July 24, 1962 J. B. PENDERGRAST, JR., ETAL 3,045,831

COMMODITY RACK

Filed July 19, 1960 3 Sheets-Sheet 1

Fig. 1

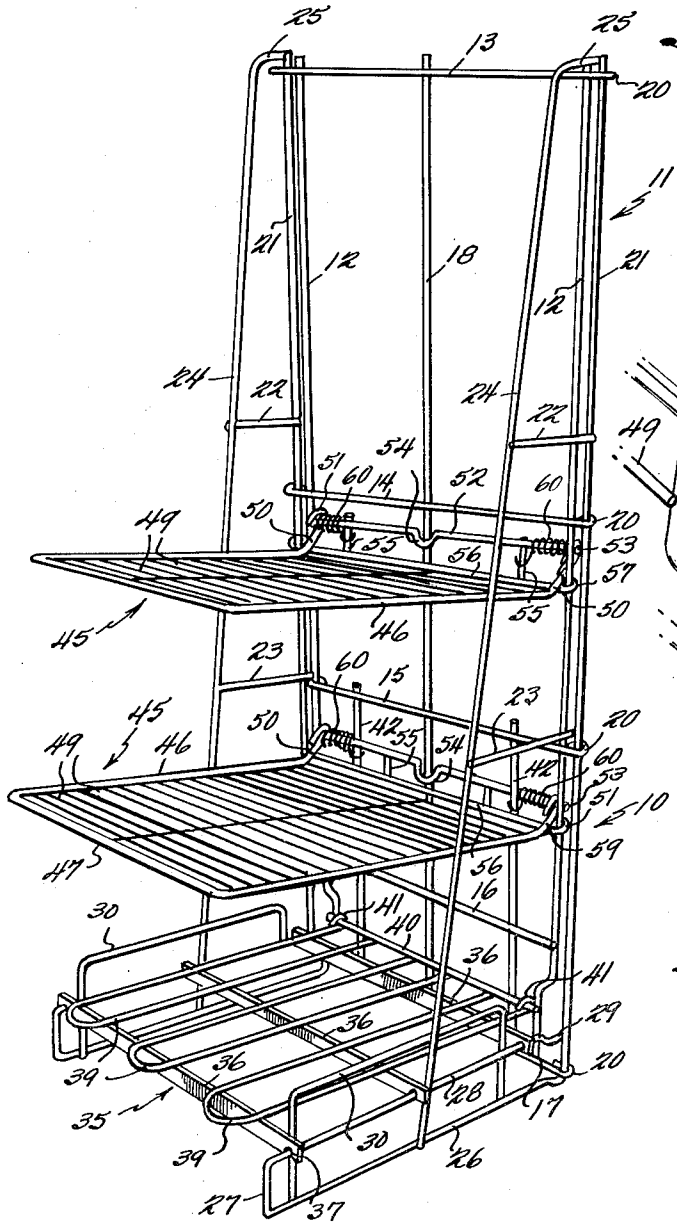
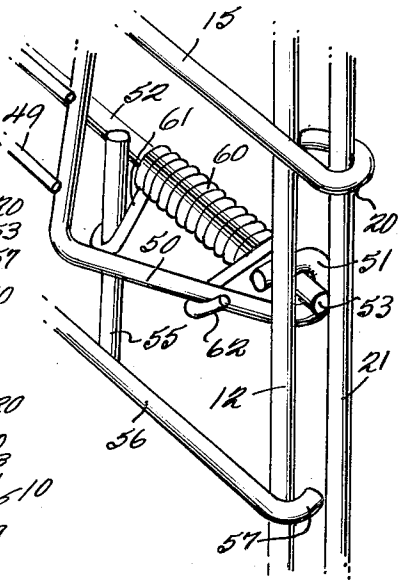


