

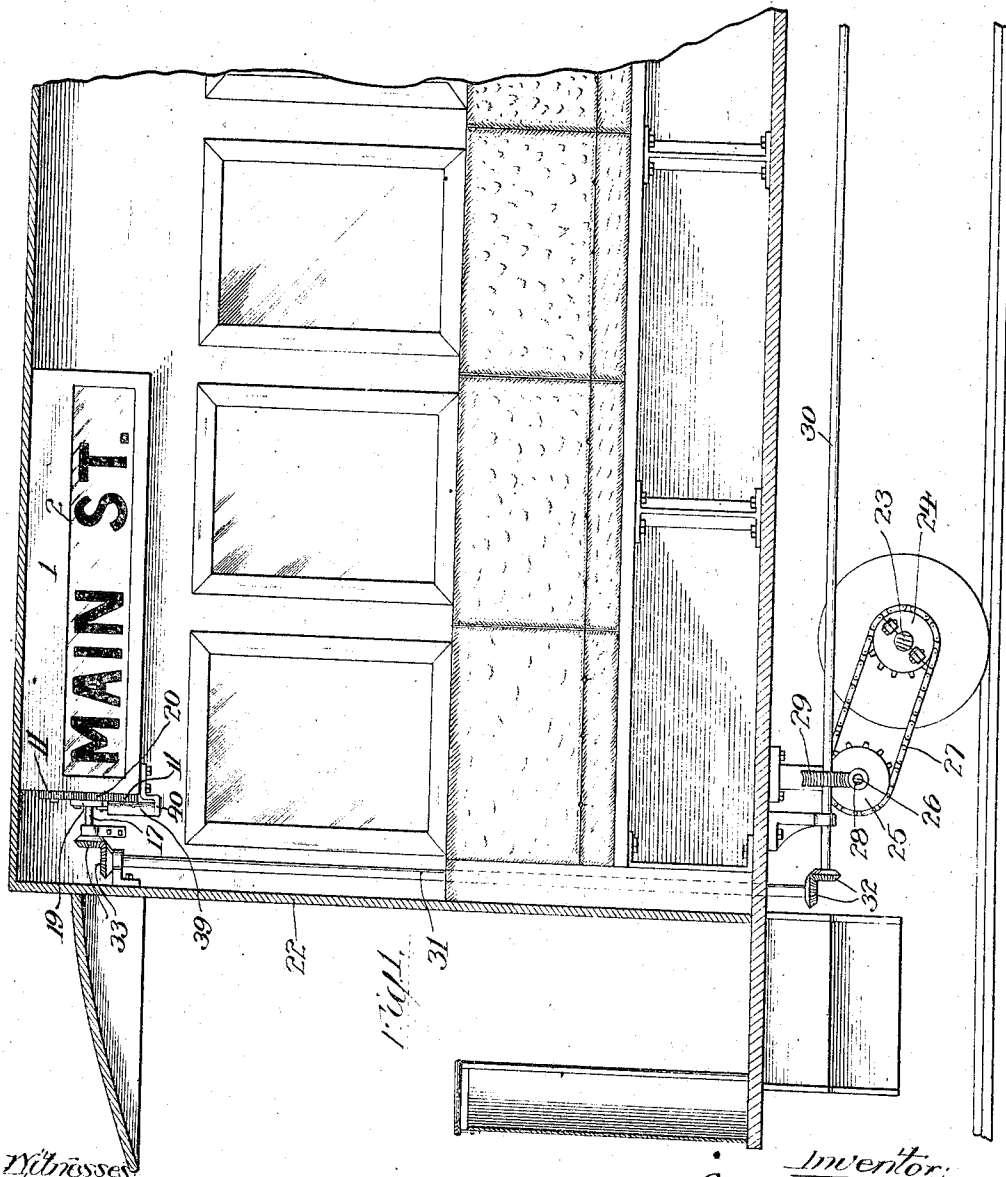
No. 858,847.

PATENTED JULY 2, 1907.

E. A. ALLEN.
INDICATOR OR DISPLAY APPARATUS.

APPLICATION FILED JULY 3, 1905.

