Feb. 11, 1936. W. M. BODINE 2,030,741

ARTICLE DISPLAY AND CONVEYING EQUIPMENT

Filed March 29, 1935 2 Sheets-Sheet 1

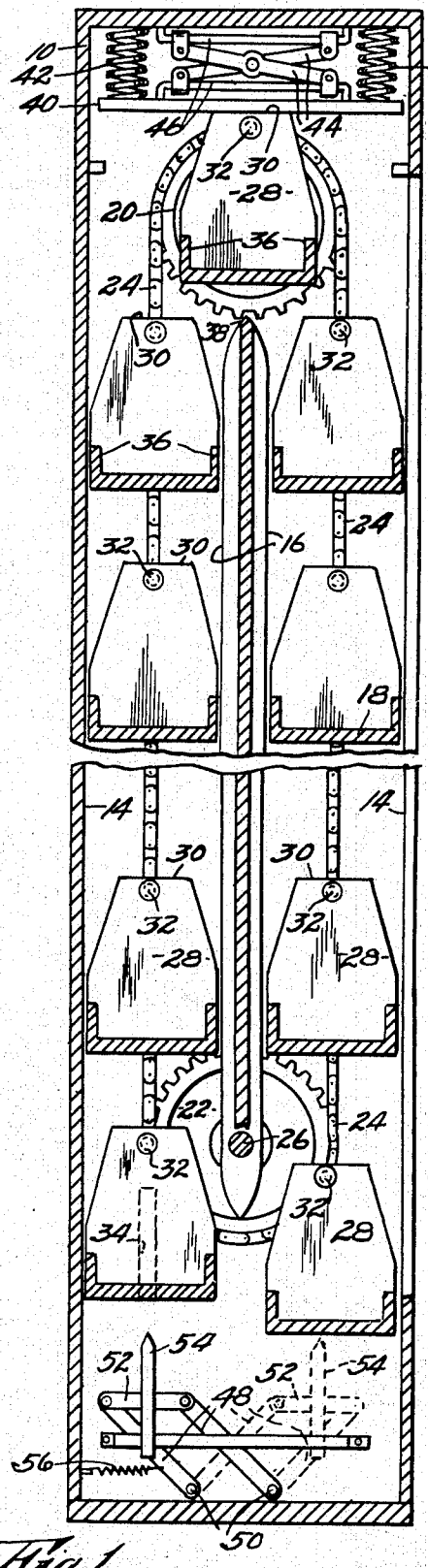


Fig 1

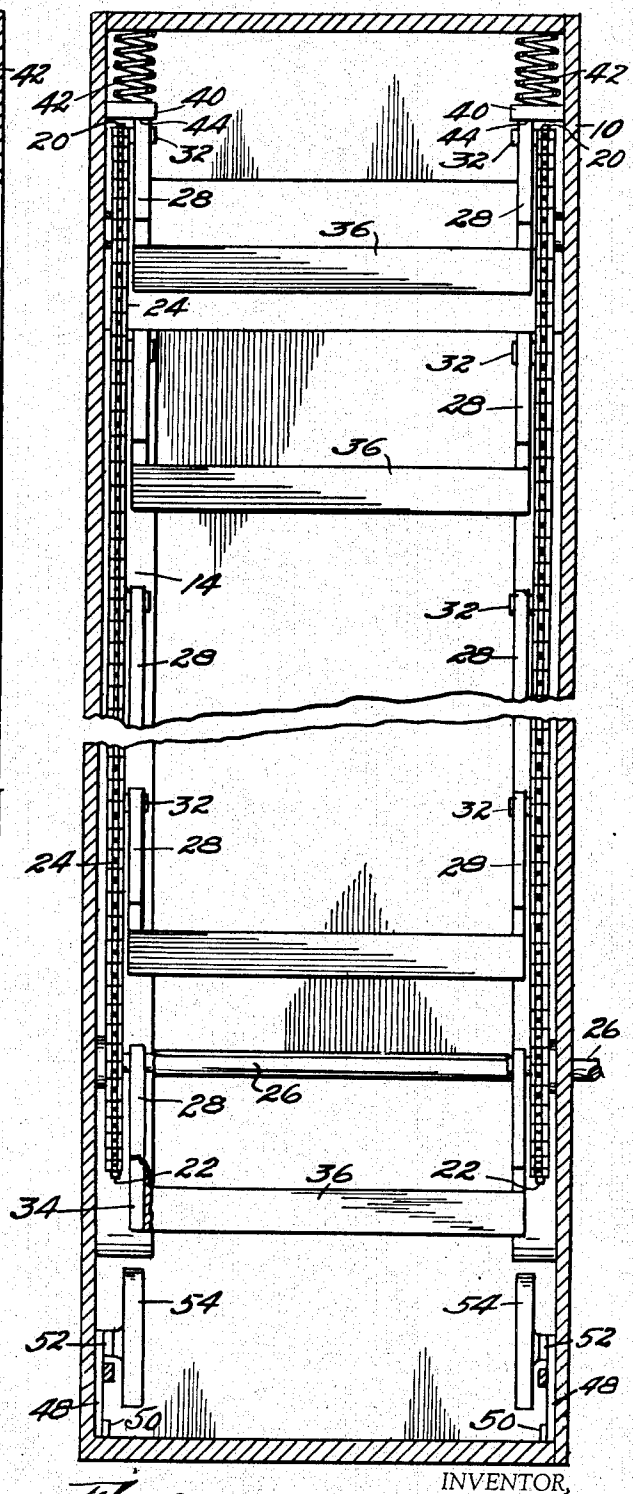


Fig. 2

INVENTOR,
