W. H. AVERY & W. E. PARKER.

TRAVELING DISPLAY APPARATUS.

APPLICATION FILED JULY 31, 1912.

1,087,208.

Patented Feb. 17, 1914.

3 SHEETS—SHEET 1.

Fig. 1.

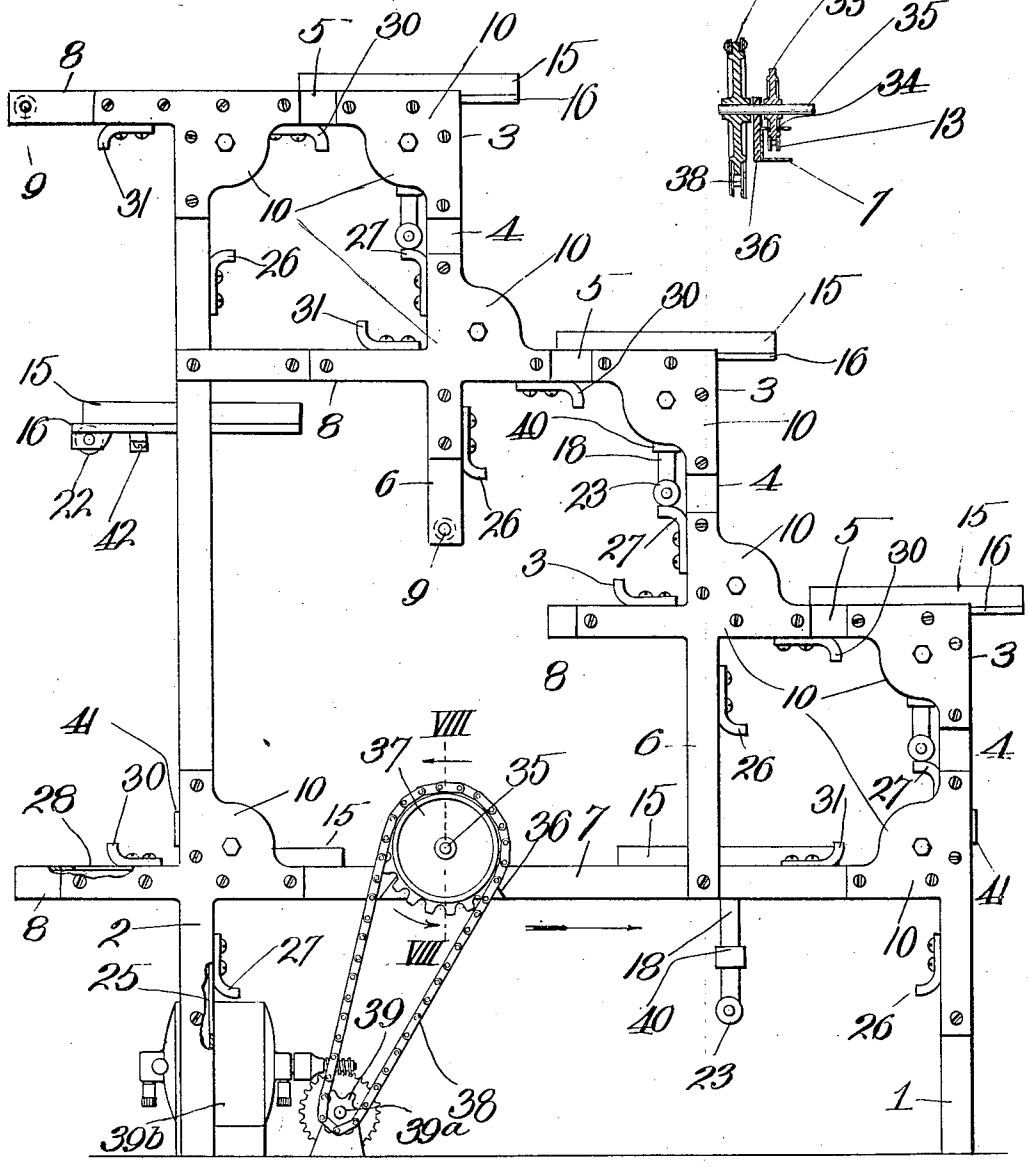


Fig. 8.

