Feb. 20, 1962 R. R. RUHNKE 3,021,961

RACK

Filed Oct. 13, 1958 2 Sheets-Sheet 1

Fig. 1

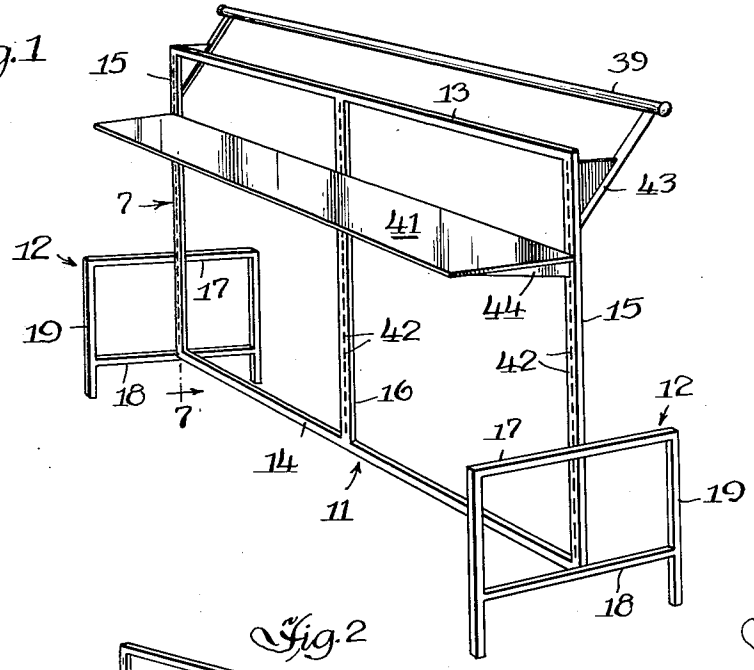


Fig. 2

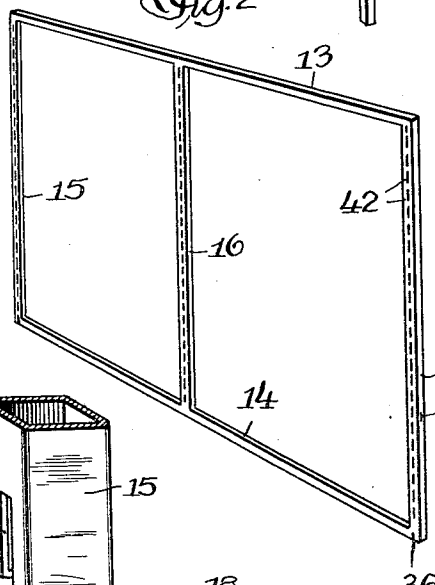


Fig. 5

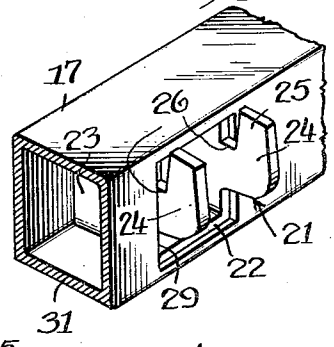


Fig. 3

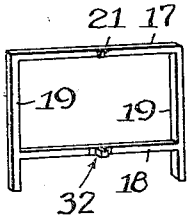


Fig. 4

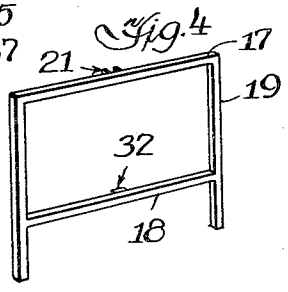
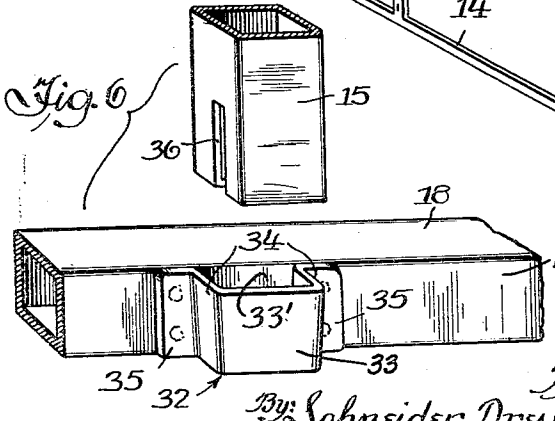


Fig. 6



Inventor,
Richard R. Ruhnke,
By: Schneider, Dressler, Goldsmith & Clement,
Attys.

