

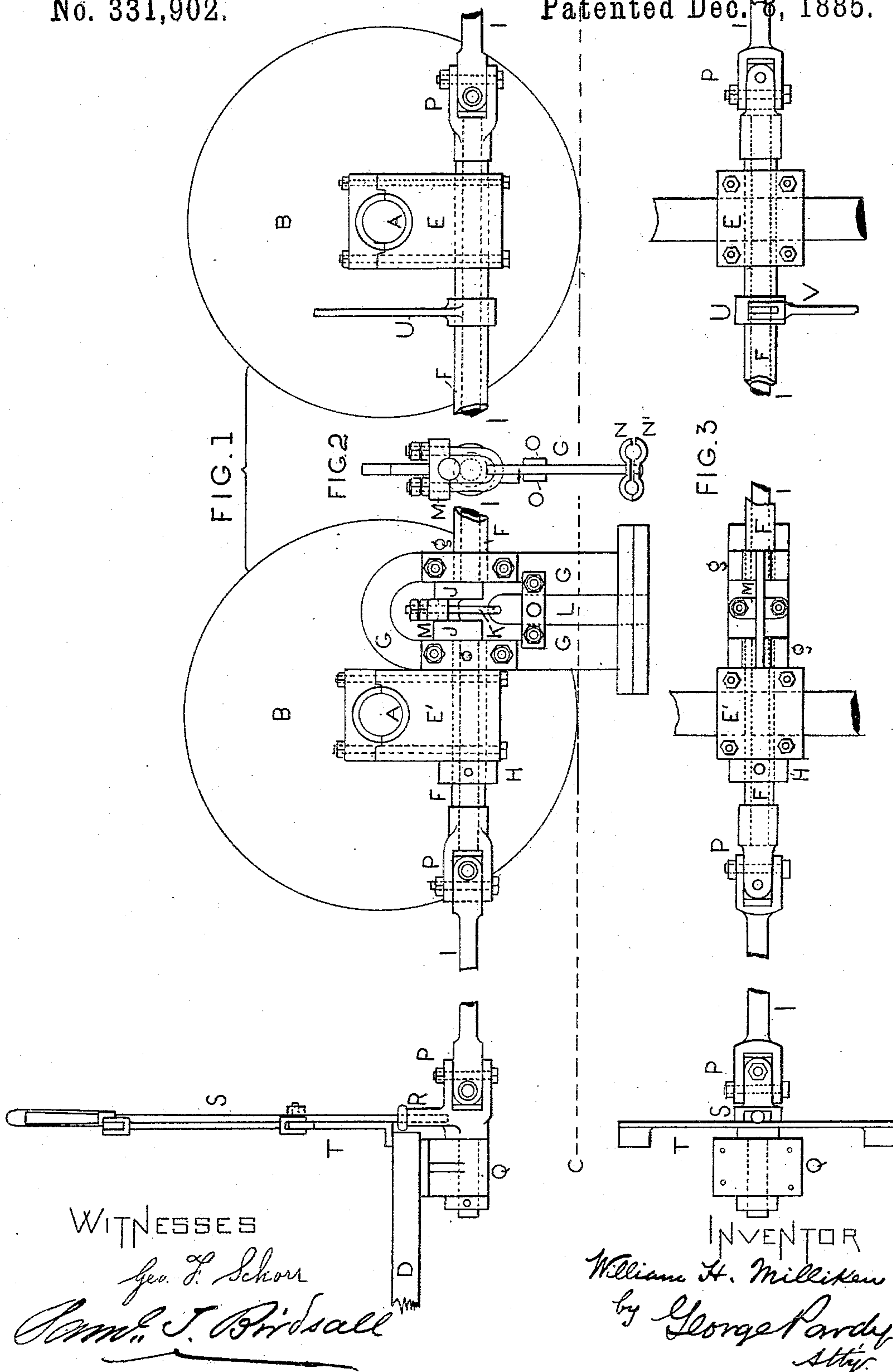
(No Model.)

