

April 11, 1950

S. C. PORTER

2,503,562

NESTING METAL PALLET

Filed March 6, 1947

5 Sheets-Sheet 1

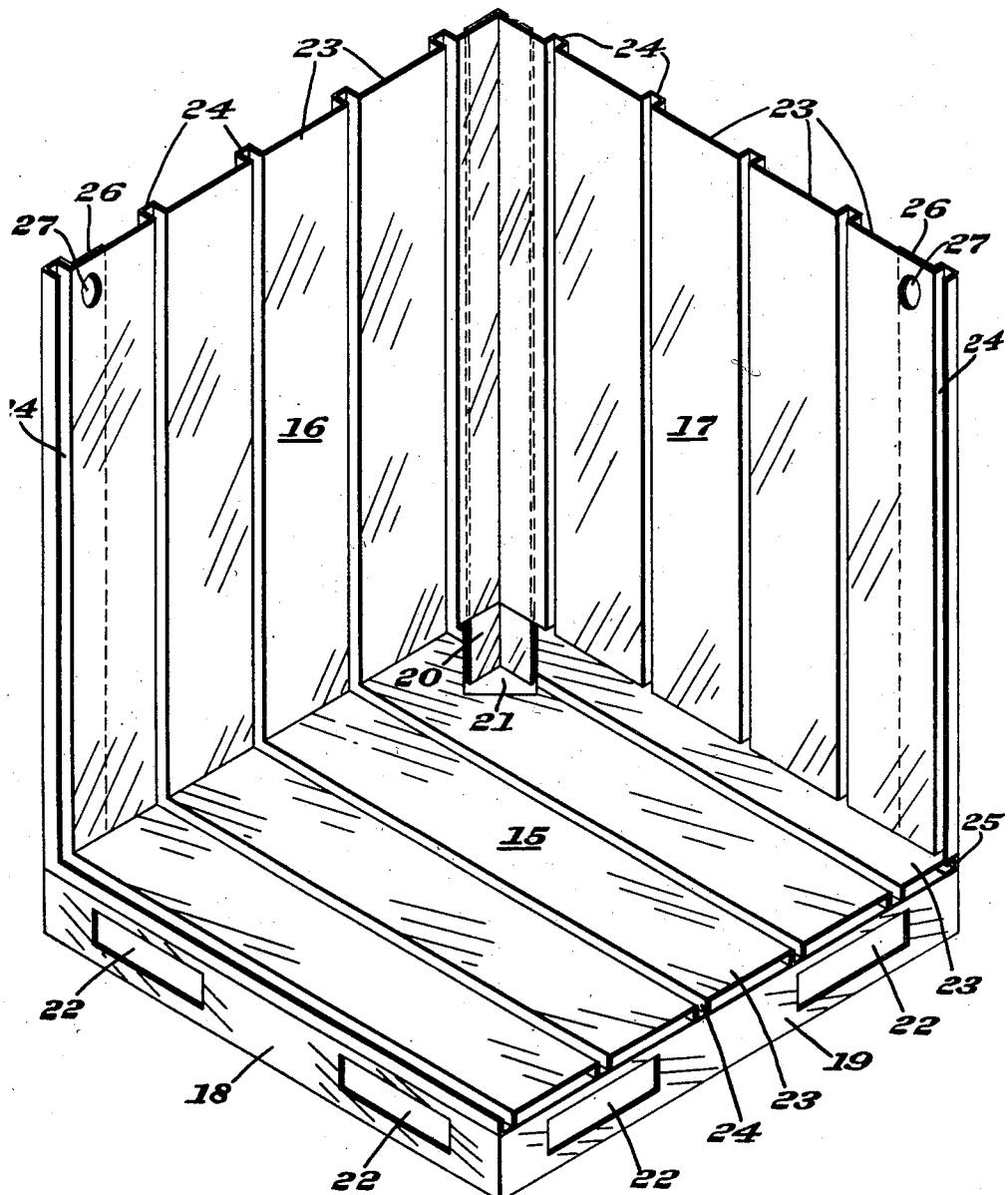


Fig. 1

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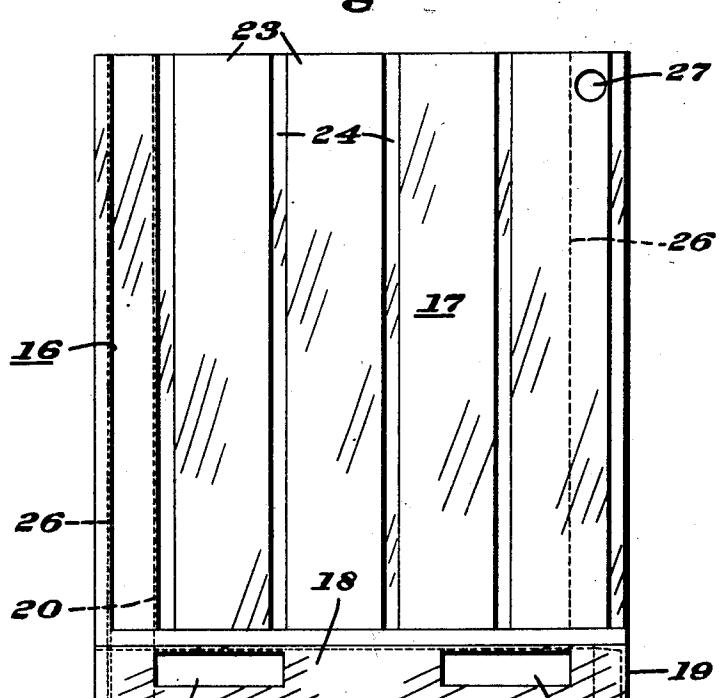
