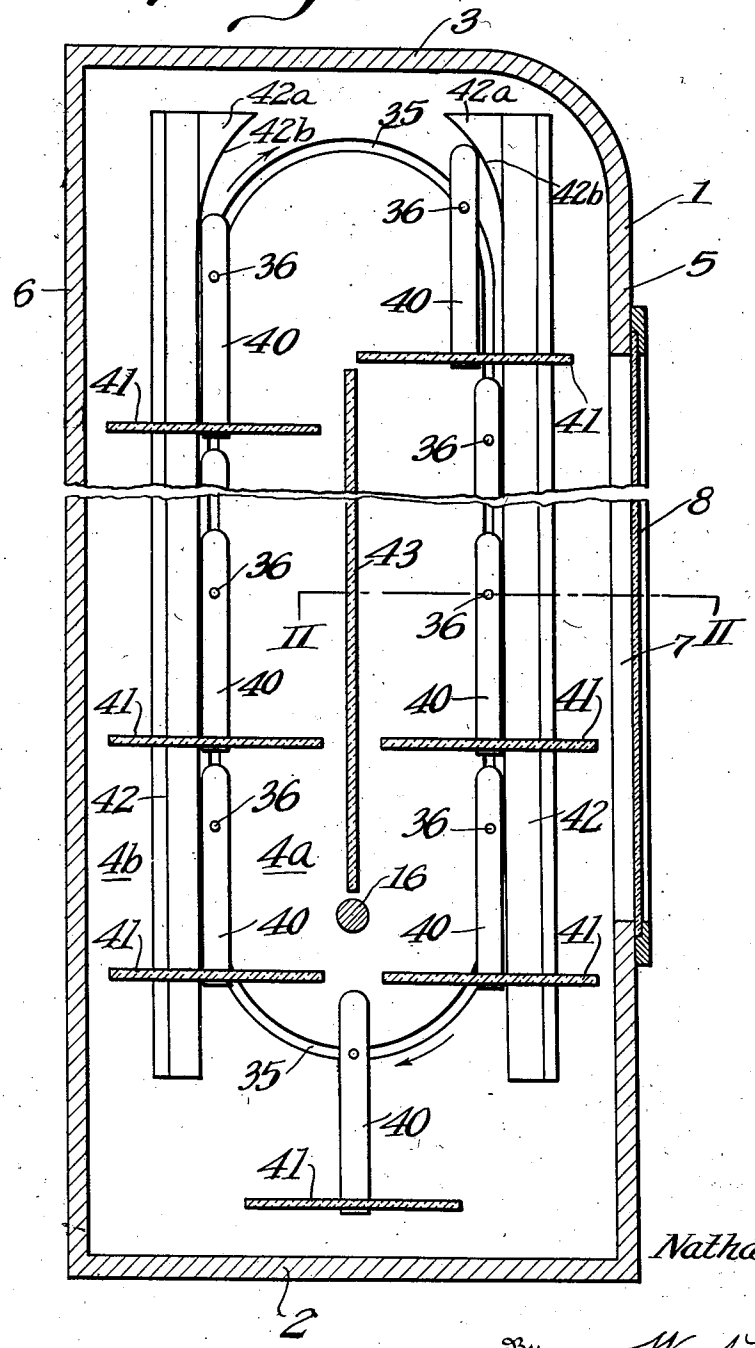
April 6, 1943. N. A. HALLWOOD 2,315,790

MERCHANDISE EXHIBITING MEANS

Filed March 28, 1940 4 Sheets-Sheet 1

Fig. 1.



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MERCHANDISE EXHIBITING MEANS

Filed March 28, 1940 4 Sheets-Sheet 2

Fig. 2.

