M. GODFREY, R. EKRON & H. M. SVEBILIUS.

STATION INDICATOR.

APPLICATION FILED SEPT. 9, 1910.

1,013,485.

Patented Jan. 2, 1912.

3 SHEETS—SHEET 1.

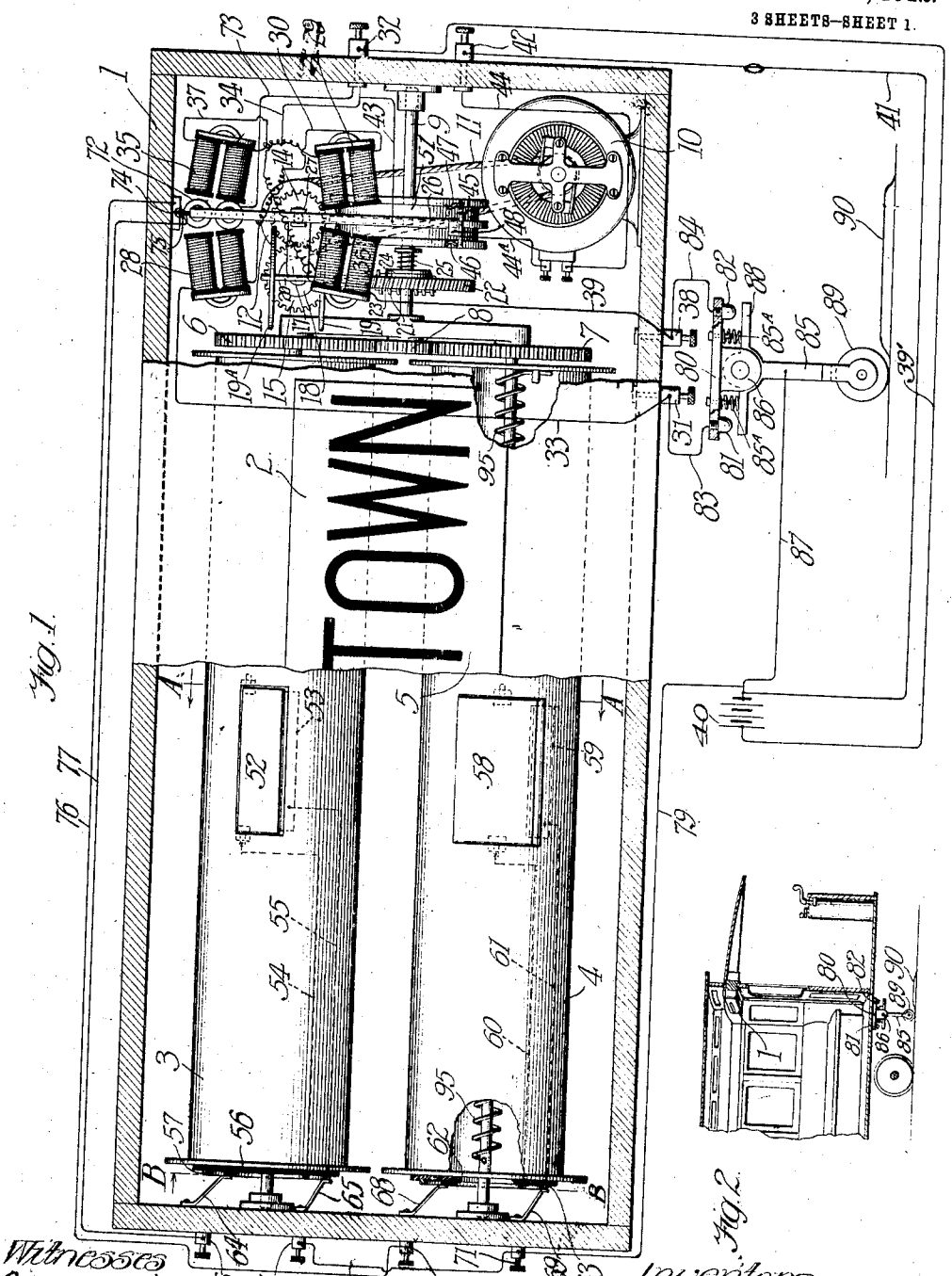

Fig. 1.

Fig. 2.

Witnesses
Martin A. Olsen.
Edwin Phelps

Inventors
R. Ekron, M. Godfrey, & H. M. Svebilius
By Rummler & Rummler,
Attys

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3 SHEETS—SHEET 2.

Fig. 5.