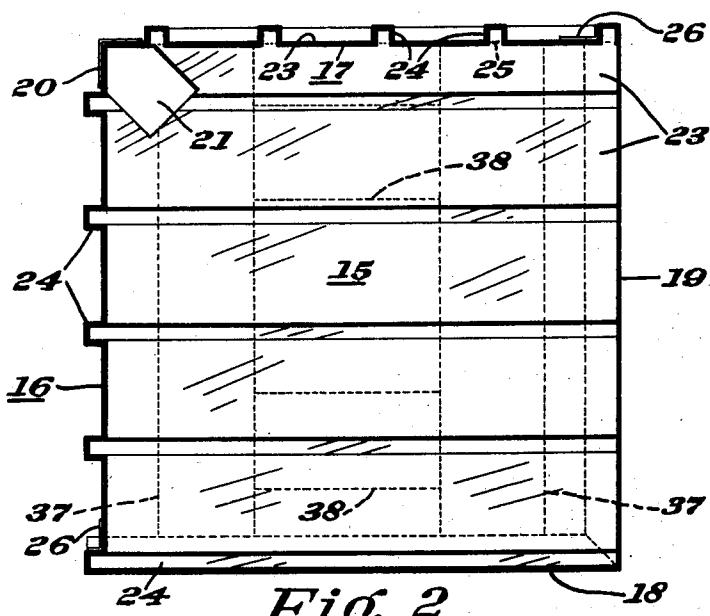
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5 Sheets-Sheet 2



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NESTING METAL PALLET

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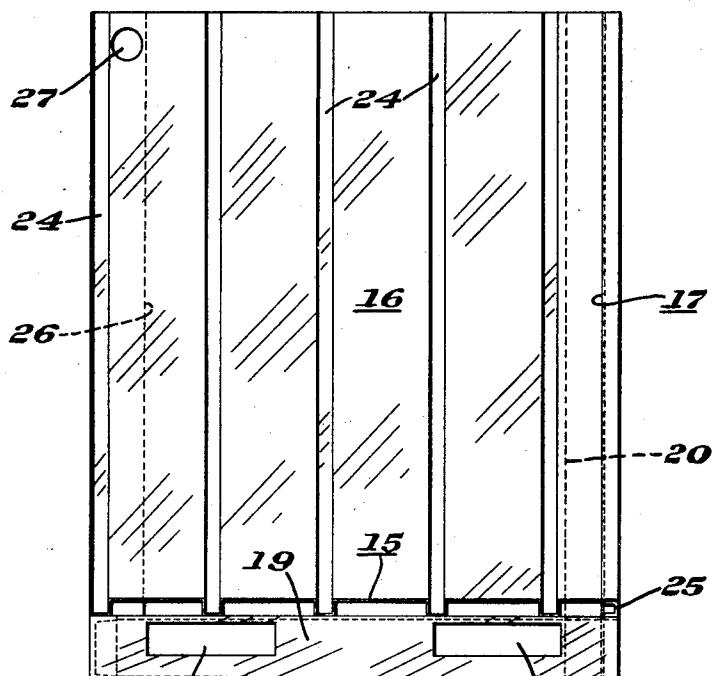


