H. M. VAN DEMARK.

STATION INDICATOR FOR RAILWAYS.

APPLICATION FILED FEB. 1, 1908.

1,053,330.

Patented Feb. 18, 1913.

3 SHEETS—SHEET 1.

FIG. 1

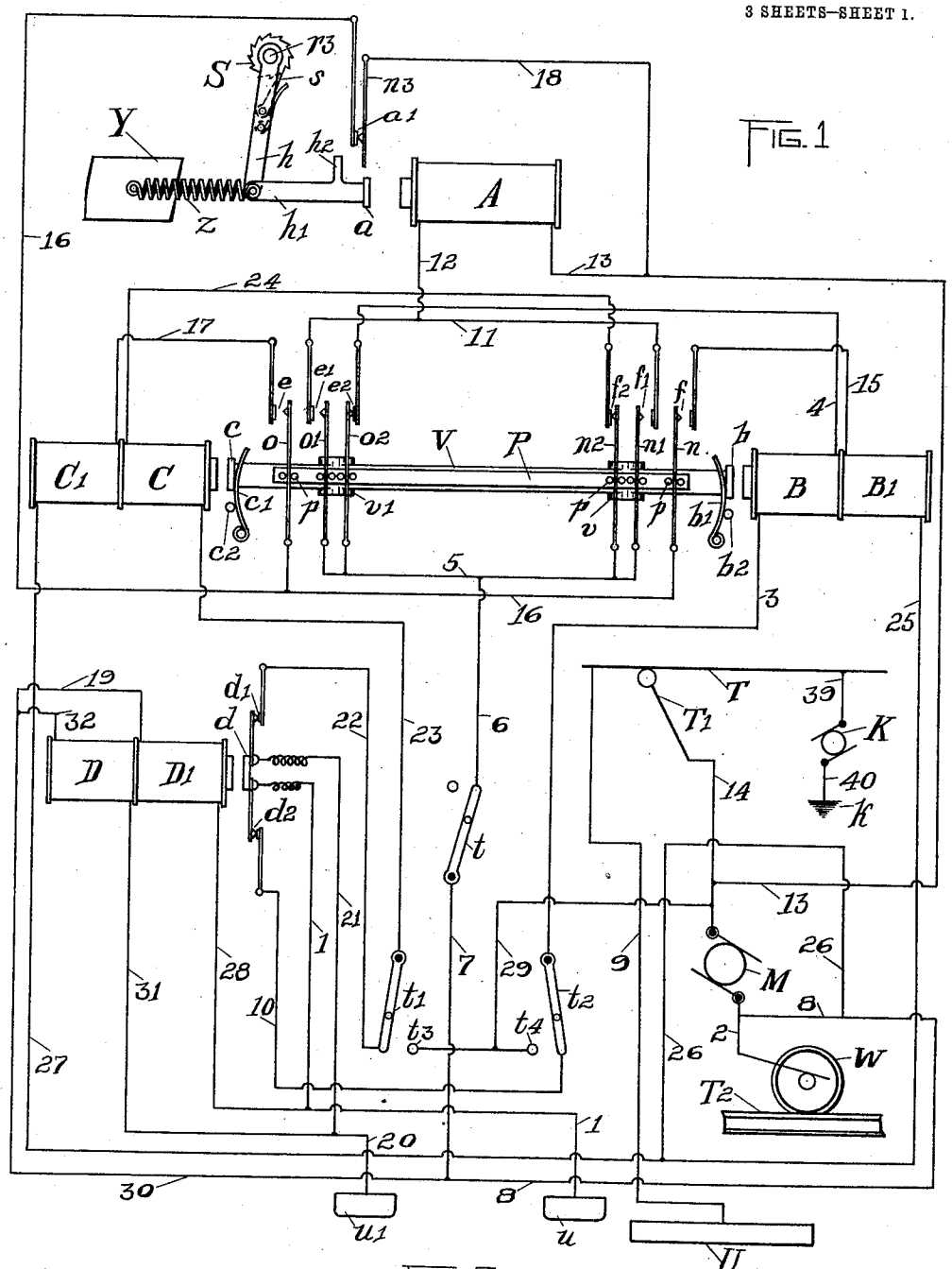
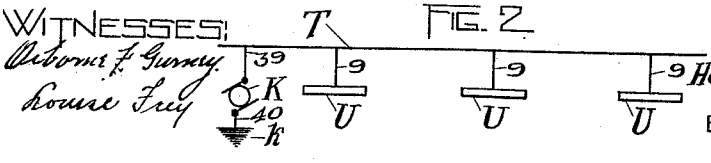


FIG. 2



WITNESSES:

Osborne F. Gurney.

