Jan. 16, 1951 S. S. TARPINIAN 2,538,712

CHANGEABLE EXHIBITOR

Filed Sept. 2, 1947 2 Sheets-Sheet 1

Fig. 1.

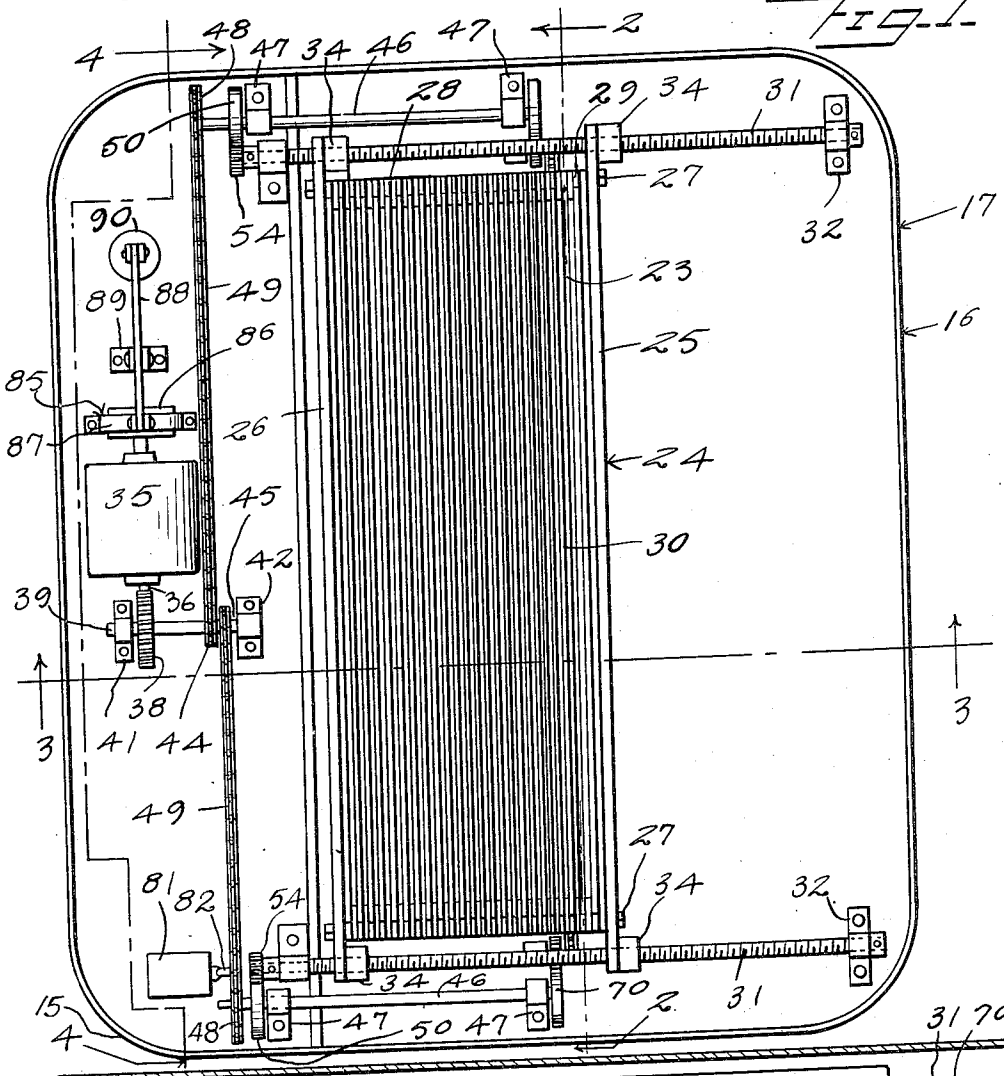
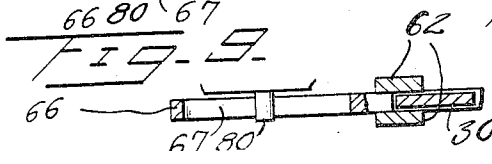


Fig. 2.

