Aug. 19, 1941. C. H. WELCH 2,252,794

DISPLAY DEVICE

Filed Aug. 15, 1940

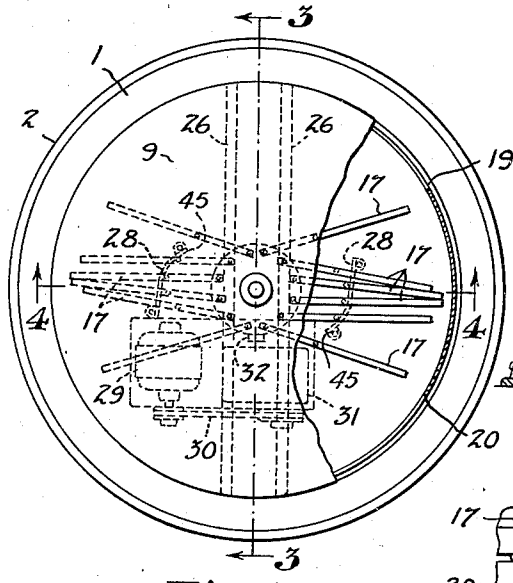


Fig. 1

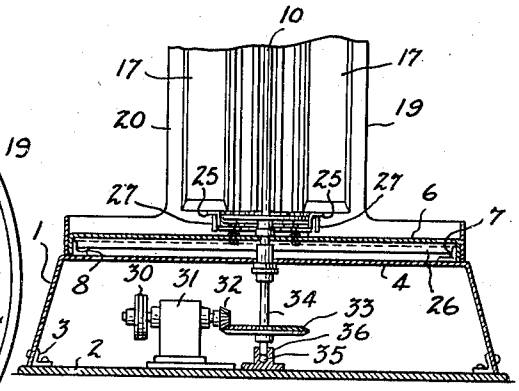


Fig. 3

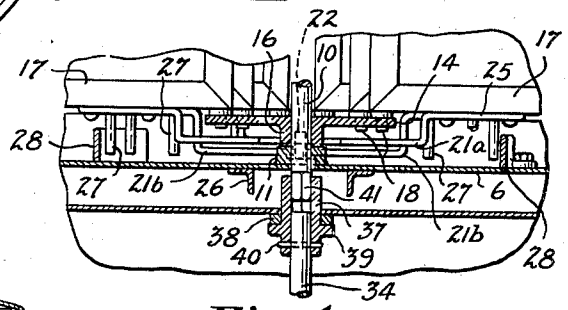


Fig. 4

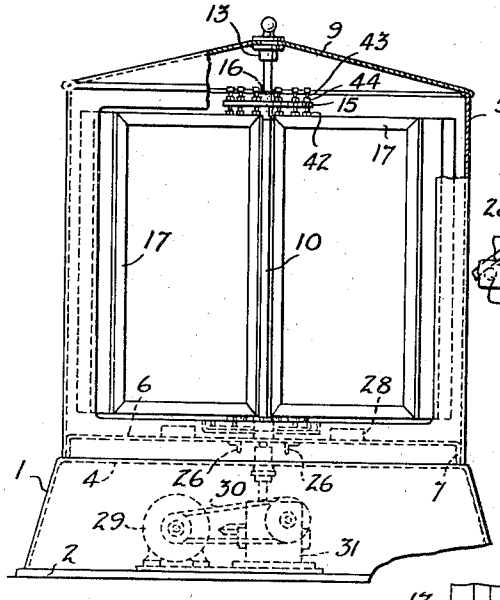


Fig. 2

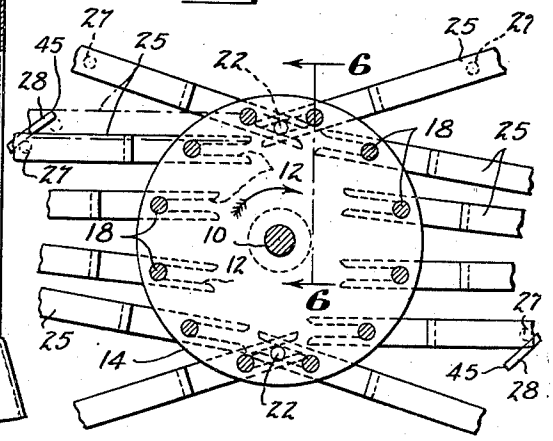


Fig. 5

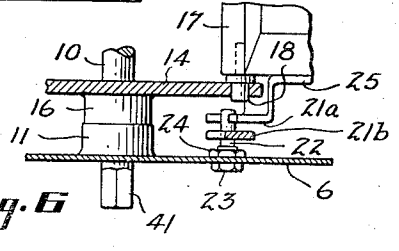


Fig. 6

INVENTOR
Charles H. Welch
BY Evans & McCoy
ATTORNEYS

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DISPLAY DEVICE

Charles H. Welch, Cleveland Heights, Ohio

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8 Claims. (Cl. 40—35)

This invention relates to display devices, and more particularly to displays in which frames for cards, photographs, and the like are pivotally mounted on rotatable carriers so that the cards can be successively moved into view for advertising purposes and the like.

Rotatable display devices are usually mounted in casings and provided with mechanisms for swinging the card frames from one side to another across suitable windows or openings in the casings so that both sides of each frame can be brought successively into view through the openings or windows. Numerous mechanisms for swinging the frames have been employed and have been found to operate with some degree of success. However, such mechanisms are frequently quite elaborate and expensive to manufacture, as well as being subject to misadjustment. It is therefore the principal object of the present invention to provide a generally improved rotary display device having simple and inexpensive means for swinging card frames so that both sides of the latter can be successively brought into view.

Another object is to provide an improved frame swinging mechanism for a rotary display device in which the frames are each released for swinging movement at approximately the same position or positions in their rotational cycle and in which the swinging movement of the frame is accurately controlled and restricted to a predetermined path or paths. More specifically, the invention aims to provide a frame swinging mechanism which incorporates slotted arms on the frames that are engageable with a stationary pin or pins so that the interaction of the pins in the slots controls and actuates the frames.

Another object is to provide an improved display device having a base portion to contain the drive mechanism and a top or casing which is removably mounted on the base and contains the rotary carrier with the swinging frames, there being provided a disconnectable drive between the drive means in the base and the rotary carrier in the casing which is automatically established upon assembly of the casng with the base.

