United States Patent [19]

Siegal

[11] **3,810,430**

[45] **May 14, 1974**

[54] **SHELF ASSEMBLY**

[75] Inventor: **Burton L. Siegal**, Chicago, Ill.

[73] Assignee: **Tiffany Industries, Inc.**, St. Louis, Mo.

[22] Filed: **Oct. 16, 1972**

[21] Appl. No.: **297,664**

[52] **U.S. Cl.** **108/144**, 108/109, 211/148, 248/243, 312/264

[51] **Int. Cl.** **A47b 57/10**

[58] **Field of Search** 108/107, 108, 109, 110, 108/144; 211/148, 176; 248/235, 241, 243, 248, 250; 287/20.924, 189.35

[56] **References Cited**

UNITED STATES PATENTS

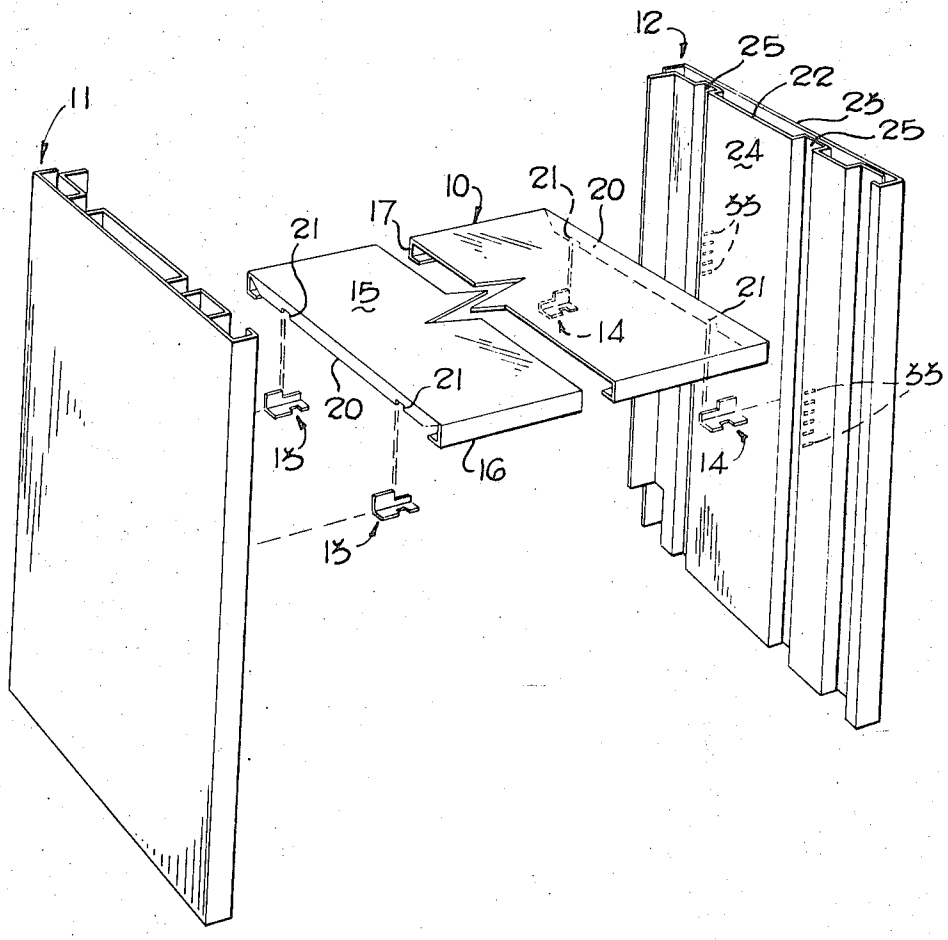
2,252,997	8/1941	Vanderveld	248/243
2,005,593	6/1935	Onions et al.	108/109

Primary Examiner—Bobby R. Gay
Assistant Examiner—William E. Lyddane

[57] **ABSTRACT**

This shelf assembly includes a unitary shelf, which is adjustably supported between vertical end panels by a pair of brackets detachably attached to each panel. The panels include opposed pairs of vertical grooves, each groove providing a bearing face at one side, and vertically spaced seating slots at the other side. The brackets are ell-shaped and include an upright leg providing a bearing portion, and an outstanding leg providing a seating portion. The outstanding leg is wider than the groove, and the brackets are attached to the panel by inserting the outstanding leg seating portion into a slot at one side of the groove, and rotating the upright leg into bearing relation with the other side of the groove.