Fig. 3



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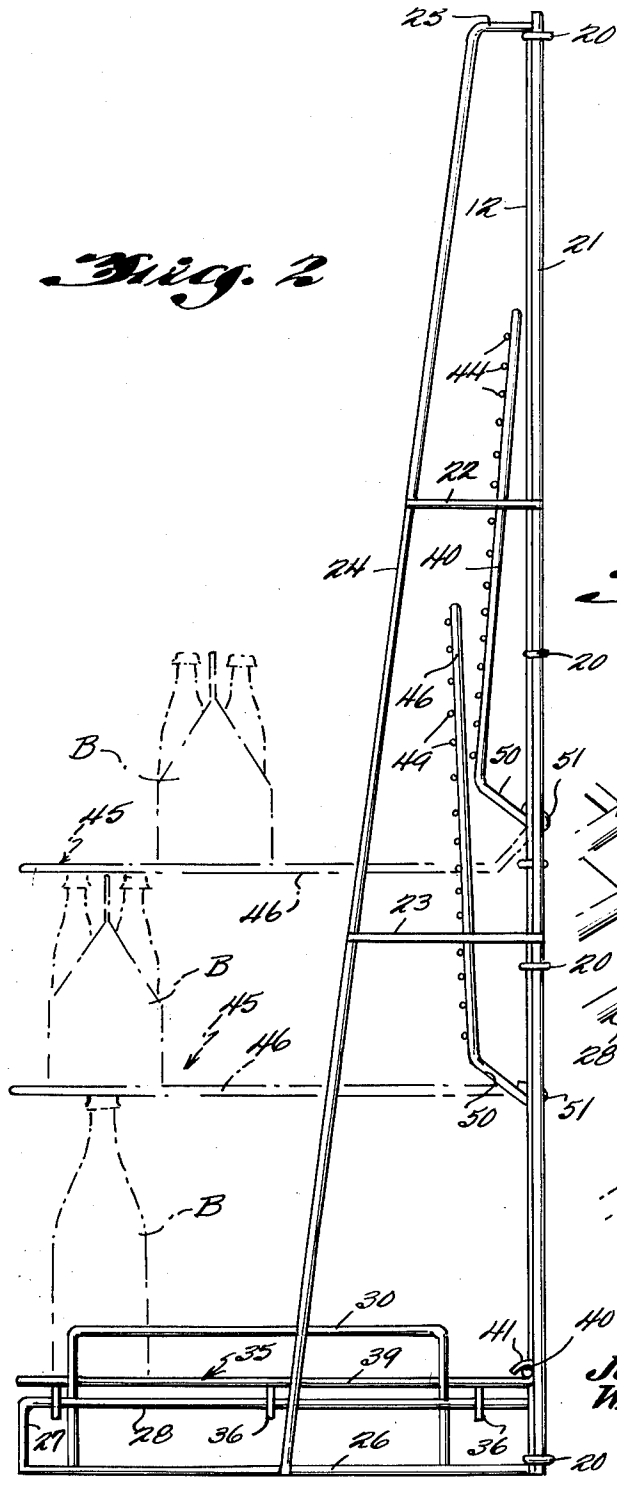


