

No. 844,526.

PATENTED FEB. 19, 1907.

C. N. LIBEY,
MAIL CARRYING APPARATUS.

APPLICATION FILED JULY 24, 1906.

2 SHEETS—SHEET 1.

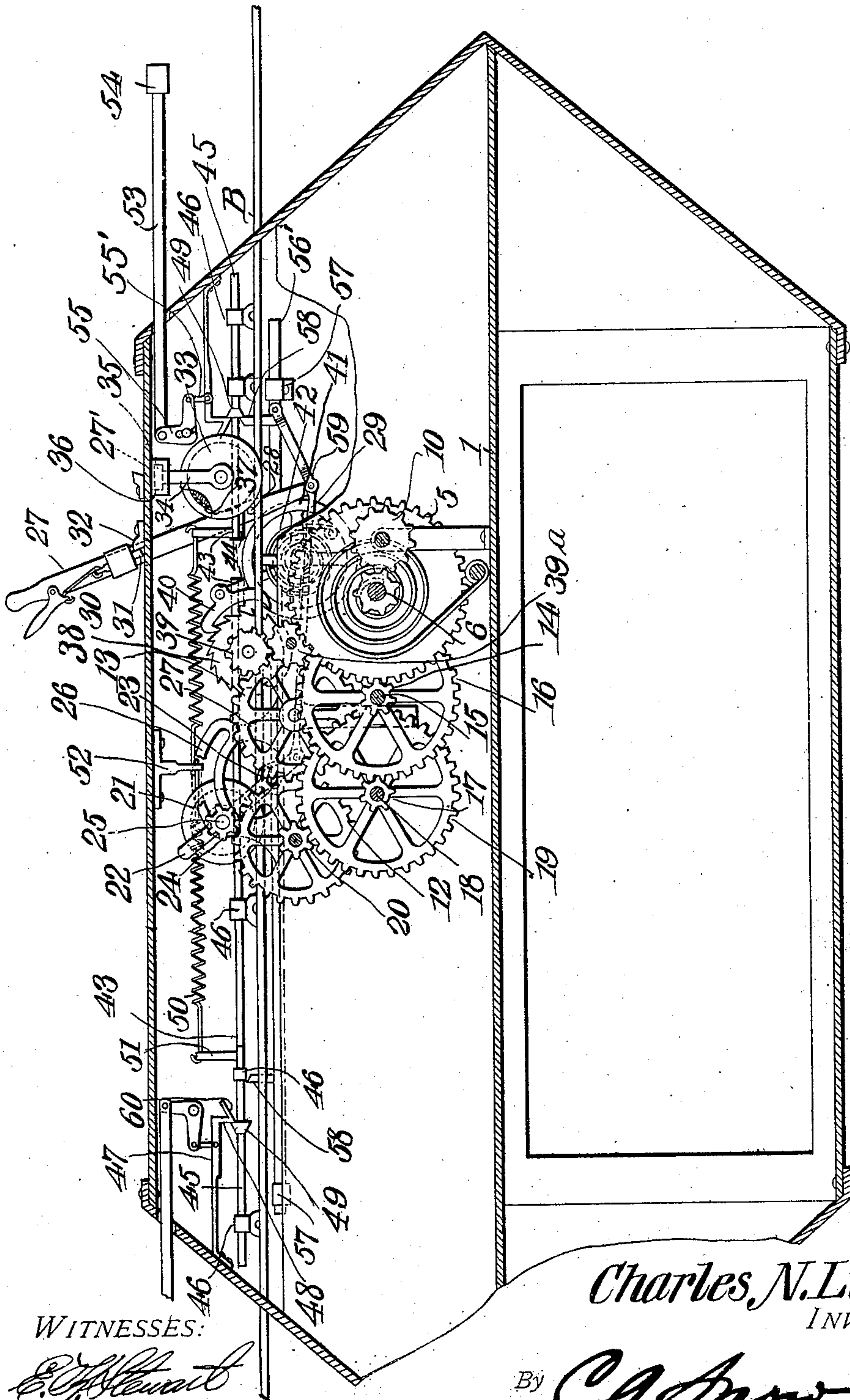


Fig. 1.

