July 24, 1934. P. J. SANDERS 1,967,843

DISPLAY APPARATUS

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Fig. 1

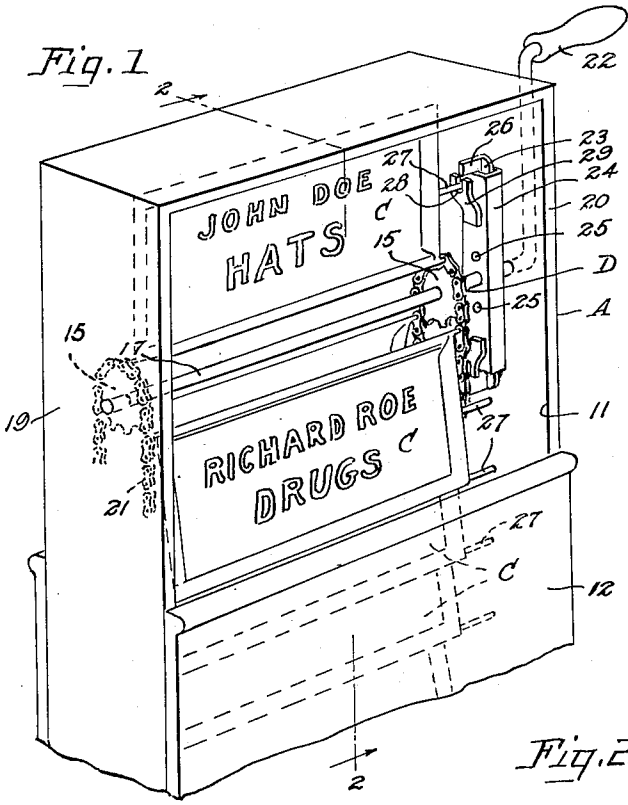


Fig. 2.

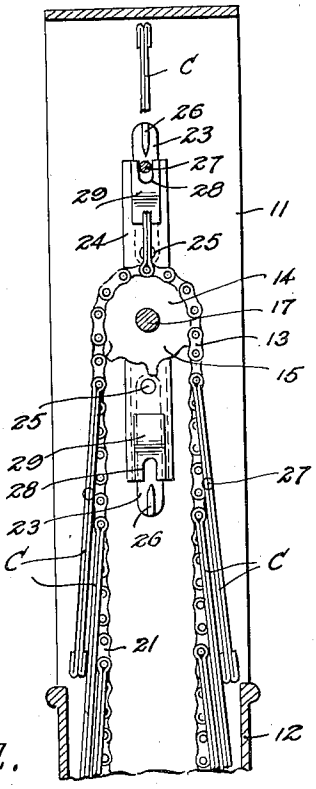
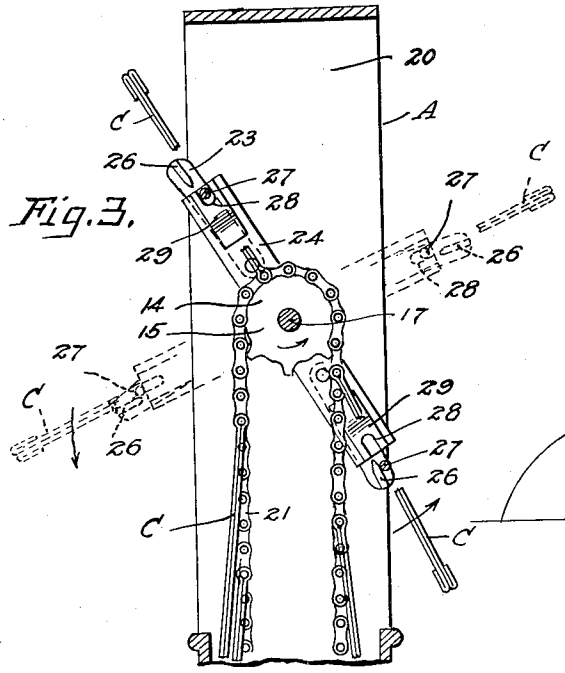
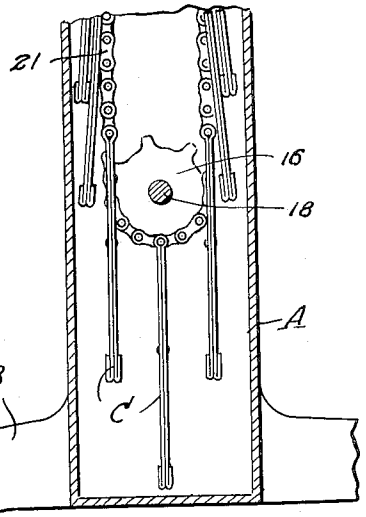