Witnesses
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3 SHEETS—SHEET 2.

Fig 4.

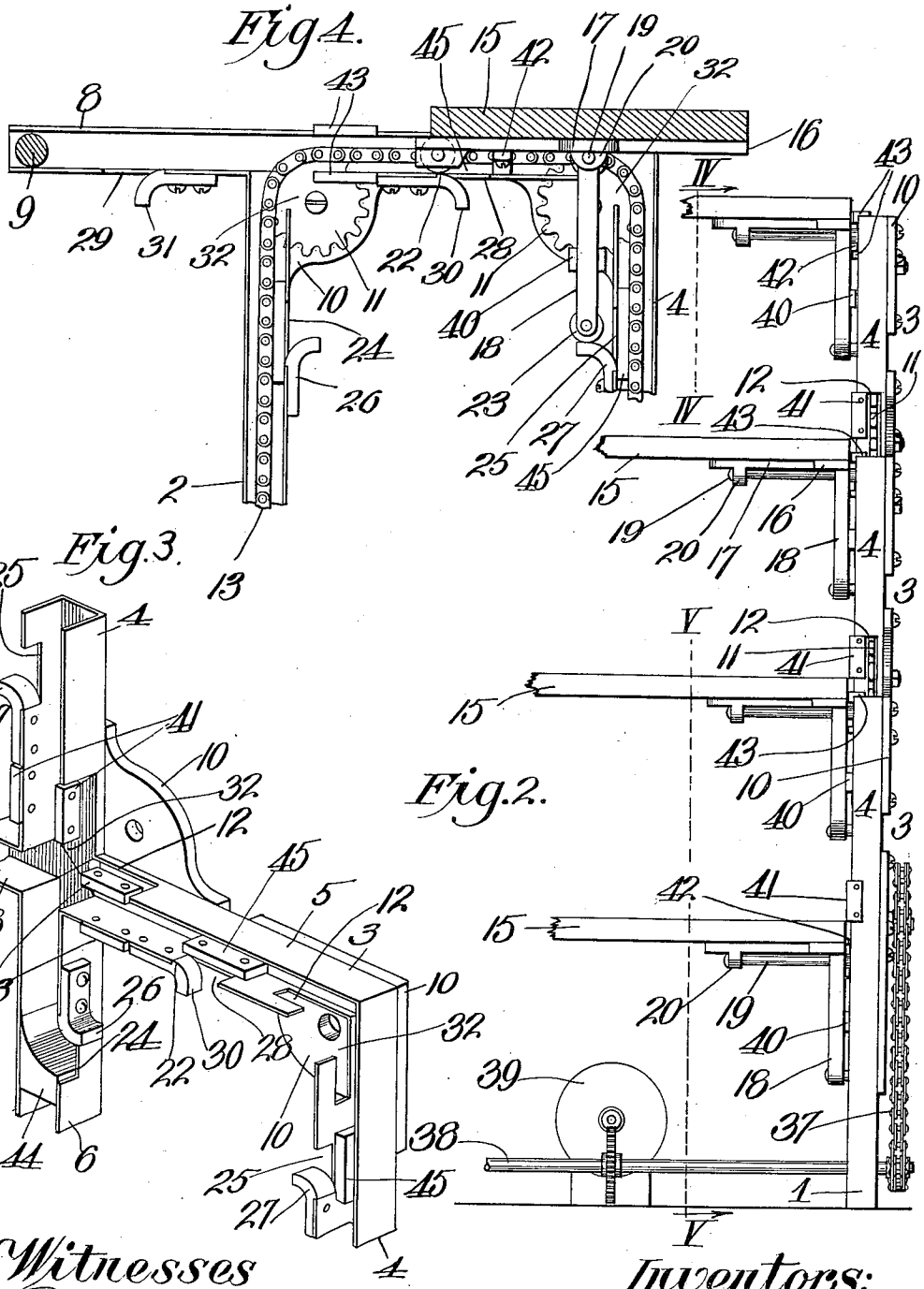


Fig. 3.