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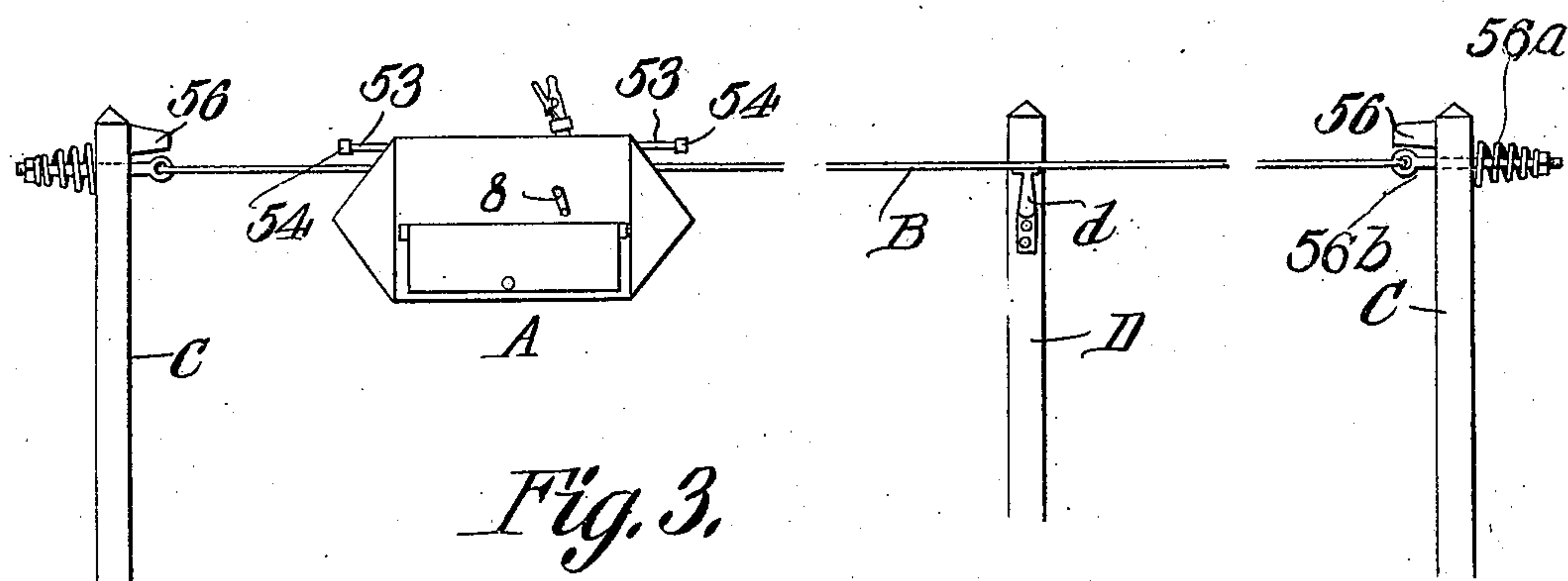
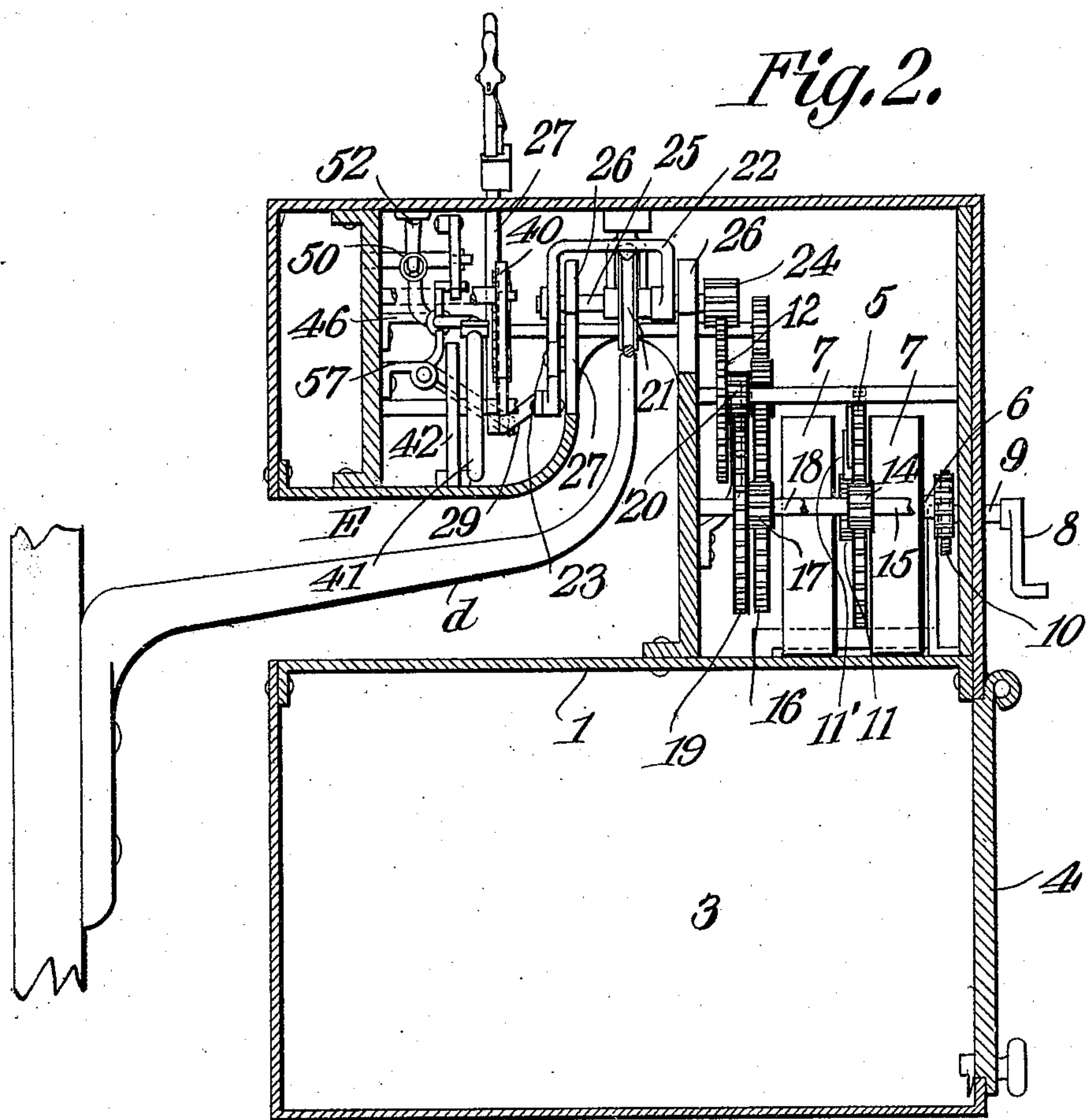
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WITNESSES:

