Nov. 13, 1923. 1,473,752

J. C. WOOD

STATION INDICATOR

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Fig. 1.

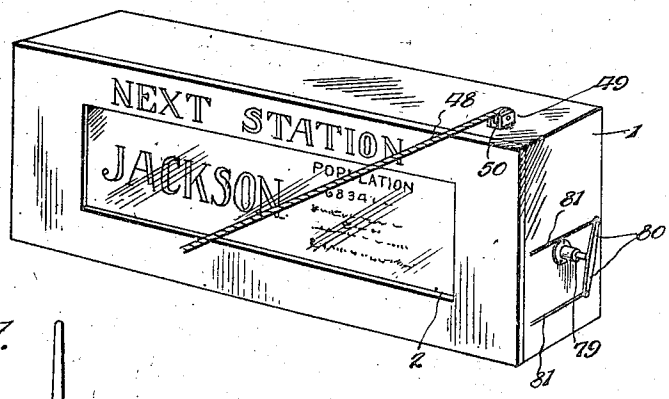



Fig. 7.

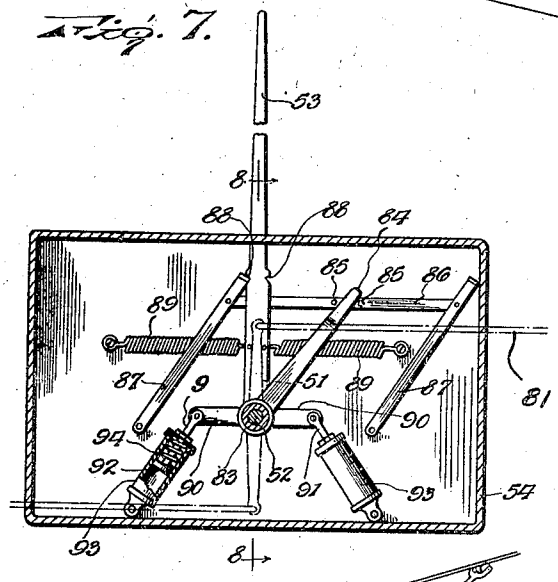
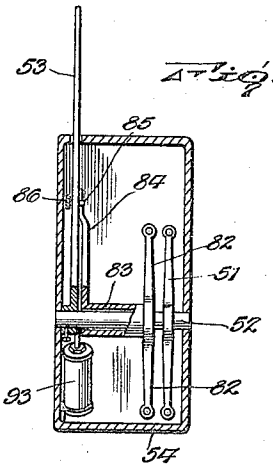



Fig. 8.



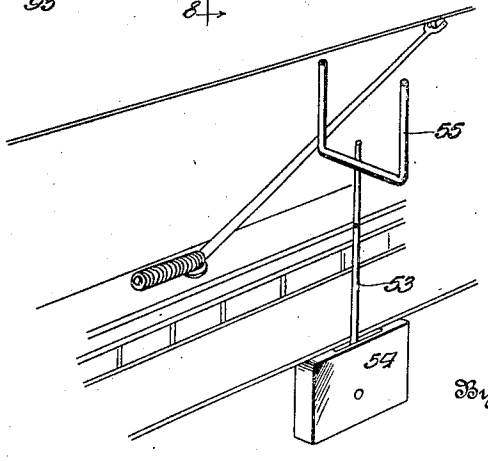




Fig. 6.