Fig. 2.

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3 SHEETS—SHEET 3.

Fig. 7.

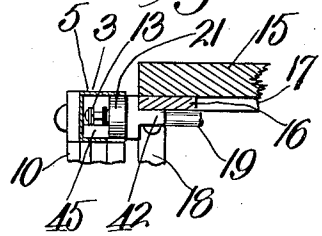


Fig. 5.

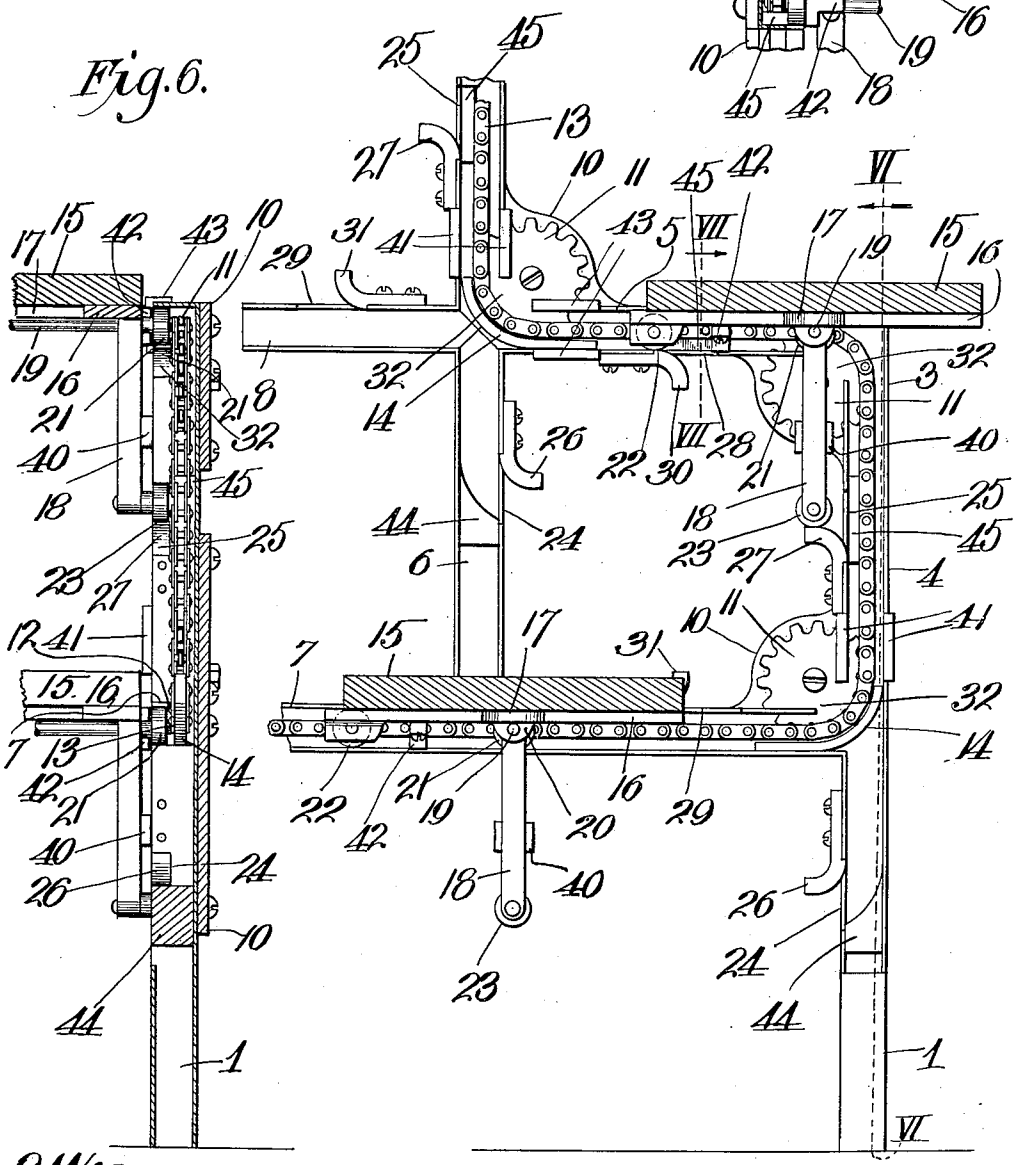


Fig. 6.