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CHARLES N. LIBEY, OF LIMA, INDIANA.

MAIL-CARRYING APPARATUS.

No. 844,526.

Specification of Letters Patent.

Patented Feb. 19, 1907.

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To all whom it may concern:

Be it known that I, CHARLES N. LIBEY, a citizen of the United States, residing at Lima, in the county of Lagrange and State of Indiana, have invented a new and useful Mail-Carrying Apparatus, of which the following is a specification.

This invention relates to mail or parcel carrying systems; and it relates more particularly to a self-propelled mail or parcel box or car designed more particularly for use in rural-free-delivery systems, in which the box is adapted to travel back and forth on an aerial line between a road traveled by the mail-carrier and a residence or farm-house more or less remote therefrom.

One of the objects of the invention is to improve and simplify the construction of this class of devices and render them more reliable.

A further object of the invention is to provide a self-propelled mail box or car adapted to travel over a single wire or line suitably suspended between the road and residence, the box or car being capable of traveling on an upgrade as well as a downgrade.

Another object of the invention is the employment of a mechanism for automatically arresting the motion of the car and stopping the propelling mechanism.

A still further object of the invention is the provision of a simple means for starting the motor and reversing the driving connections between the same and the driving-wheel of the car.

With these objects in view and others as will appear as the nature of the invention is better understood the invention comprises the various novel features of construction and arrangement of parts which will be hereinafter more fully described, and set forth with particularity in the claims appended hereto.

In the accompanying drawings, which illustrate one of the embodiments of the invention, Figure 1 is a longitudinal section of the car, showing the motor and controlling mechanism therefor. Fig. 2 is a transverse section of the car, one of the line-supporting brackets of an intermediate post being shown. Fig. 3 is a side elevation of the self-propelled mail box or car shown in its operative position on an aerial line or wire, intermediate portions of the latter being broken away and the two terminal and one of the intermediate posts being shown.

Corresponding parts in the several figures are indicated by similar characters of reference.