Welton M. Bodine.

BY
Harvey & Hamilton
ATTORNEYS

Feb. 11, 1936. W. M. BODINE 2,030,741

ARTICLE DISPLAY AND CONVEYING EQUIPMENT

Filed March 29, 1935 2 Sheets-Sheet 2

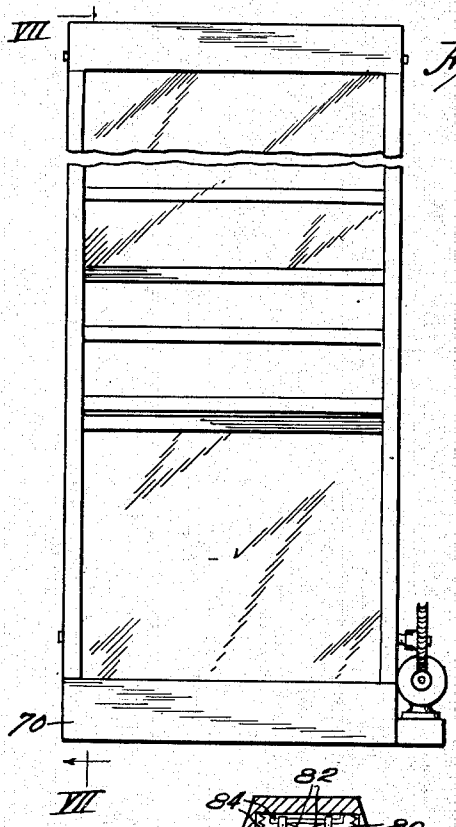



Fig. 6.

