

Aug. 6, 1946.

LE ROY WEISS
ADJUSTABLE PALLET

2,405,535

Filed Aug. 24, 1944

3 Sheets-Sheet 1

Fig. 1.

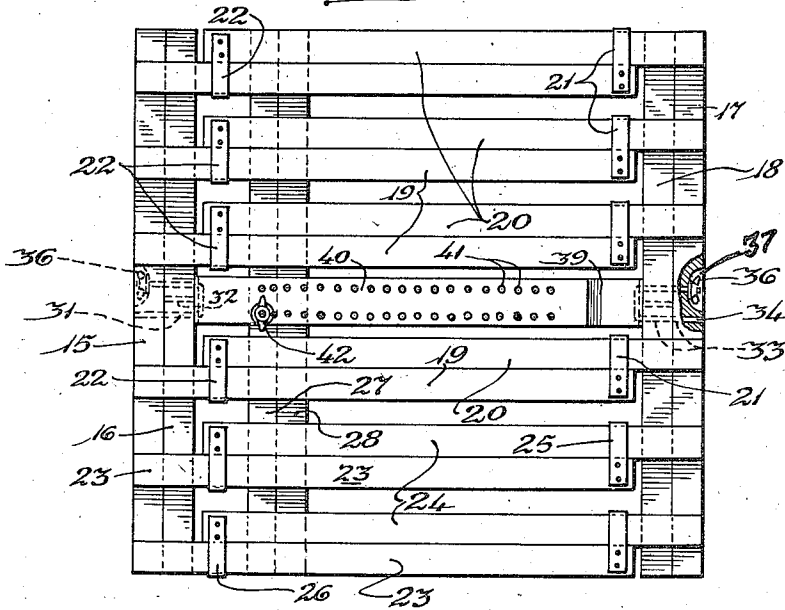
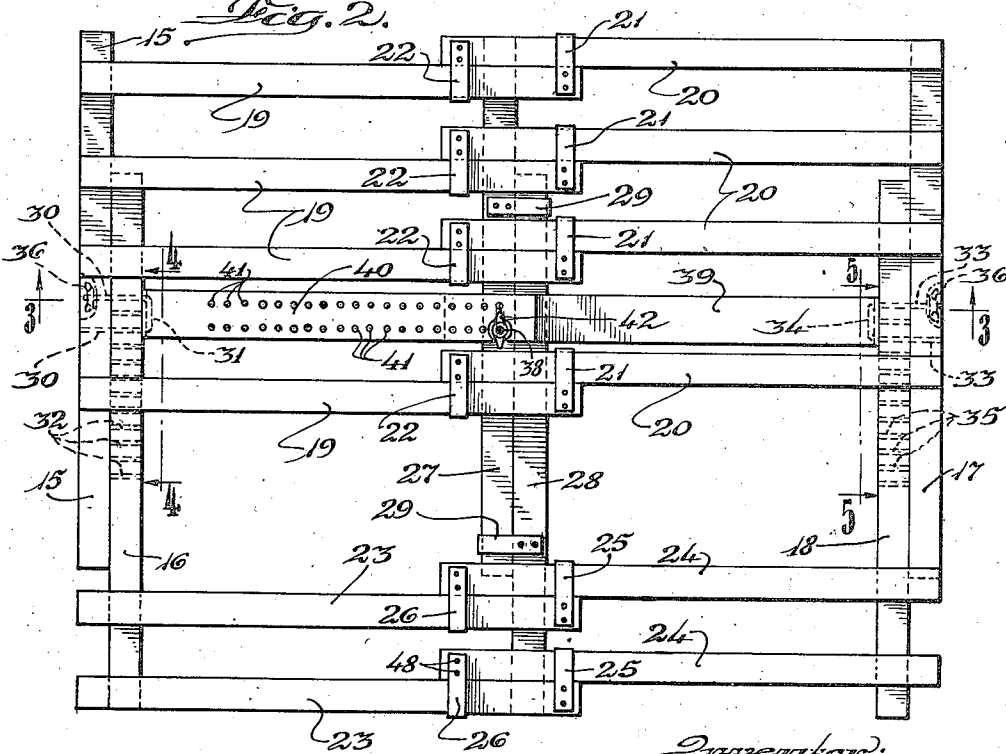


Fig. 2.