W. H. MILLIKEN.

GRIPPING DEVICE FOR ROPE RAILWAYS.

No. 331,902.

Patented Dec. 8, 1885.



UNITED STATES PATENT OFFICE.

WILLIAM H. MILLIKEN, OF SAN FRANCISCO, CALIFORNIA.

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To all whom it may concern:

Be it known that I, WILLIAM H. MILLIKEN, a resident of San Francisco, State of California, have invented an Improved Gripping Device for Cable Railways, of which the following is a specification.

The invention relates to grips which operate in underground tubes, and has for its objects, first, to produce a grip which will, in the act of opening it, release the rope to rest it upon the main carrying-wheels, instead of, as heretofore, carrying the rope in the grip to drag through it and cut the jaws thereof or to drag over anti-friction rollers placed at each end; second, to produce a grip which may in a convenient manner be withdrawn from the rope-carrying tube without detaching it, so as to permit the car to proceed over a connecting line having no underground rope or tube, or to switch off from the up-line to the down-line, or vice versa, without it being necessary to run the rope-tube through the switch; third, to produce a grip which may be operated conveniently and effectively from either end of the car, while the grip is supported under the car upon the wheel-axles; fourth, to produce a grip which will take the rope on either side of its upright shank without turning the grip around, so that the rope may be led upon either side of the slot in the tube without it being necessary to conform to the construction of the grip or providing facilities for turning the car around, or crossing the rope to get the grip upon the right side, &c.; fifth, to produce a grip of such compact construction as to obtain ample accommodation in a minimum-sized rope-carrying tube.

In the accompanying drawings, Figure 1 is a side elevation, in two broken parts, of my grip and its operating mechanism detached from the car. Fig. 2 is a sectional elevation to illustrate the form of the gripping-jaws. Fig. 3 is a plan.

The same letters of reference indicate the same parts in all the figures.

A A are the wheel-axles of the car; B B, the wheels.

C is the line of the road-bed or rails, and D is the end platform of the car. (This is shown in the drawings below its proper elevation for

want of room on the sheet. It will stand several inches above the axles.)

E E' are hangers, in shape like an ordinary pillow-block, which hang in the middle of each axle to form carriers for the two parts of the long hollow shaft F, running lengthwise of the car below the axles. The two opposing ends (between the axles) of this hollow shaft enter and are secured in clamp-boxes g, formed in the opposite limbs of the frame G, which frame is shaped like a horseshoe-magnet. The caps of these clamp-boxes are secured to the frame by bolts, and they may be drawn up so tightly upon the ends of the hollow shaft as to prevent either piece of this shaft from turning in the boxes; also, a couple of small pins or keys may be used, if necessary, to prevent any possible movement of the shaft independent of the frame. The short piece of this hollow shaft, which is accommodated in the hanger E', has a collar, H, upon the end projecting through the hanger opposite the grip-frame, which collar is made fast by set-screws, so that when this collar rests next to one face of the hanger, and the grip-frame is close against the other face of the hanger, all longitudinal movement, as far as the hollow shaft and grip-frame are concerned, is prevented. Passing through this hollow shaft there is a solid shaft, I, which has a double crank, J, at that part which is between the two limbs of the horseshoe-frame G. From this crank there depends a link, K, to connect with the upright bar L of the grip. This link is simply a stirrup-bolt, which stands with its ends upward, one end on each side of the crank-pin. These ends pass through the cross-bar M, and a couple of screw-nuts keep the bolt from drawing back through the bar. The bar M rests on the crank-pin, and from the crotch of the bolt the bar L is hung, the bolt passing through a hole in this bar. The lower ends of the frame G are firmly secured in the middle of the plate N, which plate has two semicircular recesses on its under side, on either side of the frame, which recesses correspond with the diameter of the rope. A similar plate, N', is firmly attached to the lower end of the upright bar L, with concave recesses on the upper side to correspond with those on

