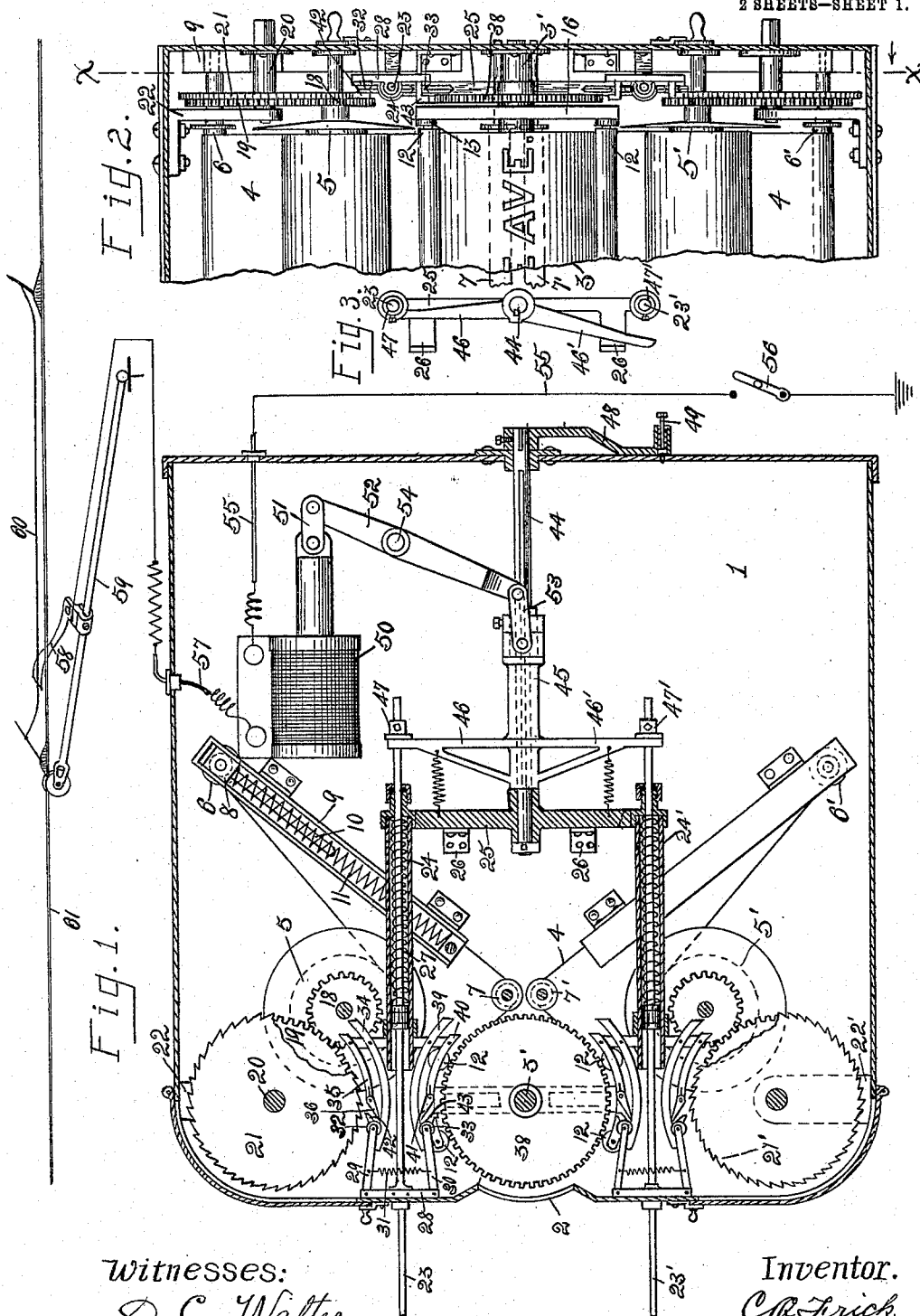


C. O. FRICK.
STATION INDICATOR.
APPLICATION FILED APR. 20, 1908.

937,207.

