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J. H. PENDLETON, A. BRYSON, Jr., & C. TIERS.

CABLE GRIP.

No. 406,300. Patented July 2, 1889.

Fig. 1.

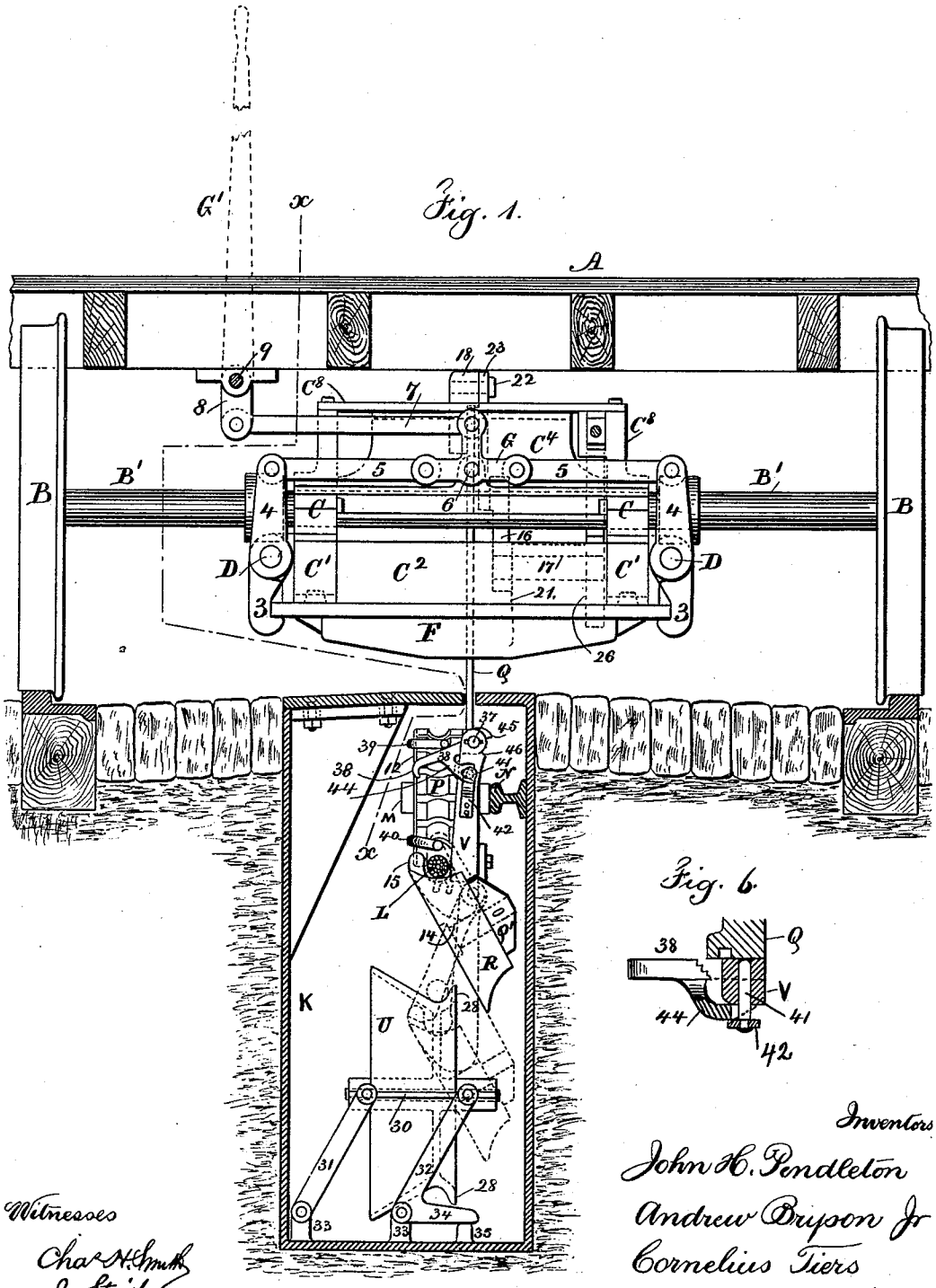


Fig. 6.