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Fig. 8.

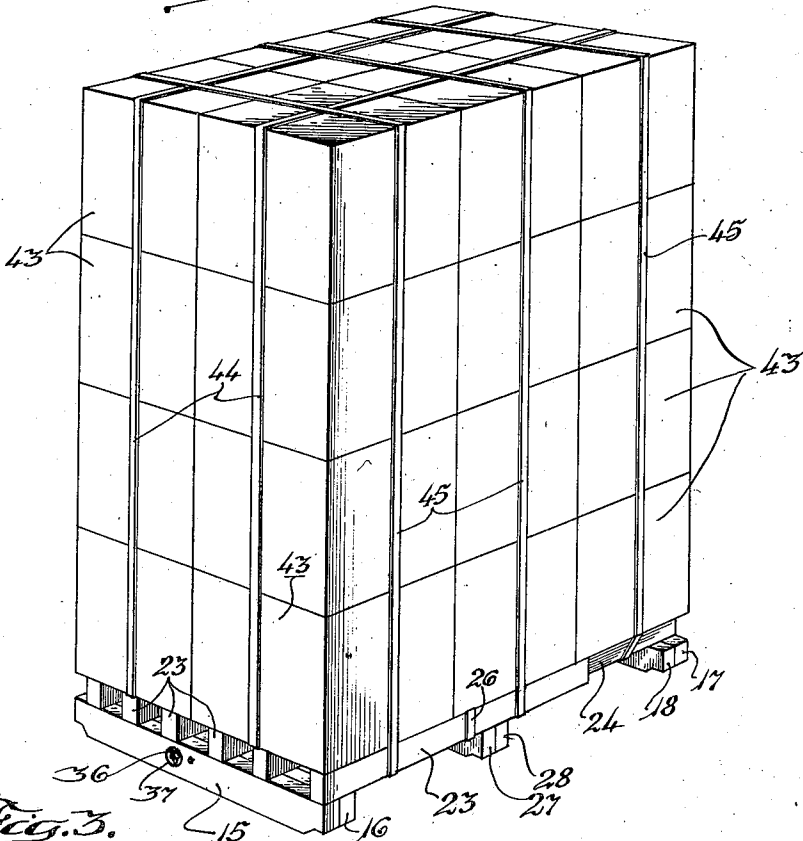


Fig. 3.

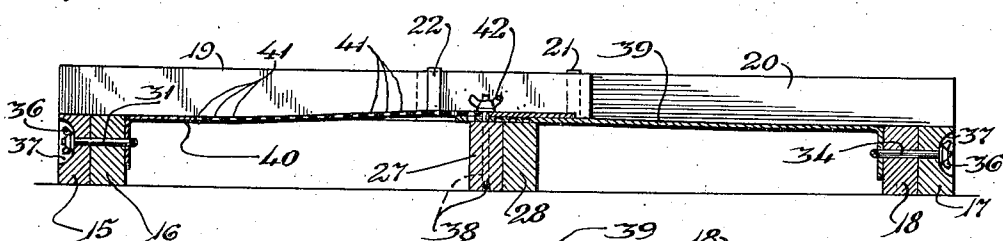


Fig. 4.

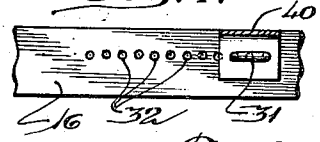


Fig. 5.

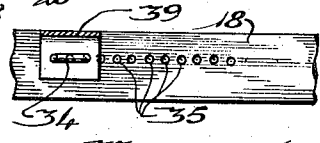


Fig. 6.

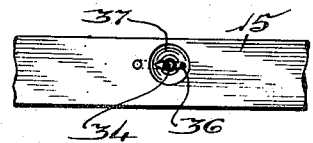
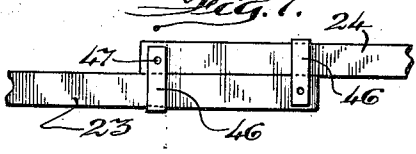


Fig. 7.



