

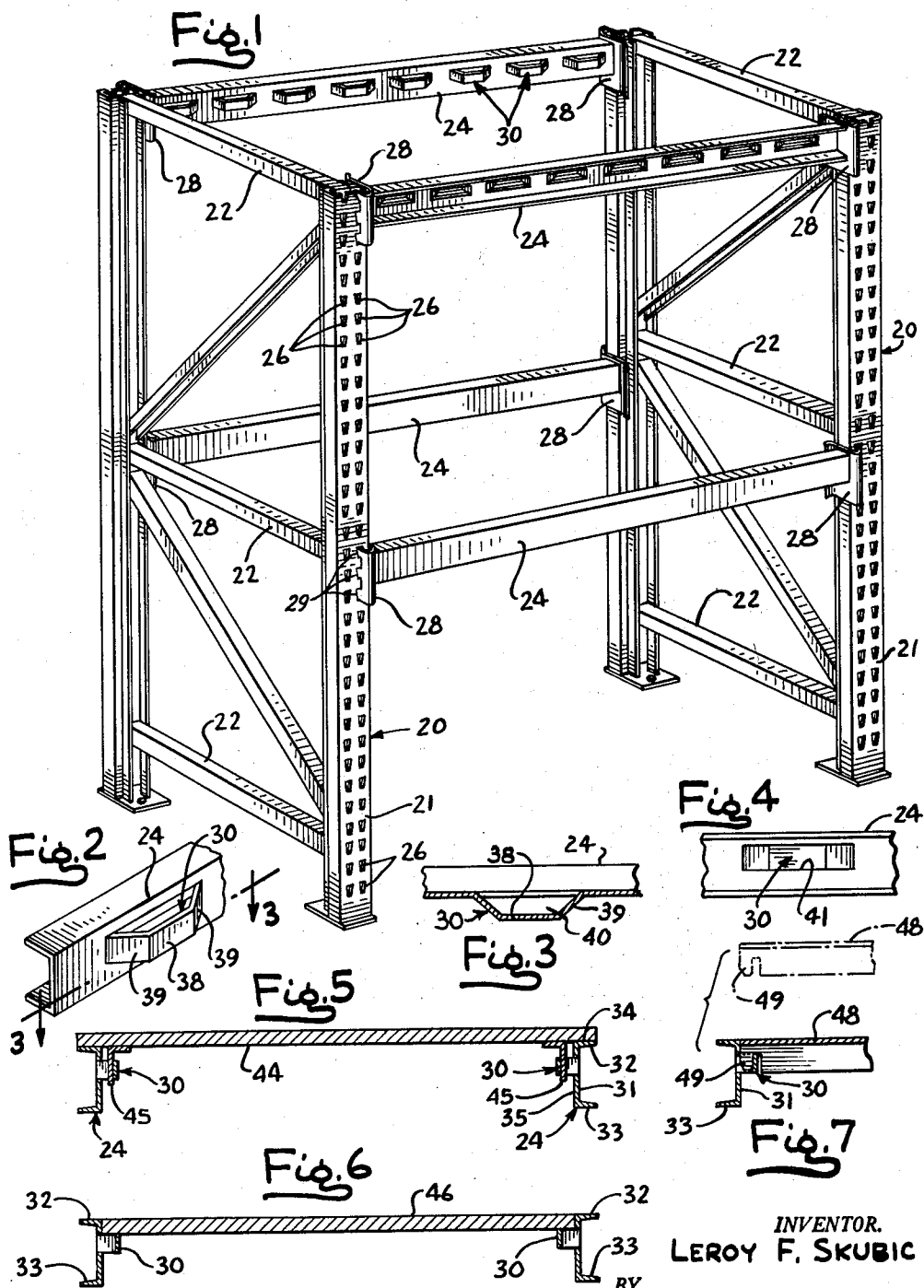
July 28, 1964

L. F. SKUBIC  
PALLET RACK

3,142,386

Filed April 15, 1960

2 Sheets-Sheet 1



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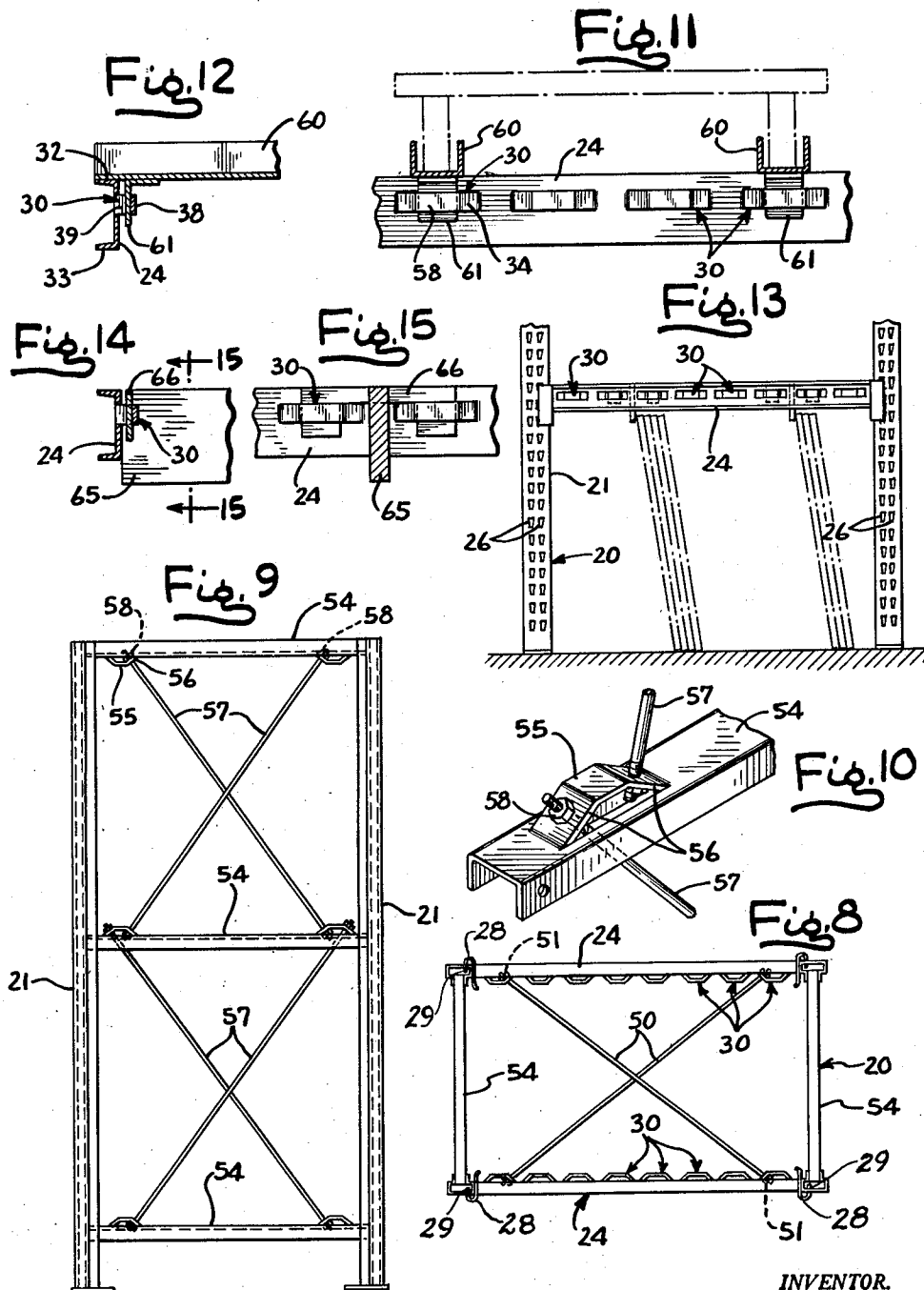
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3,142,386

## PALLET RACK

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The present invention relates to metal storage racks and more specifically, to racks of the type finding particular but not necessarily exclusive utility in material handling and storage applications such as in supply depots and similar facilities.

More particularly, the present invention relates to an improved rail construction for use in metal storage racks to be used for supporting articles such as pallets, skids, deckboards, and the like thereon. The type of storage rack to which the present invention pertains is illustrated in U.S. Patent 2,925,920, issued February 23, 1960, to Leroy F. Skubic.

The principal object of the present invention is to provide improved metal storage rack structures which can be completely disassembled and which when assembled afford a strong, rugged storage suitable for the storage of heavy materials such as loaded pallets.

Another object of the present invention is to provide a metal storage rack having posts and end units which are strong and rigid and which can be tied together readily to facilitate erection and yet can be completely disassembled for shipping or storage.

A further object of the present invention is to provide a storage rack construction of the foregoing character which includes improved shelf means constructed to facilitate the support of objects on the shelves. More specifically, it is an object to provide a storage rack structure having shelf beams which can be employed not only to strengthen the structure but also find utility in the positioning of articles on the rack. A more detailed object of the invention to provide, in a metal storage rack of the above type, shelf beams which are capable of receiving cross braces, upwardly directed channels, depending stop members and the like.

Still a further object of the present invention is to provide a metal storage rack structure of the foregoing character which can be readily assembled and disassembled and which is capable of a wide variety of uses with attachments which can be removably secured thereon to facilitate the stacking and storage of various sizes and shapes of articles.

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 storage rack embodying the present invention.

FIG. 2 is an enlarged perspective view of a portion of the rack beam shown in FIG. 1.