Patented Oct. 19, 1909.

2 SHEETS—SHEET 1.



Witnesses:
D. C. Walter
Hazel B. Nett

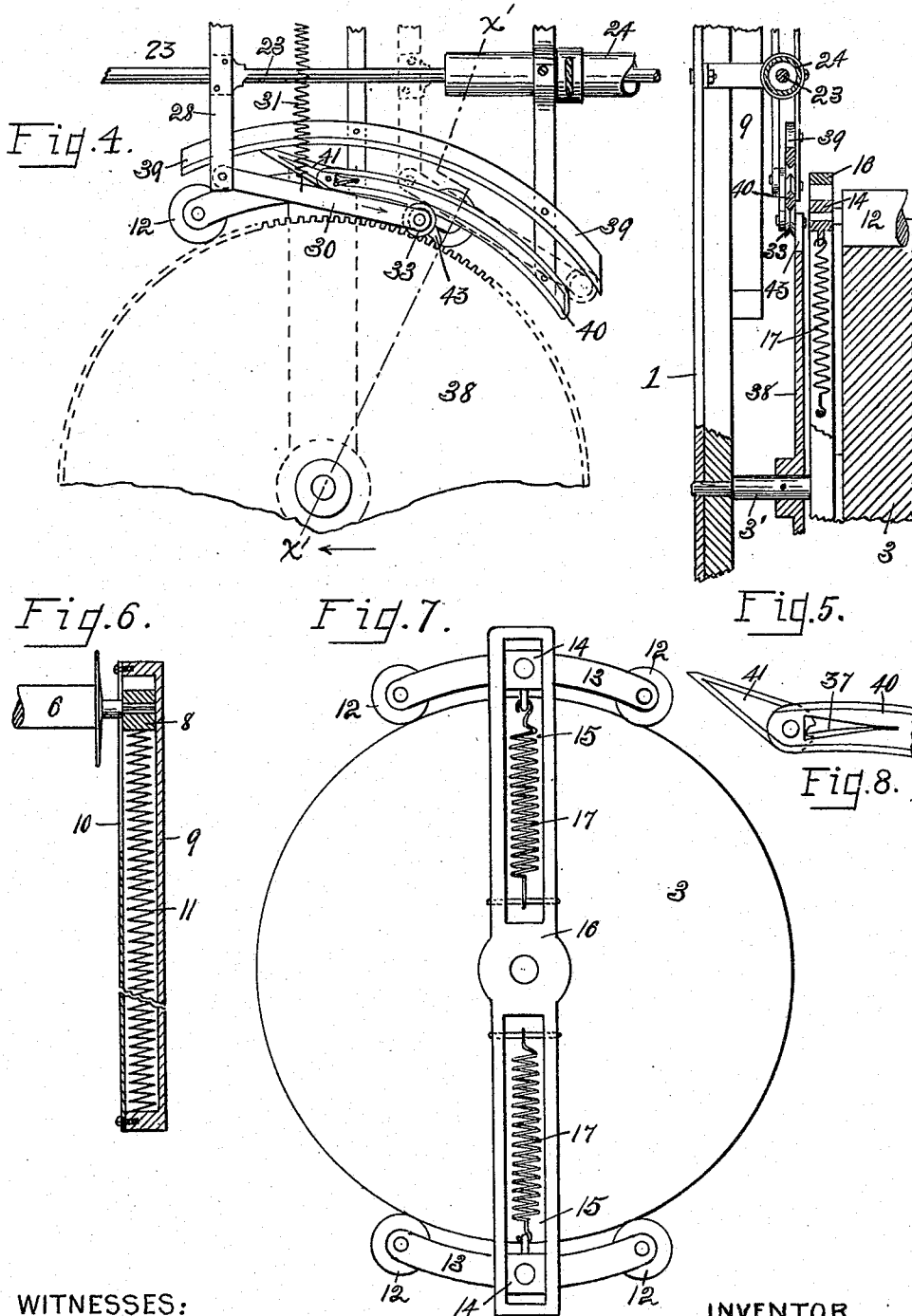
Inventor.
C. O. Frick,
By Brown & Owen,
His attys.

