United States Patent [19]

Carlstrom

[11] E **Patent Number: Re. 32,435**

[45] **Reissued Date of Patent: Jun. 9, 1987**

[54] **BRACKET STRUCTURE FOR SUPPORTING A SHELF OR PARTITION OF A DISPLAY CASE OR THE LIKE**

[75] Inventor: **William Carlstrom**, Far Hills, N.J.

[73] Assignee: **Lyle/Carlstrom Associates, Inc.**, Somerville, N.J.

[21] Appl. No.: **837,086**

[22] Filed: **Mar. 6, 1986**

Related U.S. Patent Documents

Reissue of:

[64] Patent No.: **4,444,321**
Issued: **Apr. 24, 1984**
Appl. No.: **378,592**
Filed: **May 17, 1982**

[51] **Int. Cl.**[4] **A47B 47/00**

[52] **U.S. Cl.** **211/186;** 24/326; 24/625; 24/590; 24/663; 248/221.4; 248/235; 248/239; 312/140; 403/407.1

[58] **Field of Search** 248/544, 222.3, 221.4, 248/239, 73, 235; 211/186; 24/326, 625, 590, 663, 336, 341; 108/108, 109, 64; 312/140; 403/407; 411/349

[56] **References Cited**

U.S. PATENT DOCUMENTS

592,929	11/1897	Exline	24/213 CS
1,978,087	10/1934	Johnson	24/453
2,114,430	4/1938	Roseman	24/663 X
2,203,973	6/1940	Walls	24/221 R
2,765,698	10/1956	Devine	24/221 R
4,223,966	9/1980	Winters	312/140

FOREIGN PATENT DOCUMENTS

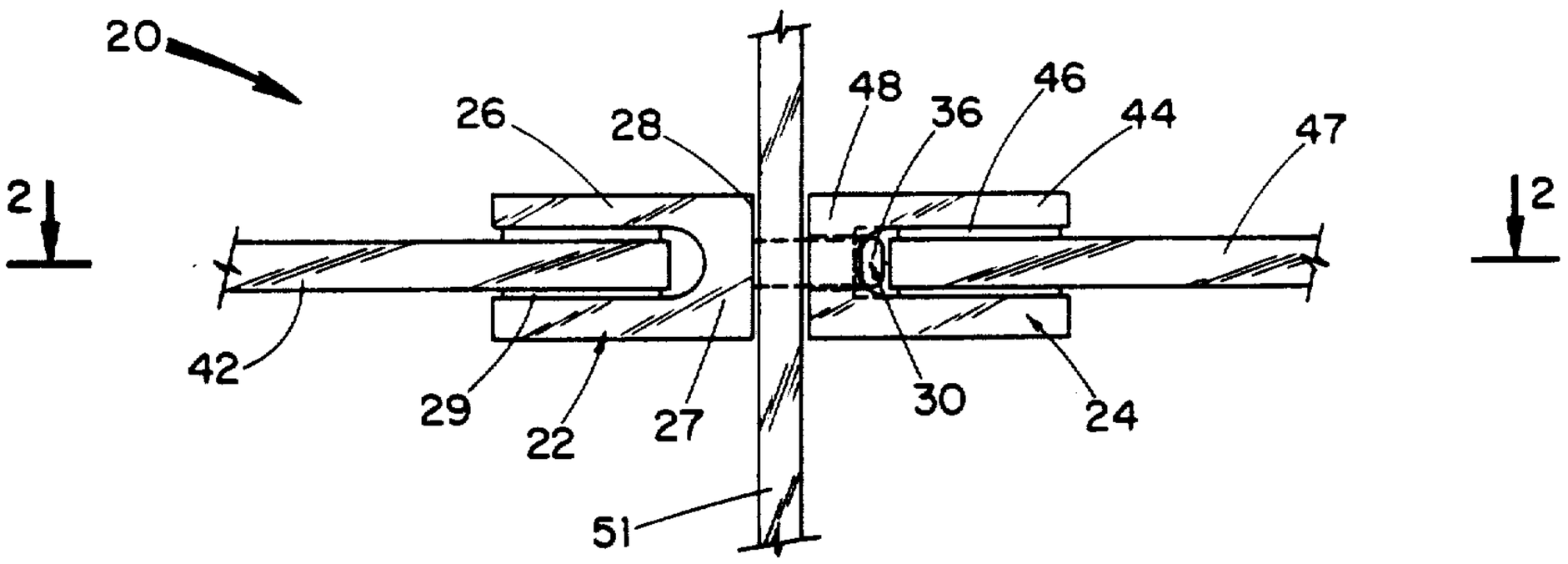
2550374	11/1980	Switzerland	312/140

Primary Examiner—J. Franklin Foss
Assistant Examiner—David L. Talbott
Attorney, Agent, or Firm—Edward H. Loveman

[57] **ABSTRACT**

A bracket structure for supporting a horizontal or vertical sheet-like member and adapted for attachment to a supporting apertured panel having a first U-shaped clip with two opposing spaced flat side walls joined by an integral end wall. A stem extends outwardly of the end wall which has a cylindrical slotted neck to define flexible spaced bifurcations. When the bifurcations are pressed together they define a round head which may enter an aperture in the supporting panel.

