Feb. 23, 1960 L. F. SKUBIC 2,925,920

VERTICALLY ADJUSTABLE PALLET RACK

Filed March 22, 1957

Fig. 1

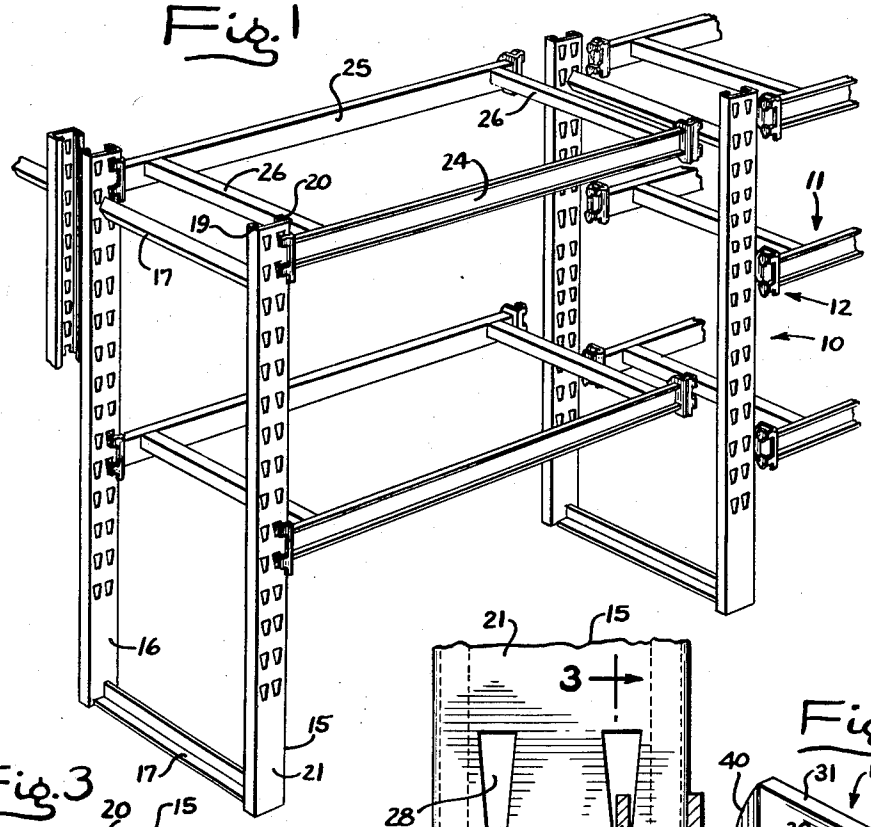


Fig. 3

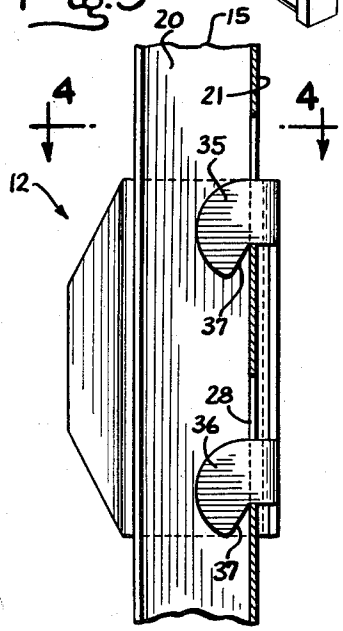


Fig. 2

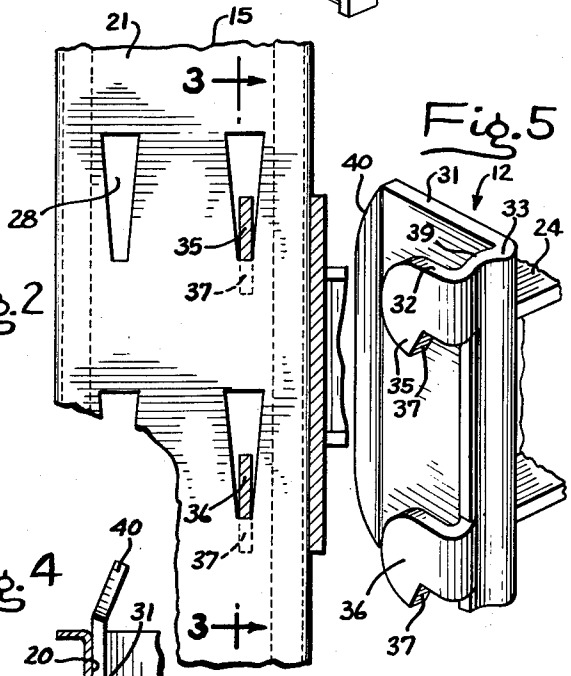
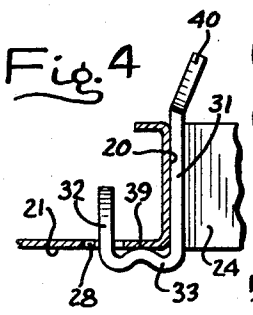


Fig. 5

Fig. 4



INVENTOR
LEROY F. SKUBIC

by: Carlson, Pitzner, Hubbard & Wolfe
ATTYS.

United States Patent Office 2,925,920 Patented Feb. 23, 1960

2,925,920

VERTICALLY ADJUSTABLE PALLET RACK

Leroy F. Skubic, Beverly Shores, Ind., assignor to The Paltier Corporation, Michigan City, Ind., a corporation of Illinois

Application March 22, 1957, Serial No. 648,487

2 Claims. (Cl. 211—147)

The present invention relates to pallet racks and finds particular utility in material handling and storage applications such as in supply depots and similar facilities.

One object of the present invention is to provide an improved pallet rack which is easily assembled or dismantled and which, when assembled, affords a strong rigid structure capable of supporting heavily loaded pallets and the like.

Another object of the present invention is to provide an improved pallet rack having the foregoing characteristics which is susceptible of complete assembly without the use of fastening devices such as nuts and bolts.

A further object of the present invention is to provide an improved pallet rack of the foregoing type which is simple and economical to manufacture, which is light in weight, and which will support a heavy load without shaking and wobbling.

Other objects and advantages of the present invention will become apparent as the following description proceeds, taken in connection with the accompanying drawings, wherein:

Figure 1 is a perspective view of a pallet rack, partially disassembled, and embodying features of the present invention.

Fig. 2 is a vertical section view through a shelf-supporting bracket and illustrating the engagement of the bracket with a vertical post.

Fig. 3 is a section view taken substantially in the plane of line 3—3 of Fig. 2, and further illustrating the engagement between a shelf bracket and a vertical post.

Fig. 4 is a section view taken substantially in the plane of line 4—4 of Fig. 3.