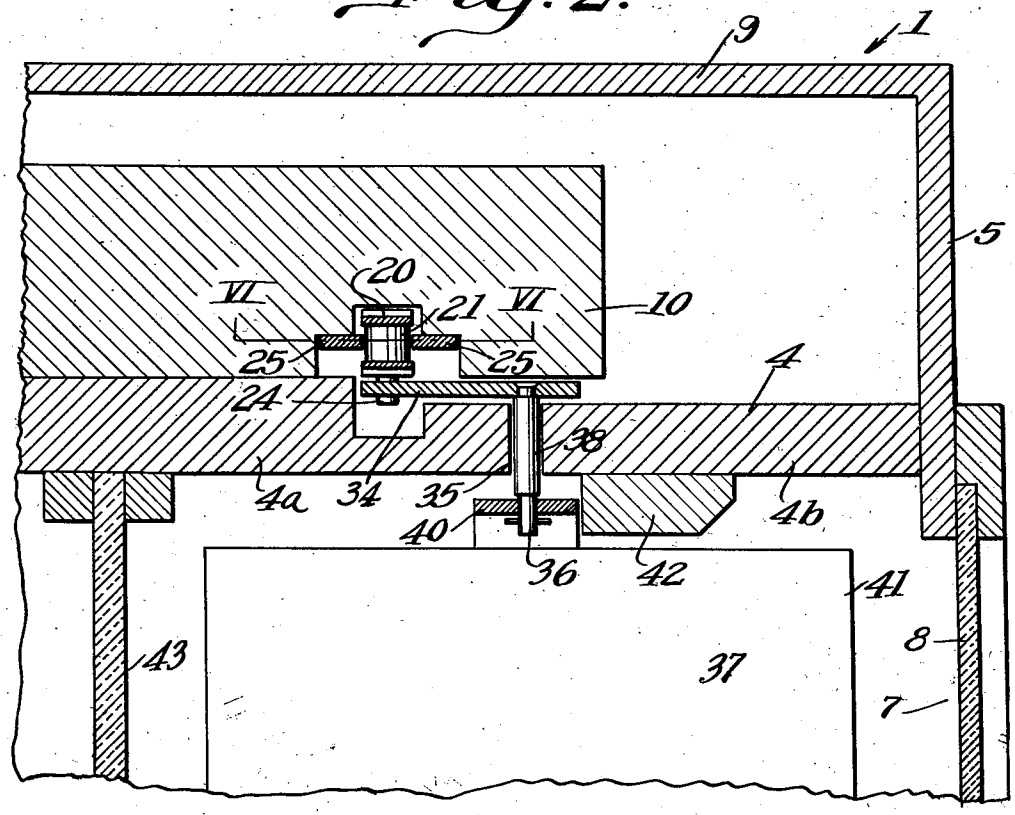
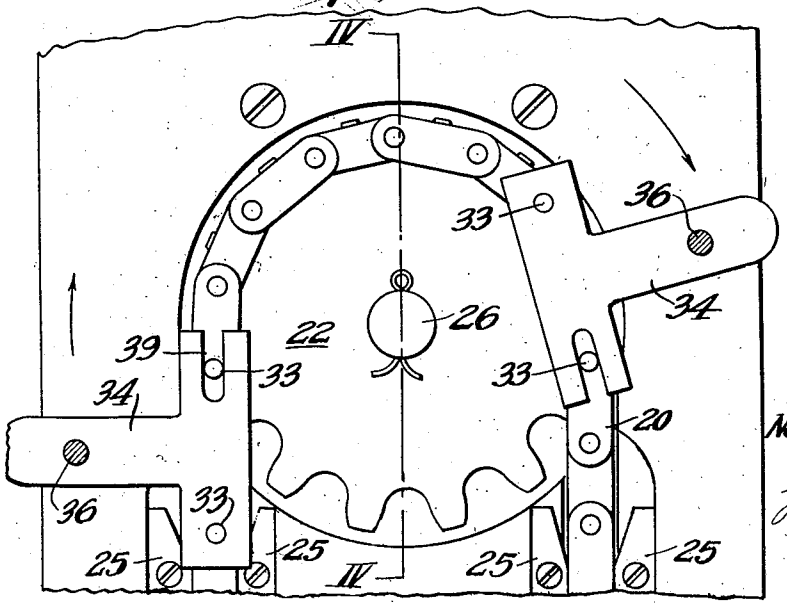


Fig. 3



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MERCHANDISE EXHIBITING MEANS

Filed March 28, 1940 4 Sheets-Sheet 3

Fig. 6.

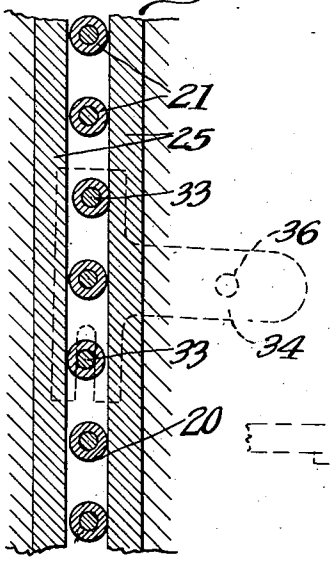


Fig. 4.

