

(No Model.)

3 Sheets—Sheet 1.

A. H. LIGHTHALL.
GRIP FOR CABLE RAILWAYS.

No. 288,180.

Patented Nov. 6, 1883.

FIG. 1.

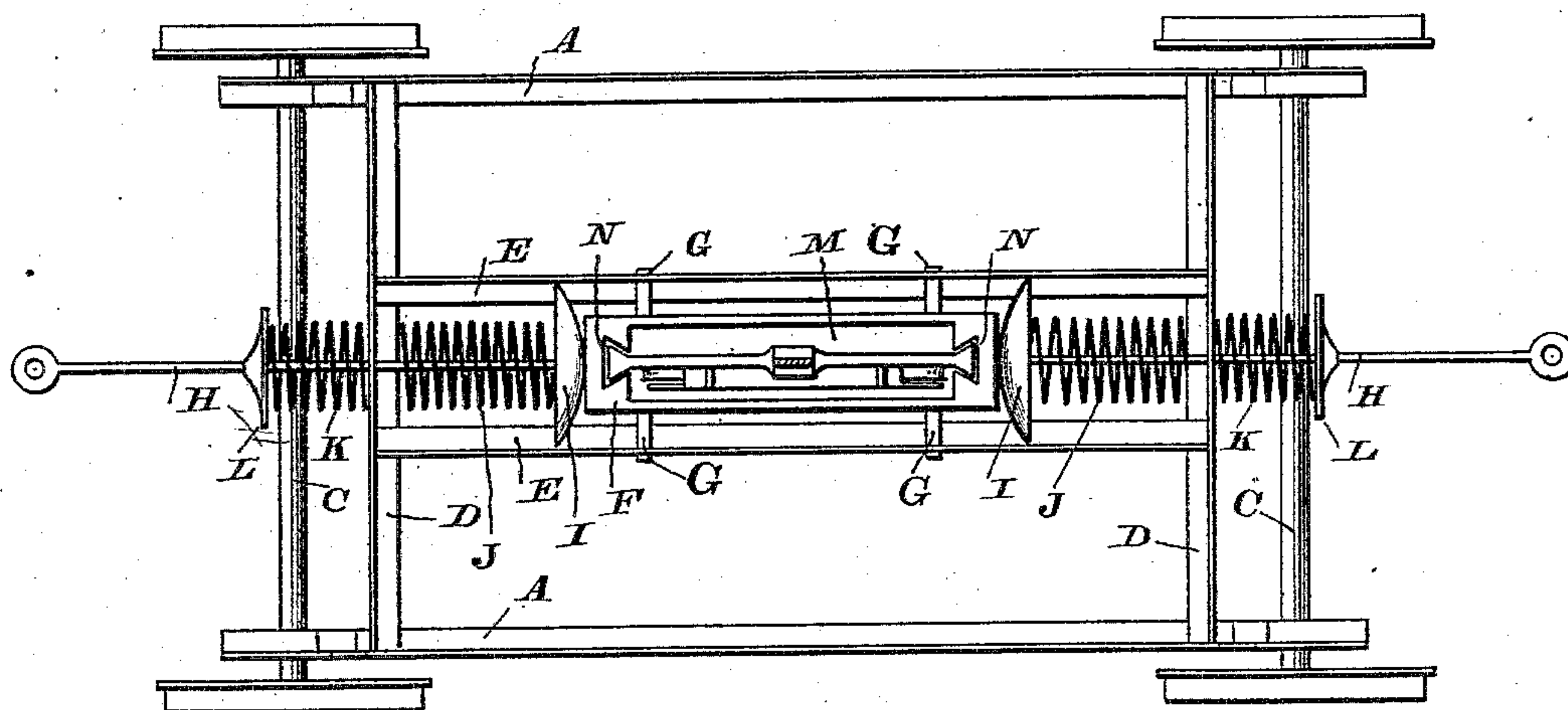