Louise Fry

INVENTOR:

Howard M. Van Demark

BY W. H. Cooley

ATTY

H. M. VAN DEMARK.

STATION INDICATOR FOR RAILWAYS.

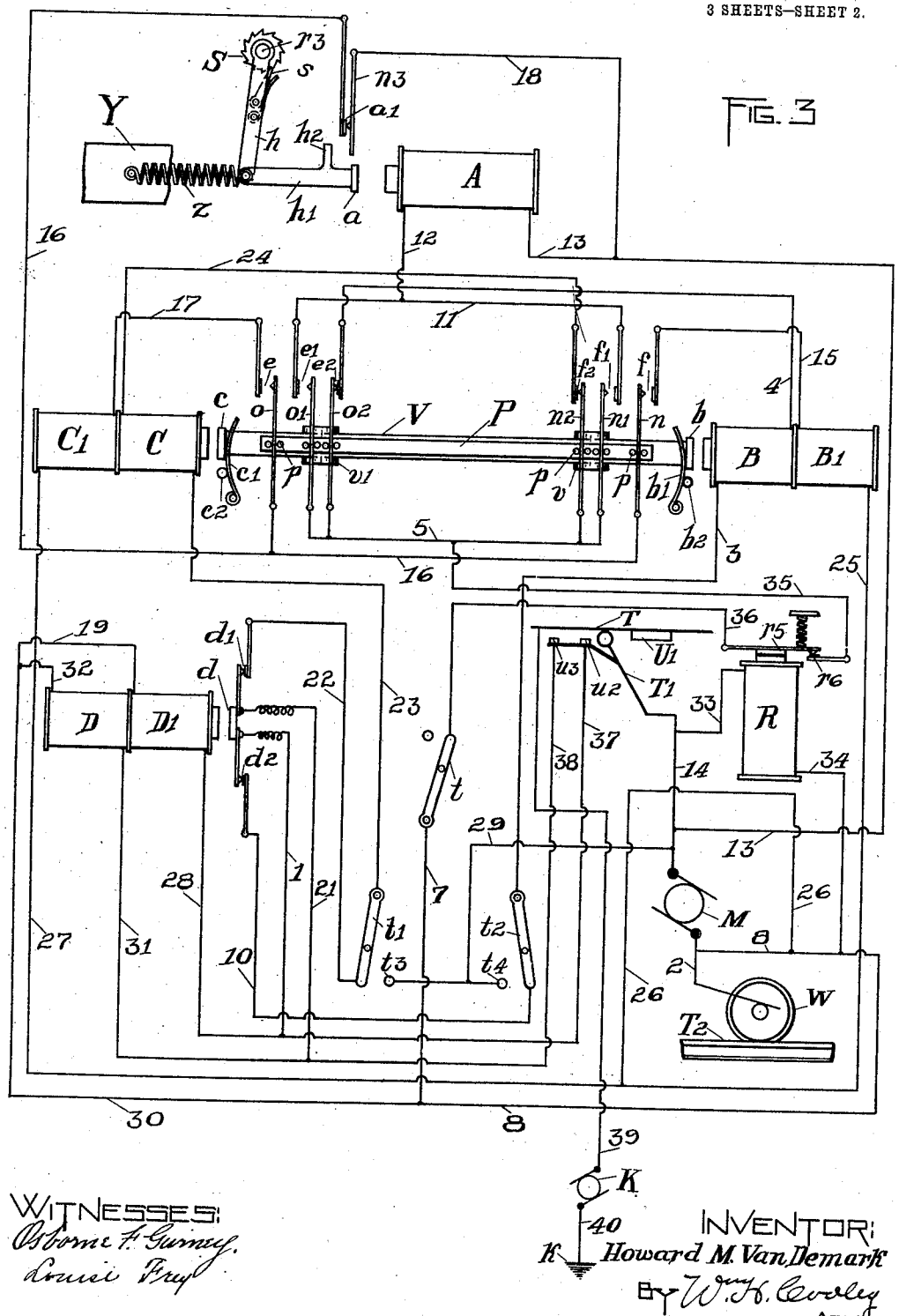
APPLICATION FILED FEB. 1, 1908.

