

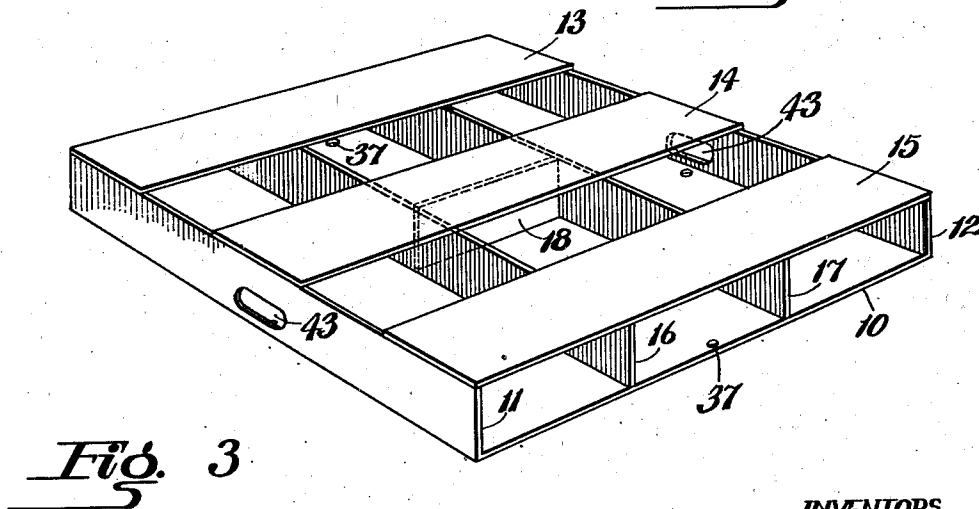
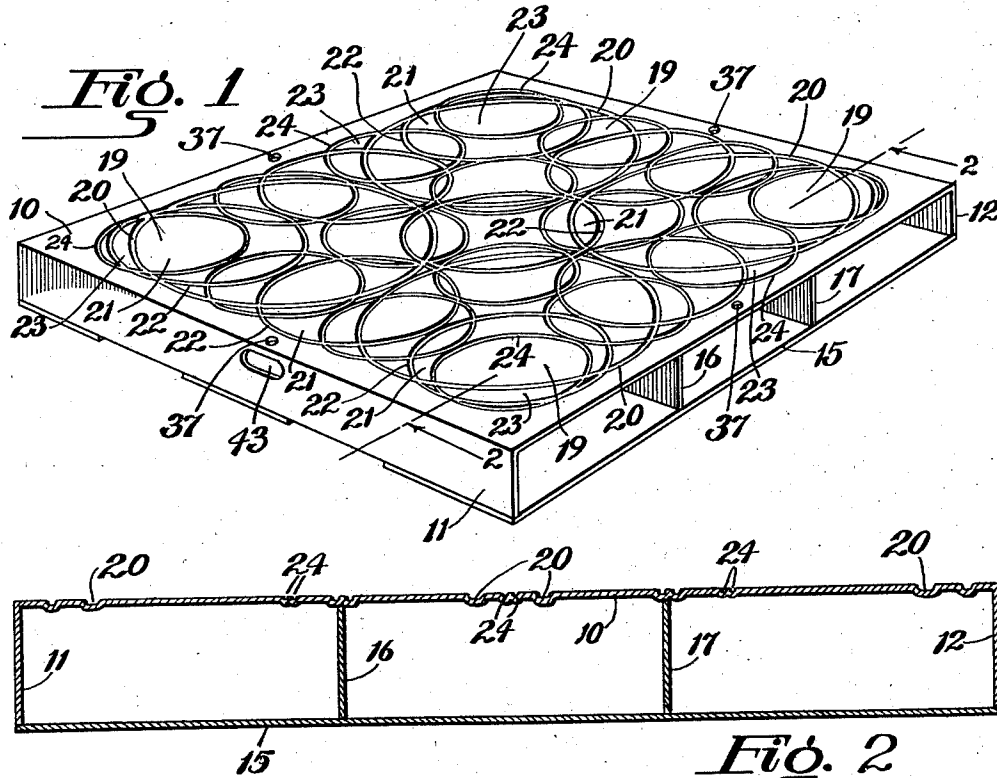
June 29, 1948.

