

July 28, 1953

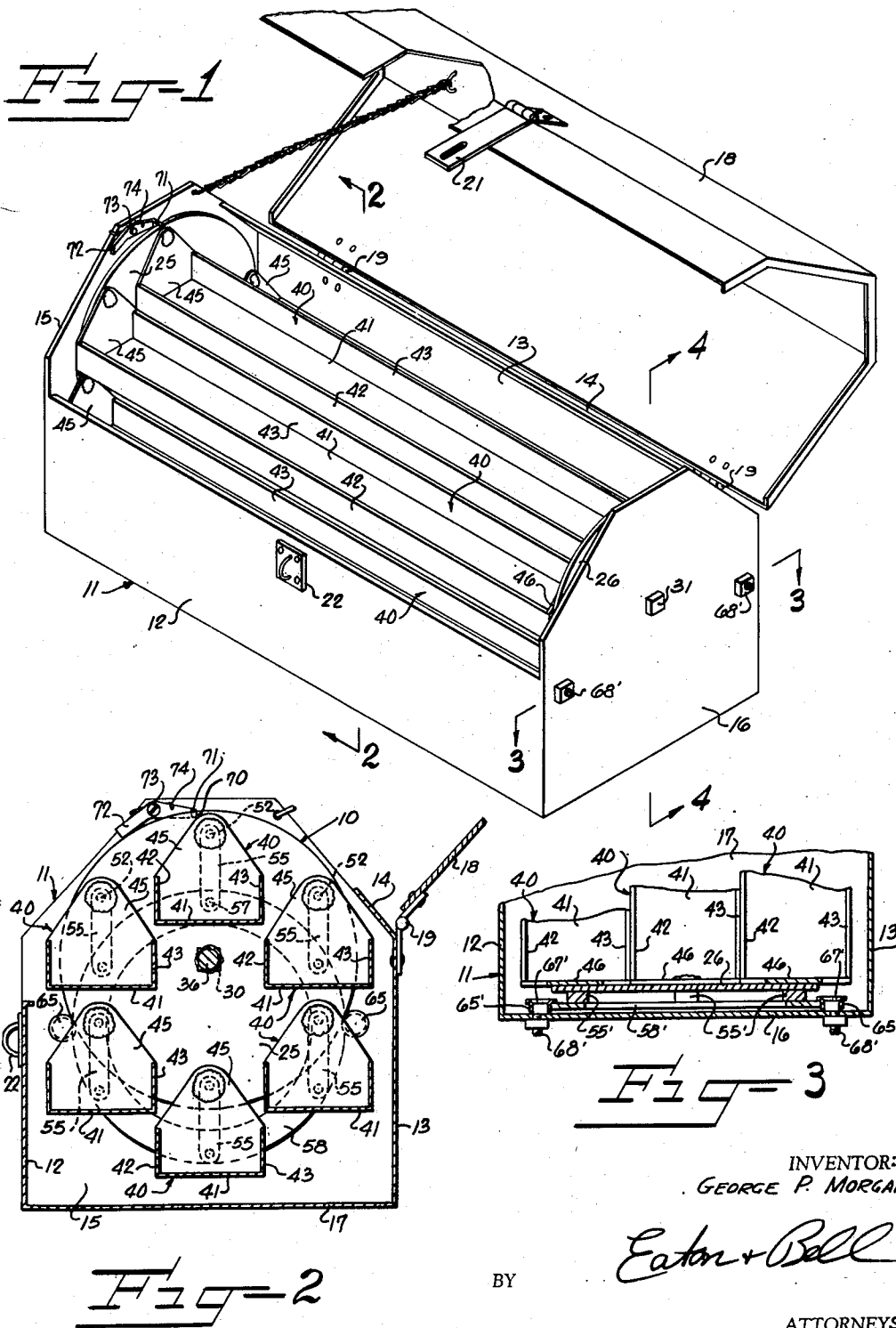
G. P. MORGAN

2,646,891

APPARATUS FOR SUPPORTING AND DISPLAYING ARTICLES

Filed May 11, 1950

3 Sheets-Sheet 1



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APPARATUS FOR SUPPORTING AND DISPLAYING ARTICLES

