

Oct. 23, 1956

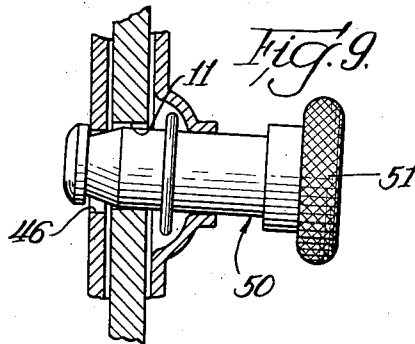
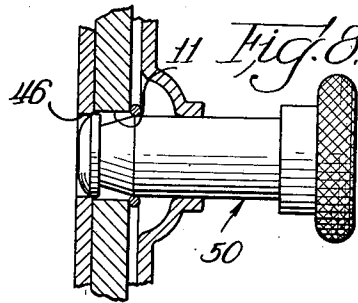
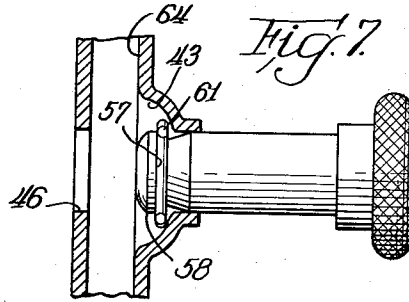
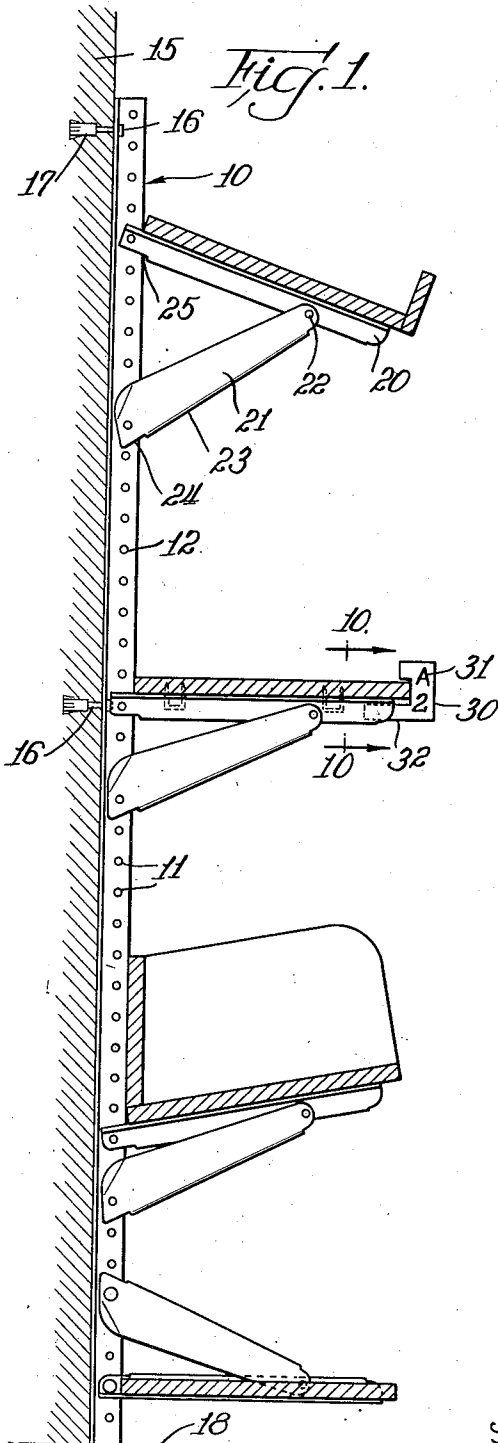
R. J. BELLON ET AL

