Feb. 2, 1960 J. E. BOUCHARD 2,923,079

DISPLAY DEVICE

Filed Aug. 6, 1957 3 Sheets-Sheet 1

FIG. 1.

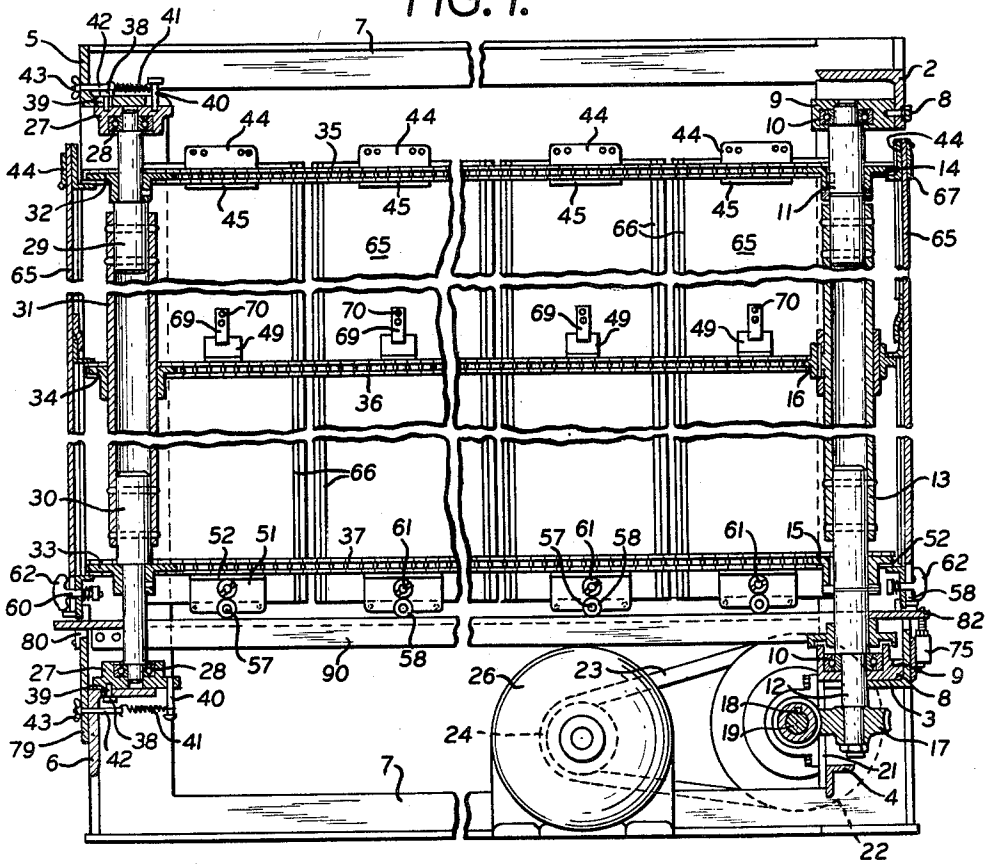


FIG. 2.

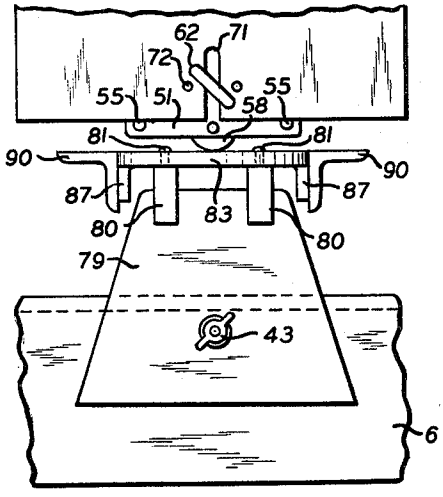
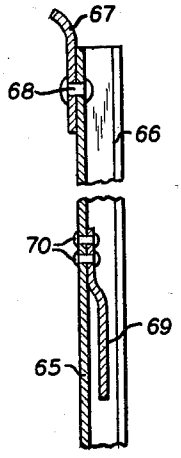


FIG. 4.