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WITNESSES:

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INVENTOR.

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By Cunn & Cunn.
his attys.

UNITED STATES PATENT OFFICE.

CLAUD OATES FRICK, OF FOSTORIA, OHIO.

STATION-INDICATOR.

937,207.

Specification of Letters Patent.

Patented Oct. 19, 1909.

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To all whom it may concern:

Be it known that I, CLAUD OATES FRICK, a citizen of the United States, and a resident of Fostoria, in the county of Seneca and State of Ohio, have invented a certain new and useful Station-Indicator; and I do hereby 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 figures of reference marked thereon, which form a part of this specification.

My invention relates to registers or indicators of the class particularly adapted for use on street cars or the like for successively indicating the names of streets or stations when reached, but is not restricted to such use, as it may be employed for advertising or other purposes in which a band or strip containing reading matter is intermittently moved to successively bring fresh parts of such matter into view.

The primary object of my invention is the provision in an apparatus of this class of simple and efficient mechanism which is operative to positively rotate the master ribbon-roll and the take-up roll in unison at each operation and then to permit the take-up roll to automatically adjust itself to compensate for its gradually increasing size as the ribbon increases in quantity thereon.

Further objects of the invention as well as the operation, arrangement and construction of the parts thereof will be apparent by reference to the following specification, and a preferred embodiment thereof is illustrated in the accompanying drawings, in which,—

Figure 1 is a vertical section of the apparatus taken on the dotted line $x x$ in Fig. 2, with a diagram of an electric operating means and portions of the parts disposed beyond said line also in section. Fig. 2 is a front elevation of one end portion of the apparatus with the front of the casing removed. Fig. 3 is an inner end view of the reversing parts. Fig. 4 is an enlarged end view of a portion of the operating mechanism with the latter shown out of normal position. Fig. 5 is a section on the line $x' x'$ in Fig. 4. Fig. 6 is an enlarged view of one end portion of one of the yieldingly mounted idler-rolls and its mounting, with the latter in longitudinal section. Fig. 7 is an en-

larged end view of the master ribbon-roll and the cooperating sets of pressure rolls, with the yielding connection of the latter, and Fig. 8 is an enlarged view of a switch-point and a portion of the rail by which it is carried.

Referring to the drawings, 1 designates the casing or housing in which the mechanism comprising my invention is mounted, and 2 the opening in the front thereof through which the matter on the ribbon is displayed. Disposed transversely of the casing immediately in rear of the opening 2 with its trunnions or shaft ends 3 suitably journaled in the casing sides is the master ribbon-roll 3 around a part of which the ribbon or belt 4 containing the matter to be displayed passes. The ribbon 4 has its ends attached to and is adapted to wind from one to the other of the rolls 5 and 5' which are mounted transversely of the casing in planes, respectively, above and below the master-roll 3 as shown. The ribbon on leaving, for instance, the upper roll 5, passes around the yieldingly mounted idler-roll 6, thence under the idler-roll 7 at the rear of the roll 3, after which it passes around the roll 3 and over the idler-roll 7', which is disposed at the rear of the roll 3 in contiguous position to the companion idler 7, thence around the yieldingly mounted idler-roll 6' and to the other ribbon-roll 5', as shown. Each idler 6, 6' has its trunnions journaled in blocks or cross-heads 8, which are mounted in guides 9 for movement longitudinally thereof, the trunnions working through registering slots 10 therein for such purpose. The guides 9 are fixed to opposite sides of the casing and are preferably disposed so that the ribbon in passing around the idlers thereof is caused to make decided loops between the rolls 5, 7 and 5', 7', respectively, as shown. The block 8 in each guide is yieldingly held in extended position relative to its roll 5 or 5' by a compression-spring 11, which is mounted within the guide, as shown. The ribbon 4 is held closely to the master-roll 3 by the pressure-rolls 12, which are shown as being arranged in sets at the upper and lower sides of the roll 3. The rolls 12 of each set are transversely connected at their ends by yokes 13, which carry blocks 14 for working in slots or guide-ways 15 in the opposite end-portions of the members 16. These members are disposed diametrically of the end-

