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J. M. D. DE NIET

3,400,831

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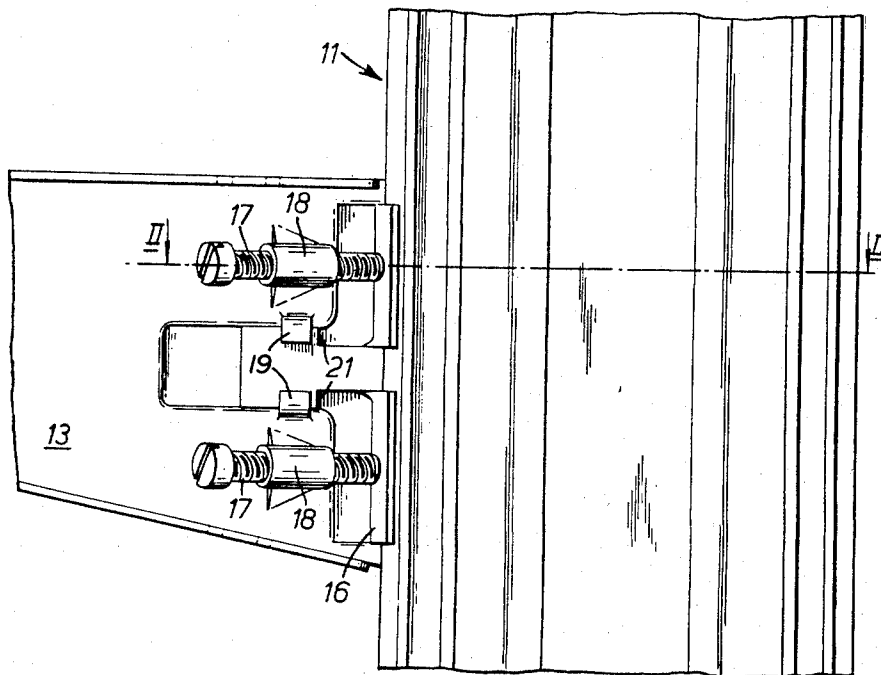


FIG. 1.

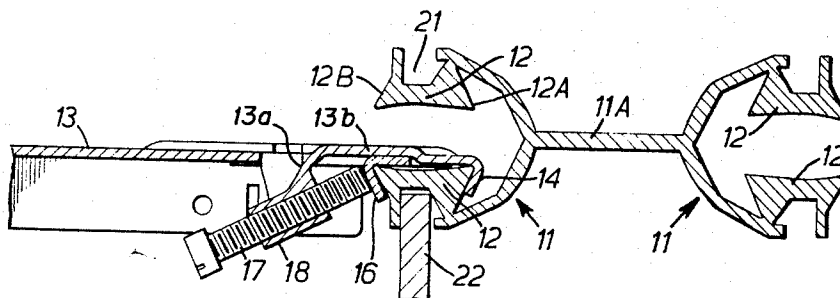


FIG. 2.

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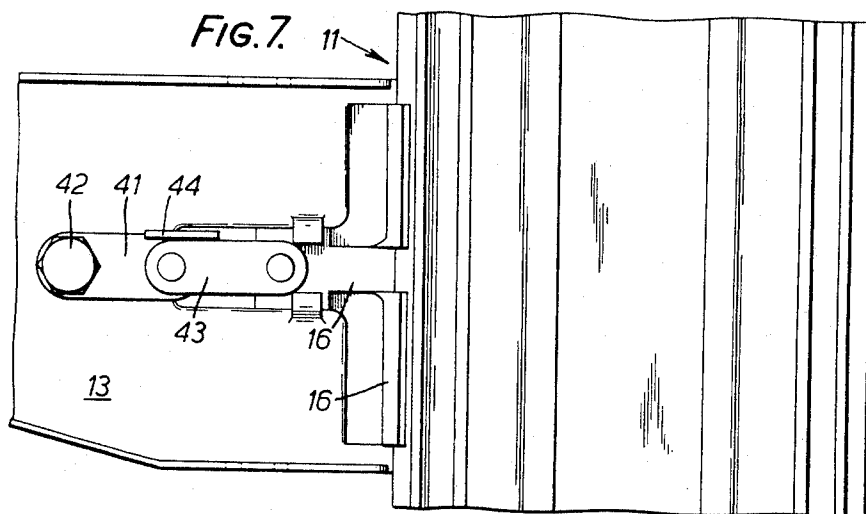
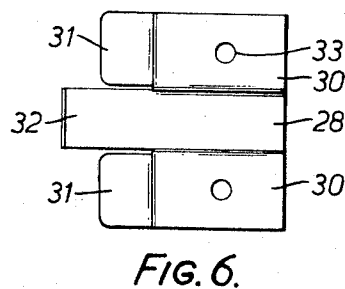
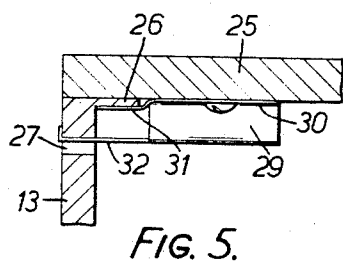
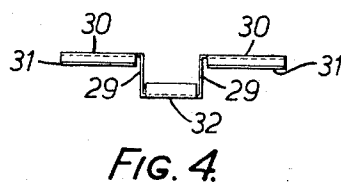
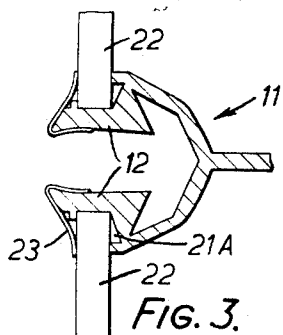
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ABSTRACT OF THE DISCLOSURE