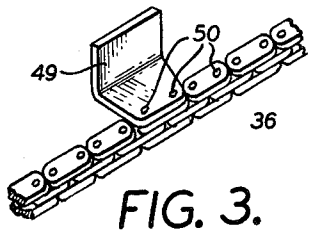


FIG. 3.

INVENTOR
JOSEPH EDGAR BOUCHARD
BY Hubbell and Cohen
ATTORNEYS.

Feb. 2, 1960 J. E. BOUCHARD 2,923,079

DISPLAY DEVICE

Filed Aug. 6, 1957 3 Sheets-Sheet 2

FIG. 5.

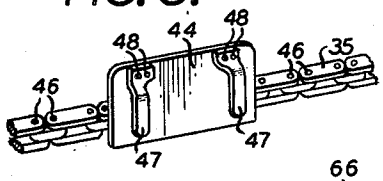


FIG. 6.

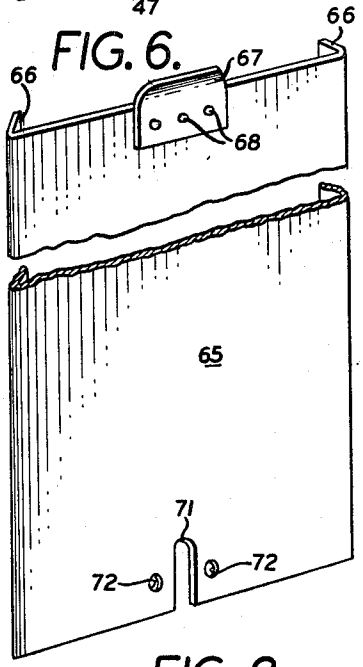


FIG. 7.

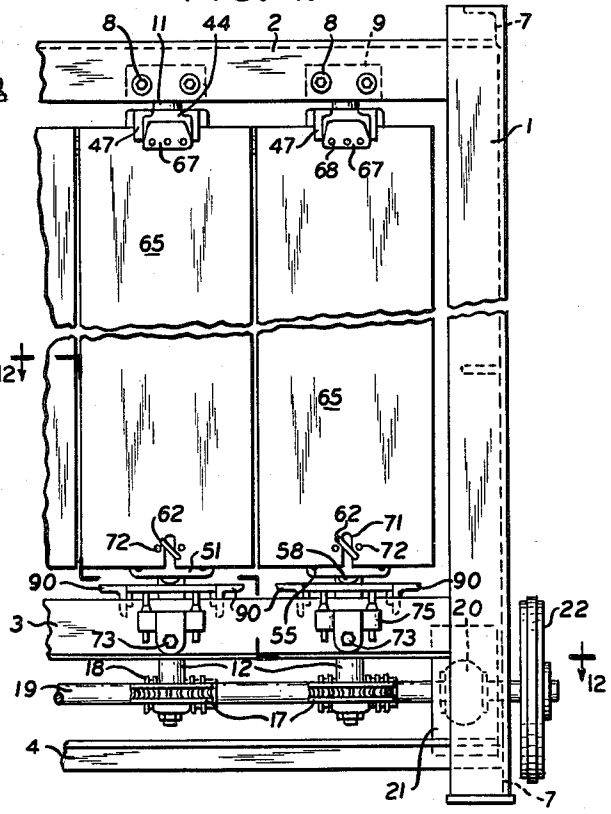


FIG. 8.

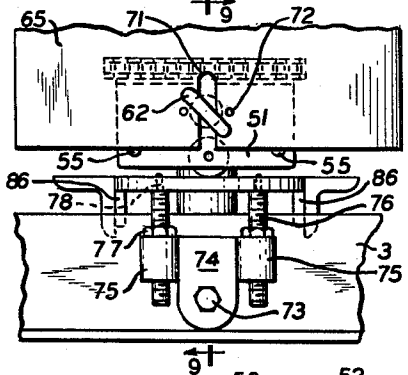


FIG. 9.