2,767,950

SHELF BRACKET

Filed June 2, 1952

2 Sheets-Sheet 1



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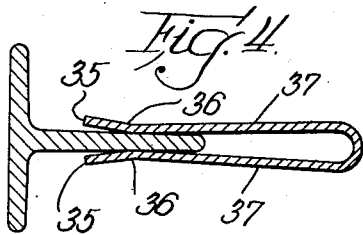
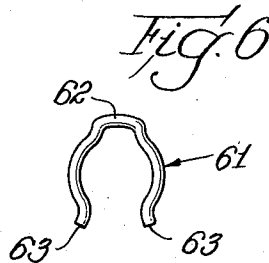
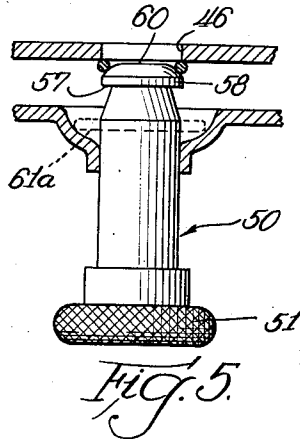
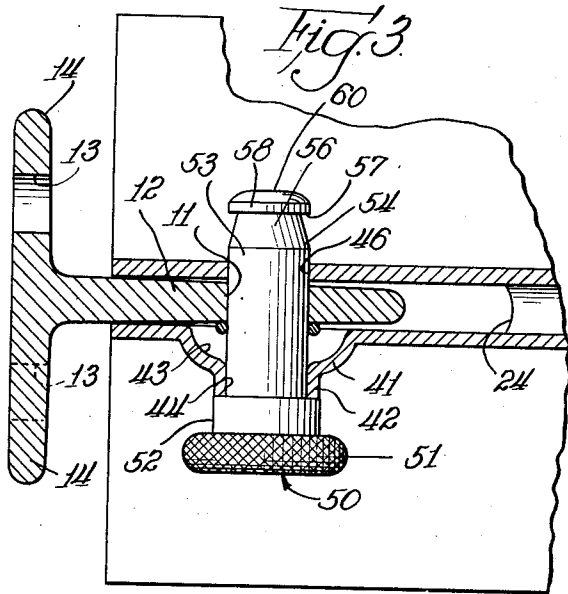
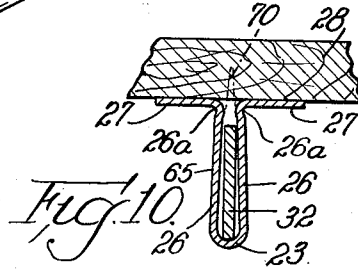
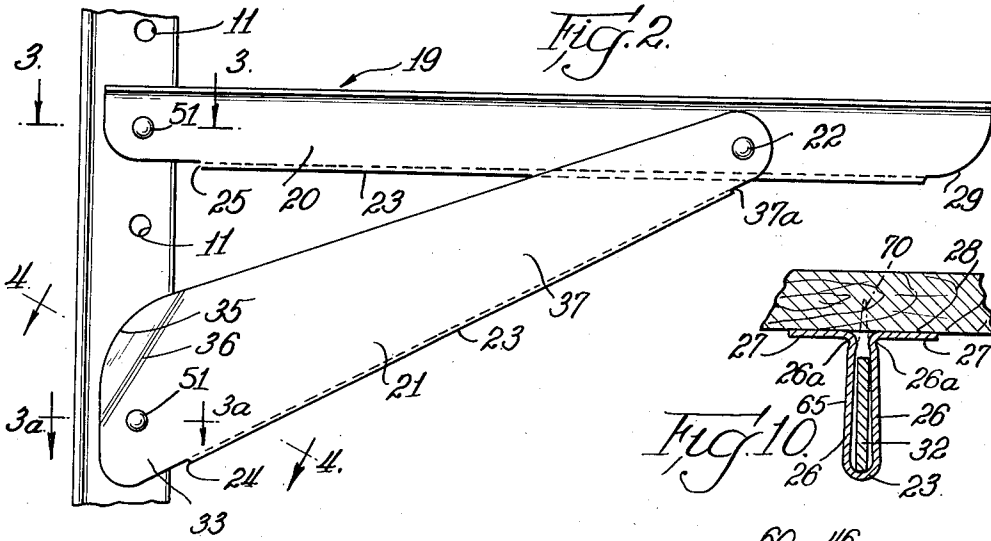
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SHELF BRACKET

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2 Sheets-Sheet 2



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2,767,950

SHELF BRACKET

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7 Claims. (Cl. 248—243)

The present invention relates generally to display shelving and more particularly to shelf supports and fastenings which can be built, changed or dismantled quickly and easily altered with respect to height and levelness or inclination of the shelves, without the necessity of any tools.

Heretofore, any change that a manager of a store might want to make in any section of his conventional shelving to enhance his merchandising potentials involves a major operation and a delay of waiting for skilled labor to come in to make the change along with all of the attendant disturbances of changes being made during store hours.