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3 Sheets-Sheet 2

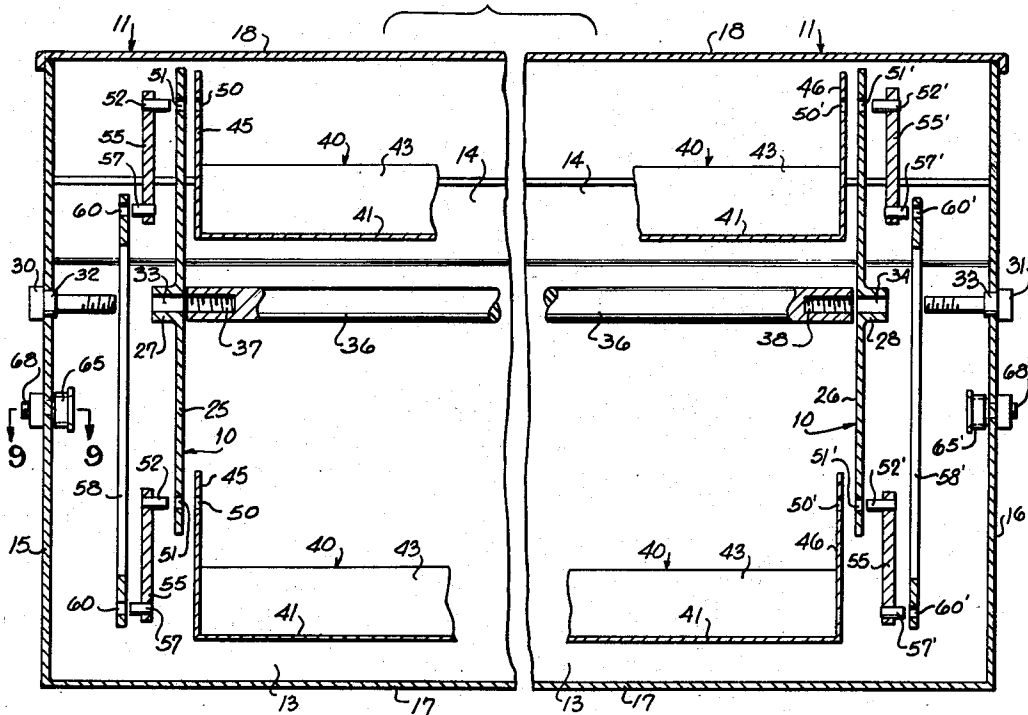


Fig-4

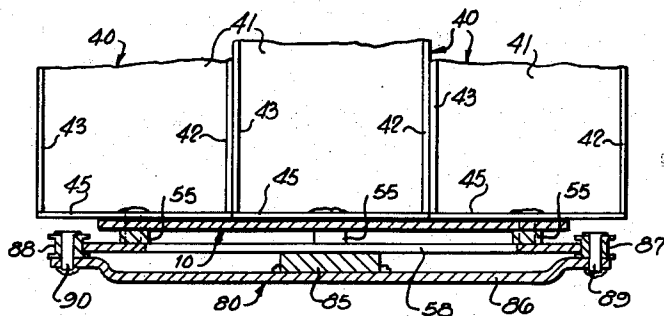


Fig-7

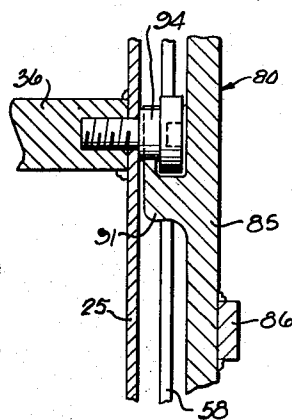


Fig-8

GEORGE P. MORGAN,  
INVENTOR

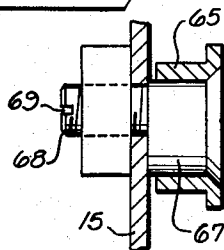


Fig-9

BY