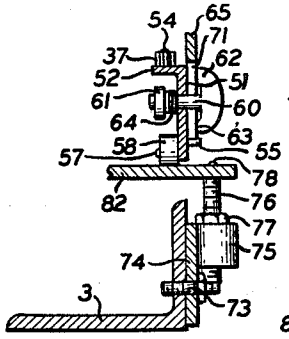


FIG. 10.

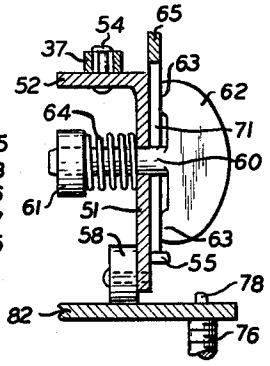
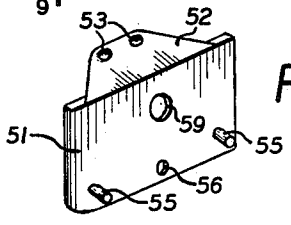


FIG. 11.



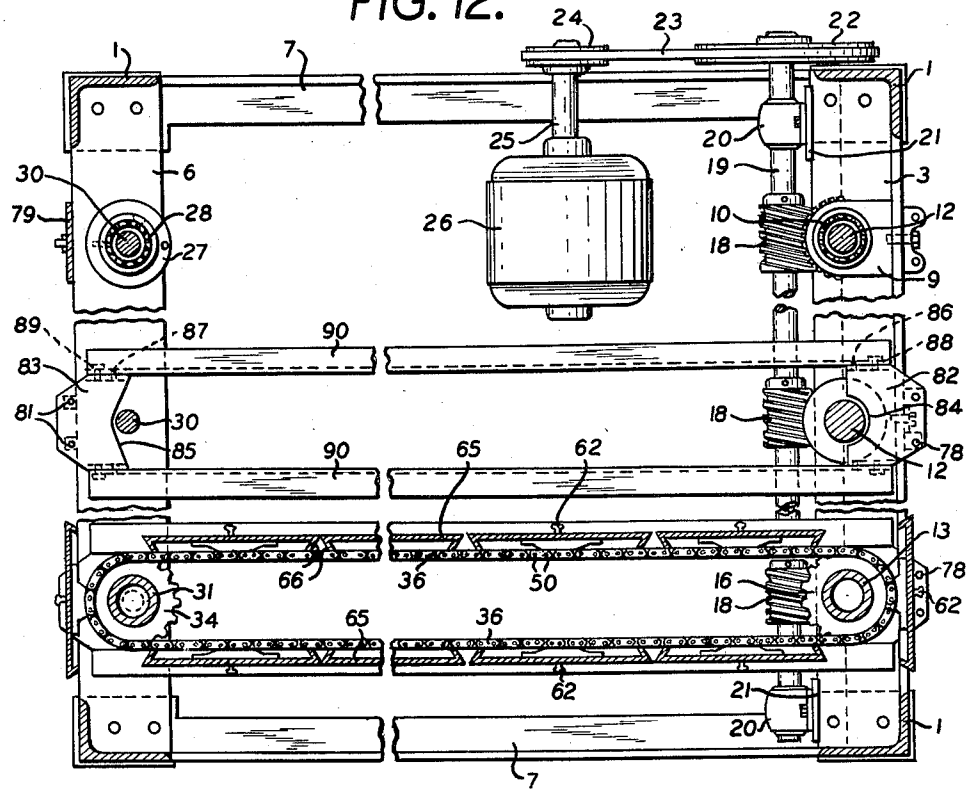
INVENTOR
JOSEPH EDGAR BOUCHARD
BY Hubbell and Cohen
ATTORNEYS.

