

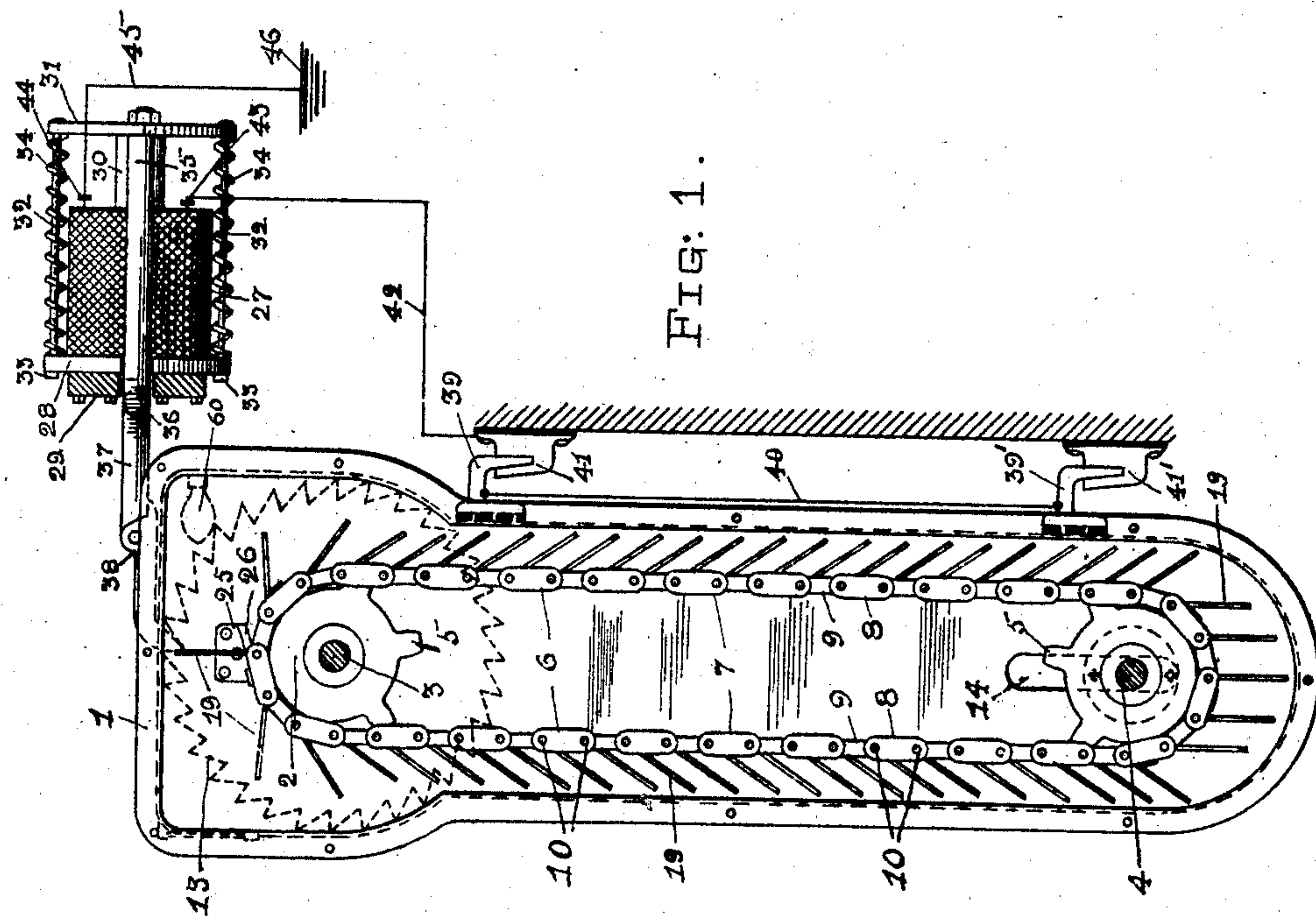
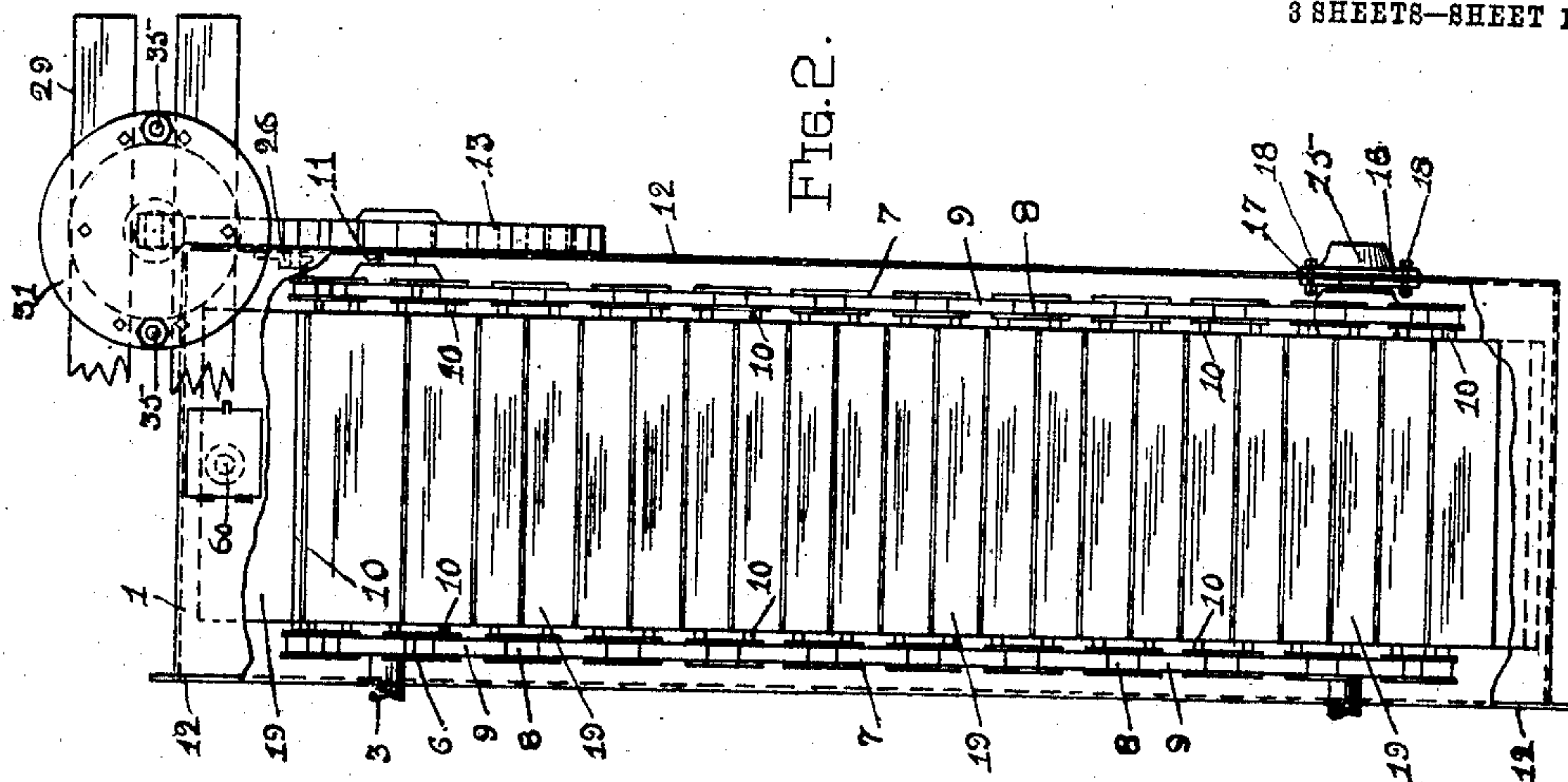
No. 859,498.