Eaton + Bell

ATTORNEYS

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G. P. MORGAN

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3 Sheets-Sheet 3

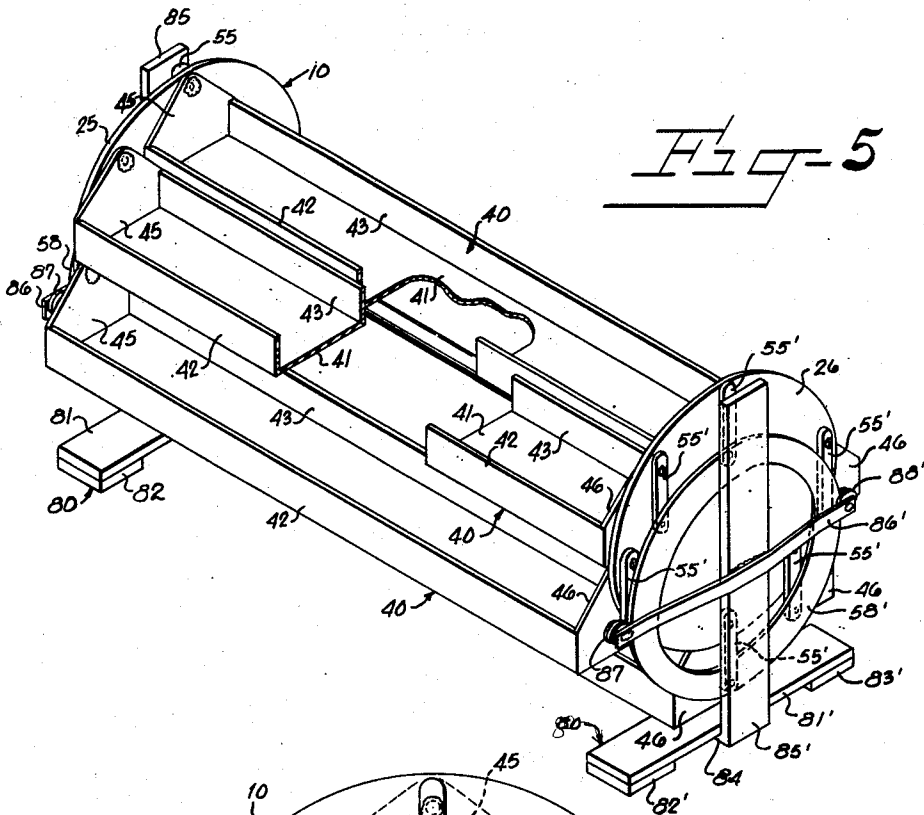


Fig-5

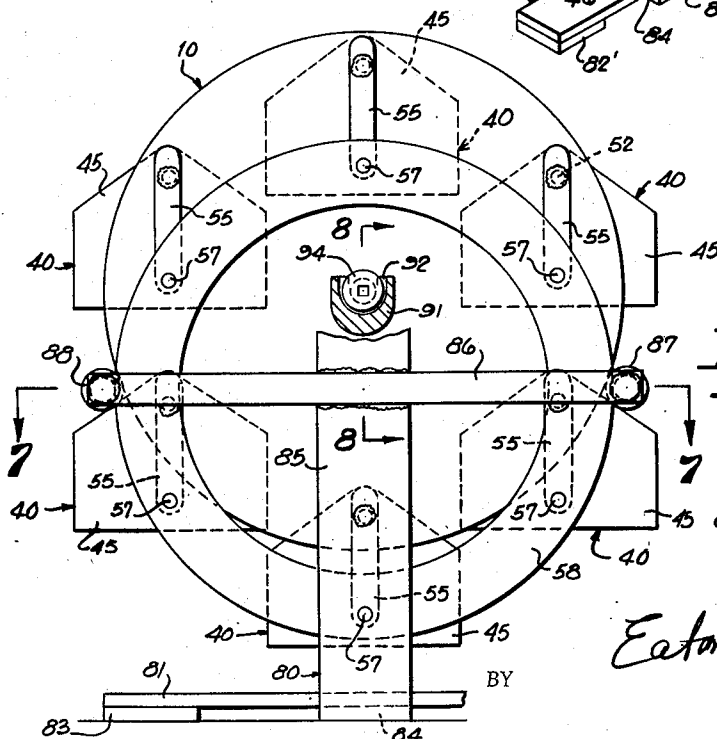


Fig-6

GEORGE P. MORGAN,  
INVENTOR.