Referring to the drawings, A designates the mail box or car, which may be of any suitable shape, preferably pointed at its ends, so as to reduce the resistance of the air, and is constructed of metal, so as to form a weatherproof structure. The car is suspended on an aerial line or wire B, that is attached at its ends on the terminal posts C. In some cases where the distance between the terminal posts is such as to necessitate some intermediate support or supports for the line one or more posts D are employed, the same supporting the line by means of an outwardly and upwardly turned arm *d*. When intermediate supporting-posts are employed using the above method of line suspension, the box or car A is made with an open portion E, extending inwardly from one side to about the center, said open portion or passage extending the full length of the car, so as to permit the line to pass through the latter and also to permit the supporting-arms *d* to pass.

The body of the car may be and preferably is divided into separate compartments, as by means of a wall 1, forming an upper compartment 2 for the propelling-motor mechanism and the controlling devices therefor and a lower compartment 3, comprising a receptacle for receiving the mail-matter or other parcels; a hinged door 4 being provided in one of the side walls of the compartment 3 for permitting the mail-matter to be placed therein and removed. If desired, a door may be provided for the upper compartment to permit access to the motor and its controlling mechanism for the purpose of inspection, repair, or renewal of any of the parts.

The propelling-motor is preferably of the clockwork type, comprising a main driving gear-wheel 5, mounted on a shaft 6 and driven by two coil-springs 7, connected at their inner ends to the shaft, two springs being employed, so as to insure safety and prevent the car from being disabled should one of the springs be broken. The springs 7 are wound by means of a crank 8, located outside of the body of the car, the shaft 9 thereof being connected to the shaft 6, to which the inner ends of the springs are attached by means of a speed-multiplying gearing 10, which latter facilitates the winding of the springs. Between the shaft 6 and the gear-

wheel 5 is a ratchet mechanism comprising a ratchet-wheel 11, keyed on the shaft 6, and a pawl 11' on the wheel 5, so arranged as to permit the springs to be wound without having to actuate the entire train of gears of the motor and to permit the springs as they unwind to actuate the motor, as will be readily understood. The driving gear-wheel 5 imparts motion to two companion gear-wheels 12 and 13, which are arranged to mesh, a train of speed-multiplying gears being employed between the driving gear-wheel 5 and the gear 12. This train of gears comprises a pinion 14, meshing with the gear-wheel 5 and rigidly connected on the shaft 15 of the gear-wheel 16, which latter meshes with the pinion 17 on the shaft 18, that rotates the gear-wheel 19, meshing with a pinion 20, driving the gear 12. The gear-wheels 12 and 13 rotate in opposite directions and are arranged and adapted to drive the propelling-wheel 21 of the car in either a forward or reverse direction, a suitable reversing mechanism being employed for throwing the propelling-wheel into mesh with either one of the gears 12 and 13. For this purpose the propelling-wheel, which is peripherally grooved to engage over the wire or line B, is mounted on an arm 22, that tilts about a fulcrum 23, located in a line extending centrally between the wheels 12 and 13, so that by tilting the arm 22 the pinion 24, connected with the propelling-wheel, can be thrown into mesh with either one of the gear-wheels. The propelling-wheel 21 is mounted on a shaft 25, whose ends are guided in arc-shaped ways 26 in the vertical extensions or frames 27. When the pinion 24 of the propelling-wheel is in mesh with the gear-wheel 12, the members of the motor are rotated in such a manner as to drive the propelling-wheel in an anticlockwise direction and propelling the car to the left. When the arm 22 is shifted, so that the pinion 24 meshes with the gear-wheel 13, the driving-wheel will be rotated in a clockwise direction, so that the car is moved to the right. The arm 22 is shifted by means of the operating-lever 27, that is fulcrumed at 28 and extends through a slot 27' in the top of the body of the car. The lower end of the operating-lever is connected with the lower end of the arm 22 by a pitman 29.

In order to hold the pinion 24 in mesh with either of the gears 12 and 13, a latch mechanism 30 is provided on the projecting end of the operating-lever, the dog 31 of the mechanism being adapted to interlock with either one of the projections 32 on the top of the car. When the operating-lever 27 is thrown to the left, the driving connection between the motor and propelling-wheel is such as to cause the car to move to the left, and vice versa when the operating-lever is thrown to the right.

In the construction shown a single propelling-wheel is employed. This wheel, besides propelling the car, serves also to suspend the same on the line B. In order, however, to better guide the movement of the car, a grooved guide-wheel 33 is arranged adjacent to one end of the same and journaled on the yoke 34, that is suspended from the top of the car-body by a head 35, that is rotatably mounted in the bearing 36. This permits the guide-wheel 33 to swivel, so that the car can readily travel around a curve in the line, if such is necessary. The wheels are preferably shod with a tire of rubber, (indicated at 37,) so as to increase the tractive effect.