Another object is to provide a display device having pivoted frames on a rotary carrier within a casing and a plurality of windows or openings in the casing across which each of the frames is adapted to be swung so as to successively present both sides of each frame to view through the several openings in the casings.

Another object is to provide a display device of the rotary type in which swingable frames are provided with bifurcated arms which engage a stationary pin that operates the arms as a lever to swing the frames, the arms being so arranged that a plurality thereof engage the pin simultaneously. Other objects and advantages will become apparent from the following detailed description of a suitable embodiment of the invention which is made in connection with the accompanying drawing, in which:

Figure 1 is a top plan view, with parts broken away, showing my improved display device;

Fig. 2 is an elevational view, with parts broken away, of the display device shown in Fig. 1;

Fig. 3 is a sectional view, with parts removed, taken substantially on the line 3—3 of Fig. 1;

Fig. 4 is a sectional detail on an enlarged scale illustrating the operating mechanism for swinging the frames;

Fig. 5 is an enlarged plan view, partly in section and somewhat diagrammatic, of the operating mechanism shown in Fig. 4; and

Fig. 6 is a sectional detail taken substantially on the line 6—6 of Fig. 5.

Briefly, the present invention contemplates a rotary carrier having card frames pivotally mounted thereon. Each frame has a bifurcated arm secured thereto and guides are provided to direct the movement of the frames so that the arms are received on and embrace stationary pins which actuate the arms to swing the frames from one side to another across suitable windows in the casing for the device. The casing is removably mounted on a pedestal or base and a disconnectable drive extends from the carrier to a suitable motor in the base so that the casing may be easily removed from the latter. Referring now to the drawings by numerals which indicate like parts throughout the several views, my improved rotary display device will now be explained in detail. The base or pedestal has an annular base side wall 1 which tapers toward the top. The side wall is supported on a platform 2, preferably being secured thereto by brackets 3. Across the top of the base is disposed a deck 4 which may be secured thereto by welding, or if desired, the deck may be integral with the side walls 1. For example, the base may be formed of sheet metal, such as steel, in a stamping operation wherein the sides 1 and deck 4 are formed from a single piece of metal.

