

Aug. 15, 1939.

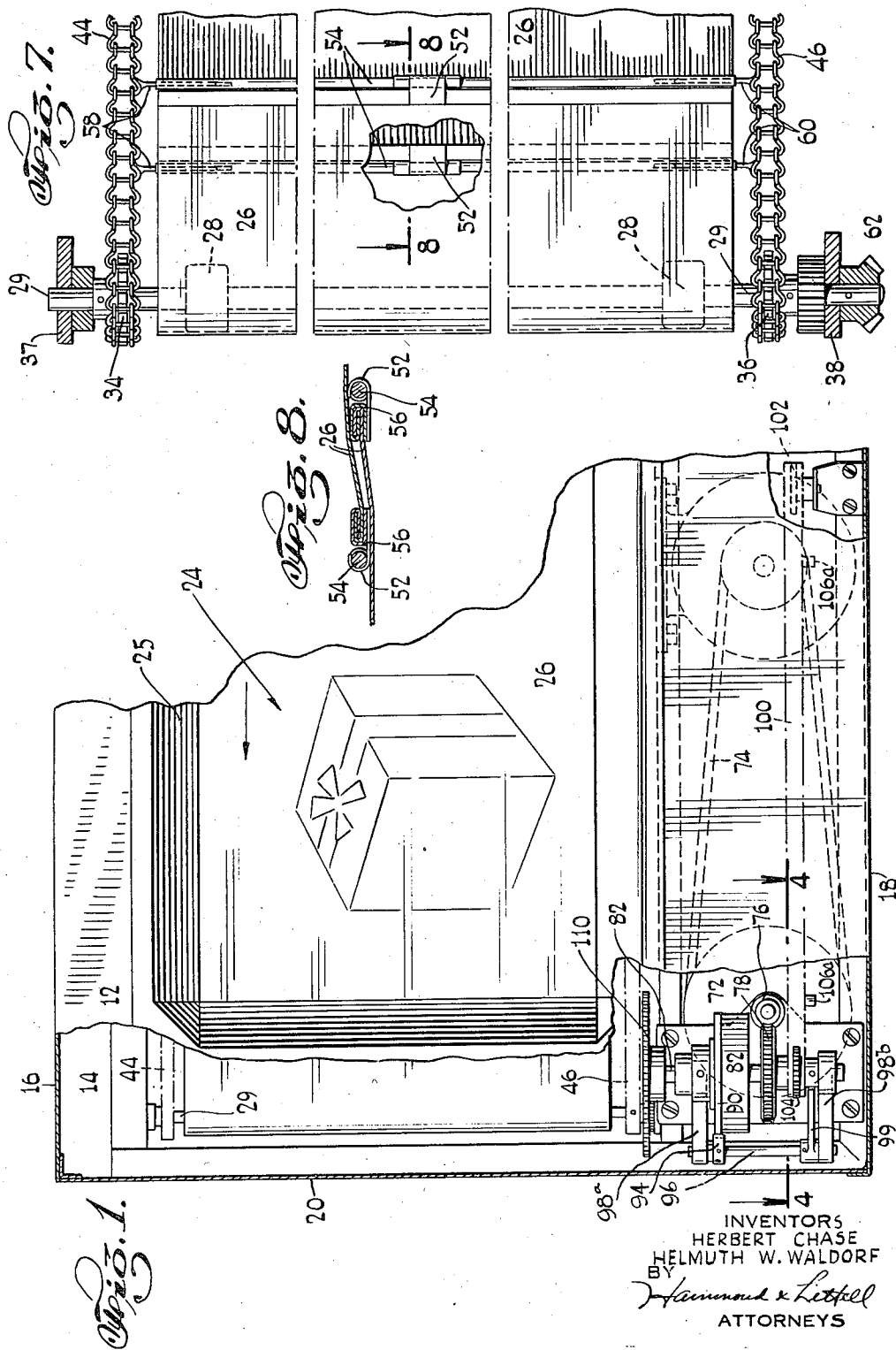
H. CHASE ET AL

2,169,679

DISPLAY DEVICE

Filed March 10, 1938

3 Sheets-Sheet 1



Aug. 15, 1939.

