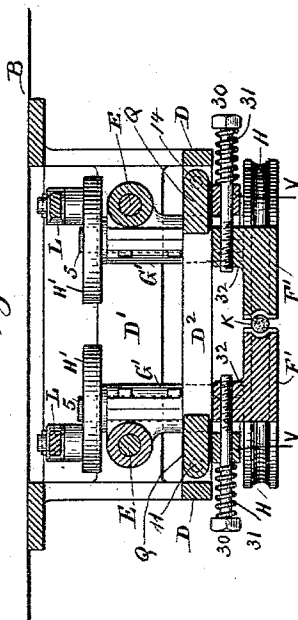
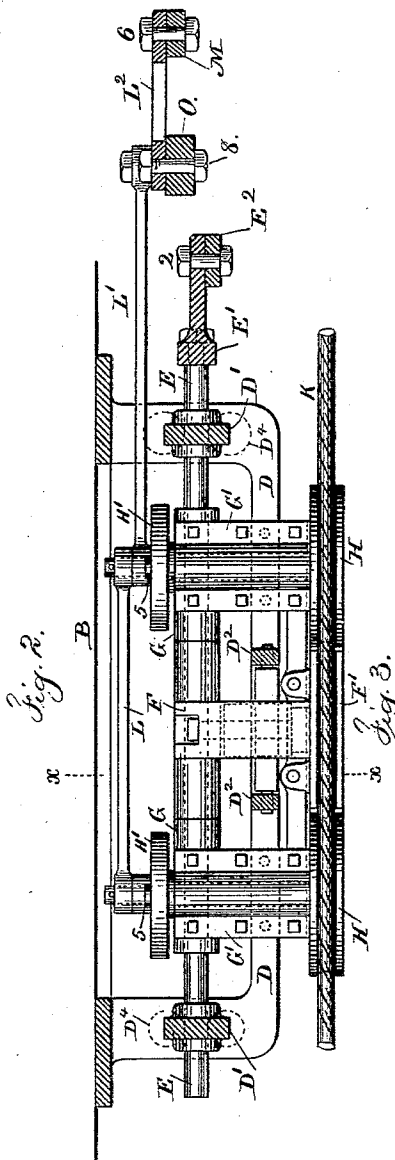
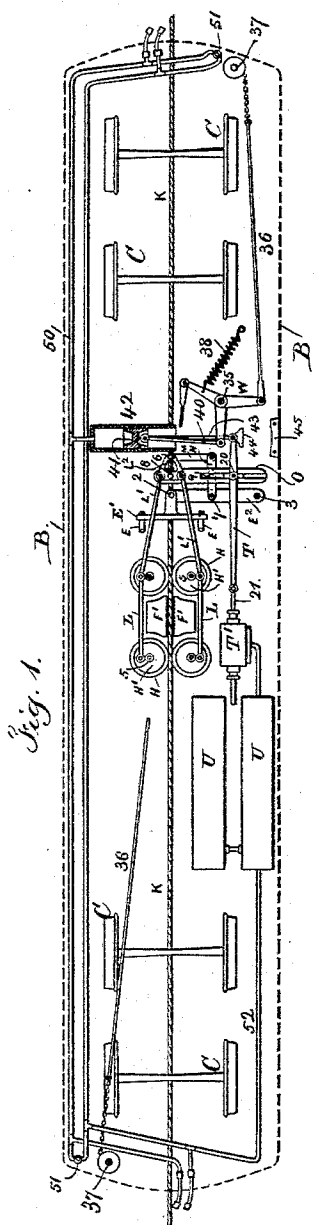


J. H. PENDLETON.

GRIPPING DEVICE FOR CABLE RAILWAYS.

No. 387,997.

Patented Aug. 14, 1888.



Witnesses.

Chas. H. Smith
H. L. Serrell.