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UNITED STATES PATENT OFFICE.

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TRAVELING DISPLAY APPARATUS.

1,087,208. Specification of Letters Patent. Patented Feb. 17, 1914.

Application filed July 31, 1912. Serial No. 712,460.

To all whom it may concern:

Be it known that we, WILLIAM H. AVERY and WILLIAM E. PARKER, citizens of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Traveling Display Apparatus, of which the following is a specification.

This invention relates to traveling display apparatus, and has for its object to produce an apparatus whereby a large variety of goods may be displayed in a comparatively small space,—such as a show window,—in an attractive and efficient manner, and upon which the display may be changed expeditiously in whole or in part, without at any time leaving the window naked of display or curtaining the window.

With this general object in view, the invention consists in certain novel and peculiar features of construction and organization, as hereinafter described and claimed; and in order that it may be fully understood, reference is to be had to the accompanying drawings, in which:—

Figure 1, is a fragmentary front view of a traveling display apparatus embodying our invention. Fig. 2, is a fragmentary front view of the same. Fig. 3, is a fragmentary perspective view of the same. Fig. 4, is an enlarged vertical section taken on the line IV—IV of Fig. 2. Fig. 5, is a similar section taken on the line V—V of Fig. 2. Fig. 6, is a vertical section on the line VI—VI of Fig. 5. Fig. 7, is a vertical section on the line VII—VII of Fig. 5. Fig. 8, is a vertical section on the line VIII—VIII of Fig. 1.

In carrying out the invention, a skeleton frame is employed, consisting of two stair-like sides connected rigidly together, and each side is preferably constructed as follows:

1 and 2 are front and rear vertical standards respectively, and the upper end of standard 1 is connected to the upper end of standard 2, by steps 3, 4 and 5 indicating the riser and tread portions respectively, of said steps.

The riser portion 4 of the front or lowest step is preferably in vertical alinement with and forms an upward extension of standard 1, and the riser portions of the remaining steps are provided with vertically-depending portions 6, the depending portion 6 of the riser of the second step, being preferably secured at its lower end to a horizontal bar 7 connecting standards 1 and 2. The tread portions 5 of the steps are provided with rearwardly-projecting extensions 8 and bar 7 is provided with a corresponding extension. The two stair-like sides are rigidly connected together so as to constitute a frame, by cross rods 9, one of which connects the lower ends of a pair of the riser extensions 6, and the other connects the rear ends of the uppermost pair of tread extensions 8, and the parts 1, 2, 4, 5, 6, 7 and 8 are in the form of channel bars arranged with their channels facing inwardly.

10 are brackets secured to the outer sides of the channel bars at each bending point of the conveyer, hereinafter identified, and journaled on and at the inner sides of said brackets, are sprocket wheels 11, the adjacent sides of the contiguous channel bars being provided with slots 12 through which said sprocket wheels protrude into the communicating channels of the said channel bars.

There is an endless sprocket chain 13 extending through channel bars 2, 4, 5 and 7, of each side of the frame, which engages the sprocket wheels where they project into the tortuous channels constituted by said bars, and secured in the channels adjacent to the sprocket wheels which the chains underlie, are guards 14, whereby displacement of the chains from the said sprocket wheels, is prevented.

15 are traveling shelves arranged horizontally at uniform distances apart between and along the length of said chains, and secured to the underside of each shelf, at opposite ends thereof, is a pair of brackets, each consisting of a head 16 extending transversely of the shelf, a stem 17 extending longitudinally of the shelf, and a vertical arm 18 depending from the head midway the length thereof.