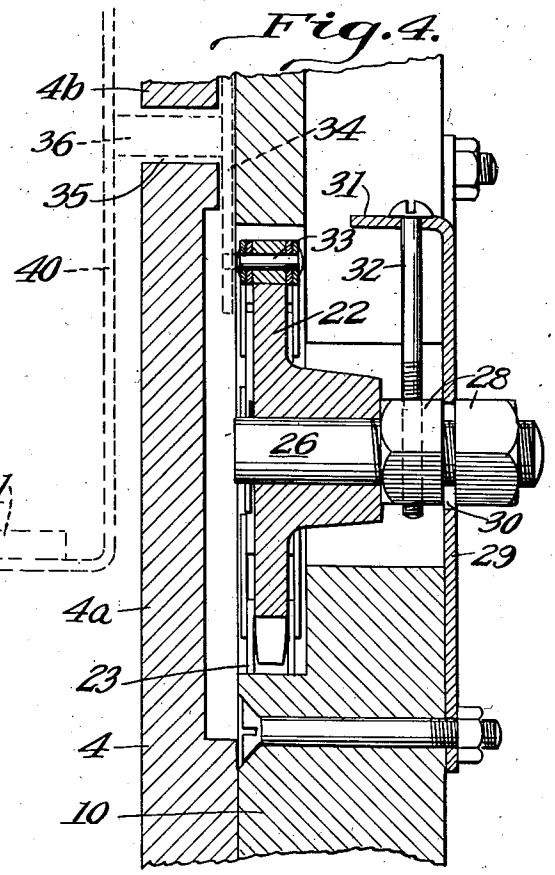
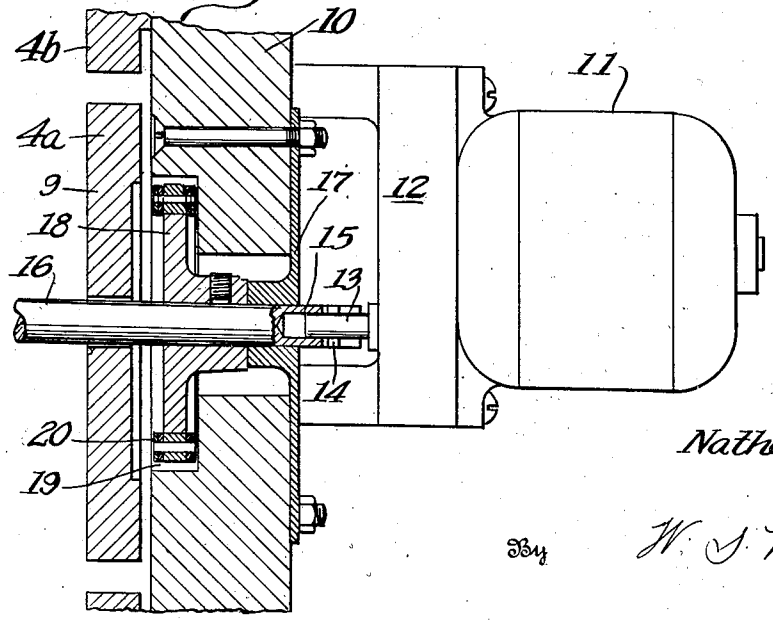


Fig. 5.



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MERCHANDISE EXHIBITING MEANS

Filed March 28, 1940 4 Sheets-Sheet 4

Fig. 7.