Inventor

S. S. Tarpinian

Fig. 3.

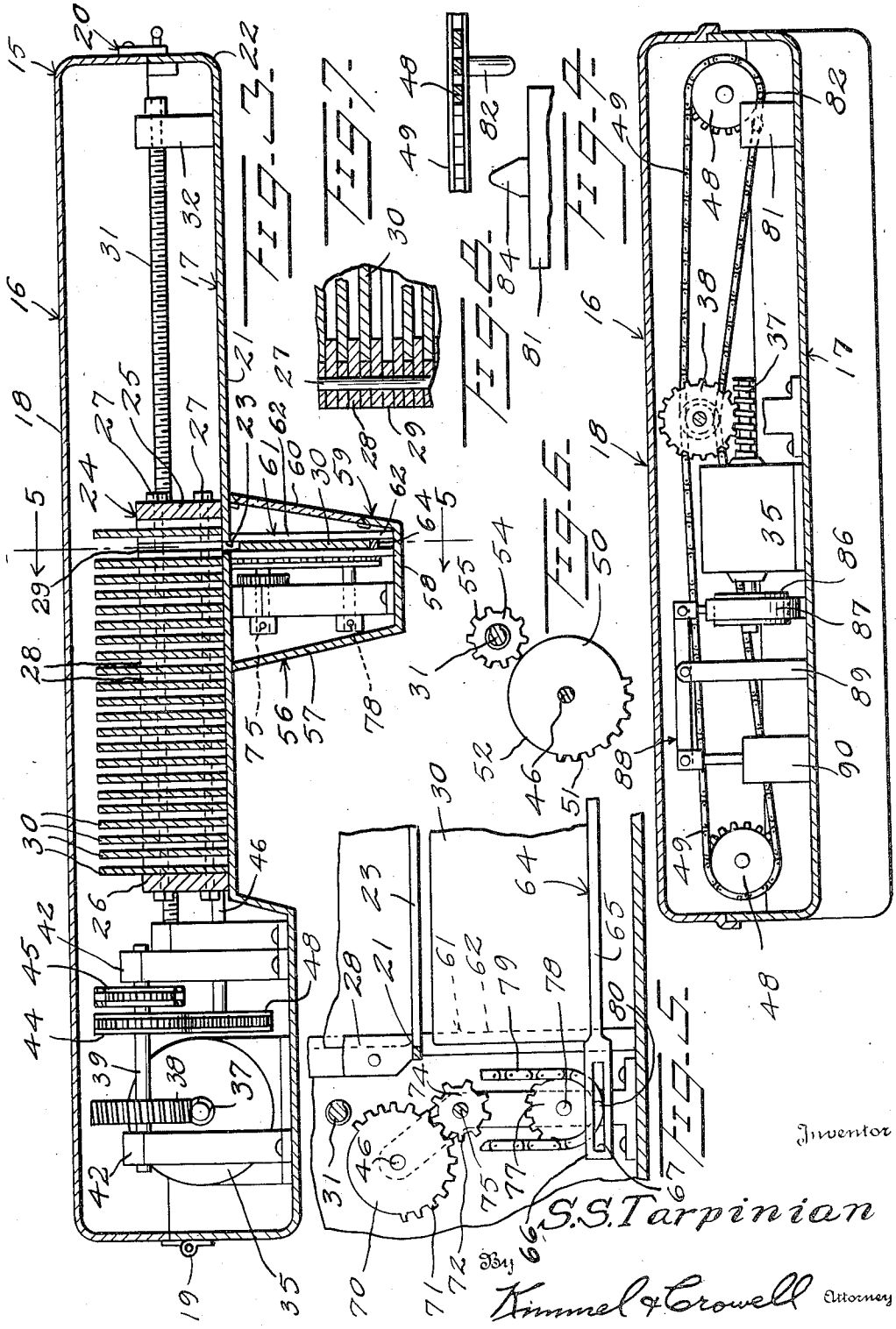


By Kimmel & Crowell Attorneys

Jan. 16, 1951 S. S. TARPINIAN 2,538,712

CHANGEABLE EXHIBITOR

Filed Sept. 2, 1947 2 Sheets-Sheet 2



Inventor
S. S. Tarpinian
By
Kimmel & Crowell Attorneys

Patented Jan. 16, 1951 2,538,712

UNITED STATES PATENT OFFICE

2,538,712

CHANGEABLE EXHIBITOR

Samuel S. Tarpinian, Hazel Park, Mich.

Application September 2, 1947, Serial No. 771,642

3 Claims. (Cl. 40—36)

1

This invention relates to changeable sign exhibitors and more particularly to an exhibitor for public conveyances for indicating the name of the next stopping point or street.

It is an object of this invention to provide an improved changeable exhibitor of the kind to be more particularly described hereinafter which is operated electrically for moving a sign from a concealed magazine into a position where it may be readily viewed by the occupants of the vehicle.

Another object of this invention is to provide an exhibitor of this kind which is adapted to be electrically operated in a complete cycle when initially started by the operator or conductor on the vehicle or in any other suitable manner.

Still another object of this invention is to provide a device of this kind which is of such construction that the number of cards for stops may be varied according to the route over which the vehicle is used by merely adding or removing the necessary cards from the magazine.

Yet another object of this invention is to provide a device of this kind having an elevating means for removing and reinserting the cards progressively from the sliding rack or magazine, the rack and elevator being operated in time relation to each other for progressively removing and reinserting a card in the rack and moving the magazine so that the subsequent card may be moved to a viewed position.

A further object of this invention is to provide an electrically operated sign exhibitor of this kind having an electric motor which is initially started in a selected direction by the operator of the vehicle or other suitable means for depressing momentarily a starting switch and which is stopped by the opening of a limit switch actuated in timed relation to the rotation of the motor.