3 SHEETS—SHEET 1.



Witnesses
L. S. Allen
Frederick

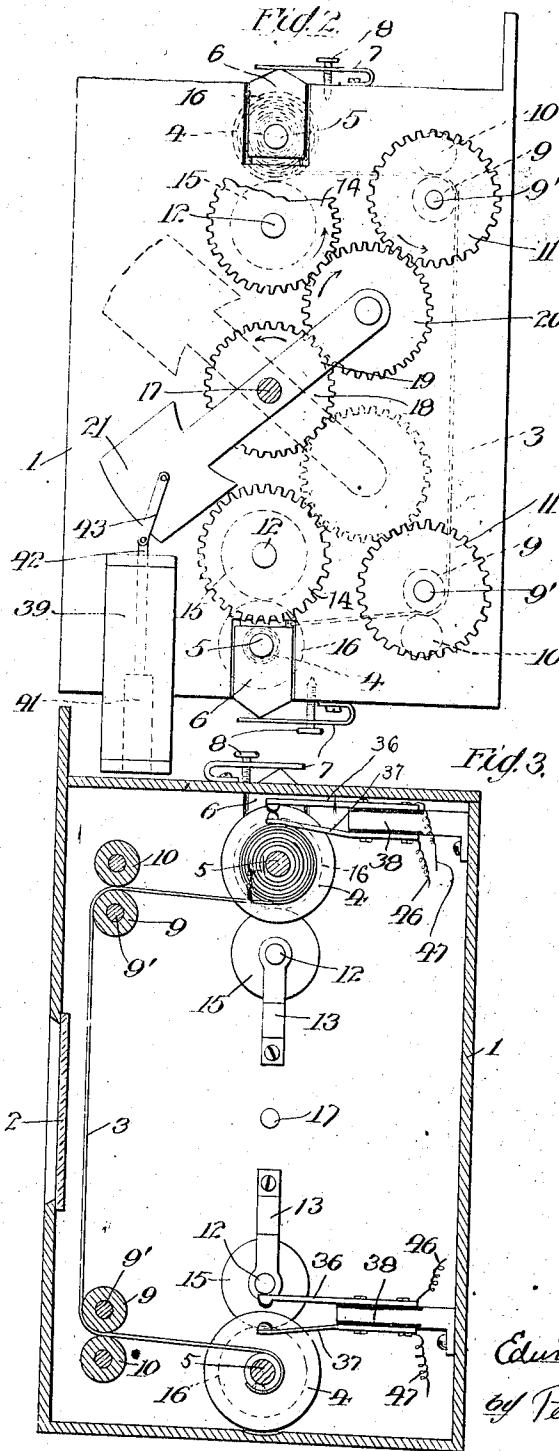
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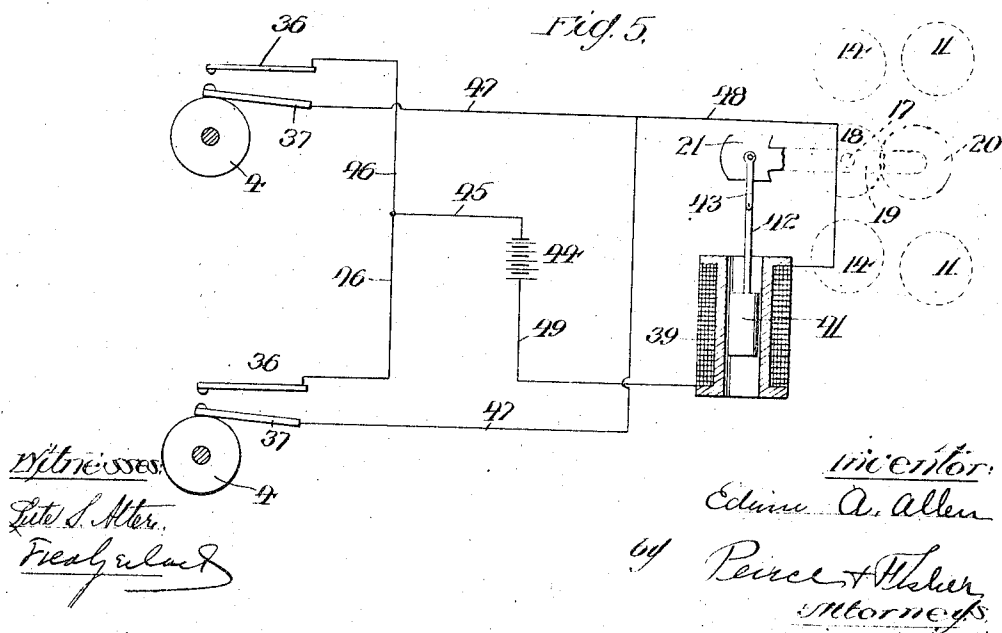
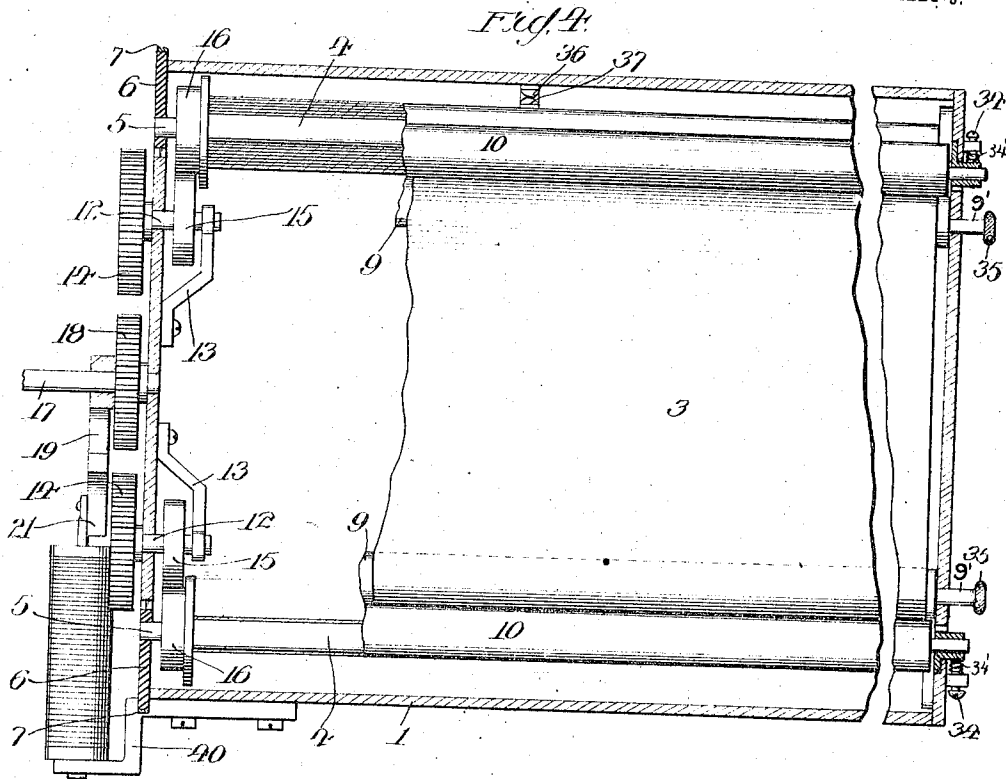
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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