FIG. 3 is a section view taken in the plane of line 3-3 of FIG. 2.

FIG. 4 is a rear elevation view of the beam portion shown in FIG. 2.

FIG. 5 is a section through two shelf beams of the

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rack shown in FIG. 1 with a deckboard attachment mounted thereon.

FIG. 6 is a section view through two spaced shelf beams of the character shown in FIG. 1 with wooden plank decking thereon.

FIG. 7 is an illustration of the use of the shelf beams with the metal cross member.

FIG. 8 is a plan view of a shelf unit and tie rods in use on the storage rack shown in FIG. 1.

FIG. 9 is an end view of storage rack including cross members constructed in accordance with the present invention.

FIG. 10 is a detailed perspective view of the corbel employed in constructing the end unit shown in FIG. 9.

FIG. 11 is a fragmentary elevation view of a shelf embodying the present invention adapted for use with a skid type pallet.

FIG. 12 is a section view taken substantially in the plane of line 12-12 of FIG. 11.

FIG. 13 is a storage rack having shelf beams embodying the present invention and illustrating the use of the rack with depending stops for use as separators when storing doors and like items.

FIG. 14 is a detailed view illustrating the stop member and rack beam to which it is attached.

FIG. 15 is a section view taken substantially in the plane of line 15-15 of FIG. 14.

While certain illustrative storage racks have been shown in the drawings 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. On the contrary, the invention 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.

The metal storage racks of the type herein contemplated are formed in sections or units 20, each of which is made up of a pair of vertical posts 21 secured together by means of appropriate cross members 22. Extending between corresponding posts 21 of the post units 20 are a plurality of horizontal shelf beams 24. Each of the posts 21 has a vertical face into which is punched or cut columns of tapered apertures 26. The shelf beams 24 are provided at their ends with brackets 28 having downwardly extending hooks 29 thereon which engage in the apertures 26 in the face of the posts. One illustrative post and bracket construction is shown in the above referred to Patent No. 2,925,920 and reference should be made thereto for the details of such shelf brackets and posts.

In accordance with the present invention, the shelf beams and some of the post unit cross members are provided with outwardly extending members 30, hereinafter referred to as corbels, which serve to support bracing rods, decking members, article support guides such as skid pallet channels, article storage separators and stops, tie bars and the like. These corbels also provide an upper surface for receiving deck boards and paneling. The corbels are opened and accessible from the back of the beam so that the various decking and tying members can be secured to the shelf beams. Each beam is provided with a plurality of the corbels 30, which are spaced apart along the length of the beam. While the distances can be any

selected amount, it has been found that a series of corbels evenly spaced on 6" centers are convenient for most purposes.

Referring to FIG. 2, the shelf beam and corbels 30 are shown in detail. The shelf beam 24 comprises a channel having a vertical portion or web 31 with legs 32, 33 projecting from the upper and lower edge portions thereof respectively. The upper leg 32 defines a horizontal surface 34 while the vertical web 31 defines a vertical surface 35 opposite from the projecting legs. The corbels 30 are punched or pressed outwardly from the web 31 and surface 35 at spaced intervals. Each corbel 30, as shown in the drawings, comprises a central vertical portion 38 which is spaced from but extends generally parallel to the vertical face 35 of the beam. This portion of the corbel is connected to the web 31 by a pair of inclined portions 39 on either side thereof.

For receiving an inserted leg of various shelf attachments, the corbel defines an open vertical slot 40 between the corbel portions 38, 39 and the web 31 of the beam. Complete access to the corbel is afforded by a slot 41 in the shelf beam web 31 directly back of each corbel. While this slot 41 is formed when the corbel is pressed directly from the web of the beam, should the corbel be fastened to the beam by other means it is desirable that the slot 41 be deliberately cut in back of the corbel through the beam.

Among the many uses of the corbels they serve admirably to support decking on the storage rack. This is illustrated in FIGS. 5, 6 and 7. In FIG. 5 there is shown decking in the form of wooden or metal planks 44 which extend across shelf beams 24, each of which are provided with corbels 30, the deck boards resting on the upper surfaces 34 of the flanges. The decking 44 is provided with downwardly extending tongues or prongs 45 which engage in corresponding corbels 30 on the shelf beams 24. It will be appreciated that the decking is securely held in position and is locked against endwise or sidewise slipping on the beam. The decking boards 44 can be wide enough so that when positioned on the beams the boards afford a solid deck or alternatively can be narrowed to provide a slat type deck.

In FIG. 6 there is illustrated the use of the corbels 30 to support planks extending between the shelf beams. In this construction, the planks 46 rest on the upper surfaces of the corbels 30 which surfaces, are spaced below the upper surfaces of the horizontal flanges 32. It will also be appreciated from FIG. 6 that the corbels are punched from the beam web 31 at a point intermediate the upper and lower flanges 32 and 33. By specifying the distance between the upper surface of the corbels and the upper surface 34 of the beam flange 32, it is possible to accommodate specified thicknesses of deck planks 46.