Feb. 20, 1962 R. R. RUHNKE 3,021,961

RACK

Filed Oct. 13, 1958 2 Sheets-Sheet 2

Fig. 7.

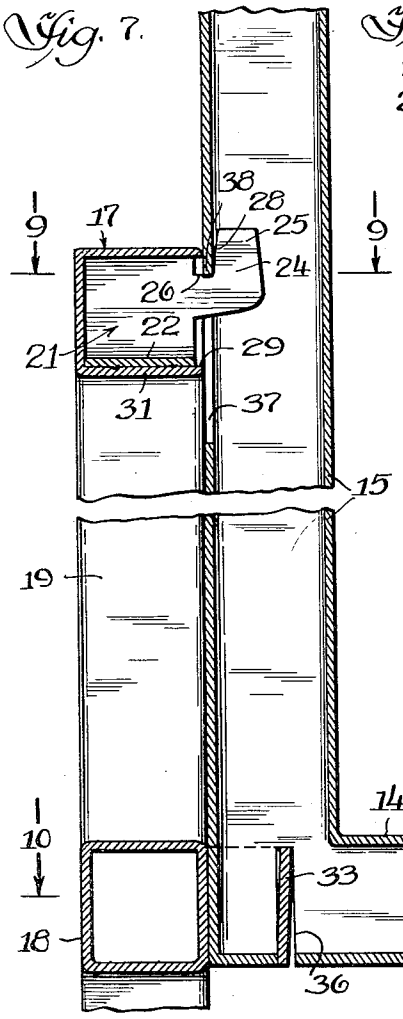
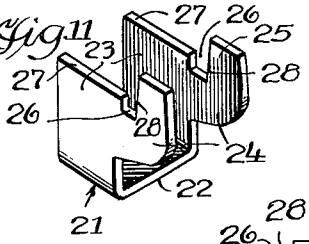


Fig. 11



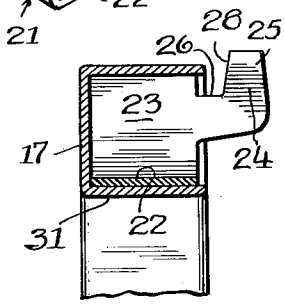
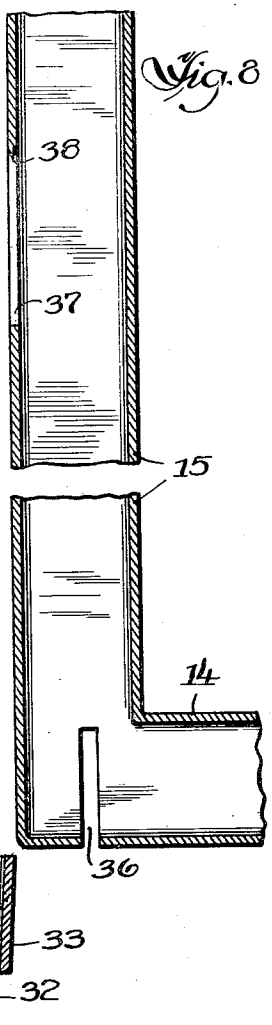