of the roll 3, being loosely carried by the trunnions thereof, and are provided with contraction-springs 17, which attach at their outer ends to the blocks 14 and act to yieldingly draw the rolls 12 to the roll 3. As the mechanisms for moving the ribbon in opposite directions are duplicates, only one will be described in detail, and it will be understood that like parts of the two are designated by like numerals except that the numerals of one have the prime mark added.

Fixed to the roll 5 at one end thereof is the spur-gear 18, which meshes with the larger gear 19 that is carried by the stub-shaft 20 and has the ratchet-wheel 21 fixed to one side thereof, said stub-shaft having one end journaled in the casing side and its other end journaled in a bracket 22 projecting from the casing, as shown.

23 designates a reciprocatory rod, which has its forward end working through a suitable bearing in the casing front and its rear end portion preferably provided with a piston and working through a dash-pot 24, which tends to retard the movements of the rod in either direction. The dash-pot 24 is carried at the upper end of the vertical yoke 25, which is fixed to the casing side by brackets 26, or in any other suitable manner, and carries the dash-pot 24' of the other mechanism at its lower end, as shown. The rod 23 is normally retained at its limit of forward movement by the action thereon of a compression-spring 27, which is mounted within the dash-pot 24, and has rearward movements imparted thereto by the means hereinafter described or in any other suitable manner. Secured to the forward end portion of the rod and adapted to coact with the casing front to limit the forward movement of the rod is the cross-piece 28, which pivotally carries the rearwardly projecting arms 29 and 30 at its opposite ends. These arms are normally held in contracted relation by the contraction-spring 31 and carry the peripherally grooved wheels 32 and 33, respectively, at their free ends.

Fixed below the ratchet-wheel 21 are the two spaced rails or tracks 34 and 35, which are curved to stand in concentric relation to each other and to the axis of the ratchet-wheel. The inner rail 35 has its ends terminating short of the ends of the rail 34, and is provided at its forward end with a pivotal switch-point 36, which is normally influenced by a spring 37, or in any other suitable manner, to stand with its point in yielding contact with the inner face of the rail 34 short of its forward end, as shown. Disposed above a ratchet-wheel 38, which is carried at an end of the roll 3 on the shaft therewith, is a similar arrangement of rails or tracks 39 and 40, which are spaced relative to each other and stand in concentric relation to the axis of the ratchet-wheel.

The inner or shorter one of these rails is provided at its forward end with a pivotal switch-point 41, which is influenced to normally have contact at its point with the track 39 near its forward end, as shown.

When the rod 23 is in its normal at-rest position the wheels 32 and 33 engage the inner curved faces of the rails 34 and 39, respectively, in advance of the associated switch-points 36 and 41, as shown in Fig. 1, being yieldingly held thereto by the action of the spring 31. On a rearward movement of the rod 23 the wheels 32 and 33 come in contact with and are guided by the switch-points 36 and 41 to the inner rails 35 and 40, respectively. As the wheels 32 and 33 move into engagement with their respective rails 35 and 40 a pawl 42, carried at the free end of the arm 29, engages a tooth on the ratchet-wheel 21 while a pawl 43 at the free end of the arm 30 engages a tooth in the ratchet-wheel 38, thus importing partial rotation to both said ratchet-wheels during the period of movement of the wheels 32 and 33 on the inner rails 35 and 40, respectively. When the rod 23 has reached its limit of rearward movement the wheels 32 and 33 leave the rear ends of the rails 35 and 40 and are drawn by the action of the contraction spring 31 into contact with the projected rear ends of the outer rails 34 and 39 by which they are guided to return to their normal positions on the forward movement of the rod 23, with their pawls free from contact with the two ratchets. As the wheels on their return movements come in contact with the switch-points 36 and 41 said points move inwardly against the tension of their springs to permit the wheels to pass in advance thereof in readiness to be again directed to the rails 35 and 40 when the rod is next moved to the rear.