Fig. 3

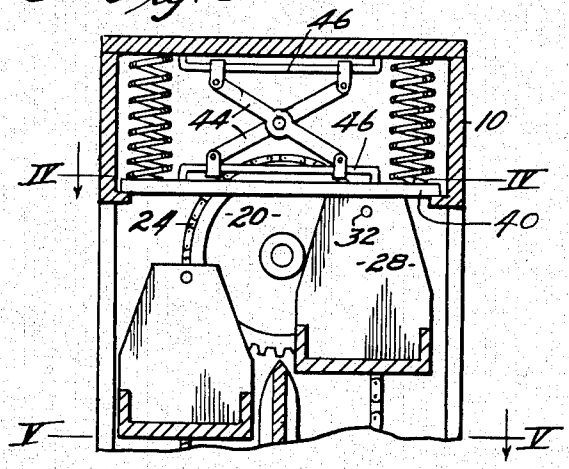



Fig. 4

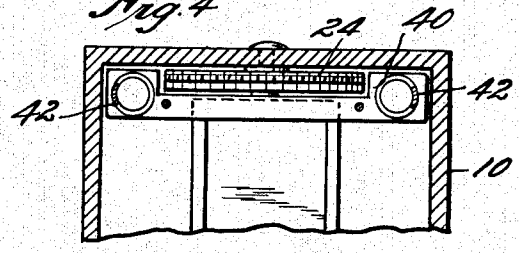
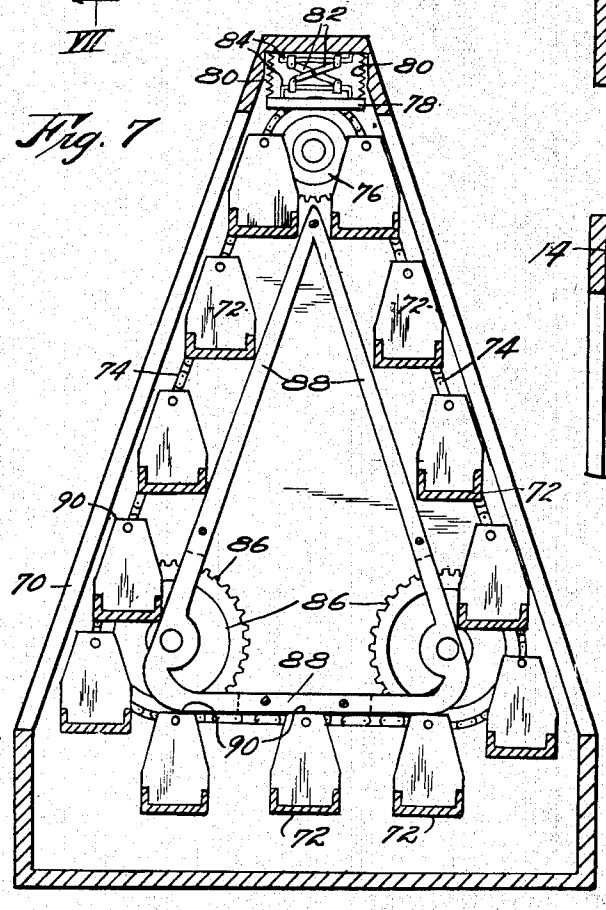



Fig. 7



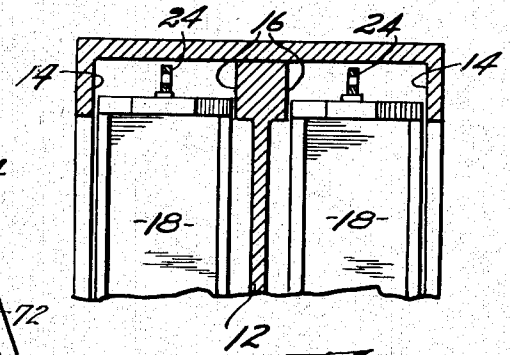




Fig. 5

INVENTOR,
Walton M. Bodine.

BY

Harvey & Hamilton,
ATTORNEYS.

Patented Feb. 11, 1936

2,030,741

# UNITED STATES PATENT OFFICE

2,030,741

## ARTICLE DISPLAY AND CONVEYING EQUIPMENT

Walton M. Bodine, Kansas City, Mo.

Application March 29, 1935, Serial No. 13,663

5 Claims. (Cl. 211—121)

This invention relates to display and conveying equipment of the type which might be employed in retail stores or the like for the purpose of carrying various articles of merchandise, and the primary object of the invention is the provision of such equipment having novel and unique means for supporting the plurality of article-carrying shelves so that they are maintained in a substantially horizontal plane while being carried through a circumscribing path of travel by spaced-apart, endless chains that may be motivated and caused to form paths of travel having desired lines.

One of the important aims of this invention is the provision of article display and conveying equipment that may be employed in displaying or storing articles and which is advantageous in conserving space to the extent that store rooms having especially high ceilings might have the walls thereof completely occupied by show cases wherein is provided the mobile shelving equipment which is contemplated by this invention.

It is well known in the art of article display that only that section of the merchandise which is substantially on the eye level commands the attention of the prospective purchaser and if sections of the shelves of the show case could be progressively brought to that said level, the appeal would be increased and the advertising ability of the equipment made appreciably greater.

This invention further aims to provide means for making accessible articles that may be kept in a display case which is extended from floor to ceiling, and where such a case is utilized, it is apparent that it becomes a valuable fixture for storage purposes in that half of the volume of stored articles may be kept in a small space directly in front of a wall and between the said wall and the other half of said stored articles, but yet made quickly available because of the fact that all of the shelves of the equipment are movable around to an accessible position.

This invention aims to provide unique means for maintaining each of a series of pivotally mounted shelves in a horizontal plane as they are moved around wheels that support endless chains. The means herein illustrated embody the invention, but the specific nature of said means might well be altered without departing from the concepts of the invention.