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STATION INDICATOR

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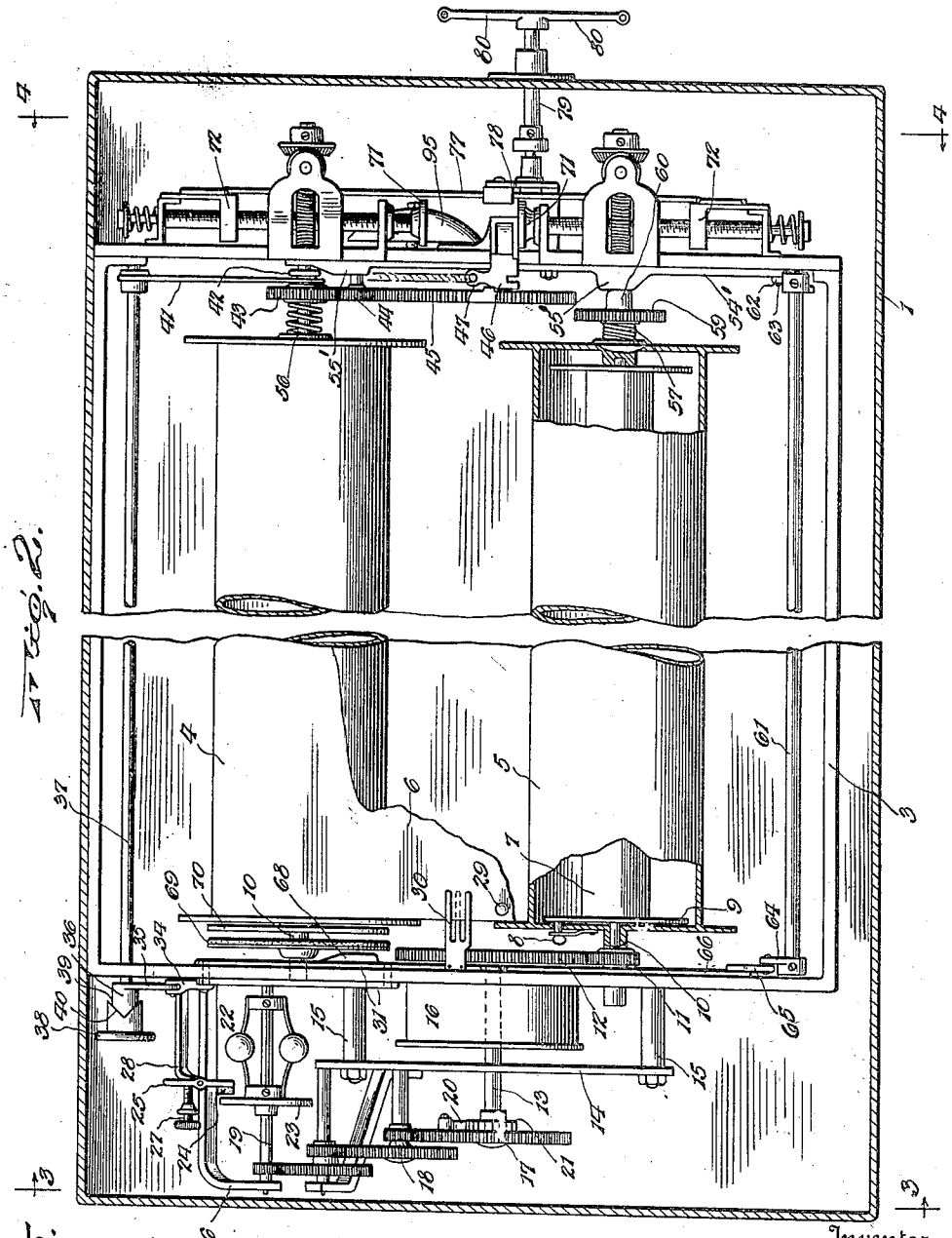


Fig. 2.

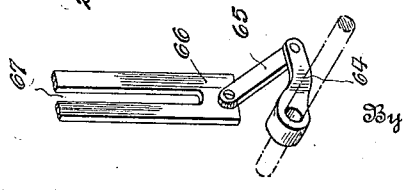


Fig. 5.

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STATION INDICATOR

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Fig. 4.