11 Claims, 14 Drawing Figures



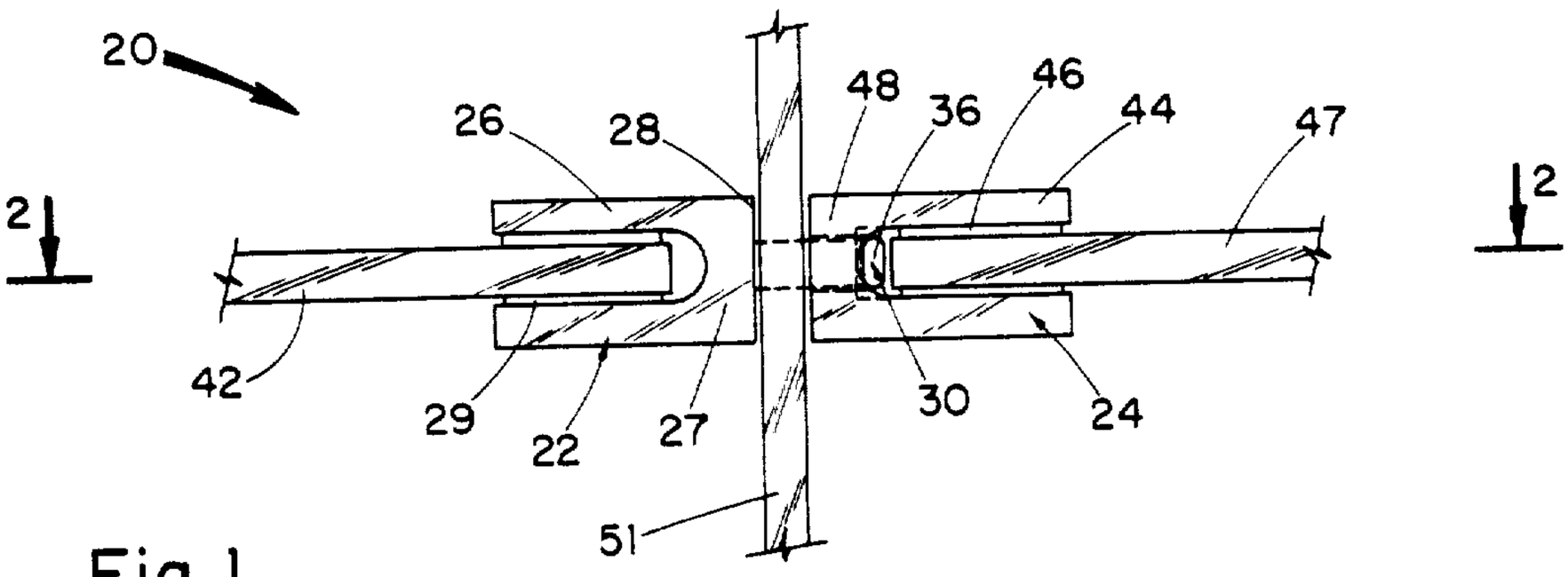


Fig. 1

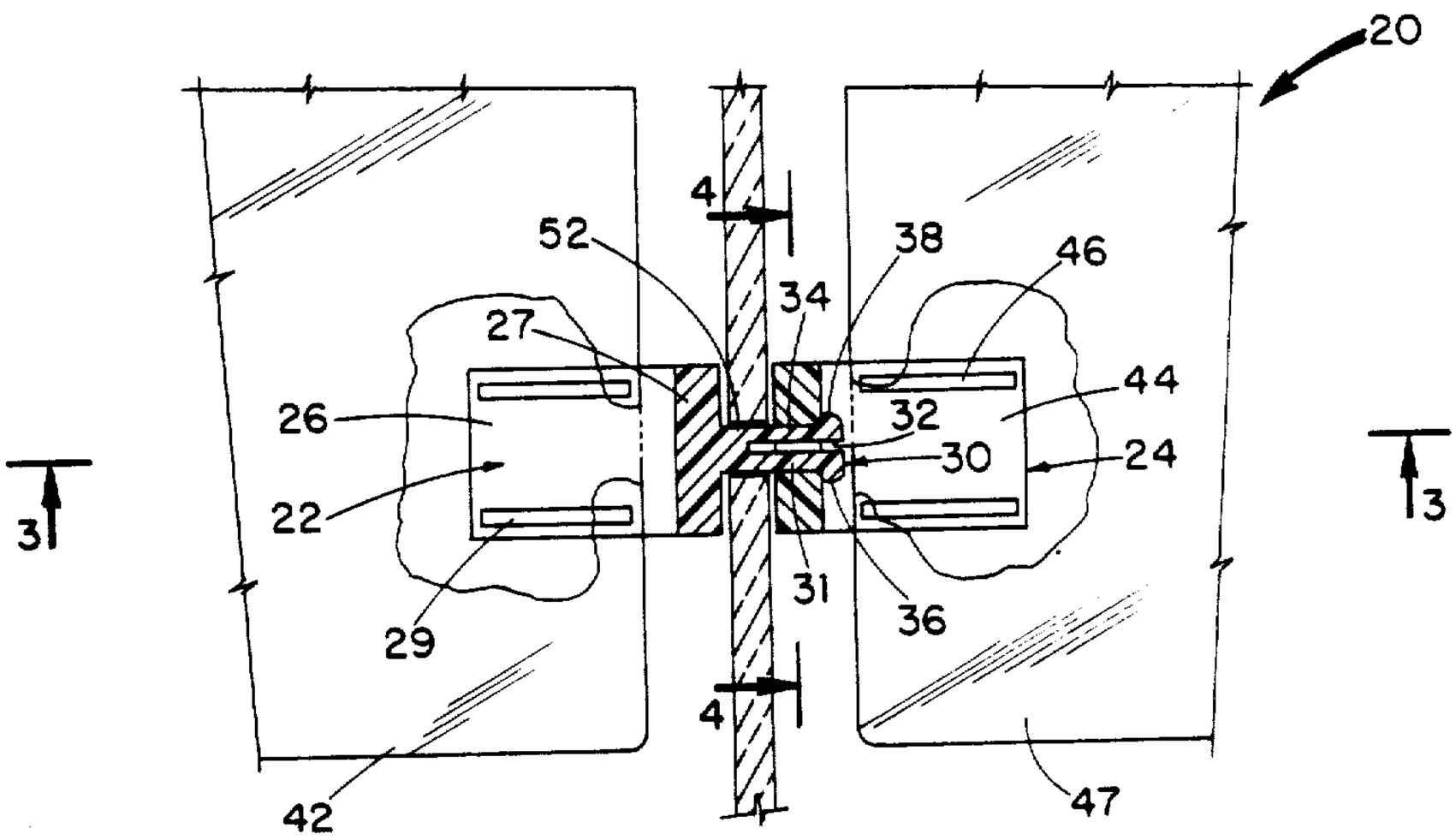


Fig. 2

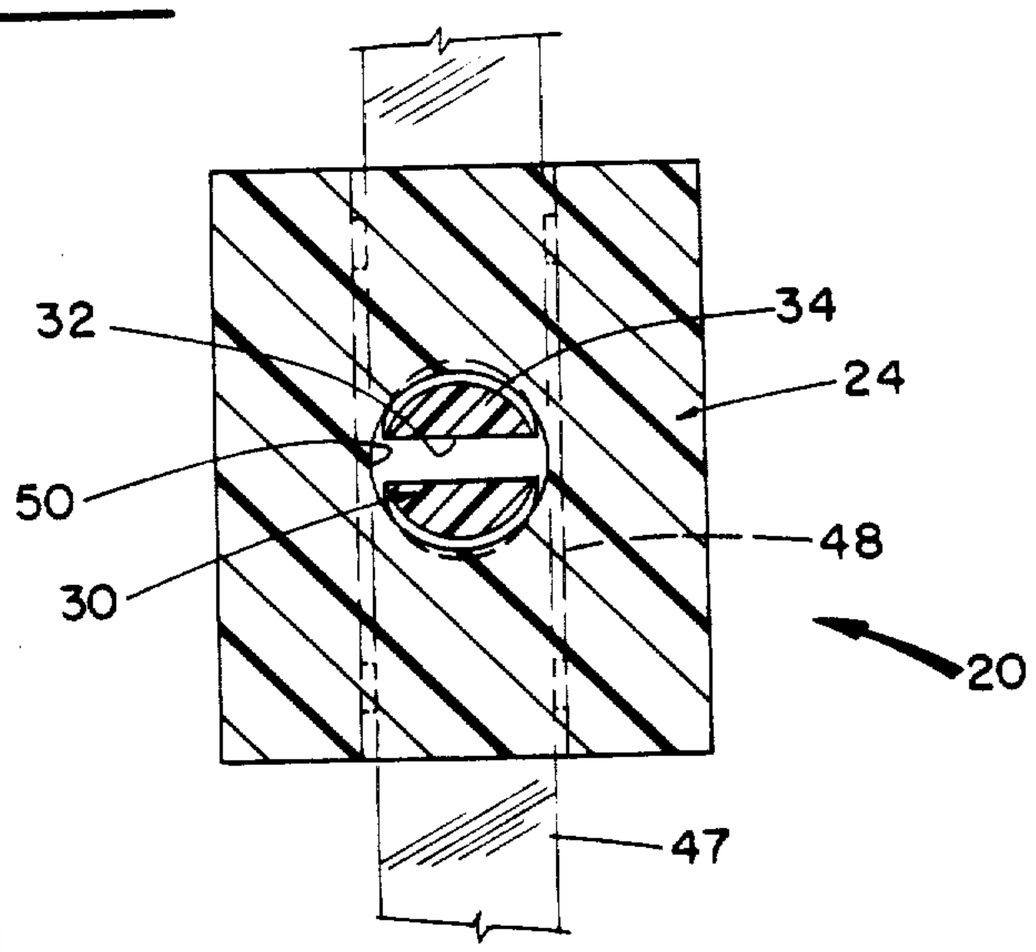


Fig. 4

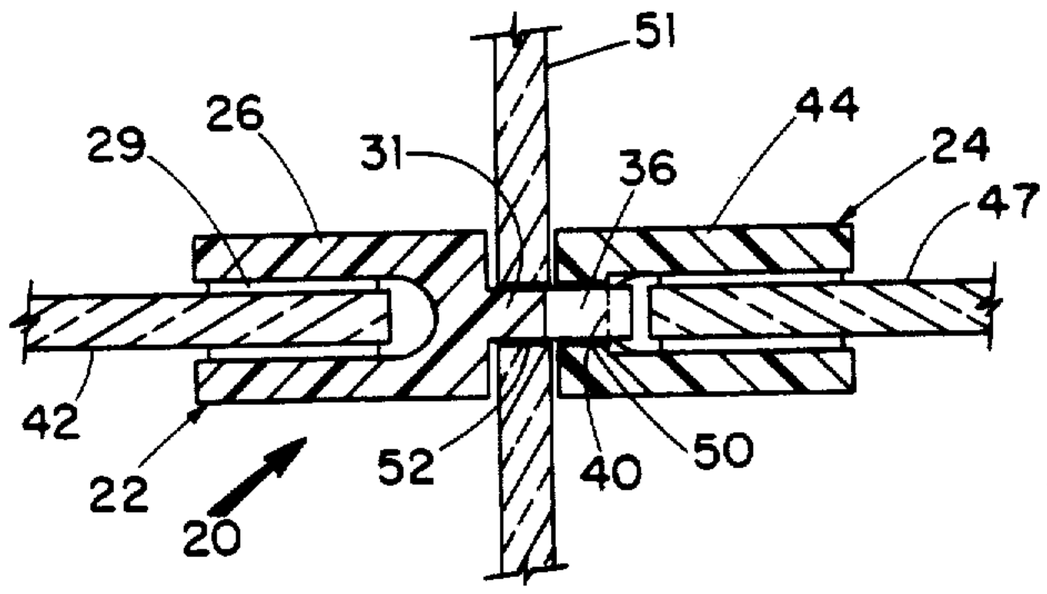


Fig. 3

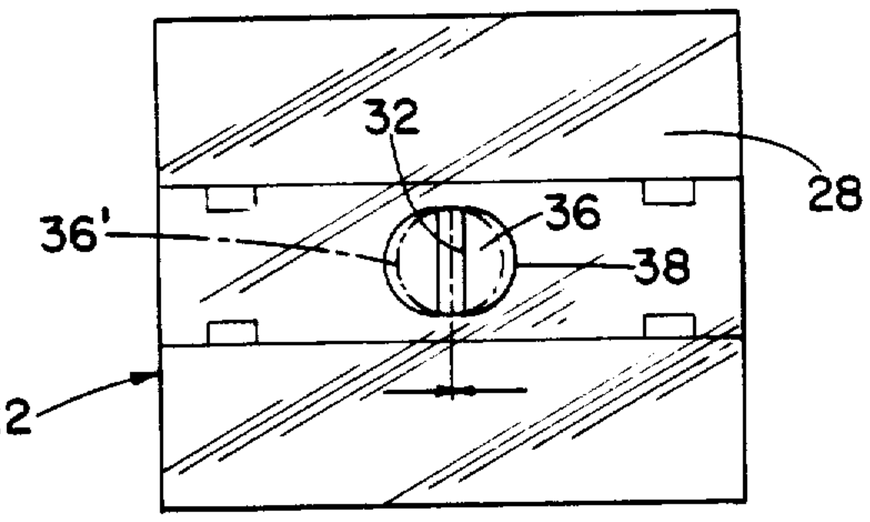


Fig. 7