The usual form of show case which the present invention is adapted to improve is one having a true vertical or slightly inclined face and for purpose of illustration, these types of display and storage cases have been set down in the drawings, wherein:

Figure 1 is a vertical, sectional view through display and conveying equipment embodying this invention.

Fig. 2 is a front elevation of the same, with parts removed for clearness.

Fig. 3 is a fragmentary, sectional view through the uppermost portion of the display equipment.

Fig. 4 is a sectional view taken along line IV—IV of Fig. 3.

Fig. 5 is another sectional view taken along line V—V of Fig. 3.

Fig. 6 is a front elevation of a modified form of display case embodying this invention, and,

Fig. 7 is a vertical, sectional view through the case taken on line VII—VII of Fig. 6.

In describing the invention, reference will first be made to the equipment as illustrated in Figs. 1 to 5 inclusive. This equipment comprises a case 10 of any ordinary construction, which may have any number of suitable openings covered or not, and which has a vertical, central partition 12, that extends from a point spaced upwardly from the bottom of case 10 to a point spaced downwardly from the top thereof as illustrated in Fig. 1.

The ends of case 10 have vertical guide faces 14 and 16, between which the ends of the plurality of shelves 18 are adapted to ride as the shelves are carried through their paths of travel. An upper and a lower wheel in the form of a sprocket wheel 20 and 22 respectively support an endless chain 24, upon which is pivotally mounted each of a plurality of shelves 18. These wheels 20 and 22 are rotatably mounted and the lower ones should be mounted upon a transverse shaft 26, to which may be attached any suitable source of power for the purpose of simultaneously driving the two endless chains 24, one of which is located adjacent each end respectively of case 10. These chains 24 are in opposed, spaced-apart relation and are arranged in like opposed paths of travel so that shelves 18 might be properly supported. Each shelf 18 has an end wall 28 thereon and a shoulder 30 is provided along the upper edge of this wall. Each shelf is pivotally mounted as at 32 to the opposed chains 24 and the ends of shelves 18 are provided with grooves 34 for the purpose more fully hereinafter set down.

By virtue of the pivotal connection between shelf and chains, the weight upon shelves 18 assists in holding the shelf in a horizontal plane as it is being carried through the rectilinear

portion of the circumscribing path of travel through which each shelf is carried. Reference to Fig. 5 indicates the manner in which the ends 28 of each shelf 18 is confined between guide faces 14 and 16 which precludes any objectionable swinging. Rails 36 may be provided along the longitudinal edges of each shelf 18 to prevent articles from sliding off the shelf as it is traveling.

The edge of partition 12 prohibits an observer from seeing the two tiers of shelves and when standing in front of case 10, the shelves will pass across the line of vision one at a time at a rate of speed dependent upon the particular driving means employed. As the shelves 18 approach upper wheel 20 they are withdrawn from between guide faces 14 and 16 because the latter terminated as illustrated in Fig. 1. Faces 16 converge to a point 38 which allows each of the shelves 18 to freely move up and over wheel 20.

Means is provided for precluding tipping on the part of the shelves as they move over wheel 20. This means comprises a contacting plate 40 having springs 42 for yieldably pressing the lower face thereof against shoulder 30 of each shelf as it presents itself. Contacting plate, shoulder, and shelf 18 are all in horizontal, parallel planes and this relation is maintained throughout the operation of the apparatus. To insure such relationship, linkage 44 is used. The ends of these closed links 44 are in slidable engagement with parallel guides 46, one of which is carried on the upper surface of plates 40, while the other is carried on the under side of the top of case 10. As the shelf is carried around wheel 20, contacting plate 40 is lifted upwardly against the force of springs 42 and while the shelves are out from between guide faces 14 and 16, they will be held against any swinging motion.

In addition to the unique means just set forth, this invention provides means for holding the shelves horizontal as they are carried around the lower wheel 22. This means is in the form of a pair of parallel arms 48 pivotally joined to the bottom of case 10 as at 50 and interconnected by a head 52 which carries a post 54.

