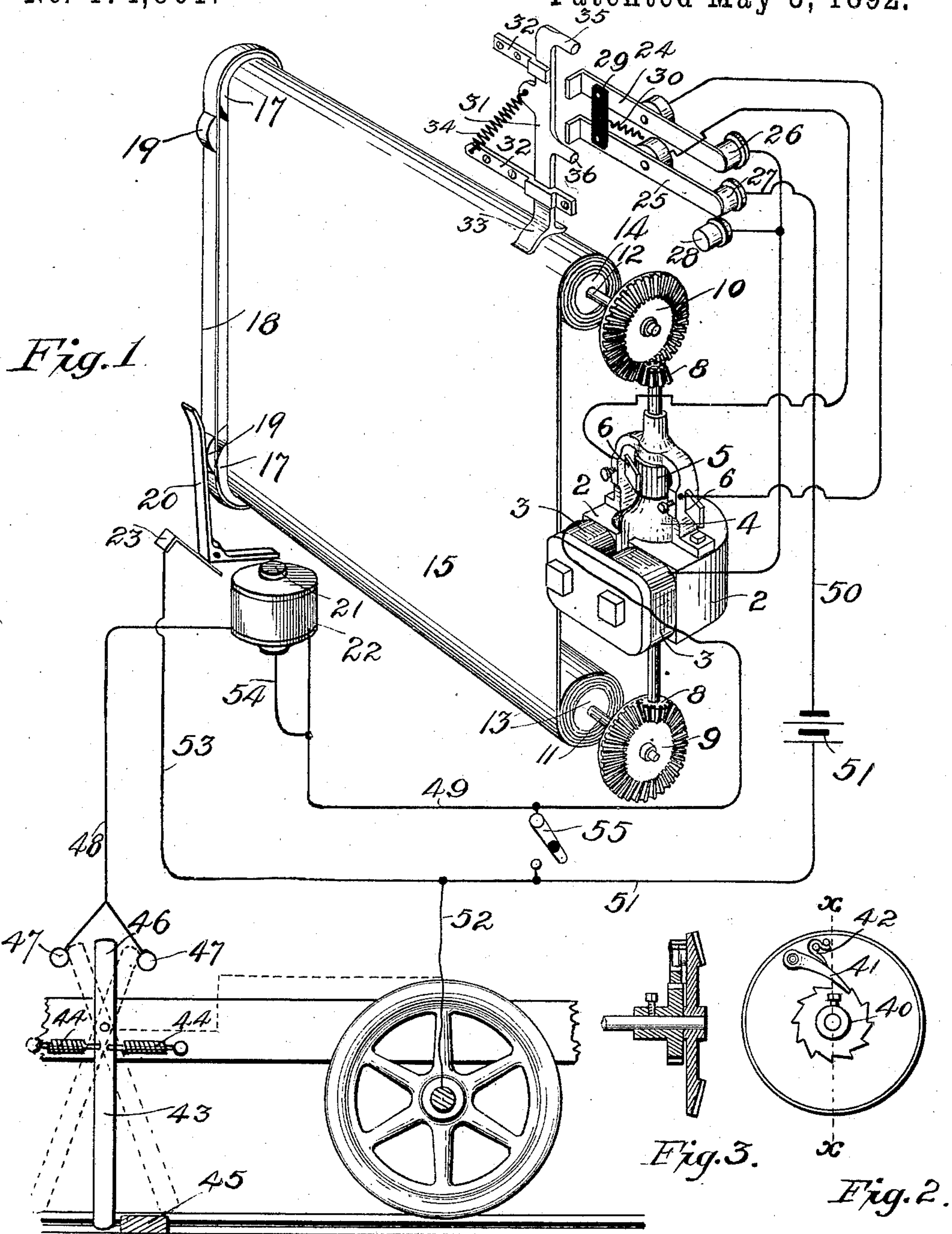


(No Model.)

J. H. DEAN.
STATION INDICATOR.

No. 474,001.

Patented May 3, 1892.



Witnesses.
Char. E. Vandoren,
Ch. Hawley.

Inventor
James H. Dean.

By Paul & Merwin Attys.

UNITED STATES PATENT OFFICE.

JAMES H. DEAN, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR OF ONE-HALF TO
BERNARD CLOUTIER, OF SAME PLACE.

STATION-INDICATOR.

SPECIFICATION forming part of Letters Patent No. 474,001, dated May 3, 1892.

Application filed December 21, 1891. Serial No. 415,704. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. DEAN, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain Improvements in Street or Station Indicators, of which the following is a specification.

My invention relates to means for indicating accurately the streets or stations upon the railway-line, and relates especially to an electrically-controlled street-indicator for street-cars.

The object of the invention is to provide a reliable, accurate, and automatic indicator which will operate positively and be of such construction as not to get out of order easily.

A further object is to make such a device automatically reversible.

