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3,071,400

RELEASABLE LOCKING JOINT STRUCTURES

Filed July 27, 1960

FIG. 3

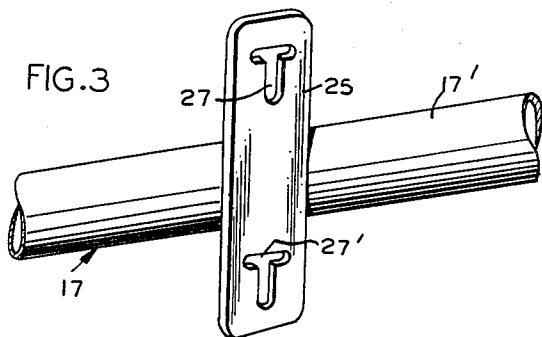


FIG. 2

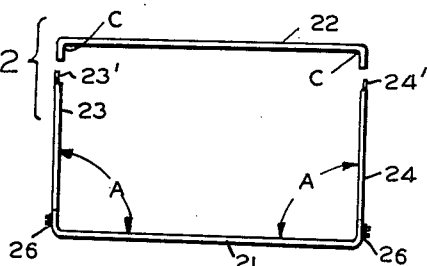


FIG. 1

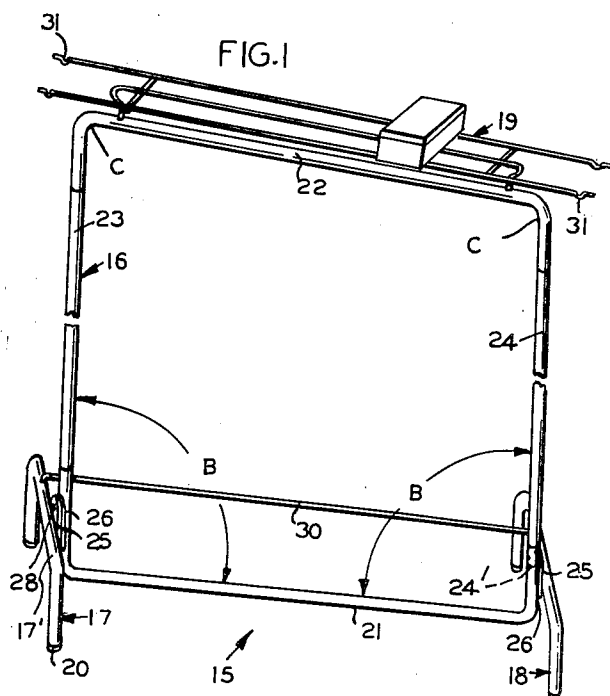


FIG. 4

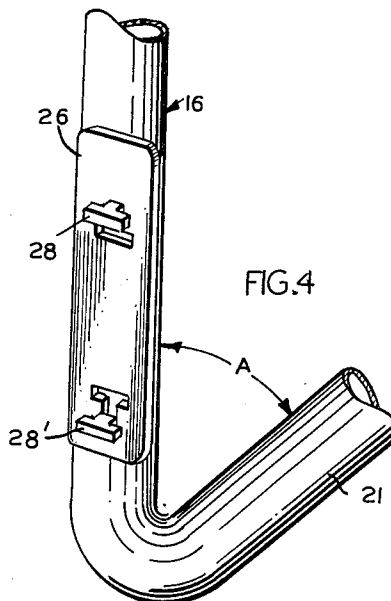
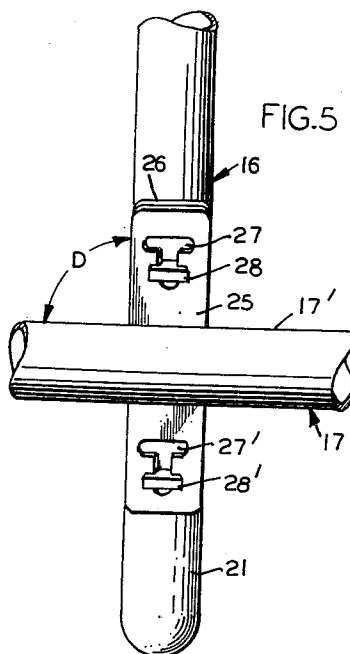


FIG. 5



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RELEASABLE LOCKING JOINT STRUCTURES

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1 Claim. (Cl. 287-54)

The present invention relates to releasable joint constructions for use for instance in articles having framework shipped or stored in "knock-down" condition, as clothing racks and stands, display frames, tubular-frame furniture and the like.

An object of this invention is to provide a novel and improved joint structure which is self-locking and separable.

Another object is to provide novel and improved joints of the character mentioned, adaptable for releasably joining two elongated members in crossed relation.

A further object thereof is to provide a novel and improved joint construction of the type set forth, which does not detract from the appearance of the article they are used on.

Another object thereof is to provide a novel and improved knock-down clothes rack of the type comprising principally a rectangular frame releasably joined in upright position to a pair of inverted U-shaped legs which hold said frame between them; such frame being made of parts which are releasably and securely joined in a novel manner to augment locking action at all joints.

Still another object of this invention is to provide constructions having the attributes mentioned, which are reasonably cheap to manufacture, easy to assemble and dis-assemble and efficient in carrying out the purposes for which they are designed.

Other objects and advantages will become apparent as this disclosure proceeds.

For the practice of this invention, one form it may assume is to have two rigid strips of like size and rather of short length. One strip has a T-slot near each end. From the other, T-prongs are struck up, one near each end, which are spaced to be entered simultaneously into said T-slots, and upon relative sliding movement of said strips, said strips are automatically interlocked. Their sliding in the opposite direction, releases said strips for separation. Dimensions of the slots and prongs are such that when the strips are associated, they will be held securely one on the other. The positions of the prongs on their little plate or strip, are preferably such, that said plates coincide when associated to interlock.

