

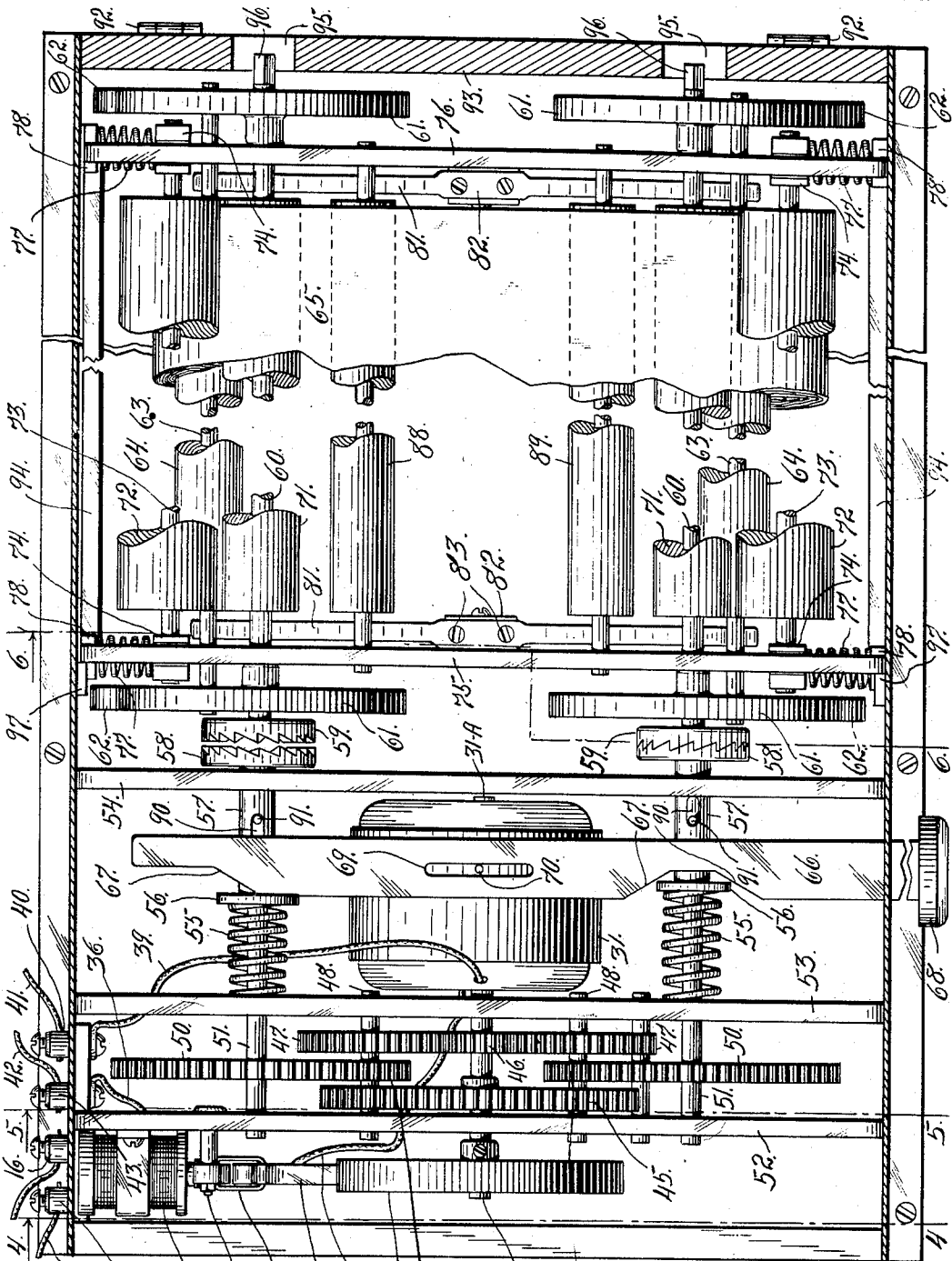
L. O. WISENBERG.
STATION INDICATOR.