1,053,330.

Patented Feb. 18, 1913.

3 SHEETS—SHEET 2.

FIG. 3



WITNESSES:

Osborne A. Gurney.

Louis Fray.

INVENTOR:

Howard M. Van Demark

BY W. H. Cooley

ATT'Y.

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

H. M. VAN DEMARK.

STATION INDICATOR FOR RAILWAYS.

APPLICATION FILED FEB. 1, 1908.

1,053,330.

Patented Feb. 18, 1913.

3 SHEETS—SHEET 3.

FIG. 4

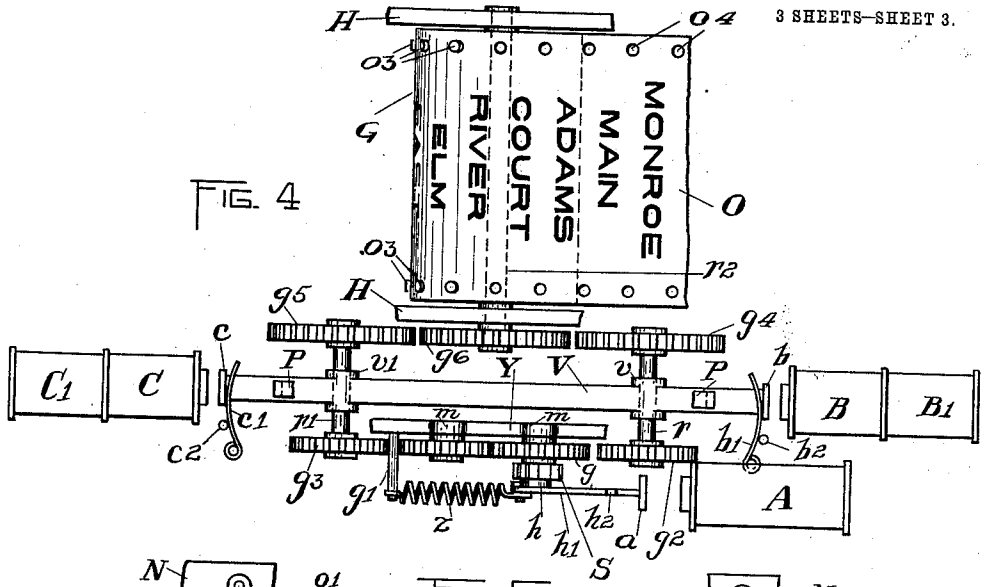


FIG. 5

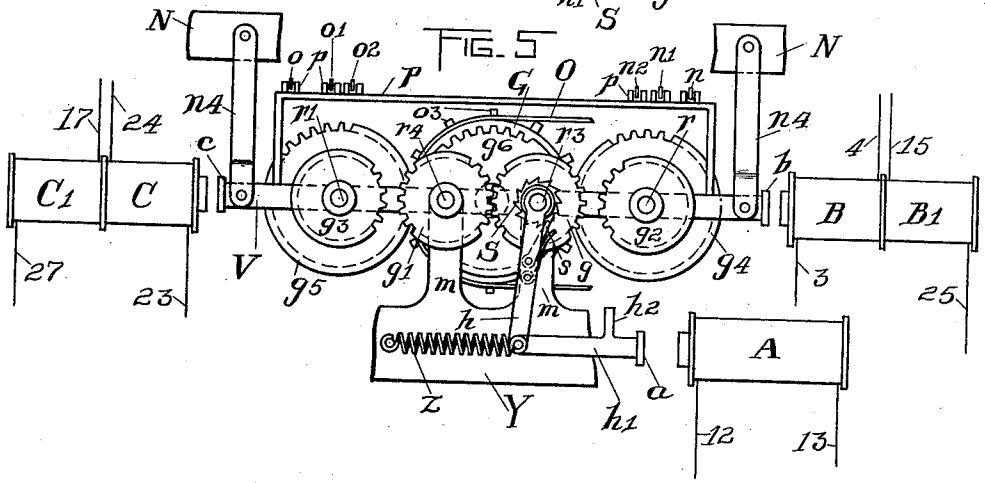
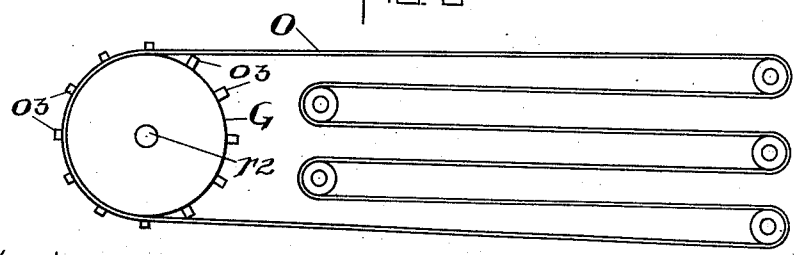


FIG. 6



WITNESSES:

Osborne F. Gurney

Louise Fry

INVENTOR:

Howard M. Van Demark

BY Wm. H. Crowley

ATTY.