PATENTED JULY 9, 1907.

I. E. HOOVER.
STREET ANNUNCIATOR FOR ELECTRIC CARS.

APPLICATION FILED APR. 14, 1906.

3 SHEETS—SHEET 1.



WITNESSES.

Grace Condrick
Chas. A. Boase

INVENTOR.

Ira E. Hoover
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No. 859,498.

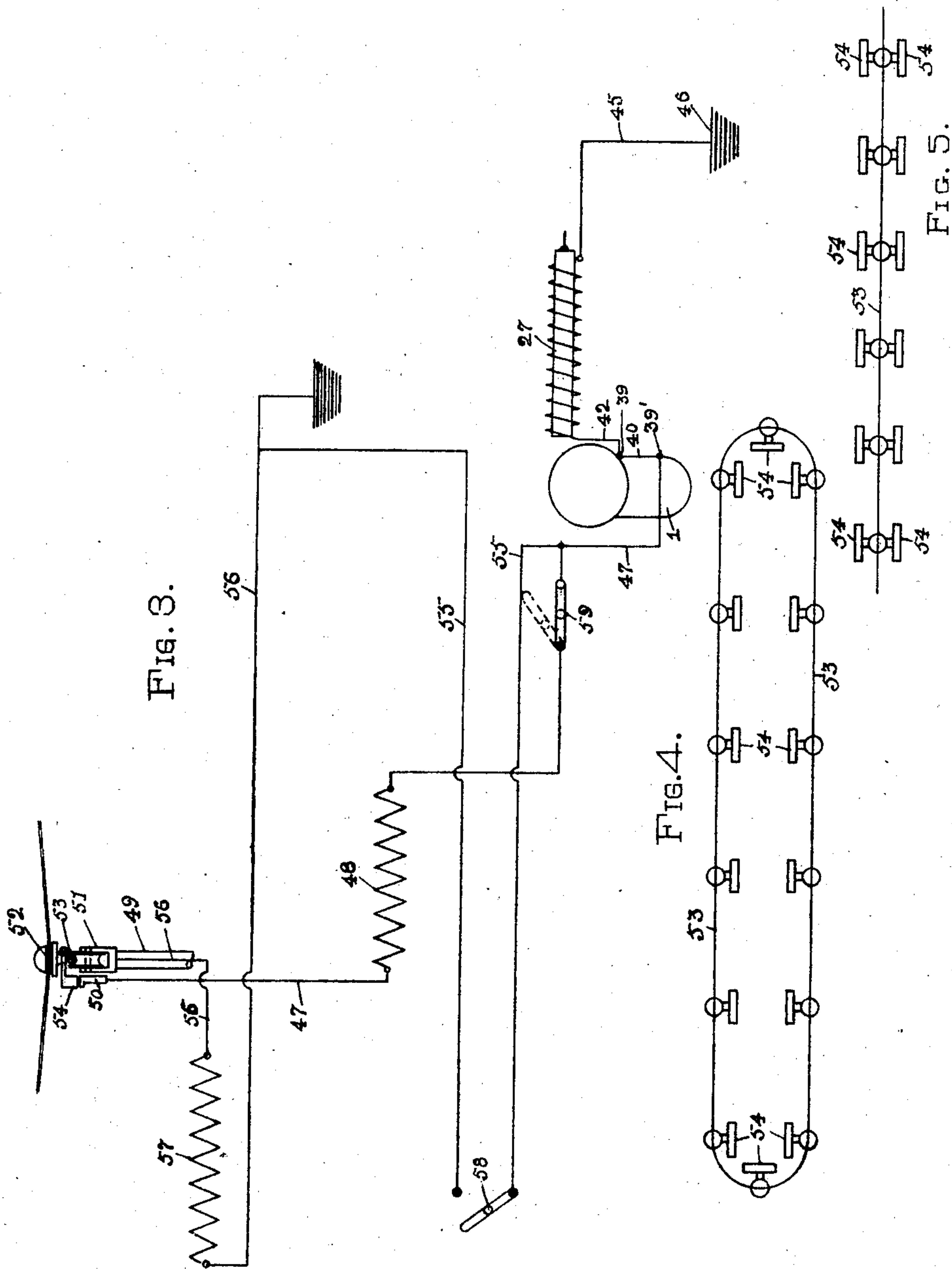
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3 SHEETS—SHEET 2.



WITNESSES.