The present invention obviates these difficulties and provides a pleasing shelving system for stores which can quickly and easily be installed, altered or dismantled by persons unskilled mechanically.

A further object of the invention is to provide improved shelf supports which require no bolts or tools to install or change once the uprights have been disposed in upright supported relationship.

A further object of the invention is to provide a unitary bracket arrangement which is easily attached, detached or altered to provide for a horizontal or inclined shelf upon a moment's notice, or vice versa, by those unskilled mechanically.

Another object of the invention is to provide a unitary bracket assembly which is foolproof against tampering yet readily operable for release by finger manipulation.

Also, an object of the invention is to provide a shelf bracket which can be quickly and easily attached or detached by a single hand while the other hand is holding the supported shelf or other member in place.

The invention is further characterized by a relationship of parts which gives a snap action and a sharp clicking sound at opposite ends of its limit of movement to indicate when it is fully released or fully secured.

Still a further object of the invention is to provide an attachment device for shelving brackets which can be operated merely by rectilinear movement of a single element, yet if loosened from any cause whatsoever while bearing weight locks itself against inadvertent detachment as long as the shelf is weight bearing.

The invention is also characterized by a structural arrangement which is easy to assemble, alter and dismantle without any dangers of the cooperating parts becoming lost.

Another object of the invention is to provide a construction wherein the shelf supports can be handled by unskilled persons and snapped on the uprights and the shelving in turn snapped on to the supports during assembly or reassembly, yet can also be snapped off in both relationships without need for any tools.

A further object of the invention is to provide a shelf construction and mounting assembly which is inexpensive to manufacture, is pleasing in appearance, and is self-indicating as to how it can be manipulated with the fingers for assembly or dismantling by those unskilled mechanically.

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These being among the objects of the invention, other and further objects will become apparent from the drawings, the description relating thereto, and the appended claims.

5 Referring now to the drawings:

Fig. 1 is a side elevation of a shelving assembly including cooperating unitary supports and upright combinations in which the supports are shown in their many and diverse interchangeable positions with respect to the level and inclination of the shelves;

Fig. 2 is an enlarged side elevation of the shelf support which includes a unitary bracket and strut assembly mounted in place to support a shelf in horizontal position;

Fig. 3 is a section taken through the bracket of the unitary support upon line 3—3 of Fig. 2 which section could also be taken through the bracket as indicated by the line 3a—3a in Fig. 2 because they are substantially identical;

Fig. 4 is a section taken upon line 4—4 in Fig. 2;

Fig. 5 is a fragmentary view similar to Fig. 3 showing the initial stages of assembly of the respective securing elements of the unitary shelf support embodying the invention;

Fig. 6 is a plan view of the spring element employed as one of the elements in the unitary shelf support embodying the invention;

Fig. 7 is a view similar to Fig. 5 with the spring shown in Fig. 6 mounted in place and the securing element or pin in its retracted position;

Fig. 8 is a view similar to Fig. 5 illustrating the position of the pin and spring in which both the bracket or the strut element of the shelf support are secured to the upright just prior to the time that the pin is thrust home to the position shown in Fig. 3;

Fig. 9 is a sectional view similar to that of Fig. 5 illustrating the safety catch features of the pin in event it becomes partially displaced while the shelf is weight bearing; and

Fig. 10 is an enlarged section taken upon line 10—10 of Fig. 1.

Referring now to the drawing in further detail an upright is shown at 10, having a T-shaped cross-sectional shape. A series of holes 11 are provided in the flange portion 12 which tapers appreciably from its base to its free edge, as shown in Fig. 3. Openings 13 are provided in the base or arm portions of the upright 10 so that the upright can be rigidly supported against a wall 15 as shown in Fig. 1 by bolts 16 received through the holes 13 and tightened into expansion nuts 17 embedded in the wall 15. Thus a series of uprights are mounted at predetermined points along a wall with the perforated flange portions 12 extending in a direction perpendicular to the wall surface and with the lower ends of the uprights resting on the floor 18, in weight-supporting relationship.

In those instances where it is desired to have shelving in the middle of a floor, like an island, two of the uprights 10 can be secured back to back and supported as hereinafter described.

