July 14, 1959 R. A. MAGNUSON ET AL 2,894,644

GARMENT RACK

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Fig. 1.

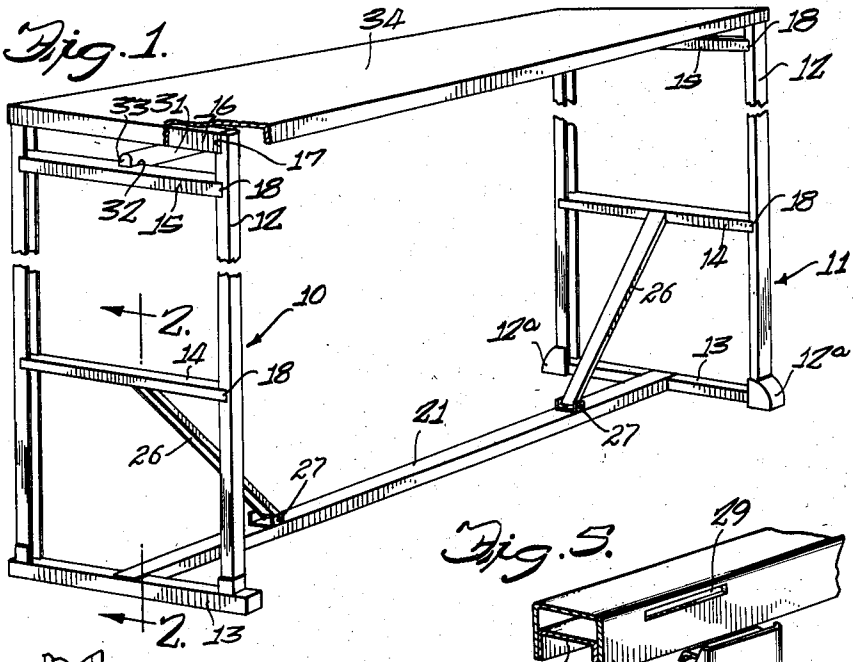


Fig. 5.

Fig. 3.

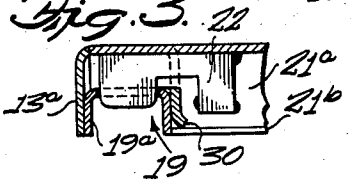


Fig. 2.

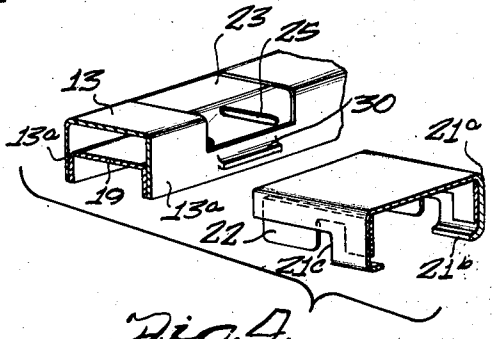


Fig. 4.

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GARMENT RACK

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3 Claims. (Cl. 211—177)

The present invention relates generally to collapsible or knock-down garment racks and more especially, the invention is concerned with improvements over garment racks of the type disclosed in United States Patent No. 2,589,269, issued March 18, 1952, to Raymond A. Magnuson and Nels M. Christiansen.

It is a general object of the present invention to provide an improved garment rack embodying few parts which are novelly constructed and arranged to facilitate assembly and disassembly.

It is a more specific object of the invention to provide in a garment rack an improved brace construction which not only insures rigidity of the assembled rack but also permits both assembly and disassembly by one person without any need for external support for any of the rack's parts to aid him in so doing.

Other objects and advantages will become apparent from the attached detailed discussion and upon reference to the drawings, in which:

Figure 1 is a fragmentary perspective view of an assembled rack embodying the features of the present invention.

Fig. 2 is a fragmentary section taken along line 2—2 in Fig. 1.

Fig. 3 is an enlarged fragmentary section of the connection between the bottom rail and a lower cross brace, as shown in section in Fig. 2.

Fig. 4 is an exploded perspective view of the connection shown in Fig. 3.