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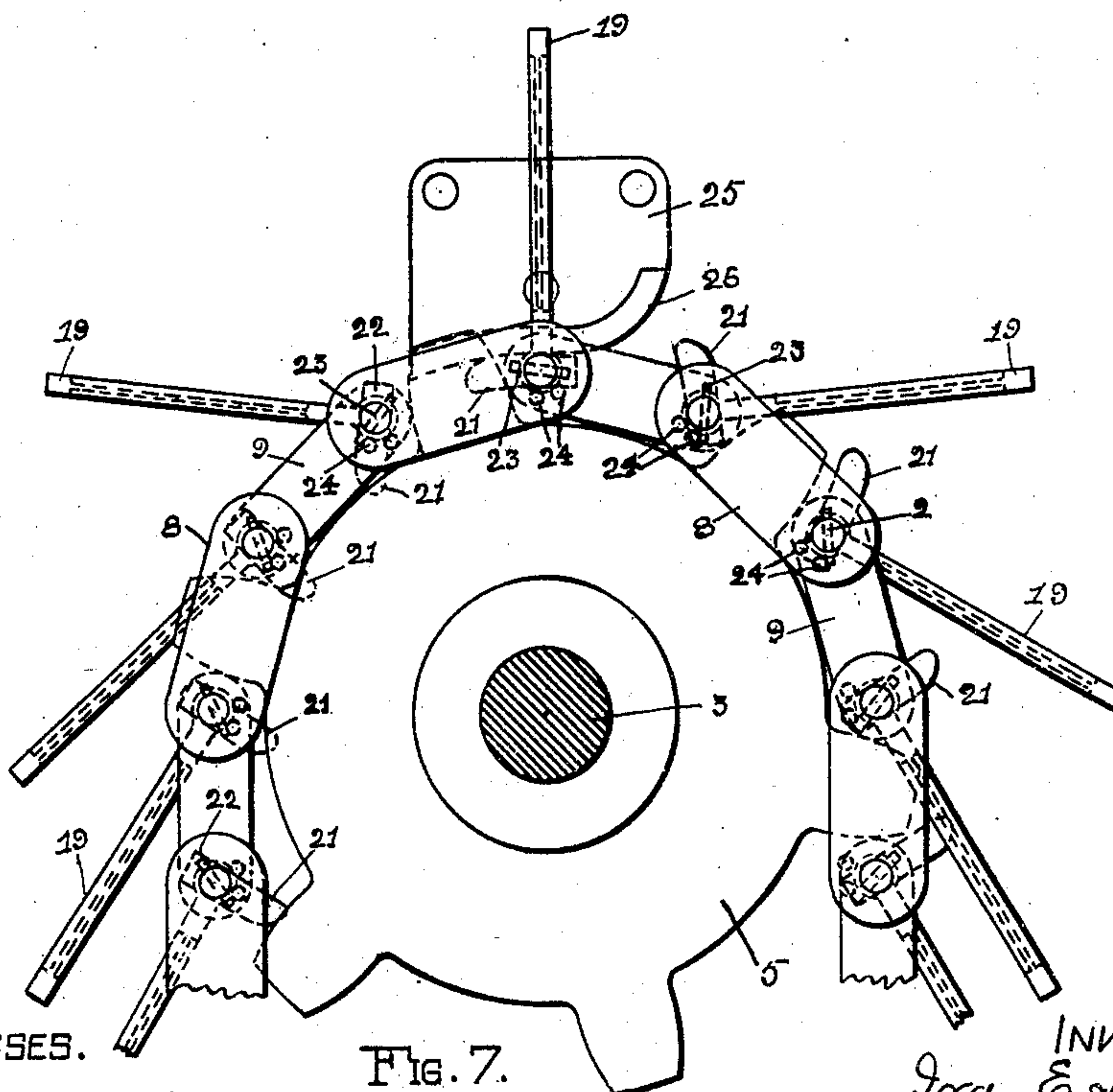