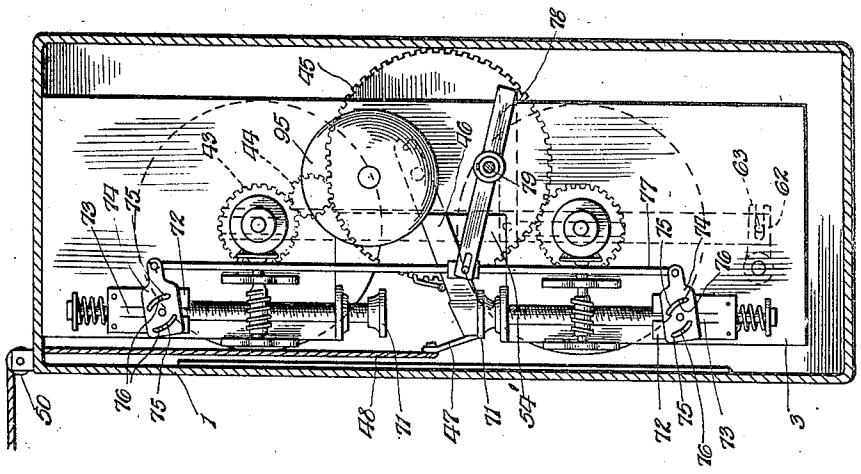
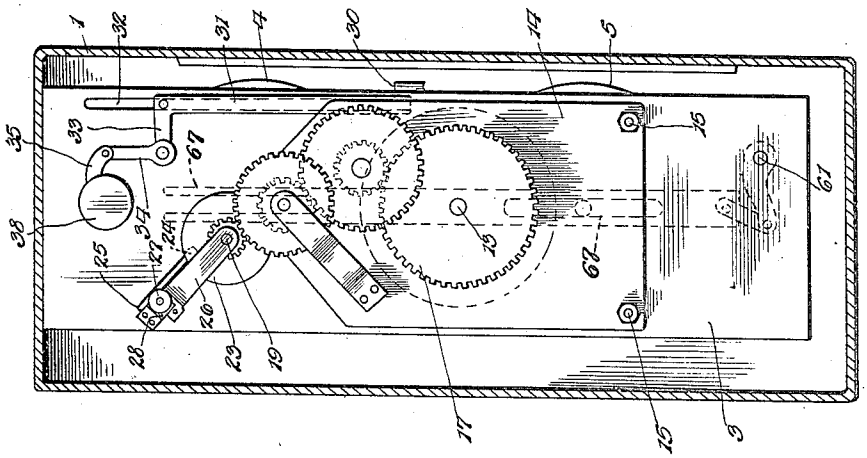


Fig. 3.



Inventor

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By Lacey & Lacey, Attorneys

Patented Nov. 13, 1923. 1,473,752

# UNITED STATES PATENT OFFICE.

JOSEPH C. WOOD, OF JACKSON, TENNESSEE.

## STATION INDICATOR.

Application filed August 1, 1922. Serial No. 579,041.

*To all whom it may concern:*

Be it known that I, JOSEPH C. WOOD, a citizen of the United States, residing at Jackson, in the county of Madison and State of Tennessee, have invented certain new and useful Improvements in Station Indicators, of which the following is a specification.

This invention relates to station indicators of the type shown in an application for patent filed by me March 16, 1922, Serial No. 544,202, and the primary object of the present invention is to provide mechanism whereby the indicator will be especially adapted for use upon a belt line. The invention seeks to provide a station-indicating mechanism for use upon a loop or belt line by which, when the last station upon the line has been passed, the belt or apron carrying the names of the stations will be automatically reversed so that the name of the station at the beginning of the run will be again properly displayed behind the sight opening in the casing. The invention further seeks to provide means whereby premature shifting of the belt will be prevented, and also to provide means whereby the operating mechanism may be reversed in the event that an accident or some other cause necessitates the car returning over the line in a reverse direction. Another object of the invention is to simplify the construction disclosed in my previous application and thereby reduce the cost of production as well as attain greater certainty in the operation of some of the parts. The several stated objects and other incidental objects which will appear in the course of the following description are attained in the use of such a mechanism as is illustrated in the accompanying drawings, and the invention resides in certain novel features which will be particularly pointed out in the claims following the description.

In the drawings—

Figure 1 is a perspective view of my improved station indicator;

Fig. 2 is an enlarged front elevation of the same with the front wall of the casing removed and certain parts broken away and shown in section;

Fig. 3 is a transverse section on the line 3—3 of Fig. 2;

Fig. 4 is a transverse section on the line 4—4 of Fig. 2;

Fig. 5 is a detail perspective view of a part of the mechanism for actuating the reverse controlling brake or clutch;

Fig. 6 is a perspective view of a portion of a mechanism whereby the indicator will be automatically operated by the travel of the car;

Fig. 7 is an enlarged sectional elevation of the operating members of the apparatus shown in Fig. 6;

Fig. 8 is a section upon the line 8—8 of Fig. 7.