Extending longitudinally of each shelf are alined shafts 19, each secured at its outer end to one of the chains and journaled in the depending arm 18 and a depending lug 20 of one of the said brackets, and journaled on the outer ends of said shafts are rollers 21, similar rollers 22 and 23 being respectively journaled at the left-hand ends of the heads of the brackets and the lower ends of the depending arms thereof, and said rollers, at times, lie within the channels

of the frame, and to guard against tilting of the shelves, two sets of rollers being usually in engagement with the channels, the rollers 21 and rollers 23 when the shelf is moving upward or downward, and the rollers 21 and rollers 22 when the shelf is moving horizontally. At times it is possible for the shelves to tilt when two sets of the rollers are within the channels and special means, hereinafter described, are provided to guard against tilting of the shelves at such times.

The walls of the upright channels are formed with openings 24 through which the rollers 23 may enter the vertical channels, and have similar openings 25 through which said rollers emerge from the vertical channels, and secured to said walls adjacent openings 24, are curved guide plates 26, and to the side walls of the same channels adjacent openings 25, are secured curved guide plates 27, guide plates 26 being to insure the proper entrance of rollers 23 into the vertical channels and guide plates 27 to enable the said rollers to emerge from said channels, without any incidental tilting of the shelves.

The horizontal channels are provided with openings 28 through which rollers 22 may pass to enter the horizontal channels, and with openings 29 through which said rollers may emerge from said horizontal channels, and adjacent to openings 28 and 29 respectively, are curved guide plates 30 and 31 whereby tilting movement of the shelves is prevented as the rollers 22 enter or leave the channels, it being understood that the rollers 22 always enter horizontal channels as the rollers 23 emerge from vertical channels, and that the curved plates 26 and 31, and 27 and 30 coöperate together in maintaining the shelves in a horizontal position as the rollers 21 are changing their direction of travel by passing concentrically of the axis of one set of the sprocket wheels from vertical channels to horizontal channels or vice versa, and to accommodate this curved travel of rollers 21, the juxtaposed ends of the inner sides of communicating channels are preferably cut away as shown at 32.

For imparting travel to the chains, they are engaged by sprocket wheels 33 protruding into channels through openings 34 in one wall thereof, and said sprocket wheels are mounted on a shaft 35, journaled in suitable bearing plates 36 secured to the sides of the frame. A sprocket wheel 37 is secured to shaft 35, and power is transmitted to said wheel by a chain 38, leading from a sprocket wheel 39 on a counter-shaft 39^a driven by an electric motor 39^b, as shown, or by any equivalent means.

Assuming that the motor is started and that power is transmitted to the shaft 35 in the direction indicated by the adjacent arrow, Fig. 1, it will be seen that the chains are caused to travel in such a manner that the shelves in effect, ascend the steps of the frame.

The course of all of the shelves is similar and a detailed description of the operation of one shelf will therefore suffice. Assuming a shelf occupies a horizontal position between bars 7, it will be understood and seen by reference to the drawings, that the rollers 21 and 22 of the brackets attached to said shelf, are traveling in the channels of bars 7, and that the arms 18 of said brackets depend below said bars. In the operation of the chains, the shelf travels forwardly and as its rollers 21 pass out of channel bars 7, and into the riser channels of the first or lowest step, the rollers 23 pass under the curved guide bars 26 and through openings 24 into the depending portions of said risers. At the same moment the rollers 22 pass upwardly through openings 29 of bars 27, so that as the shelf changes its direction and starts vertically upward with its rollers 21 and 23 in the channels of the said risers and their extensions, the rollers 22 move vertically above openings 29. The upward movement of the shelf continues with only the rollers 21 and 23 guided, until the rollers 21 attain the horizontal plane of openings 25 of the first or lowest set of risers, at which time it would be possible for the shelf to tilt downwardly and forwardly because the rollers 23 at such time are opposite the communicating ends of channels 7, and to guard any possibility of such tilting action, the depending arms are provided with cross plates 40 which fit at such time, between a pair of parallel guards 41 projecting from the sides of the channels, as shown. The upward movement continues until rollers 22 enter the tread portions of the channels of the first step, through the openings 28, and at the same moment rollers 21 turn around the adjacent sprocket wheels, and rollers 23 move rearwardly and upwardly through openings 25 of the riser portions of said step. As this curved movement ends, the rollers travel horizontally rearward and the rollers 22 eventually attain the plane of the intersections of the channels of the tread of the first and the riser of the second step, at which time rollers 23 are unsupported. To guard against tilting movement of the shelf, at this time, the heads 16 of the brackets carrying the shelves, are provided with lugs 42 which lie in vertical planes between the sides of the frame and the arms 18, for engagement between a pair of guards 43 secured to and projecting inwardly from the upper and lower walls of the tread channel bars of the first step, the said lug fitting snugly between said plates and there-