Still a further object of this invention is to provide an electrically operated brake for the motor of the device for braking the motor shaft when the electric circuit is broken and for releasing the motor shaft for rotation when the motor is in operation so that the device will not coast past the stopping points nor will the device be actuated by vibration or other factors tending to cause the gears to creep or rotate.

With the above and other objects in view, my invention consists in the arrangement, combination and details of construction disclosed in the drawings and specification, and then more particularly pointed out in the appended claims.

In the drawings:

Figure 1 is a top plan view with the cover removed of a changeable exhibitor constructed according to an embodiment of this invention,

2

Figure 2 is a transverse section taken on the line 2—2 of Figure 1,

Figure 3 is a longitudinal section taken on the line 3—3 of Figure 1,

Figure 4 is a transverse section taken on the line 4—4 of Figure 1,

Figure 5 is a fragmentary detailed section taken substantially on the line 5—5 of Figure 1,

Figure 6 is a fragmentary detailed section showing the relation of the driving gear to the driven gear of the mechanism operating means,

Figure 7 is a fragmentary detailed section of the guide means in the magazine,

Figure 8 is a fragmentary detailed section of the limit switch and the operator therefor,

Figure 9 is a fragmentary section taken on the line 9—9 of Figure 2.

In the drawings, the numeral 15 indicates generally a changeable exhibitor for supporting changeable signs in a public conveyance or vehicle having regular stopping points.

The changeable exhibitor 15 is particularly arranged for use in a subway or bus or the like. The exhibitor 15 is formed of an elongated flat housing 16 having a bottom section 17 and a hinged cover 18. The cover 18 is hingedly connected to the bottom section 17 at the rear end thereof by a hinge 19.

