# United States Patent [19]

**Faulstich**

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[54] **FREE STANDING SHELF SUPPORT UNITS AND SYSTEM**


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[52] **U.S. Cl.** ..... **108/111**

[51] **Int. Cl.** ..... **A47b 3/00**

[58] **Field of Search** ..... 108/111, 64, 91, 99; 211/149, 152, 177, 178, 104, 118, 130 V, 132 V, 167; 248/436; 182/152, 178



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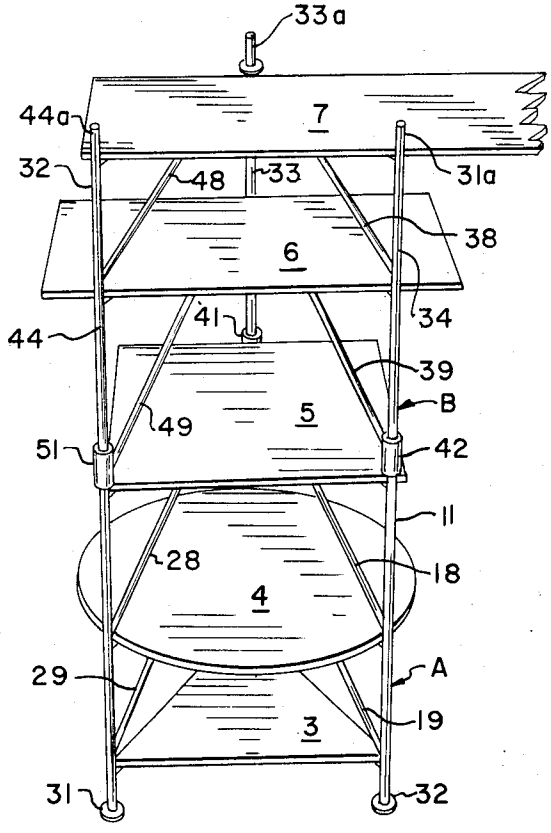
*Attorney, Agent, or Firm*—Ancel W. Lewis, Jr.



[57] **ABSTRACT**

Highly versatile free standing shelf support units are usable singly or in combination to support shelves of different shapes and sizes for displaying merchandise and the like. These units are readily collapsible for movement to different points of use. An upper shelf support unit stacks on a base shelf support unit for added shelf capacity. Each shelf support unit is comprised of two sections pivotally connected to one another for swinging movement between a shelf-supporting position in which the sections are disposed at a selected angle relative to one another and a collapsed position. Each section has a plurality of horizontal shelf support members at different heights to support a plurality of shelves at different elevations. The sections preferably are made up of a minimum number of metal rods welded together to provide a durable, lightweight, low cost design.