Fig. 3.





INVENTOR
Paul J. Sanders
BY Clark & Ott
ATTORNEYS

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Fig. 4.

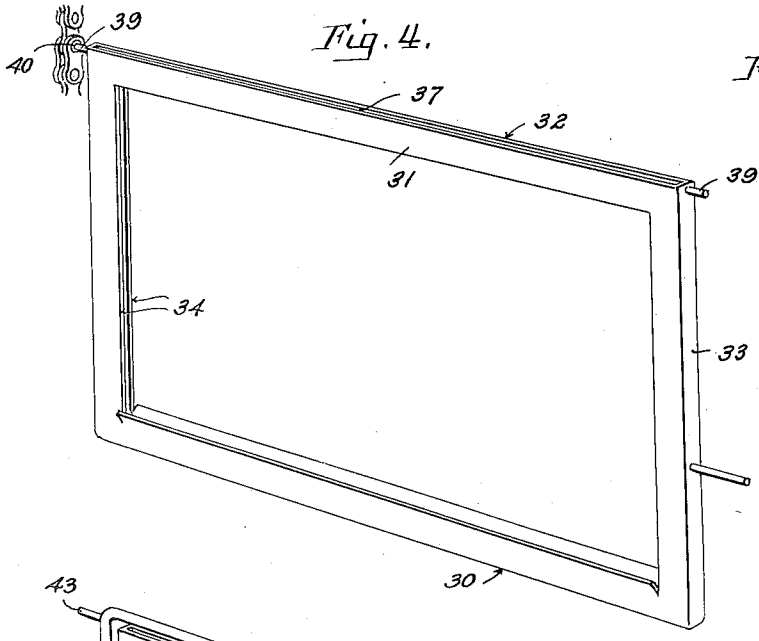


Fig. 5.

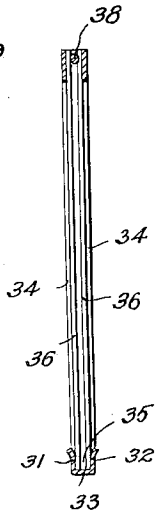


Fig. 7.

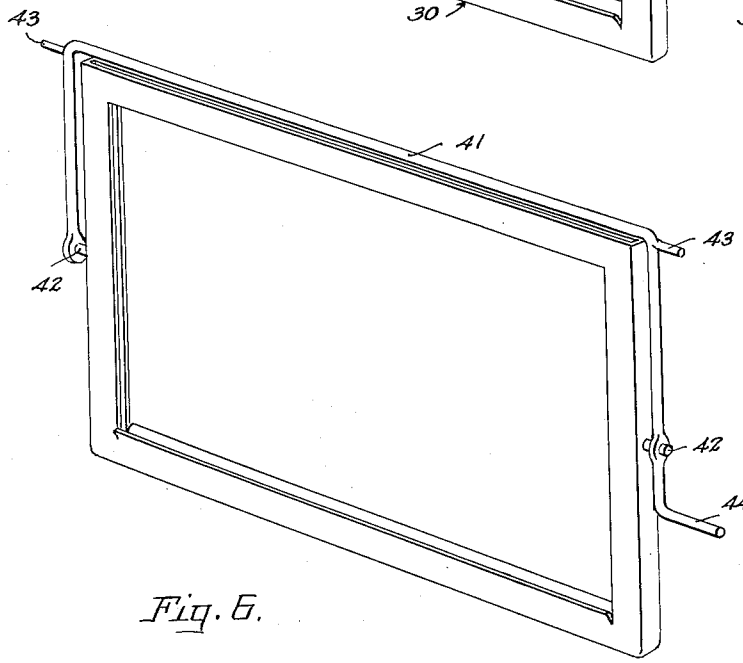
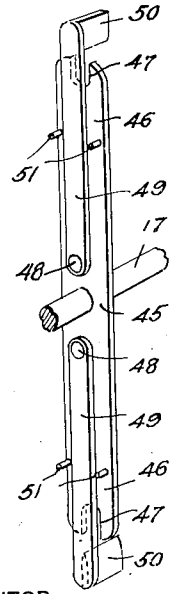