Eaton & Bell

ATTORNEYS

## UNITED STATES PATENT OFFICE

2,646,891

APPARATUS FOR SUPPORTING AND  
DISPLAYING ARTICLES

George P. Morgan, West Asheville, N. C.

Application May 11, 1950, Serial No. 161,413

2 Claims. (Cl. 211-131)

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This invention relates to apparatus for supporting and displaying a plurality of articles and more especially to that type of apparatus in which a plurality of trays are pivotally secured between two rotatable disks so the disks may be rotated to present a selected tray at any desired position about the axis of the disks.

This type of supporting and displaying apparatus is particularly adapted to be used in association with a container such as a tool chest or a fishing tackle box or the like, in which it is desired to keep a plurality of small articles in separate trays and it is also adapted to be used in association with a stand for supporting the same so that the apparatus may be used to display a plurality of articles supported in the trays thereof.

It is an object of this invention to provide an apparatus of the type described for supporting and displaying a plurality of articles comprising a pair of spaced disks rotatably secured on the end walls of a suitable container or on suitable support members of a display stand and having a plurality of pivoted trays extending between the disks. A control ring is disposed adjacent opposed surfaces of the disks, in off-center relation thereto, and has a plurality of spaced links pivotally secured at one end adjacent the periphery of the control ring, the other end of each of the links having a stud secured thereto, slidably penetrating the corresponding disk and being fixed to a corresponding one of the trays, means are provided to permit rotation of the control rings about an axis disposed in fixed off-center relation to the axis of the disks, whereby the disks may be rotated to move the trays from one position to another and, due to frictional contact and the off-center arrangement of the control ring relative to the disks, accidental rotation of the disks is resisted and also the trays will remain in a horizontal position when moved about the axis of the disks.

It is another object of this invention to provide an apparatus of the type described wherein a pair of control rollers are suitably secured in at least one of the end walls of the display stand or container and said rollers being adapted to engage the periphery of the control ring so the control ring may turn in engagement therewith to properly position the trays and insuring that the axis of the control rings will remain in fixed relation to the axis of the disks.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds, when taken in connection with the accompanying drawings, in which—

Figure 1 is an isometric view of a tool box with its cover in a partially opened position and showing the improved article supporting apparatus in association therewith;

Figure 2 is an enlarged vertical sectional view

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taken substantially along the line 2-2 in Figure 1;

Figure 3 is an enlarged fragmentary sectional plan view taken substantially along the line 3-3 in Figure 1;

Figure 4 is an enlarged exploded vertical sectional view, with parts broken away, taken substantially along the line 4-4 in Figure 1;

Figure 5 is an isometric view of the apparatus showing the same associated with a support stand for displaying articles supported by the apparatus;

Figure 6 is an enlarged elevation looking at the right-hand or lower end of Figure 5 with parts broken away and with parts in section;

Figure 7 (Sheet 2) is a fragmentary sectional plan view taken substantially along the line 7-7 in Figure 6;

Figure 8 (Sheet 2) is an enlarged vertical sectional view taken substantially along the line 8-8 in Figure 6.

Figure 9 (Sheet 2) is an enlarged sectional plan view taken substantially along the line 9-9 in Figure 4 and showing part of the means for preventing rotation of the control rings about the axis of the disks.

Referring more specifically to the drawings, the numeral 10 broadly designates the apparatus or rack for displaying and supporting a plurality of articles, not shown, and, in Figures 1, 2, and 3, the apparatus is shown associated with a suitable container such as a tool chest or box 11 having a front wall 12, a rear wall 13, end walls 15 and 16 and a bottom 17, all of which are suitably secured to each other. The front wall 12 is of less vertical height than the end walls 15 and 16 and the rear wall 13 is provided with an angularly extending extension 14.