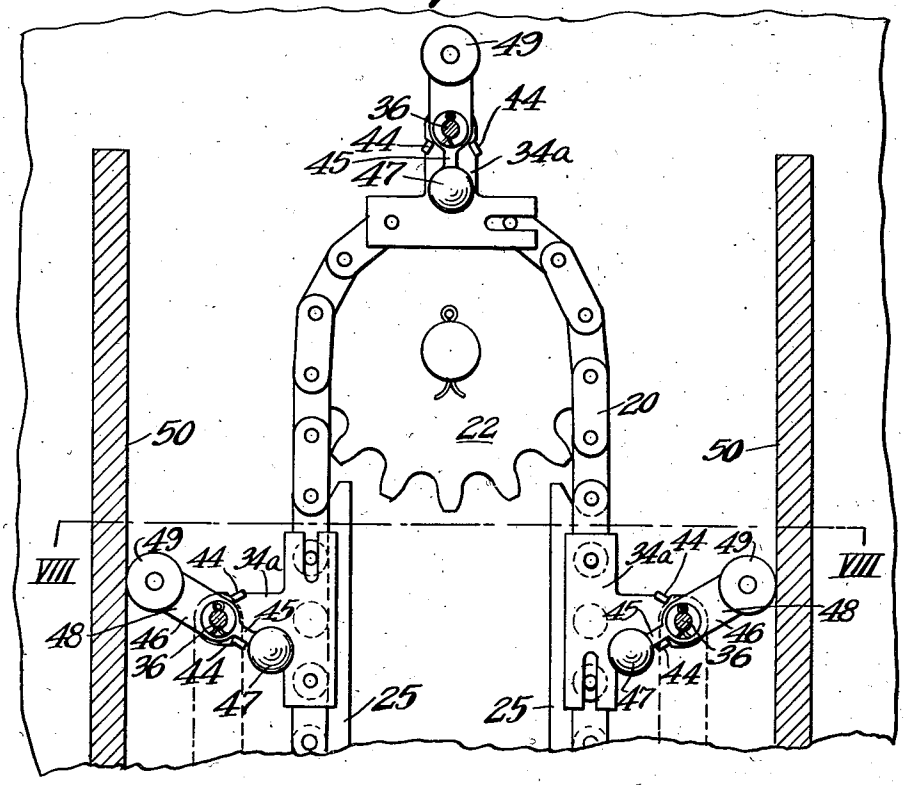
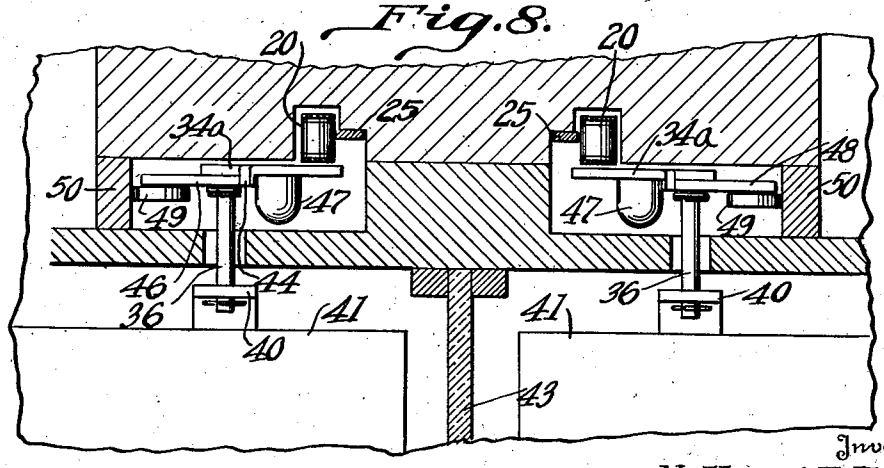


Fig. 8.



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UNITED STATES PATENT OFFICE

2,315,790

MERCHANDISE EXHIBITING MEANS

Nathan A. Hallwood, Columbus, Ohio

Application March 28, 1940, Serial No. 326,451

11 Claims. (Cl. 312—182)

This invention relates to improvements in merchandise display cases, the general object of the invention being to provide a case or cabinet having the interior thereof provided with movable merchandise-receiving shelves, the latter being so operated as to move in a substantially vertical plane while passing a glazed panel arranged in the front of the case or cabinet, whereby to provide an attention attracting display means having novel mechanical characteristics.

Ordinarily, merchandise cases or cabinets are provided with fixed or stationary shelves for the support of the products undergoing display. Such cases or cabinets are quite commonplace and do not attract any unusual amount of attention. Therefore, it is a cardinal purpose of the present invention to provide means for supporting the shelves of a display case so that they will be in a state or motion when viewed from the exterior of the case or cabinet, to the end of producing a novelty which will compel greater attention on the part of observers than when the shelves are merely stationary as in prior show case construction.