**12 Claims, 2 Drawing Figures**



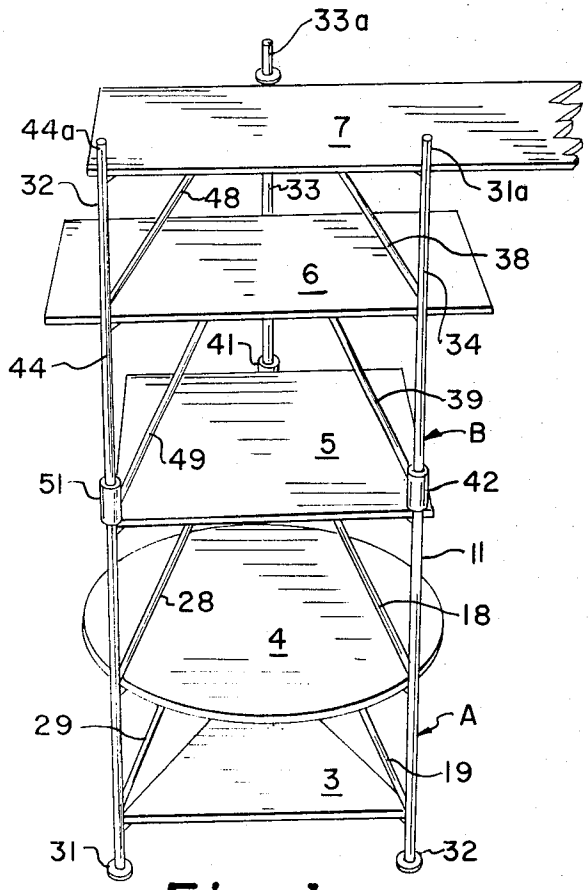



Fig_1

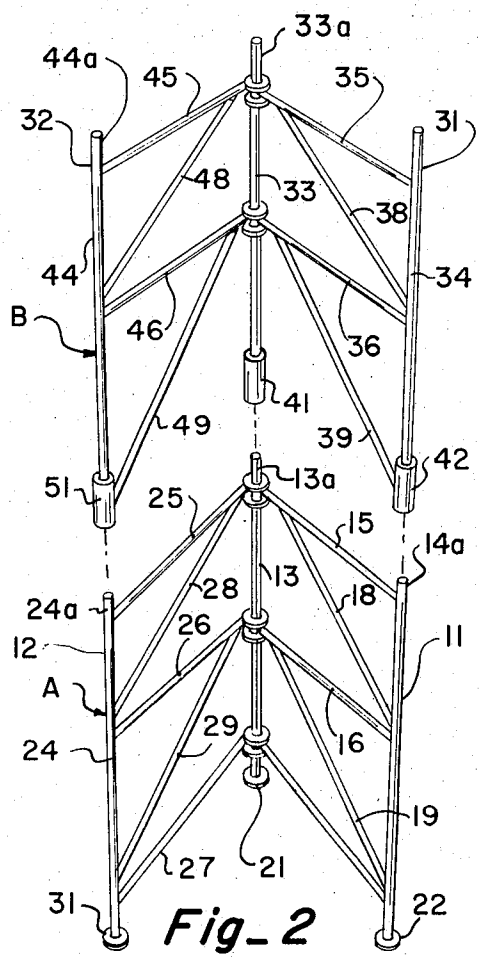



Fig_2

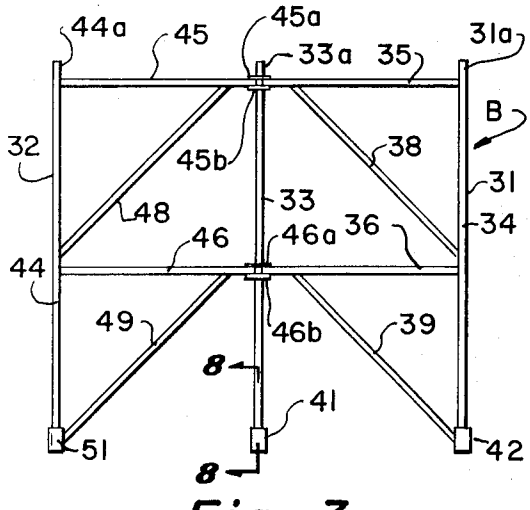



Fig_3

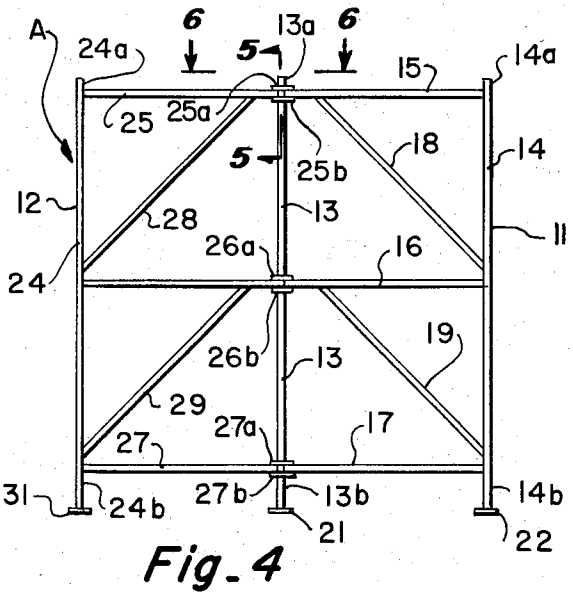



Fig_4

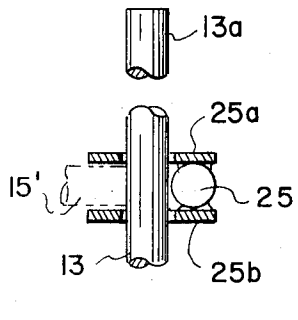



Fig_5

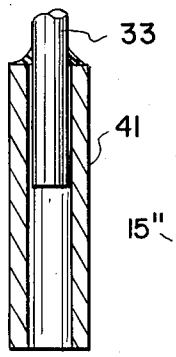



Fig_8

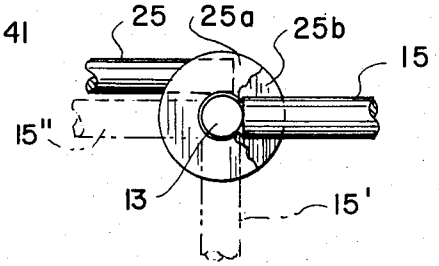



Fig_6

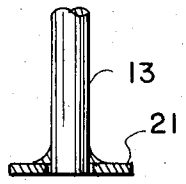



Fig_7

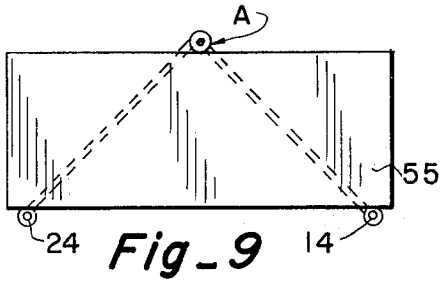



Fig_9

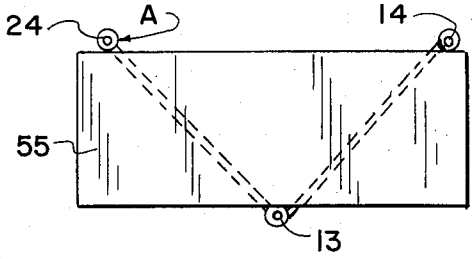



Fig_10

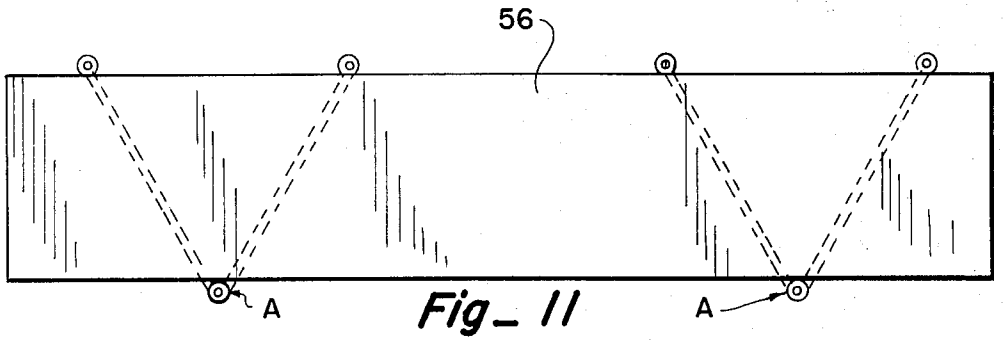



Fig_11

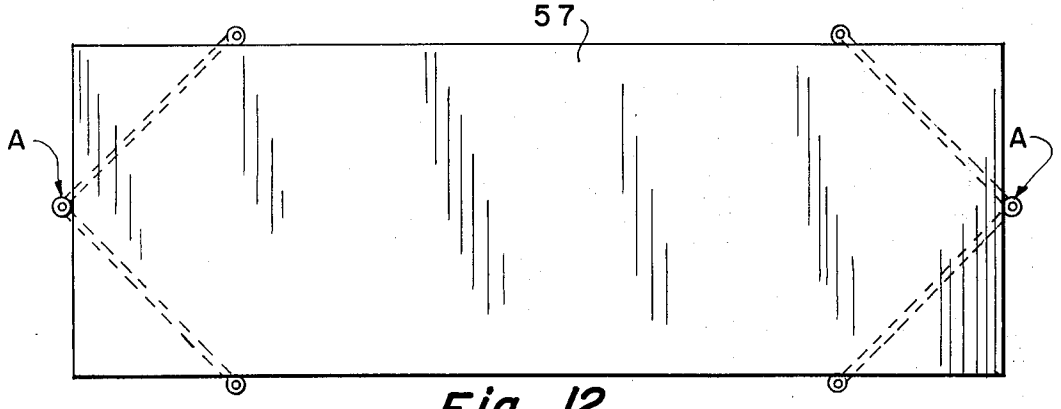



Fig_12

# FREE STANDING SHELF SUPPORT UNITS AND SYSTEM

## BACKGROUND OF THE INVENTION

This invention generally relates to shelf-type devices and more particularly to novel free standing-type, collapsible shelf support units and system which is particularly suited for displaying merchandise in showrooms and the like.

Display shelves or stands for articles of merchandise have heretofore taken a variety of forms. In the past, stands and the shelf-type supports for displaying merchandise have been bulky, unsuited for easy movement from place to place and relatively expensive to manufacture. A majority of the known shelves on showroom floors are supported by upright members which must be physically attached to the walls making them relatively inconvenient, inflexible and expensive.

Accordingly, it is an object of this invention to provide a novel shelf assembly of a relatively inexpensive design, lightweight and highly portable which is particularly effective in displaying articles of merchandise without appreciably detracting from the merchandise.