The chest 11 is provided with a top member or lid 18 hingedly secured to the upper surface of the rear wall 13 adjacent the extension 14, as at 19. The end walls 15 and 16 of the chest 11 are preferably cut away at their upper surfaces so that the upper ends thereof will be semi-octagonal in shape and the lid 18 is formed so it will fit over and conform to the upper configuration of the end walls 15 and 16. A suitable hasp having cooperating portions 21 and 22 may be secured to the respective lid 18 and front wall 12 of the chest 11 if so desired.

The display rack 10 comprises a first pair of rotatable members such as disks 25 and 26 having hub portions 27 and 28, respectively, integral therewith. These disks are mounted for rotation on the proximate surfaces of the end walls 15 and 16 by means of shoulder screws 30 and 31 which slidably penetrate the end walls 15 and 16. The shoulder screws 30 and 31 also slidably penetrate the hub portions 27 and 28, respectively, of the disks 25 and 26 and the shoulder screws 30 and 31 are threadably embedded in

the opposed ends of a rod 36, the rod 36 being provided with threaded bores 37 and 38 in the opposed ends thereof for reception of the screws 30 and 31. The rod 36 extends substantially the entire length of the chest 11 and is welded to disks 25 and 26.

A plurality of members for supporting articles such as trays broadly designated at 40 are mounted for rotation on the proximate surfaces of the disks 25 and 26, in a manner to be presently described. These trays 40 may be of any suitable size and shape but are preferably rectangular in shape and each has a bottom 41, side walls 42 and 43 and end walls 45 and 46, the end walls 45 and 46 projecting substantially above the upper surfaces of the side walls 42 and 43 and being shown as substantially triangular in shape.

In the drawings the rack 10 is shown as being provided with six trays 40, all being of identical construction and bearing the same reference characters, but it is to be understood that any desired number of trays may be provided. The end wall 45 of each tray 40 has a bore 50 adjacent the apex of the triangularly-shaped portion thereof which coincides with one of a plurality of circularly arranged spaced bores 51 in the disk 25. A stud 52 slidably penetrates each bore 51 and is fixedly secured in the bore 50 by any suitable means such as welding. The outer end of each stud 52 has the upper end of a link 55 fixedly secured thereto as by a pressed fit. The lower end of each link 55 has a stud 57 fixedly secured therein by any suitable means such as a pressed fit. An annular member or control ring 58 is provided with a plurality of circularly arranged spaced countersunk bores 60 each of which is slidably penetrated by one of the studs 57 and each of the studs 57 being flattened at its outer end to hold the same in position in the control ring 58.

It will be noted that each of the trays 40 is provided with a depending link 55 secured thereto in the manner heretofore described, all of said links and associated parts are identical and shall bear the same reference characters.

The end 46 of each tray 40 is provided with studs and links identical to the studs 52 and 57 and identical to the links 55 associated with the end 45 of the tray 40, and, for purposes of clarity the parts shown at the right-hand end of the rack 10 in Figures 1 and 6 will bear the same reference characters with the prime notation added as the parts at the left-hand side of the rack 10, and a further description thereof is deemed unnecessary.

The supporting and displaying apparatus or rack 10 is supported in the chest 11 by the shoulder screws 30 and 31, but additional means are provided to lend support thereto and primarily to guide the control rings 58 and 58' so as to prevent relative swinging movement between the disks 25 and 26 and the respective control rings 58 and 58' thus insuring that the attitude of the trays 40 will be constant relative to the box 11. A support is provided for both control rings 58 and 58' and the supports being identical, only the left-hand support will be described and like parts associated with the support at the right-hand side of Figures 1 and 4 will bear like reference characters with the prime notation added.

The support comprises a pair of diametrically opposed grooved control rollers 65 (Figures 2, 3, 4 and 9) rotatably mounted on eccentric portions 67 of shoulder bolt 68 (Figure 9) secured in the end wall 15 of the chest 11.

Referring to Figure 9, it will be observed that the shoulder bolts 68 slidably penetrate the end wall 15 and each has a lock nut threadably mounted thereon. The outer end of the shoulder bolt 68 has a screw driver slot 69 therein so as to adjust the eccentric portion and its control roller 65 relative to the axis of the corresponding control ring 58.