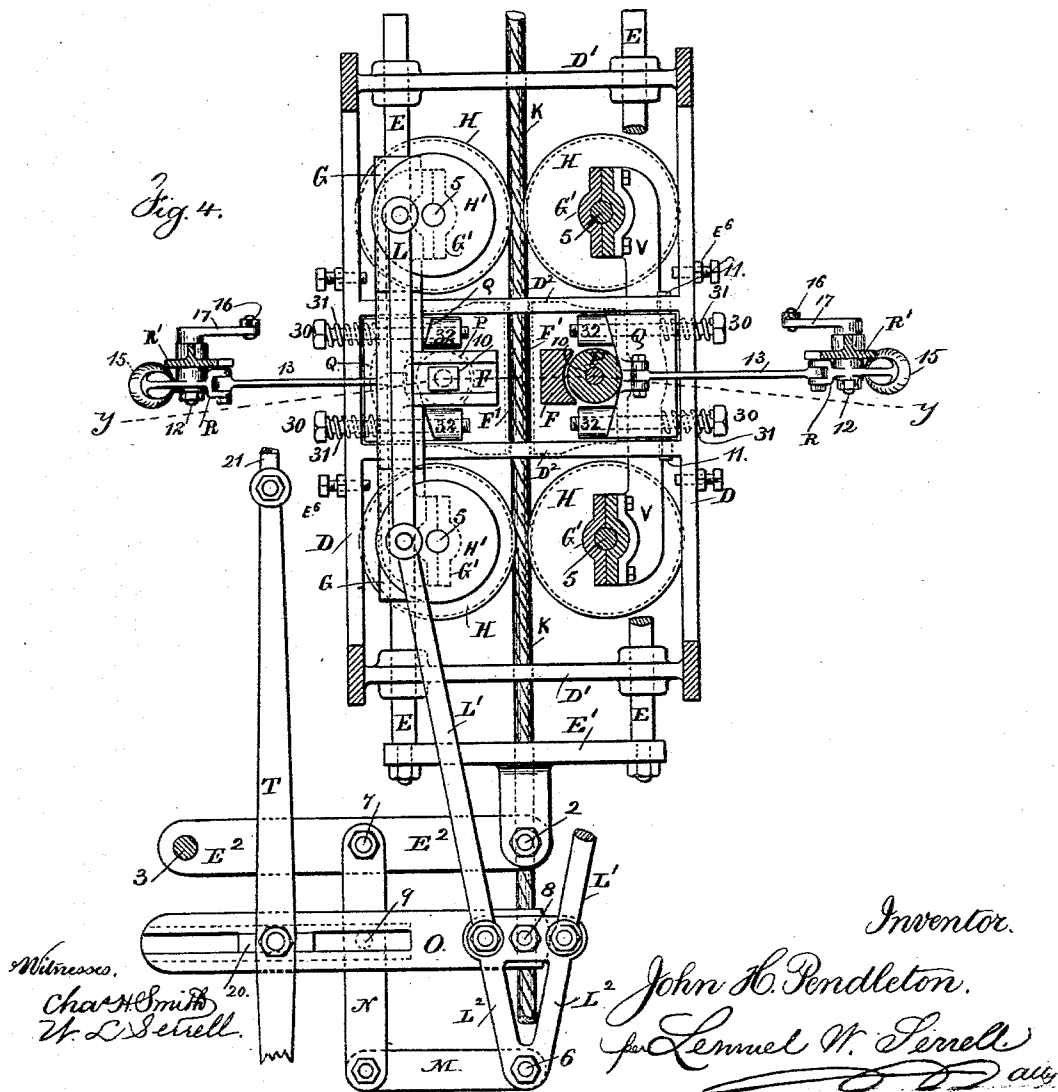
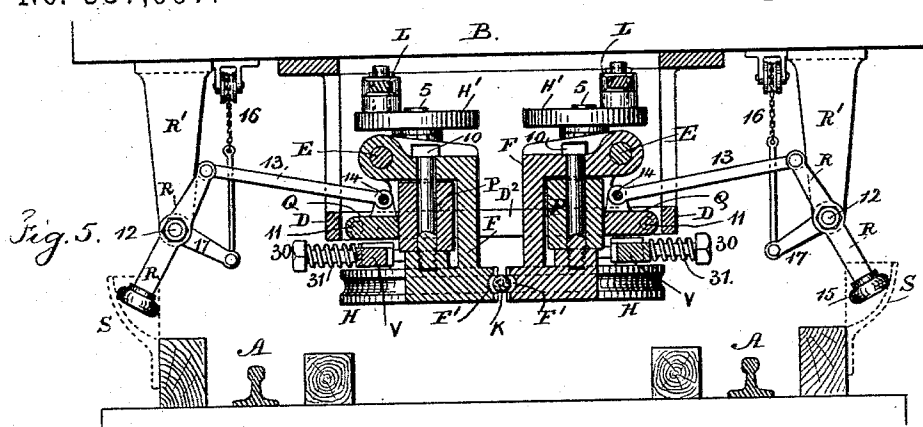
Inventor,
John H. Pendleton.
per Lemuel W. Serrell.
attys.