Fig. 6.



INVENTOR
Paul J. Sanders
BY
Clarke & Ott
ATTORNEYS

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DISPLAY APPARATUS

Paul J. Sanders, Maplewood, N. J.

Application September 23, 1933, Serial No. 690,647

15 Claims. (Cl. 40—104)

This invention relates generally to display apparatus of the type set forth in my co-pending application, Serial No. 607,953, filed April 28, 1932, which includes a driven flexible support upon which a plurality of display panels are swingably mounted to be moved by and with said support around a guide over which the support is trained and wherein the panels are successively displayed as they move around the guide.

The present invention is directed to an improved means which cooperates with each panel as it approaches during and as it recedes from a display position so as to effect the relative swinging of the panels into display position, to support each panel while being displayed, and to lower each panel from the display position to a dependent position, silently and without subjecting the panel to shocks and jars.

The invention further contemplates a flexible conveyor upon which a series of display panels are pivotally mounted for movement therewith around an arcuate supporting guide together with arms having pivoted carriers for successively swinging the display panels on their pivotal connection with reference to the flexible conveyor so as to elevate the same to a display position and to subsequently swing and lower the same from such display position to a depending position.

The invention further comprehends a display apparatus of the character indicated in which an adjacent pair of display panels are simultaneously exhibited in relative display positions and in which the display panels are successively moved from one display position in which one of the faces of each panel is exposed to view, to an adjacent display position in which the opposite face of each panel is exposed to view.

Other objects which fall within the purview of the invention are to provide a display device of the character indicated which is comparatively simple and not unduly complicated in its construction and mode of operation and which may be economically produced and is highly efficient for its intended purpose.

With these and other objects in view, the invention also resides in certain novel features and arrangement of parts which shall be more fully described and claimed hereinafter.

In the drawings;

Fig. 1 is a fragmentary perspective view of the upper portion of the display apparatus constructed in accordance with the invention.

Fig. 2 is an enlarged vertical sectional view therethrough taken approximately on the line indicated at 2—2 in Fig. 1.

Fig. 3 is a similar fragmentary view illustrating in full and broken lines the relative positions of the arms and display panels.

Fig. 4 is a perspective view of a panel frame constructed in accordance with one form of the invention.

Fig. 5 is a vertical sectional view therethrough.

Fig. 6 is a perspective view of another form of frame and mounting therefor.

Fig. 7 is a perspective view of a modified form of the arm structure.

Referring to the drawings by characters of reference, A designates a display frame or cabinet having a suitable base B which frame or cabinet houses a series of display panels C and the operating mechanism indicated generally by the reference character D which functions to move the panels C into and out of display position. The display frame or cabinet A is provided with a window opening 11 in the front wall 12 thereof, through which an adjacent pair of display panels C are visible, one in a dependent display position and the other in an upstanding display position when in registry therewith.

The operating mechanism D, for moving the display panels, includes a flexible carrier 13 upon which the panels C are pivotally mounted for movement therewith around arcuate guides 14, which, in the present disclosure are shown as pairs of sprockets 15 and 16 secured upon a pair of vertically spaced horizontally disposed rotatable shafts 17 and 18, which shafts are journaled in the opposite end walls 19 and 20 of the frame or cabinet A. As illustrated, the flexible carrier 13 consists of a pair of appropriately spaced endless sprocket chains 21 trained around the pairs of sprockets 15 and 16, one of which pairs of sprockets constitutes combined traction and guide means. The shaft 17 is provided with a crank-handle 22 secured to an end which projects from the cabinet to afford means for manually turning said shaft and its sprockets 15.