44 designates a rock-shaft, which has one end journaled in the center of the yoke 25 and its other end journaled in the rear of the casing 1. Feathered for movement longitudinally of this shaft intermediate its bearings is the sleeve 45, which is provided at its forward end with the two oppositely extending arms 46, 46', one of which is adapted to coact with the forward side of a button 47 on the rear end of the rod 23 and the other with a button 47' on the rear end of the rod 23', as shown. The arms 46, 46' are slightly angled relative to each other, as shown in Fig. 3, to enable both to be placed in neutral positions relative to the buttons 47 and 47' or either arm moved into position to engage its button by a rocking of the shaft 44 in the proper direction, so that rearward movement may be communicated to either rod 23, 23' when the sleeve is reciprocated. The rocking adjustment of the shaft 44 is controlled by an arm 48, which is fixed to the shaft end without the casing and carries a snap-pin 49

at its free end for engaging holes or depressions in the casing to retain the arm in set position.

A simple and efficient means for imparting intermittent reciprocatory movements to the sleeve 45 and connected parts consists in providing a solenoid 50 within the casing, the core of which is connected to the sleeve 45 through the medium of the link 51, lever 52 and link 53, said lever being fulcrumed to a stud projecting from the casing side, as at 54. One terminal of the solenoid coil may be grounded through a wire 55, which may have a switch 56 in circuit therewith, while the other terminal connects through a wire 57 with a contact-finger or brush 58, which is carried by the trolley-pole 59 in position to have contact with contact-pieces 60 arranged at suitable points along the side of the trolley-wire 61. It is thus apparent that when the switch 56 is closed and the brush 58 makes contact with a contact-piece 60 a circuit to the solenoid is closed, thereby energizing it and imparting the requisite movement to its core and attached parts to move the sleeve 45 and rod 23 or 23' with which it has engagement to the rear, which position is maintained until the brush breaks contact with the piece 60.

The operation of my invention is as follows:—On a rearward movement of the rod 23, when the solenoid is energized and the arm 46 of the sleeve 45 is in contact with the button 47 of such rod, the wheels 32 and 33 carried by the arms 29 and 30, respectively, are directed by the switch-points 36 and 41 to the inner rails 35 and 40 so that the pawls 42 and 43, carried, respectively by said arms, engage the teeth on the ratchet-wheels 21 and 38 and impart equal movements thereto in opposite directions of rotation. The meshing of the gear 19, which is fixed to the side of the ratchet-wheel, with the smaller gear 18 at the end of the ribbon-roll 5, causes said roll to rotate at a greater speed than the master-roll 3 to partially compensate for the difference in size of said rolls. As the ribbon winds on the roll 5 the gradually increasing-diameter of said roll causes the speed of movement of the ribbon to increase in the same proportion, thus causing a constantly changing variance between the speed at which the ribbon is wound on the roll 5 and that at which it is paid out by the master-roll. This difference in speed of the rolls 3 and 5 is compensated for, so as to prevent a slipping of the ribbon on the former, by the permissible shortening of the loop in the ribbon which is formed by passing the ribbon over the yieldingly mounted idler-roll 6. When the wheels 32 and 33, substantially reach their limits of rearward movements they pass around the rear ends of the respective rails 35 and 40 into engagement with the rails 34 and 39 on