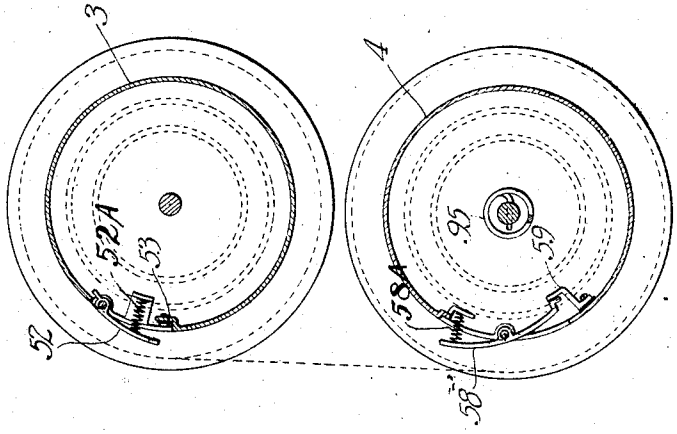
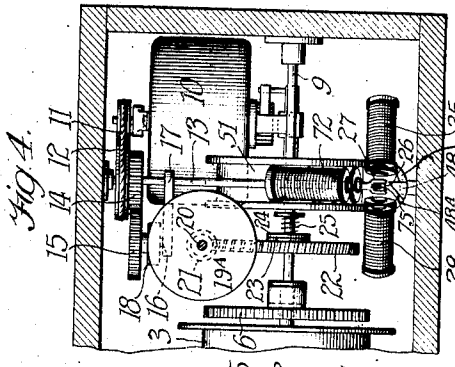


Fig. 4.



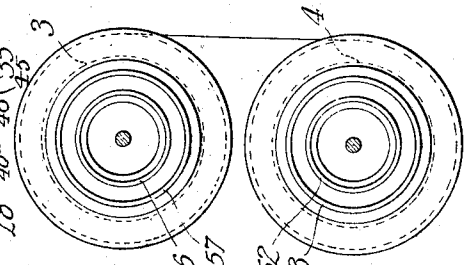
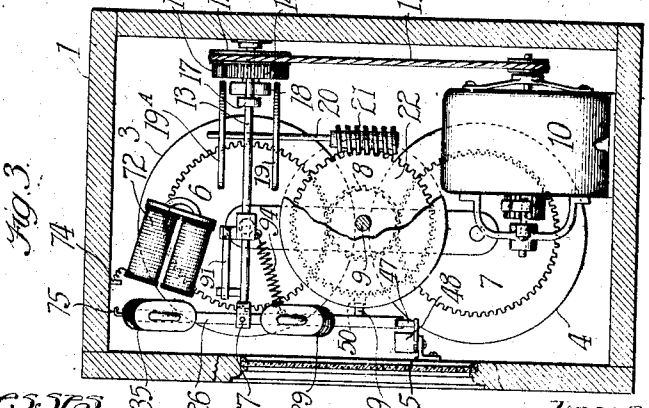


Fig. 6.

Fig. 3.



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Edwin Phelps

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R. Ekron, M. Godfrey and H. M. Svebilius,
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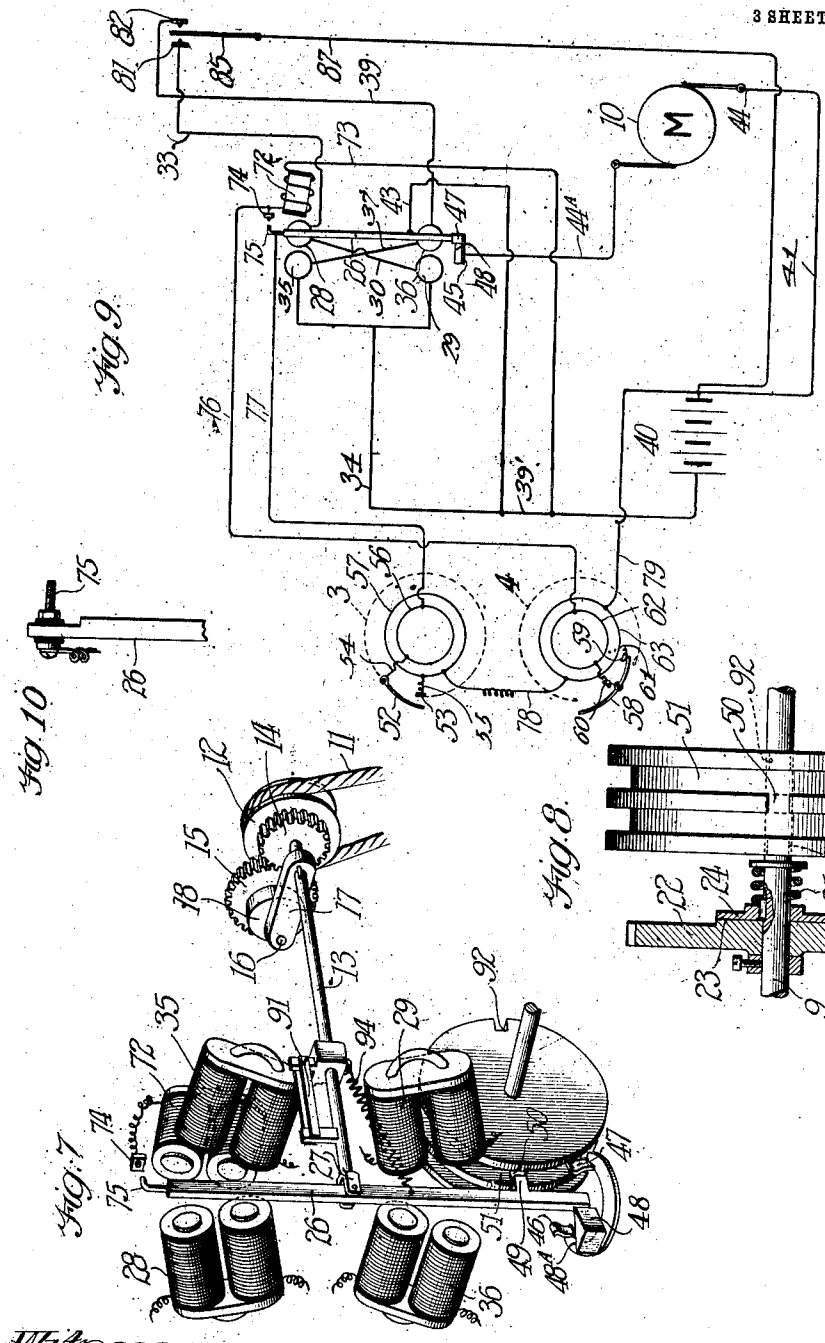
3 SHEETS—SHEET 3.