Fig. 4

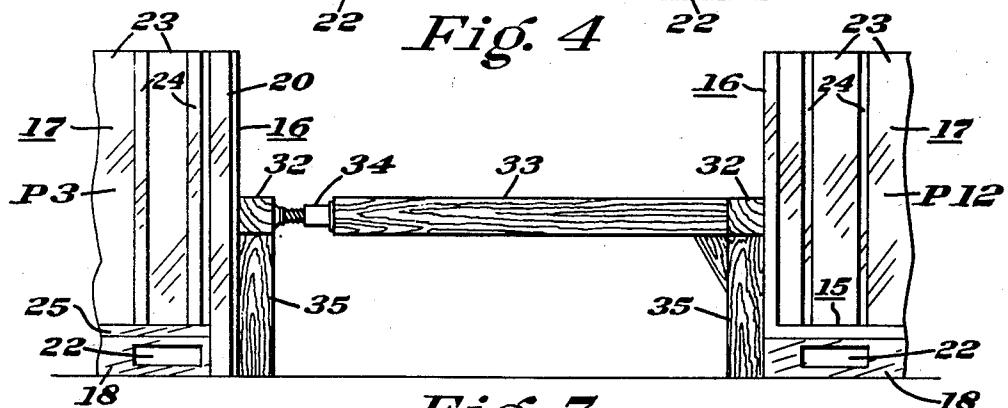


Fig. 7

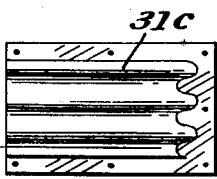


Fig. 8



Fig. 9

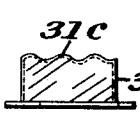


Fig. 10

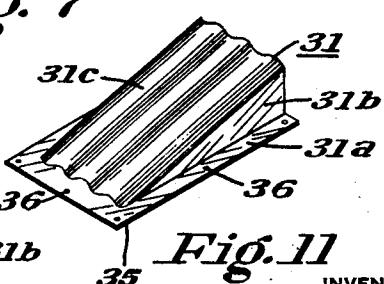


Fig. 11
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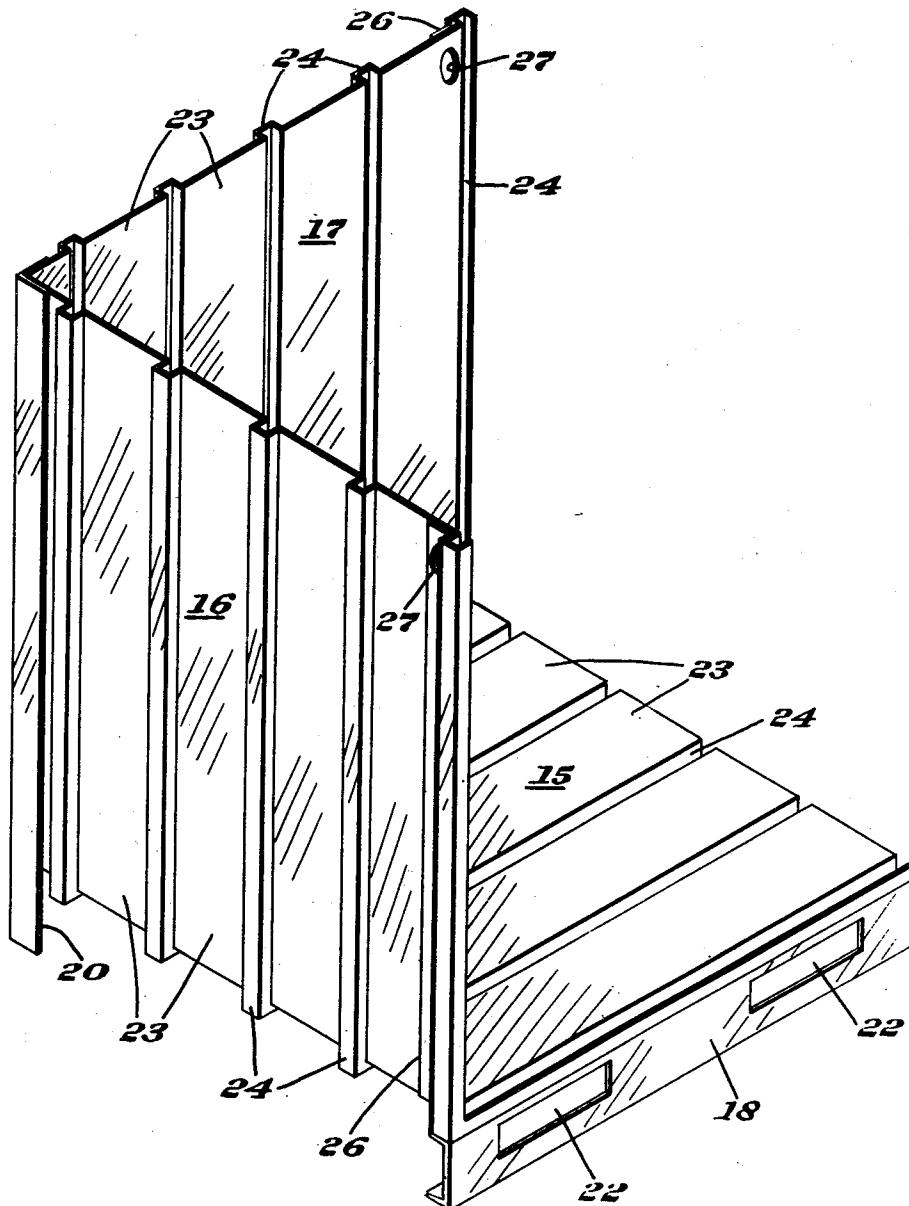