Still another object of this invention is to provide novel shelf support units which may be used individually to support shelves or easily stacked one on another to meet specific shelf capacity requirements and are readily adjusted and disposed in different arrangements to meet specific shelf width and length requirements.

Yet a further object of this invention is to provide novel free standing shelf support units formed of two hinged sections particularly suited for being made of relatively small metal rods welded together in rigid frameworks.

Still a further object of this invention is to provide novel free standing shelf units capable of being stacked one on the other for maximum display and adjustable by pivoting the sections to accomodate different shelf widths and lengths and the sections of each unit may be collapsed when not in use or for storage or transportation purposes.

In accordance with the present invention in a preferred form shown there is provided a base shelf support unit and an upper shelf support unit which stacks on the base unit. Each unit is of a generally similar size, shape and construction preferably being made of metal rods welded together in integral frameworks. Each shelf support unit has two framework sections pivotally connected together to swing freely between an open angularly disposed position and a collapsed position. Each section has a plurality of spaced horizontal shelf support members, and outer vertical compression member and an inner common vertical compression member making up the framework.

Other objects, advantages and capabilities of the present invention will become more apparent as the description proceeds taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective view of a free standing shelf support system embodying features of the present invention;

FIG. 2 is a perspective view of the upper and base shelf support units of FIG. 1 with the shelves removed and the upper unit rasied to a position separated from the base unit;



FIG. 3 is an elevation view of the upper shelf support unit in the open or fully expanded position;

FIG. 4 is an elevation view of the base shelf support unit in the open or fully expanded position;

FIG. 5 is a view taken along lines 5—5 of FIG. 4 partially in section with an angular setting of one of the two section at ninety degrees relative to the other;

FIG. 6 is a plan view taken along lines 6—6 of FIG. 4 with the ninety degree position and the folded or collapsed position of one section shown in dashed lines;

FIG. 7 is an elevation view partially in section of one of the feet of lower base unit;

FIG. 8 is a view taken along lines 8—8 of FIG. 3 partially in section showing the female sleeve coupling attached at the lower end of the upper shelf support unit;

FIG. 9 is a top plan view of a shelf support system representing the outer ends of the sections in a forwardly facing direction;

FIG. 10 is a top plan view of a shelf support system representing the inner common end in a forwardly facing direction;

FIG. 11 is a top plan view of a shelf support system representing two of the base shelf support units arranged side by side and supporting a common shelf; and

FIG. 12 is a top plan view of a shelf support system representing two of the base shelf support units arranged in opposed relation facing one another and supporting a common relatively wide shelf.