10 Claims, 3 Drawing Figures



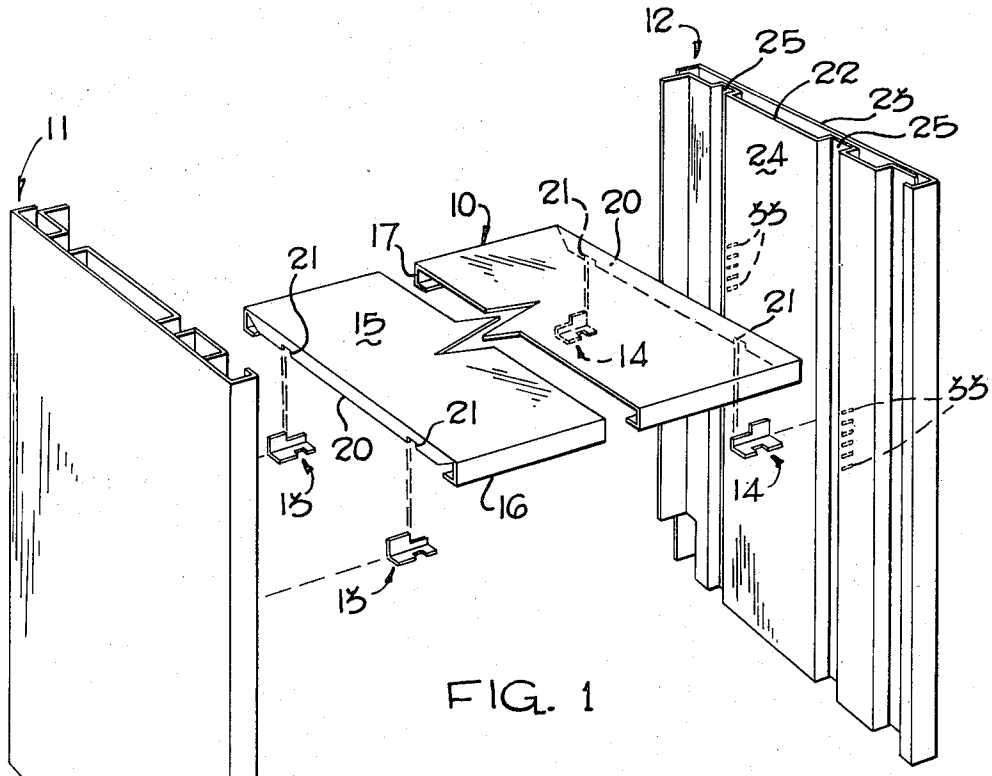


FIG. 1

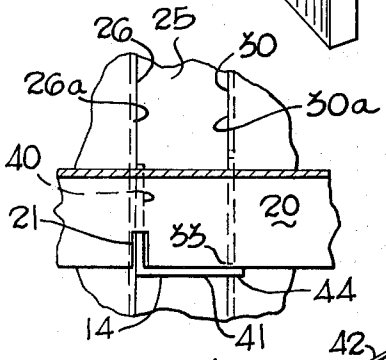
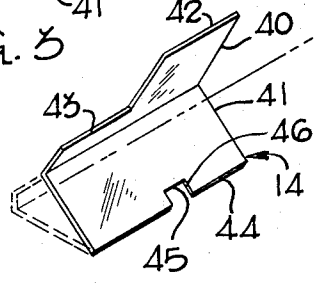


