the platform to be carried by a sling. For this purpose, the end plates 1 and 2 are formed with outwardly extending tubular sections 14 at their upper ends with a slot 14^a through the upper wall to enable a gripping member 61 of corresponding shape, on the end of a sling 6, to be displaced into the tubular section positively to engage the pallet. The sling 6 may constitute wire rope and the like connected to suitable pulleys or other actuating means.

The lower base plate 3 can be a single plate or panel of metal, wooden laminate or of plastic material, or it can be formed of connected parallel sections. The tie rod 5 can be a single rod, as illustrated in FIGS. 1 to 4, or it can be formed of two or more lengths of rod 53 and 54, as shown in FIGS. 5 and 6, with the rod sections connected at their adjacent threaded ends by means of an internally threaded sleeve 55. In such event, the portions of the rods extending through the openings 14[0] in the end plates 1 and 2 can be formed with enlarged heads 56 and 57 whereby the desired tightening action is achieved by turning the sleeve 55.

If the surface area of the pallet is large in relation to its compressive strength, the center of the panel 4 can be strengthened against sagging by means of an intermediate section having its upper face fixed to the panel 4 while the lower end rests on the base plate 3. This section is advantageously formed with an I cross-section and is joined to the panel by cementing, bolting, riveting or by other known joinder means. It is also possible to obtain a pallet having a large surface area by arranging several single panels in side by side relationship. FIG. 6 illustrates one example of a double pallet. This pallet comprises two end sections 1 and 2 of the type previously described, an intermediate section 7, two panels 43 and 44, of the same construction as previously described, and one or more base plates 3 of substantially the same construction as previously described. At its lower end the intermediate section 7 is formed with a flange or pedestal 71 arranged to rest on an intermediate surface of the base plate 3. At its upper end the intermediate section is formed with two vertically spaced left hand flanges 731 and 721 adapted to receive the right hand end of panel 43 and two vertically spaced right hand flanges 732 and 722 adapted to receive the left hand end portion of panel 44. Assembly and tightening are carried out by conventional means, but preferably with the aid of a tie rod which may be either of the construction described with reference to element 5 in FIG. 2 or as shown in FIG. 6.

For assembly purposes, the enlarged tubular end sections 31 and 32 of the base plate 3 are engaged in their respective slideways 11 and 23 of the end sections 1 and 2. Thereafter, the intermediate section 7 is positioned with its flange 71 resting on the base plate 3. Finally the ends of the panel 43 are positioned with the left hand end between flanges 12 and 13 of section 1 and the right hand end between the flanges 721 and 731 of section 7. The same arrangements are made with the panel 44 in which the left hand end is positioned between flanges 722 and 732 of section 7 while the right hand end is positioned between the flanges 22 and 23 of section 2. All that remains is to position and tighten the tie rods 53, 54 until the whole assembly is interlocked.

The intermediate section 7 is formed to employ the action of web against web confined by the two flanged sections, with the two slideways such as 11 being replaced by a flange 71 which rests on the base plate. It is also possible to provide the intermediate section with two slideways, one to the right and the other to the left, for use with two base plates corresponding in construction to the base plate 3. In this way, it is possible similarly to obtain a pallet formed by the arrangement of two pallets of the type shown in FIG. 2 in side by side relationship, the intermediate sections merely being combined into a single intermediate symmetrical section. It is obvious that pallets of large surface area may be obtained by similar arrangement of more than two single pallets.

It is possible, by the use of a strengthened base plate 3, substantially to reduce both the weight and cost of the pallet. These components may be assembled by the tie rods to enable disassembly to be effected in a rapid and easy manner so that a damaged or worn component can be immediately replaced.

It will be apparent that pallets of the type described can be used with increased effective load without increase in weight.

In the modification shown in FIG. 7, the panel 4 is in the form of a prestressed arch which is obtained by placing the assembly and interlocking means 5 under high tension, either by tightening the nut members 51 and 52 in FIGS. 1 to 3, or by tightening the threaded sleeve 55 in the modification shown in FIGS. 5 and 6.