J. H. PENDLETON.

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UNITED STATES PATENT OFFICE.

JOHN H. PENDLETON, OF BROOKLYN, ASSIGNOR TO THE RAPID TRANSIT
CABLE COMPANY, OF NEW YORK, N. Y.

GRIPPING DEVICE FOR CABLE RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 387,997, dated August 14, 1888.

Application filed April 28, 1887. Renewed June 13, 1888. Serial No. 276,937. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. PENDLETON, of Brooklyn, in the county of Kings and State of New York, have invented an Improvement in Greeting Devices for Cable Railways, of which the following is a specification.

The object of this invention is to make use of the traveling cable for pumping air into a reservoir during the time that the car may be standing still or moving slowly, and to regulate this pumping action in proportion to the pressure in the reservoir, so that when the maximum pressure is attained the pump may stop. In connection with this I make use of wheels having shafts and cranks, so that the revolution of the wheels by the contact with them of the cable shall revolve the cranks and operate the pump, and the pressure will accumulate until the resistance to the rotation of the wheels becomes greater than the power required to propel the car, and the car will be started gradually, and a grip is applied automatically to grasp the cable, so that the car will be moved at the same speed as the cable, and I provide means by which the grip and wheels can be separated so that the cable can be dropped.

In the drawings, Figure 1 is a diagrammatic plan view. Fig. 2 is a longitudinal section showing the rollers and grip and the parts connected with them. Fig. 3 is a cross-section at the line $x x$, Fig. 2. Fig. 4 is a plan view with the bearings at one side in section, and Fig. 5 is a cross-section at the line $y y$, Fig. 4.

The track-rails are represented at A, and a portion of the car-platform at B, and C C indicate the positions of the wheels and axles. On the under side of the car is a quadrangular frame composed of the sides D and cross-bars D' D'. This frame and cross-bars are rigidly affixed to the car and sustain the rollers and grip. Through the cross-bars D' D' are the slide-rods E, connected together rigidly at one end by the cross-head E', and there is a link, E², hinged at 2 to the cross-head E' and connected by a pivot, 3, to the under side of the car. Instead of the rods E sliding through fixed guides in the cross-bars D' D', there may be rollers D' D' (see dotted lines, Fig. 2) supported in the frame D and provided with grooves to receive said rods to lessen the friction

on these rods as they move back and forth. The link E² allows the rods E to slide through the cross-bars D' to a limited extent for the purpose of applying the gripping mechanism, as hereinafter mentioned. Upon these slide-rods E are hanging stocks F, having gripping-surfaces F', and these hanging stocks are between the sleeves G upon the slide-rods E, which sleeves are permanently fastened to such rods; but the rods can turn slightly at their ends in the cross-head E' when the wheels are opened to drop the cable. These sleeves G are connected with the boxes G', within which are shafts 5, each one of which has at its lower end a grooved wheel, H, adapted to act with the cable K, and at the upper end is a crank-wheel, H', the cranks of which are connected in pairs by the links L, and L' are connecting-rods to the triangular frame L², the apex of which is pivoted at 6 to the link M, and N is a second link to the link E², to which it is attached by a pivot, 7.

Upon the triangular frame L² is a pivot, 8, by which the lever O is connected, and the fulcrum-pin 9 of this lever is upon the link N. It will now be understood that the wheels H are revolved by the traveling cable K, as it moves between the pairs of wheels, and the crank-wheels H' communicate to the links L and connecting-rods L' a movement that reciprocates the frame L² and swings the lever O upon the pivot 9. At the same time these motions are not interfered with by any slight endwise movement of the slide-rods E, because all of the parts move in harmony as the link E² swings upon the pivot 3 that is fixed to the car-body.

Each stock F is adapted to receive within it the roller P upon a vertical pivot-pin, 10, and at each side of the frame D, and between the cross-bars D', are the double-inclined grip-blocks Q, and each one of these is pivoted at 11 to said cross-bars D'.