Fig. 2

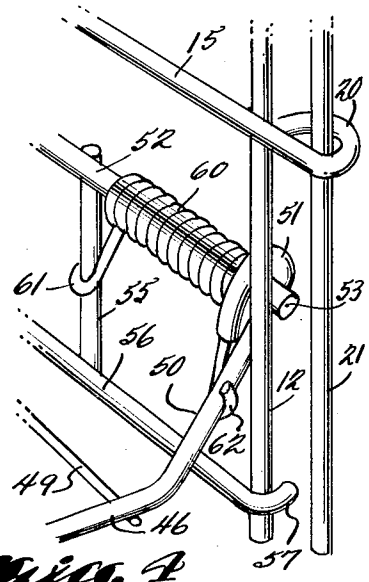


Fig. 4

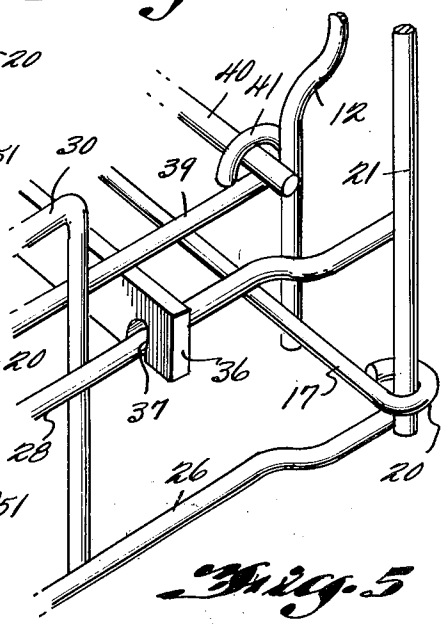


Fig. 5

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Fig. 6

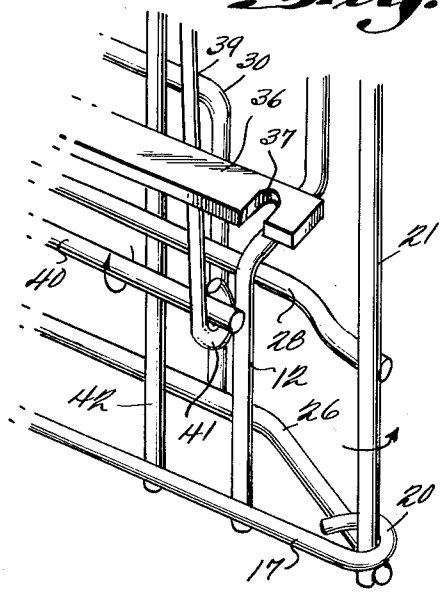


Fig. 8

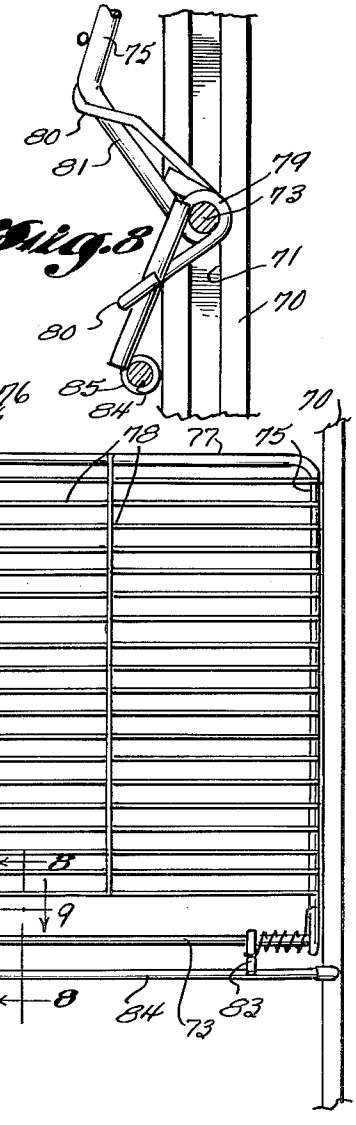


Fig. 7

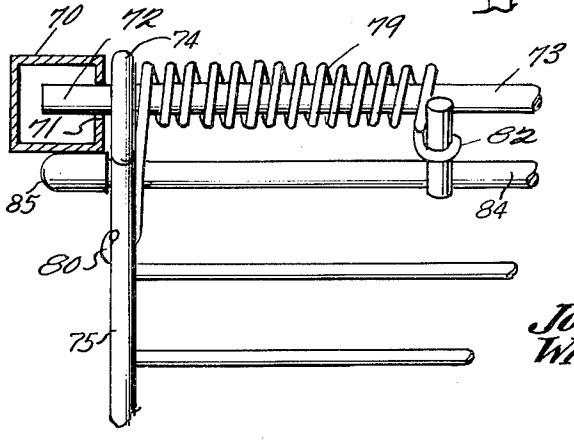


Fig. 9

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3,045,831

COMMODITY RACK

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Filed July 19, 1960, Ser. No. 43,936
5 Claims. (Cl. 211—49)

This invention relates to a commodity rack, and has as its primary object the provision of an improved rack provided with spring-biased shelves which, when unfilled, will fold upwardly to out-of-the-way position.

An additional object of the invention is the provision of such a rack wherein the shelves are vertically movable so as to accommodate a relatively wide variety of bottled, packaged or other goods or commodities.

Still another object of the invention is the provision of such a rack wherein the shelves may be moved downwardly by the weight of the goods thereon in order that the upper shelf will rest on the contents of the lower shelf, thus providing a substantial and firmly packed unit which may be moved with a minimum of effort and difficulty, and which will substantially obviate the risk of the contents falling during movement or by accidental tilting.

Still another object of the invention is the provision of a rack of this character which may be readily folded when not in use.

A still further object of the invention is the provision of a rack of this character wherein the contents are readily visible from all sides.

An additional important object of the invention is the provision, in a rack of this character, of a self-adjusting shelf so arranged that the shelf exerts pressure on the merchandise below it, not by arcuate movement about a hinged pivot, but by downward pressure of the entire shelf, which is impelled downwardly as a result of the weight of goods loaded on the shelf, which overcomes the friction of springs located at the hinge point, the shelf being so arranged as to prevent arcuate movement below the point at which the shelf is horizontal.