Another object of the invention resides in the provision of a display case or cabinet of the type indicated provided with internally disposed, relatively spaced, driving and guiding sprockets having trained thereabout endless link chains with the forward and return runs of said chains movable in vertical planes, the commodity-receiving shelves of the case being pivotally suspended from said chains and movable in unison therewith, while the forward and return runs of said shelves are separated by a divisional wall so placed, with respect to the glazed panel of the case, that only the merchandise arranged on the forward run of the shelves can be observed through the panel.

Further objects of the invention reside in the provision of improved means for maintaining the commodity-supporting shelves in true horizontal planes throughout their full orbit of movement in connection with the endless link chains, the horizontal order of the shelves being maintained irrespective of the positions of placement of the articles to be displayed thereon; in the provision of improved means for guiding the runs of the link chains between the spaced sprockets; in reducing to a minimum the element of friction in the movable members of the display case in order that said members may operate smoothly, silently and without vibration; and in other features of construction and operation hereinafter more particularly set forth.

The present application constitutes a continuation-in-part of my prior application, Serial No. 192,337 filed February 24, 1938.

In the accompanying drawings, forming a part of this specification and in which similar characters of reference denote like and corresponding parts throughout the several views thereof:

Fig. 1 is a vertical sectional view taken through a merchandise display case formed in accordance with the present invention;

Fig. 2 is a horizontal sectional view taken through one side of the case on the plane indicated by the line II—II of Fig. 1;

Fig. 3 is a vertical sectional view disclosing one of the upper sprockets and the link chain associated therewith, and disclosing more particularly the slotted T-shaped carrier arms used in effecting the support of the merchandise-receiving shelves;

Fig. 4 is a detail vertical sectional view disclosing the adjustable supporting means for an upper sprocket member;

Fig. 5 is a horizontal sectional view disclosing the drive means for the lower sprockets;

Fig. 6 is a vertical sectional view on the line VI—VI of Fig. 2 and illustrating the vertical guide construction for the sprocket chains.

Fig. 7 is a vertical sectional view of a display case provided with a modified form of guide means for the shelf supporting chains and brackets.

Fig. 8 is a horizontal sectional view taken through one end portion of the case, shown in Fig. 7, on the plane indicated by the line VIII—VIII of Fig. 7.

Referring more particularly to the drawings, the numeral 1 designates the casing or cabinet of my improved display case. In the specific embodiment of the application selected for illustration, the cabinet comprises bottom and top walls 2 and 3, respectively, spaced vertical side walls 4—4 and vertical front and back walls 5 and 6, respectively. Any suitable materials may be used in the construction of this cabinet such as metal or wood. The front wall 5 is formed with an elongated opening 7, which is preferably covered by a glass panel 8.

Connected with the side walls 4 are supplemental housings 9, in which housings are positioned stationary frame members 10. Joined with the frame member in one of these housings, as shown in Fig. 5, is an electric motor 11, which through suitable speed reducing mechanism of a conventional nature, disposed within a case 12, drives a power shaft 13. This shaft is

equipped with a cross pin 14, which is received within slots provided in the socketed end 15 of a horizontally disposed, longitudinally extending drive shaft 16. The latter extends across the lower part of the casing 1, and is journaled at its ends in bearing plates 17, secured to the frame members 10.

Fixed to rotate with the shaft 16 is a pair of longitudinally spaced chain-receiving sprockets 18, arranged in pockets 19 formed in the frame members 10. Engaging with the teeth of the sprockets 18 is a pair of longitudinally spaced, vertically disposed, endless link chains 20, the cross pins of which chains carry antifriction rollers 21. The upper portions of the chains 20 pass around a pair of sprockets 22, arranged above and in vertical registration with the lower set of sprockets 18, the sprockets 22 being also situated in pockets or recesses 23 formed in the frame members 10. The inner faces of said frame members, between the sprocket-receiving pockets 19 and 23 are vertically grooved as at 24 in order to receive the vertical runs of the chains 20. In addition, as shown in Figs. 2 and 6, the grooves 24 receive spaced stationary metallic guide plates 25, the inner vertical edges of which engage with the rollers 21 of said chains so that the vertical runs of the latter will be positively guided and confined to definite paths of movement irrespective of working stresses placed thereon, the element of friction, at the same time, being minimized.