EDWIN A. ALLEN, OF GALESBURG, ILLINOIS.

INDICATOR OR DISPLAY APPARATUS.

No. 858,847.

Specification of Letters Patent.

Patented July 2, 1907.

Application filed July 3, 1905. Serial No. 268,065.

To all whom it may concern:

Be it known that I, EDWIN A. ALLEN, a citizen of the United States, and a resident of Galesburg, county of Knox, and State of Illinois, have invented certain new and useful Improvements in an Indicator or Display Apparatus, of which the following is declared to be a full, clear, and exact description.

The invention relates to an indicator or display-apparatus and in particular to such apparatus having a long ribbon or tape having matter marked or printed thereon, and the invention seeks to provide simple and effective means by which the ribbon or tape may be shifted in different positions to display or expose the matter printed on the ribbon.

The invention is particularly applicable and is especially designed to be employed as an indicator for street or railroad cars and the indicator ribbon will bear the names of the streets or stations passed by the car.

The invention consists in the features of construction, combinations and arrangements of parts hereinafter set forth, illustrated in the accompanying drawings and more particularly pointed out in the appended claims.

Figure 1 is a sectional view of the end of a car with my improved indicator applied thereto. Fig. 2 is an end view of the apparatus showing the operating mechanism. Fig. 3 is a cross section through the apparatus. Fig. 4 is a longitudinal section, certain parts being broken away. Fig. 5 is a diagrammatic view of the circuits and apparatus for automatically arresting the movement of the indicator ribbon.