APPLICATION FILED JAN. 18, 1910.

1,002,352.

Patented Sept. 5, 1911.

4 SHEETS-SHEET 1.



Witnesses
Otto E. Heddick.
J. D. Thornburgh.

Fig. 1

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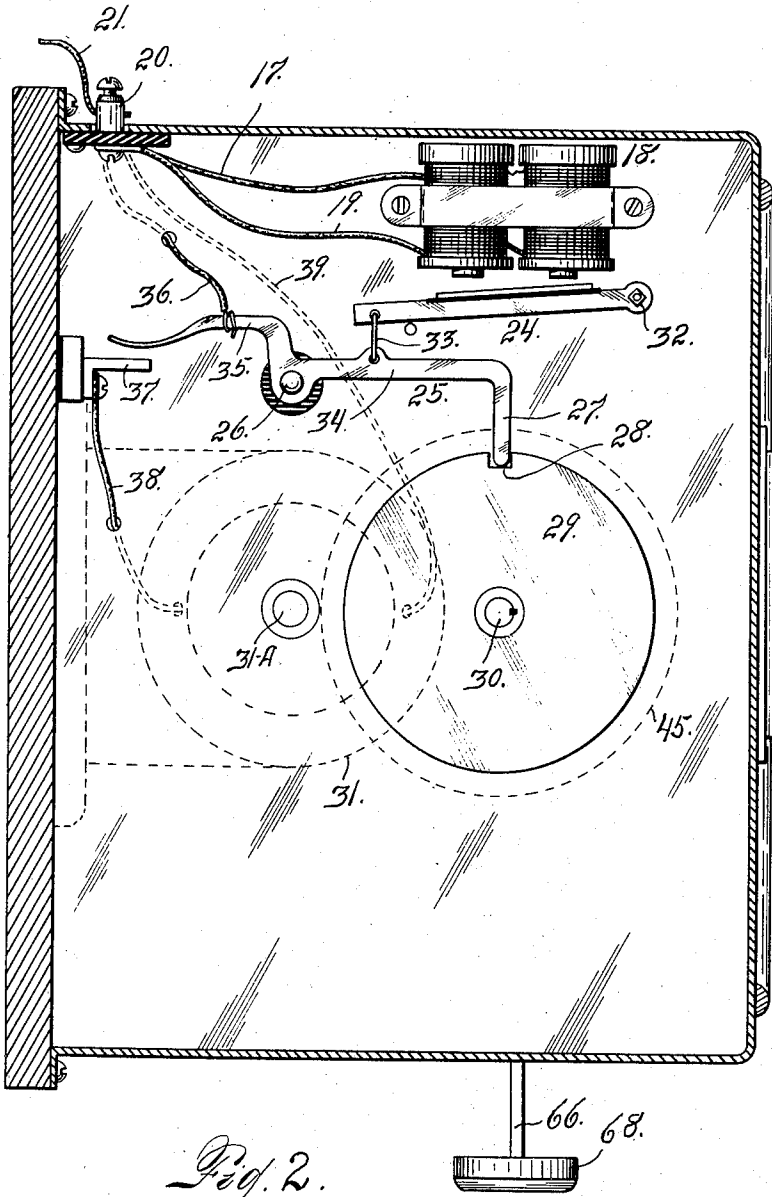


Fig. 2.