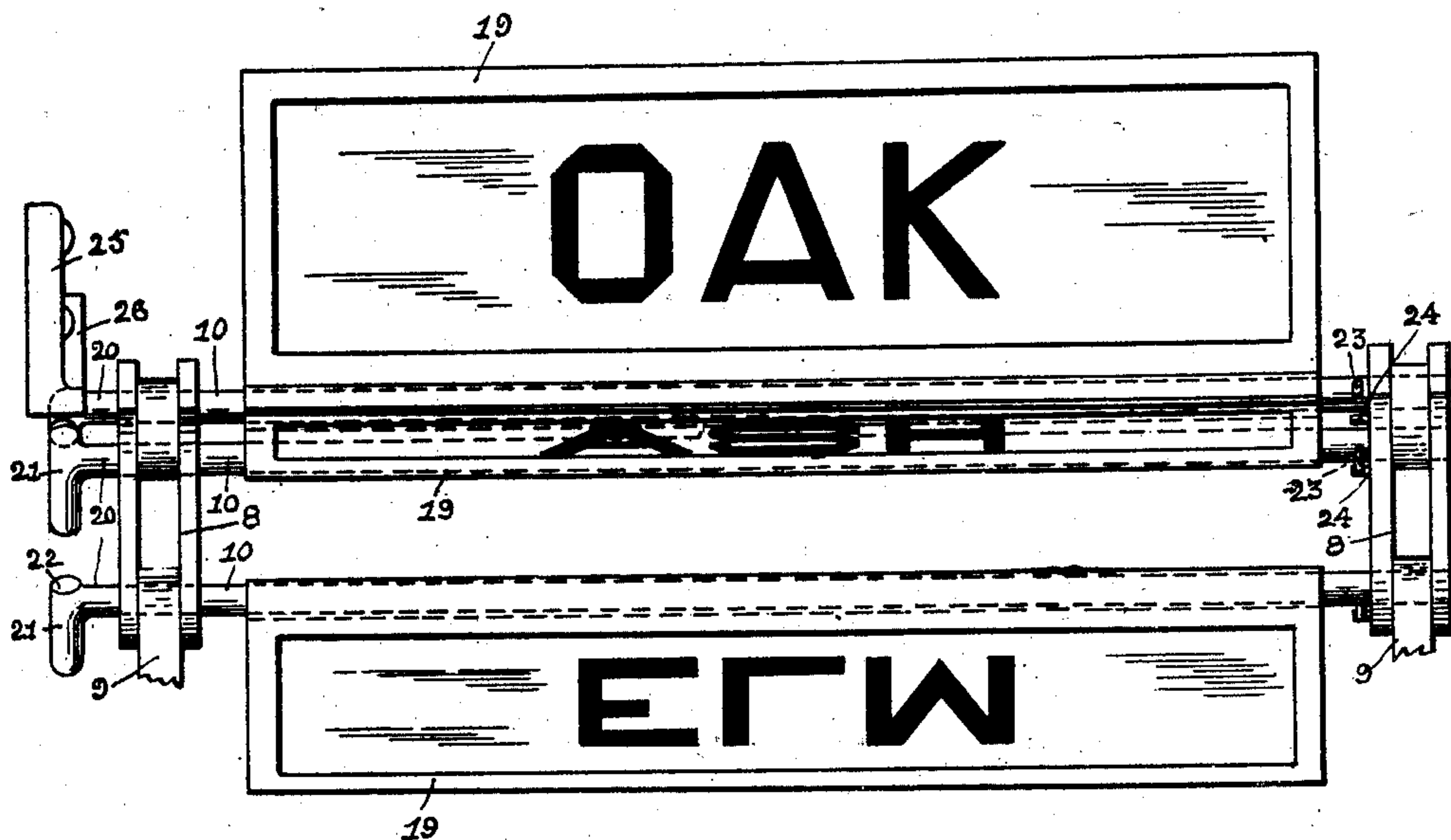
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Fig. 6.