Adjustable bracket means for shelving comprising aluminium extrusion support members, channel shaped in cross-section, each of the channels having an inwardly extending vertically arranged dove tailed projection, each bracket comprising a vertical web having a fixed jaw formed on the end thereof, an adjustable jaw slidable in a vertical plane on the inner end of the web with both jaws being convergent, and screw-threaded means for moving the adjustable jaw toward the fixed jaw to clamp the opposed side faces of the projections and thereby support the bracket in its intended position of use.

This invention relates to storage equipment of the known type in which brackets are securely attached to spaced, upright support members of channel-cross section.

The invention provides storage equipment of the type comprising spaced upright support members of uniform cross-section and brackets for attachment thereto, wherein each support member is of channel cross-section, each limb of which is formed integrally with an inwardly directed projection, and each bracket is provided with securing means for secure engagement with any one of the said projections at any point along the length thereof, the relative dimensions of the parts being such that one support member can support two brackets side-by-side, one on each said projections, in a manner allowing vertical adjustment of one bracket independently of the other.

With this arrangement the user can position two brackets side-by-side upon a single support member, e.g., to support two adjacent, contiguous shelf or like members at the same height, or, if desired, the two brackets can be vertically offset from each other.

The invention also provides novel support members and brackets for use in such equipment.

Some embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

FIGURE 1 is a side view of a bracket and supporting member;

FIGURE 2 is a section on the line II—II of FIGURE 1;

FIGURE 3 is a view, similar to FIGURE 2, showing a minor modification;

FIGURES 4, 5 and 6 illustrate a novel shelf clip for use with the equipment;

FIGURE 7 is a view, similar to FIGURE 1, of another form of bracket in accordance with the invention.

In the embodiment shown in FIGURES 1 and 2, each upright support member 11 is of generally U-shaped channel cross-section, each of the opposed limbs of the section having formed integrally therewith an inwardly directed projection 12 whose side-faces 12A, 12B are undercut and converge towards the adjacent limb of the channel section, so that the projection is of substantially dovetail section. The inner faces of the projections 12 are concave to facilitate the insertion of the brackets which are secured, in use, to the support members.

The support members are also formed with external, longitudinal recesses 21 to receive back panels 22 which fill the gaps between adjacent support members.

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The support members are of uniform cross-section throughout their lengths, so that they are readily produced by extrusion, for example of an aluminium alloy.

Each of the brackets 13 is formed at its inner end with a fixed jaw 14 for cooperation with an adjustable jaw 16 formed as a slide which is releasably retained against that face of the bracket which is vertical in use. The slide is movable towards and away from the fixed jaw, and can be forced towards the fixed jaw by releasable clamping means, formed in this embodiment by a pair of screws 17. The screws are mounted in internally threaded bushes 18 welded to small projections 13a struck out of the bracket 13.

The slide or jaw 16 is set in a recessed or jogged portion 13b of the bracket 13 and retained therein by means of a pair of overlying tongues 19 formed out of the bracket. The slide is undercut at 21 so that when the screws 17 are fully retracted (and only then) the slide can be drawn out and detached from the bracket, the reverse procedure being employed to assemble the slide initially.

As will be clearly understood from FIGURE 2, the jaws are shaped and dimensioned to embrace the projection 12 and engage the undercut surfaces 12A and 12B. With the slide in a retracted position, the inner end of the bracket can be introduced through the open mouth of the channel 11 between the projections 12, and then moved laterally to engage the fixed jaw 14 behind the projection 12. The adjustable jaw 16 is then moved inwardly by means of the screws 17 until the jaws securely clamp around the projection. The vertical position of the bracket can be adjusted as desired by slackening the screws and sliding the bracket bodily to any desired new position along the support member.

The clamped joint obtained between the bracket and the support member is extremely strong, yet readily released and resecured for vertical adjustment of the bracket, and the user has complete freedom of choice of the position of the bracket along the support. Further, the brackets and support members are so dimensioned relative to each other that two brackets can be supported side-by-side upon one support member, one bracket being secured to each of the opposed projections 12. This enables, for example, two contiguous adjacent shelf units to be supported at their adjacent ends by two brackets on the same support member. Alternatively, the shelf (or equivalent) members can be vertically offset to any desired extent, since the brackets are vertically adjustable independently of each other.