The unitary shelf supports 19 received upon the upright to carry the shelves each comprise two main members, a bracket 20 and a strut 21, hinged together by a rivet 22 in the relationship shown in Fig. 2. Both members are preferably sheet metal stampings shaped symmetrically in their main portion like a letter U along a medial fold line 23 with the stock at the ends of the fold lines cut away as at 24 and 25 to leave projecting sides or ears 33 which slip over the flange 12 of the upright 10 in overlapping relationship.

The U-shape of the bracket 20 is better shown in Fig. 10 wherein the upper portion of its sides 26 are bent towards each other slightly and then directly away from each other along bend lines 26a to provide a vertically

disposed channel having a narrow throat bordered by coplanar flanges 27 upon which shelving 28 rests in weight borne relationship. The flanges 27 extend the length of the bracket, particularly along the ears to give them lateral support when mounted upon the flange 12. The bracket 20 may be of any suitable length depending upon the width of the shelf expected to be supported thereon. However, it is desired that all the brackets be of a uniform length of approximately fifteen inches so that they are completely inter-changeable at all levels and with others like them on other uprights in event such changes are desired.

At its outer end the bracket 20 is rounded for decorative purpose as shown at 29 and preferably the end of the channel is left open although the sides may be squeezed together if desired to provide a closed and finished appearance to prevent foreign articles being inserted in the channel. If left open as planned, cardboard inserts 30 can be received in the channel to provide vertically disposed signs or indicia which can be seen the length of the aisle or shelving to identify different sections of the store according to the departmentalization of the store. Such an arrangement is shown in Fig. 1 in a diagrammatic way as represented by a card 30 roughly formed in the shape of a J with color or indicia 31 thereon. The long leg 32 of the card is inserted into the channel whereas the short leg, if one is provided, rests on top of the shelf. It will be appreciated, however, that the card can be a depending card as well as an upright card. The longer leg 32 of the card, however, is sufficiently wide that it is received in the channel under edge-wise pressure which holds it in place.

Although the strut 21 could also be provided with coplanar flanges similar to those 27 of the bracket 20 for strengthening purposes, it is preferred to provide the strut with flat sides somewhat triangular in shape with the wide portion thereof at the inner end where the ears 33 overlap the tapering flange 12. At the narrow end of the strut the U-shaped fold portion is cut away as at 37a to receive the sides 26 of the bracket 20 therebetween in overlapping relationship in which relationship they are preferably secured permanently together by the rivet 22, as already mentioned, which extends through all four of the overlapping walls. However, in some embodiments it will be appreciated that the rivet 22 can be formed as a pin with a cotter key securement (not shown) to cooperate in any one of a number of openings in the sides 26 of the bracket 20 if desired without departing from the spirit of the invention. However, for purposes of illustration herein the bracket and the strut are shown pivoted with respect to each other at a mutually predetermined point.

At the wide end of the strut both ears are preferably bent along lines indicated at 36 so that the end portions 35 diverge to readily receive the edge of the flange 12 of the upright therebetween in guided relationship and the sides 37 are stressed at the fold line 23 towards each other next to the cut-away portion 24 to establish a frictional spring pressure between the ears 33 against the sides of the flange 12 when they are moved into position on the flange. The bend lines 36 are so disposed that they extend the width of flange 12.

Where the ears 33 overlap the flange in their intended positions, they are punched out as indicated at 34 where they coincide with openings 11, and since the ears of both the bracket 20 and strut 21 are preferably constructed identically in this respect, the following description will be general rather than limited to one of the elements.

Before the respective brackets and struts are folded to the form already described, one of the ears 33 is punched and pressed outwardly to the shape indicated by the bell 41, which terminates in a cylindrical flange 42 to define a recess 43 and an opening 44, respectively. The other ear is merely punched out to form an opening 46 of approximately the same diameter as the opening 44.

The openings 44 and 46 are substantially the same diameter as the openings 11 in the flange 12 of the upright. Once these openings in the ears are made the members 20 and 21 are folded to the form already described so that the openings 44 and 46 are brought into axial alignment. Either one of the ears can be the one provided with the bell portion 41. The relationship shown is best adapted for right handed operation.

A pin 50 is received in the openings 44 and 46. This pin has a radial flange portion knurled on its outer surface to serve as a handle 51 for ready handling by a person's fingers and also has a slightly reduced portion 52 next to the handle whose outer diameter is substantially the same as the outer diameter of the cylindrical flange 42 and whose length is enough to provide ready finger access to the handle. The remaining portion of the pin, generally referred to herein as the shank portion 53, is of a diameter slightly less than the diameter of the openings 44 and 46, and is of the relative length shown in the drawing having reference particularly to Fig. 3.