A further object of the invention is to provide a hinged shelf so supported as to also have vertical sliding movement relative to a frame or support and to provide in conjunction with said shelf, a hinge having spring tension so adjusted that the shelf remains normally in a horizontal position when merchandise is placed on it for display, but which permits the shelf to swing upwardly to a vertical position when the merchandise is removed.

A more specific object of the invention is a hinge, in such a shelf construction, provided with a forward and rear extension on each side, so arranged that when the extensions are positioned in front of and behind properly spaced vertical supports, the spring tension provides sufficient friction to hold the shelf in the position in which it is placed; but, whereby also by pushing the rear of the hinge downwardly and thus relieving the tension exerted by the spring against the vertical support, the shelf can easily be moved, or by tilting of the shelf, removed, or placed in the exact position desired without the use of tools, nuts, bolts, or other mechanical devices.

A further specific object of the invention is the provision in a rack, of a supported shelf suitable for building displays of merchandise in tiers, so arranged that when a first layer of merchandise is placed on the base of the rack, or on the floor, in a position adjacent properly positioned vertical back supports, and a shelf is then fixed to the back supports, an additional layer of merchandise can be placed on the shelf, and on further shelves and merchandise placed on the other shelves until the display is built to the desired point. Each shelf is thus adapted to rest on the top of the merchandise below, so that the shelves themselves do not alone carry the weight

of the merchandise but provide leaves between the layers of merchandise to supply firmness and stability and to keep the display from falling, and thus protect the merchandise while on display. The arrangement is such that spring tension moves the shelf pivotally to a vertical position when the merchandise has been removed from that individual shelf, and as each layer of merchandise is removed, each shelf swings upwardly to uncover the next layer of merchandise below, but as the shelves are loaded they will self-level until they rest on the layer of merchandise below.

An additional important object of the invention is the provision of a vertically movable shelf which is so hinged that it can swing upwardly to a vertical position, but wherein means are provided to preclude downward swinging below a horizontal position of a 90° angle to the vertical support. Thus when the merchandise is put on display, if the shelf is improperly positioned, the entire shelf automatically moves downwardly by the weight of the merchandise thereon until it is properly resting on the merchandise below, rather than swinging downwardly below the horizontal.

Still another object of the invention is the provision of a rack of this character wherein the shelves may be made in any desired size, and of substantially any type of sufficiently rigid material, such as wire, sheet metal, plastic, paper board, wood or the like.

As conducive to a clearer understanding of this invention it may be pointed out that previous devices have required specially designed bases and back frames of varying complexity, while in the instant invention there is provided a shelf which, while illustratively shown with a foldable base, can be used to create displays by merely attaching suitably spaced vertical supports to any suitable vertical surface, affixing the shelves thereto and loading the merchandise thereon. Previously designed display devices have been primarily designed for one product and have no flexibility of use, while displays built using the shelf and rack of this invention may be readily adapted for use for a wide variety of commodities including canned goods, bottles, boxed goods, or other articles, simply by placing the shelf in the required position, and adding or removing shelves as may be needed to bring the new display to the desired height.

Hitherto known display devices having movable shelves have also been limited, in the main, to certain fixed positions to which they can be moved, or, alternatively, require tools, nuts, bolts, or other mechanical devices to fix them in the requisite position. The shelves in the instant invention can be placed in any exact desired position within the confines of the vertical supports and may be so placed or inserted or removed by simply manually relieving the spring tension. Additionally, display devices of this general character have required the construction of special back frames for retaining the shelves, and specially constructed shelves designed to permanently fit the back frames. The present device enables the manufacturer to build display fixtures of any type or of any desired material in any design desired which include the vertical supports needed for the shelves of the instant invention, and further where different types of display racks are dimensioned for shelves of the same size, the shelves may be made interchangeable from one rack to another even if one rack is made of wood, while another is made of wire, or sheet metal, or other materials.

A further important object of the invention is, therefore, the provision of an improved rack, and shelf construction therefor, which overcomes all of the foregoing difficulties, which fills a need in the present field of self-service merchandising for a display device which can be used for mass displays of a desired product, which will give protection to the product while on display, which

may be easily and quickly loaded with merchandise, which facilitates the selection of merchandise by the customer, which can be readily and easily changed for the display of a different product when desired, and can be built in situ or readily stored in a small space.