The apparatus preferably includes an inclosing box-like casing 1 which may be constructed of wood or light sheet metal, and is provided at its front with a glazed opening 2 through which the streets, stations, or other matter upon the indicator ribbon are displayed. The indicator ribbon or tape 3 is arranged within the box or casing and its ends are detachably connected to bobbins or winding rolls 4 mounted respectively in the upper and lower portions of the box or casing 1. The bobbins or winding rolls 4 are revolvably mounted and the uppermost roll is preferably arranged to be removed from the casing in order that the indicator tape or ribbon may be removed. For this purpose the stud 5 at one end of the roll (see Fig. 4) is journaled in a block 6 mounted to slide in the cut-away portion at the side of the box. Block 6 is yieldingly held in position by a spring 7 and screw 8. By releasing the screw and removing the top of the box, the slide block 6 may be removed and the uppermost winding roll or bobbin can be removed. Preferably, a pair of driving rolls 9 and 10 are associated with each of the winding rolls or bobbins 4. These pairs of drive rolls engage the ribbon or tape on opposite sides of the opening 2 in the box or casing 1, and these rolls also serve to guide the ribbon or tape into a position closely adjacent the opening 2 and in parallel relation therewith.

The drive or guide rolls 9 and 10 are journaled in the sides of the casing and are preferably covered with rubber or other suitable yielding material, so that they will maintain a firm grip upon the tape. The outer ends of the shafts 9 upon which the drive rolls 9 are mounted, extend through one side of the box or casing and are provided with gears 11 by which motion is positively imparted to the drive roll 9 of each pair, the roll 10 of each pair being driven by friction.

Stub shafts 12 are journaled in the end of the box or casing and the inner ends of these stub shafts are carried in brackets 13 (see Fig. 4). The projecting ends of the stub shafts on the outer side of the box are provided with gears 14, and inside the box or casing the stub shafts are provided with friction drive wheels 15 which engage corresponding friction wheels 16 fixed to the ends of the winding rolls or bobbins 4.

The main drive shaft 17 is journaled at one end in the side of the box and carries a master gear 18 which is arranged in the plane of the gears 11 and 14. An arm 19 swiveled on the shaft 17, carries an idler or coupling gear 20 which is always held in mesh with the master gear 18, and which may be shifted to engage either pair of the gears 11 and 14 to drive the tape or ribbon in opposite directions. The arm 19 extends on both sides of the drive shaft 17 and carries on its end opposite the gear 20, a weight 21 which serves to counterbalance the gear 20. The drive shaft 17 may be driven from any suitable source of power and when rotated in the direction of the arrow shown in Fig. 1, will carry the idle or coupling gear 20 into engagement with the gears 11 and 14 with the upper portion of the casing so that the drive rolls 9 and 10 will be positively driven to move the tape or ribbon upwardly past the opening 2. At the same time the winding roll or bobbin 4 at the upper end of the case will be driven through the gear 14 and friction gears 15 and 16 to take up the ribbon or tape as it leaves the drive rolls 9 and 10. The speed at which the drive rolls 9 and 10 will move the ribbon will depend of course, upon the speed of the drive shaft 17, but the speed with which the tape or ribbon is wound upon the bobbin 4 would ordinarily, if positively driven, vary in accordance with the size of the roll of tape on the bobbin, but these rolls are driven through the friction gears 15 and 16, which are so held by the spring 7 that they will slip to compensate for this difference in operation. The winding rolls will therefore not tend to pull the tape or ribbon from the grip of the drive rolls 9 and 10, but will merely serve to take up the slack as it leaves the drive rolls.

When the drive shaft 17 is reversed, the arm 19 and idler or connecting gear 20 will be automatically shifted out of engagement with the upper set of gears 11 and 14 into engagement with the lower set as indicated in dotted lines in Fig. 2. By this peculiar arrangement therefore, the power to drive the ribbon may be applied to

either end thereof for shifting it in opposite directions past the opening 2 and the coupling device will be automatically shifted from the drive and winding rolls at one end of the ribbon to the drive and winding rolls at the other end by the reversal of the drive shaft 17.

In Fig. 1 the indicator box is shown arranged in the upper portion of one end of a car 22 and the drive shaft 17 is positively geared to the axle 23 of the car so that its speed will be proportional to the speed of the car and the distance through which the ribbon is moved by the drive rolls 9 and 10 will be directly proportional to the distance to which the car moves.