R R are swinging levers upon the shafts 12, supported by the hangers R', and the links 13 connect the upper ends of the levers R to the hinges 14 upon the grip-blocks Q. These levers R can be swung by the stationary inclines S (see dotted lines, Fig. 5) upon the guard-rails of the track acting upon the rollers 15 at the lower ends of the levers R, or such

levers may be moved by a hand-lever or hand-wheel and shaft acting upon a chain, 16, and arm 17, that projects from each shaft 12, and when the levers R are acted upon the grip-blocks Q can be swung upward and backward from the rollers P, and there will be then nothing to prevent the gripping-surfaces F' swinging downward and separating and the wheels H separating sufficiently to drop the cable, the parts turning upon the rods E; but in the normal position the grip-blocks Q are adjacent to the rollers P, as seen in Figs. 4 and 5, and the surfaces of the said grip-blocks Q adjacent to the rollers P are inclined from the middle toward each end, so that if the slide rods E and the parts carried by them receive an endwise movement in either direction the rollers 10 will travel upon the inclined surfaces of these grip-blocks Q, and the gripping faces F' will be pressed toward each other, but will not grasp the cable except near the extremes of movement in either direction.

In the lever O there is a longitudinal slot receiving a pivot-block, 20, for the connecting-rod T, which extends to the pump-rod 21 of the pump T', and U are reservoirs. I have shown two, but there may be one or more; hence as the lever O is swung upon its pivot 9 by the movements of the shafts and crank-wheels, as aforesaid, the pump T' is operated and air is pumped thereby into the reservoirs U.

When the car is standing still and the cable K is traveling, the wheels H are revolved by the cable, and in so doing the pump is operated and an air-pressure is stored up in the reservoirs U, and that pressure can be availed of in any of the operations necessary upon cars propelled by a traveling cable, and whenever the pressure in the pump accumulates sufficiently to prevent the wheels H' revolving then the car will be moved by the cable itself acting upon such wheels, and through them giving to the rods E an endwise movement and causing the double-inclined grip-blocks Q to press the wheels more firmly upon the cable and grasp the same sufficiently for moving the car under ordinary circumstances. There is a yoke-bar, V, at each side connecting the lower ends of the boxes G', and the bolts 30 and springs 31 serve to apply a yielding pressure to such yokes, because said bolts 30 pass freely through holes in the yokes V and screw into blocks 32 upon the gripping blocks F', the springs 31 being between the heads of the bolts and the yoke-bars, and these springs are sufficiently strong to cause the wheels to grip the cable firmly.

It will be apparent that when the pivot-block 20 is moved over the pivot 9 of the lever O there will not be any motion given to the pump-piston, because the parts will simply rock upon that pivot, and when the pivot-block 20 is slid away from the pivot 9 the movement of the pump will be increased.

There is a lever, W, pivoted at 35 upon the under side of the car. This lever has three

arms. The two opposite arms are connected by rods and chains 36 to the shafts and hand-wheels, similar to ordinary brake-shafts at the opposite ends of the cars, and there is a spring, 38, to move the lever W in the oppositedirection, and the third arm of this lever W is connected to a link, 40, extending to the piston 41 in the cylinder 42, and a second link, 43, connects this piston 41 to the outer end of the connecting-rod T, and on the end of this link 43 is a shoe, 44, and there is a segment, 45, fastened to the under side of the car.

The spring 38, in acting upon the lever W, tends to move the connecting-rod T toward the pivot 9, so that the wheels H may be revolved by the cable K freely while the car is standing still; but when the car is to be started either hand-wheel and shaft 37 may be moved to swing the lever W and move the connecting-rod T and cause the pump T' to compress the air, and in so doing the air becomes an accumulating resistance to the revolution of the wheels H, and thereby the car is started gradually and the grip on the cable is increased by the endwise movement which the parts receive in consequence of the rods E sliding in the frame D, as aforesaid.

I provide for moving the links 40 43 and lever W by air-pressure, instead of using the hand-wheel and shaft 37. With this object in view, the pipes 52 extend from the reservoirs U to the three-way cocks 51, and the pipes 50 pass from the three way cocks to the cylinder 42; hence when either three-way cock 51 is opened the air under pressure passes by 52, 51, and 50 to the cylinder 42 and acts upon the piston 41 to swing the connecting-rod T and bring the pump into action, and if the motion given by the piston 41 or by the lever W is sufficient to bring the shoe 44 against the stationary segment 45 the friction tends to prevent the shoe moving, and thereby increases the resistance to the revolution of the wheels H by the motion of the cable, and insures the movement of the car itself.

It is to be understood that the double-inclined grip-blocks Q will usually be operated automatically by inclines upon the guard-rails of the track to throw the grip-blocks Q up out of the way when the cable is to be dropped, or to swing them down to place when the cable is to be grasped, such inclines acting upon the swinging levers R, the chain 16, and a hand-wheel and shaft to act upon the same being provided should it be necessary to suddenly drop the cable in cases of an emergency. Adjustable stops are shown at E' for limiting the movement of the grip-rollers and grip when said rollers and grip are swung to drop the cable.

