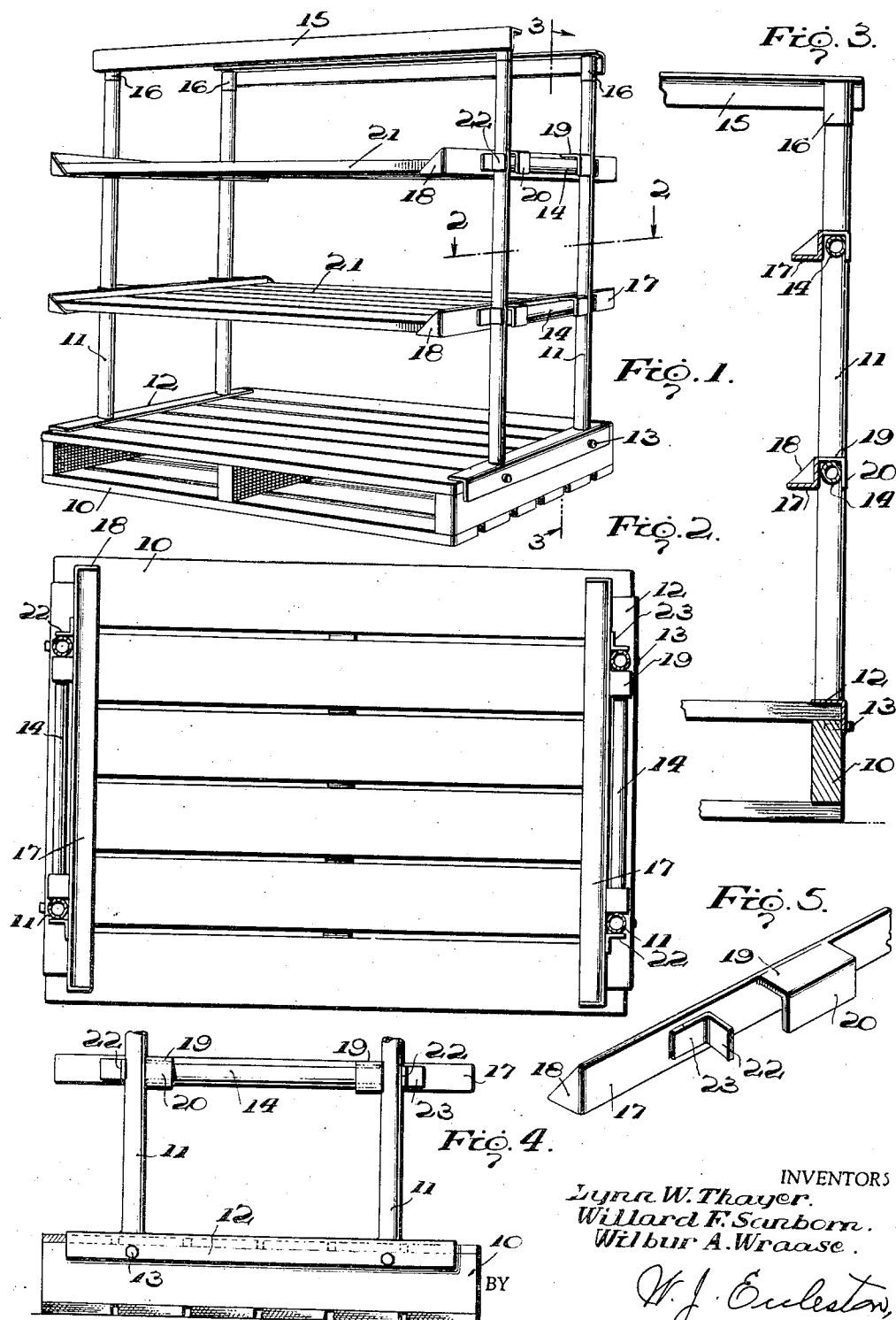


June 21, 1960

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SHELVING SUPPORT FOR PALLET FRAMES

2,941,772

Filed Aug. 25, 1958



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SHELVING SUPPORT FOR PALLET FRAMES

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Filed Aug. 25, 1958, Ser. No. 757,166

5 Claims. (Cl. 248—120)

(Granted under Title 35, U.S. Code (1952), sec. 266)

The invention described herein, if patented, may be manufactured and used by or for the Government for governmental purposes, without the payment to us of any royalty thereon.

The present invention relates to shelving supports and more particularly to supports for use with the framework of materials handling pallets.