The casing 1 of my present apparatus may be of the same form as that disclosed in my above identified application and is provided with a glazed sight opening 2 in its front wall through which the names of the stations may be read. Within this casing is a frame 3 which may also be of the same form and construction as the frame disclosed in my aforesaid application and may be secured within the casing in any convenient or preferred manner. This frame carries the operating mechanism and may be readily removed from the casing when cleaning, repairing or adjustment of the operating mechanism is necessary. Mounted within the frame 3 are upper and lower drums or rolls 4 and 5 upon which the apron or belt 6 carrying the names of the stations is wound. Within each drum is a roller 7 which is normally held in fixed concentric relation to the drum by a latch 8 engaging a disk 9 at the end of the roller. The end of the apron is secured to the roller 7 and that portion of the apron which is not to be used is wound upon the roller and housed within the drum, it being understood that so much of the apron as will be needed to display the names of all the stations upon the run will be wound about the lower drum 5 and as the car makes its runs will be automatically unwound from the drum 5 and wound upon the drum 4. In making a circular run or trip upon a belt or loop line, the name of the station from which the run starts will, of course, be first displayed and as the car leaves that station, the apron will be shifted so that the name of the next station will be displayed. Obviously, when the last station on the run has been passed, the name of the first station should be again displayed at the sight opening, and the particular object of my present improvements is to automatically return the apron to its initial position so that the name of the first station will be again displayed at the sight opening.

Upon the trunnion or supporting stub shaft 10 of the lower drum 5, I secure a

pinion 11 which meshes with a gear 12 on the inner end of a motor shaft 13, the said shaft being supported rotatably in the end of the frame 3 and in a plate 14 supported in spaced relation to the end of the frame by posts 15 or equivalent devices which project from the end of the said frame. A housing or case 16 is secured to the end of the frame 3 and a motor spring is wound within this case and has its ends secured respectively to the wall of the case and to the shaft 13 so that, as the drum 5 is rotated, the motion thereof will be transmitted through the gears 11 and 12 to the shaft 13 to wind the spring. Upon the outer end of the shaft 13 is loosely mounted a gear 17 which meshes with a pinion 18 constituting one member of a train of gears whereby motion may be imparted to a governor shaft 19, as will be readily understood upon reference to Fig. 2 of the drawings. A pawl 20 is mounted upon the inner side of the gear 17, and a ratchet wheel 21 is fixed upon the shaft 13 so as to ride under or be engaged by said pawl in an obvious manner. While the car is making its run, the shaft 13 will be rotated so as to wind the spring and the ratchet wheel 21 will ride under the pawl 20 and the governor will not be operated. Upon the governor shaft 19 is mounted a centrifugally acting speed governor 22 which may be of any well-known type and is equipped with a brake disk 23 which is adapted to ride against a brake shoe 24 secured upon the lower end of a brake lever 25. This brake lever 25 is pivotally mounted upon an arm 26 which projects from the end of the frame 3 and constitutes a support for the governor shaft. The brake lever is set so as to be engaged sooner or later by the brake disk 23 by manipulation of a set screw 27 which is threaded through the upper end of the lever and is swiveled at its inner end in a bracket 28 projecting from the end of the frame 3.