In order to arrest the motion of the car at the terminals of the line, an automatic brake mechanism is employed, which, according to one of the embodiments, includes a balance-wheel and escapement mechanism for controlling the movement of the clock-works or motor and brake-shoes arranged to be actuated when the car reaches either terminal of the line and engage the balance-wheel, and thereby stop the escapement, so as to bring the motor to rest. The escapement-wheel 38 is suitably mounted and provided with a pinion 39, meshing, by means of a second pinion 39^a, with one of the gear-wheels of the motor, preferably the wheel 16, and cooperating with the escapement-wheel 38 is a pallet 40, whose movement is controlled by a balance-wheel 41, having a hair-spring 42. Arranged in such a relation as to engage the periphery of the balance-wheel are two independently-actuated brake-shoes 43. These shoes are faced with pieces of felt 44 or equivalent material, so as to frictionally engage the periphery of the balance-wheel and bring the latter to rest. When the balance-wheel is stopped, it is obvious that the escapement is prevented from operating, so that the train of gears of the motor mechanism will be brought to rest, and thereby the car stopped. The shoes are arranged on the inner ends of rods 45, horizontally movable in bearings 46. The brake-carrying rods 45 are normally held with the brake-shoes out of engagement with the balance-wheel by means of spring-latches 47, having depending noses or beveled projections 48, that are adapted to interlock with the wedge-shaped projections or stops 49 on the brake-carrying rods. Each brake-carrying rod is provided with an extension-spring 50, which at one end is connected with a post 51 on the brake-carrying rod and at the other end to a depending stationary post 52 on the top of the car-body. This post 52 is located centrally between the brake-springs 50 and serves as a common anchor for both. When the noses 48 of the spring-latches 47 engage with the projections 49 of the brake-carrying rods, the springs are under tension, so that when the spring-latches 47 are re-

leased the brake-carrying rod will be moved inwardly by virtue of its spring, so as to cause the brake-shoe thereof to frictionally engage the balance-wheel. When this occurs, the motor mechanism is stopped and the car is brought to rest.

The spring-latches 47 are released by means of buffer devices at each end of the car. These each comprise a horizontally-extending rod 53, extending outwardly from the car-body through its conical end wall, which rod is provided at its outer end with a head 54 and is connected at its inner end with a bell-crank lever 55, that connects, by means of a link 55', with the spring-latch 47 and raises the latter when the rod 53 is pushed inwardly. The heads 54 of the push-rods 53 are adapted to strike the abutments 56, arranged on the terminal posts above the line B in the path of the heads 54. By this means the propelling force of the car causes either of the heads 54 of the push-rod 53 to forcibly strike one of the abutments 56, so that the spring-latch 47, controlled by the push-rod 53, is released from the projection 49 on the brake-carrying rod. The brake-carrying rod being thus free to act moves so that the brake-shoe carried thereby engages the balance-wheel and stops the motor. The spring-latches 47 are so arranged as to normally hold the push-rods 53 in their extended position. The line B is kept taut during expansion by the springs 56^a on the bolts 56^b, by which the ends of the line are attached to the terminal posts.

The brake-carrying rods are set by the lever 27, so that one operation will suffice for reversing the driving connection between the motor and the propelling-wheel and for disconnecting the brake mechanism from the balance-wheel. For this purpose a horizontal shipper-rod 56', movably mounted in bearings 57, is employed, the same having transversely-extending projections or posts 58, arranged to engage the wedge-shaped stops 49 on the brake-carrying rod. These posts 58 are spaced apart between the stops 49 of the shoe-carrying rods a distance slightly less than the distance between the two stops, so as to permit the shoe-carrying rods to move without the posts interfering. The operating-lever 27 is connected with the shipper-rod 56' by the pitman or link 59. The position of the shipper in Fig. 2 indicates that the operating-lever 47 has been shifted to the left in order to move the right-hand brake-carrying rod to the right, the right-hand post 58 of the rod being in engagement with the stop 49 of the adjacent shoe-carrying rod. The left-hand post 48 is sufficiently removed from the adjacent stop 49 to permit the left-hand brake-carrying rod to shift to the right as soon as the left-hand buffer device is actuated. After this occurs and it is desired to return the car the operating-lever

is shifted to the right, thereby throwing the pinion 24 into mesh with the gear-wheel 13 and simultaneously shifting the shipper-rod 56' to the left, so that the left-hand post thereof will force the left-hand shoe-carrying rod into its set position. It will be noted that the stops 49 are so shaped as to easily ride under the incline or bevel 60 of the spring-latch 47, and thereby move the free end of the latch upwardly, so that the noses 48 thereof can snap back of the stop 49 and lock the shoe-carrying rod into set position.