UNITED STATES PATENT OFFICE.

HOWARD M. VAN DEMARK, OF BROOKLYN, NEW YORK.

STATION-INDICATOR FOR RAILWAYS.

1,053,330. Specification of Letters Patent. **Patented Feb. 18, 1913.**

Application filed February 1, 1908. Serial No. 413,746.

To all whom it may concern:

Be it known that I, HOWARD M. VAN DEMARK, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Station-Indicator for Railways, of which the following is a specification.

This invention relates to means for properly operating a band or strip of suitable material bearing thereon in proper order the names of the stations to be indicated, visible only through a suitable opening therefor in a casing for the band and such other parts of the annunciator as it may, according to circumstances, be desirable to inclose within such casing.

As my present invention has to do only with the means for properly advancing the band or ribbon having the names of the stations thereon, I have herein shown and described, and that too diagrammatically, only such mechanism as is necessary for the accomplishment of this result. The casing for the apparatus and the support for the different parts thereof, forming no part of my present invention, are not shown or referred to herein.

My invention comprises a band of the character above indicated, operably supported upon suitable wheels or drums, one of which is angularly advanced in the right direction by means of electromagnetically controlled apparatus on the car under the control of coöperating mechanism external to the car and adjacent to the pathway thereof.

Special features of my present invention comprise, means for automatically determining the direction of the travel of the station indicator band by the direction of the travel of the car and also means for preventing any chance or improper action of the annunciator mechanism under any and all conditions of operation of the car.

The accompanying drawings illustrating, diagrammatically only such features of an annunciator system as are essential to the embodiment of my invention therein, are as follows:—

Figure 1 is a diagrammatic view of the circuit connections for the entire system. Fig. 2 is a diagrammatic view of the connection with the trolley circuit of the engaging members external to the car. Fig. 3 is a diagrammatic view similar to Fig. 1, but showing the engaging members external to the car in a different location, and an additional relay R which is necessitated thereby. Fig. 4 is a diagrammatic plan view of the mechanism for intermittently operating the band carrying the names of the stations, and Fig. 5 is a side view of the parts seen in Fig. 4. Fig. 6 shows diagrammatically the means which I employ for providing for an excessive length of the band carrying the names of the stations.

Referring to the drawings,—T is the trolley wire to which there are connected the contact members U—U, as seen in Figs. 1 and 2, located along the pathway of the car, one near each station and on the side thereof toward the next succeeding station. The contact members U are operatively connected, as indicated in diagram in Fig. 2, and the trolley wire T is connected by wire 39 to the source of electric energy K at the distributing or power station, from which the wire 40 leads to ground k as seen also in Figs. 1 and 3. These members U are adapted to be engaged or contacted with by members carried by the car in the manner to be explained.

T^1 is the trolley connected by wire 14 to the motor M, which is grounded by means of wire 2 in the usual way upon the iron work of the truck and through the wheel W and rail T^2. Wire 13 is connected to wire 14. One terminal of the coil B^1 is connected by wire 25, and one terminal of the coil C^1 is connected by wire 27, through wire 26, to the ground connection 2 of the motor. The other terminal of the coil B^1 is connected by wire 15 through contacts f to wire 16, while the other terminal of the coil C^1 is connected by wire 17 through contacts e with wire 16. Wire 16 is connected through contacts a^1 with wire 18, which is connected to wire 13. Wire 13 is also connected to one terminal of the coil of electro-magnet A, the other terminal of which is connected by wire 12 to wire 11 which may be connected either through contacts e^1 or through contacts f^1 to wire 5.