Fig. 5

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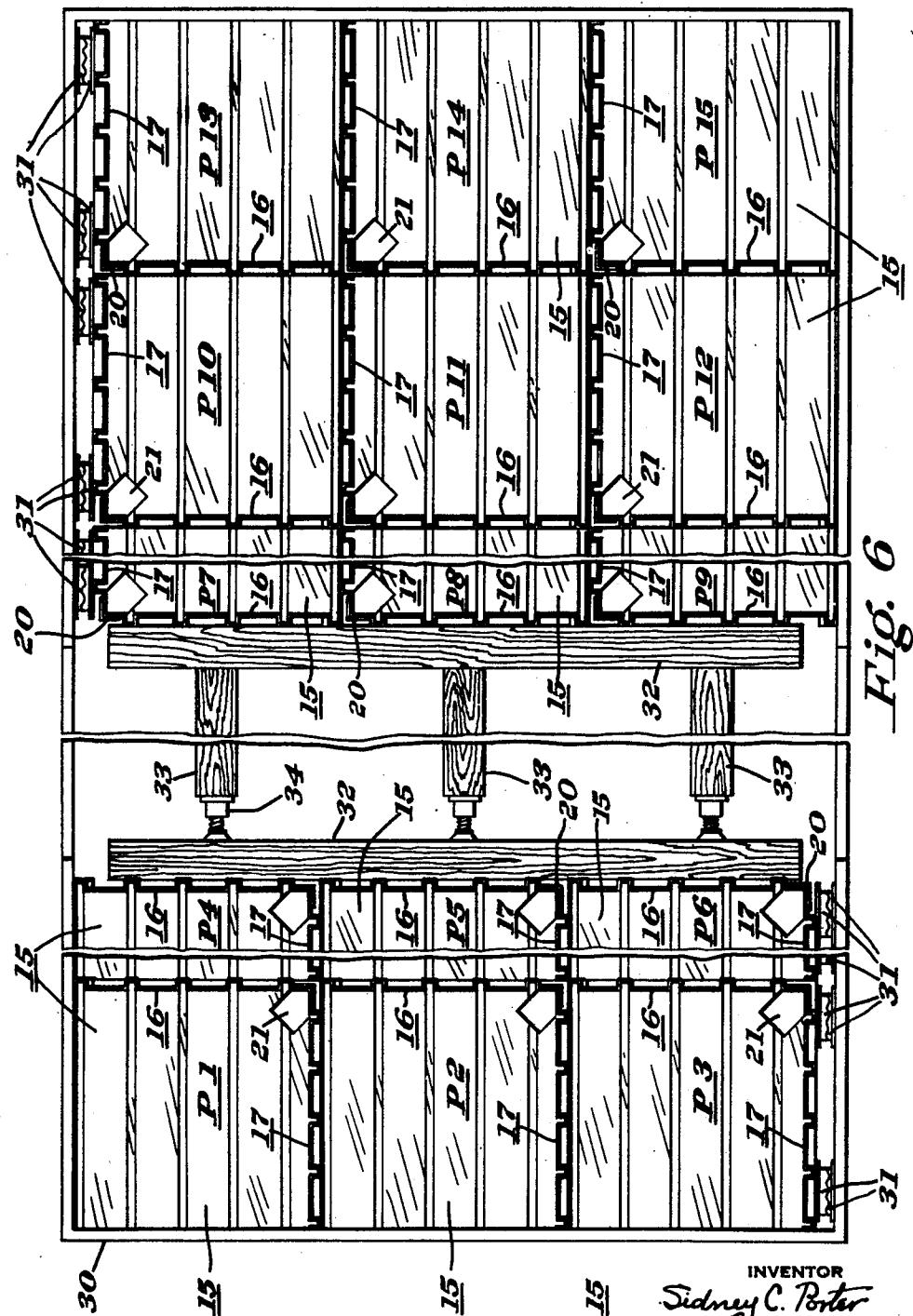
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NESTING METAL PALLET

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5 Sheets-Sheet 5



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UNITED STATES PATENT OFFICE

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NESTING METAL PALLET

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Application March 6, 1947, Serial No. 732,694

7 Claims. (Cl. 248—120)

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This invention relates in general to load-carrying mechanisms and in particular to pallets for use in supporting relatively small articles and for holding the same in position during their transportation in a railway car or other similar vehicle.

An object of the invention is to produce a loading pallet which is strong and durable, is capable of withstanding shocks and strains encountered during transportation, is so formed that it is capable of cooperating with other pallets in absorbing thrusts, strains and stresses occasioned by quick starts, stops and changes in direction of motion during transportation and is capable of being nested with similar pallets for return shipment, after being unloaded.