Any suitable form of gearing may be employed between the car axle 23 and the drive shaft 17. In the form shown, a sprocket wheel 24 is mounted on the car axle and is connected to a companion sprocket wheel 25 on a cross shaft 26 by a chain 27. A gear 28 on the cross shaft 26 engages a worm wheel 29 on a shaft 30 which extends longitudinally beneath the car. An upright counter-shaft 31 is geared at its lower end to the shaft 30 by the beveled gears 32 and at its upper end to the shaft 17 by the beveled gears 33. In a similar manner shaft 30 may be arranged to drive another indicating device at the opposite end of the car. By the arrangement described, it will be seen that the drive rolls 9 and 10 will be positively driven to move the indicator or display ribbon at a speed proportional to the speed and distance through which the car moves while the winding rolls 4 will be operated to take up the slack. Moreover, the direction of movement of the ribbon will be automatically reversed when the direction of the travel of the car is reversed at the end of its route and at the same time the coupling device will be shifted automatically from the drive and winding rolls at one end of the ribbon to the drive and winding rolls at the opposite end thereof, so as to properly move the ribbon whereon the streets or stations are marked in accordance with the direction in which the car is moving. It is obvious that other means may be employed for operating the indicating mechanism. It is only essential that the movement thereof should be controlled by the movement of the car so that the distance through which the ribbon moves is proportionate to the travel of the car. It should be noted that the feed rolls 9 and 10 which are positively driven, insure that the movement of the ribbon shall be exactly proportionate to the distance through which the car moves, while the winding rolls which are driven through the friction gearing which may slip or yield as is necessary, serve merely to wind up the slack of the ribbon. To further insure the accurate feed of the ribbon the feed rolls 9 and 10 as stated, are covered with rubber or other friction material, and the rolls 10 are yieldingly held by springs 34 and may be adjusted by screws 34 (see Fig. 4) to tightly grip the tape or ribbon.

During operation, the drive rolls and associated winding roll at one end of the ribbon are in gear with the drive shaft while the rolls at the opposite end are free to permit the ribbon or tape to be unrolled therefrom, and is retarded only by the friction of the different parts to an extent sufficient to keep the tape or ribbon at proper tension.

In preparing the indicator for use, a blank ribbon or tape may be inserted in the indicating apparatus and a regular trip then made with the car so that the names

of the different streets or stations which are passed on the trip can be noted upon the blank tape in the indicator at the proper places. An indicator or display ribbon or tape for regular use can then be prepared from this blank, which when placed in the indicating apparatus will automatically announce the stations or streets as desired. If for any reason it becomes necessary to adjust the tape or ribbon, this may be effected by shifting the connecting gear 20 to its inoperative, central position and then turning either of the sets of rolls by the buttons 35 at the projecting ends of the shafts 9' (see Fig. 4).

Means are preferably provided for preventing the ribbon or tape from being detached from either of the rollers or bobbins. For this purpose, a pair of contact strips 36 and 37 are associated with each of the winding rolls and are arranged to be brought into contact by the increase in the diameter of the tape on one roll and before the tape has been entirely unwound from the other roll. In Fig. 3 the contacts 36 and 37 at the upper end of the box are shown as having been brought into contact by the accumulation of the ribbon upon the upper winding roll or bobbin. These contacts are mounted upon, but are insulated from suitable supports 38, as indicated and are arranged to control the circuit through a solenoid 39 which is carried upon a bracket 40 at the side of the box. The core 41 of the solenoid is connected by a rod 42 and a link 43 with the arm 19, which carries the coupling gear 20. Ordinarily the circuit through the solenoid is open and in no way interferes with the shift of the coupling gear. However, if the ribbon or tape accumulates upon one of the winding rods 2 to an extent sufficient to bring either pair of contacts 36 and 37 into engagement, a circuit is closed (see Fig. 5) from battery 44 through conductor 45 through one of the conductors 46 to the pair of contacts 36, 37, which have been shifted into engagement from thence by the conductors 47 and 48 to the solenoid 39 and by conductor 49 back to battery. The core 41 will then be drawn to the central position and will hold the coupling gear 20 in its idle, central position, as indicated by dotted lines in Fig. 5.

While the present improved indicator is especially applicable for announcing or indicating the streets or stations on cars, advertisements or announcements of any kind can be placed upon the tape or ribbon and displayed in a show window or elsewhere.