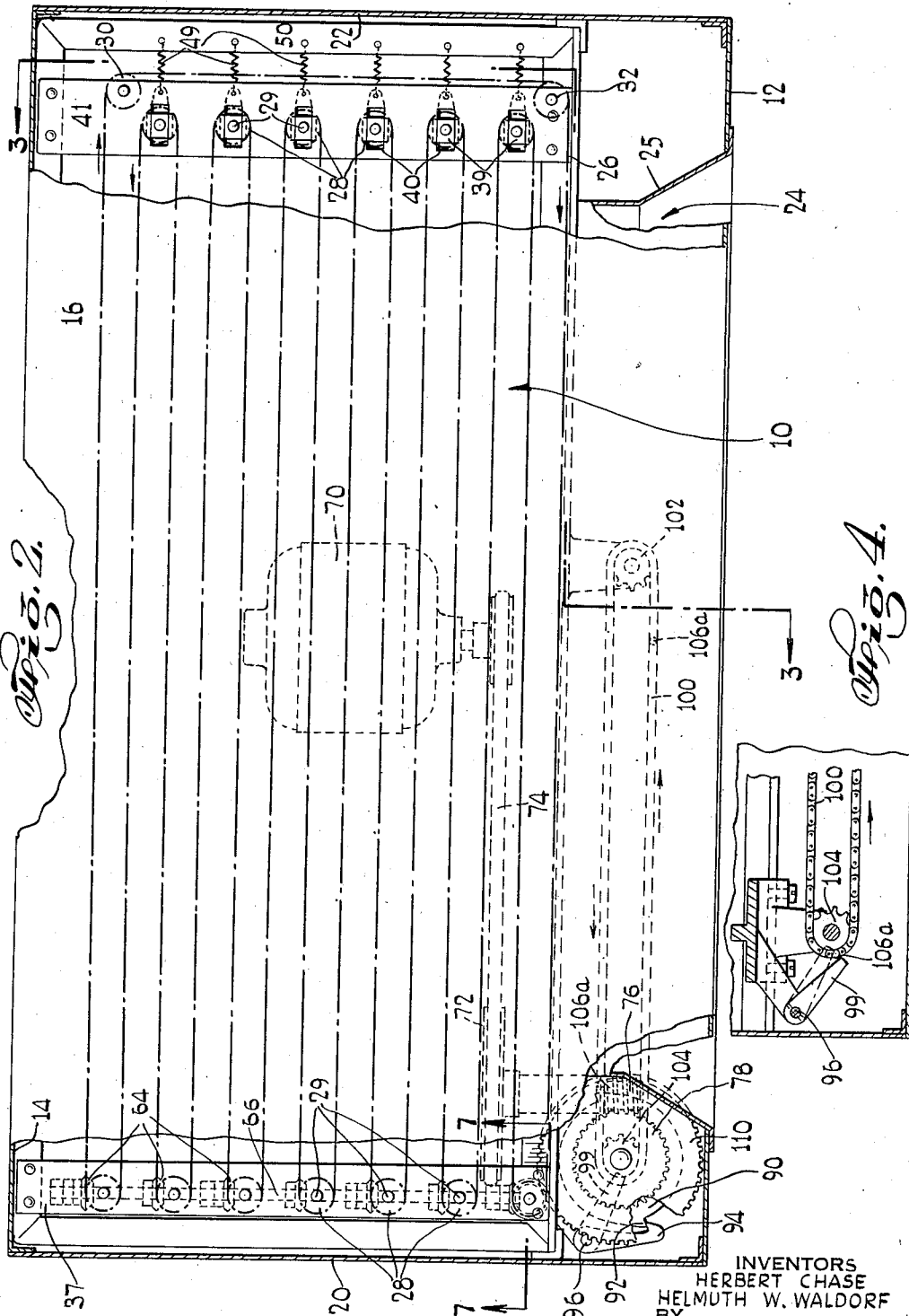
H. CHASE ET AL

2,169,679

DISPLAY DEVICE

Filed March 10, 1938

3 Sheets-Sheet 2



INVENTORS
HERBERT CHASE
HELMUTH W. WALDORF
BY *Hammond & Little*
ATTORNEYS

Aug. 15, 1939.