To this end my invention consists in two parallel rolls, whereon the paper-sign strip is arranged and between which the signs are displayed as the paper strip is wound from one roll to the other, in combination with a small electric motor arranged between said rolls and geared to the same, a belt arranged upon said rolls, lugs thereon, an electro-magnet having an armature adapted to be tripped by said dogs upon said belts, a circuit extending through said electro-magnet and to said motor, a battery included in said circuit, and a circuit-closer included therein and adapted to be operated by said electro-magnet, a branch circuit including said electro-magnet, and a circuit-closer arranged in said circuit and adapted to operate at the street crossing or intersections to energize said electro-magnet, and thereby operate the first-mentioned circuit-closer to complete the circuit through the electric motor, in an automatic reversing-switch, and in other details of construction and combination, all as hereinafter described, and particularly pointed out in the claims.

My invention will be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is a diagrammatic representation of apparatus embodying my invention. Fig. 2 is a detail view of one of the miter-gears employed in the paper-roll shafts. Fig. 3 is a vertical section thereof on the line *x x* of Fig. 2.

As shown in the drawings, 2 2 represent the

pole-pieces of the electric motor, 3 the winding thereof, 4 the armature, and 5 the commutator with which the brushes 6 6 make contact. The armature and the commutator are arranged on the shaft, upon which are provided the miter-gear pinions 8 8, which mesh with the large miter-gears 9 and 10, arranged upon the shafts 11 and 12, respectively, and upon the rollers 13 and 14 of which the two ends of the paper or cloth strip 15 are wound, as shown. Upon the opposite ends of the shafts 11 and 12, which are supported in any convenient manner, I provide the pulleys 17 and 17, and upon the same arrange the endless belt 18, provided with the dogs 19, which as the belt revolves with the strip of paper are adjusted to strike the upper end of the bell-crank 20 and throw the same out of engagement with the ends of the core 21 of the electromagnet 22. A small spring 23 is arranged to hold the bell-crank in either position in which it may be. Within the same case in which these devices are inclosed I arrange the three-pole switch consisting of the two contact-levers 24 and 25, pivoted on insulated blocks and adapted to make contact with the fixed buttons 26 and 27 or 27 and 28. The two levers are connected by the metal strap 28, and are held in either extreme position by a small spiral spring 30. This switch may be operated by hand; but I prefer to render the device automatic by the use of the sliding bar 31, held in the fixed guides 32 and having the presser-foot 33 held firmly against the top of the roll of paper by a spring 34. This bar is provided with the lugs 35 and 36, the latter of which is adapted to engage the switch-levers to throw the same into contact with the buttons 27 and 28 when the end of the street-railway line has been reached and all of the flexible strip has been wound upon the upper roller beneath the presser-foot 23. The lug 35 acts to throw the levers back when the paper has been wound off the roll against which the foot 23 presses. The gear-wheels 9 and 10 are fixed upon their shafts by ratchet-and-pawl devices similar to that shown in Figs. 2 and 3, a ratchet-wheel 40 being fixed on the shaft and a pawl 41 pivoted on the back of the gear-wheel and held in engagement with the ratchet-wheel by a small spring 42. The

ratchet connections of the two wheels are oppositely arranged, so that when the armature of the motor is turning in one direction one of the miter-gears will be positively operated to wind the strip of paper 15 upon its shaft, while the other gear will slip upon its shaft and allow the paper to be drawn off the same rather than thrown therefrom.

The operation of my device is as follows:
 Depending from the car is an arm 43, pivoted thereon and normally held in a substantially vertical position by springs 44. The lower end of this arm stands a short distance above the track or road-bed, and is adapted to strike a projection 45, provided in the track at each street intersection or station. As the arm strikes this projection its upper end or an extension 46 thereof is thrown into contact with one of the contact buttons or plates 47. Now, following the strand 48, it will be seen that the circuit may be followed through the windings of the electro-magnet 22, thence by the wire 49 to the windings 3 of the electric motor, and from said windings to one of the posts 26 or 28, to both of which it is connected. A strap 29 of insulating material connects the forward ends of the switch-levers 24 and 25. From the contact-post 26 or 28 current passes to one of the brushes of the electric motor, and then from the other brush back to the second switch-lever, and thence out through the post or button 27 into the wire 50, containing the battery, and thence to ground through the strand or leg 52, connected with the car-axle or other metal part of its frame, thereby completing the circuit from ground through the arm 43 and the metal lock 45, and forthwith starting the motor to turn the paper 15 and change the sign thereon. At the same instant the iron bell-crank 20, arranged above the core 21, is drawn down into contact with said core, after which the motor is held in closed metallic circuit, the circuit being completed through the leg 54, passing from the core 21 to a connection with the wire 49, and a leg 53, extending from electrical connection with the part 20 to the wire 51. After passing the block 45 the arm 43 of course returns to its vertical position; but the motor will run and the paper strip 15 be moved until one of the dogs 19 strikes against the vertical arm of the bell-crank 20, thereby forcibly breaking the electrical connection between the core 21 and severing the circuit of the battery and the motor. This operation will be repeated at each street-crossing or other point determined by the locations of the blocks 45, and the street-indicator operated while the car is running over the line in either direction, the motor being made to operate in the desired direction by the circuit-changing switch controlled by the bar 31. For convenience in closing the circuit of the motor and adjusting the sign-roll, I provide the hand-switch 55 between the wires 51 and 49. It is obvious that by providing a four-pole switch to be operated by the movement of the arm

43, and two poles of the switch being connected with the strand 48 and the other two with the strand 52, or by simply running the wire 52' to the pivot-stud of the arm 43, as shown by dotted lines, the electrical ground connection may be dispensed with, the arrangement being such that when the bar 43 is in its vertical position the four-pole switch will be open; or it is obvious that if the car was adapted to run in one direction a two-pole switch would be all that would be required.