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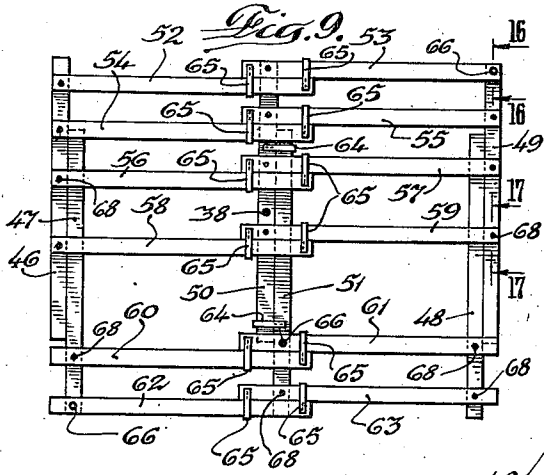


Fig. 10.

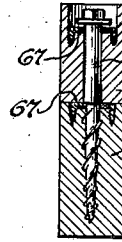


Fig. 11.

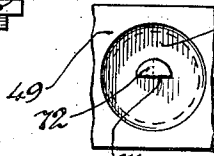
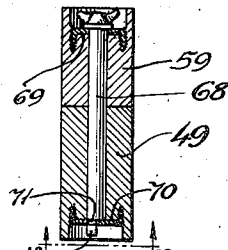
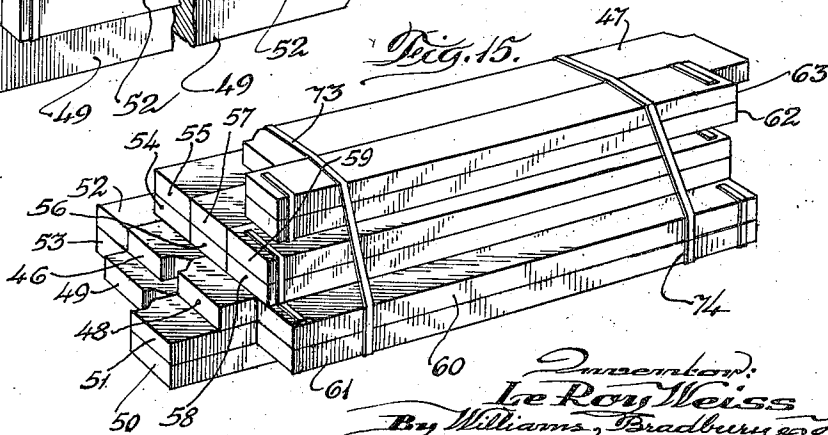
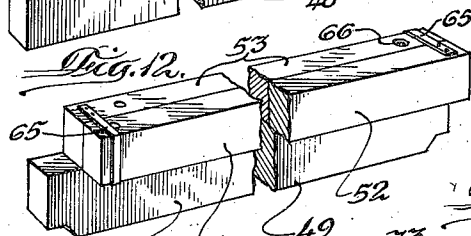
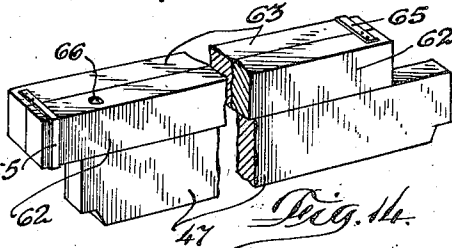
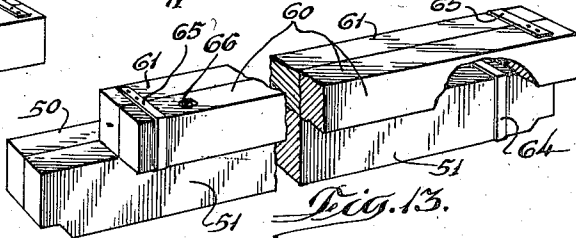
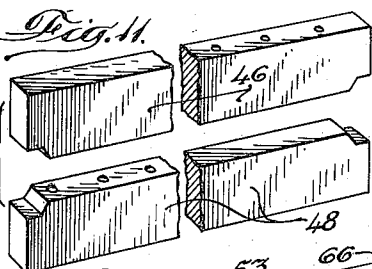
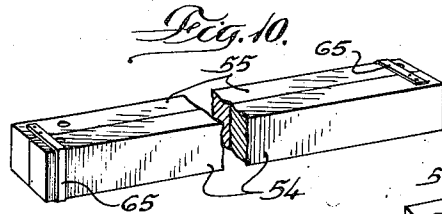
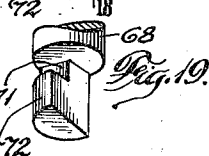