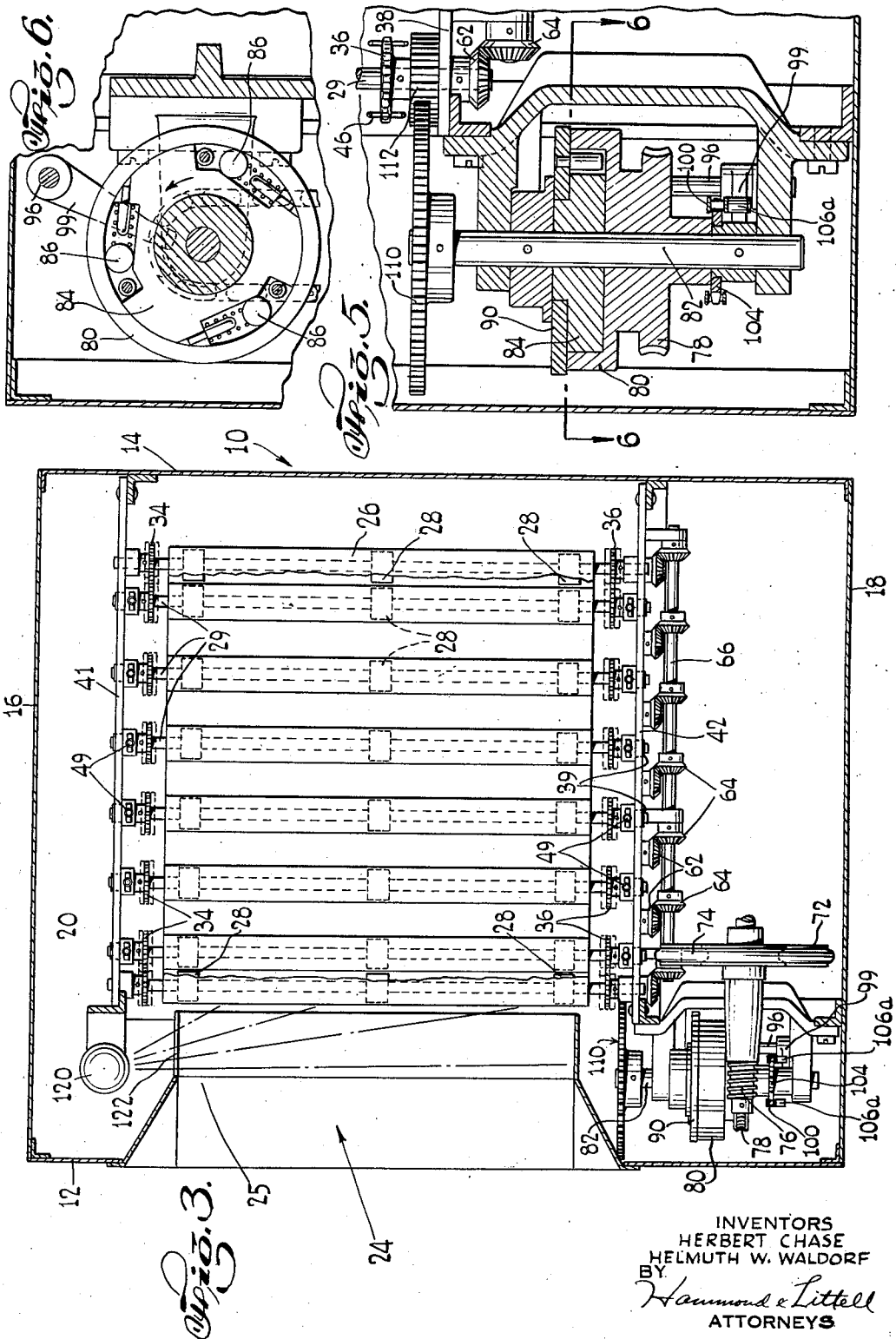
H. CHASE ET AL

2,169,679

DISPLAY DEVICE

Filed March 10, 1938

3 Sheets-Sheet 3



UNITED STATES PATENT OFFICE

2,169,679

DISPLAY DEVICE

Herbert Chase and Helmuth W. Waldorf, New
York, N. Y.; said Waldorf assignor to said
Chase