The length of the shank 53 is such that when the reduced portion 52 of the pin is brought into contact with the end of the cylindrical flange 42, the uniform diameter of the shank portion 53 extends to a point 54 which is appreciably beyond the opening 46 where it tapers as indicated at 56 to a square shoulder 57 behind a head portion 58 that is rounded on its outer face as at 60. The axial length of the taper 56 is at least twice that of the thickness of the ear 33 so that if pin were moved so that the ear was to slide down the tapered surface 56 it would be engaged as shown in Fig. 9 by a substantially overlapping relationship with the shoulder 57 to prevent the removal of the pin as more particularly described hereinafter.

Also, in this connection with Fig. 9 it might be well to note that the diameter of the opening 44 and the diameter of the shank portion 53 are so related to each other that in the "cocked" position of pin 50 shown in Fig. 9 there is a frictional binding of appreciable extent between the shank 53 and the cylindrical flange 42. Thus, not only does the shoulder 57 prevent the removal of the pin as shown in Fig. 9 but frictional engagement between the cylindrical flange 42 and the shank 53 of the pin assists in preventing the removal of the pin as long as it is weight bearing.

A C-spring 61, Fig. 6, is provided to slide frictionally along the shank of the pin 50 and when disposed on the tapered portion 56 to contract enough to engage behind the shoulder 57 against inadvertent removal.

The main portion of the C-spring 61 follows a circular path, but its midpoint is offset outwardly as at 62, and its ends 63 are also turned outwardly so that they constitute three circumferentially spaced points which extend far enough in a radial direction to engage the body of the flange 12 around the opening 11 when the spring is permitted to contract to its normal size behind the shoulder 57. Furthermore, once the spring 61 is installed on the pin 50 the portions 62 and 63 operate to hold the spring square with the pin whenever the spring engages the face of the flange 12 or ear 33 around a hole 11, 44, or 46 therein through which the pin is either pushed or pulled. Thus the spring never becomes cocked in its operation. In fact, the circular portion of the pin also cooperates with the shoulder 57 when the spring is thereagainst also to keep the spring square so that the spring cannot foul up a hole through which the pin is about to be pushed.

The description of the manner of assembly and installation of the pin 50 and spring 61 upon either the bracket 20 or the strut 21 will be of further assistance in understanding the operation of the spring and pin. Reference is made to Fig. 5, where the spring is located at the opening 46 as held in place by the rounded end portion 60 of the head 58 of the pin. In this position pressure upon the handle 51 will cause the rounded end to

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spread the sides of the C-spring outwardly to slip over the head portion 58 of the pin after which the spring will contract and snap into place behind the shoulder 57.

Once the C-spring is in position against the shoulder 57 the pin is assembled against removal from either the bracket or the strut and is ready for operation. Another way, of course, of assembling the C-spring upon the end is shown by locating the C-spring in the dotted line position 61a where it is at rest in the recess 43 just inside of the cylindrical flange 42. In this position the C-spring can be held against outward movement by any suitable tool having an opening therein corresponding with the opening 46 in size, and pressure upon the flanged end 52 of the pin 50 will also cause the C-spring to snap into place behind the shoulder 57.

Referring now to Fig. 7, once the C-spring 61 is located behind the shoulder 57 the pin is drawn to its fully retracted position as shown in Fig. 7, in which position the spring 61 and also the head portion 58 of the pin are accommodated deeply enough in the recess 43 to be outside the inner face 64 of the ear having the recess formed therein. In this position the space between the ears 33 is open to receive the flange 12 of the upright therein and the bracket or the strut can be moved around sufficiently that one of the openings 11 in the flange 12 can be maneuvered into substantial coincidence with the opening 46 in the bracket. During this maneuvering the head portion 58 can be of assistance when manually urged inwardly and jostled enough for the head portion 58 to slip into the opening 11. For this purpose, it will be seen the pin is completely free of any restraint from the C-spring and alignment can be attained almost instantly without need for "oversized" openings.