Fig. 8



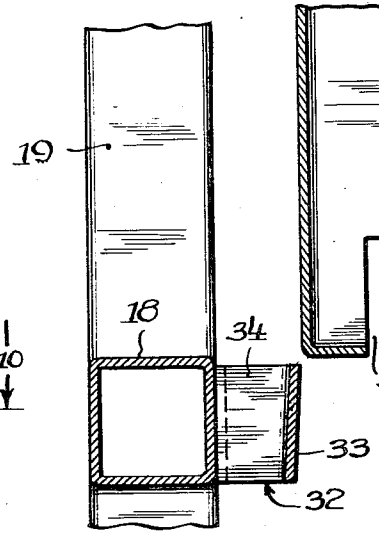


Fig. 9

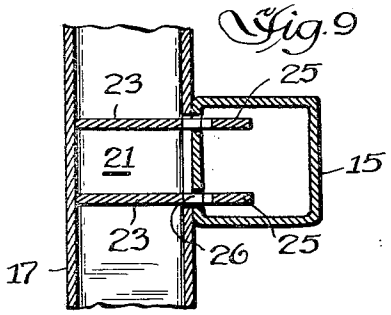
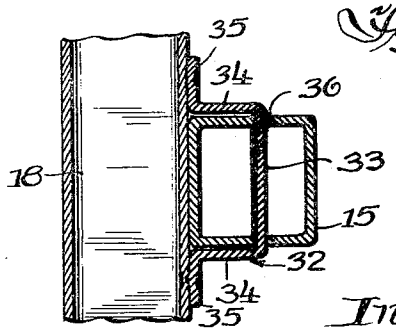


Fig. 10



Inventor,
Richard R. Ruhnke,
By: Schneider, Dressler, Goldsmith & Clement,
Attys.

United States Patent Office 3,021,961 Patented Feb. 20, 1962

3,021,961

RACK

Richard R. Ruhnke, Skokie, Ill., assignor to Garcy Corporation, a corporation of Illinois

Filed Oct. 13, 1958, Ser. No. 767,003
13 Claims. (Cl. 211—177)

This invention relates to improvements in racks, and is more particularly concerned with the novel construction and assembly of a knock-down rack structure including end frames adapted to be rigidly secured to the rack frame to support it in upright position.

In racks of the general character disclosed herein, various component frame parts or sections thereof have been secured in assembled condition by various devices including bolts, clamps, cleats and the like. Such assembly has however failed to afford efficient means to facilitate quick and easy assembly and disassembly without the aid of tools and further has not been entirely satisfactory from the standpoint of stability.

In accordance with the present invention, the means for securing component rack parts assembled rigidly includes novelly constructed brackets which are quickly engaged and disengaged with component frame parts and which, when engaged, obtain a binding wedging action with said parts to insure utmost stability to the assembly. More particularly, end frames of the rack assembly carry as integral portions thereof simply constructed brackets which are easily and quickly engaged in slots in the center frame and which, when engaged, cause the complemental parts to be drawn tightly against one another to prevent wobble ordinarily present in racks of prior construction. The brackets are readily fabricated from strap material stamped and bent into requisite shape to engage in or be engaged by complemental means formed in the engaged rack part.

The structure by means of which the above noted and other advantages of the invention are attained will be described in the following specification, taken in conjunction with the accompanying drawings, showing a preferred illustrative embodiment of the invention, in which:

FIGURE 1 is a perspective view of a rack embodying features of the invention;

FIG. 2 is a perspective view of the center frame;

FIG. 3 and 4 are perspective views of the end frames;

FIG. 5 is a fragmentary enlarged perspective view of the horizontal top rail of an end frame, illustrating one of the brackets affixed thereto;

FIG. 6 is an enlarged exploded perspective view of parts of the end and center frames, illustrating another attaching bracket;

FIG. 7 is a fragmentary enlarged vertical sectional view taken substantially on line 7—7 of FIG. 1;

FIG. 8 is a sectional view similar to FIG. 7 but showing the center frame separated from the end frame;

FIG. 9 is a detail sectional view taken on line 9—9 of FIG. 7;

FIG. 10 is a detail sectional view taken on line 10—10 of FIG. 7; and

FIG. 11 is an enlarged perspective view of one of the brackets.