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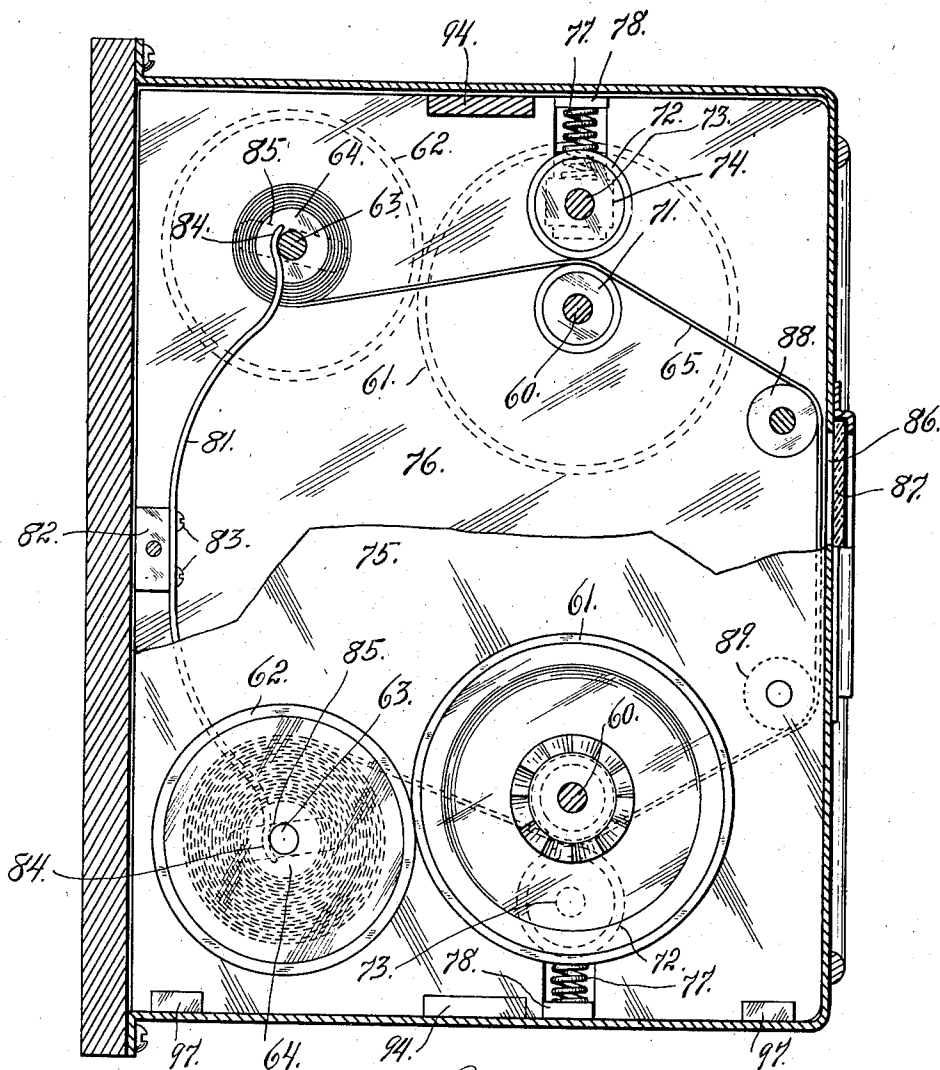


Fig. 4.

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UNITED STATES PATENT OFFICE.

LEROY O. WISENBERG, OF DENVER, COLORADO.

STATION-INDICATOR.

1,002,352.

Specification of Letters Patent.

Patented Sept. 5, 1911.

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To all whom it may concern:

Be it known that I, LEROY O. WISENBERG, a citizen of the United States, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Station-Indicators; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to station indicators, my object being to provide a construction adapted to be mounted upon a car and which shall automatically display the names of the streets or stations at a proper time for the guidance of the passengers. In other words, the names of the streets are automatically announced visually before each street is reached so that the passengers do not have to rely upon the uncertain announcement of the conductor, who usually speaks in such a low or peculiar tone that passengers cannot hear or understand, the result being that they are often carried past their streets, particularly on dark and stormy nights.