Fig. 13.



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UNITED STATES PATENT OFFICE

2,405,535

ADJUSTABLE PALLET

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Application August 24, 1944, Serial No. 551,037

12 Claims. (Cl. 248—120)

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My invention relates to adjustable pallets or skids of a type adapted to support a considerable number of boxes or crates connected in unit form for safe and convenient handling and shipment. The invention has for its principal object the provision of a structure of this character capable of being adjusted quickly and easily through a wide range of sizes so as to make a single pallet capable of use to advantage with groups of boxes or crates of different sizes.

In the preparation of a load upon a pallet or skid, it is important that the supporting parts of the pallet be distributed throughout the outline of the base of the load so as to insure that there shall be adequate support at spaced points for each box or crate and thus make it unnecessary to rely too strictly upon the strength of the individual boxes or crates, and it is important also that the support provided by the pallet extend substantially to the outer faces of the group of boxes or crates. It is, accordingly, the object of the invention to provide a construction by reason of which the pallet may be increased in size by fairly small increments to accommodate different sized boxes or groups of boxes so as to obtain the best possible results in connection with the handling and shipment of any desired product.

It is another object of the invention to provide a structure capable of being adjusted readily in either direction or in both directions by the removal of a minimum number of pins or other fastening devices, while at the same time insuring that the parts may be held strongly against undesired shifting in use. For attaining this object an improved arrangement of unit structures has been provided, together with an improved arrangement of holding means for maintaining the parts in their adjusted positions.

Another object is to provide a pallet or skid which may be readily enlarged as desired, and which after use may be quickly and readily dismantled and bundled for return in relatively small compass for re-use.

It is another object of the invention to improve devices of this type in sundry details hereinafter pointed out. The preferred means by which the several objects of the invention have been attained are illustrated in the accompanying drawings, in which:

Fig. 1 is a top plan view of the improved pallet adjusted to its smallest size;

Fig. 2 is a top plan view of the pallet of Fig. 1 but adjusted to its largest size;

Figs. 3, 4 and 5 are vertical sectional views

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taken substantially at the line 3—3, the line 4—4, and the line 5—5, respectively, in Fig. 2;

Fig. 6 is a face view of a fragmentary portion of the runner as seen from the right in Fig. 1;

Fig. 7 is a top plan view of fragmentary portions of a pair of the cross bars showing a modified form of construction;

Fig. 8 is a perspective view of the improved pallet with a group of boxes or cartons secured thereon;

Fig. 9 is a view on a reduced scale similar to Fig. 2 but with some of the parts omitted, showing a slightly modified arrangement of the parts for enabling the pallet to be more or less completely dismantled and bundled in "knock-down" or compact condition for shipment;

Figs. 10 to 14 are perspective views on a reduced scale showing the several runners and cross bars of the modification shown in Fig. 9 separated from other portions of the pallet, with the intermediate portions of the runners and bars broken away for clearness of illustration, and with certain of the parts bunched in sub-unit form;

Fig. 15 illustrates a bundle of the parts of the modified pallet ready for shipment;

Figs. 16 and 17 are vertical sectional views taken on a substantially enlarged scale at the lines 16—16 and 17—17, respectively, of Fig. 9;

Fig. 18 is a bottom plan view of the parts as shown at the line 18—18 of Fig. 17; and

Fig. 19 is a perspective view of the removable connector bolt shown in Fig. 17.