Surmounting the base is an upright casing 5 of generally circular or cylindrical form. This casing is formed of sheet metal such as steel, although wood and similar materials can be em-

ployed. A bottom 6 in the casing 5 is formed with a circular peripheral flange 7 which is directed downwardly and is welded or otherwise secured to the inside of the casing circumferentially around the lower edge of the latter. As shown in Fig. 3, the bottom 6 of the casing is spaced above the top 4 of the base and is retained and centered on the base by suitable means such as an upstanding ring or bracket 8 which extends around the edge of the base top. Preferably, the bottom periphery of the casing embraces and has telescopic sliding engagement over the bracket 8 to facilitate removal of the casing from the base.

Surmounting the casing is a conical top or cover 9 which may be formed of sheet metal or similar material and is peripherally secured by welding or otherwise to the upper edge of the casing wall 5.

Extending vertically through the center of the casing is a rotatable carrier which includes a vertically disposed shaft 10 journaled at its bottom end in an opening formed in the bottom 6 of the casing. This opening may be reinforced by a ring or bushing 11 secured to the bottom 6, as by welding, to form a rigid bearing for the lower end of the shaft. The upper end of the shaft 10 is received in a socket or journal member 13 which is secured to the peak of the top 9. This member may be formed in separable halves which are disposed on opposite sides of the top and are connected together through a hole in the latter. Cross members 26, which may be in the form of angle irons, are secured to the underside of the casing bottom 6 adjacent to the opening for the shaft 10 for the purpose of strengthening the structure and supporting the weight of the carrier. Mounted on the shaft 10 for rotation therewith are lower and upper circular discs or rotors 14 and 15, respectively. These rotors are spaced apart vertically along the shaft and the lower rotor has a hub 16 which bears against the journal or bushing 11 to support the carrier in the housing and to prevent endwise movement of the shaft 10.

Extending between the discs or rotors 14 and 15 are a multiplicity of frames or holders 17 which carry pictures, photographs or other material to be displayed and which are provided with bottom pivots 18 received in suitable sockets or apertures formed in the disc 14 adjacent the outer margin of the latter. At the top of each frame is a socket element 42 which receives the end of a pivot screw 43 threaded downwardly through the upper disc 15 adjacent the periphery of the latter and secured in adjusted position by a lock nut 44. The pivots 18 and the screws 43 are vertically aligned with one another and spaced equidistant from the shaft 10 so that the pivots for the frames 17 travel in circular paths, or substantially so.

As shown in Fig. 2, the frames 17 are preferably of rectangular shape, although other forms and shapes may be used if desired. The socket 42 and the pivot 18 are disposed at the top and bottom ends respectively of one of the upright side pieces of each frame so that the frames are mounted for swinging movements on the pivots as they are rotated by the carrier.

Windows or openings, the edges of which are indicated at 19 and 20, are formed in opposite sides of the casing walls 5 so that the cards, pictures, or advertising material displayed in the frames 17 may be viewed through the openings or windows as the frames are successively moved thereacross.

Secured to each of the frames 17, preferably along the bottom edge thereof, is an actuating or swinging arm 25. Each of the arms 25 is formed with a bifurcated end portion which extends underneath the bottom rotor or disc 14 and beyond the circular path of the pivots 18 toward the axis or shaft 10 of the carrier. The end portions of the arms on adjacent frames are offset different amounts, providing one alternate series having offset portions 21*a* and another alternate series having offset portions 21*b*. In this manner, the bifurcated ends of the arms are prevented from engaging one another during the swinging of the frames, as will later appear. Elongated slots 12 are formed in the offset portions 21*a* and 21*b* of the arms and open through the free ends of the latter. These slots have sides that are parallel or approximately so, as shown in Fig. 5, and as the carrier is rotated, the slots receive stationary pins or fulcrum elements 22 secured to the bottom 6 of the casing. The pins 22 may be formed with heads 23 which seat against the underside of the bottom 6, the pins extending upwardly through suitable apertures in the bottom and threadedly receiving nuts or similar devices 24 which may be tightened against the top surface of the bottom 6 to hold the pins in place.

