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T. J. FINLAYSON
DRIVE-IN PALLET RACK

3,391,795

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2 Sheets-Sheet 1

Fig. 1.

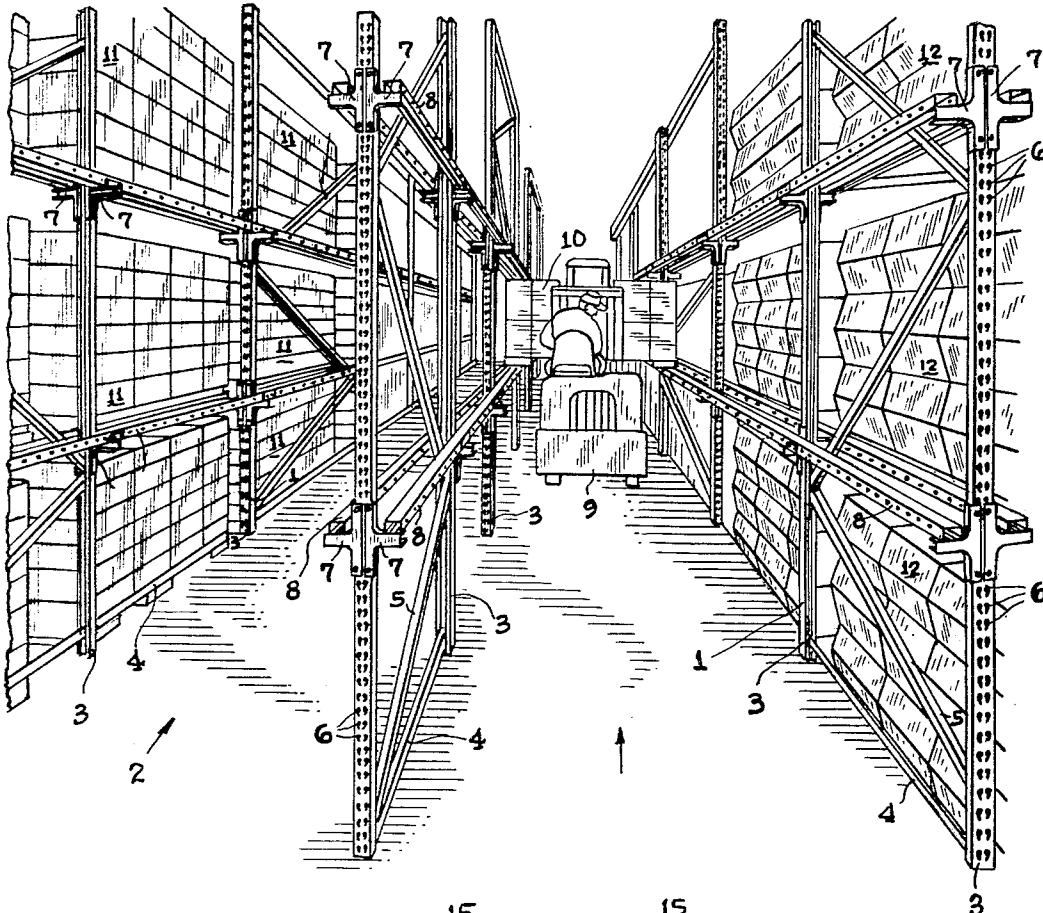
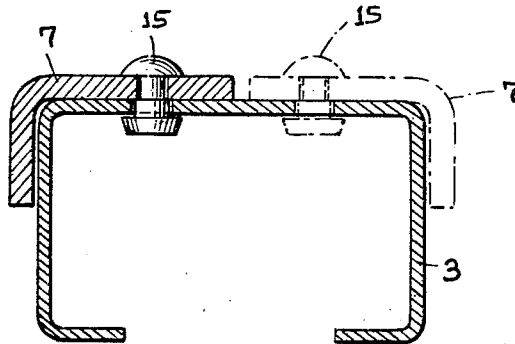


Fig. 6.