The display panels C, when in dependent position, are disposed in overlapping relation and are so spaced upon the sprocket chains 21 that when one of said display panels is being swung on its pivotal connection with the sprocket chains from the upstanding display position to a dependent retreating position, the next succeeding display panel is being swung upwardly on its pivotal connection from its dependent display position into the upstanding display position.

The means for swinging a display panel into and out of the upstanding display position, consists of a carrier bar 23 located within and projecting from the open end of an actuating arm 24 secured upon the shaft 17 and within which arm the said carrier bar 23 is pivoted on a fulcrum pin 25 for limited swinging movement of its projecting end, which end is provided with a lateral blade 26. The movement of the arm 24 with the shaft 17 is in timed relation with the movement of the display panels C and the sprocket chains 21 so that, when the arm 24 is being

lifted, the lateral blade 26 will engage beneath a projecting pin 27 secured to a side edge of the panel to swing the same on its pivotal connection and with reference to the sprocket chains 21 to the upstanding display position. As the panel approaches the horizontal position or reaches a point which is approximately 90° from the pendent position, the pin 27 will move into a detent slot 28 in the free end of a laterally offset finger 29 secured upon the arm 24 to thus couple the panel to the arm 24 during the final stage of its approach to the upstanding display position, while in the said display position and during its initial stage of its movement from the display position. When the arm 24 with the carrier bar 23 is moved past upper dead center, the carrier bar 23 will swing, by gravity, upon its fulcrum pin 25 to one side of the detent slot so as to be in a position to underlie the pin 27 as it moves out of the detent slot 28 and thereby support the panel during approximately the last 90° of its downward movement as the arm 24 descends.

The relative movements of the arm 24 and the panel pin 27, which causes the pin to engage with the detent slot 28, are due to the combined translatory and pivotal movements of the pin while the outer portion of the arm is traveling in a fixed arcuate path. Simultaneously, with the downward movement of said display panel from its upstanding display position, the next succeeding panel to be displayed is moved by the sprocket chain 21 into a position where its pin 27 is engaged by a blade 26 of a carrier bar 23 pivoted on an oppositely disposed arm 24 so that said panel is in turn swung on its pivotal connection while moving with the sprocket chains thereby bringing it to the upstanding display position in the manner described for the previous panel.

The display panel which bears the matter to be displayed may be of any desired type, but in the embodiment illustrated in Fig. 4, it includes a rectangular frame 30 having spaced front and rear walls 31 and 32, which are joined along three of their outer edges by a marginal wall 33 and which front and rear walls are cut away to provide aligned display openings 34. This construction provides a channel 35 between the said walls to receive and hold a pair of cards 36 bearing or inscribed with the matter to be displayed, which cards are inserted and removed through the open edge 37 of the panel frame. In order to hold the cards in position within the frame, and to prevent accidental or unintentional displacement thereof, the frame 30 is provided with a rod 38 extending through the channel 35 on one side of the frame adjacent to and in the path of the open edge 37 but spaced from the front and rear walls a sufficient distance to provide a clearance to admit of the insertion and removal of the cards and the disposal of the same on opposite sides of the rod 38. This construction allows for the ready insertion and removal of the cards. The terminals 39 of the rod 38 protrude from the sides of the panel frame and constitute trunnions which engage in openings 40 in the pintles of the sprocket chains.

The display panels C may be pivotally mounted in U-shaped yokes 41 on trunnions 42 secured to the side edges of each of the panel frames at the center thereof to allow turning of the panel frame on the trunnions so as to exhibit either face of the panel. As illustrated, in Fig. 6, the yoke 41 is provided with outwardly projecting pins 43 which pins engage in the openings 40 in the pintles of the sprocket chains to pivotally connect the display panels C with the sprocket chains when this form of mounting is employed. The terminal portion 44 of the yoke 41 is bent laterally providing a projection which is engaged by the carrier bar 23 and its arm 24 when the panel is swung on its pivotal axis into and out of upstanding display position.