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R. Ekron, M. Godfrey and H. M. Svebilius
By Runnicles & Runnicles
Attys

UNITED STATES PATENT OFFICE.

MARK GODFREY, ROBERT EKRON, AND HENRY M. SVEBILIUS, OF CHICAGO, ILLINOIS; SAID GODFREY AND SVEBILIUS ASSIGNORS TO SAID EKRON.

STATION-INDICATOR.

1,013,485. Specification of Letters Patent. Patented Jan. 2, 1912.

Application filed September 9, 1910. Serial No. 581,308.

To all whom it may concern:

Be it known that we, MARK GODFREY, ROBERT EKRON, and HENRY M. SVEBILIUS, citizens of the United States of America, and residents of Chicago, county of Cook, State of Illinois, have invented certain new and useful Improvements in Station-Indicators, of which the following is a specification.

The main objects of this invention are to provide an improved form of station indicator, adapted to successively display to the view of passengers in the car the names of the stations as they are approached by the car; to provide an improved form of operating mechanism for devices of this kind; to provide improved means for controlling the starting and stopping of the operating mechanism; to provide improved means for automatically changing the direction of motion of the movement of the indicator sheet when the relative direction of travel of the car is changed; to provide improved means for effecting the rewinding of the sheet; to provide improved means for insuring accurate registration of the successive station names with the display opening; and to provide in an electrically operated device of this kind improved circuit closing mechanism.

An illustrative embodiment of this invention is shown in the accompanying drawings, in which:

Figure 1 is a front elevation of a station indicator constructed according to this invention, parts thereof being broken away to more clearly illustrate some of the mechanism within. Fig. 2 is a fragmentary detail of a railway car showing an indicator in position. Fig. 3 is an end elevation of the operating mechanism. Fig. 4 is a plan view of the same. Fig. 5 is a sectional detail of the display sheet supporting rollers, the section being taken on the line A—A of Fig. 1. Fig. 6 is an end elevation of the rollers viewed from the plane of the line B—B of Fig. 1. Fig. 7 is a perspective view of the electro-magnetic controlling mechanism. Fig. 8 is a detail of the clutch mechanism which connects one of the driving gears with its shaft. Fig. 9 is a diagrammatic view of the electrical connections. Fig. 10 is an enlarged detail of the end of the armature 26, showing the arrangement of the contact member thereon.

The device shown in the drawings comprises a pair of rollers, on which travels a sheet which has indicated thereon the names of the stations along the route of the car. A small, intermittently operated, electric motor is connected by suitable gearing to the rollers so as to advance the sheet to successively display the stations as they are approached by the car.

The operating mechanism is controlled by an armature mounted so that its movements are controlled by several electro-magnets and adapted to normally hold the mechanism inactive. When one of the magnets becomes energized through the temporary closing of its circuit, the armature is swung into position to release the mechanism and to complete the circuit through the motor. The sheet has indicated thereon all the stations which the car passes in making a complete trip. During the trip the sheet is wound from one roller to the other, and as the car arrives at its terminal, the last wrapping of the sheet on the first roller is unwound, and the circuit is closed automatically by one of the magnets, which causes the operating mechanism to rewind the sheet on to the other roller.

The operating mechanism is so arranged, as will hereinafter appear, that if the direction of travel of the car is reversed, and stations are passed, the sheet will be driven in the reverse direction a corresponding number of stations, thus insuring that when the car again assumes its forward direction of travel, the indicator will properly indicate the stations as they are approached.