Upon the apron 6, I secure stops 29 which are spaced apart a distance equal to the length of the run or trip of the car and are of such dimensions that they may readily fit against the drum 4 or the drum 5, as the case may be, as the apron is wound thereon, and may pass through the slot in the drum if it should be necessary to wind upon the roller 7 that portion of the apron to which the stop is secured. The stops 29 are adapted to impinge against a fork 30 and thereby actuate a slide 31 to which the said fork is secured and which slide is mounted upon the end of the frame 3 and is offset between its ends so as to pass through and be guided by a vertical slot 32 in the end of the frame. The upper extremity of this slide is bent transversely with respect to the frame 3 to form an arm 33 which is pivoted to the lower end of a link 34 having its upper end pivoted to an arm 35 projecting from a cam 36 fitted loosely upon a reversing rod 37 which is mounted in the ends of the frame and is adapted to slide therein, the rod extending the full length of the frame, as clearly shown in Fig. 2. Adjacent the cam 36, a co-operating cam 38 is secured upon reversing rod so that, when the cam 36 is rocked, its inclined or cam face 39 will ride upon the cam face 40 of the cam 38 and will thereby transmit an endwise movement to the reversing rod 37. To the opposite end of the rod 37, I secure a depending shifting arm 41 which has its lower end fitted in an annular groove in the hub 42 of a gear 43 which is secured upon the adjacent trunnion or shaft of the upper drum 4 and is normally in mesh with a pinion 44 which forms a part of the actuating mechanism whereby the apron will be normally wound upon the upper drum 4 and unwound from the lower drum 5. The pinion 44 is constantly in mesh with a gear 45 which is actuated at intervals by the operating lever 46, the said lever being pivotally mounted upon the frame 3 and being constructed at its free end with a lug or projection 47 to which the end of the operating cable 48 is secured. The operating cable 48 passes upwardly from the lever 46 through an opening 49 in the top of the casing 1 and then passes over an idler or guide roller 50 to any desired point of operation. It may be simply carried to the end of the car to be manually operated by the conductor as the car passes each station or it may, as indicated in Fig. 7, be attached to an arm 51 extending from a rock shaft 52 which rock shaft has secured thereto a lever 53 projecting from a casing 54 in which the rock shaft is mounted, as shown in Fig. 8, the casing being mounted on the side of the car and the lever 53 being adapted to impinge against a trip 55 of any convenient or preferred form secured upon any fixed support at the station. A shifter bar 54′ is mounted upon the frame 3 and is provided with cams or wedge-shaped projections 55′ which are adapted to bear against the hubs of the gears which are secured upon the adjacent trunnions or shafts of the drums 4 and 5, the upper projection 55′ bearing against the hub 42 which has been previously mentioned and the said hub and the gear 43 being held in engagement with said projection by a spring 56 coiled around the trunnion between the gear and the end of the drum. A similar spring 57 is coiled around the trunnion of the drum 5 and bears against the gear 59 which is mounted upon the said trunnion and the hub 60 of which is adapted to be engaged by the lower wedge 55′. When the indicator is mounted upon cars making straight runs, the shifter bar 54′ is automatically raised or lowered at the end of the run so as to auto-

matically shift the gears 43 and 59 and reverse the direction of travel of the indicator apron 6. When the car, however, is traveling upon a loop or belt run, the shifter bar 54′ is in its lowered position and is not moved out of that position unless an accident or like cause makes it necessary for the car to make a return trip. In order that the apron may not be released and returned to its initial position through the action of the spring motor when the bar 54′ is shifted, I provide a clutch or brake controlling rod 61 which is rotatably mounted in the lower end of the frame 3 and is supported by the end members of said frame. To one end of this rod, I secure a crank arm 62, the free end of which is forked or slotted so as to engage a pin or stud 63 projecting from the lower end of the shifter bar 54′. To the opposite end of this rod 61, I secure a crank 64, the free end of which is connected by a link 65 with the lower end of a slide 66. The slide 66 is longitudinally slotted, as shown at 67, and is mounted vertically upon the adjacent end of the frame 3, the slotted construction permitting the slide to readily pass the trunnions or shafts 10 of the drums 4 and 5. Upon the upper portion of the slide 66, I provide a cam or wedge-like projection 68 which is adapted to bear against a friction brake or clutch disk 69 slidably mounted upon the shaft or trunnion 10 of the upper drum 4 so that the said disk 69 may be caused to effect binding engagement with the end of the drum or with a second friction disk 70 which is rigidly secured upon the said trunnion or shaft 10. The cranks 63 and 64 are disposed in such angular relation to the controlling rod 61 that, when the shifter bar 54′ is raised to effect reversal of the indicating mechanism, the brake or clutch disks 69 and 70 will be caused to engage before the gear 43 is entirely out of mesh with the pinion 44.

As disclosed in my application hereinbefore mentioned, I employ adjustable stops 71 which are arranged within the path of movement of the operating lever 46 and are automatically set so as to progressively limit the movement of the operating lever and thereby compensate for the increase and decrease in diameter of the apron as it is wound and unwound. The feeding of these stops is determined by suitable gearing and split nuts 72 which encircle threaded shanks or stems of the stops and are caused to engage said stems or be released therefrom by means controlled through connections with the shifting bar 54′. In my former application, these split nuts were closed or opened by the shifting of collars which encircle the nuts. In my present device, I pivotally mount upon a tongue 73 disposed within the split portion of the nut a lever or plate 74 which is provided with eccentric slots 75 at opposite sides of its pivot. The slots engage pins or studs 76 upon the respective members of the nuts 72 and each lever or plate is projected laterally beyond the nut to be pivotally attached to the end of a link 77 which is actuated by the connections with the shifting bar 54′.