In place of the tubular arm 24, a flat bar 45, as illustrated in Fig. 7, may be employed which bar is secured on the shaft 17 and provides a pair of diametrically disposed actuating arms 46 each of which has a detent slot 47 in its outer end, and pivoted to each of said arms on fulcrum pins 48 are carrier bars 49 which bars project beyond the end of their respective arms 46 and are provided each with a lateral blade 50 for engagement with the projecting pin 27 of the frame 30 or with the terminal portion 44 of the yoke 41 when the panel frame is mounted for turning movement in the said yoke. The bars 49 have limited swinging movement on their pivotal connection with the arms 46 respectively between a pair of pins 51 secured to each arm which pins form stops for limiting the movement thereof.

From the foregoing it is apparent that there is provided a display apparatus which successively moves a series of display panels into and out of display postions in one of which display positions the panels are disposed in dependent relation which exposes to view one face of each of the panels, and in the other display position, the panels are disposed in an upstanding relation which exposes to view the opposite face of each of the panels.

What is claimed is:

1. In a display device, the combination of a conveyor, a rotary support therefor, a display panel pivotally suspended upon said conveyor, an arm secured to said rotary support and a bar pivoted to said arm, said bar moving with said support in timed relation with said conveyor so as to engage and swing the panel on its pivot from a depending position upwardly towards an upstanding display position and to subsequently engage said panel after it has passed through the upstanding display position and to lower said panel gradually as it swings downwardly on its pivot to a depending position, while moving with the conveyor, and said arm moving in timed relation with the movement of said panel so as to engage with the same during its upward movement and to support the same through its upstanding display position.

2. In a display device, the combination of a conveyor, a rotary support therefor, a display panel pivotally suspended upon said conveyor, an arm mounted for rotary turning movement and a bar pivoted to said arm, said bar moving with the arm in timed relation with said conveyor so as to engage and swing the panel on its pivot from a depending position upwardly towards an upstanding display position and to subsequently engage said panel after it has passed through the upstanding display position to lower said panel gradually as it swings downwardly on its pivot to a depending position while moving with the conveyor and said arm moving in timed relation with the movement of said panel so as to engage with the same during its upward movement and to support the same throughout its upstanding display position.

3. In a display device, the combination of a conveyor, a rotary support therefor, a display panel carrier pivotally suspended therefrom, said panel carrier having a projection, an arm secured

to said rotary support, said arm having a detent slot in its free end, and a bar pivoted to said arm for limited swinging movement of its outer end with respect thereto, an offset portion at the outer end of said bar projecting beyond the free end of said arm, said arm and bar moving with said rotary support in timed relation with said conveyor so as to position the offset portion of said bar beneath the said projection as the panel carrier moves upwardly with said conveyor whereby the offset portion engages with said projection and swings the panel carrier on its pivot, from a depending position, upwardly towards an upstanding display position, for engagement of the projection within the detent slot of the arm, and for movement of the panel carrier into and through said upstanding display position, and said bar moving on its pivot with relation to said arm as it passes upper dead center into a position underlying the said projection, as the projection recedes from said slot, so as to lower the panel carrier gradually as it swings rearwardly on its pivot to a depending position.

4. In a display device, the combination of a conveyor, a rotary support therefor, a display panel carrier pivotally suspended therefrom, said panel carrier having a lateral projection, an arm mounted for rotary movement, said arm having a detent slot in its free end, and a bar pivoted to said arm for limited swinging movement of its free end with respect thereto, said arm and bar moving in timed relation with said conveyor so as to position the free end of the bar beneath said projection as the panel carrier moves upwardly with said conveyor, so as to engage and swing the panel carrier on its pivot, from a depending position, upwardly towards an upstanding display position for engagement of the projection within the detent slot of the arm for movement of said panel carrier into and through said upstanding display position, and said bar moving on its pivot with relation to said arm as it passes under dead center into a position underlying the said projection as the projection recedes from said slot, so as to lower the panel carrier gradually as it swings rearwardly on its pivot to a depending position.