The forward end of the cover is adapted to be secured to the bottom section 17 by a latch 20 carried partially by the cover and partially by the bottom portion of the housing. The bottom section 17 is formed of a bottom wall 21 which is substantially flat throughout its length and having the side walls 22 thereof turned upwardly.

The bottom wall 21 of the housing is provided with an elongated slot or transverse opening 23 which extends substantially across the bottom intermediate the length thereof. A magazine 24 is slidably supported within the housing 16 for sliding movement from one end to the other along the bottom wall 21. The magazine 24 is formed of a pair of elongated bars 25 and 26 which extend transversely of the housing 16 and are enclosed therein.

The bars 25 and 26 are spaced apart longitudinally by bolts 27 on which are supported sign racks or guide members 28 and spacers 29 between each of the guide members. The guide member 28 is formed of a flat piece of metal extending vertically in the housing 16 and spaced apart from an adjacent strip 28 by a spacer 29.

The longitudinally spaced apart guides 28 form separate guide means in which signs 30 are adapted to be slidably disposed for vertical sliding movement in the racks and in the magazine 24.

A longitudinally extending screw 31 is rotatably mounted on each of the opposite sides of the housing 16 and extends along the length thereof. The ends of the screws 31 are rotatably supported within bearings 32 fixed on the bottom wall 21 of the housing 16. A nut 34 is fixed to or formed on the outer end of each of the magazine bars 25 and 26 and the screw 31 is engageable through these nut members for sliding the magazine longitudinally in the housing 16.

For sliding the magazine along the length of the housing 16 I have provided an electric motor 35 for rotating the screws 31 by means of a suitable gearing system. The motor 35 is provided with a shaft 36 which extends through both ends of the housing thereof. A screw 37 is fixed on one end of the shaft 36 for direct rotation by the motor. A gear 38 is provided for engagement with and rotation by the screw 37. The gear 38 is fixed on shaft 39 which is rotatably supported between bearings 41 and 42 fixed to the bottom wall 21 of the housing.

A pair of sprockets 44 and 45 are also fixed on the shaft 39 and are adapted to be rotated upon rotation of the motor shaft 36. A counter shaft 46 is rotatably supported on opposite sides of the housing 16 and extends longitudinally parallel to and outwardly of the shafts or screws 31. The shafts 46 are rotatably supported in bearings 47 fixed to the bottom wall 21 of the housing 16. A sprocket 48 is fixed on one end of the counter shaft 46 and a chain 49 is trained between the sprockets 48 and the sprockets 44 and 45 in the drive shaft 39.

Upon rotation of the motor shaft 36 the counter shafts 46 are adapted to be rotated simultaneously. The screws or shafts 31 which actuate the magazine 24 are driven intermittently from the counter shaft 46 for purposes to be described hereinafter.

The gear driving mechanism for each of the screws or shafts 31 which operate the magazine 24 are identical, being arranged oppositely so that rotation of the motor shaft will effect rotation of the supporting shaft 31 for sliding the magazine in one direction in the housing 16. A gear 50 is fixed on each of the counter shafts 46 and is formed with gear teeth 51 which extend one-third of the circumference of the gear. The remaining two-thirds portion of the gear 51 is flat as indicated by the numeral 52 in Figure 6.

A gear 54 is fixed to or secured on one end of the shaft or screw 31 for engagement with the gear 50. Gear teeth 55 are disposed entirely about the circumference of the gear 54 for engagement with the gear teeth 51 on the gear 50. The ratio of the gears 50 and 54 is 3 to 1 so that the gear 54 will be rotated in one complete revolution by engagement with the teeth 51 on one-third of the circumference of the gear 50.

The housing 16 is formed with a downwardly extending viewing chamber 56 fixed to or formed on the lower side of the bottom 21 below the transverse opening or slot 23. The viewing chamber 56 is formed of a transverse downwardly extending rear end wall 57 and a flat bottom wall 58. The bottom wall 58 extends substantially parallel to the bottom 21 and is spaced downwardly therefrom.