In the circuits in my annunciator there are included switches t, t^1 and t^2. Switch t has only one operative position on a closed contact and is shown in Figs. 1 and 3 in such position, while in the same figures, switch t^1 is shown upon one of its two op-

erative and closed circuit contacts, the other operative contact therefor is seen at t^3 in these figures and switch t^2 is shown in these figures upon one of its operative and closed circuit contacts, the other operative contact for this switch t^2 being shown in these figures at t^4. A wire 29 extends from a common connection between the contacts t^3 and t^4 in each of these figures and is connected to the wire 14, the other connections of which will be described later. Wire 5 is connected by wire 6, through switch t with wire 7, which in turn is connected by wire 8 to ground wire 2.

One terminal of the coil B is connected through wire 3 and switch t^2, wire 10, contacts d^2 and wire 1 to the contact member u carried by the car. The other terminal of the coil B is connected by wire 4 through contacts e^2, wire 5, wire 6, switch t, wire 7 and wire 8 to ground wire 2. One terminal of the coil C is connected through wire 23, switch t^1, wire 22, contacts d^1, wire 21, and wire 20 to contact u^1 carried by the car, while the other terminal of this coil C is connected by wire 24 through contacts f^2, wire 5, wire 6, switch t, wire 7 and wire 8 to ground wire 2.

One terminal of the coil D^1 is connected through wires 28 and 1 to contact u. One terminal of coil D is connected by wires 31 and 20 to contact u^1. The other terminals of the coils D and D^1 are connected respectively by wires 32 and 19 to wire 30, thence through wire 8 to ground wire 2. Contacts t^3 and t^4 of switches t^1 and t^2, respectively, are connected through wire 29 with wire 14 and therethrough to the trolley circuit. The contact U is of such a length relative to the lengths and distances apart of the contacts u and u^1 that both such contacts u and u^1 will simultaneously engage for a brief interval the contact U. In Figs. 1 and 2 the elements U are shown diagrammatically as connected by wires 9 with the conductor from the power station comprising the source of electric energy for propelling the vehicle, which source it is preferable, when such vehicle is electrically propelled, to employ as the source of electric energy for the electrically controlled actuating mechanism of the station indicator on the car. Such elements U may, however, when an overhead trolley is used, be preferably located directly on the trolley to form lateral extensions thereof and in this case the engaging members u and u^1 will be carried by the trolley pole but insulated from each other. This latter arrangement is indicated for one element U in Fig. 3 at U^1 and for the engaging members u and u^1 in Fig. 3 at u^2 and u^3. The proper connections for the engaging members u^2 and u^3, which it should be noted diagrammatically illustrate a preferred location of such members, are through wires 37 and 38. Wire 37 is connected to wires 1 and 28 and wire 38 is connected to wires 21 and 31.

The order of the engagement of the contacts u and u^1 with contact U is determined by the direction of the travel of the car, which we will suppose is from left to right. Contact u therefore first engages contact U and a circuit is then established as follows: beginning with contact u, through wire 1, contacts d^2, wire 10, switch t^2, wire 3, coil B, wire 4, contacts e^2, wire 5, wire 6, switch t, wires 7 and 8 to ground wire 2. Simultaneously, however, with this circuit, thus established, the coil D^1 is energized by being placed in the following circuit, viz.: starting with contact u, wire 1, wire 28, wire 19, wire 30 and wire 8 to ground wire 2. The coil B being energized, the armature b is drawn to the right, tending to more firmly close contacts e^2, opening contacts f^2 and closing contacts f^1 and f. The result of this is that the following circuits are established:—first, from the trolley circuit through the wires 14 and 13, to and through coil A, wire 12, wire 11, contacts f^1, wire 5, wire 6, wire 7 and wire 8 to ground wire 2; second, starting with wire 13, through wire 18, contacts a^1, wire 16, contacts f, wire 15, coil B^1, wire 25, wire 26 and wire 8 to ground wire 2.

The coil B^1 when energized serves to hold the armature b to the right, after the contact u has left the contact U. During the time that coils B or B^1 are energized, the magnet A is holding the armature a to the right. When the contact u^1 engages the contact U, which occurs just before the contact u leaves contact U, there is a circuit established through contact u^1, wire 20, wire 31, coil D, wires 32, 30 and 8 to ground wire 2, thus energizing the coil D, which alone, however, is not sufficient to draw the armature d to the left and open contacts d^1 and d^2, but when the coils D and D^1 are both energized, then armature d is drawn to the left and then either coil D or D^1 alone if energized is sufficient to hold the armature d to the left and thus hold contacts d^1 and d^2 open. The result of this is that, contacts d^1 and d^2 being open, after the contact u leaves the contact U and while the contact u^1 is still on contact U, the coil C cannot be energized by reason of the contact u^1 being in contact with the contact U, because the contact d^1 being open anl located in the energizing circuit, as clearly indicated, of coil C, such coil cannot be energized, and this condition obtains under all conditions,—even if the car stops with contact u^1 on contact U, the coil C cannot be energized. So long as contact u remains on contact U, the coil B remains energized and armature b is held to the right. The energizing circuit of coil B^1 is closed through contacts f and also through