It will be understood that changes may be made in the details of construction, arrangement and operation without departing from the spirit of the invention, especially as defined in the following claims.

I claim:

1. A pallet comprising a pair of end sections of similar construction comprising a vertically disposed end plate, a pair of flanges extending inwardly substantially perpendicularly from the upper end portion of the end plate in vertically spaced apart substantially parallel relation and a slideway in the form of a tubular section on the lower end portion of the end plate, a panel portion dimensioned to have a height corresponding to the spaced relationship between the flanges of each pair with the ends of the panels received between the flanges of each end section on opposite ends of the panel, a base plate extending between the lower end of the end plates with an enlarged portion on the ends of the base plate in engagement with the slide-ways, aligned openings through the end plates in the area between the flanges, a tie rod dimensioned to span the end plates with end portions projecting through the openings, abutments on the through-extending portions of the tie rods and means for effecting movement of the abutments in the direction toward and away from each other to increase or decrease respectively the pressure on the end plates, and in which the edge of the panel between the flanges of an end plate outermost of the panel is tapered inwardly from a point below the opening to the upper edge to provide a pivot point about which the end plate rocks in response to increased compression by the tie rod onto the end plates to place the panel under compression and the base plate in tension and which includes an intermediate plate between the end plates with the upper face of the intermediate plate in engagement with the underside of the panel and having a pedestal on the lower end which rests on the base plate.

2. A pallet as claimed in Claim 1 in which the intermediate plate comprises a single plate having a pedestal at its lower end which rests on the base plate and having a pair of vertically spaces flanges extending perpendicularly in one direction from the upper end portion and another pair of spaced flanges extending perpendicularly in the opposite direction from the upper end portion of the intermediate plate and in which the panel section is subdivided into two panels with the adjacent inner ends engaged between the adjacent flanged sections in the intermediate plate.

3. A pallet as claimed in claim 1 in which the panels are in the form of trapezoidal members having their base portion of larger dimension lowermost whereby the lower edge of the ends of the panel engage the end plates to define pivotal points.

4. A pallet as claimed in claim 1 in which the lower surface of the upper flanges taper toward the outer free end.

5. A pallet as claimed in claim 1 in which the tubular sections on the lower ends of each of the end plates are rectangular in cross-section and in which the enlarged portions on the ends of the base plate are of similar shape for engagement within the tubular sections in telescoping arrangement.

6. A pallet as claimed in claim 1 in which the enlarged end portions on the base plate are integral with the base plate and formed by folding the edge portions of the base plate.

7. A pallet assembly which includes two pallets, as claimed in claim 1, arranged in end to end relationship to double the surface area of the pallet, and means interconnecting the adjacent end sections into a composite assembly.

8. A pallet as claimed in claim 1 in which the end plates include passages extending therethrough in the area immediately below the lower flange for passage of the forks of a lift truck into position to engage the underside of the panel.

9. A pallet as claimed in claim 1 in which the means for securing the elements in their assembled relation comprises aligned openings through the end plates in the area between the flanges, a tie rod dimensioned to span the end plates with

threaded end portions projecting through the openings, and nut members threadably engaging the through-extending threaded end portions of the tie rods.

10. A pallet as claimed in claim 9 in which the aligned openings are spaced a shorter distance from the upper flange than from the lower flange.

11. A pallet as claimed in claim 1 in which the end plates are tightened onto the panel to stress the panel into a prestressed arch.

12. A pallet as claimed in claim 1 which includes brackets extending outwardly from the upper end of the end plates for receiving sling means for lifting the pallet.

* * * * *

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,675,596 Dated July 11, 1972

Inventor(s) Francois Colas

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

On the cover sheet, insert -- [30] Foreign Application Priority Data December 15, 1967 France.....PV 132,453 -- ; on the same cover sheet [62], "362,869" should read -- 3,626,869 -- .

Signed and sealed this 26th day of December 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents

FORM PO-1050 (10-69)

USCOMM-DC 60376-P69
* U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-334.