This post is in alignment with the grooves 34 of the various shelves 18 when they are moved downwardly on one side of wheel 22 and post and groove interengage just as the shelf passes from between guide faces 14 and 16. As the shelves are carried around lower wheel 22, post and groove 54 and 24 are in engagement and thereby any swinging movement on the part of the shelf being held is precluded. The shelf itself draws the post and arm structure over to the position shown in dotted lines of Fig. 1 and when the shelf is lifted from engagement with post 54, spring 56 will immediately retrieve the post and make it ready for engagement with the next succeeding shelf 18. Thus it is seen that shelves 18 are maintained in a substantially horizontal plane throughout their path of travel.

The structure illustrated in Figs. 6 and 7 is only slightly modified and embodies the invention as completely as does the other mechanism illustrated in Figs. 1 to 5 inclusive. In this instance, case 70 has a pair of inclined sides and shelves 72 are carried by the endless chains 74 in precisely the same manner as before mentioned. Upper wheel 76 has the same contacting plate, 88 the springs, 82 the links, and 84 the guides. Because of the forms of case 70, two lower wheels 86 are employed. A guide rail 88 extends from one wheel to the other and as the shelves are carried transversely across the case 70 the shoulder 90 of each is immediately adjacent to the lower side of the rail 88 and is effective in precluding any swinging of the shelves as they pass thereunder.

It is obvious from the foregoing that the points of invention might be embodied in structures of widely varying characteristics and while two forms of display and conveying equipment have been illustrated, it is desired to be limited only by the scope of the appended claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. Display and conveying equipment of the character described comprising a pair of opposed, spaced-apart, endless chains disposed in like circumscribing paths; shelves pivotally supported by the chains therebetween; and means for maintaining the shelves in a horizontal plane as they are being carried through their entire path of travel, said shelves being successively directly engaged by yieldable contacting members as they travel through a portion of their path of travel to limit swinging of the shelves about their pivotal connections with the chains to an amount sufficient to allow reversal of the direction of travel of the chain at its point of connection with the respective shelf without tipping that shelf out of a horizontal plane.

2. Display and conveying equipment of the character described comprising a case; a pair of opposed, spaced-apart, endless chains disposed in like circumscribing paths; shelves pivotally supported by the chains therebetween; wheels mounted on the case for supporting the chains; and means for maintaining each shelf in a horizontal plane as it is being carried around the wheels by the chains comprising a shoulder on the shelf having a face parallel to the shelf, a contacting plate carried by the case, and means for yieldably maintaining the contacting plate horizontal as the shelf is drawn against the same.

3. Display and conveying equipment of the character described comprising a case; a pair of opposed, spaced-apart, endless chains disposed in like circumscribing paths; shelves pivotally supported by the chains therebetween; wheels mounted on the case for supporting the chains; and means for maintaining each shelf in a horizontal plane as it is being carried around the wheel comprising a vertical groove provided in the shelf, a vertical post movably carried by the case, engageable in the groove, and means for maintaining the post vertical and, thereby, the shelf horizontal as the shelf is drawn around the proximal wheel.

4. Display and conveying equipment of the character described comprising a case; a pair of opposed, spaced-apart, endless chains disposed in like circumscribing paths; shelves pivotally supported by the chains therebetween; wheels mounted on the case for supporting the chains; and means for maintaining each shelf in a horizontal plane as it is being carried around the wheel comprising a vertical groove provided in the shelf, a vertical post movably carried by the case engageable in the groove, and means for maintaining the post vertical and, thereby, the shelf horizontal as the shelf is drawn around the proximal wheel, said post being drawn along a portion of its path of travel by the shelf and having means for returning it to the point of beginning upon disengagement by the shelf.

5. Display and conveying equipment of the

character described comprising a case; a pair of opposed, spaced-apart, endless chains disposed in like circumscribing paths; an upper and a lower wheel for each chain respectively mounted on the case around which the chain is adapted to travel; a shelf pivotally supported by the chains between the same; means for preventing appreciable swinging of the shelf as it is carried from one wheel toward the other; means for maintaining the shelf in an upright position and horizontal plane as it is carried around the upper wheel comprising a shoulder formed on the shelf, a contacting plate carried by the case for engaging the shoulder and yieldable means maintaining said contacting relation as the shelf is drawn against the plate; and means for maintaining the shelf in a horizontal plane as it is being carried around the lower wheel comprising a groove provided in the shelf, a post movably carried by the case engageable in the groove, and means for yieldably maintaining the post in the groove-engaging position as the shelf is drawn around the said lower wheel.

WALTON M. BODINE.