The member of the connections between the shifter bar 54′ and the link 77 which acts directly upon the link is a reversing lever 78 fixed to a rock shaft 79 mounted in and projecting through the end of the casing 1 and equipped at its end beyond the casing with alined oppositely extending cranks 80 to which are secured cables or other flexible connections 81 which extend into the housing 54 and are there attached to cranks 82 projecting from a sleeve or hollow shaft 83 fitted about the rock shaft 52. A reversing arm 84 extends from the sleeve or hollow shaft 83 and has its free end disposed between studs 85 upon a link 86 or otherwise operatively engaged with said link whereby rocking of the arm 84 will effect endwise movement of the link, as will be readily understood upon reference to Fig. 7. This link constitutes a connection between pivoted stops 87 which are mounted within the housing 54 at opposite sides of the rock shaft 52 and have their upper ends adapted to engage in notches 88 provided in the edges of the operating lever 53. Springs 89 are disposed at opposite sides of the lever 53 and extend in opposite directions therefrom, the inner ends of these springs being secured to the lever and their outer ends being secured at fixed points in the housing 54 so that these springs will normally hold the lever 53 in a vertical position but will yield to permit oscillation of the lever when it impinges against the trip 55, as will be readily understood. The stops 87 will be so set that the lever 53 will be permitted to yield to and ride under the trip or projection 55, but, when the said trip or projection has been passed, the lever will at once return to its initial position and the return movement will be limited by engagement with the active stop 87. To avoid breakage or other damage to the lever 53 by its forcible impact against the active stop, I provide cranks 90 which project in opposite directions from the lower end of the lever at right angles thereto and have plunger rods 91 pivoted to their free ends. The plunger rods 91 carry plungers 92 working in dash pots 93 which are suitably supported within the housing 54, as clearly shown. The plungers may be caused to work against the force of coiled springs 94 or the dash pots may be filled with oil or other liquid if preferred. The dash pots serve to cushion and check the return movement of the lever 53 under the influence of the spring 89 so that violent engagement of

the lever with the active stop 87 will be avoided.

A bell 95 is mounted upon the frame 3 and is preferably so arranged that it may be sounded directly by the operating lever 46 so that the attention of passengers will be directed to the change of station.

Normally, the indicator apron winds upon the drum 4 and unwinds from the drum 5 and the gears 11 and 12 are intermittently operated as the apron is shifted so that the motor spring attached to the shaft 13 is gradually wound until it reaches its full tension just as the name of the last station is displayed. The motor spring obviously exerts a constantly increasing tendency to unwind, but this tendency is resisted and overcome by the engagement of the gear 43 with the idler 44 and through said idler with the operating gear 45. As the car, however, leaves the last station upon its run and the apron is again shifted, the stop 29 upon the apron is brought into engagement with the fork 30 so that the slide 31 will be raised and the cam 36 rocked thereby causing the cam 38 to move relatively away from the cam 36 and shift the reversing rod 37 endwise. This endwise shifting of the rod 37 will obviously carry with it the shifting arm 41 so that the gear 43 will be carried out of mesh with the idler 44 against the tension of the spring 56 and the apron will then be rewound upon the drum 5 through the action of the spring motor and the reverse rotation imparted by it to the gears 12 and 11. To properly retard the action of the motor, the governor 22 and the intervening train of gears are provided, it being obvious that the reverse rotation of the motor shaft 13 will cause the ratchet wheel 21 to engage the pawl 20 and thereby actuate the gear 17 and the train of gearing of which it is a part so that the governor 22 will be actuated. Should the speed become excessive, the disk 23 will be brought into engagement with the brake shoe 24 by the action of the governor and the movement of the parts will be thereby effectually retarded so that damage to none of the parts will occur. The reverse travel of the indicator apron will continue until the second stop 29 engages the fork 30 and thereby shifts the slide 31 downwardly whereupon the reversing rod 37 and the parts associated therewith will return to their former positions (shown in Fig. 2) under the influence of the spring 56. The shifting bar 54′ and the brake-controlling rod 61 which is operatively connected therewith are inactive at all times, except when accidents or other causes make it necessary to reverse the travel of the car. When a reverse trip of the car becomes necessary, the arms 80 are operated to rock the shaft 79 and the reversing lever 78 so that the shifter bar 54′ will be raised to release the gear 43 from the idler 44 and permit the gear 59 to mesh with the gear 45. To prevent action by the spring motor as the gear 43 moves to inactive position and before the gear 59 is in active position, I provide the brake or clutch 69, 70, which is thrown in so as to hold the drum 4 against rotation and thereby prevent action of the spring motor until the gear 59 is in full engagement with the gear 45.