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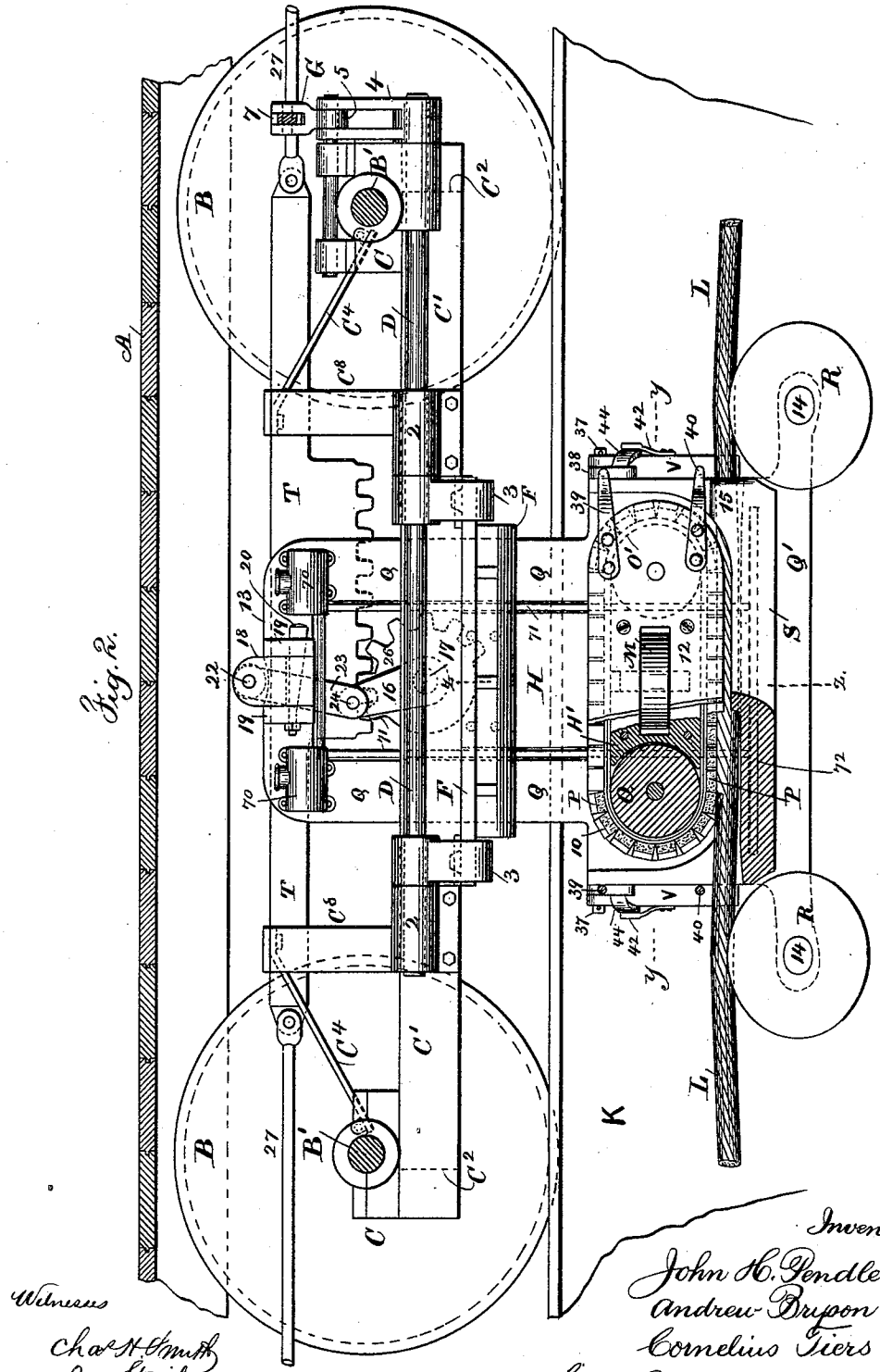


Fig. 2.