contacts a^1, hence, as soon as the magnet A has drawn the armature a to its extreme right hand position and opened contacts a^1, the energizing circuit of the coil B^1 is opened and such coil is deënergized, but this cannot occur until just at the completion of the operative stroke of the armature a. This condition is provided in order that should the contact u leave the contact U before the magnet A, which is comparatively slow in its operation, has drawn the armature a to its extreme right hand position and made one complete operation of the indicator, the coil B^1 being still energized, holds the armature b to the right and maintains the coil A in its energizing circuit through the contacts f^1.

Suppose the car stops with contact u on contact U—the coil B is energized and remains in its energizing circuit, hence the coil A remains energized and even if the energizing circuit of the coil B^1 is opened through contacts a^1, still, the magnet A holds the armature a to its extreme right hand position and there can be no repeated or improper action of the mechanism controlled by the magnet A. Again, if the contact u leaves contact U before the armature a is drawn to its extreme right hand position the coil B^1 still remains in its energizing circuit, holding the armature b to the right and maintains coil A in its energizing circuit until armature a has reached its extreme right hand position, thereupon coil B^1 is deënergized by the opening of contacts a^1, permitting armature b to return to its initial position, thus opening the contacts f^1 and deënergizing coil A.

The armatures b and c are connected together, as seen in Figs. 1, 3, 4 and 5, through a bar V, carrying bearings v and v^1 in which are revolubly supported the shafts r and r^1, respectively. Supported from this bar V is seen the contact-actuating bar P, carrying a series of upwardly extending pins p arranged to engage and operate the spring and movable members o, o^1, o^2, n, n^1 and n^2, respectively, of the pairs of contacts e, e^1, e^2, f, f^1 and f^2. The shaft r has rigidly secured thereon spur gears g^2 and g^4. The shaft r^1 has rigidly secured thereon the spur gears g^3 and g^5. The ribbon or band carrying roller G is revolubly supported in bearing plates H and upon the shaft r^2, which carries the gear g^6 adapted to intermesh with either the gear g^5 or g^4, according as the armature b is drawn to the right or armature c is drawn to the left. Revolubly supported upon studs r^3 and r^4 projecting from the uprights m formed on the portion of the framework Y are seen two spur gears g and g^1 intermeshing with each other, the gear g having connected therewith the ratchet wheel S adapted to be engaged by the spring-actuated pawl s carried by the swinging lever h and articulating with the left hand end of the bar h^1, upon the right hand end of which is secured the armature a arranged to be drawn to the right under the influence of the magnet A. A spring z operates, as indicated, to hold the lever h and the bar h^1 in their extreme left hand positions. The bar h^1 carries an upward projection h^2 adapted to engage the movable and spring-actuated member n^3 of the contacts a^1. The gears g^2 and g^3 are arranged to intermesh and engage and be operated by, respectively, the gear g and the gear g^1, according as the armature c is drawn to the left or the armature b drawn to the right. Thus it will be seen that the energizing of the coil B or the coil B^1, either one or both of them, drawing the armature b to the right, causes the gears g^5 and g^6 to intermesh and simultaneously also the gears g^1 and g^3 to intermesh, and the simultaneous energizing of the magnet A with the energizing of the coils B or B^1, either one or both of them, by moving the armature a to the right, causes a movement of the indicator band O upon the drum G in one direction, while similarly the energizing of the coils C and C^1, either one or both of them, simultaneously with the energizing of the coil A, causes a movement in the opposite direction of the station indicator band O upon the drum G.