Still another object of the invention is the provision of such a rack which is sturdy and durable of construction, reliable and efficient in operation, and relatively simple and inexpensive to manufacture, assemble and utilize.

Still other objects reside in the combinations of elements, arrangements of parts, and features of construction, all as will be more fully pointed out hereinafter and disclosed in the accompanying drawings wherein there is shown a preferred embodiment of this inventive concept.

In the drawings:

FIGURE 1 is a perspective view of one form of rack constructed in accordance with the instant invention, the shelves being shown in the down position which they would normally assume when loaded;

FIGURE 2 is a side elevational view of the device of FIG. 1, on an enlarged scale, showing the shelves in folded position, the shelves being indicated in dotted lines as carrying packaged goods thereon;

FIGURE 3 is an enlarged fragmentary perspective view of a detail of shelf construction, showing the shelf in the up position;

FIGURE 4 is a view similar to FIG. 3 but showing the shelf in down position;

FIGURE 5 is a perspective view of the lower frame construction, showing details of the means whereby the assembly may be folded;

FIGURE 6 is a view similar to FIG. 5 but showing the assembly in folded relation;

FIGURE 7 is an elevational view of a modified form of construction, only portions thereof being shown;

FIGURE 8 is a fragmentary enlarged sectional view taken substantially along the line 8—8 of FIG. 7; and

FIGURE 9 is an enlarged sectional view taken substantially along the line 9—9 of FIG. 7.

Similar reference characters refer to similar parts throughout the several views of the drawings.

In the illustrative embodiment hereinafter shown and described, the rack and its associated shelves are shown as made of wire, but it will be readily understood that other materials may be employed so long as the inherent principles of the instant invention are retained. It will be further understood that the shelves can be loaded with any desired goods, not necessarily only bottled goods.

Having reference now to the drawing in detail, the rack of the instant invention is generally indicated at **10**, and comprises a back portion generally indicated at **11**, which includes two spaced apart identical uprights **12**. The uprights **12** are fixedly secured to opposite end portions of a transverse upper bar **13**, as well as intermediate bars **14** and **15**, a lower transverse bar **16** and a base bar **17**. An intermediate upright **18** is also secured to the transverse bars **13**, **14**, **15**, **16** and **17**.

Each of the bars **13**, **14**, **15** and **17** carry at their outer ends looped portions **20**, all of which are identical, and all of which are aligned on opposite sides of the device, and through these looped end portions extend oppositely disposed vertical side members **21**, so arranged as to pivot along a vertical axis. Each of the side frame members **21** has secured thereto forwardly extending pieces **22** and **23** at suitable intermediate points, the other ends of which are secured to inclined side members **24**. Each member **24** has an arcuate upper end portion **25**, which is secured to the top of each member **21**. At their lower extremities upright members **21** have integrally extending right angularly horizontally disposed foot extremities **26**, which have upwardly reverted end portions **27**, from which a portion **28** extends backwardly and is secured at **29** to each member **21**. Additional U-shaped reinforcing members **30** are secured to each portion **26**, and extend upwardly to form lower side frames.

It will thus be seen that the side members including portions **24** and their associated members may be swung about the axis formed by members **21** to a position in the rear of uprights **12**, as best shown in FIG. 6, when the device is not in use. When the device is operating the parts assume the position of FIG. 1, and are held in place by a base member generally indicated at **35**. The base member **35** has a plurality of transversely extending relatively narrow vertical plates **36**, each provided adjacent its ends with a notch **37**, the notches being adapted to engage, when in operative position over the members **28**. Secured to the plates **36** is a shelf including a plurality of U-shaped wire members **39**, which extend in substantial parallelism with the side frame members **26** and **28**, and have their ends pivotally secured to a transversely extending rear bar **40** which is fixedly secured to the lower portions of members **12**. The end portions of the outermost legs of the outer U-shaped members are reverted as at **41** and surround the ends of bar **40**, so that the entire base may pivot on the bar **40**. Thus with the parts in the position shown in FIG. 1, the base **35** is in horizontal position, with the notches **37** engaging over the bars **28**, so that the parts are held in assembled relation.

When it is desired to fold the assembly, the base may be pivotally swung about the bar **40** in the direction indicated by the arrows in FIG. 6, whereupon the notches **37** disengage from their associated members **28** so that the latter may be swung in the direction indicated by the arrow in FIG. 6 to a position to the rear of the back **11**.