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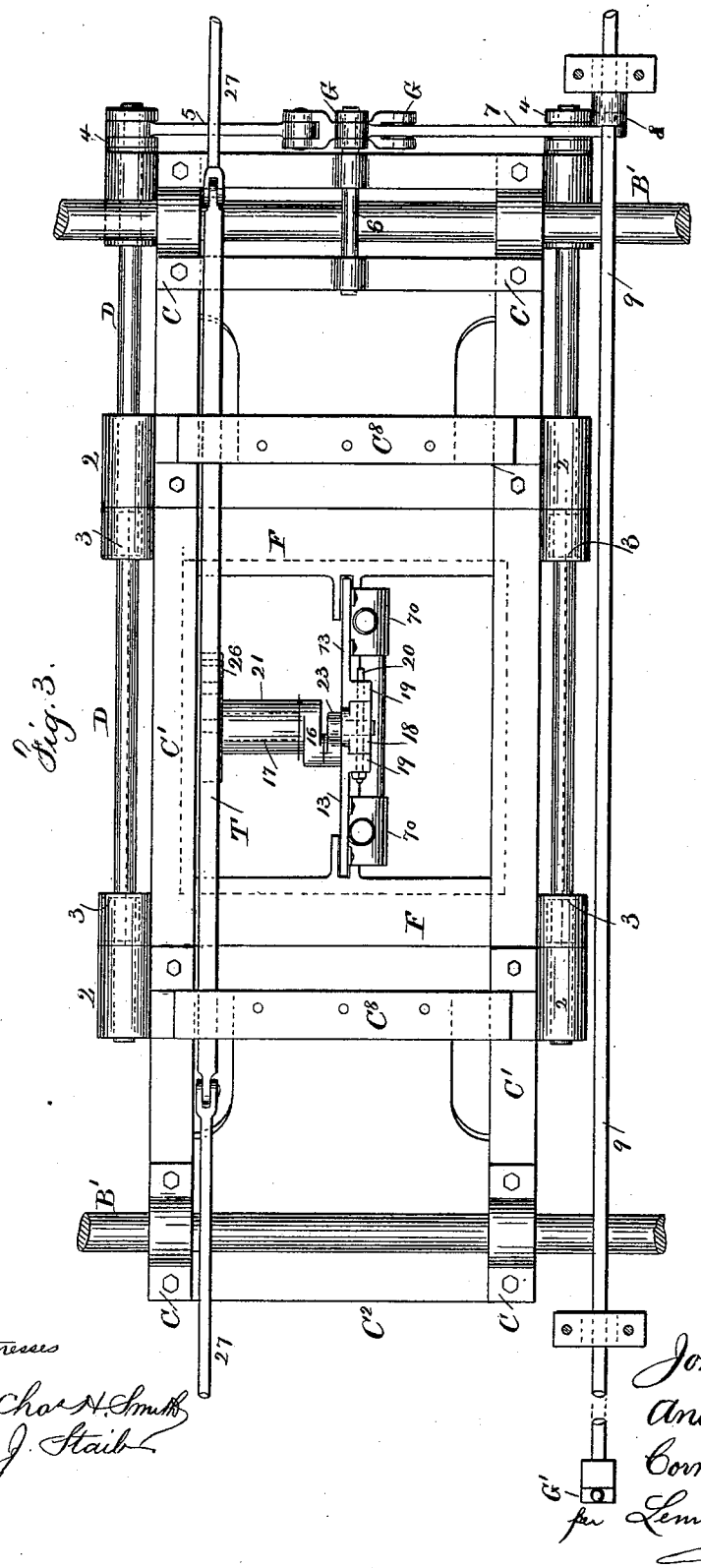
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Fig. 3.