If the car be traveling from right to left, the contact u^1 engaging with contact U causes, first, the energizing of the coil C from following circuit: starting with contact u^1, wire 20, wire 21, contacts d^1, wire 22, switch t^1, wire 23, coil C, wire 24, contacts f^2, wire 5, wire 6, switch t, wire 7, wire 8 to ground wire 2. Simultaneously also the following circuit is closed: commencing with contact u^1, wire 20, wire 31, coil D, wire 32, wire 30 and wire 8 to ground wire 2. The energizing of coil C draws the armature c to the left, closing contacts e and e^1 and opening contacts e^2. Upon the closing of contacts e, the coil C^1 is energized through the following circuit: starting from the trolley circuit through wires 14 and 13, wire 18, contacts a^1, wire 16, contacts e, wire 17, coil C^1 wires 27 and 26 and 8 to ground wire 2. The coil C^1 remains energized therefore until the contacts a^1 in its energizing circuit are opened by the movement of the armature a to its extreme right hand position. During this time, however, magnet A has been energized, through the following circuit, viz.: starting with trolley circuit through wire 14, wire 13, coil A, wire 12, wire 11, contacts e^1, wire 5, wire 6, switch t, wires 7 and 8 to ground wire 2. Thus it will be seen that the energizing of coil A takes place regardless of the direction of the travel of the car. It will be noted also that by reason of the coils D and D^1, the energizing

of either one alone of which is insufficient to draw the armature d to the left, but the energizing of both of which draws the armature d to the left, that such armature d is drawn to the left once each time that the contacts u and u^1 are simultaneously engaged with the contact U and held there as long as either contact u or u^1 engages the contact U, there is prevented an improper energizing of either the coil B or C. It will also be seen that according to the direction of the travel of the car, either the coil B or C is energized and that when one of such coils has been energized, the magnet A is energized and remains energized until the completion of the operative movement of the armature a and that the armature b is held to the right or the armature c to the left, according to the direction of the travel of the car, by the energizing respectively of the coils B^1 or C^1, and that such coils B^1 or C^1 remain energized until the opening of their energizing circuit through the contact a^1 by the movement to its extreme right hand position of the armature a. Thus it will be seen that the proper angular advance and in the proper direction of the drum G is provided for, regardless of the direction or the rate of travel of the car, or whether it stops with one or both or neither of the contacts u and u^1 in engagement with the contact U.

The connecting bar V is supported from the frame-work of the machine N by the links n^4, as seen in Fig. 5, and as seen in Figs. 1, 3 and 4, diagrammatically, the armatures b and c are held in neutral position by means of springs b^1 and c^1 respectively the direction of whose movement is toward the fixed stops b^2 and c^2 respectively, and by which their motion is limited in a way to normally maintain a neutral position of the armatures b and c.

The indicator band O carries the names of the stations, which may be visible through a proper opening therefor in any suitable casing, which may be provided for such parts of the indicator as it is desired to inclose in this way, and the angular advance given to the drum G for each complete movement of the armature a is just sufficient to advance the indicator band O by that amount sufficient to expose to view the next indication thereon.

When there is a large number of stations to be indicated, necessitating a great length of the band O, such band may be disposed to and fro and supported on rollers in the manner clearly indicated in Fig. 6. The drum G carries pins o^3 adapted to engage through suitable holes therefor o^4 in the edge of the indicator band O.

When the engaging members u and u^1 are carried by the trolley pole as indicated at u^2 and u^3 in Fig. 3 and the elements U are located as indicated at U^1 in Fig. 3, it sometimes occurs that upon the disengagement of the trolley wheel, carried by the pole T^1, from the trolley T, that before such trolley wheel is replaced the engaging members u or u^1, indicated at u^2 and u^3 in Fig. 3, may contact accidentally with the trolley wire T. This would result in an improper actuation of the station indicator. To obviate this difficulty, I make the following provision:—The energizing coil of the relay R is connected by wire 33 to the trolley circuit and by wires 34 and 8 to the ground connection 2 of the motor. The coil of such relay R is of high resistance and adapted to receive the full potential of the trolley circuit. When the coil R is energized, the armature r^5 is drawn thereby to close the pair of contacts r^6, the fixed one of which is connected by wire 35 to wire 5, while wire 36 connects the armature r^5 with the contact point of switch t. The result of this connection is, when the vehicle is electrically propelled from an overhead trolley circuit, that when the trolley wheel is disengaged from the trolley wire T, the retracting spring of armature r^5 operates to open the pair of contacts r^6 and under these conditions neither of the coils A, B, B^1, C, C^1, D or D^1 can be energized as the circuit thereof is broken at the pair of contacts r^6.