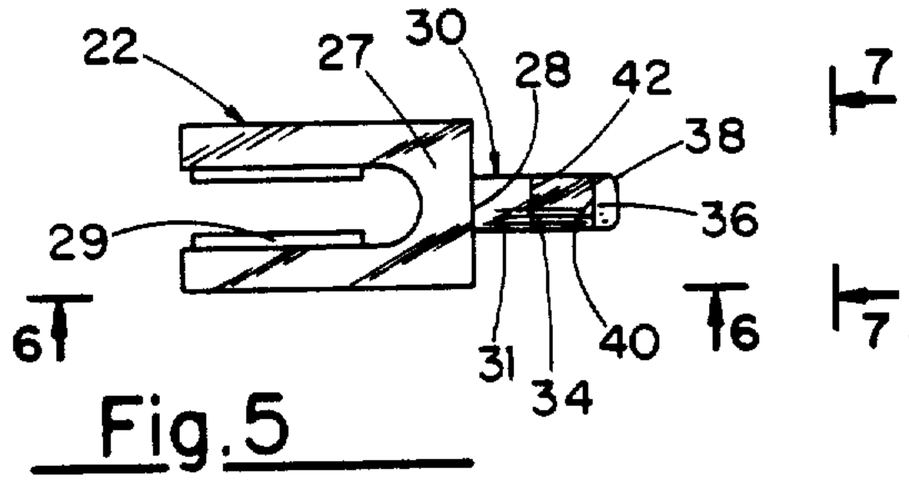


Fig. 5

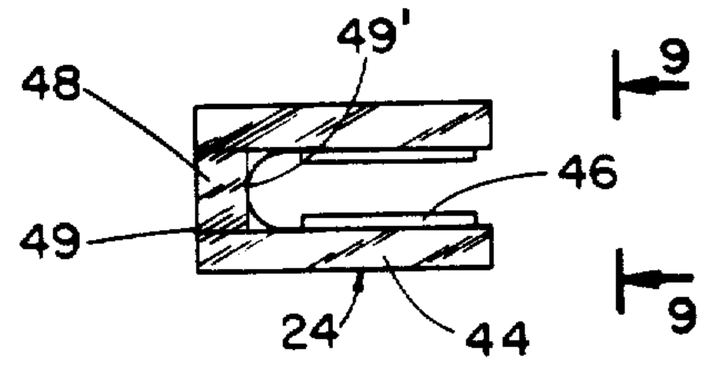


Fig. 8

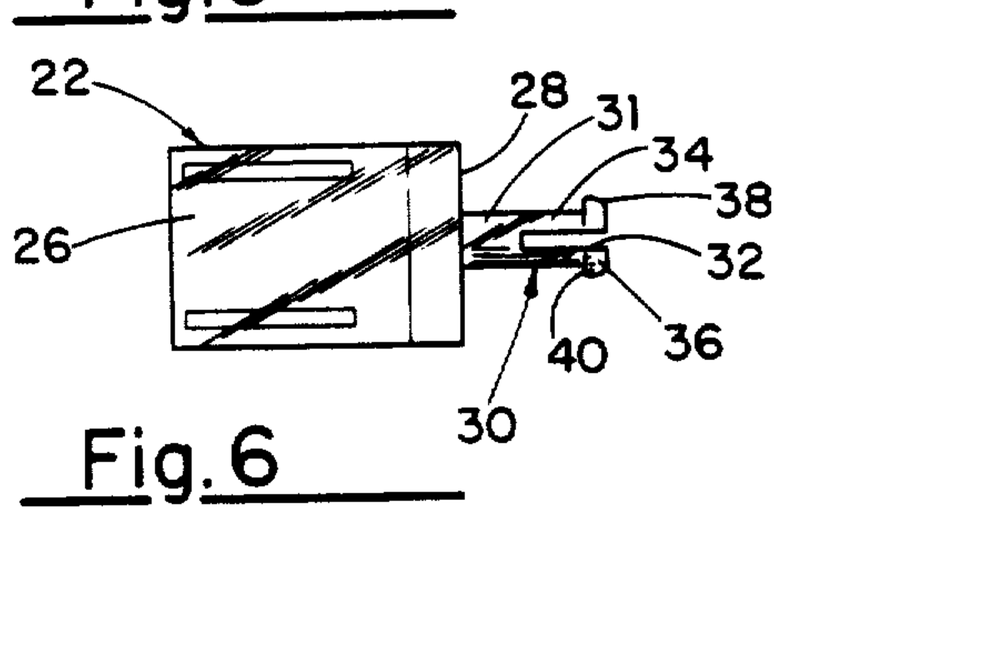


Fig. 6

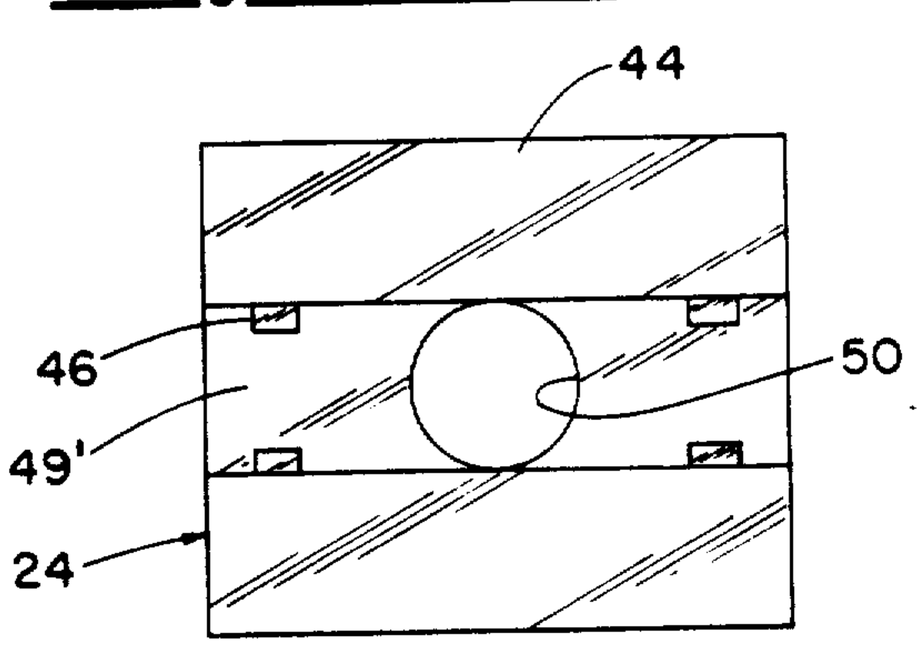


Fig. 9

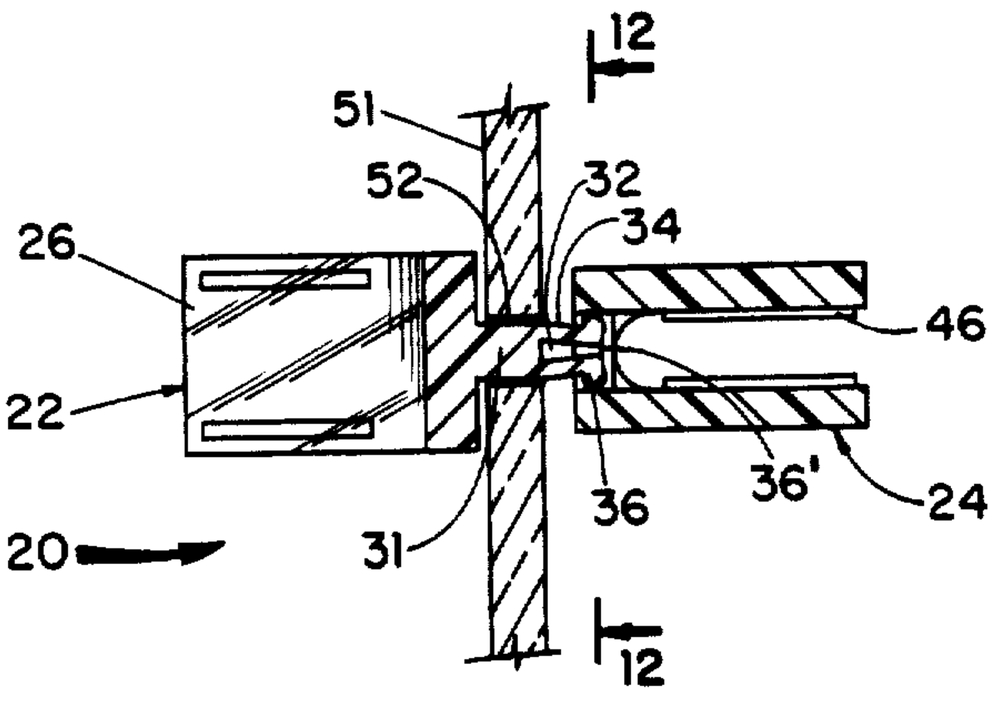


Fig. 11

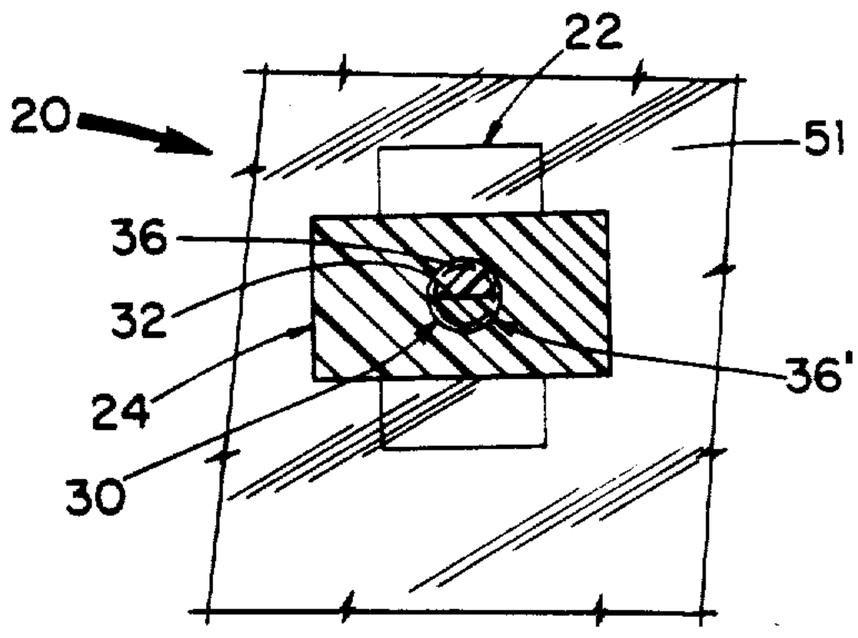


Fig. 12