In the form shown, the mechanism is housed in the casing 1, which is mounted in the car in such position that the names of the stations, as they appear at the window or display opening 2, can be seen by the passengers. A winding roller 3 and a rewinding roller 4 are journaled within the casing 1, and carry the display sheet 5. Gears 6, 7 and 8 connect the rollers 3 and 4 with the shaft 9. A motor 10 is connected by the belt 11 to a pulley 12, which is loose on the shaft 13. A gear 14, fixed to the pulley 12, meshes with the gear 15 on the stud shaft 16. An arm 17 carries the stud shaft 16, and is keyed to the shaft 13. A friction wheel 18 is mounted to rotate with the gear 15, and may be shifted into driving engagement with either of two friction disks 19

and 19A on the shaft 20. The shaft 20 carries a worm 21, which meshes with a gear 22 on the shaft 9. The gear 22 is loosely mounted on the shaft 9, and has a friction surface 23, coacting with a friction disk 24 splined on the shaft 9, and normally urged against the surface 23 by the spring 25. An armature 26 is pivotally supported in the forked end 27 of the shaft 13. Electro-magnets 28 and 29 are arranged at opposite sides of said armature 26 and at opposite sides of the axis of the shaft 13, and are connected in series by the conductor 30. Conductors 33 and 34 connect them with the respective binding posts 31 and 32. The electro-magnets 35 and 36 are opposed to the magnets 28 and 29, being connected together in series by a conductor 37, and to the respective binding posts 32 and 33 by the conductors 34 and 39.

The source of electricity, which supplies energy to the device, is indicated in the drawings as a battery 40, which is connected with the binding post 32 by the conductor 39′, and with the binding post 42 by the conductor 41. Conductor 43 connects the binding post 32 with the armature 26. The conductor 44 is connected to the binding post 42, and to one of the binding posts on the motor 10. The other binding post on the motor is connected by the conductor 44A to the member 45, which carries the contacts 46, 47 and 48, which are located to be engaged by the armature 26 when it is shifted to different positions. The contacts 46 and 47 are formed of spring material, and so positioned as to engage the armature 26 and remain in contact therewith through the greater part of its range of travel. The contact 48 is rigid on the member 45, and has an inclined face 48A adapted to shift the end of the armature sidewise, as hereinafter described. A lug or shoulder 49, on the armature 26, is adapted to lock the operating mechanism, by engaging the slot 50 on the central flange of a drum 51, which is mounted on the shaft 9. The armature 26 is normally held in this position by means of the springs 94 and 91. The rollers 3 and 4 carry mechanism which coacts with the sheet to effect the rewinding thereof. On the roller 3 there is a circuit breaker, which comprises a hinged member 52, which is urged outwardly away from the surface of the roller by a spring 52A. When the sheet 5 is wound on this roller, it holds the member 52 flush with the surface of the roller and in contact with the spring contact member 53, and closes a circuit which energizes magnet 72. The contact members 52 and 53 are connected by conductors 54 and 55 to rings 56 and 57, mounted on the end of the roller 3 and insulated from each other. The roller 4 carries a similar circuit breaker, comprising a member 58 pivoted intermediate of its ends and having a spring 58A which urges it away from the surface of the roller. The sheet 5 holds the member 58 flush with the surface of the roller 4, but when it is released by the sheet, it engages the contact member 59, and closes a circuit which energizes the magnet 72. The contact members 58 and 59 are connected by the conductors 60 and 61 to insulated contact rings 62 and 63 on the end of the roller 4. Brushes 64 and 65 bear on the rings 56 and 57, and are connected to the respective binding posts 66 and 67. Brushes 68 and 69 bear on the rings 62 and 63, and are connected to the respective binding posts 70 and 71. An electro-magnet 72, adjacent to one end of the armature 26, and at right angles to the magnets 36 and 37, is connected to the binding post 32 by a conductor 73, and to the contact plate 74. The contact plate 74 is mounted on the casing 1 in position to be engaged by a contact member 75 carried by the armature 26, and insulated therefrom. The conductor 76 connects the binding post 70 with the contact plate 74, and the conductor 77 connects the binding post 66 with the contact member 75. The binding posts 70 and 71 are connected together by conductors 78, and to the battery 40 by the conductor 79.