Fig. 5 is an exploded perspective view of the connection between the diagonal brace and the end cross brace of the illustrative device, as shown in section in Fig. 2.

While the invention has been described in connection with a preferred embodiment, it will be understood that it is not intended to limit the invention thereto, but it is intended to cover all modifications and alternative construction falling within the spirit and scope of the invention as expressed in the appended claims.

In the illustrative rack, the supporting elements are embodied in two end frames **10** and **11**, each comprising a pair of spaced upright posts **12** and a series of cross braces **13**, **14**, **15** and **16**, rigidly connecting the posts together. The posts and cross members may be formed of wood or, as shown, of sheet metal of relatively light gauge bent into channel or open-tube shape of rectangular cross section.

The cross braces **14** and **15** may advantageously be of channel section wherein the web of the channel at each end of the cross brace is cut away to permit the channel flanges **18** to straddle one of the posts **12** and to be appropriately attached thereto as by spot welding. Each of the lower cross braces **13** extends slightly beyond the bottom ends of the posts **12** and includes at each of its ends a recess formed in the upwardly facing web for receiving the posts. When the post **12** is positioned within the recess the joint may be completed by welding or brazing. If desired, foot-caps **12***a* may be secured to

cover and strengthen the joints between the posts **12** and the lower cross braces **13**.

It will be observed that in the illustrative rack each of the cross braces **13** and **14** is reinforced by a supplemental channel located within the channel-shaped members comprising these cross braces and preferably connected thereto by spot welding or the like. Thus, a downwardly opening shallow channel **19** is arranged within the cross brace **13** in such a manner that its flanges **19***a* fit snugly within the flanges **13***a* of the cross brace (Fig. 3). As will be seen, the channel **19** is so positioned that the outer edges of the flanges **19***a* and **13***a* are flush. In like manner a shallow channel **20** is disposed within the cross brace **14**.

The ends of the upper cross braces **16** are seated in notches **17** formed in the top of each of the posts **12** by cutting away the upper portion of the inside post face. The members **16** may be further connected with the posts by spot welding or the like if desired.

The end frames **10** and **11** thus constitute two rigid structures which are light in weight and when disconnected from the rack are relatively flat and can be readily stored. The width of the end frames is preferably slightly greater than the width of the garments to be hung in the rack but if desired may either be narrower or wider.

For maintaining the end frames **10** and **11** in spaced relationship, an elongated bottom rail **21** is provided which is adaptable to detachably interconnect the respective bottom cross braces **13**. From the drawings it will be seen that the bottom rail **21** may advantageously be of downwardly opening channel section similar to that of the cross braces, including depending flanges **21***a* having inturned shoulders **21***b* formed along their lower edges defining the open side of the rail. As will be seen from Fig. 4, the rail **21** carries at its ends connecting elements in the form of downwardly directed locking tabs **22** which are adapted to enter appropriate sockets **23** provided in the respective bottom cross braces **13**.

In this instance the locking tabs **22** comprise a pair of generally rectangularly-shaped plate members preferably cut from flat sheet metal and spot welded to the ends of the rail **21** inside the spaced flanges **21***a*. The lower portion of the end of the rail **21** is cut away as at **21***c* to expose the connecting tabs **22**.

For receiving the locking tabs **22**, each of the sockets **23** is formed by a centrally positioned opening in the web portion and contiguous inner flange portion of the brace **13**, and two spaced transverse slots **25** are provided in the upwardly facing web portions of each of the supplemental channels **19** exposed by the opening. Thus each socket **23** is complementally formed with respect to the end of the rail **21**, and the locking tabs **22** at each end of the rail can be easily inserted into the slots **25** so that the bottom rail is seated firmly in the lower portions of the end frames **10** and **11**. Attention is directed to the fact that the slots **25** are somewhat longer than the locking tabs **22** to allow some play, for purposes to be presently explained, without producing any looseness of the assembled rack.

When the rack is assembled diagonal braces **26**, also preferably of channel section, extend across the lower corners between the bottom rail **21** and the end frames **10** and **11**, having appropriate connections thereto. In the present instance the braces **26** are mounted on the upper web of the bottom rail **21** as by ordinary hinges **27** spaced inwardly from the lower cross braces **13**. When in properly assembled relation the upper ends of the braces **26**, which carry downwardly turned hook members **28** thereon are seated in sockets **29** provided in the inner flanges **14***a* of the cross braces **14** (Fig. 5).