It is well recognized that small articles are likely to move independently during shipment in vehicles such as railway cars. This is particularly objectionable with heavy articles, such as bricks, which, because of their weight, are likely to move through the end of the car in which they are loaded when the car is either started or stopped too quickly. That is to say, the mass action of such merchandise may damage or even wreck the transporting vehicle where a large bulk of such articles is involved and where the inertia effect of individual articles throughout the mass of articles may supplement that of other articles. Because of difficulties of this type, the practice has grown up of employing loading or shipment pallets which, in effect, act as a container for a relatively small number of articles and thus eliminate, to some extent, the mass effect of the articles in response to a quick start or a quick stop or a sudden change in the direction or rate of movement.

An object of the present invention is to produce a loading pallet which is rigid, strong and durable but which involves a minimum of material in its make-up, is capable of being readily loaded and unloaded and is so formed that it cooperates with other pallets in segregating the articles carried thereby into relatively small groups and in preventing the mass effect of such articles by absorbing the strains occasioned by the inertia of the articles in resisting movement while stationary and in resisting a change in the rate or direction of movement while in motion.

A further object is to produce a loading pallet of the character described which is not only capable of being effectively nested with other similar pallets, for return shipment after being unloaded, but which is effectively secured to those pallets with which it is nested, so as to prevent

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objectionable independent or relative movement as between nested pallets.

A further object is to produce a simple and effective pallet which is capable of being easily loaded and unloaded and which is capable of cooperating with similar pallets in assembling a load-carrying structure such that each pallet reinforces adjacent pallets in producing a substantially continuous load-carrying platform and in resisting transportation strains and stresses and in absorbing the same so as to neutralize or minimize the mass effect of the load carried by the cooperating pallets.

15 A further object is to produce a three-sided metal pallet which is strong and durable, is easily loaded and unloaded and is capable of being effectively nested with other similar pallets to facilitate shipment when unloaded.

These and other objects are attained by means 20 of mechanisms embodying the features herein described and illustrated in the drawings accompanying and forming a part hereof.

In the drawings:

25 Figure 1 is an isometric view of a pallet embodying my invention looking into the pallet.

Figure 2 is a plan view of the pallet shown in Figure 1.

Figure 3 is a side elevation of the pallet looking in the direction of the arrow in Figure 2.

30 Figure 4 is a side elevation of the pallet looking in a direction at right angles to that indicated by the arrow of Figure 2.

Figure 5 is an isometric view of the pallet shown in Figure 1 and so taken as to disclose the 35 external face of the near upright wall constituting a part of the pallet.

Figure 6 is a diagrammatic view, portions being 40 broken away for convenience of illustration, showing the relative arrangement of cooperating pallets and reenforcing structure when assembled in load-carrying relationship in transportation vehicles such as railway cars.

Figure 7 is a diagrammatic side elevation of 45 pallets and supporting structure such as are illustrated in Figure 6.

Figures 8, 9 and 10 are respectively plan view, side elevation and rear view of a locking wedge for use in securing pallets in place in a transportation vehicle when the pallets are assembled to form a load-carrying structure.

Figure 11 is an isometric view of the wedge shown in Figures 8, 9 and 10.

The pallet embodying my invention consists of three major portions, viz., a rectangular floor structure and two upright wall structures secured

to the floor structure and extending along adjacent edges thereof. In the preferred embodiment of my invention, the floor structure is square, and is provided with a supporting structure for supporting it in an elevated position on a floor or platform such as the floor of a railway car. The support structure includes, together with other elements, at least one leg which is adapted to perform the double function of a support and of a member which may be employed as an interlocking member in securing two or more pallets in nested relationship when the same are unloaded. The support structure is so formed with relation to the floor structure, as to facilitate the handling of the loaded pallets or nested pallets by a lift truck and also to contribute to the effective nesting of unloaded pallets.

Referring to the drawings: Each pallet consists essentially of a substantially rectangular floor structure 15 and two upright walls 16 and 17 which are secured to the floor structure, extend along adjacent edges thereof and are secured together at their adjacent edges. In the illustrated embodiment, the pallet is provided with a support structure which includes support members 18, 19 and 20. Each of the support members 18 and 19 is shown in the form of a structural channel. Each is secured to the floor structure 15 and the two members extend along adjacent edges of the floor structure. Their abutting ends are preferably secured together by any suitable means such as welding. The support member 20 is shown in the form of an angle bar which extends along the adjacent edges of the upright walls 16 and 17 and, by being secured to those walls, rigidly holds them in fixed position with relation to each other. The member 20 is preferably secured to the walls 16 and 17 by welding. It extends downwardly below those walls so that its lower edge is located in the plane defined by the lower edges of the support members 18 and 19. The floor structure 15 is provided with a slot 21 located immediately adjacent the member 20. In the illustrated embodiment, this slot extends diagonally of the floor structure, is of sufficient width to receive a support member similar to the member 20 and is of such length that several such members may be received thereby in the operation of nesting unloaded pallets.