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MATERIAL HANDLING PLATFORM

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4 Sheets-Sheet 1



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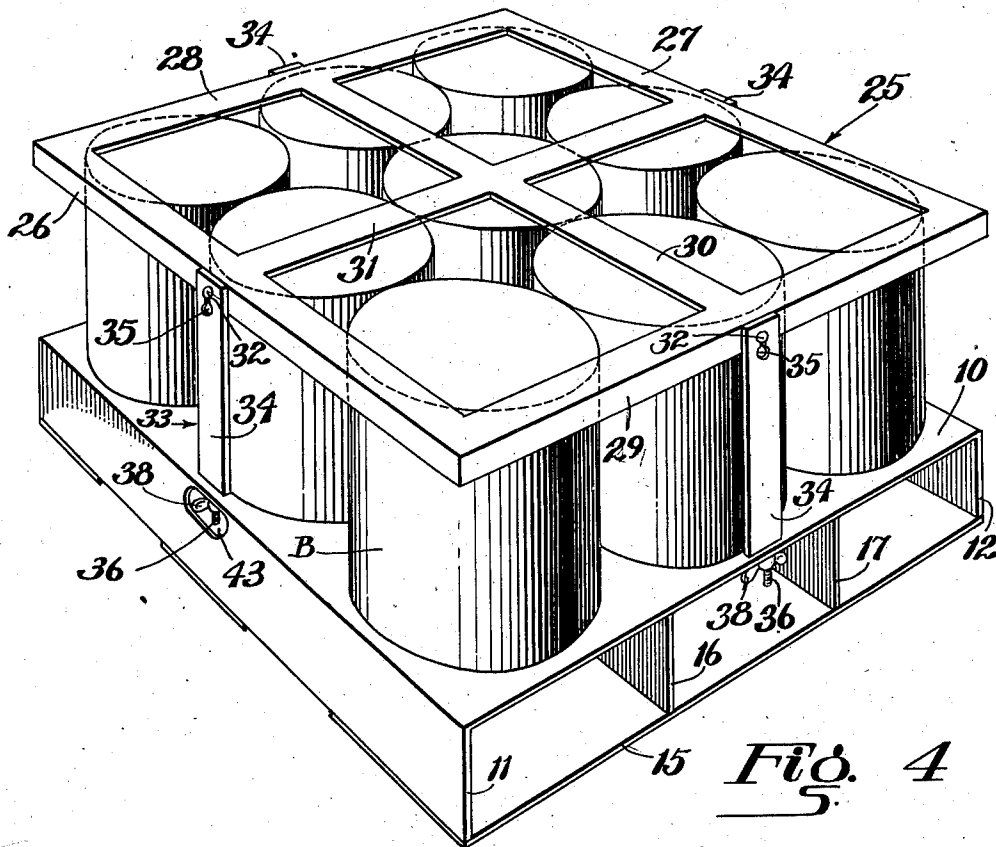
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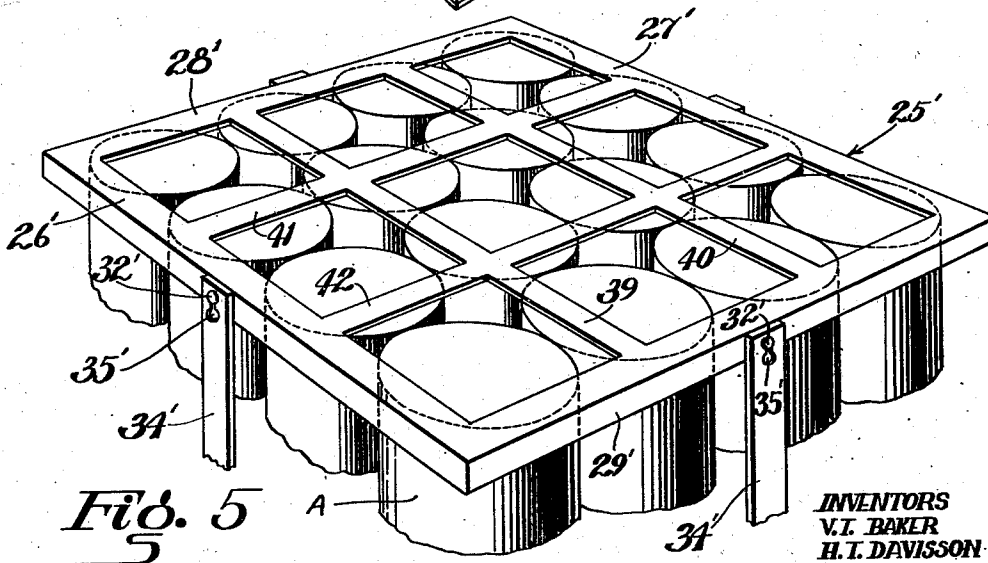
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*Fig. 4*