Preferably, the pins 22 are located opposite the centers of the openings 19 and 20 and are so arranged as to receive the slotted or bifurcated ends of the arms 25 before the corresponding frames commence their movement across the openings in the casing.

As the carrier is rotated slowly, as will be hereinafter described, depending abutment elements or fingers 27 secured to the frames 17 move into engagement with curved guide members 28 adjustably secured on the bottom member 6 of the casing. The guides 28 are curved or formed inwardly toward the axis of rotation of the carrier, as shown in Fig. 1. By this arrangement the rotary movement of the individual frames 17 is temporarily retarded so that they are confined to relatively narrow, circumferentially spaced portions of the casing 5, thus leaving clear the larger circumferential portions, opposite the openings or windows 19 and 20, for viewing of the cards or other material in the frames 17.

A drive for the rotary carrier is located within the base 1 and comprises an electric motor 29 mounted on the platform 2 and connected by a belt 30 to a speed reducing mechanism 31. A bevel gear 32 carried by a driven shaft of the speed reducer meshes with a horizontally disposed ring gear 33 secured on a vertical shaft 34. The bottom of this vertical shaft is supported on a ball 35 within a socket 36 carried by the platform 2 of the base. The upper end of the shaft 34 is received within a sleeve 37 journaled in an opening formed in the top 4 of the base. The top opening may be reinforced by a ring or bushing 38. A radial flange 39 formed on the sleeve 37 bears against the underside of the bushing 38 to prevent upward or axial shifting of the shaft 34 and the latter is drivingly connected to the sleeve by means of a pin 40. The upper end of the sleeve 37 is in the form of a square or rectangular socket which slidingly receives a mating non-circular or square end 41 formed on the bottom of the carrier shaft 10. In the assembly of the casing 5

on the base 1 the square end 41 of the carrier shaft is received within the socket of the sleeve 37 as the bottom end of the casing is telescopically fitted about the ring member or bracket 8. The assembly of the casing with the base automatically establishes a driving connection between the drive means in the base and the carrier in the casing. This arrangement is very advantageous because it permits the use of a number of casings with a single base, whereby different groups of pictures or advertising displays can be presented without the necessity for replacing the entire device or interchanging the different materials to be displayed in the frames 17.

In the operation of the device the rotary carrier in the casing 5 is turned slowly so that the discs or rotary members 14 and 15 make about one revolution in a period of several minutes. For example, in a display device having twelve of the frames 17, I prefer to rotate the carrier so that one revolution of the same is completed in about ten minutes, allowing approximately twenty-five seconds for viewing each side of every frame through the windows 19 and 20. As the rotation of the discs 14 and 15 draws one of the frames 17 toward one of the openings or windows 19 and 20, the abutment 27 on the frame engages one of the guides 28 and the rotary or swinging movement of the frame in the casing is thereby arrested or retarded. As the discs 14 and 15 continue to rotate slowly, the abutment or element 27 is drawn along the guide 28 toward discharge end 45 thereof, and the frames 17 rotate on the pivots 18 and 43 backward or in a reverse or counter-clockwise direction as viewed in Fig. 5. This pivoting of the frames swings the free or open ends of the offset bifurcated portions 21 of the arms one at a time into alignment with the pins 22. As the fingers or abutments 27 approach the discharge ends of the guides 28 and one of the frames 17 reaches the position indicated by the broken line 17*a* of Fig. 5, the open end of the slot 12 is received on one of the pins 22. Upon movement of one of the frames beyond the position shown by the broken lines 17*a* of Fig. 5, the finger abutment 27 thereof is released by the guide 28 and the continued rotation of the discs 14 and 15 causes the bifurcated end of the arm 25 to ride along one of the pins 22.