The outer periphery of the control ring 58 is adapted to ride in the grooves of the control rollers 65 at the left-hand end of the chest in Figure 1 and identical control rollers bearing the same reference characters with the prime notation added are mounted on the right-hand end wall and the control ring 58' rides in the grooves of these rollers 65'. If desired, control rollers may be provided only at one end of the chest 11, as they will be sufficient to guide the control rings relative to the disks 25 and 26.

The eccentric portions 67 on the shoulder screws 68 are provided so as to adjust the rollers 65 snugly against the periphery of the ring 58 at diametrically opposed points.

It will be observed that the bottom 41 of each tray 40 is disposed in a horizontal plane and when it is desired to move one of the trays 40 from, say, the uppermost position, to one of the intermediate or lower positions, the tray 40 is moved about the axis of the shaft 36 and this will cause the studs 52 and 52' to rotate in the bores 51 and 51', respectively, to cause one end of the links 55 and 55' at opposed ends of the apparatus to rotate about the axis of the disks 25 and 26 and to cause the other or lower ends of the links to rotate about the axis of the control rings 58 and 58'. The lower ends of the links 55 and 55' each being pivotally connected to the control rings, will cause the control rings 58 and 58' to rotate between the control rollers 65 and 65'.

Friction between the outer peripheries of the control rings 58 and 58' and the rollers 65 and 65' will cause the trays 40 to remain in the desired position until sufficient pressure is applied to the same to overcome the friction and move the trays about the axes of the control rings and the disks.

Referring to Figures 1 and 2 it will be observed that the disk 25 is provided with a notch 70 in the periphery thereof for receiving a dog portion 71 of an arm 72 pivotally secured intermediate its ends to the end wall 15 of the container, as at 73, and which is normally urged in a clockwise direction by a tension spring member 74. The arm 72 is provided to lock the disk 25 and associated parts against rotation when it is desired to transport the chest 12. Pressure upon the left-hand end of the arm 72, in Figure 2, will cause the dog 71 to move out of engagement with the notch 70 in the disk 25 to permit free rotation of the disk 25 and associated parts. In ordinary use the friction of the control rings 58 and 58', 60' and the control rollers 65 and 65', will prevent rotation of the disks 25 and 26 unless pressure is applied to the disks or to one of the trays, the arm 71 being provided to lock the disk when it is desired to transport the apparatus.

Referring now to Figures 5, 6, 7 and 8 the rack 10 is shown in association with a display stand broadly designated at 80 to hold the rack 10 and to permit the contents of the trays to be displayed rather than confined within a container such as the chest 12. The display stand 80 comprises a pair of spaced standards or sup-

ports, one at each end of the rack 10, each being of identical construction and bearing the same reference characters with the parts at the right-hand end of the apparatus in Figure 4 bearing the prime notation.

The left-hand standard comprises a base member 81 having feet 82 and 83 and being provided with an upstanding member 85 having its lower end suitably secured intermediate the ends of the base member 81, as by welding, the upstanding member 85 being of a greater height than the overall height of the rack 10. A tie member 84 extends between the base members 81 and 81' and has its ends secured intermediate the ends of the base members 81 and 81', as by welding.

The upstanding member 85 is provided with a transverse arm 86 suitably secured intermediate the ends thereof, as by welding, and extending outwardly from each side of the upstanding member 85. The transverse arm 86 has grooved control rollers 87 and 88 rotatably mounted on studs 89 and 90, respectively, secured, as by welding, in the opposed ends of the transverse arm 86. The control rollers 87 and 88 may be identical to the rollers 85 and 85' heretofore described if so desired and are adapted to receive the peripheral edge of the control ring 58. If desired, the arm 86' with rollers 87' and 88' thereon may be omitted from the upstanding member 85', inasmuch as a single arm 86 is sufficient for satisfactory operation.