In a clothing rack for instance, such joint structure is used for the rectangular frame where it crosses its inverted U-shaped leg members as illustrated herein. Such frame in the construction shown, is made of tubular stock comprising an upright lower U-member, and inverted upper U-member and vertical posts having reduced ends telescopically fitted into the corresponding distal end of said upper and lower U-members. As will be explained, provision is made to create a stress at each junction of frame parts, which will augment the locking action of the joint structures which releasably affix the leg members to the frame.

A more detailed description of the use of this invention will now be given, for which reference is had to the accompanying drawing in which corresponding parts are indicated by similar characters of reference.

FIG. 1 is a perspective view of a clothes rack embodying the teachings of this invention.

FIG. 2 is a composite view of parts of the frame partially assembled, drawn to a reduced scale.

FIG. 3 is a fragmentary perspective view showing a leg member equipped with a plate having T-slots.

FIG. 4 is a fragmentary perspective view showing the

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frame member equipped with the plate having the T-prongs.

FIG. 5 is a fragmentary perspective view showing the parts illustrated in FIGS. 3 and 4, assembled.

In the drawing, the numeral 15 designates generally a clothes rack comprised of a rectangular frame denoted generally by the numeral 16, intermediate and joined to the inverted U-shaped leg members 17, 18. A hat- and package-carrying shelf 19 of wire-work may be provided atop and spaced from the frame and the feet at their distal ends may be provided with slide casters 20 or roller casters (not shown) if desired. The leg members and frame may be of tubular stock. Said frame 16 comprises a lower, upright U-shaped member 21, and upper, inverted U-shaped member 22, the distal ends of which upper and lower members are telescopically joined to the posts 23 and 24, which have reduced ends for such purpose; all such telescopic joints holding by friction. The reduced ends of said posts which are viewable in the drawing, are indicated by the numerals 23' and 24'.

Where the frame 16 crosses the leg members 17, 18, a self-locking joint structure is provided. Since these joints are identical, a description of one will suffice. There are two plates 25, 26 of identical size preferably. Plate 25 is positioned vertically across and welded to the base element 17' of the leg member 17. Through each free end portion of said plate 25, there is an upright T-slot. These slots are denoted by the numerals 27 and 27' respectively. Plate 26 is positioned upright, outside along a side of the frame 16, near the bottom of said frame, whereat it is welded thereto to be opposite the plate 25. This plate 26 has the T-shaped prongs 28, 28' struck up therefrom perpendicular to said plate's surface, and so spaced therealong that when engaged in the T-slots 27, 27' respectively, said plates will coincide. The leg of each T-prong is of a height that the plates 25, 26 will be in tight frictional contact when the T-prong legs are within the openings forming the legs of said T-slots.

When the joint structures of FIG. 5 are used in conjunction with leg members 17, 18 to releasably interlock thereto a sectional frame 16, and a rod 30 having some resilient quality, is provided connecting the leg members a bit away from said joints, I make the corners C of the frame member 22, 90 degrees each, but the corners of frame member 21 before assembly of the frame, I make an angle A near to, yet not equal to 90 degrees. After the posts 23, 24 are set in assembly with the member 21, such posts will not be parallel and will require either to be brought together a little from their upwardly convergent condition shown in FIG. 2, or urged apart a little if angle A is less than a right angle, to mount the member 22. Not only is there good frictional engagement at the telescopic joint against disassociation of the members 21 and 22 from the posts, but such friction and resulting engagement is augmented due to the stresses set up in the frame 16 to bring the angles A to 90 degrees each. I prefer that the rod 30 shall be slightly bent if the angles A are less than 90 degrees each, but it may be straight if such angles A are more than 90 degrees. With said tie rod 30 is assembly before the frame member 22 is mounted on the otherwise assembled rack 15, then upon completion of the frame assembly, the stressing to change angle A to a right angle B, will stress the tie rod 30, which in turn will stress the joint connection of FIG. 5 to augment the friction of the association of the plates 25, 26 and thus strengthen the joint afforded at the leg members 17, 18. The rod 30 used with member 21, serves or may serve as a shoe rack. Garment hangers are supported of course, on the upper frame member 22. Umbrellas may be hung on the hooks 31.

Although the joint structure shown in FIG. 5 shows

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angle D a right angle, it may be made to suit any angular relation in which the parts joined are to be associated, by change of angle D to that angle which is required.

This invention is capable of numerous forms and various applications without departing from the essential features herein disclosed. It is therefore intended and desired that the embodiments described herein shall be deemed merely illustrative and not restrictive and that the patent shall cover all patentable novelty herein set forth, reference being had to the following claim rather than to the specific showing herein to indicate the scope of this invention.

I claim:

In a structure including an upright frame made of an upright U-shaped member having upright arms and an inverted U-shaped top member; the distal ends of said top member being telescopically associated with the respective distal ends of said upright member, a pair of leg members; said frame being intermediate said leg members; said leg members being releasably joined to the upright arms of said upright member respectively by co-operating joint structure on each arm of said upright member and the leg members respectively adjacent them;

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each joint structure requiring relative movement along the vertical, of an arm and its associated leg for effecting their release from each other; the improvement being that the distal ends of said top member before assembly with said upright member is of a predetermined distance apart different than the distance the distal ends of said upright member are apart, whereby said frame parts are stressed upon assembly to form the frame, and a rod having some resilient quality, joined at its ends to said leg members respectively; said rod being spaced from said frame and in stressed condition whereby the locking action of said joints is augmented at each joint structure respectively; such stressed condition of said rod being caused by assembling said frame members.

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