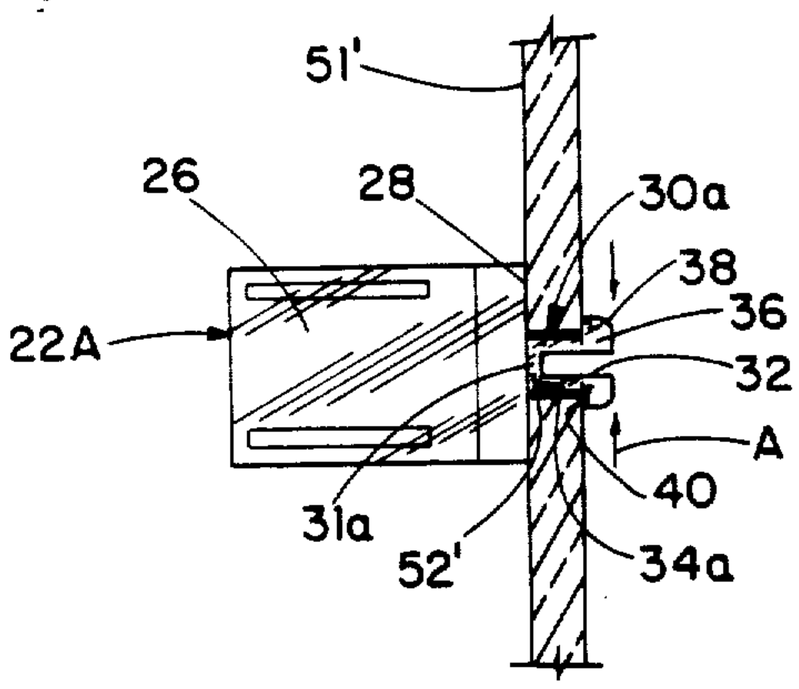


Fig. 6A

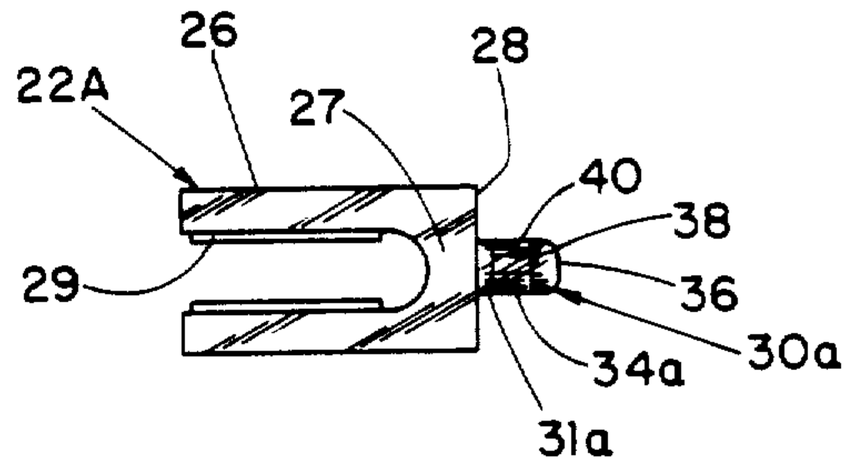


Fig. 5A

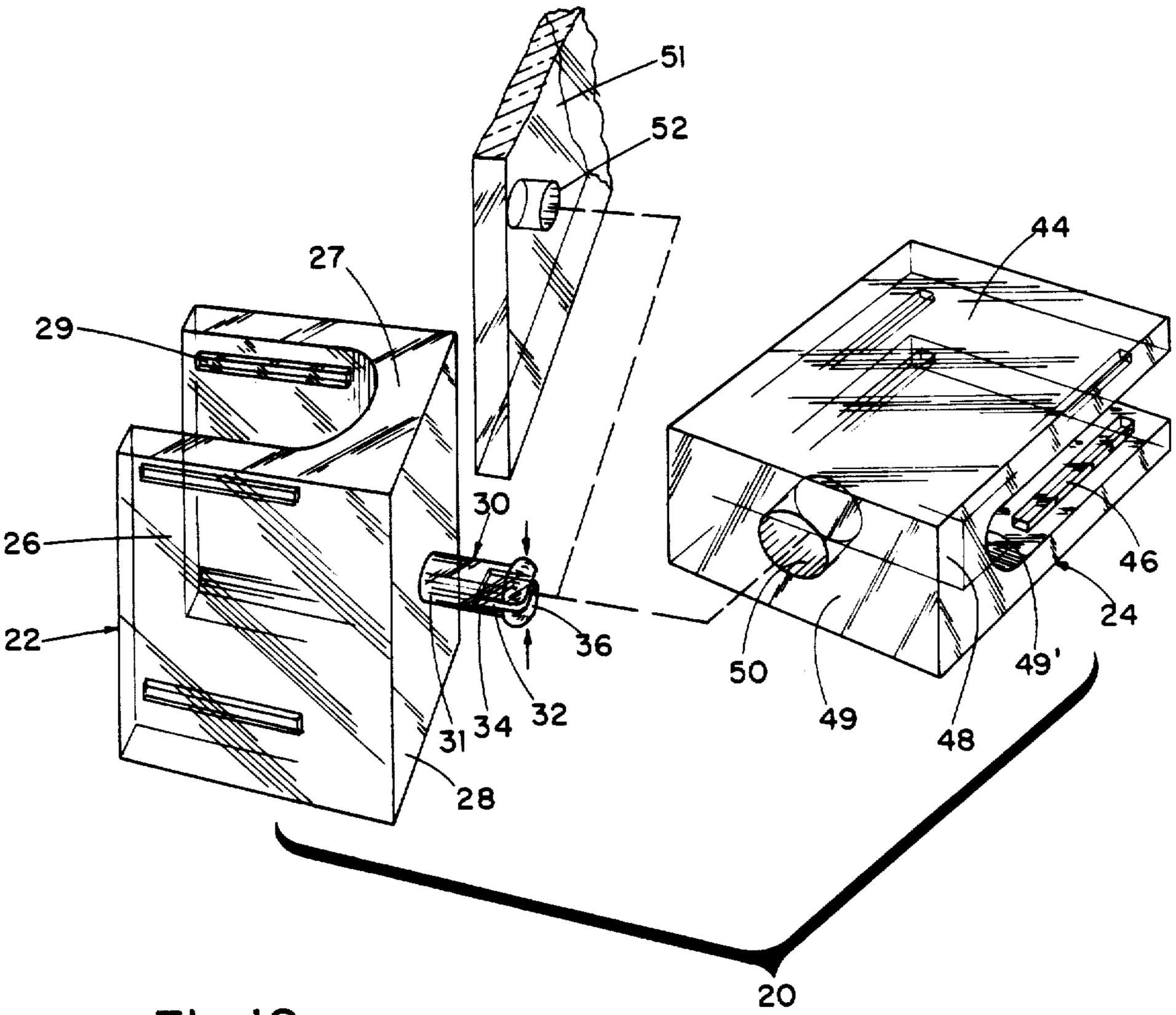


Fig. 10

BRACKET STRUCTURE FOR SUPPORTING A SHELF OR PARTITION OF A DISPLAY CASE OR THE LIKE

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.

This invention relates to the art of shelf supporting brackets and more particularly concerns a bracket structure supporting a sheet-like member such as a horizontal shelf or a vertical partition in a display case, or the like.

It has been known heretofore to provide brackets of various types adapted for clamping a horizontal shelf or vertical partition to a stationary partition or shelf. Prior U.S. Pat. No. 4,223,966 discloses one type of U-shaped clamping clip which is mounted on the wall of a display case by means of a screw engaged in a bore in the base of the clip to support a shelf on partition.