Each of the support members 18 and 19 is provided with a rectangular slot 22 which is formed in the web portion thereof and extends longitudinally of the member. Each of these slots is adapted to receive the forwardly projecting extension or fork of a lift truck and slots are so located that two such trucks may simultaneously engage either of the members 18 or 19. A reference to Figure 5 will disclose that the two sides of the pallet, opposite those fitted with the support members 18 and 19, are open below the floor structure 15 so that one or more lift trucks may be employed on one such side during the operation of moving either a loaded or unloaded pallet or a nest of pallets.

The floor structure and each of the two side walls are made of steel or other suitable metal and are, in effect, corrugated, thus adding strength to the pallet. The corrugating effect is accomplished in the illustrated embodiment by fabricating the floor structure and each of the side walls from metal plates 23 and channel irons 24. The plates and channels are alternately arranged and are preferably secured together by welding.

In a structure such as illustrated, each of the plates 23 of the floor structure may be bent at

right angles, as shown in Figures 1 and 5, so that it not only forms a part of the floor structure but also forms a part of the side wall 16. The channels 24 of the floor structure may likewise be bent so that each constitutes a part of the side wall 16. This, however, is not essential to my invention and it will, of course, be understood that the channels and plates of the side wall 16 may be separately formed as shown, for example, in connection with the side wall 17. Under such conditions, the abutting ends of the channels 24 of the floor structure and the side wall 16 will be secured together by welding or in any other suitable manner.

As shown, one end plate 23 of the floor structure is secured along its edge to a channel 25 which, in turn, is secured to the support members 18 and 20. The plates 23 and channels 24 of the side wall 17 are preferably secured to the floor structure by welding. Each side wall is shown as reinforced by an angle bar 26. These angle bars extend along the end channels and one leg thereof is secured to such channels, preferably by welding. The other leg is secured to the adjacent plate 23. Each end plate is provided near the top with an eye or aperture 27 for receiving a crane hook during the operation of handling either the loaded or unloaded pallets. Each eye 27 is so positioned in the plate that it is also formed in the adjacent leg of the angle bar 26.

By employing similar three-sided pallets such as illustrated, I am able to assemble a load-carrying structure from these pallets which, in effect, provides a continuous metal load-carrying platform and an arrangement of upright walls which segregates the load carried by each pallet from that carried by every other pallet and, in effect, provides continuous partitions extending in spaced relation both along and across the assembled load-carrying platform. That is to say, pallets such as illustrated may be employed in constructing a load-carrying structure wherein the pallets cooperate to, in effect, form a continuous load-carrying platform which is traversed both lengthwise and crosswise by spaced partitions. Each of these partitions is, in effect, continuous so that each side wall of each pallet, employed in the assembled structure, cooperates with side walls of adjacent pallets in providing struts which extend lengthwise and crosswise of the assembled load-carrying platform. These struts are effective in transmitting thrusts which are occasioned by shocks and strains resulting from transportation conditions.

As previously noted, each of the pallets illustrated as the now preferred embodiment of my invention is provided with a substantially square floor structure, the length and width of which is about, but a little less than, one-third the width of the ordinary railway freight car. In Figure 6, I have diagrammatically illustrated such a freight car with portions broken away for convenience of illustration. Figure 6 also illustrates a method of employing the pallets so as to produce an assembled structure such as I have previously described.

As there illustrated, a loaded pallet p1 is fitted into one corner of the car 30 and is so located with relation to the adjacent end and side walls of the car that its side or upright walls 16 and 17 and the adjacent walls of the car form a compartment which is, in effect, surrounded by four upright walls. A pallet p2 is then so located in the car that its floor structure, in effect, forms a continuation of the floor structure of the pallet

p1. It is also so positioned with relation to the pallet *p1* and the end wall of the car that its upright walls *16* and *17*, together with the upright wall *17* of the pallet *p1* and the end wall of the car, form a four-sided load-carrying compartment. The pallet *p3* is similarly located with relation to the end wall of the car and the pallet *p2*. Under such conditions, the three pallets cooperate to form, in effect, a continuous load-supporting platform extending across the car and divided into three parts by vertically extending partitions, i. e., the upright walls *17*. The cooperation of the side walls *16* of the three pallets, in effect, forms a transverse strut extending from one side wall of the car toward the other.

In Figure 6, I have shown the three pallets, *p1*, *p2* and *p3* secured against transverse movement with relation to the car by means of two wedges *31*, such as are illustrated in Figures 8 to 11, inclusive. By such an arrangement, the side walls *16* of the three cooperating pallets are effective as a strut in transmitting thrusts transversely of the car so that they are absorbed by one or the other side wall of the car.