5. In a display device, the combination of a conveyor, a rotary support therefor, a display panel pivotally suspended therefrom, said panel having a lateral projection, an arm secured to said rotary support, said arm having a detent slot in its free end, and a bar pivoted to said arm for limited swinging movement of its free end with respect thereto, said arm and bar moving with said rotary support in timed relation with said conveyor so as to position the free end of said bar beneath said projection as the panel moves upwardly with said conveyor whereby the free end of said bar engages with the projection to swing the panel on its pivot, from a depending position, upwardly towards an upstanding display position for engagement of the projection within the detent slot of said arm and movement of said panel into and through said upstanding display position, and said bar moving on its pivot with relation to said arm as it passes upper dead center into a position underlying said projection as the projection recedes from said slot with the movement of the panel with the conveyor from upstanding display position, so as to lower the panel gradually as it swings rearwardly on its pivot to a depending position.

6. In a display device, the combination of a conveyor, a rotary support therefor, a display panel pivotally suspended therefrom, said panel having a lateral projection, an arm secured to said rotary support, said arm having a detent slot in its free end, and a bar pivoted to said arm for limited swinging movement of its free end with respect thereto, said arm and bar moving with said rotary support in timed relation with said conveyor so as to position the free end of said bar beneath said projection as the panel moves upwardly to said conveyor whereby the free end of said bar engages with the projection and swings the panel on its pivot, from a depending position, upwardly towards an upstanding display position for engagement of the projection within the detent slot of said arm, for movement of said panel into and through said upstanding display position and said bar moving on its pivot with relation to said arm so as to pass from a position on one side of said slot to a position on the other side of said slot, to underlie the said projection as the projection recedes from said slot with the movement of the panel from upstanding display position, so as to lower the panel gradually as it swings rearwardly on its pivot to a depending position.

7. In a display device, the combination of a conveyor, a rotary support therefor, a display panel carrier pivotally suspended therefrom, said panel carrier having a projection, and an arm secured to said rotary support, said arm having a detent slot in its free end, a bar pivoted to said arm for limited swinging movement of its free end with respect thereto, an offset portion at the outer end of said bar projecting beyond the free end of said arm, said arm and bar moving with said rotary support in timed relation with said conveyor so as to position the offset portion of said bar beneath the said projection as the panel carrier moves upwardly with said conveyor whereby the offset portion engages with said projection and swings the panel carrier on its pivot, from a depending position, upwardly towards an upstanding display position, for engagement of the projection within the detent slot of the arm and movement of said panel carrier into and through said upstanding display position, and said bar moving on its pivot with relation to said arm so that the offset position of said bar passes from a position on one side of said slot, to a position on the other side thereof, to underlie the said projection as the projection recedes from said slot, so as to lower the panel carrier gradually as it swings rearwardly on its pivot to a depending position.

8. In a display device, the combination of a conveyor, a rotary support therefor, a display panel pivotally suspended therefrom, said panel having a projection, an arm secured to said rotary support, said arm having a detent slot in its free end and a bar pivoted to said arm for limited swinging movement of its outer end with respect thereto, an offset portion at the outer end of said bar projecting beyond the free end of said arm, said arm and bar moving with said rotary support in timed relation with said conveyor so as to position the offset portion of said bar beneath said projection as the panel moves upwardly with said conveyor whereby the offset portion engages with said projection and swings the panel on its pivot, from a depending position, upwardly towards an upstanding display position, for engagement of the projection within the detent slot of the arm, and movement of said panel into and through said upstanding display position, and said bar moving on its pivot with

relation to said arm as it passes upper dead center into a position underlying the said projection as the projection recedes from said slot, so as to lower the panel gradually as it swings rearwardly on its pivot to a depending position.

9. In a display device, the combination of a conveyor, a rotary support therefor, a display panel pivotally suspended therefrom, said display panel having a lateral projection, an arm mounted for rotary movement, said arm having a detent slot in its free end, and a bar pivoted to said arm for limited swinging movement of its free end with respect thereto, said arm and bar moving in timed relation with said conveyor so as to position the free end of the bar beneath said projection as the panel moves upwardly with said conveyor, so as to engage and swing the panel on its pivot, from a depending position, upwardly towards an upstanding display position, for engagement of the projection within the detent slot of the arm for movement of said panel into and through said upstanding display position and said bar moving on its pivot with relation to said arm as it passes upper dead center into a position underlying the said projection as the projection recedes from said slot, so as to lower the panel gradually as it swings rearwardly on its pivot to a depending position.