Conventional knock-down garment racks which are commercially available are extremely difficult for one

person to assemble. Usually such racks must be put together by at least two persons. One person must normally hold one end frame in a vertical position with one end of the bottom rail connected thereto and the corresponding diagonal brace in place while another person holds the other end frame in a vertical position and connects thereto the opposite end of the bottom rail and the other diagonal brace. Then while the end frames are maintained in a vertical position, the upper ends of these frames must be connected together by a tension member extending therebetween to hold the rack in assembled condition.

Where one person attempts to assemble such a rack alone he must use an external support, such as the wall of a room or the like, to aid him in holding up one end frame of the rack while he manipulates the other end frame and bottom rail, and then puts in place the upper tension member. This is an inconvenient and clumsy procedure at best.

The reason that assembly of such racks is so difficult is that conventional end frame and bottom rail connections are not capable of maintaining the end frames in a vertical condition during assembly without temporary external support being provided for these end frames. After the first end of the conventional bottom rail is connected to one vertical end frame and the diagonal brace put in place, the upper end of this end frame if externally unsupported tends to tip or lean outwardly or away from the central portion of the rack. Such outward leaning of this end frame of course results in an outward and upward pulling action being exerted along the diagonal brace so that the bottom rail is accordingly pulled upwardly at the joint between the brace and the rail, and the bottom rail thus tends to pivot about the connection between itself and the end frame. Under such circumstances the difficulty inherent in the assembly of such a garment rack will be readily apparent.

In carrying out the invention, means is provided for facilitating assembly and disassembly of the rack by one person without any need for external supports for any of the rack's parts. In the present instance such means includes an outwardly turned tang 30 longitudinally extending along each of the inner flanges 13*a* of the cross braces 13 and disposed directly below the socket 23 for locking cooperation with the inner end portions of the inturned bottom rail shoulders 21*b*. It will be seen that the tang 30 corresponds in length to the distance between the interior surfaces of the flanges 21*a* so that the opposing end portions of each of the inturned shoulders 21*b* at one end of the bottom rail 21 are adapted to engage the underside of the respective ends of the tang projecting from the corresponding bottom cross rail 13. In practice the length of the tang 30 is slightly less than the inner web measurement of the channel-shaped bottom rail to facilitate easy movement of the parts into and out of engagement.

Thus in assembling the illustrative rack a person may stand up one end frame with one hand and easily insert the tabs 22 at one end of the bottom rail into the slots 25 carried in the lower cross brace 13 on that end frame with the other hand. Engagement of the rail shoulders 21*b* with the tang 30 may then be effected by simply swinging this end frame slightly outwardly to permit the inner end portions of the shoulders adjacent the cutaway portion 21*c* to slip under the ends of the tang. Such slight swinging movement of the end frame and resulting pivotable connection between the bottom rail and end frame is possible because of the aforementioned play of the locking tabs 22 within the slots 25. The corresponding diagonal brace 26 is then connected to the end frame by seating the hook 28 in the socket 29 provided by the end frame cross rail. This is accomplished by swinging the end frame slightly inwardly to resume a vertical position so that the hook member 28 extends into and becomes tightly seated in the socket 29.

In this way the bottom rail 21 and end frame are positively locked together as shown in Fig. 3 and the end of the bottom rail is seen to fit snugly within the socket 23. The members are held from becoming disengaged and the end frame stands up vertically without requiring external supports and without causing the bottom rail to be lifted or otherwise displaced.

Thus, one end frame is capable of maintaining itself upright and the person may then assemble the other end of the rack in like manner. To complete the assembly, the upper ends of the end frames 10, 11 are connected by a tension member which pre-stresses the frame members and thereby holds the braces 26 in compression to remove all play and produce a rigid assembly. The end frames 10 and 11, whether of metal or wood, yield sufficiently to permit them to be pre-stressed for the aforesaid purposes.