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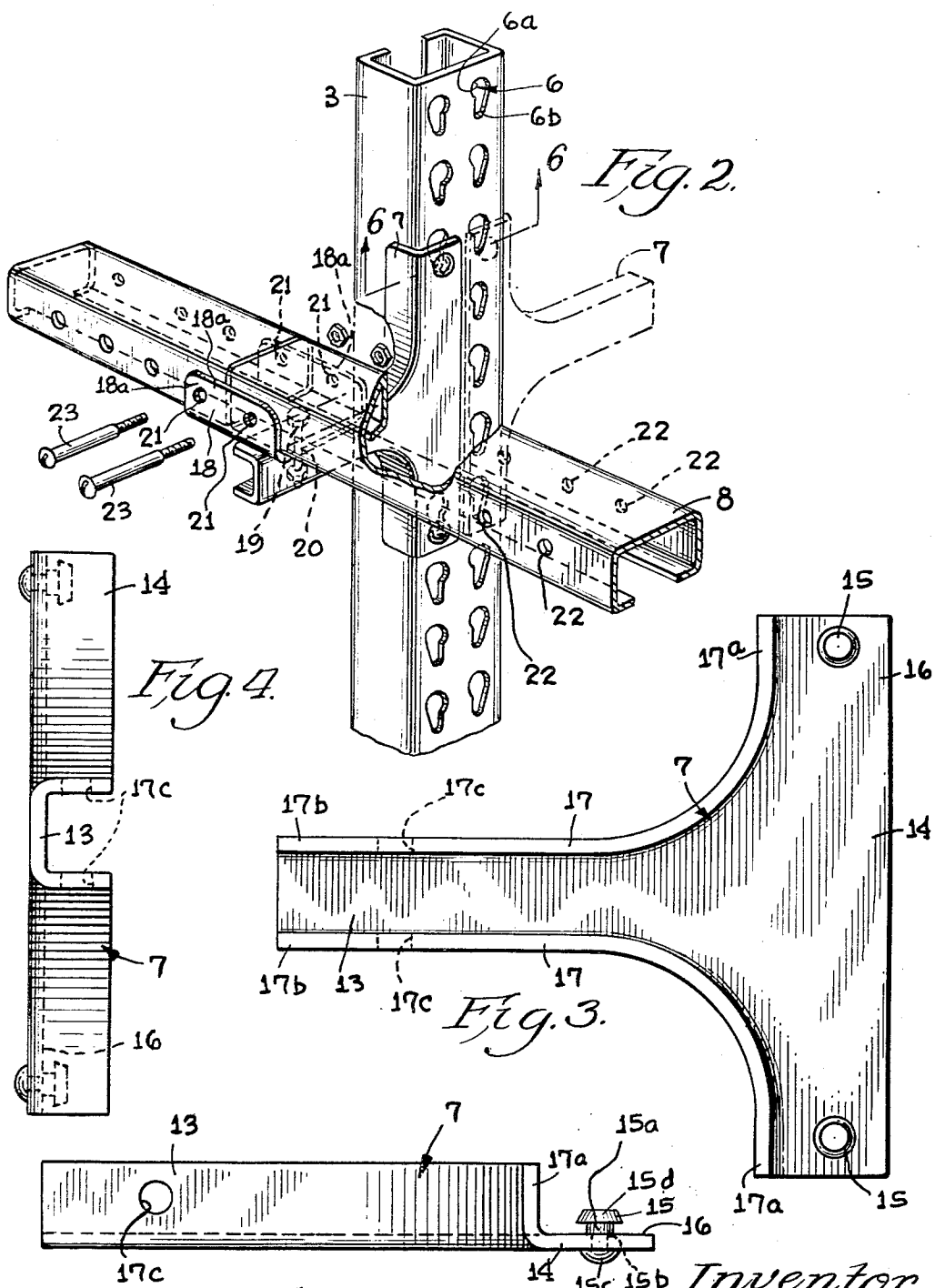


Fig. 5.

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3,391,795

DRIVE-IN PALLET RACK

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ABSTRACT OF THE DISCLOSURE

A rack structure having upright skeletal walls spaced parallel to form aisles therebetween with load support rails secured to the walls by means of one-piece support arms which are of symmetrical design to permit their being employed as either left hand or right hand connectors.

This invention relates to the art of support structures commonly referred to as pallet racks and particularly to an improved and simplified construction for a drive-in pallet rack.