*Fig. 5*

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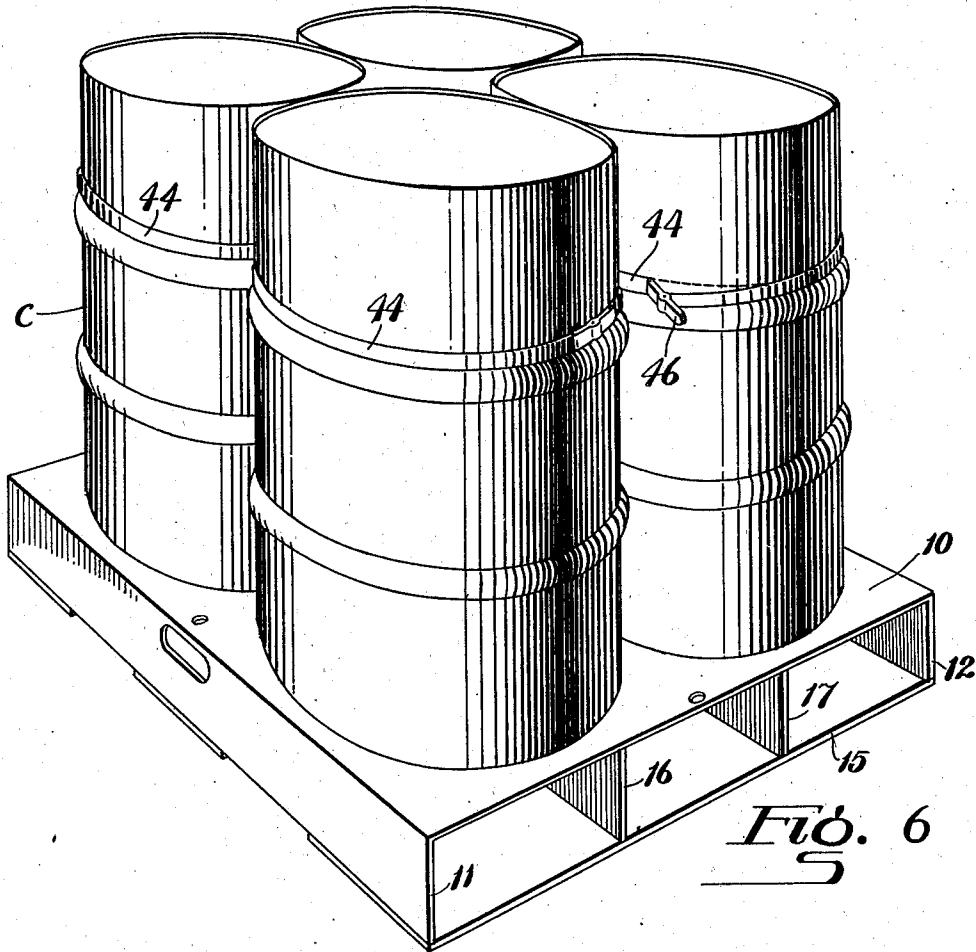
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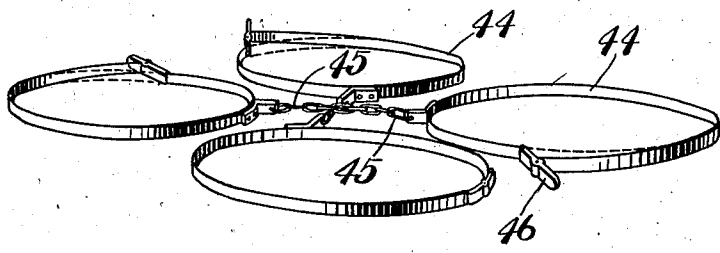
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*Fig. 6*