Feb. 2, 1960 J. E. BOUCHARD 2,923,079

DISPLAY DEVICE

Filed Aug. 6, 1957 3 Sheets-Sheet 3

FIG. 12.



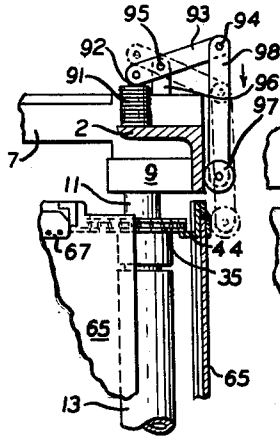


FIG. 13.

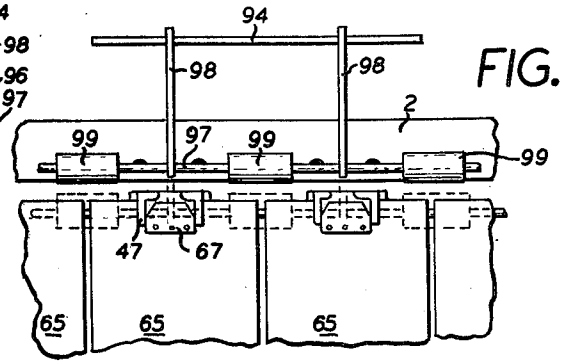


FIG. 14.

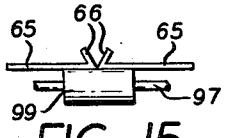


FIG. 15.

INVENTOR
JOSEPH EDGAR BOUCHARD
BY Hubbell and Cohen
ATTORNEYS.

United States Patent Office 2,923,079 Patented Feb. 2, 1960

2,923,079

DISPLAY DEVICE

Joseph Edgar Bouchard, Sillery, Quebec, Canada

Application August 6, 1957, Serial No. 676,516

3 Claims. (Cl. 40—32)

This invention relates to billboards and other display devices and particularly to billboards which are adapted to successively display a plurality of different advertisements.

One object of the present invention is to provide a new and improved multiple surface billboard which is adapted to successively display a plurality of different advertisements.

Another object of the present invention is to provide a new and improved billboard display which displays in successive order a plurality of different advertisements by successively moving into side-by-side relation a plurality of separate elements.

Still another object of the present invention is the provision of a billboard having several pluralities of elements which can be successively brought into side-by-side relation to successively display a number of different advertisements, said elements being readily removable for replacement with elements having different advertisements thereon.

The above and other objects, characteristics and features of the present invention will be more fully understood from the following description taken in connection with the accompanying illustrative drawings.

In the drawings:

Fig. 1 is a vertical transverse sectional view of a billboard embodying the present invention;

Fig. 2 is a fragmentary elevational view of a portion of the billboard shown in Fig. 1, illustrating in detail the means for supporting the elements on which are disposed portions of advertisements;

Fig. 3 is a fragmentary perspective view of one chain employed to successively move elements in the billboard shown in Fig. 1;

Fig. 4 is a fragmentary vertical sectional view of an element in the billboard shown in Fig. 1, which element is adapted to carry a portion of an advertisement;

Fig. 5 is a fragmentary perspective view of a portion of another chain employed to successively move elements in the billboard;

Fig. 6 is a perspective view of the element shown in Fig. 4;

Fig. 7 is a fragmentary front elevational view of the billboard embodying the present invention;

Fig. 8 is a fragmentary front elevational view illustrating in detail some of the features of the present invention;

Fig. 9 is a sectional view taken along the line 9—9 of Fig. 8;

Fig. 10 is a view similar to Fig. 9 but showing only a portion thereof and in enlarged scale;

Fig. 11 is a perspective view of one of the brackets adapted to connect an element to a movable chain;

Fig. 12 is a sectional view taken along the line 12—12 of Fig. 7;

Fig. 13 is a fragmentary view, partly in section and partly in elevation, illustrating means for aligning side-by-side elements;

Fig. 14 is a fragmentary elevational view of the top of the billboard illustrating other details of the aligning means shown in Fig. 13; and

Fig. 15 is an elevational view of one of the rollers shown in Fig. 14.