Referring now to the drawings, in FIG. 1 there is shown a free standing, collapsible shelf system having a base shelf support unit A and a demountable upper shelf support unit B releasably mounted on the base shelf support unit together with a plurality of shelves of different shapes and sizes designated from top to bottom by numerals 3, 4, 5, 6 and 7, respectively, these shelves being removably supported on the units A and B at vertically spaced intervals. Because of the flexibility and adjustability of the base support units as described more fully hereinafter the shelves may be a variety of shapes and sizes. As shown in FIG. 1, the lower shelf 3 is triangular in shape; shelf 4 is circular; shelf 5 is square; shelf 6 is rectangular; shelf 7 is rectangular and broken away to show that the other end may extend to an adjacent support.

The base self support unit A has two sections generally designated by numerals 11 and 12 pivotally connected together for free swinging movement about a common vertical axis. Section 11 is in the form of an integral box-shaped framework comprised of an inner vertical compression member 13 and outer vertical compression member 14 together with an upper shelf support member 15 connected at its ends to the inner and outer compression members 11 and 13 and an intermediate shelf support member 16 connected at its ends to the vertical compression members 11 and 13 to form an upper box-shaped framework portion. Section 11 also includes a lower shelf support member 17 connected at its ends between the vertical compression members 11 and 13 to form with the intermediate shelf support member 16, a lower box-shaped framework portion. An outwardly and downwardly extending diagonal brace member 18 is connected at its ends between the upper shelf supporting member 15 and outer vertical compression member 14 in the upper framework portion and an outwardly and downwardly extending

diagonal brace member **19** is connected at its ends between the intermediate shelf support member **16** and outer vertical compression member **11** in the lower framework portion to further strengthen the base unit to carry greater loads on the shelves. As shown, the lower ends of these diagonal brace members terminate above the associated lower shelf support member a sufficient distance so as not to interfere with the shelf thereon and are suited for supporting shelves on an incline.

Section **11** has an upper extension **13***a* of inner vertical compression member **13** and an upper extension **14***a* of outer vertical compression member **14.** These extensions project an equal distance upwardly above the upper shelf support member **15.** A lower extension **13***b* of member **13** projects down from member **17** and terminates in a foot **21** and in a like manner, a lower extension **14***b* of member **14** projects down from member **17** and terminates in a foot **22.**

Section **12** is somewhat similar in size and shape to section **11** and is also in the form of an integral rigid framework but relies on vertical compression member **13** for vertical support of its inner ends. Section **12** has an outer vertical compression member **24** and an upper horizontal shelf support member **25** connected at its outer end to member **24** having a forked inner end portion formed by upper and lower washers **25***a* and **25***b*, respectively, surrounding member **13** in a loose fitting relationship and embracing the inner end of shelf support member **15** of section **11** in a loose fitting relationship to form a pivotal or hinged connection with section **11.** As best seen in FIG. **6,** the washers project in a direction normal to the axis of the shelf support member **15** to which they are affixed preferably by welding. As best seen in FIGS. **5** and **6,** the folded position for the two sections has member **15** of one section represented at **15''** and the 90° position represented at **15'** with the end-to-end or 180° swing position shown in full lines. From this it is clear that each of said sections will swing between at least an angle of 0° to 180° in relation to one another from the folded position for maximum effectiveness for the purposes intended. Section **12** has an intermediate horizontal shelf support member **26** connected at its outer end to member **24** having a forked inner end portion comprised of upper and lower axially spaced washers **26***a* and **26***b*, respectively, surrounding member **13** and embracing the inner end of shelf support member **16** of section **11** to form a pivotal or a hinged connection similar in construction and coaxially aligned with that of the upper shelf support member **15** above described. This hinged arrangement forms an upper box-shaped framework with the compressive forces at the inner ends of the horizontal shelf-support members **25** and **26** being carried by the common vertical member **13** via the washers forming the forked end portions.