The circuit breaker which controls magnets 28 and 29 and 35 and 36, comprises a plate 80 secured to the car, and having two contact blocks 81 and 82, insulated therefrom, and respectively connected by the conductors 83 and 84 to the binding posts 31 and 38. A T-shaped lever 85, pivoted to the lug 86 on the plate 80, is connected to the battery 40 by the conductor 87. This lever 85 is urged to its normal position by the springs 85A and is adapted to be swung in opposite directions so as to engage either of the contacts 81 and 82. An anti-friction roller 89 is carried at the free end of the lever 85, and stationary members 90 are arranged along the route so that as the car passes a station, the lever 85 will be shifted into engagement with one of the contact blocks carried by the plate 80, so as to complete the circuit through the corresponding pair of magnets. This causes the armature 26 to swing to one side, releasing the operating mechanism, and closing the motor circuit, so that the sheet 5 will advance and indicate the next station. The direction in which the lever 85 swings determines the direction in which the armature 26 swings, and accordingly determines the direction of travel of the sheet 5. The engaging surfaces of the members 90 are of a length sufficient to hold the contact long enough to insure the starting of the motor 10, regardless of the speed of the car.

The operation of the device shown is as follows:—When the car is at the beginning of the line, almost all of the sheet is wound

upon the roller 4, but its free end is connected to the roller 3, and the name of the first station appears at the display window of the casing. As the car leaves each station, the lever 85 engages one of the members 90 and closes the circuit through the magnets 28 and 29. This circuit may be traced from the battery 40 through the conductor 87, lever 85, contact 81, conductors 83 and 33, magnet 28, conductor 30, magnet 29, conductors 34 and 39′ to the battery 40. The energizing of the magnets 28 and 29 causes the armature 27 to be shifted so as to disengage the detent lug 49 from the notch 50. The end of the armature 26 thereupon engages the contact 47, closing the circuit through the motor 10, and causing its operation. This circuit may be traced from the battery 40 through the conductor 39′, binding post 32, conductor 43, armature 26, contact 47, conductor 44ᴬ, motor 10, conductors 44 and 41 to battery 40. The motor 10 drives the friction wheel 18, which, when the armature 26 is thus shifted, is swung by the shaft 13 into driving engagement with the friction disk 19. The rotation of the disk 19 causes the worm 21 to drive the gear 22 and rotate the shaft 9. This rotation is transmitted through the gears 6 to the rollers 3 and 4, and winds the sheet 5 on to the roller 3. As the roller 89 leaves the member 90, the circuit through the magnets 28 and 29 is broken, and though the armature 26 is urged by the springs 91 to assume its normal position, it is prevented from so doing by the lug 49 which rests against the side of the middle flange of the drum 51, until the drum has completed a revolution and returned the notch 50 to position to receive the lug 49. The spring contact 47 insures that the motor circuit remain closed until the armature 26 assumes its normal position. When the lug 49 enters notch 50, further operation of the mechanism is prevented and the motor circuit is simultaneously opened. The friction clutch 23 absorbs any shock due to momentum of the motor. Should the car stop so that the roller 89 remains on the member 90 for a period of time longer than is required for the mechanism to complete one cycle of operation, the current through the magnets 28 and 29 would, of course, be continued, which would hold the armature out of position to engage the notch 50, and the continuous operation of the device would result, were not means provided to check the operation of the mechanism until the roller 89 moved out of contact with the member 90. These means comprise notches 92, located in each of the outer flanges of the drum 51, at points diametrically opposite the notch 50. When the drum has completed a half revolution, the lug 49 enters one of the notches 92, because of the pull exerted upon the armature 26. The motor 10, however, continues to operate, but is prevented from rotating the shaft 9 through the slipping of its friction connection with the gear 22. When the car is moved so that the roller 89 recedes from the member 90, the springs 85ᴬ urge the lever 85 to its normal position, and the circuit of the magnets 28 and 29 is broken, whereupon the springs 91 release the lug 49 from the notch 92, and the gear 22 rotates the drum 51 so as to complete its cycle of operation. When the lug 49 engages the notch 50, the mechanism stops.

When the direction of travel of the car is reversed, the roller 89 approaches the members 90 in the opposite direction from that just described. The contact is then made at 82, completing the circuit through the magnets 35 and 36. This circuit may be traced from the battery 40 through conductor 87, contact 82, conductor 84, binding post 38, conductor 39, magnet 36, conductor 37, magnet 35, conductor 34, binding post 32, and conductor 39′ to battery 40. The energizing of the magnets 35 and 36 causes the armature 26 to swing in the direction opposite to that in which it is moved by the magnets 28 and 29, whereupon the lug 49 is disengaged from the notch 50 and the end of the armature closes the motor circuit at the contact 46. However, in this case, the shifting of the armature 26 causes the arm 17 to shift the friction wheel 18 into driving engagement with the upper disk 19ᴬ, which causes the worm 21 to drive the gear 22 in the reverse direction, so that the sheet 5 is wound back on to the roller 4, displaying the names of stations in the reverse order.