which they return to their normal positions. As the wheels thus pass from one rail to the other at their limits of rearward movements the pawls 42 and 43 move out of engagement with the ratchet 21 and gear 38, respectively, thus permitting the roll 5, which, together with the meshing gears 18 and 19 and ratchet 21, is now free to turn, to unwind sufficiently to allow the idler-roll 6, under the influence of the springs 11, to return to normal position. It is thus apparent that both the master-roll 3 and take-up roll 5 have positive rotation imparted to them at each rearward movement of the rod 23, and that the variations in the winding of the ribbon on the roll 5 is compensated for by the yielding tendency of the idler 6, thereby preventing a slipping of the ribbon on the master-roll and insuring a positive registering of each name or other matter on the ribbon with the display opening 2 in the casing front in either direction of movement of the ribbon. When the end of the line is reached the direction of movement of the ribbon is reversed by simply moving the arm 48 so as to rock the shaft 44 to throw the arm 46 out of engagement with its button on the rod 23 and the arm 46' into engagement with its button on the rod 23', thus throwing the lower instead of the upper operating mechanism into commission.

I desire it to be understood that my invention is not limited to any specific form or arrangement of parts except in so far as such limitations are specified in the claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is,—

1. In a station indicator, a master-roll, two ribbon-rolls normally free to turn, a ribbon adapted to wind from one to the other of said ribbon-rolls around the master-roll, mechanism movable to impart positive simultaneous rotary movements to the master-roll and to one only of said ribbon-rolls, means for intermittently moving said mechanism and means yieldingly coöperating with the ribbon to compensate for the constantly changing size of the ribbon-roll as the ribbon winds thereon to prevent a slipping of the ribbon relative to the master-roll.

2. In a station-indicator, a master-roll, two ribbon-rolls normally free to turn, a ribbon adapted to wind from one to the other of said ribbon-rolls around the master-roll, mechanism movable to impart positive simultaneous rotary movements to the master-roll and one only of said ribbon-rolls, means for intermittently moving said mechanism, and a yieldingly mounted idler-roll around which the ribbon is looped intermediate the master-roll and positively driven ribbon-roll, said roll being adapted to yield to permit a shortening of such loop when the ribbon winds on the ribbon-roll faster than the

turning of the master-roll permits, said idler assuming its normal position when the ribbon-roll is free to turn.

3. In a station indicator, a pair of rolls, a ribbon adapted to wind on one and passing partially around the other of said rolls in contact therewith, the roll upon which the ribbon winds being normally free to rotate, ratchet mechanism normally disconnected from said rolls and movable to effect a positive rotation of said two rolls in unison, means for imparting intermittent movements to said mechanism, and an idler-roll around which the ribbon passes, said idler being adapted to yield to compensate for the differences in winding and paying out movements of the two rolls.

4. In combination, a pair of ribbon-rolls, a ribbon adapted to wind on one and partially around the other of said rolls, a ratchet-wheel associated with each roll and adapted when moved to communicate rotation to its roll, a reciprocatory member adapted to normally stand in one position, means carried by said member and guided to move into engagement with and rotate said ratchet-wheels in unison when the member is moved in one direction, means for moving said member to impart movement to said wheels, and an idler-roll guiding said ribbon to form a loop and adapted to yield to compensate for a difference in the winding and paying-out operations of the two rolls to prevent a slipping of the ribbon on the pay-out roll, said winding-roll being free to turn when said member is in normal position.

5. In combination, a pair of rolls, a ribbon adapted to wind on one and partially around the other of said rolls, the winding-roll being normally free to turn, mechanism movable to impart positive rotary movements in unison to said rolls, means for intermittently moving said mechanism, a dash-pot for retarding the movements of said mechanism, and a yieldingly mounted idler-roll which guides the ribbon to form a loop intermediate said rolls, said idler being adapted to compensate for any difference in the winding and paying-out actions of said two rolls.

6. In combination, a pair of rolls, a ribbon adapted to wind on one and partially around the other of said rolls, the winding-roll being normally free to turn, a ratchet-wheel associated with each roll and adapted when rotated to impart movement to its roll, a reciprocatory rod normally standing in one position, two pawls carried by the rod for engagement with said wheels to impart rotary movements in unison thereto when the rod is moved in one direction, said pawls standing out of engaging position with their wheels when the rod is in normal position, means associated with each wheel for guiding its pawl to engage the wheel teeth when

the rod is moved in one direction and to disengage the teeth on the return movement of the rod, means coacting with the ribbon adapted to compensate for any difference in the winding and paying-out actions of the two rolls, and means for imparting movement to the rod in one direction.