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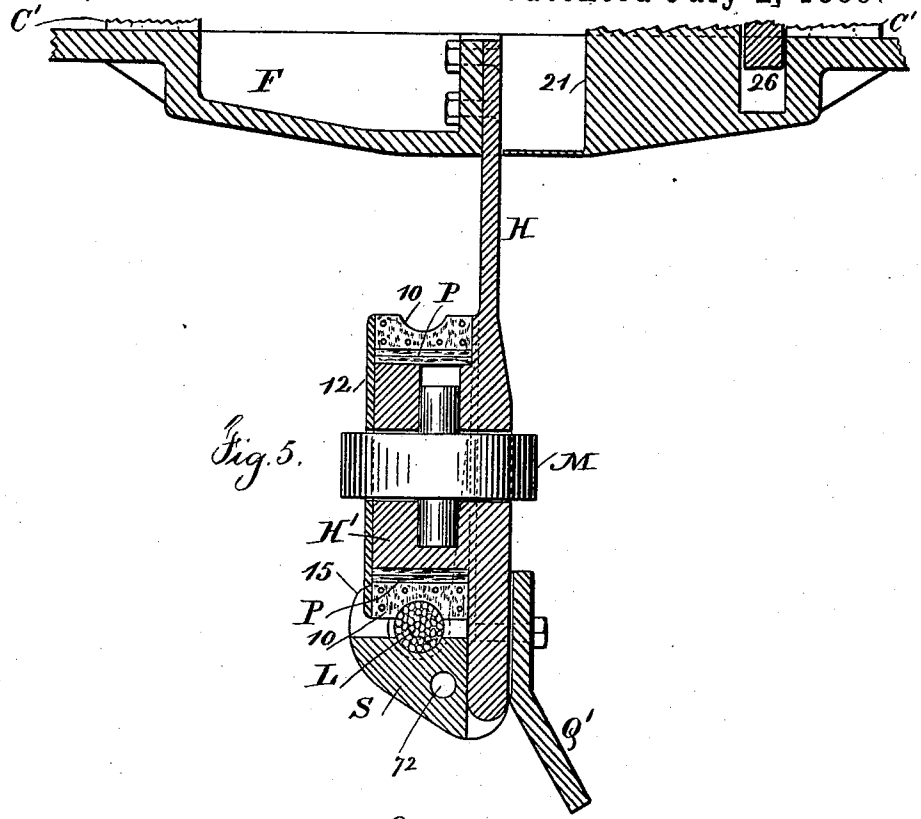
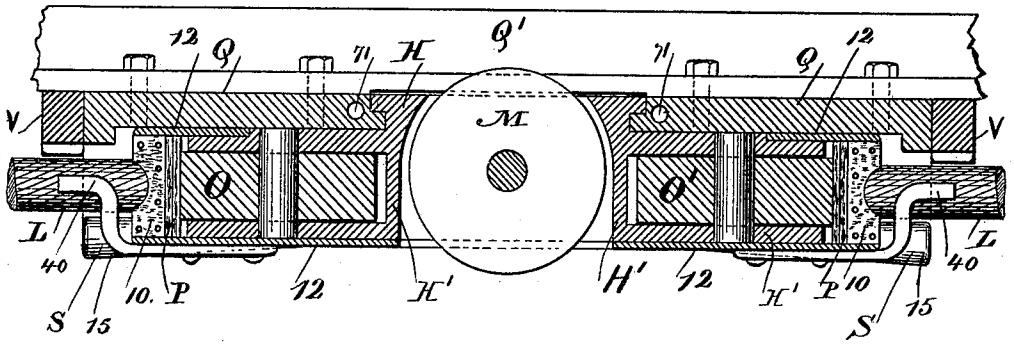


Fig. 5.

Fig. 4



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UNITED STATES PATENT OFFICE.

JOHN H. PENDLETON, OF BROOKLYN, AND ANDREW BRYSON, JR., AND CORNELIUS TIERS, OF NEW YORK, ASSIGNORS TO THE RAPID TRANSIT CABLE COMPANY, OF NEW YORK, N. Y.

CABLE-GRIP.

SPECIFICATION forming part of Letters Patent No. 406,300, dated July 2, 1889.

Application filed November 30, 1888. Serial No. 292,260. (No model.)

To all whom it may concern:

Be it known that we, JOHN H. PENDLETON, of Brooklyn, in the State of New York, and ANDREW BRYSON, Jr., and CORNELIUS TIERS, of the city and State of New York, have invented an Improvement in Cable-Grips, of which the following is a specification.

This invention is especially available with traveling cables that are within a conduit or case buried in the earth.

The object of this invention is to pick up or to drop the cable, as required, to start the endless belt of grip-blocks in motion before the grip itself is brought into action to grip the cable between the endless belt of blocks, and a shoe to cause the movement of the cable to be communicated to the car, also to support the gripping apparatus as the car moves around the curve, and lastly to drop the entire gripping apparatus away from the car should there be any injury to the cable causing the same to become entangled in the grip, so that the car may be stopped in case of an emergency.

In the drawings, Figure 1 is a cross-section illustrating the improvements as applied to the platform of the car. Fig. 2 is an elevation, partially in section, at the line *x x*, Fig. 1. Fig. 3 is a plan view of the parts below the platform of the car. Fig. 4 is a sectional plan view in larger size at the line *y y*, Fig. 2, and Fig. 5 is a partial sectional elevation at the line *z z*, Fig. 2. Fig. 6 is a section of the latch for holding the chock-lever.

The platform A, wheels B, and axles B′ are of ordinary character, and upon the axles B′ are bearings C, supporting the longitudinal bars or frames C′, and there are cross-frames C^2, the parts being constructed so as to receive the moving parts of the apparatus, hereinafter described.