Referring now to the drawings in detail, the billboard embodying the present invention comprises a framework formed of four vertical members or corner posts 1 arranged in a rectangle. The two front vertical members 1 are connected at the top by an angle iron 2 and adjacent the bottom by two horizontal angle irons 3 and 4, angle iron 4 being disposed at the bottom of front vertical members 1 and angle iron 3 being parallel to angle iron 4 and being spaced upwardly therefrom. The rear vertical members 1 are connected at the top by a horizontal angle iron 5 and near the bottom by another horizontal angle iron 6. The front and back corner posts are connected at their tops and bottoms by four angle irons 7 which define the sides of the billboard. All of the frame members 1 through 7 are preferably connected to one another as by welding although rivets, nuts and bolts or other means may be employed to connect the framework together.

Fixed to the bottom of the framework is a motor 26 having an output shaft 25 on which is mounted a pulley wheel 24. A continuous belt 23 extends over the pulley wheel 24 and over a horizontally spaced pulley wheel 22 which is mounted on a shaft 19. Shaft 19 is journalled in bearings 20 carried by the bottom member 7. Shaft 19 extends parallel to the front surface of the billboard and along the bottom thereof. Mounted on the shaft 19 for rotation therewith is a plurality of worms 18. In meshed relation with the worms 18 is a plurality of worm wheels 17, each of which is carried by a vertically extending spindle 12 which is mounted in a ball bearing 10 carried in a pillow block 9 which is fixed to the angle iron 3. Each spindle 12 is fixed to a hollow tubular shaft 13 which is in turn fixed at its upper end to a spindle 11. Each spindle 11 is mounted in a ball bearing 10 carried by a pillow block 9 which is fixed by screws 8 to angle iron 2. It will be understood, of course, that the spindles 11 and 12 and the tubular shaft 13 can be integrally formed as single shafts since they rotate in unison. It will also be understood that there are a plurality of vertically extending rotating assemblies 11, 12 and 13, one for each worm and worm wheel. Each spindle 11 carries a horizontally disposed sprocket 14, each spindle 12 carries a horizontally disposed sprocket 15 and each tubular shaft 13 carries a horizontally disposed sprocket 16.

With the construction just described, when motor 26 is energized it will impart rotary movement to pulley 24 through rotating output shaft 25 and, accordingly, pulley wheel 22 will rotate due to the movement of belt 23. With pulley 22 rotating, horizontal shaft 19 will rotate about its longitudinal axis and through the means of the worm and worm wheels 18—17, each of the vertical assemblies 11, 12 and 13 will rotate to rotate their associated sprockets 14, 15 and 16. Since all of the gear ratios are the same, all of the sprockets on all of the vertically extending rotatable shaft assemblies will rotate at the same speed.

Adjacent the rear of the framework and mounted on horizontal members 5 and 6 are a plurality of pairs of bearings 27 which are in alignment with bearings 10. Each pair of bearings 27 have rotatably mounted therein top spindles 29 and bottom spindles 30 which are connected by tubular shafts 31. Of course, spindles 29 and 30 and shaft 31 can all be integrally formed. Mounted on each of the spindles 29 and 30 and each hollow shaft 31 are sprockets 32, 33 and 34, respectively, all of which are in alignment with sprockets 14, 15 and 16, respectively. Each of the sprockets 14 and 32 are connected for simultaneous rotation by an endless chain 35; each of the center sprockets 16 and 34 are connected by an

endless chain 36; and each of the lower sprockets 15 and 32 are connected by an endless chain 37. As will be noted from a perusal of Figs. 1 and 12, chains 35, 36 and 37 appear in sets, and there are as many sets as there are side-by-side elements 65 necessary to make up a display, as will become clear hereinafter. To provide for proper tensioning of endless chains 35, 36 and 37, bearings 27 are movably mounted on angle irons 5 and 6 as by screws 40 which pass through slots 39 in angle irons 5 and 6. The slots extend in a horizontal direction whereby to permit horizontal movement of the bearings. The bearings are biased toward the rear of the billboard by tension springs 41 which are connected at one end to screws 40 and at the other end to screws 42 which are fixed to angle irons 5 and 6 by any suitable means such as wing nuts 43.