10. In a display device, the combination of a conveyor, a rotary support therefor, a series of display devices pivotally suspended therefrom, each of said devices having a projection, and means coacting with said projections and moved in timed relation with the conveyor, for successively swinging the display devices about their pivotal axes from a depending position to an upstanding position, and for controlling the downward movement of said devices about their pivotal axes, said means including an arm secured to and movable with said rotary support and a bar pivoted at one end to said arm and having a limited swinging movement with relation thereto, said bar engaging with the projection of a panel to swing said panel on its pivot upwardly with relation to the conveyor and to deliver the same to said arm for movement into and out of a display position, and said bar moving with relation to said arm as the arm passes upper dead center to underlie said projection as the panel descends to control the downward movement of the panel about its pivot.

11. In a display device, the combination of a conveyor, a rotary support therefor, a series of display devices pivotally suspended therefrom and means coacting with said display devices and moving in timed relation with the conveyor for successively swinging the display devices about their pivotal axes from a depending position to an upstanding display position and for controlling the downward movement of said display devices about their pivotal axes, said means including an arm secured to and movable with said rotary support and a bar pivoted at one end to said arm and having a limited swinging movement with relation thereto, said bar engaging with a display panel to successively swing the same on its pivot upwardly with relation to the conveyor to deliver the same to said arm for movement into and out of upstanding display position, and said bar moving with relation to said arm as the arm passes upper dead center into a position beneath the display panel as the panel descends to control the downward movement of the display panel about its pivot.

12. In a display device, the combination of a conveyor, a rotary support therefor, a series of display devices pivotally suspended therefrom and means coacting with said display devices and moved in timed relation with the conveyor, for successively swinging the display devices about their pivotal axes, from a depending position, to an upstanding position, and for controlling the downward movement of said devices about their pivotal axes, said means including a plurality of arms secured to and movable with said rotary support, and a plurality of bars each pivoted at one end to said arms respectively, and having a limited swinging movement with relation thereto, adjacent bars successively engaging adjacent display devices to swing the same on their axes respectively upwardly with relation to the conveyor, and to deliver the same into engagement with said arms respectively for moving the display devices into and out of upstanding display position and said bars moving with relation to said arms respectively as the arms pass upper dead center whereby adjacent bars successively engage beneath adjacent display devices as the same descend to control the downward movement of the same, about their pivotal axes.

13. A display device, including in combination, a display panel, a conveyor therefor to which the panel is pivoted, an arcuate guide around which the conveyor is trained, a driven rotary arm and an element carried by the arm for limited swinging movement with respect thereto, said arm and element being swingable in an arcuate path concentric to the guide, said element being adapted to be initially engaged with the display panel to swing the panel on its pivot from a depending position upwardly with reference to the conveyor, and means on the arm with which the panel is coupled and by which it is swung on its pivot through an upstanding display position.

14. In a device of the class described, the combination of a conveyor, a rotary support therefor, a plurality of display panels pivotally suspended upon said conveyor and means carried by and movable in a circular path concentric with said support for successively swinging said display panels from a depending position to an upstanding display position.

15. In a device of the character described, the combination of a conveyor, a rotary support therefor, a display panel pivotally suspended upon said conveyor, a hollow arm secured to said rotary support and a bar pivoted within said hollow arm and with its free end projecting through the open end of said arm, said bar moving with said support in timed relation with said conveyor so as to engage and swing the panel on its pivot, from a depending position upwardly towards an upstanding display position to subsequently engage said panel after it has passed through the upstanding display position and to lower said panel gradually as it swings downwardly on its pivot to a depending position while moving with the conveyor and said hollow arm moving in timed relation with the movement of said panel and so constructed as to engage with the same during its upward movement and to support the same through its upstanding display position.

PAUL J. SANDERS.