In loading a freight car, a sufficient number of pallets will be included in the assembled load-carrying structure to fully load the car while leaving a loading aisle which extends across the car between the side doors thereof. Thus, each end of the car when fully loaded will contain a number of rows of pallets such as any one of the rows *p1*, *p2*, *p3* or *p10*, *p11*, *p12*. In Figure 6, the pallets are arranged at one end of the car so that one side wall of the car cooperates to form a closing wall for end pallets of each row, whereas at the other end of the car, the other side wall performs this function. Under such conditions, the positioning wedges *31* engage one side wall of the car at one end of the car and the other side wall at the other end of the car.

In Figure 6, I have also disclosed the use of a spreader structure made up of cross timbers *32* and spreaders *33*. Each spreader *33* is shown as provided with a cooperating screw jack *34* for normally placing the spreaders under compression and thus firmly positioning the pallets in place in opposite ends of the car. In Figure 7, the spreader structure is illustrated as located above the floor of the freight car and as held in position by means of posts *35*. It will be understood that wedges *31* may be employed instead of the spreader structure for the purpose of securing the pallets against longitudinal movement relatively to the freight car.

As illustrated in Figures 8 to 11, each wedge may be fabricated from metal plate material. As there shown, the wedge consists of a base plate *31a*, side walls *31b* and a wall *31c* which is inclined with relation to the base plate and terminates on the base plate at one end. This wall *31c* is preferably corrugated, as shown, primarily for the purpose of positioning the wedges of a cooperating pair with relation to each other. As to this, it is noted that freight cars vary in width. For this reason, a wide car will necessitate replacing each of the wedges *31*, as illustrated in Figure 6, by a pair of cooperating wedges.

It will be noted that the base plate *31a* of each wedge is provided with nailing apertures *36*. Where a pair of cooperating wedges is employed, one wedge of each cooperating pair is preferably secured to the side wall by means of nails and is so positioned that its broad end is down. Under such conditions, the cooperating wedge is dropped to place between the wedge on the side

wall of the car and the adjacent upright wall of a pallet. As a preliminary to dropping the wedge to place, it is so positioned that its base will engage the side wall of the pallet and its narrow end is down. The corrugations in the faces *31c* of the cooperating wedges of each pair interlock and thus prevent lateral relative movement of the wedges of each pair.

From the foregoing, it will be apparent that the wedges *31* may be secured to the floor of the freight car and so positioned as to replace the spreader structure previously described. It, however, will be apparent that where a spreader structure, as illustrated, is employed, the upright walls *17* of the various pallets included in an assembled structure, cooperate to form spaced longitudinal struts which are effective in transmitting thrust to one or the other end walls of the car, as the case may be.

In removing the pallets from a vehicle, such as a freight car, the spreaders or the substitute structures are first removed. The wedges *31* between each transverse row of pallets and the side wall of the car are removed as a preliminary to moving the pallets of such transverse row. Lift trucks can be conveniently employed for moving the loaded pallets both into and out of transportation vehicles and where cranes are available, they may also be employed for moving the loaded pallets from place to place after removal from the vehicle.

In Figure 2, I have shown reenforcing plates secured to the underside of the floor structure of the pallet. These plates extend longitudinally and transversely of the pallet and are particularly adapted to cooperate with the forks of lift trucks, during the operation of moving a pallet. As shown in Figure 2, each pallet may be provided with two reenforcing plates *37* which extend parallel to each other in spaced relationship and are so located on the pallet that they are engaged by the fork of a lift truck during the operation of moving the pallet with such a truck. Transverse plates *38* are located in spaced relationship and are positioned between the plates *37*. It will be noted that the plates *37* are so positioned that each is engaged by the fork of a lift truck inserted through an adjacent aperture *22*.

After the pallets are unloaded, they may be readily nested. The nesting operation is simple and merely consists in locating the floor structure of one pallet on that of another in such relationship that the supporting leg *20* of the superimposed pallet extends into the slot *21* of the supporting pallet. Two or more pallets may, in this manner, be nested together and it will be apparent that the side walls *16* and *17* and also the support members *18* and *19* contribute to this nesting operation. The interengagement of the legs *20* of the nested members with the slots *21* of other pallets of the nest, in effect, secure the pallets in nesting position with relation to each other.

From the foregoing it will be apparent that the three-sided pallet of my invention has the advantage of being readily loaded and unloaded because the load-carrying floor thereof is accessible from the top and two sides. It also has the advantage of strength and durability with a minimum of weight. This is occasioned by the fact that the upright sides are rigidly secured to the floor structure, are rigidly secured together, are reenforced along their adjacent edges and are reenforced along their free vertical edges. In addition, the upright sides of each pallet cooperate

with those of other pallets in the assembled load-carrying structure.