Metal decks can be employed with the corbeled beams as shown in FIG. 7, by forming metal cross members 48 with a hook 49 at each end dimensioned to engage in a corresponding corbel 30 on a shelf beam 34.

An additional use of the corbels on the shelf beams is shown in FIG. 8 and in this modification the importance of the access opening 41 at the back of each corbel can be appreciated. To tie the shelf beams together, to prevent them from being removed from the rack, tie rods 50 extend diagonally across the rack structure between opposed shelf beams 24. These tie rods can be secured in suitable holes cut or punched in the inclined portions 39 of corresponding corbels 30. The tie rods 50 can be tightened to provide the desired degree of rigidity and most important to hold the shelves, beams and post units in squared relation. It will be appreciated that by utilizing the inclined surfaces of the corbels, straight tie rods can be employed with threaded ends for receiving adjusting nuts 51 thereby eliminating the necessity of using expensive turn-buckle arrangements. The tightening nuts on the tie rods can be easily reached through the access opening 41 in the beam 24.

For tying the crossbars and vertical posts together in the post units 20, a construction similar to that described in connection with the shelf units can be employed. To this end, as illustrated in FIGS. 9 and 10, the horizontal crossbars 54 of each post unit are provided with corbels 55 of the type described above, each of which has an inclined portion 56 through which suitable holes are provided. The crossbars 54 can be bolted to oppositely facing vertical posts 21 and tie rods 57 secured between respective ones of the corbels 55 on the crossbars and tightened by simply tightening a nut 58 on each end of the tie rods 57. With this construction the post units can be readily squared without the necessity of employing expensive turn-buckle arrangements. An important advantage of this construction is that the vertical posts, crossbars and tie rods can be completely disassembled and shipped thereby saving a substantial amount of space during shipment. This further enables the supplier to use a minimum number of interchangeable parts. To erect the rack, the crossbars 54 are simply bolted to the posts 21 and the tie rods 57 inserted in place and tightened to the corbels 55.

To facilitate the use of the storage rack with skid type pallets, there is shown in FIGS. 11 and 12 a pair of spaced upwardly directed channels 60 secured between the spaced shelf beams by means of a depending member 61 engaged in the corresponding corbel. The corbels in this instance are spaced at a distance corresponding approximately to the skid pallet dimensions.

When stacking doors and like objects it is often desirable to provide a separator between them and yet have the separations adjustable. This can be accomplished by use of the corbeled shelf beams with a depending spacer or stop engaged in selected ones of the corbels 30. Such a construction, which is shown in FIGS. 13, 14 and 15, includes a depending vertical plate 65 suspended between two shelf beams. To this end the plate has secured at each end a generally U-shaped bracket 66 adapted to engage in two adjacent corbels 30 on the shelf beam 24 as shown in FIG. 15. The depending plate 65 serves as a stop or spacer between articles standing on end beneath the beam 24, and between the two post units 20, as illustrated in FIG. 13. Alternatively, a depending pin, angle, tube or bar can be secured to the bracket 66 in place of the plate 65.

The materials from which the post units and shelf beams are constructed will depend primarily on the strength and size of the rack. It has been found that for most materials the corbels 30 can be punched directly from the web of the shelf beam 24, thereby providing the desired corbel construction as well as the access aperture 41 in the beam directly behind each corbel.

I claim as my invention:

1. A metal storage rack comprising a plurality of pairs of spaced end units each including a pair of spaced vertical posts, a pair of spaced horizontal shelf beams mounted between corresponding posts of said units, said beams having a vertical member and an upper horizontal member extending from the upper edge of said vertical member, a plurality of corbels pressed outwardly from said vertical surface in a direction opposite from said horizontal member, each said corbel having a vertical portion parallel to but spaced from said vertical member and joined at each end to said vertical member by sloping portions, said corbel defining an open vertical slot, the upper surface of said corbel being spaced below said horizontal beam member, the portion of the beam from which each corbel is pressed defining an aperture affording access to the corbel through the beam, tie rods extending diagonally of said rack between opposite ends of said spaced beams, and a tightening member on each end of the tie rods adjustably securing said tie rods to opposed sloping portions of corbels adjacent the respec-

tive ends of said beams, said members being accessible for adjustment through said access apertures in the beams.

2. In a metal storage rack, a of spaced horizontal beams, at least a pair of corbels extending outwardly from opposite surfaces of said beams to define vertical slots therewith, said beams having an aperture corresponding to each of said corbels affording access to the corbel therethrough, and adjustable tie rods extending diagonally between said beams and including members engaged with said corbels, said aperture affording access to said tie rod members.

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