*Fig. 7*

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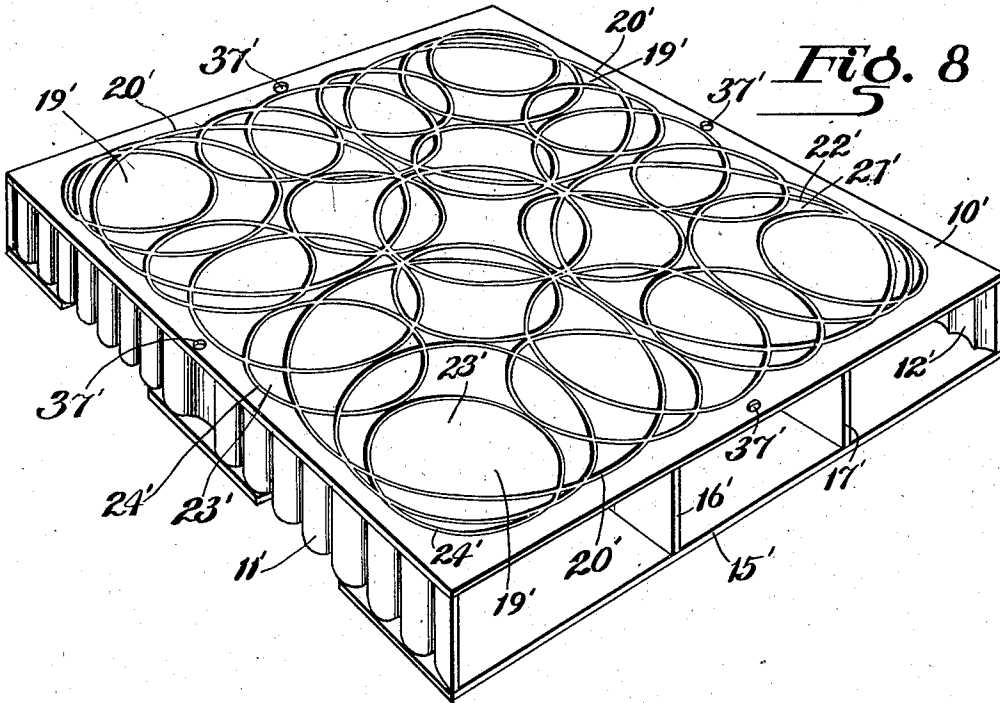


Fig. 8

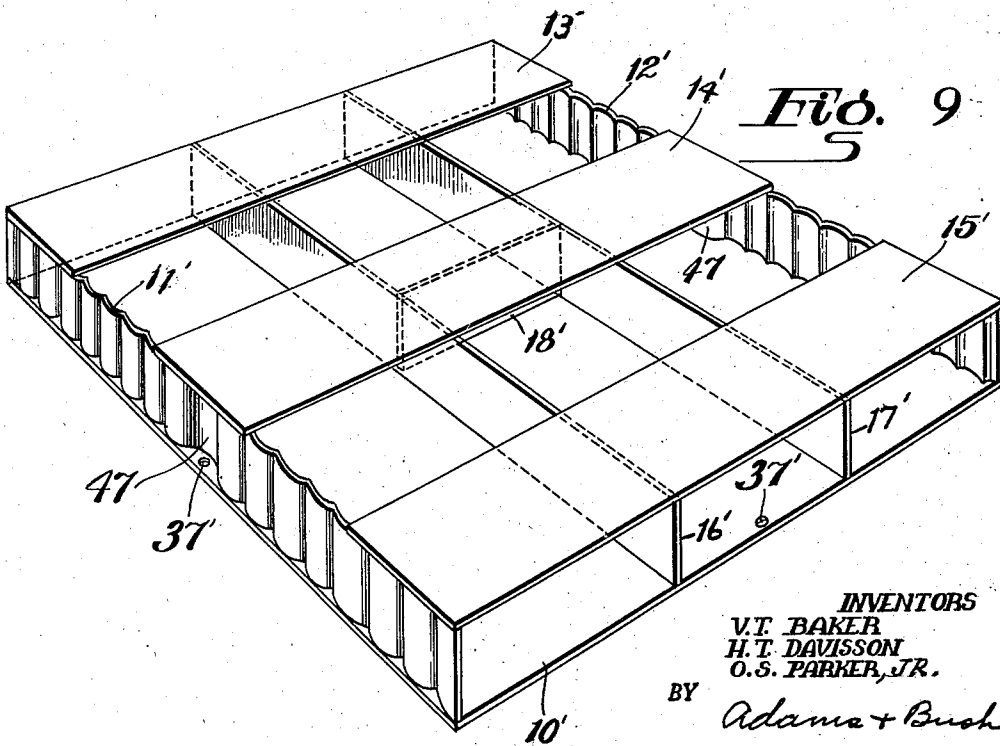


Fig. 9

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# UNITED STATES PATENT OFFICE

2,444,326

## MATERIAL HANDLING PLATFORM

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2 Claims. (Cl. 248—120)

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This invention relates to material handling platforms and has more particular reference to platforms adapted to handle material packaged in containers such as cans, buckets, or drums, etc.