Each of the upper sprockets 22, see Fig. 4, has its hub portion rotatably mounted on a horizontally disposed stud shaft 26. The outer end of this shaft is threaded for the reception of a pair of inner and outer binding nuts 28. These nuts frictionally engage with the opposite surfaces of a mounting plate 29, fastened to the upper portion of the framework 10, the plate 29 being vertically slotted as at 30 for the reception of the threaded end of the stud shaft 26. In order to provide for convenient adjustment of each of the stud shafts in a vertical direction to control the tension on the chains 20, each of the mounting plates 29 is formed with an inturned lip 31 apertured to receive the upper end of a headed vertically disposed screw 32. The threaded shank of this screw passes through transverse openings provided in the inner nut 28 and is received within a threaded opening formed transversely in the stud shaft 26. By this arrangement, it will be seen that when the outer nut 28 is loosened, the screw 32 may be rotated to raise or lower the operating positions of the associated stud shaft 26, thus tightening or loosening the chains 20. When the desired adjustment of the chains has been obtained, the outer nut 28 is tightened against the plate 29, holding the stud shaft in its desired operating positions, and relieving stress and strain on the screw 32.

Certain of the cross pins 33 of the chains 20 project laterally to one side of said chains to act as supports for a plurality of substantially T-shaped shelf carrying brackets 34, which move in unison with the chains and, as shown in Fig. 2, are located on the outer sides of the side walls 4. Each of the side walls 4 consists of an inner section 4a and an outer section 4b, the inner section being suitably secured to the frame 10 and the outer section to associated casing walls. The sections 4a and 4b are spaced to provide endless slots 35, the latter being adapted to receive horizontally and laterally projecting pins 36 carried by the brackets 34, the inner ends of the pins extending into the commodity-receiving compartment 37 of the casing 1. The pins 36 may be equipped with roller sleeves 38, if desired, to minimize friction due to contact with the side walls defining the slots 35. To prevent binding of the chain during passage thereof around the sprockets 18 and 22 while carrying the brackets 34, each of the latter is formed with a slotted end 39. Thus, for each of the brackets 34, one of the chain pins 33 is pivotally received within a round opening, while the other pin 33 is positioned in a slotted opening, as disclosed in Fig. 3. The slotted opening allows freedom of movement of the pin 33 received therein, so that there will be no kinking or binding of the chains as the latter pass around the sprockets.

The inner ends of the bracket pins 36 pass through round openings formed in the upper ends of a plurality of shelf-supporting arms 40, the lower ends of these arms being joined with horizontally maintained commodity-receiving shelves 41, which shelves move in unison with the chains 20, since they are pivotally suspended from the outer ends of the chain carried brackets 34. The inner surfaces of the outer sections 4b of the side walls 4 are provided with spaced vertically extending guide strips 42, which strips engage with the outer vertical edges of the arms 40 as the latter travel in vertical directions between the upper and lower sprockets, causing stabilized and non-swinging movement of the shelves when the same pass before the transparent panel 8. It will be noted that the arms 40 project above the bracket pins 36, so that if commodities are placed on the shelves 41 to one side or the other of the arms 40, there will be no sway or swinging movement of said shelves to cause them to lose their true horizontal positions, this advantage being attained by the edge contact of the arms 40 with the guide strips 42. Thus, the chains 20 are positively confined for true vertical movement by the guides 25, and likewise the arms and shelves 40 and 41 are similarly confined by the guides 42. The shelves 41, therefore, in moving past the window opening 7, will be disposed in true horizontal planes while moving in a downward and fixed vertical course of travel.

It is preferable to place a stationary vertical mirror 43 in the center of the cabinet in a position to separate the downwardly moving from the upwardly moving shelves. The mirror prevents the upwardly moving shelves from being viewed and concentrates the observer's attention on the commodities carried by the downwardly moving shelves. Any suitable source of interior illumination may be used within the cabinet, such, for example, as that disclosed in my aforesaid copending application.

In some instances, if care is not exercised in placing the articles to be displayed on the shelves 41, the longitudinal edges of the shelves may engage the upper edge of the mirror 43 and cause breakage or faulty operation of the display apparatus. To avoid this danger, the upper ends of the guide strips 42 carry substantially triangular blocks 42a having curved surfaces 42b which constitute continuations of the arm engaging surfaces of the strips. As the portions of the chains adjacent which the brackets 34 are attached reach and move around the upper sprocket, the upper ends of the arms 40 move on an arc which conforms substantially to the curved surfaces on the blocks 42a. If the shelves are not in balance, the arms will engage the curved surfaces and the shelves will be

prevented from tipping. After the brackets have passed around the sprockets, the strips **42** again maintain the horizontal positions of the shelves as the chains descend to the lower sprocket.