Referring to the drawings, the rack comprises an upstanding center frame 11 and a pair of end frames 12. The center frame is fabricated from tubular metal stock and includes top and bottom rails 13—14, respectively, upstanding connecting end rails or posts 15, and an intermediate reinforcing rail 16 all rigidly connected at their joinings, as by welding.

The end frames 12 are alike, and the following description of one of said frames is fully applicable to the other. End frame 12 also is fabricated from tubular metal stock and it includes top and bottom rails 17—18, respectively, and upstanding connecting standards or legs 19, all rigidly connected at their joinings, as by welding.

When in assembled condition as shown in FIG. 1, center frame 11 extends between and is detachably secured to end frames 12 midway between their ends so as to afford a wide supporting base structure for the assembly. The connection between the frames comprises, generally, a pair of novelly mounted and shaped brackets which are carried firmly on each end frame for cooperative engagement by and with the upstanding end rails 15 of the center frame.

Top rail 17 of the end frame carries a bracket 21 which is rigidly secured thereto midway between the frame ends. This bracket is fabricated from heavy sheet metal stock into a substantial U-shape and includes medial portion 22 and upstanding side portions 23, as shown in FIG. 11 Each side portion 23 has a hook-like extension 24 on one edge thereof each including an upstanding tongue 25 and a recess 26 at its junction with the top edge 27 of side portion 23. The edge 28 of said tongue which merges with recess 26 is inclined downwardly outwardly from the top edge of tongue 25 for a purpose to be described presently. This bracket is mounted inside top rail 17, one side wall of which is apertured, as at 29, to receive the bracket therethrough. The medial portion 22 of the bracket is seated on and welded to rail bottom wall 31 in such manner that extensions 24 extend outwardly on one side thereof.

Bottom rail 18 of said end frame also carries a bracket 32 arranged in vertical alignment with bracket 21. As shown in FIG. 6, this bracket is formed from heavy sheet metal stock into substantially U-shape including a medial wall 33, side walls 34 and mounting flanges 35. The bracket is secured, as by riveting or welding, to the side face 18' of bottom rail 18 to define a vertical rectangular socket 33'.

Each upstanding end rail 15 of center frame 11 is formed to cooperatively engage with brackets 21 and 32 when the rack is assembled. To this end the bottom end of rail 15 is slotted vertically, as at 36 (FIGS. 6 and 8) so as to receive the medial wall 33 of bracket 32 therein when said rail is moved downwardly thereover. The medial wall 33 is inclined upwardly outwardly so that when it is engaged in slot 36 end rail 15 is pulled tightly against the opposed face of bottom rail 18 to insure a tight joint that will prevent rail 15 from wobbling relative to rail 18.

End rail 15 also has a pair of parallel slots 37 in the outwardly disposed face thereof into which the hook-like extensions 24 are extended during assembly. When end rail 15 is moved downwardly to wedge the lower end thereof in bracket 32, the upper marginal edge 38 adjacent each slot 37 is engaged behind tongues 25 and seated in recesses 26 of bracket 21. Owing to the inclination of the tongue edge 28, end rail 15 is pulled into tight abutment with top rail 17 of the end frame.

It should be quite evident that the structure and mode of assembly is such that the rack can be easily and quickly set up and disassembled and that, when it is set up, the parts are held together rigidly by the binding-wedging action of brackets 21 and 32 so as to insure utmost stability for the assembly.

The rack may be fitted with any one or more conventional hanger bars 39, shelves 41 or like appurtenances, the upstanding end rails 15 being formed with the usual vertically spaced slots 42, selectively adapted to receive mounting brackets 43—44 engaged therein. Also the end frames may be fitted with decorative panels, not shown.

Although I have described a preferred embodiment of my invention in considerable detail, it will be understood

that the description thereof is intended to be illustrative, rather than restrictive, as many details of the structure shown may be modified or changed without departing from the spirit or scope of the invention. Accordingly, I do not desire to be restricted to the exact construction described.