Thereafter, as shown in Fig. 8, further movement of the pin 50 will force expansion of the C-spring and cause it to slide up the taper 56 to the shank portion 53 of the pin 50. This is accomplished by the C-spring being initially in a position which might permit it to slip through the opening except for the offset portions 62 and 63 on it. These offset portions engage the side of the flange 12 around the hole 11 and preserve this relationship so that the taper 56 can be forced through the C-spring and expand it.

Once the C-spring reaches the end of the taper the spring 61 is under a tension which causes frictional relationship to exist between the spring and the shank against relative displacement of the two elements. However, at this point, the head 58 of the pin has or is about to enter the opening 46 and the pin 50 is ready for its final movement.

The final movement of the pin 50 from the position shown in Fig. 8 to that shown in Fig. 3 is accomplished under the restraint of the frictional engagement between the C-spring and the shank of the pin, and when finger pressure is applied against the handle 51, the pin will snap to the position shown in Fig. 3 with a sharp clicking action indicating that it has been pressed to its expected position of securement.

Thereafter the frictional engagement between the C-spring 61 and the shank 53 of the pin 50 will hold the pin in its secured position unless through inadvertence or accident the pin creeps or is moved to the position shown in Fig. 9. In this position, however, due to the weight being carried by the bracket in one direction which is opposed by the support effort of an upright in the opposite direction there is a relative shear force concentrated against the pin at the large end of the taper. Thus the head 58 of the pin is displaced laterally to the position in which the shoulder 57 overlaps the outer face of the remote ear 33 where it becomes locked in place behind the shoulder 57 and is held there not only by the further opposition frictionally maintained by the C-spring on a shank against relative movement but also by the cocking or binding action of the shank 53 of the pin itself in the cylindrical opening 44. In this position the

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pin is locked against further removal as long as there are shear forces developed upon the pin by the two secured members.

However, it will be noted that the incline of the taper is favorable to anyone noticing the "safety lock" position of the pin and pressing upon the flange 51 to resnap it in place without any need for removing the relative shear loads upon the pin and without touching anything except the handle 51 of the pin. Mere force upon the handle 51 of the pin returns it to its position of full securement.

In the event it is ever desired to shift the pin to another hole 11 upon the upright 10 it will be apparent that the shape of the bell 41 and the reduced portion 52 upon the pin 50 as shown in Fig. 3 permits sufficient space between the ear and the flange 51 that a person can get his thumb and forefinger in position for a firm grip upon the flanged head. Thereafter either with the weight upon the shelf or with the weight removed from the shelf a person unskilled mechanically can provide a slight lifting motion to the shelf to relieve the pin of shear forces and a direct pull upon the flange 51 will cause the shank portion 53 of the pin to slide through the flange outwardly through the cylindrical flange 42 until the C-spring is flat against the shoulder 57 again and the head portion 58 is received in the recess 43 deeply enough that the bracket or strut can be moved to a new position. In the new position the process of attachment already described in connection with Figs. 7, 8, and 3 will be repeated to secure the bracket or strut in its new position, all without any need to use tools and in a way readily apparent to those unskilled mechanically.

Referring to Figs. 8 and 9 as well as 3, it is apparent that some looseness exists between the ears of the bracket 20 and the upright 10 for relative ease of assembly and movement. However, in connection with Fig. 4 it will be seen that the fold line 36 also shown in Fig. 2, is disposed in a direction somewhat longitudinal to the sides of the strut so that the strut when in place has the inner end of the fold line 36 near the root of the flange and the other end of the fold line 36 near the edge of the flange. This relationship and the tension at the bends 36 against the flange 12 rigidifies the strut and flange assembly and also through the tightness of the fit at the pivotal joint between the strut and the bracket at the pivot 22 prevents the bracket from rattling on the flange. Thus, although the unitary bracket mounts on the flange of the upright rather loosely this looseness is obviated as far as users are concerned once the end of the strut is locked in place by its pin.

Not only this, but it is readily apparent that the rounded head portion 60 can be thumb pressed to the position shown in Fig. 8 in preliminary preparation for the final full retraction of the pin. This will give a preliminary safety position just prior to the final and full retraction of the pin in those instances where it is desired to vary the position or level of the shelf.

Having described the invention and various relationships of the parts it is readily apparent that the particular relative sizes and shapes of the respective elements described as shown lend themselves best to the cooperation and results described. Consequently, the fulfillment of the objects stated is evident from the description made of the preferred embodiments of the invention and it is readily apparent to those skilled in the art that various and further modifications and changes can be made without departing from the spirit of the invention the scope of which is commensurate with the appended claims.