Application March 10, 1938, Serial No. 195,002

3 Claims. (Cl. 40—32)

This invention relates to a new and improved display device for use in the continuous exhibition of advertising matter.

One of the objects of this invention is to provide an advertising display device in the form of a compact unit which may be designed attractively and which accommodates a large number of signs within a small space and in operation displays each sign for a predetermined interval and thereafter automatically brings another sign into a display position.

Another object is to provide a device of this character having a much larger display capacity than other devices of similar nature and comparable size and at the same time constructed for prolonged operations without interruption due to mechanical difficulties.

Another object is to provide an advertising display device which successively and attractively displays all of the very large number of signs and permits easy removal and substitution of any one of the signs. The signs in our improved construction give the appearance of being imposed upon a continuous strip but actually are individually mounted and individually removable from their carrying means.

Still another object of the invention is to provide an advertising display device utilizing continuous conveying means for successively carrying signs into a position across a display opening and successively withdrawing the signs from such position after a definite period of exposure, in which the conveying means is driven evenly and under substantially uniform strains throughout its length and in which the display signs themselves are substantially free of any strains involved in operating the device.

A further object of the invention is to provide an arrangement of continuous conveyors and display signs in which each of the signs is yieldably mounted and supported on the conveyor so as to permit the use of frangible materials, such as paper and the like, in making the signs without danger of tearing them as they travel in a tortuous path in and about a small space during operation of the device.

The manner by which the foregoing and other objects of our invention are attained will be made apparent by the ensuing description of novel means and combinations characterizing a preferred embodiment of the invention. This description refers to the accompanying drawings, forming a part hereof, which illustrate one form of the improved display device, it being understood, however, that our invention is not re-

stricted to the details and arrangements illustrated in the drawings, except as required by a fair interpretation of the claims.

Figure 1 of the drawings is a fragmentary front elevation of the device, with parts broken away to reveal inside structure.

Figure 2 is a plan view, partly in section.

Figure 3 is a vertical section along the line 3—3 of Figure 2.

Figure 4 is a section along the line 4—4 of Figure 1, showing details of construction.

Figure 5 is an enlarged view, partly in section, showing the mechanism appearing in the lower left hand portion of Figure 3.

Figure 6 is a section along the line 6—6 of Figure 5.

Figure 7 is a section along the line 7—7 of Figure 2, and

Figure 8 is a detail section on the line 8—8 of Figure 7.

Referring to the drawings in greater detail, and particularly to Figures 1, 2 and 3, the illustrated form of apparatus, in general, comprises a casing 10 having front, back, top, bottom and end walls, 12, 14, 16, 18, 20 and 22, respectively, the front wall 12 being provided with an oblong opening 24 therein for the display of advertising matter. Opening 24 preferably is bordered by an inwardly directed extension 25 of the front wall, which gives the effect of a frame focusing attention upon advertising matter displayed in the opening. The casing 10 obviously may be made of any desired shape and of a wide variety of materials in order to provide a pleasing appearance. As illustrated, it consists of sheet metal sections joined together in any suitable manner. It will be apparent also that any of the several walls of the casing may be constructed to permit easy removal thereof and access to the interior of the device.

The casing 10 serves as an enclosure and support for mechanism for supporting and successively bringing a plurality of signs bearing advertising matter into display position in front of opening 24. The advertising matter is presented on a large number of individual signs 26, each being of a size somewhat larger than the display opening bordered by member 25 so that each sign may be brought into position adjacent the opening and in full view from the front side of the casing. The signs 26 may be made of various types of sheet material, paper being the material usually used. We provide means for mounting all of the signs in overlapping relation to form a continuous display surface composed of separate

sections, each section of which is capable of ready removal and replacement independently of the others and with a minimum of effort and skill. Each of these signs, moreover, is mounted yieldably, and the mechanism for mounting and conveying them is arranged so that there is no likelihood of disarrangement or tearing during travel through the device.