Upon the frames C′ are bearings 2, for the longitudinal shafts D, upon which are hooks 3, that support the plate F, which plate supports and carries the gripping device, hereinafter described, so that when these hooks 3 are separated the plate F can be dropped, together with all the parts of the grip, in order that the car may be stopped, while the gripping device may be carried along with the cable, should the same become entangled therewith, thus avoiding damage to the car or the passengers carried by the same.

In order to operate the hooks 3 to disconnect them from the plate F, any suitable mechanism may be employed. We have, however, shown the lever-arms 4 as extending above the shafts D and connected by links 5 to the three-armed lever G upon the fulcrum 6, the third arm of which lever is connected by a link 7 to an arm 8 upon the longitudinal shaft 9, that is beneath the platform A and acted upon by a lever G′ whenever it becomes necessary to drop the plate F and the parts therewith connected, there being a lever G′ at each end of the car.

Beneath the plate F is a hanging standard H, that passes down into the trunk or conduit K, in which is the cable L, and this hanging standard is sufficiently thin to pass through the slot in the top of the trunk or conduit, and this trunk or conduit is to be of any desired character and of a size to receive the parts of the grip hereinafter described.

Upon the lower portion of the hanging standard H is bolted or cast the block H′, having a recess for the reception of the horizontal wheel M upon a vertical axis, and this wheel M projects at each side farther than the surface of the block H′, and within the trunk or conduit K, wherever curves may occur, the guard-rail N is affixed, as represented in Fig. 1, against which this wheel M rolls to prevent the parts being injured by a lateral strain of the cable as the car travels around the curve, and this stationary guard-rail N may be at either side of the horizontal wheel M, according to the direction of the curve in the track and in the trunk or conduit.

The block H′ is formed with jaws, as seen in Fig. 4, for the reception of the wheels O O′, around which passes the endless belt P, having grip-blocks 10 upon the surface thereof, which grip-blocks are preferably recessed to fit over the cable L. This endless belt and the grip-blocks may be constructed in any desired manner. We have represented the grip-blocks as composed of layers or sections fastened to belts of leather that pass around the wheels O O′. At each side of the endless

belt and grip-blocks are the guard-plates 12, bolted upon the opposite surfaces of the block H′. It will now be understood that the endless belt of grip-blocks and the hanging standard H always remain in a fixed position in relation to the plate F; but at each side of the hanging standard H are the slideways for the reception of the vertical slides Q. These vertical slides Q are connected at the top by the cross-piece or frame 13 and at the bottom by the longitudinal bar Q′, the ends of which bar Q′ extend to and receive the gudgeons or shafts 14 of the pick-up wheels R. These wheels R are conoidal, the peripheries being concaved and the wheels occupying an inclined position, as shown in Fig. 1, in order that the cable may rest in the concave upper surfaces of these wheels R, and these wheels revolving freely prevent friction upon the cable when the car is at rest.

Upon the slides Q is the grip-shoe S, the upper surface of which is grooved longitudinally for the cable, and the ends of the grooves are made flaring or beveled, so that there are not any sharp angles with which the cable can come into contact, and toward the ends of the grip-shoe S are the hooks 15, that rise above the upper surface of the shoe, these hooks, also, are rounding at the edges, so that there are no angles to come into contact with the cable.

It is now to be understood that after the cable has been picked up, as hereinafter described, and it travels upon the wheels R and above but not in contact with the surface of the grip-shoe S, the cable will not be exposed to wear or friction; but when the slides Q are raised sufficiently to bring the top surface of the cable L in contact with the grip-blocks 10 on the endless cable P, as illustrated in Fig. 2, the endless belt will revolve by contact of the grip-blocks with the cable, but the car will still remain quiescent, and as the slides Q, shoe, and wheels are still further raised the cable will be bent downwardly and the grip-shoe brought into contact with the under side of the cable and friction applied thereto, until finally the cable is clamped between the grip-shoe and the endless belt and the motion given to the car corresponds to the speed of the cable.