It is obvious that numerous changes may be made in the details of construction set forth without departure from the essentials of the invention as defined in the appended claims.

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

1. In an indicator or display apparatus, the combination with an inclosing casing having a display opening, of a ribbon in said casing, separate rolls in said casing on opposite sides of said display opening for shifting said ribbon in opposite directions, gears on said rolls, a common drive shaft therefor, a master gear on said shaft and a counter-balanced coupling member swiveled to swing freely on said shaft and arranged to be automatically shifted by the reversal of said drive shaft to connect said master gear with either of said roll gears, substantially as described.

2. The combination with a display ribbon, of separate rolls for shifting said ribbon in opposite directions, gears fixed to said rolls, a drive shaft, a master gear on said shaft, an arm swiveled to swing freely on said shaft, an

idler gear carried by said arm and meshing with said master gear and a counter weight for balancing said arm and idler gear, said counter-balanced arm and gear being automatically shifted from one to the other of said roll gears by the reversal of said drive shaft, substantially as described.

3. In an indicator or display apparatus, the combination with an inclosing casing having a display opening of a ribbon in said casing, a drive roll and a separate winding roll associated with each end of said ribbon, the driving and winding rolls being arranged on opposite sides of said display opening to shift the ribbon in opposite directions past the same, a drive shaft and a coupling means automatically shifted by the reversal of said shaft to connect the same to the driving roll and to the winding roll at one end of the ribbon and to disconnect the shaft from the driving roll and winding roll at the other end of the ribbon, substantially as described.

4. In an indicator or display apparatus, the combination with an inclosing casing having a display opening of a ribbon in said casing, two pairs of drive rolls on opposite sides of the display opening engaging the ribbon to shift the same in opposite directions past said opening, winding rolls associated with each end of the ribbon, an operating gear for each pair of drive rolls, an operating gear for each winding roll, a common drive shaft, a master gear on said shaft, a swinging arm on said shaft and an idler or connecting gear on said arm meshing constantly with said master gear and arranged, when shifted, to engage the winding and drive roll gears at either end of the ribbon, substantially as described.

5. In an indicator or display apparatus, the combination with an inclosing casing having a display opening, of a ribbon in said casing, two pairs of drive rolls on opposite sides of the display opening engaging the ribbon to shift the same in opposite directions past said opening, winding rolls associated with each end of the ribbon, an operating gear for each pair of drive rolls, an operating gear for each winding roll, a common drive shaft, a master gear on said shaft, a swinging arm on said shaft and an idler or connecting gear on said arm meshing constantly with said master gear and arranged, when shifted, to engage the winding and drive roll gears at either end of the ribbon, said idler gear being automatically shifted from one to the other set of gears by the reversal of said drive shaft, substantially as described.

6. In an indicator or display apparatus, the combination with an inclosing casing having a display opening, of a ribbon in said casing, two pairs of drive rolls on opposite sides of the display opening engaging the ribbon to shift the same in opposite directions past said opening, winding rolls associated with each end of the ribbon, an operating gear for each pair of drive rolls, an operating gear for each winding roll, a common drive shaft, a master gear on said shaft, a swinging arm on said shaft and an idler or connecting gear on said arm meshing constantly with said master gear and arranged, when shifted, to engage the winding and drive roll gears at either end of the ribbon, said arm and idler gear being counter-balanced and mounted to swing freely on said drive shaft and automatically shifted from one to the other set of gears by the reversal of said drive shaft, substantially as described.

7. The combination with a display ribbon, of two pairs of driving rolls engaging said ribbon, a winding roll for the ends of the ribbon associated with each pair of drive rolls, friction gearing for driving said winding rolls, a common drive shaft and coupling means shiftable to connect said drive shaft to the driving rolls and to the friction gearing of the winding roll at one end of said ribbon and to disconnect said drive shaft from the driving rolls and friction gearing at the other end of the ribbon, substantially as described.

8. The combination with a display ribbon, of two pairs of driving rolls engaging said ribbon, a winding roll for the ends of the ribbon associated with each pair of drive rolls, friction gearing for driving said winding rolls, a drive shaft and means arranged to be automatically shifted by the reversal of said drive shaft for coupling the same to the drive rolls and the friction gearing for the winding roll at either end of said ribbon.