One object of the invention is to provide a load supporting platform having an upper surface provided with a plurality of retaining means located thereon according to a predetermined pattern, whereby said platform may be used to support and retain thereon various sizes and types of articles or containers.

Another object of the invention is to provide a packing device including a load-supporting platform as above characterized and means adapted to engage and enclose the upper portions of the articles or containers on the platform and cooperate with the retaining means formed on the upper surface of the platform for unitizing the platform and the load supported thereon.

Another object of the invention is to provide a packing device as characterized above wherein the means adapted to engage and enclose the upper portions of the articles or containers on the platform include a rack, detachably and adjustably connected to the platform.

Another object of the invention is to provide a pallet construction having a platform as characterized above.

A further object of the invention is the provision of a pallet of the character described, which is easy and inexpensive to manufacture and strong and durable in operation.

Other objects and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawings, in which:

Fig. 1 is a perspective view of a pallet constructed in accordance with the present invention;

Fig. 2 is a vertical sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a perspective view showing the bottom of the pallet shown in Fig. 1;

Fig. 4 is a perspective view of the pallet shown in Fig. 1, but showing the platform loaded with cylindrical containers and held in place by a rack member detachably connected to the pallet;

Fig. 5 is a perspective view of a modified form of rack for holding cylindrical containers on the pallet;

Fig. 6 is a perspective view of the pallet of Fig. 1,

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1, showing the pallet supporting a load of drums held together by means of interlocking hoops;

Fig. 7 is a perspective view showing the details of construction of the interlocking hoops shown in Fig. 6;

Fig. 8 is a perspective view of a modified form of pallet having corrugated sides; and

Fig. 9 is a perspective view showing the bottom of the pallet shown in Fig. 8.

Referring now to the drawings, there is shown in Fig. 1, a pallet including a substantially rectangular load supporting platform or deck member 10, preferably formed of sheet metal and having its side end portions bent downwardly forming side walls or stringers 11 and 12. The bottom of the pallet comprises a plurality of transversely extending spaced plates 13, 14 and 15 preferably formed of sheet metal and having their ends secured to the bottom edges of the side walls 11 and 12, preferably by welding. A spaced pair of vertical reinforcing members or cross-supports 16 and 17, preferably formed of sheet metal, extend longitudinally of the deck 10 and have their upper and lower edges secured, as by welding, to the under surfaces of the plates 13, 14 and 15 and the deck member 10, respectively. A third reinforcing member 18, preferably formed of sheet metal, is located between the deck 10 and the plate 14 and has its upper and lower edges secured to the inner surfaces of these plates and its end edges secured to the vertical longitudinal plates 16 and 17, preferably by welding, all as clearly shown in Fig. 3.

The load supporting platform or deck 10 is particularly adapted to support articles or containers provided with a flange or rim around their bottom edges and is provided with means adapted to engage the flanges or rims of the articles or containers to prevent lateral movement of the articles or containers relative to the platform.

In the particular embodiment shown, the upper surface of the load supporting platform or deck 10 has formed therein, preferably by pressing or stamping, a plurality of perimetric or area bounding grooves or recesses formed according to a predetermined pattern. The grooves or recesses enclose areas of the upper surface of the platform and form a plurality of groups of areas of predetermined size and shape, with each of the areas bounded by one of the grooves or recesses. The size and shape of each area and its bounding groove or recess is designed to accommodate the type of article or container to be stored thereon. When the article or con-

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tainer is supported on the area, the bottom flange or rim of the article or container is received in and engages the groove or recess whereby lateral movement of the article or container relative to the platform is prevented. The relationship between the size and number of areas in each group is such that each group of areas substantially covers the upper surface of the platform. The relative size and shape of one area to another are identical with respect to intragroup areas, but preferably vary with respect to intergroup areas.