In order to raise and lower the vertical slides Q and the parts carried by the same, any suitable mechanism may be employed; but we prefer to make use of a toggle movement, the same being composed of a crank-arm 23, upon a gudgeon or short shaft 22, that projects from the block 18, that is received between the lugs 19 on the cross-piece 13 of the slides Q, and by making use of a key or wedge 20, passing through the block 18 and lugs 19, the gudgeon 22 may be raised or lowered to adjust the parts and compensate any wear. There is upon the plate F a bearing 21 for a short shaft 17, at one end of which is a crank-arm 16, united by a pin 24 to the crank-arm 23, so as to form therewith a toggle-joint, and at the other end of the shaft 17 is a gear-wheel 26, the teeth of which mesh into teeth upon the rack-bar T, which bar T passes through and is supported by the cross-frame C^8, and at the ends thereof are rods 27, that pass to chains and vertical shafts with hand-wheels, hereinafter described, so that by turning these vertical shafts and hand-wheels the rack-bar T can be moved in either one direction or the other, and when moved in one direction the cranks 23 and 16, acting as toggles, force up the cross-piece 13, vertical slides Q, raising the bar Q′, grip-shoe S, and wheels R to lift the cable, and finally clamp the same, as before mentioned, and when the rack-bar T is moved in the other direction the toggle-cranks 16 and 23 move the slides Q downwardly to the desired extent to relieve the grip, dropping the cable or picking up the cable, as hereinafter explained; and we remark that the plate is recessed, as shown in Fig. 5, so as to allow for the movement of the crank-arm 16 down to the lowest position.

Within the trunk K are the wheels U, that support the cable L, these wheels U are conical and flanged at 28, so that the cable L in its normal position travels at the junction of the conical surfaces of the wheels and of the flange, as shown by dotted lines in Fig. 1. These wheels U are each supported in a frame 30, with suitable journal-boxes for the shaft of the wheel, and there are diagonal links 31 32, pivoted at their upper ends to the frame 30, and at their lower ends they are hinged to the blocks 33. Each of these frames 30 has two pairs of diagonal links, and one link in each pair has a foot-piece 34, that rests upon a block 35 or stop at the bottom of the trunk or conduit, so that in their normal positions the pair of links 31 32 occupy the diagonal positions shown in Fig. 1; but should the diagonal surfaces of either of the wheels R come into contact with either of the cable-supporting wheels U, such wheel U will be moved toward one side of the trunk or conduit K, the links 31 32 swinging and the frame 30 moving laterally along with the wheel, and as soon as the disturbing influence ceases to act upon such wheel U the same drops back into its normal position. It is usually intended to pick up the cable between one wheel U and the next; but should an effort be made to pick up the cable adjacent to one of the wheels U such wheel will be displaced laterally by the inclined surface of one of the wheels R or of the shoe S.

When the vertical slide Q and the parts carried by the same are forced downwardly, so that the inclined faces of the wheels R come into contact with the traveling cable L, such cable L is displaced laterally and slides up the inclined surfaces of the wheels R, near which the cable may be picked up; and we find practically that it is not necessary to lower the wheels R to the position shown in dotted lines in Fig. 1, because as soon as the

gudgeons 14 of the wheels R pass below the cable the traction of the cable is upon the edges of the wheels R above the axis, and such wheels are set in motion by the cable and the cable rolls up over the edges of the wheels and jumps up over the hooks 15 into the shoe S. For this reason the cable can be picked up with facility, and the tension of the cable and movement cause it to pass easily into this position in the shoe. It will, however, be understood that if only the devices heretofore described were made use of the cable could not be dropped, because after the slides Q and parts connected therewith have been lowered the cable would not be discharged from the shoe S, but would remain therein. In order to discharge the cable from the shoe, we make use of the swinging chocks V, pivoted at 37 upon the end portions of the slides Q, where they extend beyond the shoe S, and the lower ends of these swinging chocks are adjacent to the cable as it lies in the shoe S. The pivots 37 also form pivots for the levers 38, that extend out over the cable, and upon the guard-plates 12 are stationary arms 39 and 40, and through each swinging chock V a bolt 41 passes, the outer end of which is attached to the spring 42, and there is a wedge-shaped claw-arm 44 projecting downwardly and backwardly from each lever 38, the wedge-shaped end of which passes in between the spring 42 and the surface of the chock, so that when the lever 38 is moved downwardly the wedge upon the end of the claw-arm acts against the spring 42 to withdraw the bolt 41, and when the lever 38 is moved upwardly the reverse action takes place; and by reference to Fig. 1 it will be seen that the lever 38 has a projection 45 upon it that comes into contact with the projection 46 upon the chock V, so that when the slides Q are moved downwardly the levers 38 come into contact with the stationary arms 40, and the further movement causes the projections 45 to take against the projections 46, and the still further downward movement causes the chocks V to be swung by the levers 38, and the lower ends of said chocks V act against the cable L and throw the same over the hooks 15 and out from the shoe S; and when this takes place the wedge-shaped claw-arms 44 are away from the bolts 41, and the spring 42 is now free to project such bolts into holes in the vertical slides Q, so that such chocks V are held by the bolts in the inclined positions represented by the dotted lines in Fig. 1, and hence the cable is forced away by these chocks V and cannot be picked up by the wheels R upon the upward movement of the slides Q; but during this upward movement, when the parts approach the position shown in Figs. 1 and 2, the levers 38 come into contact with the stationary arms 39, so that such levers 38 are swung until the wedge-shaped claws 44 pass in under the spring 42 and withdraw the bolts, and the further upward movements of the parts swing the chocks V back to their normal positions, so that the cable can be picked up by lowering the slides Q and the parts connected therewith until the cable is pressed aside by the inclined surface of the wheels R and shoe S and jumps up into the shoe, as before described.