9. The combination with a display ribbon, of two pairs of driving rolls engaging said ribbon, a winding roll for the ends of the ribbon associated with each pair of drive rolls, friction gearing for driving said winding rolls, a drive shaft, a master gear on said drive shaft, a swinging arm hung on said shaft and a connecting or idler gear on said arm for connecting said master gear to the drive roll and the friction gearing for the winding roll at either end of the ribbon.

10. The combination with a display ribbon, of separate drive rolls for said ribbon, reversible operating mechanism for actuating one or the other of said rolls and means governed by the accumulation of the ribbon on either of said rolls for shifting the reversible operating mechanism to inoperative position and for holding the same in such position out of engagement with either of said drive rolls.

11. The combination with a display ribbon, of separate drive rolls for said ribbon, a drive shaft, reversible coupling mechanism for connecting said shaft to either of said rolls and automatically actuated by the reversal of said shaft, means for holding said coupling device in inoperative position out of engagement with either of said rolls and devices for controlling said means actuated by the accumulation of the ribbon on either of said rolls, substantially as described.

12. The combination with a display ribbon, of rolls whereon the ribbon is wound, a drive shaft, a shiftable coupling device for connecting said shaft to either of said rolls and means governed by the accumulation of the ribbon on said rolls for shifting said coupling device to a central, inoperative position.

13. The combination with a display ribbon, of rolls whereon the ribbon is wound, a drive shaft, a shiftable coupling device for connecting said shaft to either of said rolls, a solenoid for holding said coupling device in central, inoperative position, and contacts associated with each of said winding rolls for controlling the circuit of said solenoid.

14. In an indicator or display apparatus, the combination with an inclosing casing having a display opening therein, of a display ribbon in said casing, drive rolls in said casing on opposite sides of said display opening for shifting said ribbon in opposite directions past said opening, a common drive shaft for said rolls and a counter-balanced coupling member pivoted to swing freely on said shaft and automatically shifted by the reversal thereof, to connect and disconnect said shaft with the rolls on opposite sides of said display opening, substantially as described.

15. The combination with a display ribbon, of driving and winding rolls associated with each end of said ribbon, a common drive shaft and coupling means for positively connecting said shaft to the drive roll at either end of the ribbon and for connecting the associated winding roll to said shaft through the medium of friction gearing, said coupling means being automatically shifted by the reversal of said drive shaft to alternately connect and disconnect the driving and winding rolls at opposite ends of the ribbon with said shaft, substantially as described.

16. The combination with a display ribbon, of driving and winding rolls associated with each end of said ribbon, a common drive shaft and coupling means for positively connecting said shaft to the drive roll at either end of the ribbon and for connecting the associated winding roll to said shaft through the medium of friction gearing, said coupling means being swiveled on said shaft and counter-balanced and automatically shifted by the reversal thereof for alternately connecting the same to the driving and winding rolls at either end of said ribbon, substantially as described.

17. The combination with a display ribbon, of a drive roll and a frictional drive winding roll associated with opposite ends of said ribbon for shifting the same in opposite directions, a common drive shaft and coupling means automatically shifted by the reversal of movement of said drive shaft for connecting the same with the drive roll and frictionally driven winding roll at either end of the ribbon, substantially as described.

18. In station or street indicators for cars, the combination with a car of a display or indicator ribbon, of a drive

roll and a frictionally driven winding roll associated with each end of the ribbon for shifting the same in opposite directions; a common drive shaft, gearing between said drive shaft and the car axle and a coupling device automatically shifted by the reversal in the direction of the movement of the car for connecting said drive shaft with the driving and winding rolls at either end of the ribbon, substantially as described.

18. In station or street indicators for cars the combination with a car, of an indicator casing in said car having a display opening, an indicator ribbon in said casing, separate drive rolls engaging said ribbon on opposite sides of said opening, reversible gearing positively connecting either of said drive rolls with the car axle for operating the same at a speed proportionate to that of the car, winding rolls associated with the opposite ends of said ribbon and operat-

ing means for said winding rolls driven by said reversible gearing, substantially as described.

20. In station or street indicators for cars, the combination with the car axle and the indicator or display ribbon, of separate drive rolls engaging said ribbon to shift the same in opposite directions, reversible gearing positively connecting either of said drive rolls with the car axle for operating the same at a speed proportionate to that of the car, winding rolls associated with opposite ends of said ribbon and friction gears for operating said winding rolls driven by said reversible gearing, substantially as described.

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Witnesses:

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OCTAVIUS J. COLTON.