Referring now to Figs. 1 to 6 of the drawings, in which corresponding parts are indicated by the same reference characters, 15 and 16 indicate a pair of runners at one side of the improved pallet in spaced relation to runners 17 and 18 at the other side. In the arrangement shown, the runners 15 and 17 are connected together by four pairs of cross bars 19 and 20, the cross bars of each pair being adjustably connected to each other by means of U-clips 21 and 22, one of which is connected with each of the bars so as to extend about the other bar. Similar cross bars 23 and 24 are connected between the runners 16 and 18, each pair of the runners being slidably connected together by means of U-clips 25 and 26, each of which is carried by one of the cross bars and extends about the other cross bar. The arrangement is such that the runners 15 and 16 are movable toward and from the runners 17 and 18 so as to control the effective size of the pallet longitudinally of the cross bars.

In the arrangement shown, each of the cross

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bars 20 is connected rigidly with an intermediate runner 27, and each of the cross bars 24 is rigidly connected with a runner 28 adjacent to the runner 27. By reason of the provision of the intermediate runners 27 and 28, the intermediate portions of the several pairs of cross bars are supported adequately at intermediate points when the pallet is extended longitudinally of the cross bars as shown in Fig. 2.

In the arrangement shown, each of the intermediate runners 27 and 28 is provided with a U-clip 29 connected rigidly therewith and extending about the other of said runners. By reason of this arrangement, the structure comprising the cross bars 23 and 24 is adjustable longitudinally of the runners with respect to the structure comprising the cross bars 19 and 20, the pallet being thus adjustable in size in both directions so as to be capable of being arranged to conform to a wide range of requirements with respect to size of the pallet.

Means is provided for connecting the runners 15 and 16 together in adjusted position with respect to each other and for connecting the runners 17 and 18 in correspondingly adjusted position with respect to each other. For accomplishing this purpose, the runner 15 is provided with two openings 30 therethrough for receiving a U-bolt 31 which extends through selected openings 32 of a series of such openings through the runner 16. In like manner the runner 17 is provided with openings 33 for receiving a U-bolt 34, which extends through selected ones of a series of openings 35 through the runner 18. The U-bolts 31 and 34 are provided with wing nuts 36 on their outer ends seated in recesses 37 in the outer faces of the runners 15 and 17 for holding the U-bolts in position so as to maintain the runners at each side of the pallet rigidly in position both laterally and longitudinally with respect to each other.

As is clearly shown in Fig. 3, the runner 27 is provided with a U-bolt 38 extending in vertical position therethrough in position to engage an opening in the inner end of a link 39, the outer end portion of which is engaged by the U-bolt 34. The link 39 serves to reinforce the structure comprising the runners 17 and 18 and the intermediate runners 27 and 28. A second link 40 engages the U-bolt 31 connecting the runners 15 and 16, such link 40 being provided with a series of openings 41 therethrough, any one of which may be brought into engagement with the U-bolt 33 for holding the structure comprising the runners 15 and 16 in adjusted position with respect to the structure comprising the runners 17 and 18. A wing nut 42 is removably mounted on the upper end of the U-bolt 38 for holding the links 39 and 40 in operative engagement with the bolt.

With the bar 40 provided with openings 41 in close proximity to each other therealong, the pallet may be adjusted longitudinally of the cross bars by very small changes so as to adjust the pallet to the desired size longitudinally of the cross bars. With a considerable number of openings 32 and 35 in the runners 16 and 18 also spaced at short distances apart, the pallet can be adjusted by very small amounts longitudinally of the runners. For adjusting the size of the pallet longitudinally of the cross bars, it is necessary only that the wing nut 42 be removed for freeing the link 40 from the U-bolt 38. If the pallet is to be adjusted longitudinally of the runners, it is necessary that the U-bolts 31 and 34

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be released from engagement with the runners 15 and 17 for permitting such adjustment. The arrangement is such that any desired adjustment can be effected very quickly and easily. The parts are held in their adjusted position very firmly so as to avoid any likelihood that the parts might shift inadvertently in use.