Fig. 5 is an isometric representation of a shelf bracket useful in accordance with the present invention.

While an illustrative pallet racks has been shown in the drawing and will be described below in considerable detail, it should be understood that there is no intention to limit the invention to the specific form disclosed, but on the contrary, the intention is to cover all modifications, alternative constructions, equivalents, and uses falling within the spirit and scope of the invention as expressed in the appended claims.

Turning now to the drawings, there is shown in Fig. 1 a portion of a pallet rack illustrative of the present invention. The rack is formed in sections or units and is constructed from a plurality of vertical generally rectangular post units **10** and has at least two horizontally extending generally rectangular shelf units **11** extending between two post units **10** and secured thereto by means of novel post-engaging brackets **12**. The rack is entirely self-supporting when the shelf units are inserted between and engaged with the post units by means of the brackets **12**. Furthermore, the use of bolts for supporting the post units is not necessary as the shelf units provide adequate horizontal support to the posts. The pallet racks constructed as hereinafter described are thus extremely stable and rigid and are well adapted for supporting heavy loads.

In order to rigidly support the shelf units **11**, the post units **10** are ruggedly constructed with two posts **15**, **16** alined one in front of the other and connected adjacent their ends with horizontal cross braces **17**. Each post is a generally rectangular channel-shaped member having one open face and being substantially U-shape in cross section (Fig. 4). The two side walls **19**, **20** of the posts form the legs of the U and are directed generally rearwardly, or in other words, towards the back of the pallet rack. The face **21** of the post **15** consists of the web or bight portion of the U-shaped channel post and faces generally forwardly of the rack when the rack is in the assembled position. The horizontal cross braces **17** joining the two vertical alined posts can comprise suitably shaped metal materials and are fastened between the two posts by welding or other appropriate means.

