

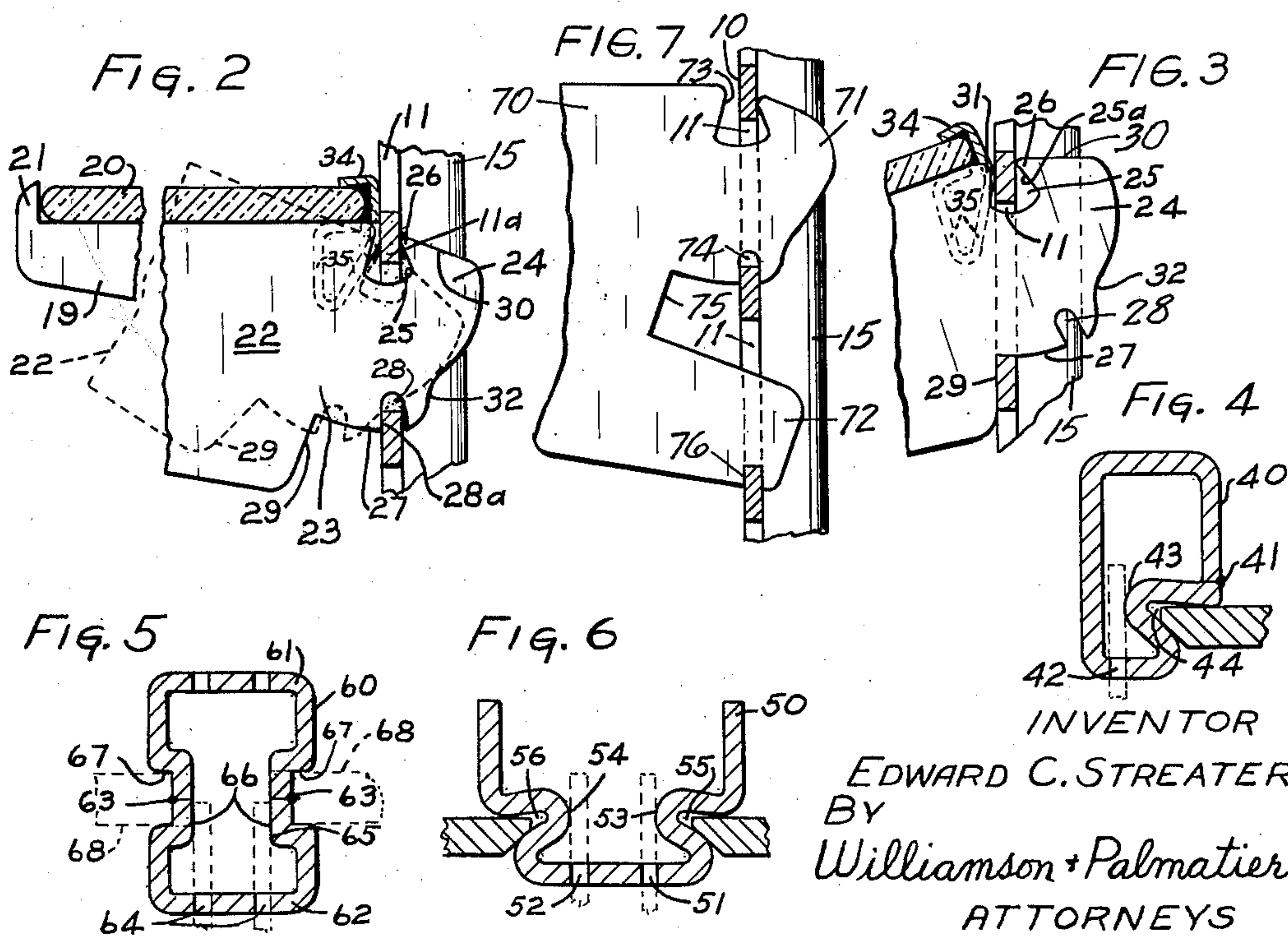