The front wall 59 of the chamber 56 is formed

with a transversely extending transparent wall 60 which may be made of glass or other suitable transparent material. An elevating means is provided in the viewing chamber 56 for lowering a card 30 from the magazine 24 into a position within the chamber 56 where the indicia inscribed or printed on the card 30 may be viewed from without as by the occupants of the vehicle within which the exhibitor 15 is installed.

The elevating means also raises the card 30 back into the magazine so that another card may then be moved into the viewing chamber after movement of the magazine 24. The magazine 24 is provided for intermittent sliding movement along the length of the housing 16 for successively disposing a subsequent card 30 over the aperture 23 in the bottom wall 21.

A guide means 61 is formed in the chamber 56 in the opposite sides thereof for guiding the cards 30 in their sliding movement from the magazine. The guide means 61 is formed of a pair of vertical flat plates 62 longitudinally spaced apart between which the ends of the cards 30 are adapted to be slidingly engaged.

An elevator 64 is disposed between the plates 62 for raising and lowering the guides 30 in the guide 61. The elevating means 64 comprises an elongated flat bar 65 which extends completely across the chamber 56 and terminates outwardly of the guide means 61.

The bar 65 is enlarged at its terminal ends as at 66 and a transverse slot 67 is formed in the ends of the bar within which an operator for raising and lowering the bar may be engaged. The elevating means 64 is driven or operated in intermittent movement in relation to the movement of the magazine 24. The elevating rod 65 is normally in the raised position when the magazine 24 is in motion. The elevator 64 is adapted to complete a cycle of its movement between successive movements of the magazine 24. A cycle of movement for the elevator includes the upward movement of the rod 65 for returning a sign 30 into the magazine, and the downward movement for bringing the next sign into chamber 56.

The elevating means 64 is actuated in a different time relation to the movement of the magazine 24 by a gear means operatively connected to the countershaft 46. A gear 70 is fixed on the countershaft 46 at the opposite end of the shaft from the gear 50. The gear 70 is provided with teeth 71 which extend two-thirds of the distance about the circumference of the gear. The teeth 71 of the gear 70 are adapted to engage with and between the teeth 72 of a gear 74 mounted on a stub shaft 75.

The ratio between the gears 70 and 74 is also three to one as was the ratio between the gears 50 and 54. The gear 74 is provided for making two complete revolutions upon the rotation of the gear 70 with the gear teeth 72.

A sprocket 76 is fixed on the stub shaft 75 to be rotated upon rotation of the gear 74. A second sprocket 77 is disposed vertically below the sprocket 76 on a stub shaft 78. A chain 79 is trained about the sprockets 76 and 77 for simultaneous rotation of both of the sprockets.

An outwardly extending pin 80 is fixed on the gear chain 79 and extends outwardly therefrom. A pin 80 is adapted to be slidingly disposed within the slot 67 on the end of the elevating bar 65. Upon rotation of the gear 70, the gear 74, and sprockets 76 and 77, the gear pin 80 will be moved with the chain 79 in its complete distance and length of travel.

The sign or card 30 is adapted to be disposed within the chamber 56 where it may be viewed and from which the cycle of operation of the exhibitor 15 is started.

When the card 30 is disposed at rest in the chamber 56 no power is being applied to the motor 35. When it is desired to change the sign in the chamber 56, the motor 35 is started by closing the starter switch connected therewith and shunted across switch 81. This switch may be closed either by the operator of the vehicle or by some suitable mechanical switch operating device.

The initial movement of the gear train connected to the motor 35 will raise the elevator shaft 65 for moving the sign 30 from the chamber 56 back into the magazine 24.

In the drawings, the gears are disposed in their relation at rest just prior to the initial movement of the gear train. When the card 30 is placed back in the magazine 24, the flat spot of the gear 70 will be in engagement with the gear 74 and the gear teeth 51 of the gear 50 will be moved into engagement with the gear 54 for rotating the screw shaft 31 and moving the magazine 24 to a position where the successive card or sign 30 will be disposed over the opening 23.