My improved construction, as illustrated in the drawing, is mounted upon a car operated by electricity, the current being supplied from an overhead trolley. The current is carried from the trolley wire by a conductor to an electromagnet, which acting on an armature moves the latter sufficiently to operate a lever, one extremity of which normally engages a notch or recess formed in the periphery of a disk which is mounted on the armature shaft of a motor, thus locking the motor shaft against movement. As soon as the lever is operated to release the motor, the circuit is closed through the latter by the engagement of the other end of the lever with a contact. The current which supplies the motor for operating the name curtain, is taken from the trolley wire in the usual way, that is to say, through the trolley pole, but the circuit is broken after the armature shaft and the notched disk mounted thereon has made a complete revolution, since when this occurs the locking lever will engage the notch or recess in the periphery of the disk, and as soon as this occurs the circuit is again broken through the motor which operates the name curtain. Pro-

vision is made through the instrumentality of suitable gears connected in operative relation with the motor, whereby the name curtain may be caused to travel in either direction. This curtain is mounted upon rolls which are rotated from the motor through the agency of suitable clutch and gearing connections, all of which will be hereinafter fully set forth, reference being made to the accompanying drawing, in which,

Figure 1 is a section taken through the casing of the station indicator mechanism, the name curtain and its operating rollers being partly broken away. Figs. 2, 3, and 4 are cross sections taken on the lines 4-4, 5-5, and 6-6, respectively, of Fig. 1.

The same reference characters indicate the same parts in all the views.

A wire 15 leads from the trolley wire to a binding post 16 from which leads a wire 17 to one terminal of an electromagnet 18, from whose opposite terminal leads a wire 19 to a binding post 20 from which a conductor 21 leads to the ground. The wire 15 is put into electrical communication with the trolley wire at predetermined intervals and the electromagnet 18 is energized and an armature 24 actuated or drawn to the cores of the magnet whereby a lever 25, fulcrumed at 26 is actuated to disengage the depending part 27 of the lever from a notch or recess 28 formed in the periphery of a disk 29 fast on the armature shaft of a motor 31. The armature 24 is pivoted at one extremity as shown at 32, its opposite extremity being connected by means of a link 33, with the arm 34 of the lever 25 carrying a depending part 27 which engages the recess 28 of the disk. The opposite arm 35 of the lever is connected with a conductor 36 and when the arm 34 of the lever is lifted to disengage the latter from the recess 28 of the disk 29, the arm 35 of the lever is brought into engagement with a contact 37 from which leads a conductor 38 to one pole of the motor 31. From the opposite pole of this motor leads a conductor 39 to a binding post 40 from which a conductor 41 leads to the source of current supply. The return current passes through a conductor 42 to a binding post 43 and thence to the arm 35 of the lever 25 through the wire or conductor 36. It will thus be understood that the motor 31, for operating the name curtain of the station indicator is supplied with current

from the same source as the propelling motors of the car, this circuit, however, being normally broken and intermittently closed.

5 When the motor 31 is in operation the armature shaft 31^A is rotated, and a gear or pinion 44 actuated to operate a relatively large gear 45, mounted on the shaft 30 and on which the disk 29 is also mounted.

