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J. A. SHOOK

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HORIZONTALLY AND VERTICALLY ADJUSTABLE RACK

Original Filed May 2, 1961

3 Sheets-Sheet 1

INVENTOR
JACKSON A. SHOOK

BY

Harness, Dickey & Purcell.
ATTORNEYS.

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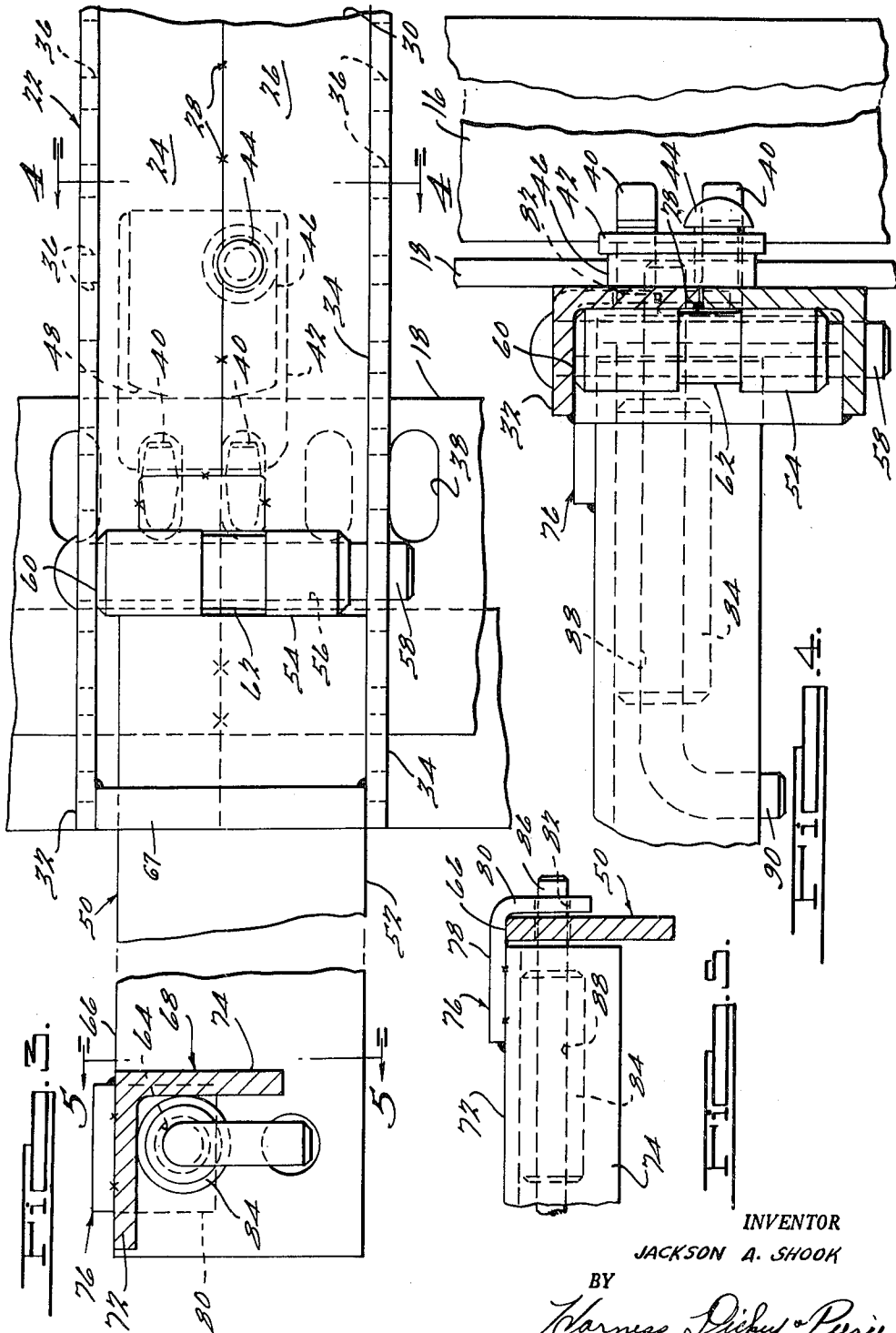
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INVENTOR