In Fig. 8 there is shown a load mounted upon a pallet and secured in position thereon, such load comprising a plurality of boxes 43. For enabling the pallet to support the boxes 43 to best advantage, the pallet is adjusted in one or both directions to make its size correspond substantially to that of the proposed load. After the boxes have been piled upon the pallet, flexible binders 44 are applied about the several boxes for binding them together as a unit. Flexible binders 45 are applied in the other direction about the boxes, such binders 45 extending also about the cross bar of the pallet. In this way the load and the pallet are connected into unit form so as to be handled conveniently by means of a crane or a lifting fork, as may be desired. As will be appreciated, the tines of a lifting fork can be inserted underneath the boxes either longitudinally of the cross bars or longitudinally of the runners so as to make the pallet and its load readily accessible from any side.

It has been found in practice that the arrangement as described is very effective so as to reduce to a minimum the likelihood of damage in the course of handling the boxes or crates loaded on the pallet.

In Fig. 7 a modified form of construction is shown in which U-clips 46 are substituted in place of the U-clips 25 and 26 of the construction as shown in Fig. 2. The difference between the two arrangements is that the clips 46 are connected to the cross bars by means of a single pin or nail 47 at each arm of the clip as compared with the arrangement shown in Fig. 2 in which two pins 48 are employed. The use of the two pins or bolts 48 may be preferred in some constructions so as to hold the clips from swinging into gripping relationship to the cross bars. It has been found, however, that the arrangement as shown in Fig. 7 is highly effective and can be more easily and quickly assembled.

Referring now to Figs. 9 to 19, inclusive, in which a modified arrangement is shown, the construction is the same as that shown in Figs. 1 and 2 except for the connections between the several parts. The means employed in connection with the arrangement of Figs. 1 to 8 for connecting the cross bars to the runners are not shown, since they are not visible from the outside and may be of any suitable type for effecting a rigid connection. The connectors of a different type employed in the arrangement of Figs. 9 to 19 are shown and will now be described.

In Fig. 9, runners 46 and 47 at one side, runners 48 and 49 at the other side, and intermediate runners 50 and 51 correspond to the runners of the structure shown in Figs. 1 and 2, except for the connecting means as hereinafter described. In like manner, cross bars 52 to 63, arranged in pairs, correspond to the cross bars of the structure of Fig. 1. The runners 50 and 51 are provided with U-clips 64 for slidably connecting them together, and the cross bars of each pair are provided with U-clips 65 for slidably connecting them together. The runners 46 and 47 and the runners 48 and 49 are to be connected together in adjusted position with respect to each other

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by the same type of devices as those shown in Figs. 1 to 6.

In lieu of the permanent and rigid connections between the runners and the cross bars as described above in connection with Figs. 1 to 6, a different type of connection is employed. The cross bars 53, 61 and 62 are pivotally connected with the runners 49, 51 and 47, respectively, by means of bolts 66, as shown in Fig. 16, such bolts being preferably in the form of lag screws having their head portions countersunk. In the arrangement shown, pressure distribution plates or washers 67 are provided in openings in the runners and cross bars for strengthening the structure and protecting the wooden parts from wear. The arrangement is such that the parts are strongly connected and that they can readily pivot with respect to each other.

All of the cross bars, other than cross bars 53, 61 and 62, are connected with the respective runners in accordance with the description as above set forth by means of bolts 68 which are readily removable, wear plates or washers 69 and 70 being employed in connection with each of the plates, as is clearly shown in Fig. 17. In the preferred arrangement, as shown in Figs. 17, 18 and 19, each of the wear plates 70 is provided with a semi-circular opening 71 therethrough, through which a correspondingly shaped portion 72 of one of the bolts 68 may be inserted, the bolt being notched at one side (see Fig. 19) so as to permit it to be rotated through 90° after insertion through the plate 70 for bringing the end portion 72 into engagement with said plate 70 for holding the bolt securely in operative position.