The pipes 50 and 52 may be provided with coupling-connections at the ends of the car, as shown, so that the gripping devices may be brought into action on either car of the train, or the air under pressure may be made use of for any of the operations on a cable railway.

It is to be understood that the parts are to

be so proportioned that when the connecting-rod T is swung so that there is but little motion given to the pump-piston the springs 31 will take off the grip by causing the rollers P to move to the bottom of the inclines on Q, but the wheels H will still be in contact sufficiently with the cable to be revolved thereby; but so soon as the pivot 20 of the connecting-rod T is moved out on the lever O, the air-pressure acting as a resistance to the revolution of the wheels H, the traction causes the car to move, and the speed is accelerated until the wheels cease to revolve and the car has the same speed as the cable. If the load increases, such as in going up a hill, the pressure of the rollers P upon the inclines Q of the grip-blocks is such that the positive grips F' will grasp the cable, and when the load lessens, the springs 30, expanding, will take off the positive grip by causing the rollers to run down the inclines of the grip-blocks Q. The air under pressure acting in the cylinder 42, or the hand mechanism may bring the shoe 44 in contact with the stationary segment 45 and stop or almost stop the revolution of the wheels H and cause them to hold the cable firmly enough for all purposes of the car-propulsion even without the positive grip.

I claim as my invention—

30 1. The combination, with the grooved wheels H for grasping the cable and the cranks and connecting-rods moved by the same, of slides for supporting the wheels and their journal-boxes, and a frame fixed to the under side of the car and supporting the slides, substantially as set forth.

35 2. The combination, with the grooved wheels H for the cable, their shafts and boxes, of the slide-rods E, from which the boxes are suspended, the stocks F, hanging from the rods E, the frame for supporting the slide-rods E, and the double-inclined grip-blocks Q, supported by the frame, and the rollers P upon the stocks F, substantially as set forth.

45 3. The combination, with the grooved wheels H and their shafts and boxes, of the slide-rods E, from which the boxes are suspended, the stocks F, also suspended by the rods E, the double-inclined grip-blocks, the yoke-bars V, extended from one box to the other, and the bolts and springs connecting the yokes to the stocks of the grip, substantially as set forth.

55 4. The combination, with the wheels H,

their shafts and boxes, of the slide-rods E, the frame upon the car for supporting the same, the hanging stocks, the double-inclined grip-blocks pivoted to the frame, the swinging levers and connecting-rods for moving the grip-blocks, and the rollers upon the stocks adjacent to the double inclines of the grip-blocks, substantially as set forth.

5. The combination, with the wheels H, against which the cable acts, of the shafts, 65 cranks, links, and connecting-rods, the frame L², links M N, link E², and pivot 3, for connecting the link E² to the car, the slide-rods E, and cross-head E', connected to the link E², and the frame for supporting the rods E², substantially as set forth.

6. The combination, with the lever O and the wheels H, cranks and connections for moving said lever O, of the connecting-rod T, having a pivot block sliding in a slot in the lever 75 O, the air-pump and reservoirs, and mechanism, substantially as specified, for moving the connecting-rod T and varying the stroke of the pump, substantially as set forth.

7. The combination, with the reservoir, air-pump, and connecting-rod, of the slotted lever 80 O, the wheels H, against which the cable acts, the cranks and connecting-rods for moving the lever O, the three-armed lever W, and connections to the hand-wheels and shafts for 85 moving the connecting-rod and varying the stroke of the pump, substantially as set forth.

8. The combination, with the pump and reservoir and the wheels against which the cable acts, of the cranks, connecting-rods, and levers for moving the air-pump and an air-cylinder and piston, and the pipes and cocks for varying the stroke of the pump by the action of the air-pressure and for applying a resistance to the rotation of the wheels for causing 95 the cable to start the car, substantially as set forth.

9. The combination, with the wheels between which the cable passes and the cranks and connecting-rods, of the lever O, the lever W, the 100 connections between the same, the shoe 44 and the stationary segment 45, to apply friction as resistance to the rotation of the wheels for giving motion to the car, substantially as set forth.

Signed by me this 19th day of April, A. D. 105 1887.

J. H. PENDLETON.

Witnesses:

GEO. T. PINCKNEY,

W. L. SERRELL.