fore guarding against tilting movement of the shelf as the rollers 22 pass the riser channels of the second step and into the extensions 8 of the tread channels of the first step. The rearward movement continues until the rollers 21 and the rollers 23 respectively attain the vertical plane of the said riser channels of the second step, the rollers 23 entering the depending portions 6 of said riser portions through the openings 24 thereof, it being understood that at the same moment the rollers 22 pass upwardly out of the tread extensions 8 through the openings 29 in the upper walls thereof. It will also be seen that at the time rollers 22 and 23 pass through openings 29 and 24 respectively, rollers 21 and the shelf travel upwardly into the riser channels of the second step on a curve determined by the diameter of the contiguous sprocket wheels 4. The course of the shelf as described with respect to the first step, is repeated with each of the other steps and from the top step it passes rearwardly until its rollers 22 enter the tread extensions 8 thereof, which extensions as distinguished from the other tread extensions 8, are provided with openings 29 in the lower walls of the channels, and at the junction of the upper step with the standard 2, the chains turn downwardly as shown in Fig. 4, it being understood that the rollers 23 enter the channel bars 2 through openings 24 therein as rollers 21 start downward into said channels and the rollers 22 pass out of the openings 29 of extensions 8. The shelf then continues downward until its course again changes, at the junction of bars 2 and 7, into a forward movement in the plane of bars 7, and as it thus changes its course, the rollers 22 enter the extensions 8 of the said bars through openings 28, in the top thereof and the rollers 23 pass out of openings 25 of standards 2, from which point of travel of the shelf, as traced, is repeated. It will be understood in this connection, that by the use of curved guide plates 26 and 27, of a radius corresponding to the radius of the curved portions of the chains, tilting or tiltable vibration of the shelves is absolutely prevented and there is no danger of an object being dislodged from a shelf, and that the speed of travel will be such that the conveyer can be started or arrested at any time without any danger of an object upon a shelf toppling over or falling from the shelf.

Within the channels provided with guide plates 26, are curved tracks 44, concentric with such plates 26, to prevent any jerking movement of the lower ends of the depending arms of the bracket-supporting shelves as the rollers 21 of such shelves start to travel upwardly into the riser portions of the steps, it being obvious that the rollers 23 as they enter openings 24 would be free to snap against the opposite walls of the channels as they enter the openings 24, if such tracks 44 were not provided. It will also be noticed that the channels are provided with plates 45 adjacent openings 25 and 28, to prevent the chains from swinging laterally or sagging and permitting rollers 21 to enter openings 25 or 28 in passing. The plates act as bridges to carry said rollers over said openings, because if they entered the same, the shelves would be jarred sufficiently perhaps, to disturb the displays upon the shelves.

It is contemplated in practice, to extend the structure from the basement below the floor of a display window or case, where the shelves can be draped out of sight of the public and where the window trimmer or draper can work to the best possible advantage with respect to convenience and rapidity. In this event the floor of the window will, of course, be provided with an opening through which the shelves may pass to the top of the lowest step, which step will preferably be a distance above the floor of a window slightly greater than the length of the depending arms of the shelves, so that in the first rearward movement of the latter, said arms will travel above the floor of the window. This avoids any necessity for providing slots in the floor of the window to accommodate the rearward travel of the depending arms of the shelves when the latter are moving rearwardly in the plane of the tread of the lowest step.