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

1. The combination, with a car, of parallel rolls arranged thereon, a strip of paper wound upon said rolls, an electric motor geared between said rolls, an electro-magnetic circuit-closer, the armature thereof, means provided in connection with said rolls for disengaging said armature, a circuit extending through the same and through the windings of said electric motor, a battery included in said circuit, and a branch circuit and secondary circuit-closer adapted to be operated to close the circuit of said battery and temporarily energize the magnet of said electro-magnetic circuit-closer to operate the same, substantially as described

2. The combination, with the rolls and the sign-strip arranged thereon, of an electric motor arranged between the said rolls and connected therewith to drive the same, an electro-magnet, an armature therefor, contacts upon each, means provided in connection with said rolls for disengaging said armature from said magnet to separate the contacts, an arm pivoted upon the frame of the car, raised blocks and depressions in the car-track, said arm adapted to engage said blocks, a battery arranged on said car, a circuit extending through the same and through said electric motor, the ends of said circuit terminating in said contacts, a leg or branch extending from the one side of the circuit and including the windings of the electro-magnet, and a break in said branch adapted to be closed by the operation of said depending arm, substantially as described.

3. The combination, with the rolls and the sign-strip arranged thereon, of miter-gears provided in connection with said rolls, an electric motor arranged transversely between the same and having a shaft provided with pinions to engage said gears, the car whereon said parts are arranged, an arm depending therefrom, the track, blocks arranged therein and with which said arm is adapted to engage, an electro-magnet, an armature therefor, means provided in connection with said rolls for disengaging the armature from the core of said magnet, a circuit extending from said core through the windings of said motor, through battery, and thence to said armature, a connection or leg to ground and a second connection or leg including the windings of

said electro-magnet, and a contact or contacts connected therewith and adapted to be closed by the movement of said depending arm, substantially as described.

5 4. The combination, in a street or station indicator, of the parallel rolls and the sign-strip arranged to be wound thereon, an electric motor arranged transversely between said rolls, miter-gears arranged on the roll-shafts
 0 and fixed thereto by oppositely-arranged ratchet devices, miter-pinions fixed on the armature-shaft to mesh with said gears, a three-pole switch, a slidable bar having lugs to engage the same and a foot 33 to engage
 5 one of the rolls of the sign-strip, means for continually holding the same against said rolls, an electro-magnetic switch, a circuit extending from the contacts thereof through said motor and said three-pole switch, a battery included in said circuit, one side of said
 0 circuit being grounded and the other side extended through the windings of the electro-magnetic switch, and a switch arranged in said extended branch and means for operating the same at the street intersections to
 5 ground said branch, all substantially as and for the purpose specified.

5 5. The combination, with the car and the truck thereof, of the track provided with raised blocks 45, an arm 43, pivoted on said truck and adapted to engage said blocks, springs for normally holding said arm in a vertical position, rolls 13 and 14, arranged on said car, a strip 15, wound thereon, miter-gears
 5 9 and 10, arranged in connection with said rolls, a motor, the armature-shaft 7, provided with pinions 8, meshing with said gears, the pulleys provided on said rolls, the belt 18, arranged thereon and provided with a dog or
 0 dogs 19, an electro-magnet 22, having the core

21, the bell-crank armature 20 therefor and adapted to be disengaged therefrom by said dogs 19, a battery, a circuit including said battery and said motor and having its terminals connected with said core and said armature, respectively, a circuit-changing switch
 45 arranged in said circuit for reversing the motor, a branch 52, extending to a ground connection, and a branch extending from the other side of the circuit through the windings
 50 of the electro-magnet 22, said arm 43 adapted to operate to close the circuit through said branch, substantially as described.

6. The combination, with the car, of the track provided with blocks 45, an arm 43, pivoted on said car to engage the same, rolls 13
 55 and 14, shafts therefor, a motor arranged between the same and connected therewith by ratchet devices, an electro-magnetic circuit-closer, a circuit including a battery, the motor, and said electro-magnetic circuit-closer,
 60 an electric connection therefrom connected with said arm 43, a branch from the other side of the circuit extending to the ground, means provided on said rolls for opening said
 65 electro-magnetic circuit-closer, the contact-levers 24 and 25, the strap 29, connecting the same, three contact-posts 26, 27, and 28 therefor, said parts included in said circuit, and the bar 31, having the foot 33 and the lugs 35
 70 to engage said levers, all substantially as and for the purpose specified.

In testimony whereof I have hereunto set my hand this 14th day of December, A. D. 1891.

JAMES H. DEAN.

In presence of—

C. G. HAWLEY,
 F. S. LYON.