I claim:

1. A rack structure comprising a substantially rectangular tubular center frame disposed in a vertical plane, a pair of substantially rectangular tubular end frames one at each end of the center frame and arranged in vertical planes perpendicular to the plane of the center frame, and vertically spaced complemental means on the center frame and end frames detachably engageable to hold the frames in assembled relation, said complemental means including two vertically spaced members projecting from each end frame, one of said members on each end frame being shaped to provide wedging action between one of said complemental means at two laterally spaced points, the other member on each of said end frames being shaped to provide wedging action between said other complemental means, said center frame being firmly secured to said end frames by the wedging action of all of said complemental means.

2. A rack structure comprising a center frame including upstanding end rails, means connecting said end rails together, vertically spaced slots in said end rails, a pair of end frames each including top and bottom rails, means connecting said top and bottom rails together, a bracket on each top rail engageable in the upper slots of the respective end rails, and a bracket on each bottom rail engageable by the lower slots of the respective end rails, said brackets cooperating with the slots in said end rails to bind the end frames to the center frame firmly.

3. In a rack structure, a first frame including a tubular rail having means for detachably securing it to a second frame, said second frame having a tubular rail provided with a pair of spaced parallel slots, said first mentioned tubular rail having an aperture in one wall thereof, the means comprising a bracket mounted within the tubular rail of said first frame in register with the aperture therein, and a pair of hook-like extensions on said bracket, each of said extensions projecting outwardly through said aperture and one of said slots for engagement with the second frame to provide two spaced points of support.

4. A rack structure including first and second frames adapted to be detachably connected together firmly, a pair of spaced brackets on said first frame, one of said brackets having a pair of laterally spaced, parallel, vertically disposed extensions, said other bracket having a vertically disposed wall extending perpendicularly to the vertical planes of said extensions, means on the second frame engageable by said one wall, and means on said second frame engageable with said extensions, each of said engagements between said second frame and said brackets being characterized by a wedging action.

5. In a rack structure including first and second frames, a pair of rails on said first frame, brackets carried by said rails and disposed on one face of said first frame, one of said brackets having parallel sides extending in vertical planes, said other bracket having a vertically disposed wall extending perpendicularly to said sides, and means on the second frame detachably engageable with said sides and said vertically disposed wall to secure the frames together, said means being effective to wedge the frames together as they are being interengaged.

6. A rack comprising a central frame, an end frame and two spaced pairs of interlocking members detachably securing said frames together, one of said pairs of interlocking members comprising two laterally spaced parallel walls at the upper edge of said end frame and a portion of said central frame engageable with said parallel walls, said other pair of interlocking members comprising a vertically disposed wall perpendicular to said parallel walls and a lower edge portion of said central frame engageable with said vertically disposed wall. each of said pairs of interlocking members having wedge means for forcing said frames toward each other and holding them in tight abutting relationship by the wedging action between said interlocking members.

7. A rack comprising a central frame, an end frame disposed at right angles to said central frame, two separate brackets on said end frame, one of said brackets having two vertically disposed extensions, said other bracket having a vertically disposed wall extending perpendicularly to said extensions, said central frame having separate slots engageable with each of said extensions and with said vertically disposed wall each of said extensions and said vertically disposed wall having wedge means forcing said frames toward each other and holding them in tight abutting relationship by the wedging action between said brackets and said central frame.

8. A rack comprising a central frame having a vertical tubular post at one end, said post having a first slot extending upwardly from its bottom end and a second slot in its outer surface, an end frame disposed adjacent said vertical post at right angles thereto, a first bracket rigidly secured to said end frame, said bracket having a wall engageable with said first slot, said wall being inclined to provide a wedging action forcing said end frame and central frame toward each other into tight abutting relationship as said post moves downwardly to engage said first bracket, and a second bracket projecting from said end frame and engageable with said second slot, said second bracket having an inclined notch engageable with a portion of said tubular post defining said second slot to provide a wedging action forcing said end frame and central frame toward each other into tight abutting relationship as said post moves into engagement with said second bracket.