The location and path of travel of the signs 26 within the casing are indicated by dot and dash lines in Figure 2. They proceed backwardly into the casing from the front opening in a series of closely spaced overlapping portions, or flights each of which passes over guiding elements 28 adjacent the ends of the casing. The flight adjacent back wall 14 passes over a roller 30 and thence forwardly toward the front of the casing and over a guide roller 32, after which it reaches a position registering with the display opening 24. In the operation of this apparatus, contact between the several elements 28, 30 and 32 and the signs serves merely to guide the signs and plays no part in driving them into and out of display position.

Referring to Figures 3 and 7, it will be observed that the guiding elements 28 are mounted upon shafts 29. Each shaft carries a pair of spaced sprockets 34 and 36 which are fastened thereto adjacent the top and bottom ends of the shaft, respectively. The signs 26 lie between these sprockets, and the sprockets on each side of the signs are located in substantially the same plane. The shafts 29 adjacent end wall 22 extend beyond the sprockets and through circular openings provided for their end portions in upper and lower mountings 37 and 38, respectively. Shafts 29 adjacent end wall 22 of the casing preferably extend through bearing blocks 39 which are mounted to slide lengthwise of the casing in elongated slots 40 formed in upper and lower mounting brackets 41 and 42, respectively. The several sprockets 34 and 36 on these various shafts 29 engage endless driving members, such as chains 44 and 46, respectively, which constitute the supporting and carrying means for the signs 26. These chains are arranged inside of the casing to travel in paths identical with that indicated by the dot and dash line in Figure 2. The above mentioned group of shafts 29 mounted in slidable bearing blocks 39 is provided with means for yieldably urging the shafts toward end wall 22 of the casing and away from the group of shafts on the opposite side, such means in the illustrated form consisting of upper and lower series of tension springs 49 connected at one end with stationary brackets 50 and at their other ends with the shafts adjacent sprockets 34 and 36, respectively. Thus with the driving chains 44 and 46 in engagement around the various sprockets these springs automatically maintain tension on the shafts and sprockets and in turn on the chains so as to keep the latter always in engagement with the sprocket teeth and under proper driving tension.

As shown more particularly in Figure 7, the signs 26 are removably but yieldably connected with chains 44 and 46 so that they are carried by the chains without being subject to appreciable strains during movement through the casing, and so that they may easily be removed and replaced, one by one, as occasion may arise to change the signs. In the illustrated construction the attachment or detachment of each sign to the conveyor is effected by two simple operations, each consisting in the location of a small

metal clip 52 around the mid portion of a rod 54 extending between the two chains. The signs are formed with stiff marginal ribs 56, of crimped sheet metal or the like, which lend rigidity and keep them in extended condition. Clips 52 are secured to these ribs so that any tension exerted through the clips is distributed uniformly over the sheet material forming the signs. The rods 54 are made of resilient material such as light metal and are mounted on the chains so as to remain in place during use of the apparatus but to be easily removable. In the form shown, they consist of metallic elements having hollow end portions which receive pins 58 and 60, respectively, these pins being secured to chains 44 and 46. The rods 54 may be removed from the chains simply by flexing a flight of the chains intermediate the sprockets and thus slipping pins 58 and 60 out of the rods. It will be apparent, of course, that instead of using this particular mounting for the rods they may be permanently secured to the chains or removably fastened thereto in other ways. We prefer, however, to use constructions equivalent to that illustrated, in which each sign is fastened at two points to spaced supports, requiring only two simple operations to attach them under slight tension, and in which each sign support is removably secured to the conveyor chains by two-point connections which are easily disconnected.