FIG. 3



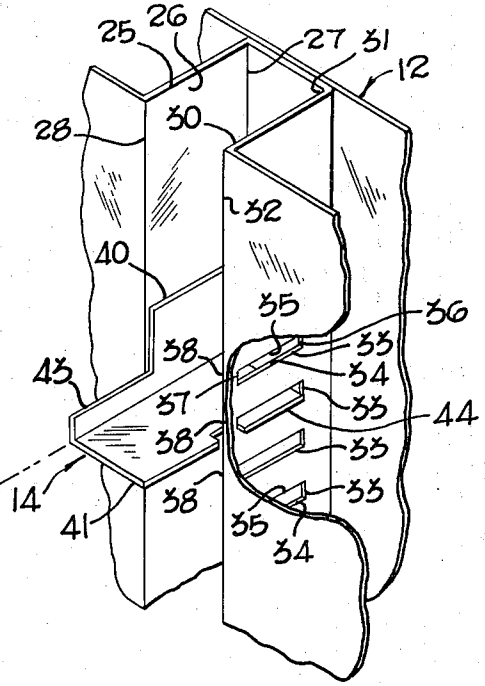


FIG. 2

SHELF ASSEMBLY

BACKGROUND OF THE INVENTION

This invention relates generally to a shelf assembly, and particularly to an elevationally adjustable bookshelf assembly.

In general, adjustable bookshelves of the type under consideration, are connected to vertical end panels by bracket elements attached to the panels or by support elements which extend from the bookshelves and are engageable with cooperating recesses on the panels. In the former type of connection the brackets are usually attached to recesses substantially in the plane of the panel and are susceptible to being dislodged inadvertently by any slight upward force. The latter type of connection, on the other hand,usually requires retractable elements extending from the ends of the bookshelves, which must be withdrawn from the cooperating recesses in order to effectuate the height adjustment. Such retractable elements, which are commonly spring-loaded are expensive to manufacture and suffer from the disadvantage that only one element can be disconnected at a time.

Another somewhat different type of adjustable bookshelf assembly provides a plurality of elongate transverse slots across the face of the end panels, which receive the ends of the bookshelves. The disadvantage of this system is that the transverse slots tend to weaken the panels and, in addition, the shelf ends which are received by the slots tend to be inadequately stiffened.

The structural arrangement of parts of the present bracket and shelf assembly overcomes these deficiencies in a manner not known in the prior art.

SUMMARY OF THE INVENTION

The shelf assembly includes a bookshelf extending between end panels and supported by brackets, detachably connected to each panel to provide height adjustment. The connection of the brackets provides a load carrying capability in an upward as well as a downward direction, thereby precluding inadvertent dislodging of the brackets during adjustment.

The shelf is formed from sheet material and includes end stiffening aprons. There are no projecting parts to interfere with height adjustment process.

The panels include vertically formed grooves, which stiffen the panels longitudinally. One sidewall of each groove includes a plurality of relatively small recesses receiving the bracket connections and formed in a direction which does not significantly reduce the strength of said panels.

The shelf assembly is of a simple, relatively inexpensive construction and the brackets are installed within the grooves by a simple twisting action so that the shelves can be erected and adjusted for height by anyone with little or no instruction.

It is an object of the invention to provide a shelf assembly comprising shelf means, having opposed ends adjacently disposed of vertical panel means and bracket means, detachably attachable to the panel means, to support said shelf means.

It is another object to provide panel means, each of which includes a pair of substantially vertical grooves disposed in side-by-side relation, said grooves having first and second sidewalls disposed in spaced parallel relation, the first sidewall providing a bearing face, and

the second sidewall providing a plurality of elevationally spaced recesses.

It is a further object to provide bracket means including opposed pairs of bracket elements received between said first and second sidewall means, each bracket element including a first leg operatively engageable with the first sidewall means, and a second leg having an outstanding seating portion selectively receivable by one of said seating recesses of the second sidewall means.