I desire to call especial attention to the following points, viz:—In my present invention it is wholly immaterial what source of electric energy is made use of for the purpose of energizing the several coils shown and mentioned herein. It is also equally immaterial whether such source be the same for all of such coils or whether each coil be energized from a separate source of electric energy, provided only, however, that some means is employed whereby the coil A may be retained in its energizing circuit, at least so far as the mechanism of my invention carried by the car is concerned, until the completion of each operative stroke to the right of the armature a, when such coil A is energized from a source of electric energy external to the car, it is desirable to provide means whereby upon the opening of such circuit at a point external to the car before the completion of the operative movement to the right of the armature a,—such, for instance, as the opening of the trolley circuit from any cause, whether by rupture or by the disengagement of the trolley, from which, in the illustration of my invention shown in the drawings, the coil A is energized,—only one complete and proper actuation of the drum G can occur as the result of any number of such openings of such circuit and re-establishment thereof, and this result may preferably be accomplished by making the

angular space between the teeth on the ratchet wheel S just equal to the angular advance to be given to the drum G by each proper and complete actuation or movement of the armature *a*. Contacts t^3 and t^4 for the switches t^1 and t^2, respectively, are connected as above stated to wire 29 whereby it will at once be seen that the coil B may be energized directly from the trolley circuit by closing the switch t^2 upon the contact t^4 and similarly coil C may be energized directly from the trolley circuit by closing the switch t^1 upon contact t^3, the circuit in such cases being clearly indicated as follows: To the coil B from wire 14 through wire 29, contact t^4, switch t^2, wire 3 to coil B the remainder of the circuit being as already described while for the coil C the circuit is from wire 14 through wire 29, contact t^3, switch t^1, wire 23 to coil C, the remainder of this circuit being as already described. It will thus be seen that the switches t^1 and t^2 may be operated to effect the same sequence of operations of the apparatus on the car as would result from the engagement of the contacts *u* and u^1 with a contact U whereby the indicator may be manually operated when desired, and it will be noted that the order of the operation of such switches predetermines, in the manner already described, the direction of movement of the band O.

From the foregoing it is believed, that the construction and operation of my station indicator mechanism is sufficiently clear to call for no further explanation.

What I claim is:—

1. In combination with a station indicator located on a car or vehicle and comprising a band or strip of suitable material bearing in proper order the names of the stations to be indicated; electro-magnetically controlled mechanism for advancing said band or strip the space of one indication thereon at a time in either direction; a source of electric energy; a series of elements arranged along and adjacent to the pathway of the car, one such element located at each point where it is desired to change the indication of the indicator; engaging means carried by the car comprising two separate members one in advance of the other adapted to engage said elements and connections between said members and said electromagnetically controlled mechanism whereby as said members engage each one of said elements in going in either direction, said electromagnetically controlled mechanism is actuated to advance said band or strip the space of one and only one indication thereon in a direction automatically determined by the direction of the travel of such engaging means relative to the elements engaged thereby and independently of the stopping of the car at any point in its course.

2. In combination with a station indicator located on a car or vehicle, a series of elements arranged along and adjacent to the pathway of the car, one such element located at each point where it is desired to change the indication of the indicator; two engaging members carried by the car adapted to engage, one in advance of the other, with said elements and means whereby as said members engage each one of said elements in going in either direction said indicator is actuated to give the next indication in a direction determined by the order of an engagement of such engaging members with such elements.

3. In combination with a station indicator located on a car or vehicle and comprising a band or strip of suitable material bearing in proper order the names of the stations to be indicated; electromagnetically controlled mechanism for advancing said band or strip the space of one indication thereon at a time in either direction; a source of electric energy; a supply conductor connected to the source of electric energy and arranged adjacent to the pathway of the car; a series of elements electrically connected with the supply conductor and arranged along and adjacent thereto, one such element located at each point where it is desired to change the indication of the indicator; an electric motor on the car and an arm for connecting the motor to the supply conductor; engaging means carried by the car but insulated from the arm and adapted to engage said elements and connections between said engaging means and said electromagnetically controlled mechanism whereby as the car passes each one of said elements in going in either direction, said electromagnetically controlled mechanism is actuated to advance said band or strip the space of one and only one indication thereon; in a direction automatically determined by the direction of the travel of such engaging means relative to the elements engaged thereby.

HOWARD M. VAN DEMARK.

Witnesses:
LOTTIE WOOD,
OSBORNE F. GURNEY.