3 SHEETS—SHEET 3.



WITNESSES.

Grace Cowditch
Charles Boake

FIG. 7.

INVENTOR.

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UNITED STATES PATENT OFFICE.

IRA E. HOOVER, OF TOLEDO, OHIO, ASSIGNOR OF ONE-HALF TO WILLARD M. GEORGE, OF TOLEDO, OHIO.

STREET-ANNUNCIATOR FOR ELECTRIC CARS.

No. 859,498.

Specification of Letters Patent.

Patented July 9, 1907.

Application filed April 14, 1906. Serial No. 311,626.

To all whom it may concern:

Be it known that I, IRA E. HOOVER, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented a certain new and useful Improvement in Street-Annunciators for Electric Cars, of which the following is a specification.

My invention relates to a street annunciator system for electric cars, and has for its object to equip an electric railway line and its cars with a system of the kind that is adapted, after each car of the line has arrived at a street or station to automatically display the name or number of the next succeeding street or station where it may be seen and read by the passengers on the car, until said street or station is reached. I accomplish these objects by the electro-mechanical equipment of the cars and the line of an electric railway, as hereinafter described, claimed, and illustrated in the drawings, in which

Figure 1 is a side elevation of the annunciator with one side of the casing removed. Fig. 2 is a rear elevation of the same with the rear portion and the side of the casing broken through. Fig. 3 is a diagrammatic illustration of the electrical connection of the annunciator. Fig. 4 is a diagrammatic view of the line of a belt railway equipped with contacts at the crossings or stations. Fig. 5 is a similar view of a single line between terminals. Fig. 6 is an enlarged front view of the upper portion of the annunciator conveyer, and Fig. 7 is an end view of the same.