A further advantage results from the structural features which contribute to the easy nesting of the unloaded pallets. The fact that each pallet is three-sided, is provided with at least one support member in the form of a leg and the floor structure is apertured immediately adjacent such leg, contributes to the ease of nesting the unloaded pallets. In the illustrated embodiment, the fact that the continuous support members 18 and 19 extend at right angles to each other and are located diagonally across from the support member (leg) 20 and the aperture 21, also contributes to the ease of nesting and gives some degree of permanency to each nest of two or more unloaded pallets. This is due to the fact that the relationship of the legs 20 and the slots 21 is such, in a nest of two or more pallets, as to substantially interlock the nested pallets. In addition, the support members 18 and 19 of different pallets of a nest overlap each other and, with the upright walls 16 and 17, limit relative motion between adjacent pallets of the nest.

While I have illustrated but one embodiment of my invention, it will be apparent to those skilled in the art that various changes, additions and omissions may be made therein without departing from the spirit and scope of my invention as defined by the appended claims.

What I claim is:

1. A loading pallet comprising a substantially rectangular floor structure; two contiguous upright wall structures extending along contiguous sides of said floor structure rigidly secured thereto and rigidly secured to each other; a supporting leg secured to and extending below said floor structure and located at one corner thereof and additional supports for said structure spaced from said leg, said floor structure having a slot formed therein adjacent to said leg and adapted to receive the corresponding leg of a similar pallet.

2. A three sided car-loading pallet comprising a substantially rectangular floor structure having a leg-receiving aperture formed therein adjacent one corner thereof; two contiguous side walls rigidly secured to said floor structure and extending substantially at right angles to each other and to said floor structure and along the two contiguous edges thereof adjacent said aperture; a supporting leg for said pallet extending along and secured to the adjacent edges of said side walls and projecting below said floor structure at the corner thereof adjacent said aperture; and two supports for said pallet secured to the two contiguous edges of said floor structure remote from said aperture.

3. A three sided car-loading pallet, comprising a substantially rectangular floor structure having a leg-receiving aperture formed therein adjacent one corner thereof; two contiguous side walls rigidly secured to said floor structure and to each other and extending substantially at right angles to each other and to said floor structure along the two contiguous edges of the floor structure adjacent said aperture; a supporting leg for said pallet located at the corner of said floor structure adjacent said aperture; and two continuous supports for said pallet rigidly secured to said floor structure and extending along the two contiguous edges of the floor structure remote from said aperture.

4. A shipping assembly composed of empty car-loading pallets nested together; each such pallet consisting of a rectangular floor structure having

a leg-receiving aperture formed therein adjacent one corner thereof, two contiguous side walls rigidly secured to the floor structure and to each other and extending substantially at right angles to each other and to said floor structure and along the two contiguous edges of the floor structure adjacent said aperture, and a supporting structure secured to said floor structure and including at least one supporting leg; said pallets being located in superimposed relationship in the assembly, with each side wall of each supporting pallet located adjacent to and overlapping a side wall of a superimposed pallet and with the supporting leg of each superimposed pallet engaging the aperture in the floor structure of the supporting pallet.

5. A shipping assembly composed of empty car-loading pallets nested together; each such pallet consisting of a substantially rectangular floor structure having a leg-receiving aperture formed therein adjacent one corner thereof, two contiguous side walls secured to said floor structure and to each other and extending substantially at right angles to each other and to said floor structure and along the two contiguous edges of the floor structure adjacent said aperture, a supporting leg for said floor structure located at the corner thereof adjacent said aperture and a separate support for said floor structure secured to each of the two contiguous edges of the floor structure remote from said aperture; said pallets being located in superimposed relation one to the other, with each upright wall of each supporting pallet overlapping an upright wall of a superimposed pallet, with the supporting leg of each superimposed pallet engaging the leg-receiving aperture of a supporting pallet and with each separate support of a superimposed pallet overlapping a separate support of a supporting pallet.

40 6. A three sided car-loading pallet, composed of a substantially rectangular loading platform having a leg-receiving aperture formed therein, two contiguous upright wall structures extending along and rigidly secured to contiguous edges of said platform, each such structure extending substantially at right angles to said platform and to the other structure, and supports for said platform rigidly secured thereto, one such support being in the form of a leg located adjacent said aperture.

7. A three sided car-loading pallet, composed of a substantially rectangular loading platform having a leg-receiving aperture formed therein adjacent to one corner thereof; two contiguous upright wall structures extending along and rigidly secured to contiguous edges of said platform and supports for said platform rigidly secured thereto and extending downwardly therefrom, one such support extending upwardly above said platform along the contiguous edges of said wall structures and rigidly secured to both such structures.

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