JACKSON A. SHOOK

BY

Karnes, Dickey & Peris
ATTORNEYS

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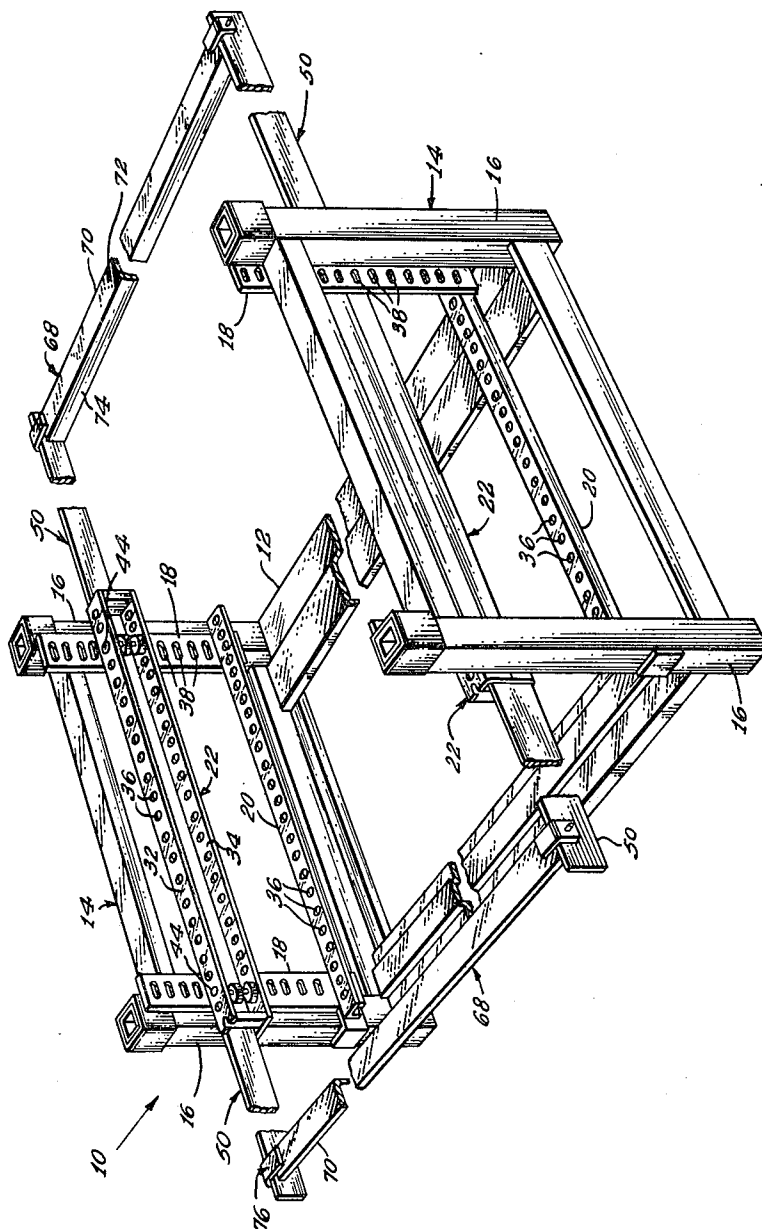


FIG. 6.

INVENTOR.
JACKSON A SHOOK

BY *Corness, Dickey & Purie.*
ATTORNEYS

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HORIZONTALLY AND VERTICALLY ADJUSTABLE RACK

Jackson A. Shook, Northville, Mich., assignor to Evans Products Company, Plymouth, Mich., a corporation of Delaware

Original application May 2, 1961, Ser. No. 107,157, now Patent No. 3,126,102, dated Mar. 24, 1964. Divided and this application Dec. 18, 1963, Ser. No. 341,154
6 Claims. (Cl. 105—369)

The present invention relates to racks of the type used in industry for the storage and transportation of a wide variety of products and workpieces in various stages of completion.

This application is a divisional application of the co-pending application of Raymond M. Krokos et al., Serial No. 107,157, filed May 2, 1961.

It is an object of the present invention to provide an improved rack of the type provided with extension means for changing the size of the rack.

It is a further object of the present invention to provide an improved rack of the above mentioned type which is simple in design, economical of manufacture, rugged in construction, and which is readily adjusted to vary the adjustment of the extensible means for varying the size of the rack.