Upon the frame C′ C^8 we place inclines C^4, which are in the form of plates, and these run over the upper ends of the vertical slides Q after the hooks 3 may have been moved and the plate F dropped, thereby forcing down the vertical slides Q and the parts connected with them, so that they will not come into contact with the axles B′ or the fenders or life-guards upon the car.

We claim as our invention—

1. The combination, with the gripping device, of the stationary standard H and connections to the car-axle, the moving slides Q, for raising and lowering the gripping device, the toggle-cranks 16 and 23, pinion 26, rack-bar T, and mechanism for giving endwise motion to such rack-bar, substantially as set forth.

2. The combination, with the endless belt P and the grip-blocks 10, of the grip-shoe S and pick-up wheels R, and the device for supporting and moving the respective parts, the pick-up wheels R being located in such a manner as to support the cable out of contact with the grip-shoe, so that such cable may travel without friction upon the shoe and be brought into contact with the grip-blocks to give motion to the endless band before the gripping action is applied to the cable, substantially as specified.

3. The combination, with the endless belt and grip-blocks, of the grip-shoe having hooks 15, near the ends of the shoe, to aid in guiding the cable into place, the end portions of the shoe and the hooks being rounded to prevent injury to the cable, substantially as set forth.

4. The combination, with the grip-shoe and hooks 15, of the pick-up wheels R and the frame or bar for supporting and moving the same, such grip-wheels R having conical concave edges, and the wheels being placed at an inclination to press the cable laterally as the wheels and cable are moved downwardly for picking up such cable, substantially as set forth.

5. The combination, with the gripping and pick-up mechanism, of the conical wheels U, having flanges 28, the frame 30, and the diagonal links 31 32, for allowing the wheels U to be moved laterally by the pick-up mechanism, substantially as specified.

6. The combination, with the grip-shoe and pick-up wheels and the frame for supporting and moving the parts, of the swinging chocks V, with the projections 46, the levers 38, with the projections 45, for moving the chocks, the spring-bolts 41, and the stationary arms 38 and 40, for causing the levers and chocks to be moved in throwing the cable out of the shoe and in restoring the parts to the normal position, substantially as specified.

7. The combination, with the pick-up and gripping mechanism, of the plate F, to which the parts of the grip are connected, the hooks 3, for supporting such plate, and mechanism for moving the hooks to disconnect the gripping mechanism from the car and allow the same to drop, substantially as set forth.

8. The combination, with the plate F, of the hanging standard H, connected therewith, the endless belt and grip-blocks, and the wheels O O′, supported by such hanging standard, the grip-shoe, the vertical slides Q, and the mechanism for moving the same to apply or release the grip, substantially as set forth.

9. The plate F and movable mechanism for supporting the same from the car, and the hanging standard H, connected with such plate, in combination with the gear-wheel 26 and shaft 17, having a journal box or bearing upon the plate F, the crank-arm 16 at the end of the shaft 17, the crank-arm 23, forming with the arm 16 a toggle, the vertical slides Q, and the grip-shoe connected with the same and receiving their motion from the toggle, and the rack-bar T, for moving the gear 26, substantially as set forth.

10. The combination, with the plate F and the grip mechanism therewith connected, of the hooks 3, for supporting such plate, the shafts D and bearings for sustaining the hooks, the lever-arms 4, links 5, three-part lever G and hand-lever G′, and link 7, for actuating the hooks in connecting or disconnecting the plate F, substantially as set forth.

Signed by us this 27th day of November, 1888.

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Witnesses:
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