The pattern of perimetric recesses or grooves and groups of areas formed on the upper surface of the platform comprises a group of four large areas 19, each bound by a circular recess 20 adapted to receive the bottom flange or rim of a large cylindrical container such as a 54 gallon steel drum supported on the area 19; a group of nine intermediate size areas 21, each bound by a circular recess 22 adapted to receive the bottom flange of an intermediate size cylindrical container such as a 100 lb. grease container, supported on the area 21; and a group of sixteen small areas 23 each bound by a circular recess 24 adapted to receive the bottom flange of a small size container such as a 5 gallon bucket, supported on the area 23. Each group of areas 19, 21 and 23 substantially covers the upper surface of the platform and each area in each group is of identical size and shape, as shown in Fig. 1. The width and depth of the various sized recesses are made to dimensions to receive the flanges of the particular size containers which they are designed to receive.

The foregoing construction permits the pallet to be used for the storage and transportation of various sizes and types of articles or containers with the articles or containers retained on the platform by the engagement of their flanges or rims in the recesses, as shown in Figs. 4 and 6.

In Fig. 4 there is shown nine 100 lb. cylindrical containers or drums B mounted on the deck of the pallet with their bottom flanges mounted in and received by the nine intermediate size circular recesses 22. In Fig. 5, sixteen 5 gallon drums A are shown assembled and as they would appear when mounted on the pallet with their bottom flanges mounted in and received by the sixteen small size circular recesses 24. In this view, the pallet is not shown and the bottom portions of the cams are broken away. In Fig. 6 there is shown four 54 gallon drums C mounted on the deck of the pallet with their bottom flanges mounted in and received by the four large size circular recesses 20.

In addition to the recesses or grooves formed in the upper surface of the supporting platform or deck, the present invention provides additional means adapted to engage the upper portions of the articles or containers supported by the platform and cooperate with the recesses to hold the articles or containers on the platform. One type of such means is shown in Fig. 4, and comprises a substantially rectangular frame or rack 25 formed of end members 26, 27 and side members 28, 29, preferably formed of four pieces of angle iron welded together; a transverse cross piece 30 having its ends secured to the frame, and a longitudinal cross piece 31 having its ends secured to the frame. The transverse and longitudinal cross pieces 30 and 31 are preferably made of sheet metal and may be made as a single piece in the form of a cross, if desired. Each of the end members 26, 27 and the side

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members 28, 29 has a headed projection or lug 32 formed thereon, intermediate of its ends.

Means are provided for holding the frame or rack 25 in place on the containers; in the particular embodiment illustrated, the holding means includes a plurality of hold-down straps or members 33, each strap consisting of an elongated flat strip 34, preferably made of sheet metal, having a keyhole shaped keeper slot 35 formed in its upper end and having an integral threaded rod 36 formed on its lower end. The keeper slot 35 readily permits attachment and detachment of the strap to and from the frame 25, the headed projections 32 being received in and projecting through the holes in the keeper slots 35 and being held in locked position when the shanks of the projections move upwardly into the slots of the keeper slots 35. The threaded ends 36 of the straps 34 project through openings 37 formed in the deck 10 and have butterfly nuts 38 threaded thereon. By adjusting the nuts 38, the frame 25 may be firmly and securely pulled downwardly onto the tops of the containers. The foregoing construction provides a solid, compact unit pallet load so that the pallet and its contents can be handled, stored and shipped as one package.

The modified form of hold-down rack shown in Fig. 5, is identical to that shown in Fig. 4 and described above, with the exception of the provision of additional transverse and longitudinal cross pieces. The modified form comprises a frame 25' formed of end pieces 26', 27' and side pieces 28', 29', a spaced pair of transverse cross pieces 39, 40 and a spaced pair of longitudinal cross pieces 41, 42. The frame is held on top of the containers and detachably and adjustably connected to the deck of the pallet by means of hold-down straps 34' having keyhole shaped keeper slots 35' formed in their upper ends adapted to engage headed projections or lugs 32' formed intermediate of the ends of the end and side pieces 26', 27', 28' and 29'. The bottom ends of the straps 34' are identical in construction to the bottom ends of the hold-down straps 34 and are adapted to project through the openings 37 formed in the deck 10 and have butterfly nuts threaded on their ends, by means of which the frame is adjustably secured to the pallet deck. The side walls 11, 12 of the pallet are each provided with an elongated opening 43 to provide access to the butterfly nuts. Obviously, a similar type of hold-down rack could be used to hold large sized drums such as those shown in Fig. 6. However, a preferred type of attachment for holding large size drums is shown in Figs. 6 and 7. In the particular embodiment shown, the attachment comprises two separate sets of two adjustable rings or hoops 44, the two rings in each set being connected together by a flexible connecting member such as chain 45.