It is also an object of the present invention to provide an improved rack of the above mentioned type including extensible means which may be readily mounted on previously known rack constructions and readily adjusted with respect thereto for varying the size of the rack.

It is also an object of the present invention to provide an improved freight bracing member which may be used as the side member of such a rack or for other uses and which is simple in design, economical of manufacture, and reliable and efficient in use.

Other and more detailed objects of the present invention will be apparent to those skilled in the art from a consideration of the following specification, the appended claims and the accompanying drawings wherein:

FIGURE 1 is a broken perspective view of a rack constructed in accordance with a preferred embodiment of the present invention;

FIGURE 2 is a broken enlarged sectional view of the structure illustrated in FIGURE 1 taken substantially along the line 2—2 thereof;

FIGURE 3 is a broken enlarged sectional view of the structure illustrated in FIGURE 1 taken substantially along the line 3—3 thereof;

FIGURE 4 is a broken sectional view of the structure illustrated in FIGURE 3 taken substantially along line 4—4 thereof;

FIGURE 5 is a broken sectional view of the structure illustrated in FIGURE 3 taken substantially along line 5—5 thereof; and,

FIGURE 6 is a broken perspective view showing both ends of the rack structure, one end of which is illustrated in FIGURE 1.

Referring to the drawings, the rack generally designated 10 includes a conventional commercially available standard industrial rack shown and described more fully in the co-pending application of Raymond M. Krokos, entitled Rack, Serial No. 90,039, filed Feb. 17, 1961 and assigned to the assignee of the present application. As there described, the rack 10 generally comprises a rectangular base 12 carrying at each end thereof an end frame designated 14 and including a pair of corner posts 16. The rack 10 illustrated in FIGURE 1 is also provided with adjustable freight bracing apparatus of the type shown in the above mentioned co-pending application and including the end plates 18 which, in the construction

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illustrated in this application are of the construction illustrated in FIGURES 1 and 2 of the above mentioned co-pending application and are mounted on the end frame 14 in the manner there illustrated and described in greater detail. As illustrated in FIGURE 1, the rack 10 may also be provided with a horizontal support member 20 which may be of the construction of the horizontal support member 38 illustrated and described in the above mentioned co-pending application and which may support one end of one or more load bracing bars, not illustrated, which may be of the construction of the load bracing bars 40 illustrated and described in the above mentioned application.

In accordance with the present invention, the improved rack 10 also includes a substantially horizontally disposed support member 22 which is of channel-shaped cross section and which in the preferred embodiment illustrated, is formed by welding together the vertical flanges of two angles 24 and 26, the weld strip, which may be continuous, being indicated by the weld marks 28. The welded-together flanges of the angles 24 and 26 define a web portion 30 of the channel-shaped member 22 and the other flanges of the angles 24 and 26 provide the spaced parallel horizontally disposed flanges 32 and 34 of the channel-shaped member 22. The member 22 is supported on the end plates 18 for adjustment vertically thereof in the same manner as the horizontal support member 20 and as illustrated and described in detail in the above mentioned co-pending application with respect to the horizontal support member 38 there shown. The horizontal flanges 32 and 34 have a plurality of apertures 36 spaced therealong for connection of crossbars (not shown) thereto such as the crossbars 40 of the above mentioned application.

Since the particular mounting of the member 22 on the end plates 18 forms no part of the present invention, it is sufficient to briefly state here that the web 30 of the channel-shaped member 22 is provided with fixed hooks (not shown) adapted to be moved through the apertures 38 in the right-hand one of the end plates 18 illustrated in FIGURE 1 and which, upon movement of the member 22 to the right, as viewed in FIGURE 1, engage the remote side of the end plate 18 to prevent withdrawal of the hooks from the apertures 38. Adjacent the left-hand one of the plates 18, as viewed in FIGURE 1, the web 30 of the channel-shaped member 22 carries a pair of hooks illustrated at 40 which project through selected ones of the apertures 38 in the plate and are held against withdrawal from the apertures 38 by a latch plate 42 pivotally mounted on the outer side of the web 30 by a rivet 44. The latch plate 42 also carries a spacer pad 46 which is provided with an arcuate surface 48 which, in the latched position of the plate 42, engages the edge of the end plate 18 to prevent movement of the channel-shaped support member 22 to the left as viewed in FIGURE 1, thus preventing the aligning of the hooks at the right-hand end of the member 22 with the apertures 38 in the right-hand plate 18.