As shown in Fig. 5 and as previously mentioned, the pins 22 are disposed radially inward from the circular path of the pivots 18 toward the shaft 10 or axis of rotation of the carrier. Accordingly, as each of the frames 17 is advanced toward the center of one of the openings or windows 19 and 20, the distance between the corresponding pin 22 and the pivot 18 of the frame is progressively diminished so that the swinging of the frame by the movement of the bifurcated arm 25 in relation to the stationary pin 22 occurs most rapidly as the frame is moved across the central part of the window or opening. Thus, there is an acceleration of the individual swinging movement of the frames from the time they are released one at a time by the discharge ends of the guides 28 until they pass the centers of the openings or windows 19 and 20. There is then a deceleration of the swinging movement of the frames until the arms 25 are withdrawn from the pins 22.

In the movement of the frames 17 across the openings 19 and 20, the bifurcated ends of the arms 25 remain in engagement with the pins 22 so as to be guided thereby and so that the swinging movement of each frame is accurately controlled and timed. When a relatively large number of the frames 17 are mounted on a single carrier so that the frames are closely spaced, the slotted portion 21*a* or 21*b* of the arm 25 on the frame 17 about to be released by one of the guides 28, is received on one of the pins 22 before the slotted or bifurcated arm of the preceding frame has cleared the pin. Accordingly, and as illustrated in Figs. 5 and 6, a plurality of the bifurcated arms may be simultaneously received on and guided by a single one of the pins 22. In order that the ends of the arm 25 of different frames may not engage or interfere with the movement of one another, the portions 21*a* and 21*b* of the arms on adjacent frames are offset different amounts, as previously mentioned and as shown in Figs. 4 and 6. In the embodiment illustrated, the disposition and arrangement of parts is such that not more than two of the slotted arms 25 concurrently embrace either of the pins 22. Therefore, only two degrees or amounts of offset are provided for the arms 25. For example, one alternate series of the arms 25 may have the bifurcated portions 21*a* disposed in substantially a common plane and offset a relatively small amount, sufficient to clear the bottoms of the pivots 18, while another alternate set or series of the arms 25, which are attached to frames interposed between the frames carrying the first mentioned set of arms, have the bifurcated portions 21*b* disposed in another common plane and offset a relatively large amount. By this offset method a multiplicity of display frames may be mounted on a single carrier and all of the frames can be positively guided during their swinging movement across the windows or openings of the display casing. It is to be understood, of course, that where a greater number of frames are employed, additional offsetting of the bifurcated ends of the arms 25 may be required, depending upon the number of arms simultaneously engaged by the guide pins 22.

The principles of the present invention may be utilized in various ways, numerous modifications and alterations being contemplated, substitution of parts and changes in construction being resorted to as desired, it being understood that the embodiment shown in the drawing and described above is given merely for purposes of explanation and illustration without intending to limit the scope of the claims to the specific details disclosed.

What I claim is:

1. A display device comprising a casing having a window therein, a rotary carrier within the casing, a plurality of frames pivotally mounted on the carrier in radial relation, a pin parallel to the rotational axis of the carrier and spaced therefrom, and an arm secured to each frame and having a bifurcated portion arranged to straddle the pin to be actuated thereby, as the carrier is rotated, to swing the frames successively across the window, the bifurcated portions of the arms on adjacent frames being offset from one another longitudinally of the pin to permit simultaneous engagement of the pin by a number of the arms.

2. A display device comprising a casing having a window therein, a rotary carrier within the casing, a plurality of frames pivotally mounted on the carrier in radial relation, a pin parallel to the rotational axis of the carrier and spaced

therefrom, an arm secured to each frame and having a bifurcated portion arranged to straddle the pin to be actuated thereby as the carrier is rotated to swing the frame successively across the window, a guide supported adjacent the path of the frames, and means on each frame engageable with the guide and cooperable therewith to direct the bifurcated portion of the arm on the frame toward the pin.