In the drawings 1 represents the oblong casing of the annunciator which is constructed of any suitable material, and of suitable dimensions to receive the conveyer 2 of the annunciator which comprises the upper shaft 3, and the lower shaft 4, each provided with a pair of sprocket wheels 5, upon which is mounted the conveyer belt 6 which is formed of the sprocket chains 7, the open sprocket links 8 of which are pivotally connected to the intermediate connecting link 9 by the common pivot rods 10, cross connecting the two chains.

The upper shaft 3 is journaled horizontal in suitable bearings 11 in the detachable sides 12 of the casing, at a suitable distance from and near the top of the casing, and upon an end portion of the shaft extended beyond one bearing is fixedly mounted a ratchet wheel 13 of suitably greater diameter than the sprocket wheels 5. The lower end portions of the sides 12 of the casing are provided with the slots 14, in vertical alinement with the upper bearings 11, and in the slots are adjustably mounted the bearings 15 in which are journaled the end portions of the lower shaft 4. The bearings 15 are formed of an outer disk 16, and an inner disk 17, which are clamped together on the sides 12, by the screws 18 extending through the slots 14. The bearings 15 thus mounted are adapted to adjust

the tension of the sprocket chains of the conveyer. They are also adapted to permit the addition or removal of links whereby the number of pivot rods 10 in the belt corresponds with the number of street crossings or stations on the line in a round trip.

On each pivot rod 10 is fixedly mounted by one side a rectangular frame 19 which extends from chain to chain and is of suitable width and otherwise adapted to receive a plate,—preferably semi-transparent,—on which is painted the name of a street or station.

Each pivot rod 10 is provided at one end with an end extension 20, upon which is fixedly mounted at right angles to the pivot rod and to the plane of its frame the cam dog 21, which has a heel portion 22, extending oppositely from the main body portion, and a less distance from the rod, and at the opposite end portion of the rod adjacent to the outer face of the open sprocket link 3, each pivot rod is provided with a diametric pin 23, the projecting end portions of which are adapted to engage stop pins 24 which project from the inner face of the sprocket link 8 adjacent to the pivot rod, and so located as to limit the movement of the frames to an arc less than an entire circle, and these stop pins are so located that when the links are in vertical position tangential to the sprocket wheels the frames will assume by gravity, on opposite vertical portions of the conveyer belt, equal downwardly diverging angles relative thereto. The face of each dog 21 that is nearest the frame of its pivot rod is rounded by a curve at the end towards the opposite face, and above the adjacent sprocket wheel of the shaft 3, there is secured to the casing a bracket 25 which is provided with a cam flange 26 which extends in the path of travel of the outer end portions of the dogs as they pass over the sprocket wheels, in such position that the rounded faces of the dogs will come into engagement therewith, and cause the depression of the dogs, thereby causing the frame of the pivot rods to which the dogs are attached to quickly move through an arc of 90 or more degrees to a vertical position, in which position the heel 22 of the dog will also be brought into engagement with the cam 26 and thereby prevent the frame, by its momentum and gravity, from completing its full arc movement between the stops 24 while the dogs are in engagement with the cam 26.

To operate the conveyer belt, there is provided a solenoid 27 which is provided at one end with a disk 28, by which it is secured to a suitable support 29, with its core 30 in line tangential to the top of the ratchet wheel 13, and to the outer end of the core is secured a disk 31, to which are secured at diametric points the guide rods 32 which extend parallel on opposite sides of the winding through suitable orifices in the disk 28, and are provided at their outer end portion with the stop collars 33. Between the disks 28 and 31, there is