Fixed to each endless chain 35 at equal distances are a plurality of brackets 44, one of which is illustrated in detail in Fig. 5 of the drawings. Each bracket 44 comprises a vertically extending plate portion having a horizontally directed tongue 45 which is fixed to one of the rollers 46 of chain 35 in any suitable manner such as by riveting. The vertical plate portion of each bracket 44 has two outstanding resilient tongues 47 riveted thereto at the top. The reason for these spring tongues will become apparent as this specification progresses. Fixed to each endless chain 36 are a plurality of spaced angle brackets 49, one of which is illustrated in detail in Fig. 3. The manner of securement of the brackets 49 may be any suitable manner such as, for instance, by riveting to two adjacent rollers 50 of the chain 36. Each bracket 49 is in vertical alignment with a bracket 44 on the associated chain 35. Fixed to each chain 37 are a plurality of spaced brackets 51, one of which is illustrated in detail in Fig. 11. Each bracket 51 has a downwardly directed plate portion and a horizontal tongue 52, the latter of which may be connected to a chain 37 in any suitable manner as by rivets which pass through two holes in tank 52 and are connected to two adjacent rollers of chain 37. At the two bottom corners of the vertical portion of each bracket 51 are fixed two horizontally extending pins 55 and between said pins is provided a small aperture 56. Disposed above aperture 56 in the vertical part of bracket 51 is a large aperture or hole 59. The brackets 51 mounted on each chain 37 are in vertical alignment with brackets 44 and 49. The manner of movably securing an element 65 to the endless chains 35, 36 and 37 for movement therewith is through the medium of the brackets 44, 49 and 51, as will be described below.

Referring now to Figs. 9 and 10, a bolt 60 extends through aperture 59 in the vertical portion of each bracket 51 with the head 62 of the bolt bearing against one surface of the vertical portion of bracket 51. Head 62 of bolt 60 is a half disc having bearing protuberances 63. The opposite end of bolt 60 is threaded and is threadedly connected to a nut 61 so as to hold in compression a spring 64 which surrounds the shank of the bolt and is disposed between the nut 61 and the vertical portion of bracket 51. In this manner the head 62 is biased by the spring 64 in the direction of the vertical portion of bracket 51.

The elements 65 on which the advertisements are to be affixed are plate-like and may be made of any suitable material such as metal. If made of metal, the element may take the form shown in Fig. 6, wherein the vertical edges of the element 65 are bent rearwardly to form flanges 66. The flanges 66 provide additional rigidity for the element 65. Fixed to the upper portion of each element 65 as by rivets 68 is a plate 67. As shown in Fig. 4, plates 67 are curved at the upper portion thereof. Still referring to Fig. 4, fixed to an intermediate part of each element 65 is a spring tongue 69. The manner of securement may be by welding or as shown herein, by rivets. Other suitable securing means may be employed. Adjacent the lower edge of each element 65 and centrally thereof is a vertically extending slot 71 which is flanked on each side by apertures 72. The spacing of the bracket 67, the spring tongue 69 and the slot 71 is identical with the spacing of the brackets 44, 49 and 51 whereby to provide for the connection of each of the elements to its associated brackets in the following manner. The curved bracket 67 fits between the spring tongues 47 and the vertical plate portion of the bracket 44. The vertical portion of the bracket 49 fits between the spring tongue 69 and elements 65. The slot 71 receives a portion of the shank of bolt 60 and the head 62 of said bolt extends transversely of the slot whereby to cause the bearing portion 63 of the head of the bolt to bear against the front surface of element 65 and bias the rear surface of the element into engagement with the vertical portion of bracket 51. It will be seen that the several means for connecting the element to its associated brackets permit for some vertical movement of the element. Accordingly, the element will tend to move downwardly and the bottom edge thereof will rest on the pins 55 secured to the vertical portion of the bracket 51.