Each of the rings or hoops 44 is made to a diameter slightly larger than the drum which it engages and is adapted to be contracted on the drum by any suitable means, such as an ordinary pivoted eccentric locking lever 46. The rings in each set are applied to diagonally opposed drums on the pallet with the chains crossing each other. With the two ring sets crossing each other as they do when applied to the drums, as described above and shown in Fig. 7, they solidify the load and form a virtually inseparable unit with the pallet. No tie-down or connecting link to the pallet is required beyond this attachment, since the weight of the drums and the recesses

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containing the bottom drum flanges do not allow the drums to shift on the pallet.

In Figs. 8 and 9 there is shown a modified form of pallet construction. This pallet is similar to that shown in Figs. 1 and 2, with the exception that the side walls or stringers are formed as separate pieces rather than being formed integral with the deck, as is the pallet shown in Figs. 1 and 2. In addition, the side walls or stringers are corrugated to provide additional rigidity and strength. The pallet shown comprises a substantially rectangular supporting platform or deck 10'; a pair of corrugated side plates or stringers 11', 12'; a bottom formed by a plurality of transversely extending spaced plates 13', 14' and 15' having their ends secured to the bottom edges of the side walls 11', 12', as by welding; a spaced pair of vertical reinforcing members or cross-supports 16', 17' extending longitudinally of the deck 10' and having their upper and lower edges secured, as by welding, to the under surfaces of the plates 13', 14', 15' and the deck 10', respectively, and a reinforcing member 18', located between the deck 10' and the plate 14' and having its upper and lower edges secured, as by welding, to the inner surfaces of these plates and its end edges secured, as by welding, to the vertical longitudinal plates 16', 17', all as clearly shown in Figs. 8 and 9. The corrugated side plates 11', 12' are each provided intermediate their ends with an enlarged corrugation 47 to facilitate the adjustment of the butterfly nuts threaded on the bottom ends of the hold-down straps. The deck 10' is provided with openings 37' for the reception of the threaded ends of the hold-down straps. The upper surface of the loading platform or deck 10' is provided with a pattern of perimeter recesses or grooves and groups of areas identical in construction and purpose as the recesses and areas formed in the upper surface of the deck 10 of the pallet shown in Fig. 1. The pattern comprises a group of four large areas 19', each bound by a circular recess 20'; a group of intermediate size areas 21', each bound by a circular recess 22'; and a group of sixteen small size areas 23', each bound by a circular recess 24'.

From the foregoing, it will be seen that there is herein provided a packing device for unitizing pallet loads, which facilitates the palletized storage and shipment of any item packaged in drums, cans, pails or similar containers, without resort to strapping or banding to secure the pallet load as a unit.

Although the particular embodiments of the pallet herein shown and described are particularly adapted for use with articles and containers having flanged bottom edges, obviously, articles or containers having flat bottoms, or bales or bags, can be stored and transported on the pal-

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lets; the recesses and grooves in such instances only contribute to the strength of the pallet and do not interfere with the storage of such articles or containers.

5 While the principle of recessing in pattern has been described and illustrated as applied to the upper surface of a pallet platform, obviously, such principle and construction can be employed on the upper surface of platform lifts, skids, or any type of load supporting platform.

10 And, while the areas have been shown as round areas bound by circular recesses or grooves, obviously, the areas can be made of any desired shape, such as rectangular, oblong, triangular, etc., with the bounding recess or groove having the same shape in outline.

15 Obviously, the invention is not restricted to the particular embodiment thereof herein shown and described. Moreover, it is not indispensable that all the features of the invention be used conjointly, since they may be employed advantageously in various combinations and sub-combination.

What is claimed is:

25 1. A portable material supporting platform adapted to support articles or containers having flanges formed on their bottom edges, said platform having an upper surface provided with a plurality of recesses formed therein according to a predetermined pattern, said recesses enclosing areas of said upper surface and forming a plurality of groups of areas of predetermined size and shape with each of said areas bounded by one of said recesses and adapted to support a flanged article with the flange engaged in the recess, the relationship between the size and number of areas in each group being such that each group of areas substantially covers the upper surface of said platform.

30 2. A portable material supporting platform as set forth in claim 1, wherein the recesses formed in the upper surface comprise groups of intersecting circular grooves of different diameters to accommodate the flanges of substantially cylindrical articles of different sizes.

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