Continued movement of the gears connected to the motor 35 will effect the lowering of the elevator shaft 65 whereby the next selected card 30 may be lowered into the viewing chamber 56. The flat spot 52 of the gear 50 is adapted to register with the teeth 55 of the gear 54 during the operation of the elevating mechanism and the flat spot of the gear 70 is adapted to register with the teeth 72 of the gear 74 during the operation of the magazine 24.

When the elevating shaft 65 reaches its extreme bottom position, a limit switch 81 is engaged by a pin 82 carried by the gear 48 for breaking the circuit to the motor 35. As the gear 48 makes one complete revolution for each complete cycle of operation of the elevating means and the magazine moving operators, the limit switch will be moved to the open position after each cycle of operation. The pin 82 on the gear 48 is adapted to engage a beveled switch operator 84. The switch operator 84 comprises a handle for moving the switch contacts to the open position. The switch 81 is normally spring biased to the closed position. The switch (not shown in the drawings) which initially starts the operation of the motor 35, may be connected in shunt across the switch 81 and is normally in the open position.

In this manner when the starting switch is initially closed, the circuit will be completed to the motor 35 and the initial movement of the gear train will cause the pin 82 to become disengaged from the switch 81 whereby the motor circuit will be complete through the switch 81 irrespective of the position of the operating switch. In this manner there is no necessity for holding the operating switch closed during the operation of the driving means for the changeable exhibitor.

In order that the motor 35 will stop immediately upon breaking of the circuit in the switch 81, I have provided a brake 85 on the shaft 36 on the opposite side from the screw 37. A wheel or drum 86 is fixed on the shaft 36 and a brake band 87 fixed to the bottom wall 21 of the housing 16 is provided about the drum 86.

A lever 88 is rockably mounted intermediate its length above the bottom 21 between pivot brackets 89 and is connected at one end to the brake bands 87. A solenoid operator 90 for the lever 88 is carried on the opposite side of the pivot 89 thereof. In the normal position of the brake 85, the bands 87 are engaged with the drum 86 for holding the shaft 36 against rotation. When the circuit to the motor 35 is completed, the circuit to the solenoid 90 is also completed and the solenoid will rock the lever 88 for releasing the brake band 87 from the brake drum 86 for permitting the free rotation of the shaft 36.

When the motor circuit is broken by the limit switch 81, the circuit to the solenoid 90 is also broken and the brake is applied on the shaft 36 to hold the shaft against movement caused by vibration or other extraneous forces.

In the operation of the changeable exhibitor 15, when the operating switch (not shown) is initially closed, the motor 35 will start rotating and the brake 85 will be released. Starting at the cycle at a point where the sign 30 has been exposed in the chamber 56, the counter shaft 46 will be constantly rotated through the sprocket and chain and gear connection to the shaft 36 of the motor. The initial movement of the exhibitor will start at a point indicated in Figure 5.

The gear 70 is in engagement with the gear 74 so the gear 74 will be rotated for raising the elevated rod 65 for moving the card 30 upwardly through the opening 23 into the magazine 24.

As the rod 65 reaches its extreme upper position, the gear teeth 71 will move out of engagement with the gear teeth 72 so the flat spot of the gear 70 will be disposed over the gear 74. At this time the gear teeth 51 will be initially moved into engagement with the gear teeth 55 on the shaft 31. The shaft 31 will then be rotated in one complete revolution for moving the magazine 24 a short distance for disposing the adjacent or successive card 30 over the opening 23.

As the gear teeth 51 move out of engagement with the teeth 55, the gear teeth 71 again come into engagement with the gear teeth 72 whereupon the sprockets 76 and 77 are again rotated and the elevated rod 65 is moved downwardly to its extreme lower position.