It will be understood that each set of endless chains 34, 35 and 36 is operatively connected to a plurality of vertical side-by-side elements 65, each of said elements being substantially identical in construction and each of said elements being connected to each set of chains in precisely the same manner as has been described above with regard to one of said elements.

The elements 65 carried by each set of chains 35, 36 and 37 are rotatably supported adjacent their bottom edges to permit for ready movement of the elements in the path defined by the sets of chains. The supporting means is in the form of a track or rail having two elongated transversely extending portions made by the angle irons 90 and two short longitudinally extending portions made by plates 82 and 83. Plates 82 are each supported by two rods 76 which are carried by two cylindrical portions 75 of a bracket 74. Brackets 74 are fixed to the angle iron 3 as by bolts 73. The rods 76 are preferably threadedly connected to the cylindrical portions 75 and are vertically adjustable relative thereto and may be locked in any vertical position as by lock nuts 77. Accordingly, the vertical position of plate 82 may be adjusted. It will be seen that plate 82 extends parallel to the front surface of the billboard or longitudinally of the billboard. The extent of this dimension is approximately the width of an element 65. Each plate 83 adjacent the rear of the billboard is supported by two blocks 80 which are fixed to a vertically extending plate 79 which is connected to the bottom rear angle iron 6 as by the wing nuts 43 which also connect springs 41 to said angle iron. Extending between the corresponding edges of each pair of plates 82 and 83 are two parallel angle irons 90 which form the long legs of the track for rotatably supporting the elements.

Each bottom bracket 51 for operatively connecting each element 65 to its associated bottom chain 37 has rotatably mounted thereon a roller or wheel 58 which is mounted on said bracket 51 by an axle 57 extending through the small central aperture 56 in the bracket 51. Rollers 57 engage the upper surfaces of the plates 82 and 83 and the angle irons 90 whereby to facilitate the movement of the elements in the manner described herein. It will be seen that by providing for vertical adjustment of the plate 82, the vertical disposition of each track can be adjusted to insure positive rolling support for the elements associated with said track.

As is shown clearly in Fig. 7, a billboard embodying the present invention includes a number of sets of vertically spaced chains, each of said sets being horizontally spaced from one another. Each of the sets of chains has connected thereto a plurality of side-by-side vertical elements 65 and the disposition of the elements 65 on their associated sets of chains is such that when an element on one set of chains is moved to the front of the bill-

board corresponding elements on each of the other sets of chains are also moved to the front of the billboard. Moreover, each of the elements in the front of the billboard are disposed in the plane of the front surface of the billboard so as to define together a single plane. When the sprockets which move the sets of chains in unison are operated, the elements in the front surface of the billboard are moved out of said front surface and the next adjacent elements on each set of chains are moved into said front surface to form a new group of coplanar elements all disposed in the front surface of the billboard. With proper ornamentation of each of the elements carried by each set of chains, a plurality of different advertisements can be successively displayed by different sets of elements, each one of said elements being moved by a different set of chains.

Means are provided for automatically actuating motor 26 to cause simultaneous action of each of the sets of chains so as to automatically shift one set of elements 65 out of the front surface of the billboard and the next adjacent group of elements into said front surface of said billboard so that a new advertisement may be displayed, deactuating the apparatus for a predetermined time interval and thereafter reactuating the apparatus to again shift the elements so as to bring a new advertisement into sight. Due to the rolling support that each of the elements is provided with by the rollers 58 bearing against the plates 81 when the element is at the front of the billboard, plate 83 when the element is disposed at the rear of the billboard and transverse angle irons 90 when the element is intermediate front and rear, little power need be expended for shifting from one advertisement to another.