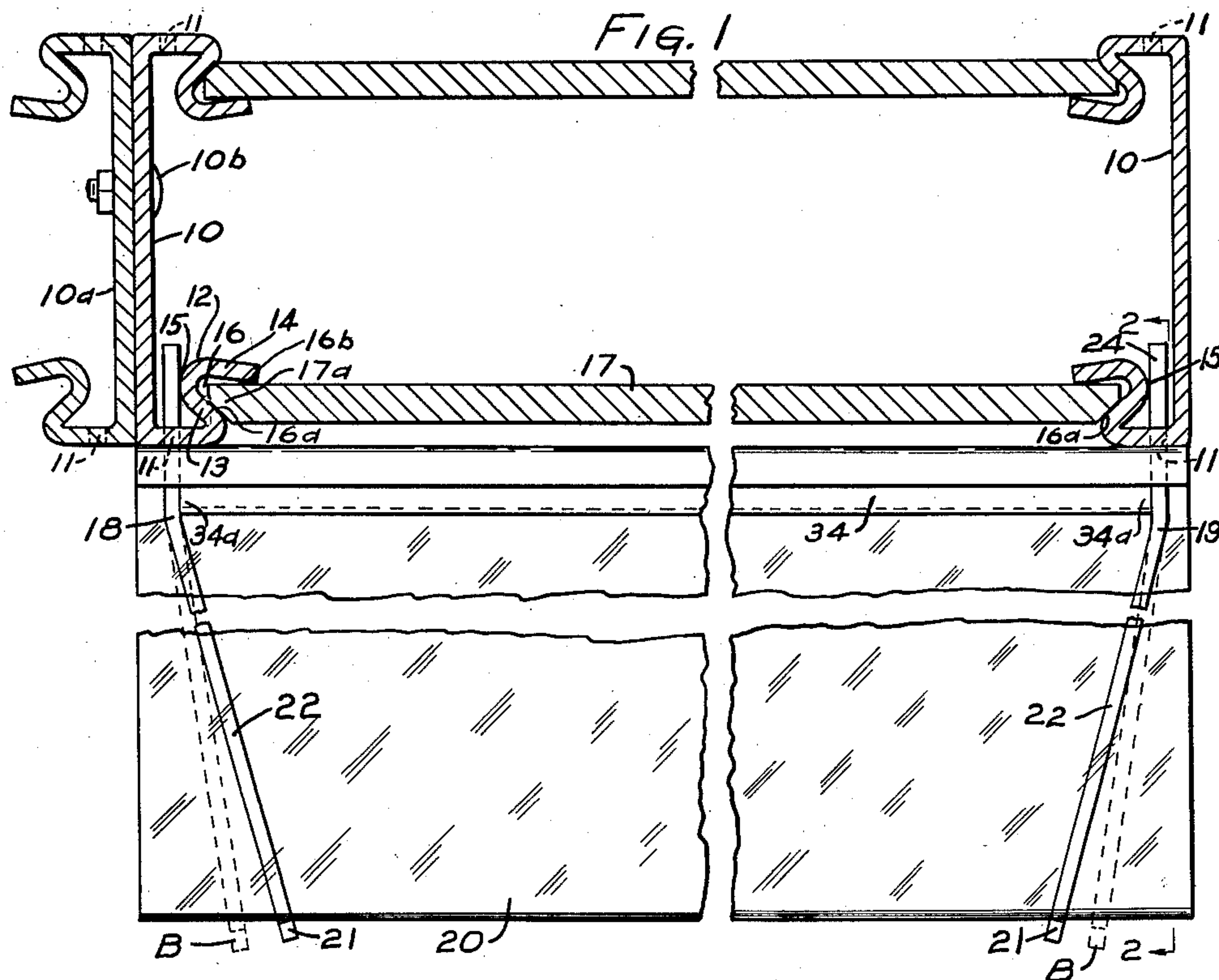
Aug. 27, 1963