With the parts connected together as shown in Fig. 9, the operation is the same as that above described in connection with Figs. 1 to 6, the skid being adjustable to larger or smaller sizes as may be required for accommodating loads of different sizes. When the skid is to be shipped back without a load, the means for securing the skid parts in their adjusted positions are removed, together with all of the bolts 68. The cross bars 62 and 63 are then swung into position parallel with the runner 47 as shown in Fig. 14, the cross bars 52 and 53 into position parallel with the runner 49 as shown in Fig. 12, and the cross bars 60 and 61 into position parallel with the runners 50 and 51 as shown in Fig. 13, thus preparing three unit assemblies for ready shipment. These three units may then be bundled with the runners 46 and 48 with the three pairs of cross bars 54 and 55, 56 and 57, and 58 and 59 into some such condition as is shown in Fig. 15, in which flexible metal bands 73 and 74 are employed in the form of loops tightened about the parts for holding them bound compactly together for shipment.

While the form and arrangement of the parts as illustrated are preferred, the invention is not to be restricted to such arrangement except so far as the claims may be so limited, it being understood that changes might well be made in the construction without departing from the spirit of the invention.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In an adjustable pallet, the combination of two runners side by side in spaced relation to each other, a set of cross bars in spaced relation to each other secured to one of said runners and extending toward the other runner, a second set of cross bars in correspondingly spaced relation

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to each other secured to said other runner and extending toward said one runner, and means slidably connecting said cross bars in pairs comprising U-clips carried by the several cross bars with the clip of each cross bar extending about the other cross bar of the same pair so as to make the pallet adjustable in size longitudinally of the cross bars.

2. In an adjustable pallet, the combination of two runners side by side in spaced relation to each other, a set of cross bars in spaced relation to each other secured to one of said runners and extending toward the other runner, a second set of cross bars in correspondingly spaced relation to each other secured to said other runner and extending toward said one runner, means slidably connecting said cross bars in pairs for making the pallet adjustable in size longitudinally of the cross bars, and adjustable means comprising a link connected with one of said runners and having a series of openings therealong adapted to engage at any one of said openings with a pin movable with the other of said runners for holding said runners at the desired adjusted distance from each other.

3. In an adjustable pallet, the combination of two runners side by side in spaced relation to each other, a set of cross bars in spaced relation to each other secured to one of said runners and extending toward the other runner, a second set of cross bars in correspondingly spaced relation to each other secured to said other runner and extending toward said one runner, means slidably connecting said cross bars in pairs for making the pallet adjustable in size longitudinally of said cross bars, a third runner positioned between said first named two runners in parallelism therewith and connected with one of said sets of cross bars at about their end portions so as to afford intermediate support for the cross bars when in extended position, and adjustable means for releasably connecting said third runner at the desired adjusted distance from the first named runner with respect to which said third runner is movable, said adjustable means comprising a link connected with one of said runners and having a series of openings therealong adapted to engage at any one of said openings with a pin carried by the other of said runners.

4. In an adjustable pallet, the combination of two runners side by side in spaced relation to each other, a set of cross bars in spaced relation to each other secured to one of said runners and extending toward the other runner, a second set of cross bars in correspondingly spaced relation to each other secured to said other runner and extending toward said one runner, means slidably connecting said cross bars in pairs for making the pallet adjustable in size longitudinally of the cross bars, and adjustable means comprising a link releasably connected with one of said runners by means of a U-bolt extending in horizontal position through the runner and the link, said link having a series of openings therealong adapted to engage at any one of said openings with a pin movable in vertical position with the other of said runners so as to hold said runners at the desired adjusted distance from each other.

5. In an adjustable pallet, the combination of two runners side by side in spaced relation to each other, a set of cross bars in spaced relation to each other secured to one of said runners and extending toward the other runner, a second set of cross bars in correspondingly spaced relation to each other secured to said other runner and

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extending toward said one runner, means slidably connecting said cross bars in pairs for making the pallet adjustable in size longitudinally of said cross bars, a third runner positioned between said first named two runners in parallelism therewith and connected with one of said sets of cross bars at about their end portions so as to afford intermediate support for the cross bars when in extended position, a link connected with one of said first named runners and having a series of openings therealong, a pin carried by said third runner adapted by engagement with a selected one of said openings in the link to hold said first named runner at the desired adjusted distance from said third runner, and a second link connecting said pin with the other of said first named runners for reinforcing and strengthening the structure.