An important object of the present invention is the provision of means for economical storage, handling and removal of small, fragile or irregularly shaped articles or packages on pallets, particularly when such pallets are provided with framework for tiering or stacking of the pallets.

Another object of the invention is to provide shelving supports of this character which can be readily applied to pallets and stacking framework now in use without any modification of the pallet or framework, and as readily removed therefrom.

A further object of the invention is the provision of supports of this character which are inexpensive to manufacture, of simple design, easily handled and operated, and strong and durable in use.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings which form a part of this specification and wherein like characters of reference denote like parts throughout;

Figure 1 is a perspective view of a pallet and its stacking framework to which the shelves and shelving supports of this invention have been applied,

Figure 2 is a horizontal vertical section taken on the line 2—2 of Figure 1 but showing the shelves removed from their supports,

Figure 3 is a fragmentary vertical section taken on the line 3—3 of Figure 1, with the shelves removed from the supports,

Figure 4 is a fragmentary end elevation of the pallet and the lower shelf support and lower portion of the stacking framework, and,

Figure 5 is a fragmentary perspective view of one end of one of the shelf supports.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of the invention, the numeral 10 designates a pallet of the usual two-way design which forms no part of the present invention, as other type pallets may obviously be used. When the pallets are to be stacked or tiered, and the articles on the pallets are not sufficiently regular in shape or sufficiently strong to support the weight of the upper pallets, it is customary to employ some form of supporting framework to directly support the weight of the upper pallets without transmitting any of such weight to the articles on the pallets. One such framework is illustrated in Figure 1, and comprises a pair of end frames removably connected at their upper ends by suitable top rails. The end frames each comprise a pair of spaced tubular uprights 11 welded to a base 12 which may be in the form of an angle iron. The base 12 of each frame is re-

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movably connected to the pallet by some suitable means indicated generally at 13. The uprights 11 of each frame are connected by one or more horizontal cross bars 14 welded to the sides of the uprights. Two such cross bars 14 are illustrated in Figures 1 and 3, although any suitable number may be used. Two top rails 15 are usually formed from angle iron and provided adjacent each end with depending sleeves 16 open at their lower ends so as to telescopically and removably receive the upper ends of the uprights 11. The top rails 15 serve to space and brace the upper ends of the side frames and also form a supporting base or surface upon which the next pallet in the tier is located. The construction thus far described is usual and forms no part of the present invention.

In the use of stacking framework of this type, the weight of the upper pallets of the tier is borne by the stacking framework rather than by the articles on the pallet. However, when the articles carried by the pallets are very fragile, or of irregular shape, or for any reason cannot be stacked upon each other so as to economically utilize the full space between the pallet and the top rails of its stacking framework, it is desirable to have removable shelves between the pallet and the top rails to accommodate a greater quantity of the articles on the pallet. In accordance with the present invention, the cross bars 14 are utilized to carry the shelf supporting brackets or supports which preferably take the form of angle irons 17, each of the angle iron supports 17 having a vertical and a horizontal flange or walls connected at their ends by end walls 18 which are shown as triangular in shape but which may obviously take other forms. The vertical flange or wall of each bracket or support 17 constitutes the back of the support, and each such back is provided with a pair of rearwardly extending, cross bar engaging hook-like members 19 so spaced along the supports 17 as to be disposed immediately adjacent the side of one of the uprights 11. The hook-like members 19 are preferably each provided with a depending rearward flange 20 arranged substantially parallel to the back of the support 17 and spaced a sufficient distance therefrom to provide a space therebetween for the reception of the cross bar, although the shape of the hook-like members 19 may obviously be varied. The members 19 may be welded to the shelf supporting brackets 17, formed integrally therewith or secured thereto in any suitable manner.

When the supports 17 are positioned with their hooks 19 extending over the cross bars 14, the back of each support 17 will rest against the uprights 11 and maintain the lower flange of the angle iron support in a horizontal position extending toward the opposite end of the pallet and the framework on such end, as illustrated in Figures 1, 2 and 3. Consequently, the lower flanges of the shelf supporting brackets 17 extend toward each other and are in position to receive the shelving 21 which is of a length to fit between the vertical flanges of the supporting brackets 17 and rest on the horizontal flanges thereof. The shelving 21 is shown as made up of a plurality of planks or boards which may be secured together or not as desired, but obviously the shelving may be of any suitable material or construction. The end walls 18 prevent the shelving from sliding laterally off the supports 17.