In accordance with the present invention, an extension member generally indicated at 50 is mounted on the horizontal support member 22 at each end thereof and is adjustable longitudinally of the member 22 for varying the amount that the extension arm 50 extends beyond the end of the member 22. In the preferred embodiment illustrated, each extension member 50 comprises a bar or strip of rectangular cross section which is disposed parallel to and substantially in engagement with the web 30 and is of a width to be received between the flanges 32 and 34. As best illustrated in FIGURE 3, the lower edge 52 of the member 50 is supported on the upper surface of the flange 34 along which it is slidable between the adjusted positions hereinafter more fully described.

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At its inner end each extension member 50 has a generally tubular sleeve section 54 having a cylindrical aperture 56 therethrough adapted to be aligned with selected ones of the pairs of aligned apertures 36 in the flanges 32 and 34 and receive a pin 58 extending through the selected aligned apertures 36 in the flanges 32 and 34 and through the cylindrical aperture 56 through the tubular section 54.

As best illustrated in FIGURE 3, it will be noted that the tubular section 54 which, in the preferred embodiment illustrated is welded to the inner end of the bar or strip, is so disposed relative to the strip that the top 60 of the tubular section 54 engages the under surface of the upper flange 32. The central portion of the tubular section 54 is relieved as indicated at 62 to prevent interference with the weld 28. Adjacent its outer end the extension member 50 is provided with an aperture 64 opening horizontally therethrough in spaced relation below the upper edge 66 thereof. At each end of the horizontal support member 22 the horizontal flanges 32 and 34 are interconnected by a vertical post 67 which is disposed in spaced parallel relation to the web 30 and co-operates therewith to slidably receive the extension member 50 therebetween. It will be appreciated that the post 67 prevents pivotal movement of the extension member 50 about the pin 58 in a direction away from the web 30.

The present invention also contemplates the provision of an improved freight bracing member indicated at 68 for interconnecting the outer ends of the extension members 50 at corresponding sides of the rack 10 and serving as side members for the rack 10, the position of the side members being adjustable relative to the rack 10 by adjusting the degree of extension of the members 50 beyond the ends of the members 22. In the preferred embodiment illustrated, each side member 68 comprises an elongated body in the form of an angle 70 which in the normal position of the side member illustrated, includes a horizontal flange 72 and a vertical flange 74 extending downwardly from the inner edge of the horizontal flange. At each end the angle 70 carries an L-shaped strap or bracket 76 including a horizontal leg 78 which, in the embodiment illustrated, is welded to the horizontal flange 72 of the angle 70 and extends beyond the end of the angle 70 and has a downwardly turned end portion 80 which extends in generally spaced parallel relation to the end of the angle 70 and is provided with a transversely extending aperture 82 (see FIGURES 4 and 5) which in the attached position of the side member 68 is disposed substantially aligned with the aperture 64 in the outer end portion of the extension member 50. The angle 70 also carries adjacent each end thereof within the included angle thereof a cylindrical sleeve bearing 84 which is welded to the flanges 72 and 74. This sleeve bearing 84 is disposed parallel to the length of the side member body angle 70 and carries a pin 86 extending through the elongated bearing opening 88 therethrough, the pin 86 being slidable longitudinally in the bearing sleeve 84. To facilitate such movement, the pin 86 has its inner end portion 90 laterally turned at right angles to the bearing 84 to provide a handle portion for moving the pin. The pin is movable between an extended operative position illustrated in the drawings, in which the pin extends beyond the end of the angle 70, and through the aperture 82 in the vertically extending portion 80 of the bracket 76, and in which it is adapted to extend through the aperture 64 in the extension member 50, and a retracted position in which the pin is withdrawn from the aperture 82 and from the aperture 64 and in which the pin 86 does not extend beyond the end of the angle 70.

When the side member 68 is connected to the extension members 50, as illustrated in the drawings, the end portion of each extension member 50 is received in the space between one end of the angle 70 and vertically extending portion of the bracket 76 which extends in spaced parallel relation thereto, and the pin 86 is disposed in its

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operative position and extends through the aperture 64 in the extension member 50, as well as through the aperture 82 of the downwardly extending portion 80 of the bracket 76. It will be noted that in this position the depending flange 80 of the bracket 76 supports the outer end of the pin 86.