10 Another gear 46 is mounted on the armature shaft 31^A and meshes with two larger gears 47, mounted on shafts 48, carrying similar gears or pinions 49, one of which meshes directly with the gear 50, while the other meshes with an idle gear 51^A, which in turn meshes with another gear 50. The two gears 50 are of the same size and each is mounted upon a shaft 51. Each shaft 51 is journaled in partitions 52, 53 and 54, located within the casing. Upon each shaft is mounted a spiral spring 55, one extremity of which engages the partition 53, while its opposite extremity bears upon a disk or collar 56 formed on one extremity of a sleeve 57 longitudinally movable on the shaft 51, the said sleeve being provided at its opposite extremity with a clutch member 58 adapted to engage a companion clutch member 59 fast on one extremity of a shaft 60 carrying at its opposite extremities relatively large friction disks 61 engaging similar disks 62 fast on the opposite extremities of a rearwardly located shaft 63 carrying a roller 64 journaled in the casing and upon which the name curtain 65 is wound when the curtain is traveling in one direction and from which it is unwound when the curtain is traveling in the opposite direction. It will be understood that the mechanism mounted on the shafts 51, together with their cooperating parts, are duplicates in every particular. However, when the machine is in operation but one of the shafts 60 is operated at the same time, since provision is made for disengaging one set of companion clutch members, 58 and 59, while the other set of clutch members are in engagement the one with the other. This adjustment of the clutch members is accomplished by means of a vertically disposed bar 66 having recesses 67. This bar is equipped at its lower extremity with a push button 68 which is movable in an opening formed in the casing. This bar 66 is slotted, as shown at 69, to receive a pin 70 mounted on the shell of the motor 31. When this push bar is moved to the position shown in Fig. 3, the recess 67 registers with the collar 56 of the lower sleeve 57, whereby the corresponding spring 55 acts to move the sleeve 57 sufficiently to bring the lower clutch faces, 58 and 59, into operative engagement. At the same time the upper recess 67 of the push bar is raised sufficiently to cause the adjacent straight edge of the said bar

to act upon the collar 56 of the uppermost sleeve 57, thus shifting the said sleeve against the adjacent spring 55 and disengaging the corresponding clutch faces 58 and 59. In this event the name curtain 65 will be drawn downwardly, that is to say, unwound from the upper roller 64 and wound upon the corresponding lower roller, designated by the same reference character.

The rotation of the shaft 57 acting through the clutch members 58 and 59, act directly to rotate the shaft 60 upon which is mounted what I will term a feed roller 71 located forward of the curtain roller 64. As the curtain 65 is unwound from either roller 64, it engages a roller 71 and is also acted upon by an opposing cooperating spring-tensioned roller 72 which bears against the apron with sufficient force to cause the feed roller to impart the necessary travel to the curtain. This tension roller 72 has its shaft 73 journaled in vertically movable boxes 74 slidable in partitions 75 and 76. Engaging these movable journal boxes are spiral springs 77, one extremity of each spring engaging the stationary part 78 of the casing while its opposite extremity bears against the journal box 74.

It will be understood that the rollers 71 act to move the curtain or impart thereto the necessary travel when the machine is in operation, by virtue of the gearing connection between the motor 31 and the said rollers. These rollers, when the machine is in operation, both travel in the same direction but the movement of one roller is imparted by the frictional engagement of the curtain only, since only one roller at a time is positively actuated by the motor. It has already been explained that the push bar 66 is so constructed that it can be operated to disengage one pair of clutches, 58 and 59, from each other, while the other pair of clutch faces is allowed to interlock for curtain operating purposes. When it is desired to reverse the travel of the curtain, the bar 66 is pushed to disengage the lower pair of clutch faces, 58 and 59 for instance, and throw the upper pair of clutch faces into operative engagement. In this event the curtain would be drawn on unwound from the lower curtain roller 64 and wound upon the upper roller.

Each curtain roller, as heretofore explained, is actuated by the engagement of friction wheels or gears 61 mounted on the shaft 60, with similar friction wheels or gears 62 mounted on the shaft 63 of the curtain roller. The friction gears or disks 62 are held in operative engagement with their cooperating friction gears 61 by a pair of bow-shaped springs 81, whose central portions 82 are secured to the casing by screws 83 or other suitable fastening devices. The extremities 84 of these springs engage the

extremities of the curtain roller shafts 63 and act on the said shafts whose extremities engage slotted openings 85 in the partitions 75 and 76, with sufficient force to bring the friction wheels or gears 62 into operative engagement with the cooperating friction gears 61.

The front part of the casing is provided with an opening 86 covered by a glass plate 87 through which the names of the streets upon the curtain 65 are observed. At the upper and lower extremities of this opening guide-rollers 88 and 89 are located. These rollers maintain the curtain in proper position in the front part of the casing, to cause it to travel in close proximity to the glass-covered opening 86, whereby the names of the streets are easily observed.