In order to prevent tilting of the shelf supports 17 when articles are placed unevenly on the shelving, an abutment 22 is secured to the back wall of the shelf support 17 in spaced relation to each hook 19 and in outboard relation thereto. Each abutment 22 is shown as formed from a rectangular strip of metal bent in its center to form a base 23 which is welded or otherwise secured to the back of the shelf support 17, and an abutment portion extending normal to the back of the support

and in a vertical position which will parallel the adjacent upright 11 when the shelf support is in position on the cross bar 14. The space between each hook member 19 and its abutment 22 is only slightly greater than the diameter of the upright so that the upright may be received in this space. If the shelf and its support 17 attempt to tilt as, for example, by downward pressure on the right hand side of the support in Figure 4, the left side of the support will be prevented from moving upwardly any substantial distance by reason of the abutment 22 engaging the side of its upright 11 due to the fact that tilting movement of the support will necessarily be about the right hand hook 19 as a fulcrum, which requires the left hand abutment to move in an arc which intersects the upright. The right hand abutment will also resist such tilting movement, but due to the shorter lever arm it will not act as quickly as the abutment farthest from the fulcrum. The abutment 22 may take any suitable form other than that shown, provided that it project outwardly from the back of the support in proximity to the upright so as to engage the upright when the support is tilted.

The shelf supports 17 and shelving 21 may be readily installed on the usual framework without any modification of the framework, and will support material or packages of any configuration without subjecting the material or packages under the shelving to the weight of those on the shelf. When it is desired to use the framework without the shelves, they may be easily removed and stored to permit the stacking framework to be used in the usual manner. The shelf supports 17 are suspended from the cross bars 14 so that their rear walls are firmly braced by engagement with the uprights 11, and due to the provision of abutments 22 the shelf supports are positively held against tilting about either of hook members 19 as a fulcrum.

While a preferred embodiment of the present invention has been shown and described, it is to be understood that various changes in the size, shape and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

We claim:

1. The combination with a pallet having a stacking framework extending thereabove, the framework comprising a pair of end frames supported by the pallet and connected at their upper ends, each end frame comprising a pair of spaced uprights connected at a point between their ends by a horizontal cross bar, of a shelf structure comprising a pair of shelf supporting brackets, hook-like members carried by the brackets and extending rearwardly for engagement with the cross bars, the supporting brackets having a length such as to extend a substantial distance beyond the uprights of the end frames, an abutment carried by the brackets in spaced outboard relation to each hook-like member, the space between each abutment and its adjacent hook-like member being substantially equal to the thickness of the frame upright which is to be received therein, whereby tilting of the shelf supporting bracket about either of the hook-like members will be prevented by engagement of one of the abutments with its adjacent upright, and a shelf removably supported by the brackets.

2. The combination with a pallet having a stacking framework extending thereabove, the framework comprising a pair of end frames supported by the pallet, each end frame comprising a pair of spaced uprights connected at a point between their ends by a horizontal cross bar, of a shelf structure comprising a pair of shelf supporting brackets adapted to be removably supported on the horizontal cross bars of the end frames, a pair of hook-like members carried by each bracket and extending rearwardly from the bracket to removably engage the cross bar, the shelf supporting brackets having a length such as to extend a substantial distance beyond the uprights of the end frames, an abutment carried by each bracket and extending rearwardly therefrom in spaced outboard relation to one of the hook-like members, the space between the abutment and its adjacent hook-like member being substantially equal to the thickness of the upright which is to be received in such space, whereby tilting movement of the bracket about either of the hook-like members will be prevented by engagement of the abutment with the upright, and a shelf removably supported by the brackets.

3. The combination with a pallet having a stacking framework extending thereabove and comprising a pair of uprights secured to each end of the pallet, each pair of uprights being connected between their ends by a horizontal cross bar, of a shelf structure comprising a pair of shelf supporting brackets adapted to be removably supported on the cross bars, a pair of hook-like members carried by each bracket and extending rearwardly from the bracket to extend over the adjacent cross bar, each shelf supporting bracket having a length such as to extend a substantial distance beyond the uprights, an abutment carried by each bracket and extending rearwardly therefrom in spaced outboard relation to one of the hook-like members so that one of the uprights may be snugly received between the abutment and its adjacent hook-like member, and a shelf removably supported by the brackets in spaced relation to the pallet.

4. A device according to claim 3, in which each shelf supporting bracket comprises a back wall, a bottom wall, and end walls connecting the back and bottom walls to limit lateral movement of the shelf on the bottom wall of the bracket.

5. A device according to claim 1, in which each shelf supporting bracket comprises a back wall to engage the adjacent uprights, a bottom wall to support the shelf, and end walls connecting the back and bottom walls to limit lateral movement of the shelf on the bottom wall of the bracket.

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