The use of screws for shelf clips or clamps has been found objectionable for several reasons. If the screws loosen and fall out the shelf partition, or divider panel, supported thereby collapses. Installation requires manual insertion of screws and tightening of screws with a screw driver, which are slow, time consuming, operations.

The present invention is directed at a bracket structure and a bracket assembly which includes interfitting male and female clips adapted to frictionally engage and support a sheet-like member such as a shelf to an apertured panel, partition, divider, etc. The male clip is U-shaped structure with an end wall and a stem extended therefrom. The stem has a cylindrical neck and bifurcations, each of which has a tip with a substantially larger radius than the radius of the cylindrical neck. The tips may be beveled to facilitate insertion thereof in a partition, divider, etc. The female clip is also U-shaped with an end wall or bight in which is a central hole through which the tips of the stem of the male clip may be inserted after they have passed through a aperture in a partition or divider, etc. Since the tips are beveled, they assist in compressing the flexible bifurcations of the stem as they are passed through the aligned holes in the mounting panel and the female clip. After the tips pass through the hole in the female clip the bifurcations expand and lock the stem and partition to the female clip. The clips may be detached easily by rotating the clip 90° with respect to each other which compreses the bifurcations of the stem allowing it to pass easily through the holes in both the female clip and the mounting panel.

It is therefore a principal object of the present invention to provide a bracket comprising a U-shaped male clip for locking a shelf to an apertured panel or the like wherein the clip has an end wall with a stem extending therefrom for engagement into an aperture in the panel.

Another object of the present invention is to provide a male clip as described wherein the neck of the stem is bifurcated at one end.

Still another object of the present invention is to provide a bracket assembly including a male clip as described and a U-shaped female clip having an end wall in which is a hole arranged to receive the stem of the male clip when the respective end walls are abutted against respective sides of the panel.

A further object of the present invention is to provide a male clip as described wherein the bifurcated stem may be easily mounted and removed from the panel by only compressing the bifurcating stem.

These and other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings in which:

FIG. **1** is a side elevational view of a bracket assembly embodying the invention, shown with a male and female clip mounted on a panel, partition, or divider each supporting a shelf at opposite sides of the panel;

FIG. **2** is a horizontal cross sectional view taken along lines **2—2** of FIG. **1**, parts of the supported shelves being broken away;

FIG. **3** is a vertical cross sectional view taken along line **3—3** of FIG. **2**;

FIG. **4** is an enlarged vertical sectional view of the clip structure taken along line **4—4** of FIG. **2**;

FIG. **5** is an enlarged side view of a male clip forming part of the bracket assembly;

FIG. **5A** is a side view similar to FIG. **5** of another male clip;

FIG. **6** is a top plan view taken along line **6—6** of FIG. **5**;

FIG. **6A** is a top plan view of the clip of FIG. **5A** shown engaged on a mounting panel;

FIG. **7** is an end elevational view taken along line **7—7** of FIG. **5**;

FIG. **8** is an enlarged side elevational view of a female clip forming part of the bracket assembly;

FIG. **9** is an end elevational view taken along line **9—9** of FIG. **8**;

FIG. **10** is an enlarged exploded perspective view of parts of the bracket assembly of FIG. **1**;

FIG. **11** is a vertical cross sectional view similar to FIG. **3** showing the female clip in partial engagement on the male clip; and

FIG. **12** is an enlarged vertical sectional view taken along line **12—12** of FIG. **11**;

Referring now to the drawings wherein like reference character designate like or corresponding parts throughout, there is illustrated in FIGS. **1**, **2**, **3**, **4**, **10**, **11**, and **12**, a bracket assembly generally designated as reference numeral **20** including a male clip **22** and a female clip **24**. The male clip has a rectangular U-shaped structure with two flat sides or side walls **26** and a bight or end wall **27** which is flat on the outer side **28** and is curved inside. Spaced ridges or ribs **29** are formed inside the clip integral with sides **26** and extend lenthwise of the side walls **26**. Extending outwardly from the center of the side **28** of the bight **27** is a stem **30** having a cylindrical neck **31** which has a diametral slot **32** extending to the outer free end of the stem **30**. The slot **32** defines two spaced bifurcations **34** each of which terminates in a semicircular tip **36** which as illustrated in FIG. **6**, are parallel and have the same cross-sectional area and each is larger in radius than the radius of the neck **31**. The bifurcations **34** are flexible so that they may be pressed together as indicated by arrows in FIG. **7** to define a circular head **36'** at the end of the stem. The outer end edge **38** of each tip **36** is beveled. The rear side of each tip **36** is formed as a flat radial annular shoulder **40**; see FIGS. **5**, **6**, and **7**. The entire clip **22** may be formed of a molded plastic material. By this arrangement, a sheet-like member such as a panel or shelf **42** may be pushed into the clip **22** between the side

walls **26** where the panel **42** will be frictionally gripped and securely but detachably clamped by the ridges **29**; see FIGS. **1**, **2**, and **3**.

The female clip **24** shown in FIGS. **1–4**, **8–12** is a rectangular U-shaped structure like the clip **22** and has flat spaced opposing side walls **44** formed with integral internal, longitudinal laterally spaced ridges **46** to receive and engage a flat shelf or panel **47**; see FIGS. **1**, **2**, **3**, and **10**. The clip **24** has a curved inner side **49'** and end wall or bight **48** formed with an external flat side **49**. Centrally located in the bight **48** is a circular hole **50** opening into the interior of the clip **24**. The diameter of the hole **50** is equal to or slightly larger than the diameter of the circular head **36'** of the stem **30** defined when difurcations **34** are bend toward each other as clearly shown in FIGS. **11** and **12**.

To mount the clip structure **20** on a support panel partition or divider **51** shown in FIGS. **1**, **2**, **3**, **11**, and **12**, the head end **36'** of stem **30** will be pressed against the rim of a hole **52** in the panel **51**. The beveled rim or edge **38** of each of the tips **36** will move in radially compressing the bifurcations **34** so that the tips **36** abut to define the circular head **36'** which will pass through the hole **52**. The female clip **24** may then be mounted on the stem **30** by pressing the bight **48** against the beveled edges of the tips **36** to compress them so that the round head **36'** passes through the hole **50** in the bight **48**. When the tips **35** pass fully through the hole **50** bifurcations **34** expand fully in a direction transverse to the length of the clip **24** as shown in FIG. **2**. There the flat, annular shoulders **40** engage at the inner curved side **49** of the bight **48**. This locks the clip structure **20** in place.