Each sleeve 57 is provided with a slot 90, through which passes a pin 91 fast on the shaft 51. The length of the slot 90 is sufficient to allow the sleeve the necessary longitudinal movement on the shaft for the purpose of causing the clutch faces 58 and 59 to engage and separate as may be desired.

One end of the casing is provided with a door 93 hinged to the casing as shown at 92. When this door is open, the entire roller mechanism carried by the two partitions, 75 and 76, may be slid out of the casing. These partitions are connected at their upper and lower extremities by cross bars 94 which, together with said partitions, constitute a rigid framework. This is an important feature, since it makes it practicable to remove the roller mechanism of the indicator, together with all parts supported by the partitions 75 and 76, to permit the substitution of another set of mechanism, whenever it may be desired to change the name curtain, or equip the indicator for use with a car traveling on a different street. This hinged door 93 is provided with openings 95 adapted to receive a key or the socket end of a crank adapted to fit over either angle extremity 96 of either of the outer disks or friction gears 61. By virtue of this construction, the name curtain may be adjusted on its supporting rollers to occupy any desired position that may be required or necessary, in the event that the car shall not travel over the entire length of the line or should commence intermediate the extremities of the line. Under any such circumstances, the name curtain may be readily adjusted to disclose the next street in advance of the car traveling in either direction, and after that the street names or stations will appear in regular order without further adjustment of the mechanism.

When it is desired to remove a name curtain from the roller mechanism or when a new curtain is desired, the door 95 is opened and the entire mechanism carried by the partitions 75 and 76 is removed, and a new

set of mechanism put in, having a proper name curtain. In this event practically no time need be lost in changing the indicator to adapt it for use on another route or line of the system.

In order that the roller mechanism may be properly adjusted when inserted in the casing, the latter is provided with stops 97 adapted to engage the upper and lower edges of the partition 75, when the roller mechanism has been moved into the proper position to bring the clutch members 59 into suitable proximity with their companion members 58. By virtue of these stops no skill is required in the proper adjustment of the mechanism when the latter is inserted in the casing.

From the foregoing description the use and operation of my improved station indicator will be readily understood. As the car travels along the conductor 15 at predetermined intervals is brought into electrical engagement with the trolley wire, whereby the current passes through the conductor 15, the binding post 16 and thence through a conductor 17 to the electromagnet 18, the circuit being completed through a wire 19, a binding post 20 and a conductor 21 to the ground 22. This results in energizing the magnet 18 and causing its armature bar 24 to move sufficiently to disengage the locking lever 25 from the notch or recess 28 of the gage wheel or disk 29, the circuit through the motor 31 being completed by the downward movement of the arm 35 of the lever, whereby the last named arm is brought into contact with the bracket 37, thus closing the circuit through the motor 31. As the motor is now supplied with current, its armature shaft will be rotated and relatively slow motion communicated to the gear 45 fast on the shaft 30, the said gear meshing with the pinion 44 on the motor shaft. The rotation of the shaft 30 imparts a corresponding movement to the disk or gage wheel 29 which is free to move as soon as the lever is disengaged from the notch in its periphery. As soon, however, as the gage wheel 29 has made a complete rotation, the lever will again drop into the recess 28, thus preventing further movement of the parts until the electromagnet 18 is again energized, and this will not occur until the auxiliary contact of the trolley pole is brought into engagement with the next swinging contact or electrode carried by the trolley wire. Simultaneously with the beginning of the operation of the motor, a gear 46 fast on the motor shaft, is brought into engagement with two gears 47, whereby the two shafts 48 are rotated. Upon these shafts are mounted relatively small gears or pinions 49, one of which meshes directly with the upper gear wheel 50, while the other or lower pinion 49 only acts on the lower wheel 50 through the medium of an