The ordinary drive-in pallet rack consists of a self-supporting structure having one or more aisles for permitting entrance of a vehicle equipped with a fork shape load lifting member. These aisles are divided from each other by vertical skeletal wall portions extending in a direction from front to back of the structure. They are provided with side shelves or supports, such as rails, extending horizontally from front to back along the sides of the vertical wall portions. The shelves or rails are spaced at different levels and are mounted opposite each other between the vertical wall portions at different vertical levels. These vertical wall members can be made very long so that their entire length can be equal to several times the length or width of a palletized load. With this arrangement, a palletized load can be elevated by means of a fork lift truck and driven into an aisle of the drive-in rack and positioned on the rails beginning at the rear of the rack, and another palletized load can be positioned forward of it. Additional palletized loads can be positioned all along the oppositely extending rails. The aisles provide a convenient way of allowing the fork lift trucks to be driven into the pallet rack for access to the loads.

In prior devices, such as shown in U.S. Letters Patent 3,144,944, issued Aug. 18, 1964, to K. McConnell, the rail supporting structure, although having additional functions over the invention herein described, is relatively complex and expensive to manufacture. It is the principal object of this invention to provide an improved rail support structure or arm which is relatively simple to manufacture and assemble and economical to produce, and still provide basic essential rail support functions.

It is another object of the invention to provide a symmetrical T-shaped arm or rail support manufactured from a single formed piece which can be inverted for either left-hand or right-hand connections to an upright.

It is another object of the invention to provide such an arm which is flanged along certain edge portions to provide a channel cross-section which imparts beam strength to the arm and a convenient location for support of a rail and connection of the rail to the arm.

Other objects and advantages of the invention should be apparent upon reference to the accompanying drawings, in which:

FIG. 1 shows a perspective view of a drive-in pallet rack as it appears during use;

FIG. 2 shows a perspective view of a portion of a vertical upright with a portion of a horizontal rail and its rail support secured to the vertical upright;

FIG. 3 shows a side view of the rail support arm embodied in the invention;

FIG. 4 shows a left-end view of the arm shown in FIG. 3;

FIG. 5 shows a bottom view of the arm shown in FIG. 3, and;

FIG. 6 shows a sectional view along the lines 6—6 of FIG. 2.

According to the general construction of the drive-in pallet rack, as shown in FIG. 1, it consists of a plurality of spaced apart parallel vertical wall members 1 separated from each other by aisle spaces 2. These vertical wall members consist of vertical uprights 3 spaced from front to back along the wall members by means of horizontal beams 4 and diagonal braces 5 which join them together rigidly. The vertical uprights 3 are provided with a plurality of keyhole openings 6 which are used to engage lugs or studs projecting from rail supports 7 mounted to project laterally from the uprights 3. These rail supports 7 support tubular rails 8 which extend from front to back along the lengths of the vertical wall members 1. They are detachably secured to these rail supports in a manner hereinafter described.

As viewed in FIG. 1, it is apparent that a fork lift truck 9 can be driven through the aisles 2 in order to transport a load 10 through the aisle and position it at the far end of the aisle between two opposite rails 8 mounted on oppositely positioned vertical wall members 1. After positioning of the load 10, another load can be driven in and positioned ahead of it. But, the rails at levels above must also be filled before loads are positioned toward the front of the aisles 2. Naturally, the first load to be positioned would be on the floor below the first level of rails if all of the usable space is to be occupied. The loads 11 and 12 shown in two aisles beyond the aisles 2 indicate how the aisles can be filled to use all the space in them.

As viewed in FIGS. 3, 4, and 5, the rail support or arm 7 consists of a single pieced member generally having a T-shape with an outer end 13 extending from an inner end 14. The inner end 14 is flat and provided with two studs 15 which project from the face 16 of the arm 7. These studs 15 are spaced an equal distance from the longitudinal center line 17 of the arm 7. The studs 15 each have a main body portion 15a which is connected between a narrow portion 15b which extends through an opening in the arm 7 and is peened over as shown at 15c to secure the stud to the arm 7. The free end of each stud 15 is provided with an enlarged flange 15d which is slightly smaller than the enlarged portions 6a of the keyhole openings 6 extending along the vertical uprights 3 so that the studs 15 can be extended through these enlarged portions 6a with the enlarged flanged portions 15d extending through the keyhole openings 6. The arm can then be lowered so that the flange portions 15d extend behind the narrow portions 6b of the keyhole openings 6 to thereby secure the studs in place and, in turn, the arm 7 to the upright 3.