When the car has completed its entire trip and arrived at the terminal, all of the sheet will have been wound on to the roller 3, and as the last turn of the sheet is unwound from the roller 4, it releases the member 58, permitting it to swing into contact with the member 59 and close the circuit through the magnet 72. This circuit may be traced from the battery 40 through the conductor 79, binding post 71, brush 69, conductor 61, the members 59 and 58, conductor 60, ring 62, brush 68, binding post 70, conductor 76, contact member 74, magnet 72, conductor 73, binding post 32, conductor 39′. to the battery 40. The energizing of the magnet 72 causes the armature 26 to swing outwardly away from the drum 51, disengaging the lug 49 from the notch 50, and bringing the end of the armature 26 into engagement with the contact 48. The diagonal face 48ᴬ of the contact 48 forces the armature to the left of Fig. 1, thereby shifting the friction wheel 18 into contact with the upper disk 19ᴬ. The engagement of the armature with the contact 48 closes the motor circuit and causes the sheet 5 to be rewound on to the

roller 4. When the roller 4 has made one revolution, the sheet 5 brings the member 58 flush with the surface of the roller, and thereby opens one shunt of the circuit at that point. However, as the member 52 is in contact with the member 53, and as the contact member 75 is in contact with the member 74, the circuit through the coil of the magnet 72 will remain energized. This circuit may be traced from the battery 40 through the conductors 79 and 78, binding post 67, brush 65, ring 57, conductor 55, members 53 and 52, conductor 54, ring 56, brush 64, binding post 66, conductor 77, contacts 75 and 74, magnet 72, conductor 73, binding post 32, conductor 39′, to the battery 40. The magnet 72 thus holds the armature 26 in position to keep the members 74 and 75 in contact, and to close the motor circuit at the contact 48. The rewinding of the sheet continues until the unwinding of the sheet from the roller 3 releases the member 52, and allows it to swing away from the member 53, which breaks the circuit through the magnet 72, and allows the springs 91 and 94 to urge the armature 26 to its normal position. This breaks the motor circuit at the contact 48. Should it happen that the notch 50 is not yet in position to register with the lug 49, the momentum of the disks 19 and rotor of the motor is sufficient to continue the rotation of the drum until the notch 50 comes into such position, and thus insures that names on the sheet will properly register with the display opening when the car again traverses its route.

In order to prevent slack in the sheet at all times, and insure registration of the station indications with the display window in the casing, the spacing between successive indications on the sheet is made to correspond with the movement of the sheet to and from the roller 3, and in order that the roller 4 will rotate to an angular extent which is just sufficient to avoid slack in the sheet, said roller 4 is loose on its shaft, and is connected thereto through a helical spring 95, one end of which is fastened to the shaft, and the other end to the roller. With this arrangement, it will be seen that although the shafts of the roller are respectively driven to an equal angular extent by the driving gearing, the spring 95 maintains the tension upon the sheet, and by winding up or unwinding, as the conditions require, produces an accurate differential movement between the rollers themselves. This differential movement is just sufficient to compensate for the amount of sheet which is reeled to and from the respective rollers, and which, of course, varies as the effective diameter of the roller increases and decreases. With the described arrangement, the accurate registration of the station indications with the display window is in no way limited by the number of stations along the route, nor does it matter whether the stations are being passed in one direction or the other along the route.

Although but one specific embodiment of this invention is herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention, as defined by the following claims.

We claim:—

1. In a station indicator, transportable with a vehicle, the combination of a winding roller and a rewinding roller, a sheet traveling on said rollers and having indicated thereon the stations along the route, mechanism connected to operate said rollers to move said sheet and successively display said station indications, reversing mechanism adapted to cause said driving mechanism to operate said rollers in different directions, controlling means comprising parts located respectively on said vehicle and at points along said route adapted to coact to actuate said operating and reversing mechanisms, further controlling means for said reversing mechanism, comprising means mounted on said rewinding roller and adapted to automatically actuate said reversing mechanism when said sheet reaches the limit of its movement and thereby cause said operating mechanism to rewind said sheet on to said rewinding roller.

2. In a station indicator, transportable with a vehicle, the combination of a winding roller and a rewinding roller, a sheet traveling on said rollers and having indicated thereon the stations along the route, mechanism connected to operate said rollers to move said sheet and successively display said station indications, reversing mechanism adapted to cause said driving mechanism to operate said rollers in different directions, controlling means comprising parts located respectively on said vehicle and at points along said route adapted to coact to actuate said operating and reversing mechanisms, further controlling means for said reversing mechanism, comprising means mounted on said rewinding roller and adapted to automatically actuate said reversing mechanism when said sheet reaches the limit of its movement and thereby cause said operating mechanism to rewind said sheet on to said rewinding roller, and other controlling means on said winding roller adapted to automatically stop said operating mechanism when said sheet approaches the opposite limit of its travel.