The proximate surfaces of the upstanding posts 85, 85' are provided with sockets 91 integral therewith, only one of which is shown in Figures 6 and 8, and each having a cavity 92, therein forming a bearing for the reception of suitable shoulder screws 94 only one of which is shown. The screws 94 correspond to the screws 30 and 31, heretofore described and are threadably embedded in the opposed ends of the shaft 35 for supporting the rack 10, the shoulder screw 94 being rotatable in the sockets 91 to permit rotation of the rack 10.

It is thus seen that I have provided a supporting and displaying rack comprising a pair of disks having a plurality of revoluble trays mounted therebetween and with control means for controlling the altitude of the trays relative to the disks as rotation is manually transmitted to the disks so as to move the trays to any desired position.

In the drawings and specifications there has been set forth a preferred embodiment of the invention and, although specific terms are employed, they are used in a generic and descriptive sense only, and not for purposes of limitation, the scope of the invention being defined in the claims.

I claim:

1. Apparatus for supporting a plurality of articles comprising a pair of axially aligned spaced members, means supporting said spaced members for rotation about their centers, a plurality of circularly arranged trays disposed between the spaced members and having studs fixedly secured to each end thereof and said studs being pivotally mounted in said spaced members, a first plurality of links each having one end thereof fixedly connected to one end of said studs, a second plurality of links each having one end thereof fixedly secured to the studs at the other end of each tray, a pair of spaced rotatable annular members mounted in off-center relation to the first spaced members, the ends of the links remote from the

ends which are fixed to the studs being pivotally connected to the corresponding rotatable annular members and the points at which the links are pivotally connected to the rotatable annular members being substantially circularly arranged and in spaced relation to each other so all of the links as well as the corresponding trays will maintain a like attitude with respect to each other when the spaced members are rotated to change the positions of the trays relative to the means supporting the spaced members for rotation, said links forming the sole support for the second rotatable members, means for supporting the annular members for rotation comprising a pair of adjustable bolts disposed on each side of the annular members and in a horizontal plane disposed below the centers of the annular members, each of the bolts having an eccentric portion provided with a roller on which the annular members rest.

2. Apparatus for supporting and displaying a plurality of articles comprising a pair of spaced axially aligned disks, means for rotatably supporting said disks at their centers, a ring adjacent the outer surface of each disk, a plurality of circularly arranged trays extending between the disks and each of the trays having a stud secured to opposed ends thereof and projecting outwardly therefrom and slidably penetrating the corresponding disks, a link fixedly connected to the ends of each of the studs remote from the ends which are secured to the trays, said rings being disposed in vertically off-set relation to the disks and means pivotally connecting the ends of the links remote from said studs to the corresponding ring at circularly arranged spaced points on the ring whereby, upon rotation of the disks, the trays may rotate substantially about the axes of the disks and the rings without changing the attitude of the trays with respect to the means supporting the disks for rotation, means for limiting lateral movement of the rings during rotation comprising a rigid member extending in transverse relation to a line extending between the axes of the disks, a pair of bolts in said rigid member each having an eccentric portion and disposed on each side of the rings at a point below a horizontal plane passing through the centers of said disks, a pair of rollers rotatably mounted on the eccentric portions of said bolts for supporting for rotation at least one of the rings at two spaced points on the periphery thereof whereby, upon rotation of the disks, like rotation will be transmitted to the corresponding rings through the medium of the links and the rings will be held for rotation about an axis in fixed spaced parallel relation to the axis of the disks through the medium of said rollers, said links constituting the sole support of said rings against vertical movement.

GEORGE P. MORGAN.

#### References Cited in the file of this patent

##### UNITED STATES PATENTS

| Number    | Name      | Date          |
|-----------|-----------|---------------|
| 425,354   | Van Doren | Apr. 8, 1890  |
| 944,969   | Newman    | Dec. 28, 1909 |
| 1,204,059 | Phenice   | Nov. 7, 1916  |
| 1,269,825 | Langdon   | June 18, 1918 |
| 1,785,954 | Hayes     | Dec. 23, 1930 |
| 2,161,750 | Schonwald | June 6, 1939  |

##### FOREIGN PATENTS

| Number | Country       | Date |
|--------|---------------|------|
| 10,257 | Great Britain | 1890 |