To detach the clips from each other and from the panel **51**, the clip **24** may be used as a tool. The space between the side walls **44** of the clip **24** is substantially less than the diameter of the tips **36**. Thus, by rotating the clip **24**, so that the planes of the side walls **44** are perpendicular to the sides **36** of the clip **22**, [as illustrated in FIGS. **11** and **12**] the tips **36** are pressed together by the walls **44** and the stem **30** may easily be pulled out of holes **50** and **52** in the bight **48** and the panel **51** respectively.

FIGS. **5A** and **6A** illustrate another clip **22A** which is similar to the clip **22** with corresponding parts identically numbered. A stem **30a** is shorter than the stem **30**. A neck **31a** has an axial length substantially equal to the thickness of a support panel **51'**. It will be noted that the flat annular shoulder **40** of the tips **36** abut and lock against the outside of the panel around a hole **52'**. To engage the clip **22A** on the panel **51'** it is simply necessary to push the stem **30a** axially to compress flexible bifurcations **34a** so that the round tips **36** of the stem **34a** can pass through the hole **52'**. To remove the clip, the tips **36** must be pressed together as indicated by arrows A, by means of the female clip **24**. That is, the clip **24** is pressed against the tips **36** so that the tips **36** are in the hole **50** whereby the tips **36** are compressed to substantially the same diameter as the hole **52'**. Then the stem **30a** may be easily withdrawn through the hole **52'**.

The clips **22**, **22A**, and **24** may be oriented horizontally to support horizontal shelves on the support panel **51** or **51'** or alternatively they may be turned vertically or diagonally to support vertical partitions or diagonal shelves respectively. If desired, the hole **50** in the bight **48** of the female clip **24** may be tapered outwardly from the curved inner wall **49'**.

The clips can be used in multiples to assemble display case, display panels, room partitions and dividers for

office or home furniture, book cases, and the like. They can be economically produced by mass production methods and machinery. They are strong, durable, and will provide long, troublefree service. They do not need auxillary fasteners such as screws which is highly advantageous.

It should be understood that the foregoing relates to only a preferred embodiment of the invention which has been by way of example only, and that it is intended to cover all changes and modifications of the examples of the invention herein chosen for the purposes of the disclosure, which do not constitute departures from the spirit and scope of the invention.

What is claimed is:

1. A bracket structure for supporting horizontal or vertical sheet-like members and adapted for attachment to a supporting apertured panel, comprising:

a clip having a U-shaped body, said body having two opposing, spaced flat side walls joined by an integral end wall;

[said side walls having ridges integrally formed on inner opposing sides of said side walls for frictionally engaging one of said sheet-like members; and]

a stem extending outwardly of an outer side of said end wall, said stem having a cylindrical neck with a diametrical slot extending from a point intermediate the end of said stem and the outer side of said end wall to the end of said stem to define two flexible parallel spaced bifurcations, each having equal cross-sectional areas throughout their respective extents and each bifurcation terminating in a tip having a larger radius than that of said neck, both of said tips when abutted defining a head adapted to pass through an aperture in said supporting apertured panel.

2. A bracket structure as defined in claim **1**, wherein said tips are formed with shoulders which engage around a rim of said aperture at one side of said panel to prevent said stem from passing through said aperture when said bifurcations are in spaced unflexed position.

3. A bracket structure as defined in claim **2**, wherein the axial length between said outer side of said end wall and said shoulders of said neck is substantially equal to the thickness of said panel so that said stem is snugly engaged and supported by said panel while said outer side of said end wall abuts the other said of said panel.

4. A bracket structure as defined in claim **2**, further comprising:

another clip having another U-shaped body, said other body having other opposing, spaced, flat side walls for receiving another one of said sheet-like members therebetween;

said other flat side walls being joined by an integral other end wall;

said other end wall having a hole adapted to receive said stem of said first named clip, said hole being substantially equal in diameter to that of said head when said bifurcations are compressed to permit said head to pass through said hole in said other end wall, whereby said shoulders on said tips engage an inner side of said other end wall when said bifurcations are in spaced, unflexed condition.

5. A bracket structure as defined in claim **4**, wherein the axial length between said outer side of said end wall and said shoulders of said neck is substantially equal in axial length to the thickness of said panel and the thickness said other end wall, so that said panel and said other end wall are snugly engaged by said stem between

said end wall of the first named clip and said tips of said stem, when said neck extends through said aperture in said panel and said hole in said other end wall.

6. A bracket structure as defined in claim 4, further comprising other ridges integrally formed on inner opposing sides of said other side walls for frictionally engaging said other sheet-like member.

7. A bracket structure as defined in claim 4, wherein the spacing of said other side walls of said other clip is less than the diameter of said tip of said stem of said first clip so that turning said other clip so that said side walls of said other clip are in a mutually perpendicular position to the side walls of said clip thereby compresses said spaced bifurcations of said clip and caused said tips to abut together and define said head which can then pass through said hole in said other end wall and through said aperture in said panel to fully disengage said first named clip from said panel and said other clip.

8. A bracket structure as defined in claim 7, wherein said end wall of said first named clip and said other end wall of said other clip have flat outer sides to abut flush

against opposite sides of said panel when engaged between said clips.

9. A bracket structure as defined in claim 7, wherein said aperture in said panel and said hole in said end wall of said other clip are both circular and of substantially equal diameter, said tips of said stem being semicircular and defining a circular head when said bifurcations are compressed, the diameter of said circular head being substantially equal to the diameter of both said aperature and said other hole.

10. A clip structure as defined in claim 4, wherein said tips of said stem have beveled forward edges opposite from said shoulders to aid in compressing said bifurcations and facilitate entry of said stem through said aperature in said panel and said hole in said other end wall.

11. A bracket structure as defined in claim 1, wherein said side walls have ridges integrally formed on inner opposing sides of said side walls for frictionally engaging one of said sheet-like members.

* * * * *