From the foregoing description, taken in connection with the accompanying drawings, the various advantages of the construction and method of operation will be readily appreciated. In operation the springs of the motor are wound or placed under tension by the crank 8 and then by merely shifting the operating-lever from one position to the other the motor is simultaneously started and the car propelled. When the device is sent from the house, the car will automatically stop when it reaches the opposite terminal of the line to await the arrival of the postman. After the postman deposits the mail in the compartment 3 the operating-lever is shifted to a position opposite to that which it occupies when reaching the road terminal of the line. By so doing the car is started back to the residence and, as before, comes to rest when the terminal is reached.

I have described the principle of operation of the invention, together with the apparatus which I now consider to be the best embodiment thereof; but I desire to have it understood that the apparatus shown is merely illustrative and that various changes may be made when desired as are within the scope of the invention.

What is claimed is—

1. In a device of the character described, the combination of a propelling-motor, a brake mechanism therefor, a propelling-wheel, means between the motor and wheel for driving the latter in either direction, and a common device for controlling said means and brake mechanism.

2. In a device of the class described, the combination of a car, a motor mounted therein, a driving-wheel, a reversible driving connection between the motor and wheel, a brake mechanism in the car for automatically stopping the motor, and a single means for releasing the brake mechanism and reversing the driving connection.

3. In a device of the class described, the combination of a car, a line on which the car travels, a single driving-wheel on the line for propelling the car, a motor on the car for driving the wheel, a brake for the motor, and means for automatically setting the brake.

4. In a device of the class described, the combination of a car, a line on which the car is movably suspended, a single driving-wheel

arranged to run over the line for propelling the car, a motor in the car, a reversing-gear between the motor and wheel, an automatically-actuated brake mechanism for the motor, and means for simultaneously releasing the brake and controlling the reversing-gear.

5. In a device of the class described, the combination of a car, a line on which the car travels, a driving-wheel which is shiftably mounted and arranged to ride on the line, a motor in the car including companion gears with which the wheel is adapted to independently engage, a manually-controlled means for shifting the driving-wheel, and a mechanism for simultaneously stopping the car and motor.

6. In a device of the class described, the combination of a car, a line on which the car travels, a driving-wheel which is shiftably mounted and arranged to ride on the line, a motor in the car including companion gears with which the wheel is adapted to be independently connected, a manually-controlled means for shifting the driving-wheel, separately-actuated brake mechanisms for the motor, means at the terminals of the line for actuating the brake mechanisms, and means for releasing the brake mechanisms.

7. In a device of the class described, the combination of a car, a line on which the car travels, a driving-wheel which is shiftably mounted and arranged to ride on the line, a motor in the car including companion gears with which the wheel is adapted to be independently connected, separately-actuated brake mechanisms for the motor, means at the terminals of the line for automatically setting the brake mechanisms, and a single device for simultaneously shifting the driving-wheel and releasing either of the brake mechanisms.

8. In a device of the class described, the combination of a car, a wheel for propelling the same, means on which the wheel is shiftable, oppositely-rotating wheels, a motor mechanism for driving the latter wheels, a manually-controlled mechanism for shifting the propelling-wheel into mesh with either of the oppositely-rotating wheels, and an automatic brake device for the motor.

9. In a device of the class described, the combination of a car, a wheel for propelling the same, means on which the wheel is shiftable, oppositely-rotating wheels, a motor mechanism for driving the latter wheels, a manually-controlled mechanism for shifting the propelling-wheel into mesh with either of the oppositely-rotating wheels, separate automatic brake devices for the motor, and a manually-controlled means for releasing the brake devices.

10. In a device of the class described, the combination of a car, a wheel for propelling the same, means on which the wheel is shiftable, oppositely-rotating wheels, a motor

mechanism for shifting the latter wheels, separate automatically-actuated brake devices for the motor, and a manually-controlled means for releasing the brake devices and for shifting the propelling-wheel into mesh with either of the oppositely-rotating wheels.