7. In combination, a pair of rolls, a ribbon passing partially around one and being paid out from it to the other roll upon which it winds, the winding-roll being normally free to turn, a reciprocatory rod normally standing in one position, means intermittently movable to positively move the rod out of normal position, a ratchet-wheel associated with each roll and movable to impart movements thereto, a pair of arms pivotally projecting from said rod in the direction of its positive movement, a pawl carried by each arm, fixed means for guiding each arm to cause it to engage one of the ratchet-wheels when the rod is positively moved and to have a disengaged returning movement, and a yieldingly mounted idler-roll acting on the ribbon to form a loop intermediate the two rolls and adapted to yield to permit a variation in length of such loop when the winding and paying-out actions of the two rolls vary.

8. In combination, a pair of ribbon-rolls, a master-roll, a ribbon adapted to wind from one to the other of the ribbon-rolls and partially around the master-roll, means yieldingly holding the ribbon to the master-roll, mechanism movable to impart simultaneous rotary movements to the roll on which the ribbon is winding and to said master-roll, means intermittently movable to impart such movement to said mechanism, and a yieldingly-mounted idler-roll guiding the ribbon to form a loop intermediate the winding and master-rolls to permit a shortening of such loop when the quantity of ribbon paid out by the master-roll is less than the quantity taken up by the winding-roll, said winding-roll being free to turn in either direction when said mechanism is in normal position.

9. In combination, a pair of ribbon-rolls, a master-roll, a ribbon adapted to wind from one to the other of said ribbon-rolls and vice versa and partially around the master-roll, two separate mechanisms, one being movable to impart positive movements in unison to the master-roll and one winding-roll to move the ribbon in one direction relative to the master-roll and one being movable to impart positive movements in unison to the master-roll and the other winding-roll to move the ribbon in the other direction relative to the master-roll, and actuating means adjustable to impart operating movements to either of said mechanisms.

10. In combination, a pair of ribbon-rolls, a master-roll, a ribbon adapted to wind from one to the other of said ribbon-rolls and vice

versa and partially around the master-roll, two separate mechanisms, one being movable to impart positive movements in unison to the master-roll and one of said winding-rolls to move the ribbon in one direction and one being movable to impart positive movements in unison to the master-roll and the other of said winding-rolls to cause the ribbon to move in the other direction, an operating rod projecting from each mechanism, a rock-shaft, a member slidable on said shaft and having a transversely projecting part, said shaft being adjustable to move said part into engagement with either rod to adapt a movement of the member to impart movement thereto for operating either mechanism, and means for automatically moving said member at predetermined periods.

11. In a station-indicator, a master-roll, a ribbon-roll associated therewith and normally free to turn, mechanism normally disengaged from such rolls and adapted, when moved from normal position, to cooperate with both such rolls to impart positive simultaneous rotary movements thereto, a ribbon

adapted to wind on one and partially around the other of said rolls, and a mechanism cooperating with the ribbon to compensate for the changing size of the ribbon-roll as the ribbon winds thereon.

12. In a station-indicator, a pair of rolls, a ribbon adapted to wind on one and partially around the other of such rolls, the roll upon which the ribbon winds being normally free to rotate, reciprocatory mechanism normally disconnected from such rolls and adapted, when moved from normal position, to connect with both such rolls and impart positive rotation thereto in unison and a mechanism cooperating with the ribbon to compensate for the changing size of the ribbon roll as the ribbon winds thereon.

In testimony whereof I have hereunto signed my name to this specification in the presence of two subscribing witnesses.

CLAUD OATES FRICK.

Witnesses:

W. G. WHITLOCK,
W. J. FORD.