The shelf units **11** for mounting between pairs of post units **10** and for supporting loaded pallets or other articles are formed by a pair of parallel longitudinal members **24**, **25** joined by a pair of transverse members **26** of such a length that the longitudinal shelf members **24**, **25** will correspond to the post members **15**, **16** when the shelf is mounted between a pair of post units.

The shelves are designed and constructed of materials sufficiently strong for supporting a desired load. For example, there is shown in the drawings, a shelf unit in which the longitudinal members are generally channel-shaped in cross section with the transverse members being tubular and substantially rectangular in cross section. Alternatively, the longitudinal shelf members can be tubular or have an angle-shaped cross section. The transverse members are fixed by welding or by suitable means between the longitudinal members.

For purposes of mounting the shelf units between the post units, a novel bracket **12** is provided on each corner of a shelf unit and is engageable in vertically alined slots **28** provided in the face **21** of the vertical posts (Figs. 3, 4 and 5). While only a single bracket will be described, it should be understood that the others are substantially similar, although each bracket is formed according to the corner on which it is to be mounted, that is, some brackets will be left-handed and others will be right-handed.

Each bracket **12** comprises a channel-shaped member which is substantially U-shaped in cross section and which has side walls formed by parallel legs **31**, **32** joined together by a web or bight portion **33** forming the face of the bracket (Fig. 4). One leg **31** of the bracket is joined to the shelf unit at one corner thereof so that the legs of the bracket extend rearwardly of the shelf and with the web **33** directed forwardly. The bracket is attached to the shelf by welding or other suitable fastening means.

In order to engage in the slots **28**, the other leg **32** is formed with a pair of downwardly projecting hooks **35**, **36** vertically alined and spaced apart a distance substantially equal to the spaced apart distance of two vertically alined slots in the post units. For holding the bracket snugly against the post, the lower forward edge **37** of each of the hooks slopes rearwardly so that upon engagement with the bottom of the post unit slots **28** the hook is cammed inwardly of the post. The rearmost edges of the hooks are desirably rounded to facilitate insertion of the hooks into the slots.

For purposes of lending additional strength to the joint formed between the brackets and the posts, means are provided on the bracket for engagement with the vertical face **21** of the post when the hooks **35**, **36** of the brackets **12** have been inserted into the slots **28**. One illustrative means is shown in Fig. 5 and comprises a rearwardly

extending projection 39 formed on the web or bight portion 33 of the bracket. This projection 39 can be provided by deforming the bight of the bracket substantially along its length as shown in the drawings, or at spaced points, or by welding or otherwise attaching projecting buttons or members to the rearwardly directed face of the web or bight portion 33.

In order to afford a support for more than one shelf, the vertical posts are provided on their face 21 with a plurality of such slots 28 vertically alined and uniformly spaced. Additionally, provision is made for the construction of a series of rack sections by forming the slots in pairs, or in other words, in two columns, which may be engaged from either side of the post. In this manner shelf units can be attached to either side of the post units and accordingly, any number of rack sections can be attached together to form an extensive pallet rack covering a large floor area. Furthermore, as shown in Fig. 1, the pallet racks may be placed back-to-back and attached in any suitable manner such as for example, by inserting bolts and nuts through corresponding slots.