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3,101,923

SHELF MOUNTING

Filed Feb. 17, 1961



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3,101,923

SHELF MOUNTING

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Filed Feb. 17, 1961, Ser. No. 102,909

6 Claims. (Cl. 248—242)

This invention relates to apparatus for supporting a shelf, and more particularly relates to a bracket arm supported on an upright standard for mounting a shelf.

This application is related to my co-pending application S. N. 102,908, filed February 17, 1961 and entitled Shelving Assembly.

Although various types of shelf-mounting apparatus have been known in the past, such shelf-mounting apparatus has had certain distinct disadvantages. Among the more important of such disadvantages is the fact that such apparatus as have been adjustable to hold shelves in more than one position have been unduly complicated, and when these apparatus are adjusted so as to hold a shelf horizontal, a necessary strength is not provided for in order to hold heavy loads. Furthermore, it has been found that in many such apparatus the shelf-supporting brackets are rather difficult to manipulate and handle because of a definite propensity to fall off the standard when being manipulated.

With these comments in mind, it is to the elimination of these and other disadvantages to which the present invention is directed, along with the inclusion therein of other novel and desirable features.

An object of my invention is to provide a new and improved shelf-mounting apparatus of simple and inexpensive construction and operation.

Another object of my invention is the provision of a novel apparatus for supporting and clamping a shelf in a predetermined position.

Another object of my invention is to provide a new and improved apparatus which is well adapted to support a shelf and heavy loads thereon in any of a plurality of positions.

A further object of my invention is the provision of a novel and improved apparatus for supporting and clamping a shelf which may be heavily loaded in any of a plurality of positions.

A still further object of my invention is to provide an improved apparatus for supporting a shelf in various predetermined positions in such a manner as to prevent sudden breaking of any portion of the apparatus even though extremely heavy loads are carried and also in such a manner that the shelf will sag before the support apparatus breaks.

These and other objects and advantages of my invention will more fully appear from the following description made in connection with the accompanying drawings wherein like reference characters refer to the same or similar parts throughout the several views and in which:

FIG. 1 is a section taken on a horizontal plane through the upright standards and showing the brackets and shelf supported thereon;

FIG. 2 is a detail section view, partly broken away and taken on a plane on approximately 2—2 in FIG. 1;

FIG. 3 is a view similar to FIG. 2 showing the shelf in a different position;

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FIG. 4 is a transverse section view through a modified form of standard;

FIG. 5 is a transverse section view through a second modified form of standard; and

FIG. 6 is a transverse section view through still another modified form of standard.

FIG. 7 is a view similar to FIG. 2 and showing a modified form of bracket arm.

The shelf-supporting apparatus includes upright standards 10 which, in the form shown, are constructed of rolled or heavy gauge metal and may be arranged in back-to-back parallel relation with additional similar standards such as 10a and may be secured thereto as by bolt 10b. The standards 10 are provided with a plurality of vertically aligned slot-like apertures 11 at the front and rear sides thereof for receiving the shelf-mounting brackets. Adjacent each vertical row of aligned apertures 11, the standard 10 has a flange portion 12 which is turned obliquely rearwardly at 13 and thence inwardly at 14 toward the cooperating standard at the other end of the shelf to define a continuously extending vertical abutment 15 disposed rearwardly of and at one side of the slot apertures 11, and a groove 16 for receiving the beveled edge portion 17a of a back panel 17. It will be noted that the forward side 16a of the groove 16 extends obliquely rearwardly and outwardly to engage the beveled surface of the panel edge portion 17a and cooperates with the rear edge 16b of the groove to slightly bow the back panel 17 forwardly.

The apparatus is also provided with a plurality of shelf-supporting brackets 18 and 19 which are substantially identical to each other but as will be clearly evident in FIG. 1, the brackets 18 and 19 are bent in opposite directions so as to be adapted for the left hand and right hand ends of the shelf 20 respectively. The brackets 18 and 19 have upstanding abutments 21 at their forward ends for engaging the forward edge of the shelf 20, and the body portions 22 of the brackets underlie and support the shelf. In the form shown, the brackets 18 and 19 are constructed of heavy gauge metal and are stiff but slightly flexible. The brackets 18 and 19 have a plate-like shape oriented in a vertical position, and it is important that the rear end portions 23 thereof be of this plate-like shape in order to be inserted through the slot-like apertures 11 in the standards and to be slightly vertically shiftable therein. It will be seen that the terminal end 24 of the rear portions of the brackets normally is disposed on the rear side of the standard and engages the abutment 15 of the standard so as to limit swinging of the brackets in one horizontal direction. The brackets 18 and 19, with their rear terminal ends 24 bearing against the abutments 15 may be flexed slightly to the dotted line position B shown in FIG. 1 so as to swing or arcuately move the front abutments 21 away from the front edge of the shelf so as to permit removal of the shelf from the brackets. When the brackets are released, they will normally return to shelf-clamping position shown in FIG. 1 wherein the front abutments 21 bear rearwardly against the front edge of the shelf.

If the shelf 20 is uplifted and the brackets 18 and 19 are released, the front abutments 21 will actually move rearwardly of the full line position shown in FIG. 1 as the brackets resiliently return to relaxed position.