the plate above it. This latter plate is allowed a rocking motion on the bar, so that when the rope is grasped by one side of the over and under lying plates the opposite extreme edges of these plates may be allowed to meet together and form, as it were, the fulcrum of the leverage which the under plate obtains. The bar L is guided and held between the cross-plates O, bolted to the opposite sides of the limbs of the frame G; also, it is further held and guided by passing through the center of the upper plate, N. The solid shaft I has a section at each end with a universal-joint connection, P, (a section at one end only is shown in the drawings, the other end being the same,) because as this shaft cannot be maintained in line, owing to the ends finding support in the bearings Q on the car-floor, while the middle has to pass at a lower elevation under the axles, these elevations varying in relation to each other, owing to the car-springs being at different times more or less compressed. It is therefore necessary to give flexibility to the shaft. The universal joints are made in ordinary fashion. A couple of forked ends interlock at right angles and supply bearings for the four pivots equidistantly projecting from four points in the circle of the block interposed between the overlapping forked ends. Inasmuch as the crank part of the shaft must be passed through the hollow shaft, it is necessary that the forked ends on this part shall be separate pieces, to be fitted and placed after the said shaft shall have been passed through the hollow one. The forked ends of the intermediate pieces may be forged on the shaft, as shown in the drawings. On the two last forked ends of the shaft next to the end platforms there are formed the sockets R, to receive the lower end of the hand-lever S. This hand-lever is the common locomotive reversing-lever, with the usual spring-pawl. There is also the notched quadrant T, as commonly applied. There is a lever, U, secured to the hollow shaft, which will have a suitable connecting-rod, V, to lead from under the car to the side thereof, with properly-formed handle. When this lever is pulled over, the hollow shaft turns and swings around the whole of the grip-frame until it may stand horizontally instead of vertically. Of course this can only be done at a point in the road provided with a suitable opening to permit the operation. When the lever S is swung out of its perpendicular, either to the right or to the left, the crank-shaft I is turned, and the bar L is lowered, to deposit the rope carried in the lower plate, N', upon the car-

rying-wheels. When the lever is again brought to its upright position, the rope is lifted from the carriers and firmly grasped between the two plates. The hand-lever S may be so placed with relation to the position of the crank that it may stand vertically, if preferred, when the grip is open, or it may have any other position chosen.

What I claim as my invention is as follows:

1. In a rope-gripping device for underground rope railways, the combination of the horizontally set over and under gripping-plates N N', and mechanism for raising and lowering the under plate separately, to lower the rope to and lift it from the main rope-carrying wheels in the act of gripping and releasing the rope, as and for the purpose herein described.

2. A rope-gripping device consisting of the combination of a grip-frame having axial supports, around which the gripper may be swung to remove it from and replace it in the rope-carrying tube, and the operating hand-lever connected with said gripper, arranged so as to be unaffected by the swinging of the main frame, substantially as and for the purpose herein described.

3. In a gripping device for rope-railways, the combination of the hollow shaft F, suitably supported, and to which the grip-frame is attached, with the solid crank-shaft I, there-through passing and operating the grip-bar L, (it being suitably connected therewith,) to give motion to open and close the gripping-jaws, as and for the purpose described.

4. In a rope-gripping device for rope railways, the combination of the gripping-plates N N', having their grooves to receive the rope on either side of the grip-frame, with suitable mechanism for operating the same, as and for the purpose described.

5. The rope-gripping device consisting of the combination of the frame G, bar L, plates N N', shafts F and I, lever S, and quadrant T, the whole suitably supported, arranged, and connected together, substantially as and for the purpose herein described.

6. In rope railways, the combination of the horizontal shaft I, set lengthwise of the car, the hand-lever S thereon, secured and moved crosswise of the car, and quadrant T, as a means of operating suitably a gripping device.

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Witnesses:

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