The driving of chains 44 and 46, and through them the display signs, is effected at a plurality of points along the length of the chains so that an extensive display surface may be utilized in a single casing while subjecting all parts of the chains to equal tension. Thus each of the shafts 29 adjacent end wall 20 of the casing (see Figures 2 and 3) carries a bevel gear 62 on its lower end, which gears mesh with cooperating bevel gears 64 keyed or otherwise secured to a drive-distributing shaft 66. By this mechanism the rotation of any one of the shafts requires corresponding rotation of all of the others, and all portions of the chains engaging with sprockets on these shafts are advanced the same distance when any one of the shafts is rotated.

The powering mechanism for this organization includes a suitable source of driving power, such as a motor 70, and means intermediate the motor and shafts 29 for successively actuating the latter and successively stopping the same for a predetermined interval of time. For example, the motor 70 drives a sprocket 72 through a belt 74. Sprocket 72 revolves a worm 76 which meshes with a worm gear 78 integral with a clutch element 80, which revolves freely on a stub shaft 82. The clutch element 80 forms a part of a friction clutch including a cooperating element 84, the latter being keyed or otherwise fastened to stub shaft 82 so that they revolve together. The internal construction of this friction clutch is illustrated in Figures 5 and 6. Since the clutch itself is of well known construction and as such forms no novel feature of my invention, it suffices to point out that when element 84 is held stationary the cooperating element 80 may revolve independently, and that when part 84 is free to revolve it is driven by element 80 through balls 86 which frictionally engage both elements. The energization of the motor 70 in our construction results in continuous revolution of pulley 72, worm 76, worm gear 78 and clutch element 80. In order to effect intermittent movement of clutch elements 84 and stub shaft 82, we provide means for restraining element 84 against revolu-

tion and means for intermittently releasing it for revolution with element 80 for a predetermined number of revolutions.

Referring to Figures 1 and 2, it will be seen that clutch element 84 includes a cam-like disc 90 having a shoulder 92 thereon which cooperates with a pivotally mounted pawl 94, the latter being fastened to a vertical rock shaft 96 extending between upper and lower supporting brackets 98a and 98b. An arm 99 is fastened to this rock shaft adjacent bracket 98b, and the rock shaft, pawl and arm are normally urged in a counterclockwise direction, as viewed in Figure 2, by suitable spring means (not shown). Thus the pawl is forced against the periphery of disc 90, and whenever shoulder 92 is engaged by the pawl rotation of disc 90, clutch element 84, stub shaft 82, and through them the conveyor means, is prevented. It is evident, however, that movement of arm 99 in a clockwise direction causes the pawl to move away from shoulder 92 and thus permits the clutch element 84, stub shaft 82, and drive transmitting mechanism connected therewith to be driven by clutch element 80 through balls 86.

To effect this intermittent disengagement of pawl 94 and shoulder 92, we provide means continuously driven by the motor, for example, an endless timing band 100 which passes over a guide sprocket 102 and over a driving sprocket 104 located adjacent arm 99 and connected with worm gear 78 to revolve therewith. The band 100 carries one or more detents, for example, 106a and 106b, which travel in a path such that they contact arm 99 and rock it from the dotted line position to the full line position, as shown in Figure 4, whenever they pass the arm. This movement of arm 99 results in disengagement of pawl 94, permitting the shoulder 92 to pass the pawl and thereby resulting in driving of the sign until the pawl is again engaged. The number of continuous revolutions of shaft 82 and the interval between successive actuation thereof may be controlled by appropriate location of the detents 106a, 106b, etc. on band 100.

As shown in Figure 5, drive from stub shaft 82 is transmitted to the shafts 29 and thence to the sign conveyors by means of a gear 110, secured to the stub shaft, and an intermeshing gear 112 fastened to one of the series of shafts 29 adjacent end wall 20 of the casing.

The assembly and operation of our improved display device will now be apparent. Assuming the device to be inactive and unloaded, one or more walls of the casing are removed and the signs to be displayed are fastened to the sign supports 54 by engaging a clip 52 on the end of each sign over an appropriately located support 54 so that the end margins of adjacent signs overlap (see Figure 7). After each sign has been attached, the motor is energized until succeeding portions of the conveyors have reached the loading point, whereupon another is attached. These operations are continued until the entire device is loaded with signs bearing advertising matter. A casing approximately two feet long and a foot and a half deep accommodates at least twenty-five signs.