Other advantages of the above described construction derive from the unconventional shaping of the support members as compared with members of conventional rectangular channel section, in that it permits a saving of material in achieving a section of equivalent strength, or alternatively permits redistribution of the same amount of material for greater strength. This stems in part from the undercutting of the projections 12 and external recesses 21, and the somewhat V-shaped section of the base of the channel section, this last fact being especially relevant to the strength of the base region, particularly in the case illustrated where two channel sections 11 are arranged back-to-back and connected by a common web 11A.

In the modified form shown in FIGURE 3, the external recesses 21 are replaced by open sided rebates 21A, with a consequent increase in lightness and/or weight of the extruded section. The back panel 22 in this case is located by the rear face of the rebate 21A and a light spring clip 23 attached to the panel.

An alternative releasable clamping means in the form of a toggle mechanism is shown in FIGURE 7. A toggle arm 41 is pivotally mounted on the bracket at 42, and

its free end is pivotally connected to one end of a link 43 whose opposite end is pivotally connected to the slide 16. A stop 44 formed on the arm 41 abuts the link 43 to limit clockwise movement of the arm 41. Conveniently, the arm 41 is provided with a hexagon head centred on the pivot axis 42, to enable the toggle mechanism to be actuated by a spanner. It will be seen that anticlockwise rotation of the arm 41 will release the toggle mechanism and withdraw the slide 16. The link 43 is slightly jogged or otherwise formed so that it is capable of a small degree of elastic shortening to ensure a good locking action.

FIGURES 4, 5 and 6 are an end view, side view and plan view, respectively, of a novel clip 24 for securing shelves 25 or like members to the brackets 13.

As shown in FIGURE 5, the bracket 13 is provided with an inwardly turned flange 26 along its upper edge and an opening 27 for cooperation with the shelf 25 and clip 24.

The clip 24 is shown as an integral member formed with a flat bottom 28, side walls 29, lateral flanges 30 extending from the top edges of the walls 29, and individual tongues 31 and 32 respectively extending longitudinally at the same end from flanges 30 and bottom 28. The tongues 31 are bent to lie parallel to the plane of flanges 30, but below such plane by a distance corresponding to the thickness of the bracket flange 26, and the tongues are slightly curved downwardly and outwardly as viewed in FIGURE 4 so as to provide a lead-in for the bracket flange on assembly. The tongue 32 projects parallel to, but further than tongues 31, and is then turned up at its outer end.

Additionally, the flanges 30 are provided with screw holes 33.

In the use of clips 24, a pair of such clips can be screwed on the underside of the shelf, one adjacent each side edge of the shelf as indicated in FIGURE 5. One is then provided with slots at the shelf edges whereby the shelf can be engaged with the associated bracket flanges and slid along the brackets. This entails "springing-out" the brackets until the shelf is slid sufficiently for tongues 32 to engage the cooperating bracket openings 27, these openings being located such that engagement of tongues 32 occurs with the shelf located in the correct disposition in relation to its brackets. The weight of the shelf and any goods loaded thereon is then taken by the brackets and their connections to the associated structure of members 11, while shelf movement parallel to the brackets is inhibited by the engagement of tongues 31. The upturned outer ends of the tongues 31 hook over the edges of the openings 27 in the brackets to prevent fortuitous disengagement of the tongues.

In some cases, one pair of clips 24 as just described is located near the front edges of the shelf, and an additional pair of similar clips located near the rear edge of

the shelf. However, these additional clips merely serve to prevent the shelf from tilting, so that tongues 32 would not be a necessary feature of the additional clips.

An advantage of the shelf clips just described is that the sequence of clip fixture to a shelf and then shelf connection with brackets is extremely simple. Also, shelves can have such clips prefixed and then be stacked one upon the other for storage and/or transport (before connection with brackets) the clips acting as spacers between adjacent shelves.

It will be appreciated by those skilled in the art that the above described brackets 13 may take other forms, such as hooks for carrying baskets, and that this and other modifications will fall within the scope of the appended claims.

I claim:

1. Storage equipment comprising a plurality of spaced upright support members, each support member having a pair of spaced limbs defining a channel cross-section, each said limb having a projection extending inwardly therefrom, each projection including a pair of opposed vertically disposed side faces, and a plurality of bracket members each having a fixed jaw at the inner end thereof, an adjustable jaw, means mounting side adjustable jaw on said bracket for sliding movement in a vertical plane for movement towards and away from said fixed jaw, and screw threaded means operable to force said adjustable jaw towards said fixed jaw for clamping engagement with the side faces of said projection to adjustably connect each of said brackets with a support member through the gripping action of said jaws with said side faces.

2. Storage equipment as claimed in claim 1, wherein each of said projections is of substantially dovetail cross-section, having a pair of opposed undercut side faces which converge towards the adjacent said limb.

3. A support member for storage equipment, said support member including a pair of opposed limbs defining a channel cross-section, and a projection formed integrally with each limb and extending inwardly thereof, each projection having a pair of opposed side faces convergent towards the adjacent said limb.

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