A lower horizontal shelf support member **27** is connected at its outer end to vertical member **24** and has a forked inner end portion formed by upper and lower washers **27***a* and **27***b*, respectively, surrounding member **13** and embracing the inner end of horizontal shelf support member **17** of section **11** to form a pivotal or hinged connection and complete a lower box-shaped framework portion again using the common vertical compression member **13** for support. An outwardly and downwardly extending diagonal brace member **28** is connected to its ends between the upper shelf support member **25** and outer vertical compression member **24** for added strength and an outwardly and downwardly extending diagonal brace member **29** is connected to its upper end to horizontal shelf support member **26** and at its lower end to outer vertical compression member **24.** An upper extension **24***a* of member **24** extends above the member **25** and a lower extension **24***b* of member **24** extends below member **27** and terminates in a foot **31** coextensive with feet **21** and **22.**

The upper unit B is similar in construction with that of base unit A so that the description above applies in general also to unit B with a few exceptions as discussed hereinafter. In general, upper unit B has two sections **31** and **32** pivotally connected together for swinging movement about a common vertical axis. Section **31** has an inner vertical compression member **33** and an outer vertical compression member **34** together with an upper shelf support member **35** and an intermediate shelf support member **36** to form the upper box-shaped framework portion reinforced by a diagonal brace member **38.** The lower box-shaped framework utilizes intermediate shelf support member **36** and is reinforced by a diagonal brace member **39** but has no lower horizontal shelf support member corresponding with that of the base unit so the lower framework portion is only three-sided with a diagonal brace for two sides.

Section **32** is generally similar to section **12** above described and has an outer vertical compression member **44,** an upper horizontal shelf support member **45** having a forked inner end portion formed by upper and lower washers **45***a* and **45***b*, respectively, surrounding member **33** and embracing the inner end of shelf support member **35** to form a pivotal or hinged connection with member **33** of section **31.** An intermediate horizontal shelf support member **46** has a forked inner end portion formed by upper and lower washers **46***a* and **46***b*, respectively, surrounding member **33** and embracing the inner end of shelf support member **36.**

A sleeve **41** is affixed to the lower end of the common vertical compression member **33,** a sleeve **42** is affixed to the lower end of **34,** and a sleeve **51** is affixed to the lower end of member **44** forming the female part of a female coupling. These couplings releasably telescope down on the upper extensions **24***a*, **13***a* and **14***a* of the base unit. The detail of the sleeve is shown in FIG. **8** wherein sleeve **41** is shown as telescoping over the lower end portion of rod **33** and is welded thereto.

In use the sections of the shelf support unit are placed at a selected angle relative to one another preferably at an angle between 60° and 180° depending on the width of the shelves. The outer edge of the shelves normally abut against the inside of the vertical compression members. The construction of the sections is preferably a solid metal rod on the order of 5/16 inch in diameter and welded together at the connections.

In the use of the above described system, either of the base or upper units are free standing and as shown the base unit supports three shelves and the upper unit two so that either may serve as separate shelf support units depending on the height required. Once assembled, the two units swing conjointly about a common vertical axis. Moreover, the shelf support unit may be positioned so that either side may face in a forward direction as represented in FIGS. **9** and **10** wherein the support unit A supporting a shelf **51** may be considered as having the outer vertical compression member **12** at

the rear in FIG. 9 while the reverse is true in FIG. 10.

Referring now to FIG. 11, two of the units A arranged side by side are shown supporting a longer shelf 52 while in FIG. 12 two units each designated A and facing one another are shown to support a shelf 53 of substantial width to illustrate the high versatility and flexibility of a shelf system in accordance with the present invention.

Although the present invention has been described with a certain degree of particularity, it is understood that the present disclosure has been made by way of example and that changes in details of structure may be made without departing from the spirit thereof.