From the above description, it will be apparent that we have produced a traveling display apparatus embodying the features of advantage enumerated as desirable in the statement of the object of the invention and which may be changed in minor particulars without departing from the spirit and scope of the invention as defined in the appended claims.

We claim:

1. In a traveling display apparatus, a frame having stair-shaped guideways, flexible devices extending along said guideways, means for driving said devices, a shelf pivotally carried by and between said devices, means for maintaining said shelf horizontal during the horizontal travel of said devices, and independent means for maintaining the shelf horizontal during the vertical travel of said devices.

2. In a traveling display apparatus, a frame having stair-shaped guideways, flexible devices extending along said guideways, means for driving said devices, a shelf pivotally carried by and between said devices, means connected with the pivotal points of said shelf for maintaining it horizontal during the vertical travel thereof, and means connected with said shelf in horizontal alinement with said pivotal points for maintain-

ing the shelf horizontal during the horizontal travel of said devices.

3. In a traveling display apparatus, a frame having stair-shaped guideways, flexible devices extending along said guideways, means for driving said devices, a shelf pivotally carried by and between said devices, rollers connected with the pivotal points of said shelf in vertical alinement with said points, rollers journaled on said shelf in horizontal alinement with said points, and means connected with said guideways and coöperating with said rollers to maintain the shelf horizontal throughout the travel of said devices.

4. In a traveling display apparatus, a frame having stair-shaped channels, sprocket chains extending through said channels, sprocket wheels projecting into said channels at the bending points thereof and engaging said chains as guides therefor at said bending points, alined pins projecting horizontally toward each other from said chains, a shelf between the chains, brackets secured to the shelf and journaled on said pins, rollers mounted on said pins and running within said channels, a second set of rollers journaled on said bracket vertically below the first-named rollers and adapted to run in the vertical portions of the channels when the first-named rollers are traveling in said portions and to emerge from said channels, when said first-named rollers enter horizontal portions of the channels, and a third set of rollers journaled on said brackets in the horizontal plane of the first-named rollers and adapted to travel in horizontal portions of the channels when the first-named rollers are traveling in such portions, and to emerge from said channels when the said first-named rollers enter vertical portions of the channels.

5. In a traveling display apparatus, a frame having stair-shaped channels, sprocket chains extending through said channels, sprocket wheels projecting into said channels at the bending points thereof and engaging said chains as guides therefor at said bending points, alined pins projecting horizontally toward each other from said chains, a shelf between the chains, brackets secured to the shelf and journaled on said pins, rollers mounted on said pins and running within said channels, a second set of rollers journaled on said brackets vertically below the first-named rollers and adapted to run in the vertical portions of the channels when the first-named rollers are traveling in said portions and to emerge from said channels when said first-named rollers enter horizontal portions of the channels, a third set of rollers journaled on said brackets in the horizontal plane of the first-named rollers and adapted to travel in horizontal portions of the channels when the first-named rollers are traveling in such portions, and to emerge from said channels when the said first-named rollers enter vertical portions of the channels, and means coöperating with said second and third sets of rollers in holding the shelves horizontal as the chains carry them around said sprocket wheels.

6. In a traveling display apparatus, a frame having an angular guideway disposed in a vertical plane, a shelf carrying device traveling along said guideway, a shelf pivoted on said device, a pair of rollers carried by said shelf in vertical and horizontal alinement respectively with its pivotal point, and means carried by said frame for coöperating with said rollers to maintain the shelf horizontal throughout the travel of said device, each of said rollers traveling inoperatively during substantially the entire guiding movement of the other roller.

In testimony whereof we affix our signatures, in the presence of two witnesses.

WILLIAM H. AVERY.
WILLIAM E. PARKER.

Witnesses:
M. K. PRESTON,
G. Y. THORPE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."