It will be seen that the rear end portion 23 of each of

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the brackets is provided with a generally fan-shaped notch 25 opening through the upper edge for receiving the aperture-defining portions 11a of the standard. The notch 25 has an enlarged lower or inner end and a diminished throat portion, and the rear edge 25a of the notch extends obliquely upwardly and forwardly to the top edge to cooperate therewith in defining a generally forwardly extending tip 26 for engaging the rear side of the standard.

The lower edge 27 of the rear portion 23 also has a downwardly opening notch 28 therethrough which is disposed below the notch 25. The forward edge 28a of notch 28 defines a standard-engaging abutment to limit the rearward movement of the bracket member through the aperture 11. A second abutment 29 is formed adjacent the lower edge 27 at a position forwardly of the notch 28 to engage the standard when the shelf is to be supported at an inclined or oblique position.

It will be noted that the height of the rear end portion 23 from the lower edge 27 to the upper edge 30 is in excess of the size or height of the aperture 11 in the standard. However, the distance from the inner bottom end of the notch 25 to the lower edge 27 is less than the size of the aperture 11. It is well to note that the distance from the inner top end of notch 28 to the upper edge 30 is also in excess of the height or size of the aperture 11. When the inner terminal end 24 is inserted through the aperture 11, the tip 26 will pass through the aperture to the rear side of the standard and the standard will be engaged by the corner 31 at the upper front side of notch 25 and by the generally downwardly and forwardly extending camming surface portion 32. When rearward pressure is subsequently applied to the bracket, the camming surface portion 32 lies along the lower edge of the aperture 11 and in a camming movement, uplifts the rear end portion 23 of the bracket so as to move the tip 26 upwardly along the rear side of the standard, whereupon the lower edge 27 is allowed to swing through the aperture 11. The bottom notch 28 will receive the lower aperture-defining portions of the standard therein so as to preclude any further inward or outward movement of the bracket or any swinging thereof with respect to the standard. It will be seen that in order to remove the bracket from the standard, the rear end portion 23 thereof must be lifted upwardly, when the bracket is swung with respect to the standard. If only the front end of the bracket is lifted there is a tendency for the bracket to swing, in which case the edges of the notch 28 will only bear more tightly against the standard to prevent removal of the bracket from the standard.

It should be noted that alternatively, the lower edge 27 may be swung through the aperture 11 so as to cause the abutment 29 to engage the outer side of the standard whereby to orient and maintain the bracket and shelf at an inclined position as seen in FIG. 3.

It should be pointed out that the construction of the rear terminal end 24 together with the standard-engaging tip 26 will allow the brackets and shelf to carry extreme heavy loads. As the load on the shelf is increased, the tip 26 will bear against the standard with increasing pressure and the tip 26 is held in a stationary condition because the inner terminal end 24 bears against the abutment 15 and because the brackets are maintained in flexed condition. As the pressure increases on the tip 26, when excessive loads are carried on the shelf, there may be some flattening of the tip 26 at the point of engagement with the standard, which may possibly allow the shelf 20 to sag slightly, but in view of the struction of the tip, together with the construction of the rear terminal end, there will be no likelihood at all of breaking of any of the vital parts which are necessary for the supporting of the shelf on the standards. In this respect, it should be noted that the present invention is particularly well adapted for use in retail establishments wherein in one situation, the shelf may be required to carry only a few pounds of such products as breakfast foods. However, if

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the shelves are put into use in supporting materials, such as heavy bags of fertilizer or the like, the shelf should be able to support these loads so that the retail establishment may have the advantage of greater flexibility in the use of its equipment. It should be understood that although the shelf 20 which is shown is constructed of glass, other materials such as wood or fiberboard shelves may be employed for additional shelf strength.

In this respect, it will be seen in the drawings that the shelf 20 is provided with a molding 34 at its rear edge and formed in such a manner as to be wrapped around the rear edge and to provide depending strengthening portions 35 beneath the rear edge of the shelf. The terminal ends 34a of the molding are disposed inwardly of the ends of the glass shelf so as to abut against the inner sides of the brackets 18 and 19. This relationship between the ends of the molding and the shelf brackets provides a self-centering feature for the shelf to facilitate ready and easy installation of the shelf.

In FIG. 4 is shown a slightly different form of standard which is indicated by numeral 40. The standard 40 is also rolled from a heavy gauge metal and has a generally tubular form, the edges of the rolled metal being welded together at 41. The standard 40 has the plurality of aligned slot-like apertures 42 therein and also has a bracket-engaging abutment 43 and a back panel-receiving groove 44 shaped and oriented in the fashion hereinbefore described in connection with standard 10.