The tension member employed may advantageously be in the form of an elongated garment hanger rail 31 connected between the opposing upper cross braces 15 and disposed at the desired height for a hanger rail. In the present instance the rail 31 is notched at 32 at each of its ends to provide a portion 33 extending over and resting on the cross braces 15. Any suitable connection between the hanger rail 31 and the cross braces 15 may be provided but a hook or clip type connection is preferred. The length of the rail 31 is suitably adjusted so that when firmly connected to the cross braces 15 it exerts a slight bending moment on the end frames 10, 11 to develop compression in the braces 26 for the aforesaid purposes.

A shelf 34 may advantageously rest on the top of the frames 10 and 11 so as to serve as a cover for the garments as well as a shelf. In the preferred form, the shelf 34 is made of sheet metal downwardly flanged at its sides and carrying at its ends downwardly extending flat hooks (not shown) which enter appropriately placed registering slots provided at the top of the upper cross braces 16.

In disassembling the rack, the shelf 34 and hanger rail 31 are first removed which thereby releases the end frames 10 and 11 for slight swinging movement outwardly with respect to the bottom rail 21 so that the upper ends of the diagonal braces 26 may be withdrawn from their seats in the sockets 29. After the hooks 28 are so disengaged from the sockets 29, the bottom rail 21 may be removed from the end frames 10 and 11 by disengaging the shoulders 21*b* from the tang 30 and lifting the tabs 22 at successive ends of the rail 21 from engagement with the corresponding sockets 23. The entire rack is thus knocked down in a matter of second's time and the individual elements which are few in number and light in weight may be readily stored in a small space.

One of the advantages of the invention is the provision of an improved knock-down garment rack which may be quickly and easily assembled in the middle of a large room, such as a wardrobe or gymnasium floor, by one person without the aid of external props or supports.

We claim as our invention:

1. A knock-down garment rack comprising, in combination, a pair of spaced and substantially vertical end frames each including a horizontal cross bar, a horizontal bottom rail detachably joined to said cross bars at substantial right angles thereto in a manner to permit limited swinging movement of said end frames relative to said bottom rail, said bottom rail having a downwardly facing opening therethrough defined by a pair of opposed inturned shoulders running longitudinally of the rail, a diagonal brace interposed between and connected to each end frame and a point intermediate the ends of the bottom rail for strengthening the assembled rack, a pair of disengageable connections interposed between the ends of said bottom rail and said respective end frame cross bars, each of said connections including a con-

necting tab on the end of the bottom rail, each of said cross bars having a complemental socket engaged by respective ones of said connecting tabs, and retaining means arranged longitudinally on each of the cross bars adjacent said sockets and engaging said inturned rail shoulders to positively prevent inadvertent disengagement of said connections when the end frames undergo limited swinging movement outwardly with respect to said bottom rail.

2. In a knock-down garment rack having a pair of spaced and substantially vertical end frames each including a horizontal cross bar, a horizontal rail for detachably joining said cross bars at substantial right angles thereto in a manner to permit limited swinging movement of said end frames relative to the rail, and including a brace member interposed between and connected to each end frame and a point intermediate the ends of the rail; a disengageable connection interposed between one end of the rail and one of the end frame cross bars; said connection comprising a locking member adjacent the end of the rail and an inturned shoulder on the rail and longitudinally spaced from the locking member, and said one of the cross bars having a complemental socket engaged by said locking member and an outturned tang engaged with said inturned shoulder so that the tang and shoulder prevent inadvartent disengagement of the connection when the end frame undergoes limited swinging movement outwardly with respect to the rail.

3. In a knock-down garment rack having a pair of

spaced and substantially vertical end frames each including a horizontal cross bar, a horizontal rail for detachably joining said cross bars at substantial right angles thereto in a manner to permit limited swinging movement of said end frames relative to the rail, and including a brace member interposed between and connected to each end frame and a point intermediate the ends of the rail; a disengageable connection interposed between one end of the rail and one of the end frame cross bars; said connection including means for positively locking the rail end and respective end frame to prevent inadvertent disengagement of the connection when the end frame undergoes limited swinging movement outwardly with respect to the rail.

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