Having thus described the invention, what is claimed as new is:

1. A station indicator comprising drums, an indicator belt carried by said drums, means for imparting a step by step movement to one of the drums to wind the belt thereon, a motor, means actuated by one of the drums to store energy in the motor, and means controlled by the indicator belt for rendering the step by step means inoperative and releasing said energy whereby the drums may be rotated uninterruptedly in a reverse direction to return the apron to its initial position.

2. A station indicator comprising upper and lower drums, an indicator apron carried by said drums, means acting upon the upper drum whereby to impart a step by step movement thereto and wind the apron thereon and simultaneously unwind it from the lower drum, a motor, gearing connecting said motor with the lower drum whereby as the apron is unwound therefrom energy will be progressively stored in the motor, a shifting rod connected with the step by step means and means controlled by the apron whereby to actuate the shifting rod and render the step by step means inoperative and release the motor to uninterruptedly rotate the lower drum in the reverse direction and rewind the apron thereon.

3. In a station indicator, the combination of an upper drum, a lower drum, means for rotating the upper drum, an indicator apron carried by the drums whereby to wind upon the upper drum and unwind from the lower drum, a spring motor operatively connected with the lower drum whereby the motor will be wound as the apron is unwound from said drum, a reversing rod mounted for endwise movement, connections between one end of said rod and the means for rotating the upper drum whereby endwise movement of the rod will release said means, a slide adapted to effect endwise movement of the reversing rod, and a clip on the indicator apron adapted to actuate said slide whereby the spring motor will be free to act and will effect reverse travel of the drums and the indicator apron.

4. In a station indicator, the combination of an upper drum, a lower drum, gearing acting on the upper drum to impart a step by step movement thereto, an indicator

apron mounted upon the drums to wind on the upper drum and unwind from the lower drum, a spring motor, gearing connecting said motor with the lower drum whereby rotation of said drum will wind the motor, the said spring motor acting in opposition to the gearing for rotating the upper drum, and trip means controlled by the indicator apron whereby to release the step by step gearing and permit the spring motor to uninterruptedly effect reverse rotation of the drums.

5. In a station indicator, the combination of an upper drum, a lower drum, means for rotating the upper drum, an indicator apron carried by the drums to wind upon the upper drum and unwind from the lower drum, a spring motor connected with the lower drum whereby the rotation of said drum will wind the motor, a slide mounted adjacent the drums, a fork projecting from said slide, a projection on the apron adapted to engage said fork, a reversing rod mounted for endwise movement and connected with the means for rotating the upper drum whereby endwise movement of said rod will release said means, a cam mounted upon said rod for rocking movement, a connection between said cam and the slide, and a co-operating cam fixed upon the reversing rod whereby lifting of the slide and rocking of the cam connected therewith will effect endwise movement of the reversing rod.

6. The combination of upper and lower drums, an indicator apron carried by said drums and normally winding upon the upper drum and unwinding from the lower drum, gearing for rotating said drums, a shifting bar arranged to act upon said gearing whereby to reverse the direction of rotation of the drums, a clutch at one end of the upper drum, a clutch-controlling rod operatively connected with the shifting bar, a slide arranged and constructed to close the clutch, connections between said slide and the controlling rod, a spring motor arranged to be wound by the normal rotation of the lower drum, and means controlled by the indicator apron for rendering the motor active.

7. In a station indicator, the combination of upper and lower drums, an indicator apron carried by said drums, means for imparting rotation to the drums, a reversing lever, means actuated by the reversing lever to effect reversal in the direction of travel of the drums, an operating lever mounted for rocking movement, stops disposed at the opposite sides of said lever and each adapted to engage one side of the lever whereby to determine its direction of movement, arms operatively connected with the reversing lever, a rock shaft concentric with the fulcrum of the operating lever, a shifting arm extending from said rock shaft and controlling the stops, and operative connections between the reversing arms and the said rock shaft.

In testimony whereof I affix my signature.

JOSEPH C. WOOD. [L. S.]