3. In a station indicator, transportable with a vehicle, the combination of a pair of rollers, a sheet traveling on said rollers and having indications thereon to represent the

stations along the route of travel of the vehicle, mechanism connected to operate said rollers for moving said sheet to successively display said station indications, reversing mechanism controlling said operating mechanism and adapted to be shifted to cause said operating mechanism to move said sheet in different directions, an armature connected to said reversing mechanism, opposed electro-magnets each arranged to actuate said armature for shifting said reversing mechanism, a pair of contacts on said vehicle respectively connected in circuit with different magnets, a third contact member movable relatively to said contacts and adapted to be oppositely shiftable to engage either of said contacts to complete a circuit through the respective magnet, and means stationed along said route and adapted to shift said third member as the vehicle passes.

4. In a station indicator, transportable with a vehicle, the combination of a pair of rollers, a sheet traveling on said rollers and having indicated thereon the stations along the route of the vehicle, a pair of friction disks, a friction wheel mounted between said disks and shiftable into engagement with either, driving mechanism connecting said disks with said rollers, a motor connected to drive said friction wheel, an armature controlling the position of said friction wheel, electro-magnets arranged at opposite sides of said armature and connected in separate circuits, controlling means comprising parts located respectively on said vehicle and at points along said route, and adapted to coact to close the circuit through either of said magnets, according to the direction of travel of the vehicle, and a motor circuit adapted to be closed by the coaction of said parts.

5. In a station indicator, transportable with a vehicle, the combination of a pair of rollers, a sheet traveling on said rollers and having indicated thereon the stations along the route of said vehicle, mechanism connected to operate said rollers for moving said sheet to successively display said station indications, reversing mechanism adapted to cause said operating mechanism to move said sheet in different directions, an armature connected to actuate said reversing mechanism, a drum, shoulders on said drum and armature adapted to coact to hold said operating mechanism inactive, a pair of electro-magnets arranged at opposite sides of said armature, and connected in relatively different circuits, and each adapted to shift said armature to disengage said shoulders, and controlling means comprising parts respectively located on said vehicle and at points along said route and adapted to coact to close the circuit through either of said magnets according to the direction of travel, and thereby shift said armature to actuate said reversing mechanism, and a motor controlled by said armature for actuating said operating mechanism.

6. In a station indicator, transportable with a vehicle, the combination of a pair of rollers, a sheet traveling on said rollers and having indicated thereon the stations along the route of said vehicle, mechanism connected to operate said rollers for moving said sheet to successively display said station indications, reversing mechanism adapted to cause said operating mechanism to move said sheet in different directions, an armature connected to actuate said reversing mechanism, a drum mounted to rotate with said operating mechanism, a pair of electro-magnets arranged at opposite sides of said armature and connected in relatively different circuits and respectively adapted to shift said armature toward different sides, controlling means comprising parts located respectively on said vehicle at points along said route and adapted to coact to close the circuit through either of said magnets, and thereby shift said armature to actuate said reversing mechanism, a motor controlled by said armature for actuating said operating mechanism, a shoulder on said armature, and a shoulder centrally located on the periphery of said drum adapted to coact with said other shoulder when said controlling means are out of coacting relationship to hold said operating mechanism inactive, other shoulders at opposite edges of said drum and circumferentially spaced away from said first shoulder, said armature shoulder being adapted to coact with either of said other shoulders to stop the movement of said sheet when said controlling means remain in their coacting relationship, and means interposed in said operating mechanism for permitting the continued operation of said motor when the movement of said sheet is stopped.

7. In a station indicator, transportable with a vehicle, the combination of a pair of rollers, a sheet traveling on said rollers and having indicated thereon the stations along the route of said vehicle, a shaft operatively connected to rotate said rollers to move said sheet to successively display said station indications, a gear mounted on said shaft, friction mechanism connecting said gear and said shaft, motor driven mechanism connected to rotate said gear, a member fixed on said shaft and having formed thereon shoulders spaced apart, an armature for controlling the operation of said motor, an electro-magnet arranged adjacent to said armature, controlling means comprising parts respectively located on said vehicle and along said route adapted to coact to complete a circuit through said magnet for actuating said armature, a shoulder on said armature adapted to have interlock-

ing engagement with one of the shoulders on said member to hold said driving motor inactive when said means remain out of coacting relationship, said armature being adapted to be shifted so that said armature shoulder will have interlocking engagement with the other shoulder on said member to check the rotation of said shaft when said means remain in their coacting relationship.

8. In a station indicator, transportable with a vehicle, the combination of a winding roller and a rewinding roller, a sheet traveling on said rollers and having indicated thereon the stations along the route of the vehicle, motor driven mechanism connected to operate said rollers to move said sheet to successively display said station indications, reversing mechanism adapted to be shifted to cause said operating mechanism to move said sheet in different directions, an armature connected to actuate said reversing mechanism, a pair of electro-magnets arranged adjacent to said armature and each adapted to shift said armature, controlling means comprising parts respectively located on said vehicle and along said route adapted to coact to close the circuit through one of said magnets and thereby shift said armature to actuate said reversing mechanism to cause the winding of said sheet on to said winding roller, a pair of relatively movable switch members connected in circuit with said other magnet and adapted to be brought into engagement when said sheet has reached the limit of its travel for completing the circuit through said other magnet, so as to thereby shift said armature to actuate said reversing mechanism to cause the rewinding of said sheet on to said rewinding roller, and means adapted to retain said reversing mechanism in such position to permit the complete rewinding of said sheet.