mounted on the guide rods 32 the helical springs 34, which are adapted to normally hold the core partially withdrawn from the cylindrical winding of the solenoid. The disk 28 also has secured thereto, in a plane at right angles to the plane of the guide rods and parallel therewith on opposite sides of the winding, the ends of the arms 35 of a yoke 36, which is provided with a stem 37 that is alined with the core 30, and has pivoted to its free end the ratchet pawl 38. The pawl 38 is adapted to engage a tooth of the ratchet wheel by gravity, and when the core is drawn into the winding, to move the ratchet wheel a definite number of degrees of its complete revolution sufficient to move the frame 19 which is uppermost in vertical alinement with the shafts 3 and 4, forward until its dog 21 is disengaged from the cam 26, and to bring the next succeeding frame into the position from which the preceding frame has been moved, each magnetic movement of the core being adapted to move the frame occupying such central vertical position forward until the dog of its pivot rod is released from the cam, and the frame drops by gravity through the arc of its pivotal movement to engagement with the stop pin, which forms the limit of its pivotal movement in that direction, and to move the next succeeding frame forward and upward until the dog of its pivot rod engages the cam 26, and is depressed thereby to pivotally raise the next succeeding frame through half the arc of its pivotal movement into the vertical position vacated by the preceding frame. As soon as the core 30 is demagnetized, the springs 34 return the core to its normal position thereby shifting the pawl 38, which automatically rises over the teeth as it passes rearward, until at the limit of its rearward movement it drops again into engagement with a tooth of the ratchet wheel, in position to repeat the operation.

In the top portion of the front side of the casing, opposite the frame that is vertically disposed while the frame conveyer is standing still, is an opening equal to or greater than the plate of the frame, through which opening the plate is plainly visible when in such vertical position.

To the back of the casing are secured the contact hooks 39 and 39', which are insulated from the casing and connected by the conductor 40. The hooks 39 and 39' are adapted to fit into complementary incuts in the contact hook supports 41 and 41' respectively, which are suitably secured to and insulated from the wall of the car. The hook 41 forms a contact with the hook 37 for the transmission of current from the hook 39 and is connected by a conductor 42 with one terminal 43 of the solenoid winding, and the opposite terminal 44 of the winding is connected by the conductor 45 to the ground 46. From the hook 39' there extends an insulated conductor 47, which has connected therein a suitable resistance 48. The conductor 47 extends along or through the trolley pole 49 of the car and is connected to a suitable insulated contact 50 attached to one side of the trolley head 51.

To operate the solenoid, one of the supports 52 of the trolley wire 53 at each street crossing or station is provided with a suitable contact 54, which is in position to make contact with the contact 50 of the trolley head in passing, whereby a current is momentarily transmitted from the trolley wire through the conduc-

tor 47, the hook 39', the conductor 40, the hooks 39 and 41, and the conductor 42, to the winding of the solenoid and thence through the winding and the conductor 45 to the ground 46. The current thus transmitted through the solenoid winding actuates the core to move the ratchet pawl, thereby shifting the uppermost frame 19 forward out of view, and replacing it with the next succeeding frame in the manner described. The trolley wire of an electric railway line being thus equipped with a contact 54 at each street crossing or station, the plates designating the names or numbers of the stations or streets are arranged in the frames of the conveyer in the order of their succession in the direction in which the car travels.

If the railway is a belt line, the name plates are arranged in the order of succession of the cross streets or stations in the direction of the travel of the car, the contacts 54 being arranged all on the same side of the trolley wire, as shown in Fig. 4. If, however, the cars run between two terminals, two contacts for each street crossing or station, one on each side of the trolley wire are provided as shown in Fig. 5. One series of the contacts is adapted to be engaged by contact 50 of the trolley head in passing in one direction, and the other series is adapted to be engaged thereby when the car is running in the opposite direction, the conveyer being provided with a series of name plates, the first half of the series having printed thereon the names or designations of the streets in their order of succession on the outgoing trip, and the last half of the series the same names arranged in reverse order to that of the outgoing.

The trolley wire of an electric railway line being equipped with contacts, and each car of the line being equipped with an annunciator constructed and connected as described, having the name plates arranged in suitable order in the frames, will automatically raise into view at each street crossing or station the name or number of the next succeeding street or station which the car will pass, and the annunciator will keep the name or number of such street or station in full view of the passengers in the car until it has been reached, and engagement has been made by the trolley with the contact at each crossing or station.