It will now be appreciated that the side members 68 may be readily attached to and removed from the extension member 50 simply by moving the pins between the operative and retracted positions, the side members being firmly held in position when the pins are in the operative position and being readily removed merely by lifting them off the extension members 50 when the pins 86 are in the retracted position. In the attached position the tolerances may be such that the side member 68 is supported on the extension member 50 either by the engagement of the pin 86 in the aperture 64 or by the engagement of the under side of the horizontal arm 78 of the bracket 76 with the top edge 66 of the extension member 50, or both the pin and the bracket may co-operate in the support of the side member 68. Engagement of the pin 86 in the aperture 64 holds the side member against movement longitudinally of the extension member 50 and against movement upwardly relative thereto. Movement of the side member 68 transversely of the extension member 50 in a direction longitudinally of the side member 68 is limited in one direction by engagement of the depending bracket flange 80 with the outer face of the extension member 50, and in the opposite direction, is limited by engagement of the end of the angle 70 with the inner face of the extension member 50.

While only one specific embodiment of the invention has been illustrated and described in detail herein, it will be readily appreciated by those skilled in the art that numerous modifications and changes may be made without departing from the spirit of the present invention.

What is claimed is:

1. A freight bracing member having at least one end adapted to be connected to a supporting member having a plate portion having a front face, a rear face, an edge extending between said faces, and said plate portion defining an aperture therethrough in spaced relation to said edge, said freight bracing member comprising an elongated body, means on said body at said one end of said bracing member adapted to extend over said edge and engage said rear face and defining an opening, the axis of which is parallel to said elongated body, a latch pin, means mounting said pin on said body for movement between an operative position in which said pin extends through said aperture in said supporting member plate portion and into said opening and a retracted position in which said pin is withdrawn from said opening and from said aperture.

2. A freight bracing member having at least one end adapted to be connected to a supporting member having a plate portion having a front face, a rear face an edge extending between said faces, and said plate portion defining an aperture therethrough in spaced relation to said edge, said freight bracing member comprising an elongated body, means on said body at said one end of said bracing member adapted to extend over said edge and engage said rear face and defining an opening, the axis of which is parallel to said elongated body, a latch pin, means mounting said pin on said body coaxially with said opening and for sliding movement axially of said pin between an operative position in which said pin extends through said aperture in said supporting member plate portion and into said opening and a retracted position in which said pin is withdrawn from said opening and from said aperture.

3. A freight bracing member having at least one end adapted to be connected to a supporting member having a plate portion having a front face, a rear face, an edge extending between said faces, and said plate portion defining an aperture therethrough in spaced relation to said

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edge, said freight bracing member comprising an elongated body, an angle-shaped connector on end of said body adapted to extend over said edge and including a portion extending transversely of said body and adapted to engage said rear face and defining an opening with its axis substantially parallel to said body, a latch pin, means mounted on said body adjacent said one end thereof and mounting said latch pin on said body for movement between an operative position in which said pin is adapted to extend through said aperture and extends into said opening and a retracted position in which said pin is withdrawn from said opening and from said aperture.

4. A freight bracing member as defined in claim 1 including means for moving said pin from said retracted to said operative position.

5. A freight bracing member as defined in claim 1 wherein said means mounting said pin includes means defining a cylindrical latch pin bearing coaxial with said opening and in which said pin is received for sliding movement axially thereof.

6. A freight bracing member having at least one end adapted to be connected to a supporting member having a plate portion having a front face, a rear face and a substantially horizontally disposed edge extending between said faces, and said plate portion defining an aperture therethrough in spaced relation below said edge, said

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freight bracing member comprising an elongated body, means on said body at said one end of said bracing member adapted to extend over said edge and support said one end of said bar on said edge for movement therealong, means mounted on said means adapted to engage said rear face and defining an opening, the axis of which is parallel to said elongated body, a latch pin, means mounting said pin on said body for movement between an operative position in which said pin extends through said aperture in said supporting member plate portion and into said opening and a retracted position in which said pin is withdrawn from said opening and from said aperture, said first named means being adapted to co-operate with said edge to position said latch pin the same spacing from said edge as said aperture is spaced therefrom and said first named means being freely movable along said edge when said latch pin is in said retracted position.

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ARTHUR L. LA POINT, *Primary Examiner.*