What is claimed is:

1. In a shelving device the combination of a shelf support having spaced ears with aligned apertures there-through, an upright having a flange received between the ears with an aperture therethrough in alignment with the apertures on the spaced ears, a pin slidable in said apertures and characterized by a handle on one end of a

shank portion at one side of one of said ears and a reduced portion near the other end tapering to a shoulder on the other side of said one of said ears, a C-spring mounted on the pin between said ears on said other side of said one of said ears and behind the shoulder, said C-spring in its normal shape having an inside diameter less than the diameter of the shank portion and radially directed extensions thereon providing an outside dimension greater than the diameter of said apertures to engage said flange and slide along the shank in frictional engagement therewith when the pin is inserted through the aperture in said flange.

2. In a shelving device, the combination of a shelf support having spaced ears, an opening in one ear, a recess in the other ear having a cylindrical flange defining a second opening in alignment with the first opening, an upright having a flange received between the ears with an aperture therethrough in alignment with said openings on the spaced ears, a pin slidable in said openings and characterized by a handle on one end of a shank portion and a reduced portion near the other end terminating in a head defining a shoulder, a spring mounted on the pin between said ears, said spring in its normal shape having an inside diameter less than the diameter of the shank portion and radially directed extensions thereon providing an outside diameter greater than the diameter of the aperture in said upright flange to engage said flange and slide along the shank in frictional engagement therewith when the pin is inserted through the aperture on said flange, said spring resting in said reduced portion behind said shoulder and in said recess when the pin is in fully-retracted position.

3. In combination with an upright having a weight-bearing apertured flange, a unitary shelf support including two elements secured together and having apertured spaced ears receiving said apertured flange therebetween with all the apertures in alignment, one of said ears having a recess around the aperture therein, a pin having a handle portion on one end of a shank portion disposed outside said recess and an inclined reduced portion near the other end terminating in a head defining a shoulder received in said apertures, a C-spring mounted on the pin between said ears and behind the shoulder, said spring in its normal shape having an inside dimension less than the side of said shank portion and an outside dimension greater than the size of said flange aperture to engage said flange and be expanded by said inclined portion to slide along the shank in frictional engagement therewith when the pin is inserted through the aperture in said flange, said spring normally resting in said recess when the pin is fully retracted.

4. In a shelving device the combination of a bracket and strut both of which have pairs of spaced ears, one ear of each pair having a hole therethrough and the other ear of each pair having a form pressed therein defining a recess that terminates in a cylindrical flange

disposed in alignment with the hole of the other ear, a pin for each pair having a radial flange at one end of a shank portion and a reduced portion near the other end terminating in a head defining a shoulder, said head being peripherally rounded at the outer extremity thereof, a spring mounted on each pin between each pair of ears behind the shoulder, said spring in its normal shape having an inside dimension less than the diameter of the shank portion and an outside dimension greater than the diameter of said holes to engage one of the ears and slide along the shank in frictional engagement therewith when the pin is inserted through a hole in said one of the ears, said spring and rounded head being received in the recess when the pin is fully retracted to clear the space between the ears.

5. In combination with a flanged upright having an aperture therethrough, a shelf support having an ear with an aperture therethrough and engaging said flange with the aperture in said flange in alignment with said aperture in said ear, a pin slidably received in said apertures and characterized by an enlarged handle at one end of a shank portion and a reduced portion near the other end terminating in a head defining a shoulder, a spring element located beyond said ear aperture in a direction opposite from said handle and received on said pin over said head and carried on the pin behind said shoulder, said spring encircling the pin and normally having an inside dimension less than the size of the head and of said shank portion and said spring having an outside dimension greater than the size of said flange aperture when the shank is pushed therethrough to engage said flange and hold its position thereagainst when the shank of the pin is displaced through said flange aperture, said spring normally resting in said reduced portion when the pin is fully retracted.

6. The combination called for in claim 5 in which the reduced portion has a longitudinal width greater than the thickness of said flange to be engaged by said ear in locked relationship behind said shoulder when said reduced portion and ear coincide and said apertures are offset with respect to each other.

7. The combination called for in claim 5 in which said spring element includes radially directed extensions thereon providing the outside diameter that is greater than the diameter of said apertures.

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