Vertical reinforcing members **42** extend between the members **17**, **16**, and **15** for added reinforcement at the lower portion of the device.

Pivotally mounted shelves **45** are provided, and since these shelves, of which there may be one or more, illustratively two, are identical, only one will be described individually. Each shelf **45** is comprised of an outer frame including side portions **46** connected at their outer extremities by an integral transverse front member **47**, and a plurality of relatively fine wires **49** extend transversely between the members **46** to provide a shelf surface. The ends of the side members **46** adjacent the rear portion **11** of the stand are offset as indicated at **50**, and extend upwardly terminating in hinge loops **51**. The loops **51** surround a rod **52**, the ends **53** of which slidably abut the rear surfaces of the uprights **12**. An offset portion **54** extends around the central vertical upright **18**. Connecting members **55** are fixedly secured to the rod **52** and extend downwardly therefrom. Members **55** are fixedly connected at their other ends to a transverse rod **56**, which has inwardly turned extremities **57**, which engage around the forward side of uprights **12**. Coil springs **60** surround each end of rod **52**, and have one end **61** hooked about each member **55**. The opposite end **62** is hooked about offset portion **50**, the arrangement being such as normally to bias the shelves upwardly to the position indicated in FIGURES 2 and 3. The ends **61** of the springs also serve to bias the members **55** and hence the rod **56** into engagement with surfaces of uprights **12**. The rod ends **53** of rods **52** are urged against the opposite surfaces of uprights **12** due to the weight of the shelf acting on spring ends **62** and serve clampingly to hold the shelf assembly in frictionally slidable relation with the uprights **12**.

It will thus be seen that in the use and operation of the device the shelves assume the position of FIG. 1, only when bottles B or cartons of bottles are positioned thereon. Similarly, the weight of the bottles will serve to force the upper shelves slidably downwardly into engagement with the bottles on the next lower shelf, or on the base **35** thus insuring a tight and compact apparatus at all times. Similarly, the contents of the top shelf will be the first to be removed due to their accessability, and when the contents of an upper shelf are removed, the spring **60** will

serve to move the shelf upwardly out of the way to the full line position indicated in FIGS. 2 and 3.

FIGS. 7, 8, and 9 show a modified form of construction, wherein the wire back frame **11** is omitted, and a frame, generally indicated at **70**, is comprised of side channel support members **71**, which may be suitably connected at their upper extremities, and which may be provided with any desired type of foldable base. The channel members **70** have on their inner sides open elongated slots **71**, into which extend the ends **72** of transversely extending shelf supporting rods **73**. The rods **73** are surrounded at their opposite ends by the looped extremities **74** of the side portions **75** of a shelf structure generally indicated at **76**. The ends of side members **75** are connected by an integral end piece **77**, and wire shelf members **78** extend transversely between the members **75** as in the previous embodiment.

Coil springs **79** surround the ends of rod **73**, and have one end **80** operatively connected to an offset portion **81** of the adjacent member **75**. The opposite end **82** of each spring **81** is connected to a connecting member **83** which is fixedly secured at one of its ends to the rod **73**, and at its other end to a parallely extending transverse rod **84**. The rod **84** has its ends, which may be provided with rubber or plastic caps **85**, slidably positioned on the inner face of each of the side channel members **71**, the arrangement being such that the springs **73** serve to bias rods **84** into clamping engagement so that the shelves are normally held in an adjusted position within the grooves or slots **71** of the channel members **70**. The operation of this form of device is substantially identical to that of the preceding embodiment, in that the weight of articles placed on the shelves **76** bias the shelves to horizontal position, the engagement of offset portions **81** with rod **84** precluding movement below the horizontal. Similarly the weight of such articles on the shelves will cause the same to slide downwardly in the slots **71** until the lower surfaces of an individual shelf are engaged by the contents of the next shelf below.

While the rack hereinbefore shown and described illustratively comprises a wire frame having a foldable base, it is to be understood that the rack and its associated shelves may be made of any other suitable materials, as long as the basic elements of the inventive concept are present, namely, a vertical support, either mounted against a vertical surface or on a base, or on horizontal supporting surface such as a floor, which support includes spaced apart parallel, aligned elements, between which the projecting ends of the shelf construction are pivotally positioned, and held tensioned therebetween by springs, the shelves being swingable to a vertical position when empty, and movable, in the support, by gravity, to a contacting position with the goods on the next lower surface when loaded.