In Figs. 7 and 8, a modified type of chain guide means has been illustrated. This guide means is employed to prevent the weight of the shelves and their contents from causing the chains to kink or sag. The chains and sprockets and their arrangements are substantially identical with the first form of the invention but only one guide plate **25** is provided to engage the rollers of each run of chain, the plates being positioned between the runs. The brackets **34***a* are the same as the brackets **34** except that the former each have a pair of spaced lugs **44** projecting from one side for engagement with one arm **45** of a bar **46** pivotally carried by the pin **36**, projecting laterally from the bracket. The end of the arm **45** is weighted as at **47** to maintain the arm **45** in engagement with the lowermost lug **44** when the bracket is moving along the vertical runs of the chain. The opposite arm **48** of the bar **46** is provided with an enlarged roller **49** which rolls along a vertical track **50** disposed in spaced relation from the vertically extending chain.

Due to the weight of the shelf and its load being imposed on the bracket **34***a*, there will be a tendency for the bracket to pivot about the lowermost pin connecting it to the chain but this movement will be prevented by the contact of the roller **49** with the track **50** and the engagement of the arm **45** with the lower lug **44**. Through the provision of the weights **47** on the arms **45**, the bars **46** and rollers **49** will be maintained above the horizontal axes of the brackets **34***a* whether they are supported by the front or rear runs of the chain.

The present invention thus provides a display case which, by the movement of its commodity-receiving shelves, readily attracts the attention of observers and creates interest not afforded by the conventional case having stationary shelves. The construction of the case is essentially simple and the moving parts therein are so mounted that the same may be used or operated for prolonged periods of time without requiring adjustment, repair or replacement.

What is claimed is:

1. In a cabinet, longitudinally spaced vertically arranged endless chains of the link and cross pin type mounted in said cabinet, drive and guide sprockets journaled in said cabinet and around which said chains are trained, said sprockets being positioned to provide ascending and descending linear paths of movement for said chains, a plurality of spaced brackets carried by said chains, each of said brackets having a fixed pivotal connection with one of the cross pins of said chains and a slotted pivotal connection with another of said cross pins, each of said brackets being further formed with an arm projecting laterally relative to an associated chain, a plurality of commodity-receiving shelves, and means for pivotally suspending said shelves from the arms of said brackets.

2. In a cabinet, longitudinally spaced vertically arranged endless chains of the link and cross pin type mounted in said cabinet, drive and guide sprockets journaled in said cabinet and around which said chains are trained, said sprockets being positioned to provide ascending and descending linear paths of movement for said chains, a plurality of spaced brackets carried by said chains, each of said brackets having a fixed pivotal connection with one of the cross pins of said chains and a slotted pivotal connection with another of said cross pins, each of said brackets being further formed with an arm projecting laterally relative to an associated chain, a plurality of commodity-receiving shelves, means for pivotally suspending said shelves from the arms of said brackets, and means for positively maintaining said shelves in true horizontal planes when the shelves are moving in linear paths.

3. In a cabinet, longitudinally spaced, vertically arranged endless chains mounted in said cabinet, drive and guide sprockets journaled in said cabinet and around which said chains are trained, said sprockets being positioned to provide ascending and descending linear paths of movement for said chains, commodity-receiving shelves, supporting arms for said shelves pivotally connected with said chains, and vertically arranged stationary guides carried by said cabinet, said guides having linear contact with the longitudinal edges of said arms while said shelves are moving in linear paths, whereby to maintain the shelves in true horizontal planes during linear movement thereof.

4. In a cabinet having a sight opening in the front wall thereof, longitudinally spaced, vertically arranged, endless chains mounted in said cabinet contiguous to the vertical side walls of the latter, a plurality of longitudinally extending horizontally arranged shelves disposed between said chains, supporting arm for said shelves pivotally connected intermediately of their lengths to said chains, and vertical guide strips stationarily connected with the side walls of said cabinet, said guide strips being disposed for engagement with the longitudinal edge portions of said arms above and below the pivotal connection of said arms with said chains while the chains are traveling in linear paths of movement.