To insure substantially perfect alignment of side-by-side elements at the front of the billboard, the angle iron 2 is provided with at least one solenoid 91 having its armature 92 pivotally connected to a beam 93 which is in turn pivotally connected to a horizontal rod 94. Beam 93 is pivotally connected intermediate its ends as at 95 and preferably is pivotally connected at a point closer to the beam's connection with the armature than with the beam's connection with rod 94. Depending from rod 94 are a plurality of strips 98 which are connected at their lower ends to a horizontal rod 97 which has mounted thereon a plurality of flat rollers 99. The rollers 99 through the hereinbefore described linkage, are movable to and from a position in which they are in rolling engagement with angle iron 2 and to and from a position in which they are in engagement with two side-by-side elements 65, the rollers in said latter position straddling the small space between two side-by-side elements. Timing means are provided so that the solenoid is normally energized to move the rollers to the position in which they overlie angle iron 2. However, upon a set of elements being moved into coplanar position at the front of the billboard, the timing mechanism deactuates the motor to stop movement of said elements and at the same time deenergizes the solenoid to release the armature so that it may move upward. Upward movement of the armature 92 causes downward movement of the rollers 99 to overlie two side-by-side elements 65 whereby to positively align said elements so that the front of the billboard appears to be one continuous surface. Upon reactuation of the motor to move one set of elements out of the front surface of the billboard and another set of elements into said front surface, the solenoid becomes energized to withdraw the rollers from their overlying position and thereby permit movement of the elements as hereinbefore described.

Although I have herein shown and described the preferred embodiment of the present invention, it will be understood that various changes and modifications may be made therein within the scope of the appended claims without departing from the spirit and scope of this invention.

Having now described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A display device comprising a plurality of movable juxtaposable elements, and a framework and a plurality of vertical axles aligned in the front and back of said framework and mounted thereat, said axles each bearing an upper and a lower sprocket connected by a pair of endless chains, each of said chains bearing attachment means to removably mount said elements on said chains, means for periodically rotating said aligned vertical axles to periodically move at least one of said elements into and out of juxtaposition with another of said elements, and means movable into and out of engagement with said juxtaposed elements for at times holding said elements in juxtaposition and for at other times releasing said elements for movement out of juxtaposition, and means operable in timed relation with said axle rotating means for moving said holding means into holding engagement with said elements upon said elements being moved into juxtaposition and out of holding engagement immediately prior to said elements being moved out of juxtaposition.

2. A display device comprising a plurality of sets of a plurality of movable display elements, one display element from each set being associated with a display element from each other set so that when said associated elements are in side-by-side relation they define a display, and means for successively moving each group of associated display elements into side-by-side relation for a predetermined time interval, and means movable into engagement with a pair of associated adjacent display elements for holding the latter in side-by-side relation for said predetermined time interval and then movable out of engagement to permit the movement of said associated side-by-side elements out of side-by-side relation and to permit adjacent elements in each set to move into side-by-side relation.

3. A display device comprising a plurality of movable juxtaposable elements, and a framework and a plurality of vertical axles aligned in the front and back of said framework and mounted thereat, said axles each bearing an upper and a lower sprocket connected by a pair of endless chains, each of said chains bearing attachment means to removably mount said elements on said chains, said attachment means on the lower chain being provided with rollers, and a track extending between said front and rear axles to support said rollers, and means for rotating said aligned vertically axles, a plurality of vertically movable rollers, and means for moving said rollers into engagement with said elements for holding the latter in juxtaposition.

References Cited in the file of this patent

UNITED STATES PATENTS

1,223,887	Kluchansky	Apr. 24, 1917
1,357,656	Saxe	Nov. 2, 1920
1,906,762	Maynes	May 2, 1933
2,099,281	Shaw	Nov. 16, 1937
2,157,397	Brink	May 9, 1939
2,169,679	Chase et al.	Aug. 15, 1939
2,231,590	Pflueger	Feb. 11, 1941
2,266,676	Carter	Dec. 16, 1941