As the elevated rod 65 moves downwardly, the successive card 30 slides down into the viewing chamber 56 in the guide means 61 provided therein.

When the gear teeth 71 have moved half of the distance between the ends thereof or another one-third of the rotation of the gear 70, the pin 82 on the gear 48 will come into engagement with the handle 84 of the limit switch 81. The cycle of operation will cease at this point with the gear 74 disposed midway the length of the gear teeth 71 on the gear 70.

This construction and arrangement is such that the carriage and the exhibitor may be operated in a reverse movement as necessary in vehicles of the public route transportation type on a return trip. The carriage and operation is reversible at the selection of the operator whereby accidental errors in exhibiting the cards may be corrected when the error is discovered.

I do not mean to confine myself to the exact details of construction herein disclosed, but claim all variations falling within the purview of the appended claims.

I claim:

1. In a changeable exhibitor including a housing, a magazine slidable in said housing, a plurality of spaced apart sign guide means in said magazine, and sign guide means in said housing adapted to successively register with said sign guide means in said magazine; magazine actuat-

ing means comprising screw thread means rotatably carried by said housing and threadedly engaging said magazine, a stub shaft rotatable in said housing, means adapted to rotate said stub shaft, a gear on said stub shaft having teeth disposed about one-third of the periphery thereof, gear means on said screw thread means adapted to engage said teeth and to be rotated only during such engagement to advance said magazine a distance equal to that between the sign guide means therein, and sign elevating means comprising a second gear on said stub shaft having teeth disposed about two-thirds of the periphery thereof, the teeth of said first and second gears being circumferentially offset whereby said gears will be effective progressively, an elevating bar slidably disposed between said housing sign guide means, means connected to said elevating bar and adapted to engage said latter teeth for raising and lowering said bar during such engagement whereby said magazine will be moved when said elevating bar is immobile, and said elevating bar will be lowered and raised when said magazine is stationary.

2. In a changeable exhibitor including a housing, a magazine slidable in said housing, a plurality of successive sign guide means in said magazine, and sign guide means in said housing adapted to successively register with said successive sign guide means in said magazine; magazine actuating means comprising screw thread means rotatable in said housing and threadedly engaging said magazine, a stub shaft disposed parallel to said screw thread means and rotatably carried by said housing, means for rotating said stub shaft, a gear on said stub shaft having teeth disposed about one-third of the circumference thereof, gear means fixed on said screw thread means adapted to engage said teeth and to be rotated one revolution during such engagement, and sign elevating means comprising a second gear on said stub shaft having teeth disposed about two-thirds of the circumference thereof, the teeth of said first and second gears being circumferentially offset whereby said gears will be effective progressively, gear means carried by said housing adapted to engage said teeth on said second gear and to be rotated two revolutions during such engagement, a driving sprocket connected to said latter gear means, an idler sprocket disposed below said driving sprocket, an endless chain trained over said driving and idler sprockets, said chain being adapted to make a complete circuit for each two revolutions of said latter gear means, a horizontally disposed vertically slidable elevating bar carried between said housing sign guide means, and means operatively connecting said bar to said endless chain whereby said magazine will be moved when said elevating bar is immobile, and said elevating bar will be lowered and raised when said magazine is stationary.

3. A device as set forth in claim 2, wherein said elevating bar is formed with an elongated slot adjacent to at least one end thereof, and said last named means includes a pin carried by said chain adapted to engage in said slot.

SAMUEL S. TARPINIAN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
239,910	Woolston	Apr. 5, 1881
524,421	Lambert	Aug. 14, 1894
530,987	Fischer	Dec. 18, 1894
646,168	Hansen	Mar. 27, 1900
757,086	Bosshard	Apr. 12, 1904
845,986	Wadsworth et al.	Mar. 5, 1907
1,864,171	Combridge	June 21, 1932
2,048,176	Briney	July 21, 1936