Upon replacement of the casing wall, the device is ready to operate. Operations are commenced simply by energizing the motor, and they continue indefinitely until it is desired to change the advertising matter being displayed. At the outset, a sign lies across opening 24, with its marginal portions and the conveyor chains

44 and 46 concealed behind wall portion 25. The motor continuously revolves worm gear 78, clutch element 82, sprocket 104 and timing band 100 through belt 74, pulley 72 and worm 76. When a detent 106a strikes arm 99 and moves pawl 94 away from shoulder 92 the conveyors and signs are driven through clutch element 84, stub shaft 82, gears 110 and 112, bevel gears 62 and 64, shafts 29 and sprockets 34 and 36. The gear ratios and the location of detents on band 100 are fixed so that the conveyors travel the exact distance necessary to withdraw one sign from the display opening and to bring the next sign in registry with the opening, whereupon the pawl 94 again engages shoulder 92 and movement of the conveyors is stopped for a predetermined interval, until the pawl is disengaged again. The conveyors are maintained inactive for a period of time best suited for full display of the particular type of advertising matter carried by the signs. The attention of passersby is attracted to the display by the operation of the device and by the make-up of the signs, which are clearly illuminated by means of a light source 120 mounted in the upper portion of the casing so as to cast a beam through an opening 122 in member 25 and directly upon the exposed surface of a sign lying across the display opening.

The display device of our invention is characterized by extraordinarily smooth and reliable operation, due to the improved manner of constructing, mounting, carrying and driving the signs therein. At the same time, it is simple to load and unload the device, so that the signs may be changed by an unskilled attendant without likelihood of trouble of any kind. The attractiveness, compactness, large capacity and high advertising value of our improved device render it suitable for many uses which are not well served by other analogous devices of known construction because of these qualities.

As pointed out heretofore, the details of construction and operation illustrated in the drawings and described in this specification are presented by way of example and not as essential features since the invention is capable of embodiment in other forms without departing from its teachings. We intend that the appended claims be given a scope sufficient to provide the full measure of protection to which the invention is entitled.

We claim:

1. In a device for displaying advertising matter, a casing having a display opening therein, a pair of spaced registering, endless conveyor members for carrying display signs into a position across said opening, said conveyor members extending in a tortuous path within said casing, and a plurality of flexible rod-like sign supports extending between said conveyors and removably secured to each, the distance between alternate supports being uniform and greater than the distance between adjacent supports throughout the length of said conveyor members, and a continuous series of individual display signs mounted on said supports, each sign being connected at opposite ends to alternate supports whereby marginal parts of adjacent signs are held in overlapping relation, and the length of each sign between connections thereof being less than the normal distance between alternate members of said flexible supports.

2. In a device for displaying advertising matter, a casing having a display opening therein, 75

a pair of spaced, registering, endless conveyor members for carrying display signs into a position across said opening, a plurality of accurately spaced sign supports extending vertically
5 between said conveyor members, means removably connecting each of said supports with each of said conveyors, a plurality of display signs, and cooperating means on said supports and on
10 each end margin of each sign for detachably and resiliently maintaining the signs in fully extended condition between spaced pairs of said supports, with the end portions of adjacent signs in overlapping relation.

3. In a device for displaying advertising matter, a casing having a display opening therein,
15

a pair of spaced, registering, endless conveyor members for carrying display signs into a position across said opening, a plurality of tubular metal rods extending vertically between said conveyor members, short metal pins fixed to said
5 members in accurately spaced relation and extending vertically therebetween and into hollow ends of said rods, a plurality of display signs, each extending between a pair of said rods, and
10 a unitary clip secured to each end margin of each sign, each clip being removably and resiliently engaged over the mid-portion of one of said rods.

HERBERT CHASE.

HELMUTH W. WALDORF. 15