Two edges of the arm 7 are folded to provide flanges 17 extending at right angles to the surface 16. These flanges 17 adjacent their inner ends 17a impart an L-shaped cross-section to portions of the inner end 14 of the arm which enable the arm along these portions to fit the corner of an upright 3. The flanges 17 extending along their outer ends 17b provide a channel shape cross-section to the outer end 13 of the arm 7 and each of the flanges 17 are provided with holes 17c through which connectors can be extended, as hereinafter described. It is evident that the flanges 17 provide multiple functions for the arm 7; they provide beam strength for the arm, a suitable L-shaped corner for proper location at the corner of an upright 3, and a symmetrical channel shape at the outer end 13 of the arm which enables the arm to be readily inverted with identical connecting holes 17c in proper position, regardless of which inverted position is utilized.

In order to accommodate the tubular rails 8 as shown

especially in FIG. 2, a short length channel 18 is provided which carries a central opening 19. The channel 18 is positioned on the outer end 13 of the arm 7. A bolt 20, or other fastener, is passed through these aligned openings to secure the channel 18 to the arm 7.

The channel 18 is also provided with additional openings 21 along its two vertical walls 18a. These openings 21 are spaced from each other by the same amount as similar openings 22 in the side walls of the tubular rails 8. In order to secure tubular rails 8 to a channel 18, the rails 8 are positioned on the channel 18 as shown in FIG. 2 with holes 21 aligned with certain of the holes 22 in the rails 8. Bolts 23 are then secured through these aligned holes to connect the rails 8 to the channel 18. In this manner, the rails 8 are, in effect, secured to an arm 7 which, in turn, is connected to an upright 3 by means of the studs 15.

As indicated in FIGS. 1, 2, and 6, the arm 7 can be inverted and repositioned to extend from either side of the upright 3 in either a left-hand or right-hand direction with the same level of the arm 7.

It should be evident that what has been shown and described is a relatively simple and economical construction for securing tubular rails 8 to vertical uprights 3 of a drive-in pallet rack structure. In addition, the arm 7, shown and described, is relatively simple in construction, but quite versatile and functional in its use.

Although only a single embodiment of the invention has been shown and described, it should be clearly understood that the invention can be made in many different ways without departing from the true scope of the invention as defined by the appended claims.

I claim:

1. In a rack structure of a type having upright skeletal walls spaced parallel to each other to form aisles therebetween, said walls having uprights which have connected thereto load support rails extending parallel to said walls, each connection between a load support rail and an upright comprising, a one-piece arm having fastener means adjacent its inner end connecting the arm to an upright and means adjacent its other end connecting a load support rail thereto, said fastener means being in the form of two studs which project from the same face of the inner end of the arm and are each spaced the same distance from opposite sides of the longitudinal centerline of the arm, the uprights each having at least a single row of holes engageable with the studs for providing the connections of

the arm to an upright, the positioning of the studs at the same distance from the centerline of the arm allowing the arm to be inverted and reconnected to the upright without changing the level of the arm relative to the upright on which it is connected.

2. In a rack structure of a type having upright skeletal walls spaced parallel to each other to form aisles therebetween, said walls having uprights which have connected thereto load support rails extending parallel to said walls, each connection between a load support rail and an upright comprising, a one-piece arm having fastener means adjacent its inner end connecting the arm to an upright and means adjacent its other end connecting a load support rail thereto, said one-piece arm being T-shaped and reinforced by having first portions of its edges folded parallel to each other to impart a channel shaped cross-section to its outer end, said first portions extending into other portions of the edges extending at right angles to the first portions, said other portions and the body of the inner end of the arm forming a corner shape for mating to the corner of the upright when the arm is connected to the upright.

3. In a rack structure as defined by claim 2 characterized by, said fastener means being in the form of two studs which project from the same face of the inner end of the arm and are each spaced the same distance from opposite sides of the longitudinal centerline of the arm, the uprights each having at least a single row of holes engageable with the studs for providing the connections of the arm to an upright, the positioning of the studs at the same distance from the centerline of the arm allowing the arm to be inverted and reconnected to the upright without changing the level of the arm relative to the upright on which it is connected.

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