In order to make the system operative by the conductor of the car independent of the contacts 50, I connect to the wire 46 a shunt wire 55 which is connected to the motor wire 56 of the trolley, and is provided with a suitable resistance 57, and with a make and break switch 58,—preferably of the push button variety,—which is held normally open by a spring, but, which being momentarily closed and then released will operate the solenoid in the same manner as if the trolley contact 50 had engaged a contact 54 of the trolley wire. Thus connected with the motor conductor, it is obvious that the conductor of the car, in the event of any line contact 54 having been missed by the trolley contact, may readily operate the solenoid to display the name of the next street. Or he may if necessary to adjust the plates to their respective crossings or stations, operate the make and break switch 58 until the plate for the next crossing or station is displayed, after which the contacts 54 will automatically change the plates in their right order. Preferably also the wire 47 is provided with a switch 59, whereby

the conductor of the car may break the circuit to the annunciator, the switch 59 being opened to break the circuit whenever it is necessary to run the car back past one or more contacts 54, which would otherwise disarrange the name plates with reference to their crossings or stations.

In the top portion of the casing 1, attached to the rear plate, is an incandescent light bulb 60, which is suitably connected in the lamp circuit of the car, so that when the lights of the car are turned on, the light of the bulb 60 will illuminate the semi-transparent plates and render the name or number of the cross street or station displayed as distinct by night as by day.

Preferably the casing 1 is made detachable from the car, in order that if a car is transferred from one line to another, an annunciator having plates suited and arranged for the latter may be substituted.

What I claim to be new is

1. In a street or station annunciator for electric cars, the combination with an electrically driven car, of a casing having a view opening, a conveyer within the casing, comprising upper and lower shafts journaled parallel in opposite sides of the casing, sprocket wheels mounted on the shafts in alinement at opposite end portions of the shafts within the casing, sprocket chains connecting the upper with the lower sprocket wheels, pivot rods connecting and pivoting opposite links of opposite chains, name plates mounted on the pivot rods, each by one side, and extending outward therefrom, a ratchet wheel mounted on one of the shafts, a push rod movable tangential to the ratchet wheel, a pawl pivoted to the push rod and adapted to engage the ratchet wheel and move it one step of a complete revolution, a solenoid adapted to move the push rod by its core in the direction to engage and turn the ratchet wheel through one step of its revolution, means to yieldingly hold the core of the solenoid withdrawn from its winding and to automatically return it to its normally withdrawn position when demagnetized, a dog for each pivot rod, a cam interposed in the path of the dogs, and adapted to be successively engaged by the dogs as they pass the cam, and successively rotate the rods and their frames through an arc that will bring the frames successively in position opposite the view opening, a series of name plates in the frames arranged in the order of succession of street crossings or stations of the line over which the car travels, and means to transmit an electric current through the winding of the solenoid between adjacent crossings or stations, substantially as set forth.

proaches the opening and bring its name plate in front of the opening during one step of the revolution of the conveyer, and to retain it in such position until the beginning of the next step, and means to successively transmit an electric current through the winding of the solenoid substantially as set forth.

2. In a street or station annunciator for electric cars, the combination of a casing having a view opening, upper and lower shafts journaled parallel in opposite sides of the casing, sprocket wheels mounted on the shafts in alinement at opposite end, portions of the shafts within the casing, sprocket chains connecting the upper with the lower sprocket wheels, pivot rods connecting and pivoting opposite links of opposite chains, frames mounted on the pivot rods, each by one side, and extending outward therefrom, a ratchet wheel mounted on one of the shafts, a push rod movable tangential to the ratchet wheel, a pawl pivoted to the push rod and adapted to engage the ratchet wheel and move it one step of a complete revolution, a solenoid adapted to move the push rod by its core in the direction to engage and turn the ratchet wheel through one step of its revolution, means to yieldingly hold the core of the solenoid withdrawn from its winding and to automatically return it to its normally withdrawn position when demagnetized, a dog for each pivot rod, a cam interposed in the path of the dogs, and adapted to be successively engaged by the dogs as they pass the cam, and successively rotate the rods and their frames through an arc that will bring the frames successively in position opposite the view opening, a series of name plates in the frames arranged in the order of succession of street crossings or stations of the line over which the car travels, and means to transmit an electric current through the winding of the solenoid between adjacent crossings or stations, substantially as set forth.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses, this 7th day of April, 1906.

IRA E. HOOVER.

In presence of—
ROY R. STUART,
W. C. HOOVER.