What is claimed is:

1. In a free standing collapsible shelf system, the combination comprising:

a free standing shelf support unit including two sections pivotally connected to one another at adjacent ends thereof for swinging movement between an open position wherein the sections are disposed at an angle relative to one another and adapted to be positioned upright with the sections disposed at a selected angle relative to one another;

said sections having a single, common vertical member at the pivotally connected ends thereof, each of said sections having an outer vertical member opposite the pivotally connected ends and each of said sections having at least two vertically spaced horizontal shelf support members with each connected at one end to an outer vertical member for that section, said common vertical member being connected integral with the pivotally connected ends of the two shelf support members of one of said sections to form a rigid four-sided open framework, the other of said sections being a rigid three-sided open framework having a hinge portion at each of the pivotally connected ends of its two shelf support members, each hinge portion extending normal to the axis of the associated support member forming a loose-fitting joint about the common vertical member which acts as a pivot with the hinge portions being supported on the adjacent shelf support members of said one section to transmit any load on the shelf support members having the hinge portions to the common vertical member and with corresponding pairs of horizontal shelf support members of said sections being at a common elevation for demountably supporting a shelf in a horizontal position.

2. In a free standing collapsible shelf system as set forth in claim 1 wherein said outer vertical members and the associated horizontal shelf support members making up the framework for each section are metal rods welded together at the connections.

3. In a free standing collapsible shelf system as set forth in claim 1 wherein each of said frameworks has a diagonal brace member connected between the associated outer vertical member and extending up to connect with an associated horizontal shelf support member for added strength and supporting a shelf on an incline, said diagonal brace member terminating above the next lower horizontal shelf support member so as not to interfere with a shelf being supported thereon.

4. In a free standing collapsible shelf system as set forth in claim 1 wherein each hinge portion has forked upper and lower portions projecting normal to the axis of the associated shelf support member, said upper and lower portions embracing the corresponding shelf support member of the other section and having aligned apertures receiving the common vertical member to connect the two sections for pivotal movement relative to one another.

5. In a free standing collapsible shelf system as set forth in claim 1 wherein said upper and lower forked end portions are in the form of a pair of axially spaced washers surrounding the common vertical member.

6. In a free standing shelf system as set forth in claim 1 further including a shelf demountably supported on each of said corresponding pairs of horizontal shelf support members.

7. In a free standing collapsible shelf system as set forth in claim 1 wherein a pair of shelf support units are arranged side by side and a shelf extends across each of the shelf support members at a common elevation.

8. In a free standing collapsible shelf system as set forth in claim 1 wherein a pair of said shelf units are arranged in opposed facing relation and a shelf extends across each of the corresponding shelf support members at a common elevation.

9. In a free standing collapsible shelf system as set forth in claim 1 wherein each of said sections swings between at least an angle between 0° and 180° in relation to one another from the folded position.

10. In a free standing collapsible shelf system as set forth in claim 1 wherein said common vertical member is a compression rod and each of said horizontal shelf support members are in the form of rods, each said open framework having a diagonal brace rod, each said brace rod being connected between the associated outer vertical compression rod and extends up to connect with an associated horizontal shelf support rod for added strength and supporting a shelf on an incline, said diagonal brace rod terminating above the next lower horizontal shelf support rod so as not to interfere with a shelf being supported thereon.

11. In a free standing collapsible shelf system as set forth in claim 1 wherein said shelf support unit is made up of a base shelf support and an upper shelf support adapted to releasably mount on said base shelf support and a horizontal shelf demountably positioned on each of the corresponding shelf support members.

12. In a free standing collapsible shelf system as set forth in claim 11 wherein said base shelf support has extension portions of the vertical members above the upper horizontal shelf support members and said upper shelf support has the lower end portions of the vertical compression members terminating in sleeve adapted to slidably fit over the extension portions to provide for the releasable stacking of said upper shelf support on said base shelf support and the vertical members of said base shelf support terminate at their lower ends in feet.

* * * * *