The form of standard shown in FIG. 6 is indicated by numeral 50 and is also formed of a rolled heavy gauge metal. This form of standard has a pair of side-by-side vertical rows of slot-like bracket-receiving apertures 51 and 52 and the standard 50 is also formed with the adjacent bracket-engaging abutments 53 and 54 and the back panel-receiving and mounting grooves 55 and 56 shaped similarly to that described in connection with standards 10. The standard 60 as shown in FIG. 5 is also formed of rolled heavy gauge metal and this standard 60 is formed in two parts 61 and 62 which are identical with each other and are welded together at their butted edges as at 63. The standard 60 has a pair of side-by-side rows of slot-like bracket-receiving apertures 64 therein and on front and rear sides thereof and the offset portions 65 define the bracket-engaging abutments 66 functioning in the manner of abutments 15 in the standard 10. The recesses 67 in the opposite sides of the standard 60 may be utilized to receive and hold panels 68 which are shown in dotted lines somewhat in the fashion of grooves 16 in the standard 10.

The form of bracket arm shown in FIG. 7 is indicated in general by numeral 70 and has upper and lower rear insert portions 71 and 72 normally extending rearwardly through adjacent apertures 11 of a standard 10. The insert portion 71 has a notch 73 in the upper edge thereof with a diminished throat portion and an enlarged bottom portion, and it will be noted that the upper insert portion 71 also has a notch 74 in the lower edge thereof. An abutment 75 is also provided forwardly of the notch 74. The lower insert portion 72 also has a notch 76 in the lower edge thereof, receiving the standard 10 adjacent the corresponding aperture 11. The upper insert portion 71 bears transversely against the abutment 15 of the standard 10 which is turned rearwardly adjacent the apertures as depicted in FIG. 1. The bracket arm 70 is bent at an oblique angle in the manner hereinbefore described in connection with FIG. 1 so that the bracket arm may be flexed to bear rearwardly against the front edge of the shelf so as to grip and urge the shelf rearwardly against the standard.

In the use of the form of bracket arm shown in FIG. 7, the lower insert portion 72 is spaced well below the upper edge of the bracket arm so as to provide additional support for the bracket arm and permit the shelf carried thereon to support extremely heavy loads. When the

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bracket arm 70 is to be removed from the standard 10, it is merely lifted upwardly so as to remove the standard from the notches 74 and 76, and then the bracket arm will be subsequently tilted up and lowered and thereby disassemble the notch 73 from the adjacent portions of the standard. To reassemble the bracket arm 70 with the standard, the bracket arm is first tilted up, and then the upper insert portion 71 is inserted through a corresponding aperture of the standard so that the notch 73 receives a portion of the standard and then the bracket arm is swung downwardly until the notches 74 and 76 may register with the standard adjacent the apertures. The bracket arm 70 may be tilted downwardly, and instead of assembling the notches 74 and 76 with the standard, the abutment 75 will be swung into engagement with the standard so as to support the bracket arm in its tilted position. Of course when a shelf is assembled with the bracket arm, the front end portion of the bracket arm is flexed and the upper insert portion 71 is restrained against movement by the abutment 15 which is disposed adjacent to and behind one side of the apertures of the standard 10.

It should be particularly noted in all forms of the invention herein described that the bracket arms are plate-like and substantially planar in shape. The rear portions of the bracket arms extend rearwardly through the standards and in every case bear sideways against the abutment which is disposed behind and at one side of the apertures in the standard. Because of this novel arrangement of the standards with the abutment 15 disposed rearwardly from the apertures, the bracket arms need merely have the simple plate-like and substantially planar shape excepting for the oblique obtuse angle bend therein just forwardly of the standard so that flexing of the front portions of the bracket arms causes the shelf to be gripped and urged rearwardly against the standards.

It should further be emphasized that the bracket arms disclosed will carry extremely heavy loads without any possibility of sudden breakage of the bracket arm under extreme load conditions. The bracket arms and shelves will sag slightly before any breakage occurs because the tip 26 defining the rear edge of the upper notch will slightly flatten and deform under heavy load conditions. When the tip 26 is under heavy load condition and if this tip is slightly deformed, there will be work hardening of it which will tend to prevent further deformation of the tip and will additionally strengthen the bracket arm in its connection with the standard. The bracket arms are readily and easily inserted and cammed into proper shelf-holding position as hereinbefore described in detail.