11. In a device of the class described, the combination of a car, a propelling-wheel, a motor for driving the wheel in opposite directions, a balance-wheel, an escapement mechanism for the motor, and an automatically-actuated brake device arranged to engage the balance-wheel and arrest the action of the motor.

12. In a device of the class described, the combination of a car, a propelling-wheel, a motor for driving the wheel in opposite directions, a balance-wheel, separately-actuated brake-shoes arranged to engage the balance-wheel and stop the motor, and automatic means for actuating the brake-shoes.

13. In a device of the class described, the combination of a car, a propelling-wheel, a motor for driving the wheel in opposite directions, a balance-wheel, separately-actuated brake-shoes arranged to engage the balance-wheel and stop the motor, automatic means for actuating the brake-shoes, a manually-controlled means for releasing the brake-shoes from the balance-wheel, and means for setting or energizing the motor.

14. In a device of the class described, the combination of a car, a propelling-wheel, a motor, a reversible gearing between the motor and driving-wheel, a balance-wheel for the motor, an escapement for controlling the motor, separately-actuated brake-shoes arranged to engage the balance-wheel, automatic means for controlling the brake-shoes to engage the balance-wheel, and a common means for releasing the brake-shoes and actuating the reversible gearing.

15. In a device of the class described, the combination of a car, a propelling-wheel, a motor for driving the wheel, separately-actuated brake-carrying rods, springs for actuating the rods in one direction, latches for holding the said rods in their inoperative position, devices at the ends of the car for releasing the latches, and a manually-controlled device for setting the brake-carrying rods.

16. In a device of the class described, the combination of a car, a motor for propelling the same, a wheel driven by the motor, longitudinally-movable brake-carrying rods disposed on opposite sides of the said wheel for independently engaging the latter, springs for actuating the said rods, and a shipper device for resetting the said rods.

17. In a device of the class described, the combination of a car, a motor for propelling the same, a wheel driven by the motor, longitudinally-movable brake-carrying rods disposed on opposite sides of the said wheel for independently engaging the latter, stops on

the rods, latches engaging the stops for holding the brakes out of engagement with the wheel, means for releasing the latches from said stops, a shipper-rod having devices adapted to engage said stops, and a manually-controlled lever for actuating the shipper-rod.

18. In a device of the class described, the combination of a car, a driving-wheel, a motor, a reversible gearing connection between the motor and wheel, a balance-wheel and escapement mechanism for the motor, brakes for engaging the balance-wheel to stop the motor, stops connected with the brake-shoes, latches for engaging the stops to hold the brake-shoes in their inoperative position, automatic devices for releasing the latches, a shipper-rod adapted to engage the stops for moving the latter into engagement with the latches, and a common mechanism for controlling the reversible gearing connection and the shipper-rod.

19. In a device of the class described, the combination of a car, a driving-wheel, a motor, a reversible gearing connection between the motor and wheel, a balance-wheel and escapement mechanism for the motor, brakes for engaging the balance-wheel to stop the motor, stops connected with the brake-shoes, latches for engaging the stops to hold the brake-shoes in their inoperative position, automatic devices for releasing the latches, a shipper-rod adapted to engage the stops for moving the latter into engagement with the latches, a lever for reversing the said gearing connection and shifting the shipper-rod, and a latch mechanism associated with the lever.

20. In a device of the class described, the

combination of a car, a driving-wheel, a motor, a reversing-gear between the motor and wheel, means located outside of the car for controlling the reversing-gear, a brake mechanism for the motor, means extending outside of the car for actuating the brake mechanism, a line on which the car travels, and a device at the terminal of the line for engaging with the last-mentioned means to operate the same.

21. In a device of the class described, the combination of a car which is provided with a longitudinal passage open at the side of the car, a driving-wheel in the car located at the inner portion of the opening, a line extending through the opening, a supporting-bracket for the line which is adapted to pass through the opening, and a movably-mounted guide-wheel in the car cooperating with the driving-wheel which is adapted to suspend the car on the line.

22. In a device of the class described, the combination of a car, a line on which the car travels, a driving-wheel arranged to run over the line, a motor for driving the wheel including a plurality of coiled actuating-springs, means for winding the springs, a brake mechanism for the motor, separate means for setting and releasing the brake mechanism, and means for reversing the motor.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

CHARLES N. LIBEY.

Witnesses:

C. A. DAMER,
AMOS LONG.