5. In a cabinet having vertical front and side walls, said front wall being formed with a sight opening, a plurality of longitudinally extending horizontally arranged shelves, endless carrier means arranged vertically in said cabinet contiguous to said side walls, arms connected with the ends of said shelves, each of said arms being pivoted intermediately of the length thereof to said carrier means, and vertically arranged guides carried by said side walls, said guides being disposed for sliding engagement with the longitudinal edges of said arms above and below their points of pivotal connection with said carrier means, whereby to maintain said shelves in true horizontal planes irrespective of article placement thereon while said arms are in contact with said guides.

6. In merchandise display apparatus, a cabinet having vertical front and side walls, longitudinally spaced vertically arranged endless chains mounted in said cabinet, said chains being of the link-roller type, drive and guide sprockets rotatably journaled in said cabinet in meshing engagement with said chains, said sprockets being positioned to provide for linear travel of the ascending and descending runs of said chains, means engaging said chains between said sprockets to prevent kinking and sagging thereof, laterally extending brackets carried by said chains, a plurality of commodity-receiving shelves, and means for pivotally suspending the shelves from the outer portions of said brackets.

7. In merchandise display apparatus, a support, a pair of rotatable drive sprockets spaced longitudinally of said support, a guide sprocket journaled on said support in vertical registration with each drive sprocket, an endless chain trained around corresponding drive and guide sprockets to provide vertically movable lengths of chain between said sprockets, substantially T-shaped brackets secured in spaced relation to said chains, the stem portions of said T-shaped brackets projecting laterally from said chains, a plurality of shelves, elongated supporting arms rigidly connected at one end to said shelves and pivotally connected at the intermediate portions to the laterally projecting stems of said brackets, and guide means engaging one longitudinal edge of each supporting arm during vertical movement of said chains.

8. In merchandise display apparatus, a support, a pair of rotatable drive sprockets spaced longitudinally of said support, a guide sprocket journaled on said support in vertical registration with each drive sprocket, an endless chain trained around corresponding drive and guide sprockets to provide vertically movable lengths of chain between said sprockets, substantially T-shaped brackets secured in spaced relation to said chains, the stem portions of said T-shaped brackets projecting laterally from said chains, shelf means suspended for swinging movement from the stems of said brackets, means engaging one side of each of the chains between the sprockets to prevent distortion of the chains in response to weight applied to said shelves, guide means mounted on said support, and roller supporting means carried by the laterally projecting stems of said brackets and engaging said guide means to assist in preventing the distortion of said chains.

9. In merchandise display apparatus, a support, a pair of rotatable drive sprockets spaced longitudinally of said support, a guide sprocket journaled on said support in vertical registration with each drive sprocket, an endless chain trained around corresponding drive and guide sprockets to provide vertically movable lengths of chain between said sprockets, substantially T-shaped brackets secured in spaced relation to said chains, the stem portions of said T-shaped brackets projecting laterally from said chains, shelf means suspended for swinging movement from the stems of said brackets, means engaging one side of each of the chains between the sprockets to prevent distortion of the chains in response to weight applied to said shelves, guide means mounted on said support, roller means mounted for swinging movement on the laterally projecting portions of said brackets, means on said stems for limiting the degree of swinging movement of said rollers, said rollers engaging said guide means to assist in preventing the distortion of said chains, and means carried by said roller mounting means for swinging said rollers to predetermined positions during movement of said brackets around said sprockets.

10. In a cabinet, longitudinally spaced, vertically arranged endless chains mounted in said cabinet, drive and guide sprockets journaled in said cabinet and around which said chains are trained, said sprockets being positioned to provide ascending and descending linear paths of movement for said chains, a plurality of spaced brackets having laterally projecting arms carried by said chains, each of said brackets having a fixed pivotal connection with a chain and a slotted pivotal connection therewith, the arms projecting away from said chains, and a plurality of commodity-receiving shelves pivotally suspended from the arms on said brackets.

11. In a display device, a support, spaced sets of sprockets mounted on said support, the sprockets of each set being journaled for rotation in the same vertical plane, endless chains extending around the sprockets of said sets, brackets carried by said chains, each bracket having a branch projecting laterally from a chain, arms each pivotally supported intermediate of its ends on the outer portion of one of said branches, guide means carried by said support for engagement with said arms on opposite sides of the pivots therefor, and shelf means carried by said arms for movement in unison with said chains, the engagement between said guides and arms serving to prevent tipping of said shelves during movement thereof.

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