idler gear or pinion 51^A. It will thus be seen that the speed of the armature shaft or the motion thereof will be geared down, so to speak, whereby a number of rotations of the armature shaft is made every time a complete revolution is imparted to the curtain rolls which are actuated by the movement of the gears 50 through the intervention of the clutch faces 58 and 59, and the feed rolls 71 with which the tension rolls 72 cooperate, as heretofore explained. As illustrated in the drawing, the relative size of the various gears is such that each feed roll 71 is given a complete revolution approximately for each rotation of the gage wheel 29 and the tension of the roll 72 cooperating with the feed roll 71 is such that a positive movement is imparted to the name curtain during each intermittent movement of the armature shaft, equal to the circumference of the feed roll. However, as heretofore explained, it will be understood that the movement of the curtain is always due to the action of a single feed roll 71 and its cooperating roll 72 which serve to pull the curtain from one curtain roll 62 and deliver it to the other curtain roll 62. The latter, however, must be rotated in order to wind the name curtain thereon and this is accomplished through the instrumentality of the friction disk or gear 61 fast on the shaft 60 of the feed roll 71, since the said friction disk 61 acts upon the cooperating disk 62 fast on the shaft of the name curtain roll 64.

Attention is called to the fact that the diameter of each name curtain roll 64 is slightly smaller than that of its corresponding feed roll 71 and consequently the relative circumference of the friction disks 61 and 62 is such that at the beginning of the operation of winding the name curtain upon a curtain roll, sufficient movement is imparted to the latter to just take up the length of the curtain which is delivered thereto by a complete rotation of the feed roll which is permitted by the movement of the gage wheel 29, as heretofore explained. The consequence is that immediately after the first convolution of the name curtain upon the winding curtain roll, less movement of the curtain roll will be required in order to take up the length of the curtain delivered thereto by a single rotation of the feed roll. Consequently the travel of the disk 62 will be retarded and the disks 61 and 62 must have a relative sliding movement upon each other on this account which gradually increases in degree until the name curtain is completely wound upon the winding roll. This sliding movement is permitted by reason of the fact that the tension of the springs 81 which act upon the shafts 63 of the cur-

tain rolls is weak as compared with that of the spring 77 which forces each tension roll 72 against the name curtain where the latter comes in contact with the feed roll, whereby the feed roll is prevented from slipping on the name curtain but imparts a positive movement thereto, this movement also resulting in giving the friction disk 61 a positive travel. It will therefore be understood that the relative tension of the spring 77 is such, as compared with that of the springs 81, that the travel of the friction disk 62 may be retarded during the positive travel of the engaging disk 61, without undue wear upon the friction wheels.

From the foregoing explanation it will be understood that every time the motor 31 acts by virtue of the delivery thereto of current from the trolley wire through the shunt circuit elements heretofore explained, a uniform length of name curtain will be drawn from one curtain roll 64 and wound upon the other curtain roll 64, this length of curtain being just such as to bring into view the name of the next street to an observer looking at the face of the indicator mechanism.

Having thus described my invention, what I claim is:

In a station indicator, the combination with a casing, of a name curtain, and rolls with which the name curtain is connected to be wound on either roll while it is unwound from the other, feed rolls for actuating the curtain rolls, a friction disk connection between the feed rolls and the curtain rolls, a pair of suitably spaced leaf springs secured intermediate their extremities to the casing, the curtain rolls being yieldingly supported by the said springs upon opposite extremities thereof, the said friction disk connection and yielding support providing for slippage, whereby the movement of the roll upon which the curtain is being wound may decrease relative to the movement of the roll feeding the same as the depth of the curtain convolutions increases thereon, a motor for actuating the feed rolls, means for locking the motor against movement, and means interposed between the motor and the said feed rolls for breaking the connection between the motor and one feed roll while the connection is established between the motor and the other feed roll, whereby the movement of the curtain may be reversed at will, for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

LEROY O. WISENBERG.

Witnesses:

JNO. G. POWELL,
JESSIE F. HOBART.