6. In an adjustable pallet, the combination of a pair of runners at one side of the pallet movable longitudinally with respect to each other, a second pair of runners at the opposite side of the pallet also movable longitudinally with respect to each other, a series of cross bar means in spaced relation to each other connected between two selected runners at opposite sides of the pallet, another cross bar means connected between the other two runners at opposite sides of the pallet so as to be adjustable toward and from said first named cross bar means, and means for holding said runners in adjusted position longitudinally with respect to each other for controlling the effective size of the pallet.

7. In an adjustable pallet, the combination of a pair of runners at one side of the pallet movable longitudinally with respect to each other, a second pair of runners at the opposite side of the pallet also movable longitudinally with respect to each other, a series of cross bar means in spaced relation to each other connected between two selected runners at opposite sides of the pallet, another cross bar means connected between the other two runners at opposite sides of the pallet so as to be adjustable toward and from said first named cross bar means, a third pair of runners positioned between said first named two pairs of runners with one of the runners of said third pair connected with said first named cross bar means and with the other of the runners of said third pair connected with said second named cross bar means, means slidably connecting the runners of said third pair together, and means for connecting the runners at each side of the pallet rigidly to each other in adjusted positions longitudinally with respect to each other for controlling the effective size of the pallet.

8. In an adjustable pallet, the combination of a pair of runners at one side of the pallet movable longitudinally with respect to each other, a second pair of runners at the opposite side of the pallet also movable longitudinally with respect to each other, a series of pairs of cross bars in spaced relation to each other connected between two selected ones of said runners at opposite sides of the pallet, another pair of cross bars connected between the other two of said runners at opposite sides of the pallet so as to be adjustable toward and from said first named pairs of cross bars, one of the cross bars of each pair being connected with a runner at one side of the pallet and

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the other cross bar of said pair being connected with a runner at the opposite side of the pallet, and means for slidably connecting together the cross bars of each pair so as to enable the runners at one side to be moved toward and from the runners at the opposite side.

9. In an adjustable pallet, the combination of a pair of runners at one side of the pallet movable longitudinally with respect to each other, a second pair of runners at the opposite side of the pallet also movable longitudinally with respect to each other, a series of pairs of cross bars in spaced relation to each other connected between two selected ones of said runners at opposite sides of the pallet, another pair of cross bars connected between the other two of said runners at opposite sides of the pallet so as to be adjustable toward and from said first named pairs of cross bars, one of the cross bars of each pair being connected with a runner at one side of the pallet and the other cross bar of said pair being connected with a runner at the opposite side of the pallet, means for slidably connecting together the cross bars of each pair so as to enable the runners at one side to be moved toward and from the runners at the opposite side, a third pair of runners positioned between said first named two pairs of runners with one of the runners of said third pair connected with one of the cross bars of each of said first named pairs of cross bars and with the other of the runners of said third pair connected with one of the cross bars of said second named pair of cross bars, and means slidably connecting together the runners of said third pair of runners.

10. In an adjustable pallet the combination of a plurality of parallel runners arranged in spaced pairs, the runners of each pair lying side by side in longitudinally extensible and contractible relation to each other, and two sets of cross bars forming a load carrying platform between and supported by the runners, the bars of one set being secured to one runner and the bars of the other set being secured to the other runner.

11. In an adjustable pallet the combination of a plurality of parallel runners arranged in two outside and one intermediate pairs, the runners of each pair lying side by side in longitudinally extensible and contractible relation to each other, and two sets of cross bars forming a load carrying platform between and supported on the runners, the bars of one set being secured to one runner of one outside pair of runners and the bars of the other set being secured to one runner of the opposite outside pair of runners.

12. In an adjustable pallet the combination of a plurality of parallel runners arranged in two outside and one intermediate pairs, the runners of each pair lying side by side in longitudinally extensible and contractible relation to each other, and sets of cross bars forming a load carrying platform extending between and supported by the runners, some of the cross bars being secured to each of the runners of one outside pair of runners but not to either runner of the intermediate pair of runners and others of said cross bars being secured to one of the runners of the opposite outside pair of runners and to one of the runners of the intermediate pair of runners.

LE ROY WEISS.