Another object is to provide shelf means having longitudinal aprons and transverse end aprons, said end aprons having a pair of spaced notches, and to notch the first leg of each bracket element to provide an upstanding lug receivable by an associated end apron notch to preclude transverse movement of said shelf means.

It is another object to provide groove sidewall means, which are defined by inner and outer margins, and seating recesses, which are provided by slots disposed between the inner and outer margins of associated second sidewalls, and to notch the second leg of each bracket element adjacent to the seating portion to provide a bearing portion, engageable with the second sidewall means to limit acceptance of the seating portion within said seating slot, and to provide a shoulder engageable with the second sidewall means to preclude outward movement of said bracket element.

It is an important object to provide bracket elements at one end of the shelf means, which are reversely formed to the bracket elements at the other end of the shelf means to provide substantially horizontal, forwardly extending, shelf seating portions.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a fragmentary perspective view illustrating the shelf assembly in exploded relation;

FIG. 2 is an enlarged detail in perspective illustrating the relationship of parts between the panel and the bracket, and

FIG. 3 is an enlarged detail of the assembled parts.

DESCRIPTION OF THE PREFERRED EMBODIMENT:

Referring now by characters of reference to the drawing, and first to FIG. 1, it will be understood that the shelf assembly includes an elongate shelf **10** supported between vertical panels **11** and **12** by bracket elements **13** and **14**. The bracket elements **13** and **14** constitute bracket means and are detachably connected to panels **11** and **12** at selected vertical points of support to provide height adjustment of said shelf **10**.

The shelf **10** is substantially symmetrical and of unitary construction including an upper face **15**, front and rear aprons **16** and **17**, and end aprons **20**. Each end apron **20** includes a pair of transversely spaced notches **21**, which cooperate with the bracket elements **13** and **14** to preclude forward and rearward movement of the shelf **10**.

In the preferred embodiment the panels **11** and **12** are formed of sheet metal substantially in mirror image of each other and will be described with reference to panel **12**, it being understood that panel **11** is identically but reversely formed.

Panel **12** includes a first panel portion **22** received in nested relation within a second panel portion **23** said

panel portions being welded, or otherwise attached together, to form a substantially rigid structural element. The first panel portion **22** is formed, as by pressing, to provide a generally flat face **24** and a pair of spaced grooves **25** disposed in side-by-side relation. Grooves **25** are shown in enlarged detail in FIG. **2**, which also illustrates the operative structural disposition of parts of the bracket elements **14** relative to said groove **25**. As shown in FIG. **2** the groove **25** includes a first sidewall **26** extending between inner and outer longitudinal margins **27** and **28** and providing a flat bearing face defining a first plane. The groove **25** also includes a second sidewall **30** extending between inner and outer longitudinal margins **31** and **32** and providing a plurality of slots **33**, disposed in elevationally spaced relation between said inner and outer margins **31** and **32**. Each slot includes horizontal margins **34** and **35** extending between inner and outer ends **36** and **37** respectively, said horizontal margins providing seating portions. The second sidewall **30** also includes a plurality of elevationally spaced bearing portions generally indicated by numerals **38** and disposed between said slot ends **37** and said outer margin **32**. It will be understood from FIG. **3** that the sidewalls **26** and **30** are disposed in parallel relation and are spaced apart a distance defined by the plane of the bearing face, indicated by numeral **26***a*, and the plane of the innermost portion of the slots, indicated by numeral **30***a*, said planes **26***a* and **30***a* constituting first and second planes.