Pallet racks constructed as herein described are particularly well adapted to be loaded with extremely heavy loads by means of a fork truck or other heavy industrial lifting vehicle. For purposes of increasing the rigidity of the pallet racks and preventing them from shaking and wobbling as they are being loaded, the brackets afford an extremely tight and rigid engagement between the shelf units and the post units. Accordingly, the leg 31 of the bracket 12 attached to the shelf unit engages the adjacent side wall 20 of the post when the hooks 35, 36 are inserted in the slots 28. In order to pull the bracket leg 31 tightly against the side wall of the post, the slots 28 are tapered downwardly and inwardly so that the side edges of the slot cam the hooks away from the post wall and pull the bracket leg 31 towards the post wall. So that the bracket 12 is tightly engaged with the post unit, the lower corner of the slot 28 should be spaced from the adjacent side wall of the post a distance substantially equal to the internal distance between the legs of the bracket. In this way the bracket will fit tightly on the post when the hooks are engaged in the slots and are in the lowermost position. In this position the hooks will be inserted through the slots and extend downwardly into engagement with the rear of the face 21 while the projection 39 will be in substantial engagement with the front face of the post and the leg 31 will abut the side wall of the post and rest flat against it. To facilitate the engagement between the bracket and the post, the rearward end 40 of the leg 31 attached to the shelf unit is flared inwardly and away from the post.

It can be seen that there is provided a rigid pallet rack structure afforded by the novel bracket construction which engages the vertical post units and tightly holds the shelf units thereon. A substantially three-point engagement between the bracket 12 and each post is provided by the engagement of the slot edges by the hooks 35, 36, the face of the post by the projection 39 on the web or bight portion 33 of the bracket, and the post wall 20 by the leg 31 of the brackets as the hooks are cammed into position by the tapered slots 28.

The pallet rack described above is particularly well suited for knockdown type construction in which no bolts or other fastening elements are used and in which the shelf units provide the lateral support for the post units as well as the support for the materials and objects to be shelved. The improved pallet racks, although capable of being put together and taken apart without the use of tools other than a mallet or other hammer, provides a particularly strong and rigid rack capable of sustaining the heaviest loads without shaking and wobbling.

I claim as my invention:

1. In a pallet rack including four rectangularly spaced vertical support posts, each post having a front wall and a rearwardly extending side wall with said side walls facing each other, the front wall of each post having a series of vertically disposed regularly spaced tapered slots therein spaced from the side wall thereof, and a shelf fitting substantially completely between said posts, the improvement consisting of a post engaging bracket mounted on the shelf having a pair of parallel legs joined by a bight portion, one of said legs being secured to a corner of the shelf so that said legs extend rearwardly thereof, the other of said legs having a plurality of spaced downwardly extending hooks engageable in corresponding slots in an adjacent post for supporting the shelf thereon, said one leg having its rearmost end flared outwardly toward the shelf to which it is secured to facilitate engagement of the bracket with the post, and an inwardly directed projection on the bight portion of the bracket engageable with the wall of the post when the bracket is mounted thereon, said hooks being tapered so that a downward force on the bracket urges the projection tightly against the front of the post whereby the engagement of the respective tapered surfaces on the hooks and posts urges the bracket into rigid shelf supporting relationship with the post.

2. In a pallet rack including a shelf member and a plurality of posts mounting said shelf member, each post having a pair of spaced side walls joined together by a web portion having front and rear surfaces, the side walls of each post extending generally rearwardly and the web having at least one series of vertically disposed regularly tapered slots therein, the improvement consisting of a bracket mounted on said shelf member formed of a U-shaped member having parallel legs joined by a bight portion, one of said legs being fixed to said shelf and oriented to extend substantially rearward thereof, the other leg having formed thereon a pair of vertically disposed downwardly directed hooks engageable in a corresponding pair of the tapered slots on one of the posts, the bight portion of said bracket having an inwardly directed elongated projection thereon for engaging the front web surface of said post when the bracket is supported thereon, said hooks being tapered so that a downward force on the bracket urges the projection tightly against the front of the post and said one bracket leg being pulled into abutting relation with the adjacent side wall of the post upon engagement of the bracket hooks within the slots in the post whereby said shelf is rigidly supported on said posts.

References Cited in the file of this patent

UNITED STATES PATENTS

570,657	Beckwith	Nov. 3, 1896
1,213,304	Vance	Jan. 23, 1917
2,026,223	Donnelly	Dec. 31, 1935
2,577,276	Saul	Dec. 4, 1951
2,729,342	Saul	Jan. 3, 1956
2,772,846	Skar	Dec. 4, 1956
2,785,842	Phelps	Mar. 19, 1957
2,815,130	Franks	Dec. 3, 1957