9. A rack structure including a central frame and an end frame adapted to be detachably connected together, the central frame including an end rail having a slot in one end thereof, the end frame having an upper horizontal rail and a lower horizontal rail connected together by spaced legs, said upper horizontal rail having a bracket extending in a vertical plane and provided with a hook-like projection engageable with said slot, a second slot in the end rail of said center frame, and a second bracket projecting from the lower horizontal rail of said end frame, said second bracket having one wall extending in a vertical plane perpendicular to the plane of said hook-like projection, said wall being engageable with said second slot to cooperate with the first mentioned bracket and slot to hold said central frame and end frame together.

10. A rack comprising a central frame having two tubular vertical rails and two tubular horizontal rails connected together, one of said vertical rails having a slot in one wall thereof intermediate its height and a second slot extending upwardly from the bottom of said frame, an end frame having two horizontal rails and two vertical rails connected together, said horizontal rails being provided with vertically spaced brackets, the upper bracket having a recess extending downwardly from its upper edge, said end frame and central frame being detachably secured together by interlocking engagement of said wall contiguous to the upper end of said first mentioned slot with said recess and the interlocking engagement of said second slot with one wall of said lower bracket.

11. A rack comprising a central frame having two tubular vertical rails and two tubular horizontal rails connected together, one of said vertical rails having a slot in one wall thereof intermediate its height and a second slot extending upwardly from the bottom of said frame, an end frame having two horizontal rails and two vertical rails connected together, said horizontal rails being provided with vertically spaced brackets, the upper bracket having a recess extending downwardly from its

upper edge, said end frame and central frame being detachably secured together by interlocking engagement of said wall contiguous to the upper end of said first mentioned slot with said recess and the interlocking engagement of said second slot with one wall of said lower bracket, the wall of said lower bracket engaged by said slot and one wall of said recess being inclined, whereby said central frame and said end frame are wedged together at each point of said interlocking engagement.

12. A rack comprising a central frame including a vertical tubular post, a slot in one wall of said tubular post intermediate its height, a second slot extending upwardly from the bottom of said post, a vertically disposed end frame perpendicular to said central frame said end frame having an upper horizontal rail and a lower horizontal rail connected together by spaced legs, a bracket projecting from said upper horizontal rail, said bracket having an upwardly extending hook-shaped projection adapted to be inserted in said first mentioned slot, a recess in said bracket contiguous to one edge of said projection, and a second bracket projecting from said lower horizontal rail, said second bracket being below and in vertical alignment with said second slot when said first mentioned bracket is positioned in said first mentioned slot, whereby said central frame and said end frame may be simultaneously interlocked at two spaced points by moving said central frame downwardly to position the edge of said one wall contiguous to the upper edge of said first mentioned slot in said recess and to position said second slot in interengagement with said second bracket.

13. In a rack structure including first and second frames, means for securing said frames together, said means comprising a bracket on said first frame, said bracket having an extension projecting from said first frame in a vertical plane and being engageable over a marginal edge formed on said second frame, and a second bracket on said first frame, said second bracket having a vertically disposed wall extending at right angles to the vertical plane of said extension, said wall being engageable with a portion of said second frame.

References Cited in the file of this patent

UNITED STATES PATENTS

1,294,811	Krauss	Feb. 18, 1919
1,409,228	Marshall	Mar. 14, 1922
1,596,296	Oberdorfer	Aug. 17, 1926
1,832,801	Wright	Nov. 17, 1931
1,847,042	Wyatt	Feb. 23, 1932
2,031,718	Kress	Feb. 25, 1936
2,205,519	Eiber	June 25, 1940
2,279,864	Eide	Apr. 14, 1942
2,345,650	Attwood	Apr. 4, 1944
2,400,162	Mulligan	May 14, 1946
2,473,047	Bershad	June 14, 1949
2,784,812	Kindorf	Mar. 12, 1957
2,919,034	Levy	Dec. 29, 1959