Considering now the structure of the bracket element **14**, it will be understood said bracket element is substantially ell-shaped and includes an upright leg **40** and an outstanding leg **41** constituting first and second leg means respectively. The upright leg **40** is notched to define a bearing face **42** and an upright lug **43**. The outstanding leg **41** is notched to define a seating portion **44**, a bearing portion **45** and a shoulder **46**. As clearly shown in FIG. **3** the outstanding leg **41**, in the vicinity of the seating portion **44**, is wider than the distance between the spaced planes **26***a* and **30***a* defining the groove **25** so that, when the bracket element **14** is disposed in its operative support position, the seating portion **44** is received through and extends beyond the selected slot **33**. It will be understood that the bearing portion **45** of the outstanding leg **41** is so spaced from the bearing face **42** of the upright leg **40** that said bearing portion **45** engages the corresponding bearing portion **38** of the sidewall **30**, when the bearing face **42** of the upright leg **40** bears against the first sidewall **26**. In order to effectuate this bearing engagement, the distance between the bearing portion **45** and the bearing face **42** is substantially equal to the distance between the planes **26**a and **30***a*.

As shown in FIG. **2** the bracket element **14** must be tilted prior to insertion within the groove **25**, because the outstanding leg **41** is wider than said groove. Following insertion, the seating portion **44** can be aligned with the selected slot **33**, and the outstanding leg **41** rotated clockwise into the slot **33** until the bearing portion **45** engages the sidewall bearing portion **38** to limit further acceptance of the seating portion **44** into the slot, at which time the upright leg **40** engages the sidewall **26**. When the bracket element **14** is in position the shoulder **46** is engageable with the slot outer end **37**, which precludes direct withdrawal of said bracket element.

It will be understood from a consideration of the bracket element **14** in its installed condition that downward load on the projecting portion of said bracket element results in the seating portion **44** engaging the upper and lower seating margins **34** and **35** of the slot **33**. This engagement provides a couple resisting rotational movement in the plane of the sidewalls **26** and **30**, particularly downward movement but also, to some extent, upward movement, thereby precluding detachment of said bracket element by inadvertent application of upward forces to the end thereof.

When the bracket element **14** carries the weight of the shelf **10** there is no tendency for it to rotate about its own longitudinal axis and it is securely connected to the panel **12** without the use of fasteners. However, once the shelf weight is removed, the bracket element can be easily disconnected by clockwise rotation of said element about its longitudinal axis until the seating portion **44** of the outstanding leg **41** is clear of the slot **33**, at which time the bracket element can be withdrawn from the groove **25**.

In the preferred embodiment the portion of the bracket element **14** projecting outwardly of the groove **25** supports one corner of the shelf **10**. As shown in FIG. **1**, the notches **21**, in the shelf end apron portions **20**, are spaced to receive the upstanding lugs **43** of the bracket elements **14**. It will be readily understood from FIG. **3** that engagement between the notches **21** and the upstanding lugs **43**, which constitute cooperating stop means, precludes transverse movement of the shelf **10**, and that the apron **20** is supported on the outstanding leg **41** of the bracket elements **14**.

Removal of the shelf **10** is effectuated simply by lifting it upwardly and forwardly. The elevational disposition of the shelf is adjusted by detaching the bracket elements and reattaching them at the new elevation, as defined by the newly selected slot **33**, and replacing the shelf in position. It is also possible to adjust the height of the shelf **10** without removal by pivoting said shelf upwardly about one pair of bracket elements to effectuate adjustment of the other pair of bracket elements.

As will be clear from a consideration of FIG. **1**, the formation of grooves **25** in the panel wall provided by panel portion **22** not only facilitates and simplifies the panel structure as a whole, but also increases its strength. In effect, the grooves **25** provide associated pairs of sidewalls, which serve as longitudinal stiffeners, strengthening the panels considerably in a transverse direction.

I claim as my invention:

1. A shelf assembly comprising:

a. an elongate shelf means including an end portion,

b. panel means having a substantially vertical groove means, the groove means including:

1. first sidewall means providing a flat bearing face defining a first plane,

2. second sidewall means providing a plurality of elevationally spaced seating recesses having seating margins defining a second plane disposed in spaced parallel relation from said first plane, and

c. bracket means detachably attachable to the panel means and received in outwardly projecting relation within said groove means to support the shelf end portion, the bracket means including:

1. first leg means operatively engageable with the flat bearing face of said first sidewall means, and

2. second, outstanding leg means having a seating portion selectively receivable by one of said seating recesses, said seating portion being operatively spaced from said first sidewall plane a distance greater than the spacing between said first and second sidewall planes, said outstanding leg means also including a bearing portion engageable with said second sidewall means to limit acceptance of said seating portion within said recess.