From the foregoing it will now be seen that there is herein provided an improved wire display rack construction which accomplishes all of the objects of this invention, and others, including many advantages of great practical utility and commercial importance.

As many embodiments may be made of this inventive concept, and as many modifications may be made of the embodiments hereinbefore shown and described, and it is to be understood that all matter herein is to be interpreted merely as illustrative, and not in a limiting sense.

We claim:

1. A display rack for commodities comprising in combination a base, spaced vertical support members connected to said base, a wire shelf assembly including first and second transverse, vertically offset, parallel wire rods, means connecting said wire rods, portions of each of said vertical support members being disposed between opposite ends of each of said first and second wire rods, the said opposite ends of said wire rods engageable with said vertical support members, a shelf pivotally mounted on said first transverse wire rod and movable from a horizontal to a substantially vertical position, spring means biasing said shelf about said first transverse rod and biasing said first and second wire rods into gripping contact with said portions of said vertical support members, whereby said shelf assembly is vertically slidable therealong, said shelf normally disposed in a vertical position, said shelf including side pieces having inclined portions adapted to engage said second transverse rod upon pivotal movement of said shelf from a vertical to a horizontal position to preclude pivotal movement of the same below the horizontal position.

2. A commodity rack comprising in combination a base, a vertical back connected to said base including a spaced pair of vertical wire members, at least one wire shelf assembly including a first transverse wire rod positioned on one side of said vertical wire members, a second transverse wire rod vertically offset from said first wire rod, positioned on the oppoiste side of said vertical wire members, short vertical wire connecting pieces extending only between said first and second wire rods rigidly forming a back support frame for a shelf, a shelf pivotally mounted on the upper one of said transverse wire rod for swinging movement about a horizontal axis, spring means biasing said shelf about said upper rod and biasing said first and second wire rods into frictional gripping contact with said vertical wire members whereby said shelf assembly is vertically slidable along said vertical wire rods.

3. A commodity rack comprising in combination a base, a vertical back connected to said base including a spaced pair of vertical wire members, at least one wire shelf assembly including a first transverse wire rod positioned on one side of said vertical wire members, a second transverse wire rod vertically offset from and parallel to said first wire rod positioned on the opposite side of said vertical wire members, short vertical wire connecting pieces extending only between said first and second wire rods rigidly forming a back support frame for a shelf, a shelf pivotally mounted on the upper one of said transverse wire rods for swinging movement about a horizontal axis, spring means biasing said shelf about said upper rod and biasing said first and second wire rods into frictional gripping contact with said vertical wire members whereby said shelf assembly is vertically slidable along said vertical wire rods, and portions of said shelf engageable with said second transverse wire rod upon pivotal movement of the same to a horizontal position.

4. A commodity rack comprising in combination a base, a vertical back connected to said base including a spaced pair of vertical wire members, at least one wire shelf assembly including a first transverse wire rod positioned on one side of said vertical wire members, a second transverse wire rod vertically offset from and parallel to said first wire rod positioned on the opposite side of said vertical wire members, short vertical wire connecting pieces extending only between said first and second wire rods rigidly forming a back support frame for a shelf, a shelf pivotally mounted on the upper one of said transverse wire rods for swinging movement about a horizontal axis, spring means biasing said shelf about said upper rod and biasing said first and second wire rods into frictional gripping contact with said vertical wire members whereby said shelf assembly is vertically slidable along said vertical wire rods, said shelf including side pieces having inclined portions adapted to engage the lower of said wire rods, said inclined portions of said side pieces forming stops to limit the downward movement of said shelf to a horizontal position.

5. A commodity rack comprising in combination a base, a vertical back connected to said base, at least one shelf pivotally mounted for vertical swinging movement from a horizontal to a substantially vertical position,

spring means normally biasing said shelf toward the vertical position, means slidably mounting said shelf on said back for vertical sliding movement relative thereto, said back including a pair of horizontally spaced longitudinally slotted channel members, said shelf mounting means including a first transverse rod having its opposite ends engaged in the slots of said channel members, a second transverse rod having its opposite ends engaging outer wall portions of said channel members, means connecting said first and second transverse rods, said spring means biasing said rods to frictionally engage said channel members, and said shelf being pivotally mounted on one of said transverse rods.

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