3. A display device comprising a casing having a window therein, a rotary carrier within the casing, a plurality of frames pivotally mounted on the carrier in radial relation, a pin parallel to the rotational axis of the carrier and spaced therefrom, an arm secured to each frame and having a bifurcated portion arranged to straddle the pin to be actuated thereby as the carrier is rotated to swing the frames successively across the window, a guide supported adjacent the path of the frames, means on each frame engageable with the guide and cooperable therewith to direct the bifurcated portion of the arm on the frame toward the pin, the bifurcated portions of the arms on adjacent frames being offset from one another longitudinally of the pin to permit simultaneous engagement of the pin by a number of the arms.

4. A display device comprising a casing having windows in opposite sides thereof, a rotary carrier within the casing and means for actuating the same, a plurality of frames mounted on the carrier for pivotal movement about axes substantially equally spaced from and approximately parallel to the rotational axis of the carrier, a pair of pins disposed on opposite sides of the carrier axis and parallel thereto and between such axis and the path of the frame axes, and arms secured to the frames and having bifurcated end portions adapted to straddle the pins and to swing the frames forwardly across the windows in the direction of rotation of the carrier as the latter is actuated.

5. In a display device having frames pivotally mounted on a rotary carrier and means for actuating the carrier so that the frame pivots travel in a substantially circular path about the rotational axis of the carrier, the improvement which comprises a pin disposed between said path and axis, an arm secured to each frame and having an elongated slot which opens through one end thereof, a guide disposed on the opposite side of the path from the pin, and means on each frame engageable with the guide during part of the travel of the frame to control the pivotal movement of the latter and direct the open end of the slotted arm onto the pin, said pin and arms being adapted to successively swing the frames forward in the direction of rotation of the carrier during actuation of the latter.

6. A display device comprising a casing, a shaft journaled in the casing, means for rotating the shaft, a pair of discs secured on the shaft in spaced relation to one another, a plurality of frames disposed between the discs in radial relation about the shaft and having pivotal connection with the discs, arms secured to the frames and having free ends which extend inwardly beyond the edge of one of the discs toward the shaft and on the side of such disc opposite the frames, a stationary pin secured to the casing adjacent the last mentioned disc, and an elongated slot in each arm opening through the free end thereof and adapted to receive the pin, said pin being located closer to the shaft than the frame pivots whereby the arms slide over the pin during the rotation of the shaft and are guided thereby to swing the frames on the pivots forwardly one at a time in the direction of rotation of the shaft.

7. A display device comprising a casing, a shaft journaled in the casing, means for rotating the shaft, a pair of discs secured on the shaft in spaced relation to one another, a plurality of frames disposed between the discs in radial relation about the shaft and having pivotal connection with the discs, arms secured to the frames and having free ends which extend inwardly beyond the edge of one of the discs toward the shaft and on the side of such disc opposite the frames, a stationary pin secured to the casing adjacent the last mentioned disc, an elongated slot in each arm opening through the free end thereof and adapted to receive the pin, said pin being located closer to the shaft than the frame pivots whereby the arms slide over the pin during the rotation of the shaft and are guided thereby to swing the frames on the pivots forwardly one at a time in the direction of rotation of the shaft, a guide on the casing adjacent the path of the frames, and elements secured to the frames and engageable with the guide to retard the frames, said guide being disposed to direct the open end of the arm slot onto the pin and to release the frame for swinging motion subsequent to the movement of the arm onto the pin.

8. In a display device having a plurality of frames pivotally mounted on a rotary carrier and means for actuating the carrier, mechanism for swinging the frames comprising a stationary pin, an arm secured to each frame, and an elongated slot in each arm adapted to receive the pin, said pin being substantially parallel to the rotational axis of the carrier and offset from the path of the frame pivots so that it slides longitudinally in the arm slots and actuates the arms as levers to swing the frames forwardly in the direction of rotation of the carrier, the slotted portions of the arms on adjacent frames being offset from one another axially of pin to permit engagement of the pin simultaneously in a number of arm slots.

CHARLES H. WELCH.