It will, of course, be understood that various changes may be made in the form, detail, arrangement and proportion of the parts without departing from the scope of my invention which consists of the matter described herein and set forth in the appended claims.

What is claimed is:

1. A shelf bracket to be applied to an apertured upright standard, comprising an elongate and stiff shelf-supporting member to extend transversely outwardly from the standard and having a rear end portion of plate-like shape oriented in an upright position, and said member also having a front end, and a body portion between said front and rear ends, the rear end portion having a terminal end shaped for insertion through an aperture of the standard and also having an intermediate portion between the terminal end and said body portion, said intermediate portion having a height in excess of the size of the aperture and also having a notch in the upper edge thereof to receive therein a portion of the standard adjacent the aperture, the rear side of the notch extending obliquely of said upper edge and forwardly and upwardly to said upper edge to define a generally pointed and forwardly extending tip for engaging the standard adjacent the aperture, and the rear end portion of said member also hav-

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ing a rearwardly facing standard-engaging abutment below the notch to limit movement of said rear end into the aperture, whereby in the event of excessive loads being carried by the shelf bracket, the tip which cooperates with said abutment in supporting the bracket on the standard will yield to allow the bracket to sag slightly before breakage occurs.

2. A shelf support, comprising an apertured upright standard, an elongate and stiff shelf-supporting member extending transversely outwardly from the standard and having a rear end portion of plate-like shape oriented in an upright position, said member also having a front end, and a body portion between said front end and said rear end portion, the rear end portion having a terminal end shaped for insertion through an aperture of the standard and also having an intermediate portion between the terminal and said body portion, said intermediate portion having a height in excess of the size of the aperture and also having a first notch of substantial width in the upper edge thereof continuously receiving therein a portion of the standard adjacent the aperture and to permit tilting of said member and notch to various oblique positions while the aperture-defining portions of the standard is in the notch, and means adjacent the lower edge of said rear portion and below the notch and defining first and second rearwardly facing abutments spaced from each other in a fore-and-aft direction and selectively engageable with the standard to limit movement of said rear end into the aperture.

3. The invention set forth in claim 2 and including a downwardly opening second notch in the lower edge of the rear portion of said member and positioned below the notch in the upper edge to define said first rearward-facing standard-engaging abutment and to receive a portion of the standard therein adjacent the aperture for limiting movement of said member with respect to the standard.

4. The invention set forth in claim 3 and said second rearwardly facing abutment is formed in the lower edge of the rear portion and spaced forwardly from said second notch at the lower edge.

5. A shelf bracket to be applied to an apertured upright standard, comprising an elongate and stiff shelf-supporting member to extend transversely outwardly from the standard and having a rear end portion of plate-like shape oriented in an upright position, said member also having a front end portion, and a body portion between said front and rear end portions, the rear end portion having a terminal end shaped for insertion through an aperture of the standard and having an intermediate portion between the terminal end and said body portion, said intermediate portion having a height in excess of the size of the aperture and also having a notch in the upper edge thereof to receive therein the aperture-defining portion of the standard, the rear side of the notch extending obliquely of said upper edge and forwardly and upwardly to said upper edge to define a generally pointed forwardly extending tip for engaging the rear side of the standard, said terminal end having a generally rearwardly facing edge with a lower camming portion extending generally downwardly and forwardly to cam the rear end portion upwardly and to hold the tip upwardly behind the standard when rearwardly directed pressure is placed against said member, and means defining a rearwardly facing abutment spaced forwardly from said camming portion adjacent the lower edge for engaging the standard and limiting movement of said rear end portion into the aperture.

6. A shelf bracket to be applied to an apertured upright standard, comprising an elongate stiff shelf-supporting member to extend transversely outwardly from the standard and having a rear end portion of plate-like shape oriented in an upright position, said member also having a front end portion, and a body portion between said front and rear end portions, the rear end portion having a terminal end shaped for insertion through an

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aperture of the standard and also having an intermediate portion between the terminal end and said body portion, said intermediate portion having a height in excess of the size of the aperture and also having a notch in the upper edge thereof, said notch having a diminished throat and an enlarged bottom to continuously receive therein a portion of the standard adjacent the aperture and to permit swinging of said member and notch with respect to the standard, and means adjacent the lower edge of the rear portion and below the notch and defining a pair of rearwardly facing standard-engaging abutments spaced from each other in a fore-and-aft direction for selectively en-

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gaging the standard and limiting movement of said rear end portion into the aperture.

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