9. In a station indicator, transportable with a vehicle, the combination of a winding roller and a rewinding roller, a sheet traveling on said rollers and having indicated thereon the stations along the route of the vehicle, motor driven mechanism connected to operate said rollers to move said sheet to successively display said station indications, reversing mechanism adapted to be shifted to cause said operating mechanism to move said sheet in different directions, an armature connected to actuate said reversing mechanism, a pair of electro-magnets arranged adjacent to said armature and each adapted to shift said armature, controlling means comprising parts respectively located on said vehicle and along said route adapted to coact to close the circuit through one of said magnets and thereby shift said armature to actuate said reversing mechanism to cause the winding of said sheet on to said winding roller, a pair of relatively movable switch members connected in circuit with said other magnet and adapted to be brought into engagement when said sheet has reached the limit of its travel for completing the circuit through said other magnet, so as to thereby shift said armature to actuate said reversing mechanism to cause the rewinding of said sheet on to said rewinding roller, and means on said winding roller adapted to break the circuit through said other magnet when said sheet has reached the opposite limit of its travel.

10. In a station indicator for vehicles, the combination of a display element having thereon a series of station indications, a casing surrounding said display element and having therein a display window, operating mechanism for shifting said display element to successively bring different station indications into registration with said window, a movable controlling member adapted when shifted in opposite directions to cause said mechanism to drive said display element in correspondingly opposite directions, a drum connected with said operating mechanism and having on its periphery three annular flanges spaced apart axially, a stop notch in each of said flanges, said notches spaced apart angularly, a detent normally urged into position for engaging the notch in the middle flange and adapted to be urged out of such engagement toward either of the outer flanges though the corresponding movements of said controlling member, means adapted to urge said detent to engage the stop notch in one of said outer flanges when said controlling member is held in either of its operating positions, and thereby prevent a complete rotation of said drum; said means being automatically rendered inactive through the passing of said controlling member out of its operative position, whereby said detent will normally return to its position for engagement with said middle stop notch and prevent more than one revolution of said drum for each operation of said controlling member, and a motor controlled by the movement of said controlling member for driving said operating mechanism in either direction, according to the position of said controlling member.

11. The combination of a pair of rollers, a sheet having its opposite ends connected to said rollers, motor driven mechanism connected to operate said rollers for reeling said sheet from one to the other of said rollers, means controlled independently of said sheet for actuating said mechanism to cause the winding of said sheet on to one of said rollers, and a circuit breaker on one of said rollers adapted to be held open by said sheet and adapted, when released by said sheet, to close, and an electric circuit controlled by

said circuit breaker for actuating said mechanism to rewind said sheet.

12. The combination of a pair of rollers, a sheet having its opposite ends connected to said rollers, motor driven mechanism connected to operate said rollers for reeling said sheet from one to the other of said rollers, means controlled independently of said sheet for actuating said mechanism to cause the winding of said sheet on to one of said rollers, a circuit breaker on one of said rollers adapted to be held open by said sheet and adapted, when released by said sheet, to close, an electric circuit controlled by said circuit breaker for actuating said mechanism to rewind said sheet, and a second circuit breaker on the other roller adapted to be held closed by the sheet and adapted when released to open said circuit and stop said rewinding operation.

13. In a station indicator, transportable with a vehicle, the combination of a winding roller and a rewinding roller, a sheet traveling on said rollers and having indicated thereon the stations along the route of the vehicle, motor driven mechanism connected to operate said rollers to move said sheet to successively display said station indications, reversing mechanism adapted to be shifted to cause said operating mechanism to move said sheet in different directions, an armature connected to actuate said reversing mechanism, a pair of electro-magnets arranged adjacent to said armature and each adapted to shift said armature, controlling means comprising parts respectively located on said vehicle and along said route adapted to coact to close the circuit through one of said magnets and thereby shift said armature to actuate said reversing mechanism to cause the winding of said sheet on to said winding roller, a pair of relatively movable switch members connected in circuit with said other magnet and adapted to be brought into engagement when said sheet has reached the limit of its travel for completing the circuit through said other magnet so as to thereby shift said armature to actuate said reversing mechanism to cause the rewinding of said sheet on to said rewinding roller, and means adapted to continue the energization of said other magnet to secure the complete rewinding of said sheet.

Signed at Chicago this 6th day of September, 1910.

MARK GODFREY.
ROBERT EKRON.
HENRY M. SVEBILIUS.

Witnesses:
EUGENE A. RUMMLER,
EDWIN PHELPS.