2. An assembly as defined in claim **1**, in which:

d. the first and second sidewall means include outer longitudinal margins,

e. the bracket means is substantially ell-shaped to provide first and second right-angularly related leg means, and

f. the first leg means is notched to provide an upright lug disposed outwardly of said outer longitudinal margins and engageable with the end portion of the shelf means to substantially preclude transverse movement of said shelf means.

3. An assembly as defined in claim **1**, in which:

d. the first and second sidewall means include outer longitudinal margins,

e. the bracket means is substantially ell-shaped to provide first and second right-angularly related leg means, and

f. the second leg means is notched to provide the bearing portion, said bearing portion being disposed inwardly of said outer longitudinal margins, and said notch defining a shoulder engageable with said sidewall means to substantially preclude outward movement of said bracket means.

4. A shelf assembly comprising:

a. an elongate shelf means including opposed end portions,

b. panel means at each end of the shelf means, each panel means including a panel wall having a pair of substantially vertical grooves formed therein, said grooves being disposed in spaced, side-by-side relation, each groove including:

1. a first sidewall means, and

2. a second sidewall means disposed in spaced parallel relation from said first sidewall means, and including a plurality of elevationally spaced seating slots, and

c. bracket means detachably attachable to each panel means to support the end portions of the shelf means, and including opposed pairs of bracket elements received in outwardly projecting relation within associated grooves, each bracket element including:

1. first leg means operatively engageable with the first sidewall means, and

2. second, outstanding leg means having a seating portion selectively receivable by one of said seating slots, and a bearing portion engageable with said second sidewall means to limit acceptance of said seating portion within said slot.

5. An assembly as defined in claim **4**, in which:

d. each end portion of the shelf means includes transversely spaced stop means, and

e. one of the leg means of each bracket element includes an upstanding lug providing a cooperating stop means engageable with said shelf stop means to substantially preclude transverse movement of said shelf means.

6. An assembly as defined in claim **4**, in which:

d. the end portions of the shelf means include an apron portion having transversely spaced notches, and

e. the first leg means of each bracket element is notched to provide an upstanding lug receivable by an associated notch to substantially preclude transverse movement of said shelf means.

7. An assembly as defined in claim **4**, in which:

d. each second sidewall means is defined by inner and outer margins,

e. the seating slots are disposed between said inner and outer margins of said second sidewall means,

f. each second sidewall means includes a plurality of sidewall bearing portions adjacently disposed of associated slots between said slots and said outer margins, and

g. the second leg means of each bracket element is notched adjacent to the seating portion to provide the bearing portion.

8. An assembly as defined in claim **4**, in which:

d. each sidewall means provides a longitudinally stiffener defined by inner and outer longitudinally extending margins disposed in spaced parallel relation,

e. the slots of the second sidewall means are disposed between said inner and outer margins of said second sidewall means and include outer ends,

f. each second sidewall means includes a plurality of sidewall bearing portions adjacently disposed of associated slots between said slots and said outer margins,

g. the second leg means of each bracket element is notched adjacent to the seating portion to provide the bracket bearing portion, engageable with said sidewall bearing portion to limit acceptance of the bracket seating portion within the slot,and a shoulder, engageable by said slot outer end to substantially preclude outward movement of said bracket element.

9. An assembly as defined in claim **4**, in which:

d. the bracket elements at one end of the shelf means are reversely formed to the bracket elements at the other end of said shelf means.

10. An assembly as defined in claim **9**, in which:

e. each end portion of the shelf means includes an apron portion, and

f. the second leg means of each bracket element extends forwardly and is engageable in seating relation by an associated apron portion.

* * * * *