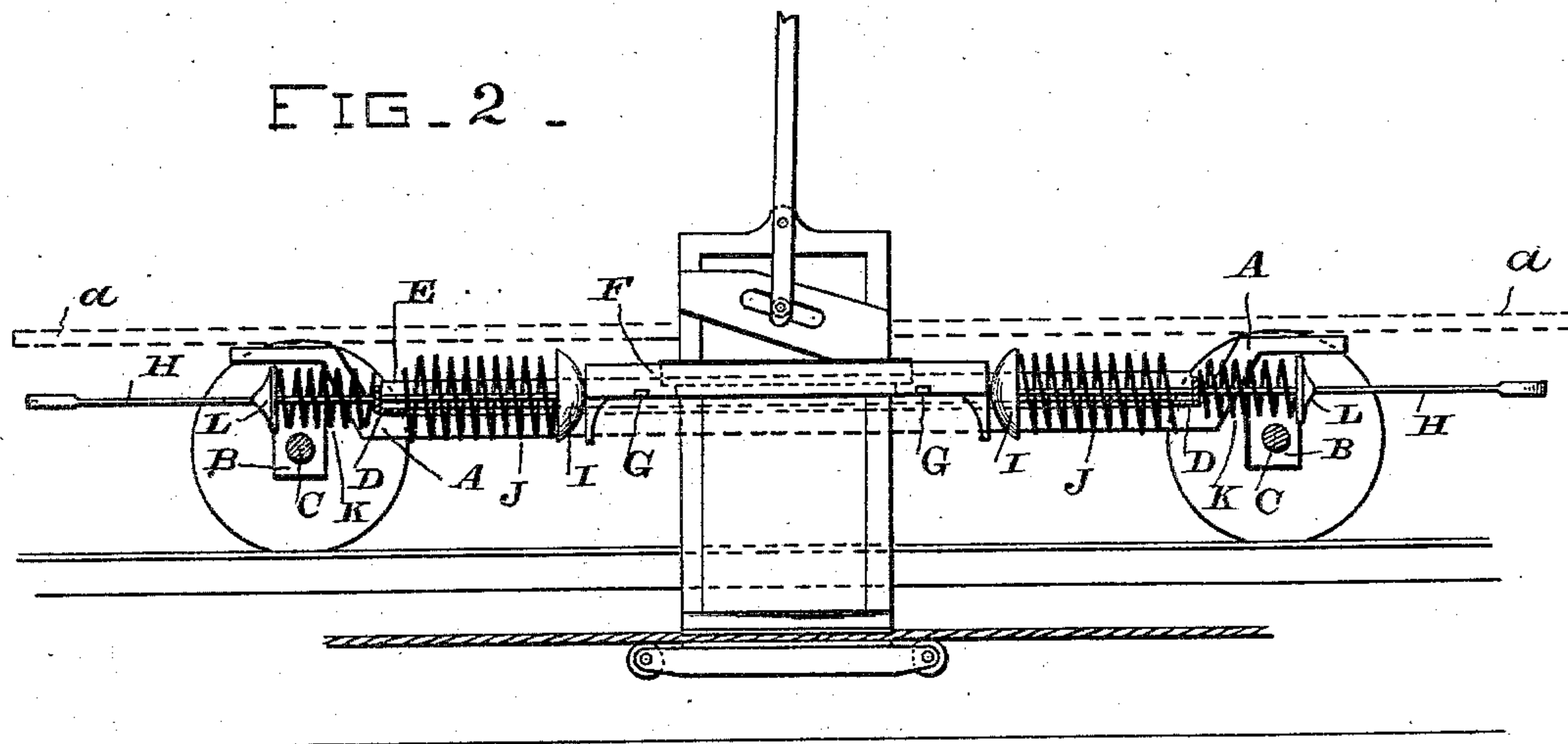


FIG. 2.



WITNESSES.
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Edmund Derby.

INVENTOR.
Alvin H. Lighthall
By *C. M. Smith*
Attorney

(No Model.)

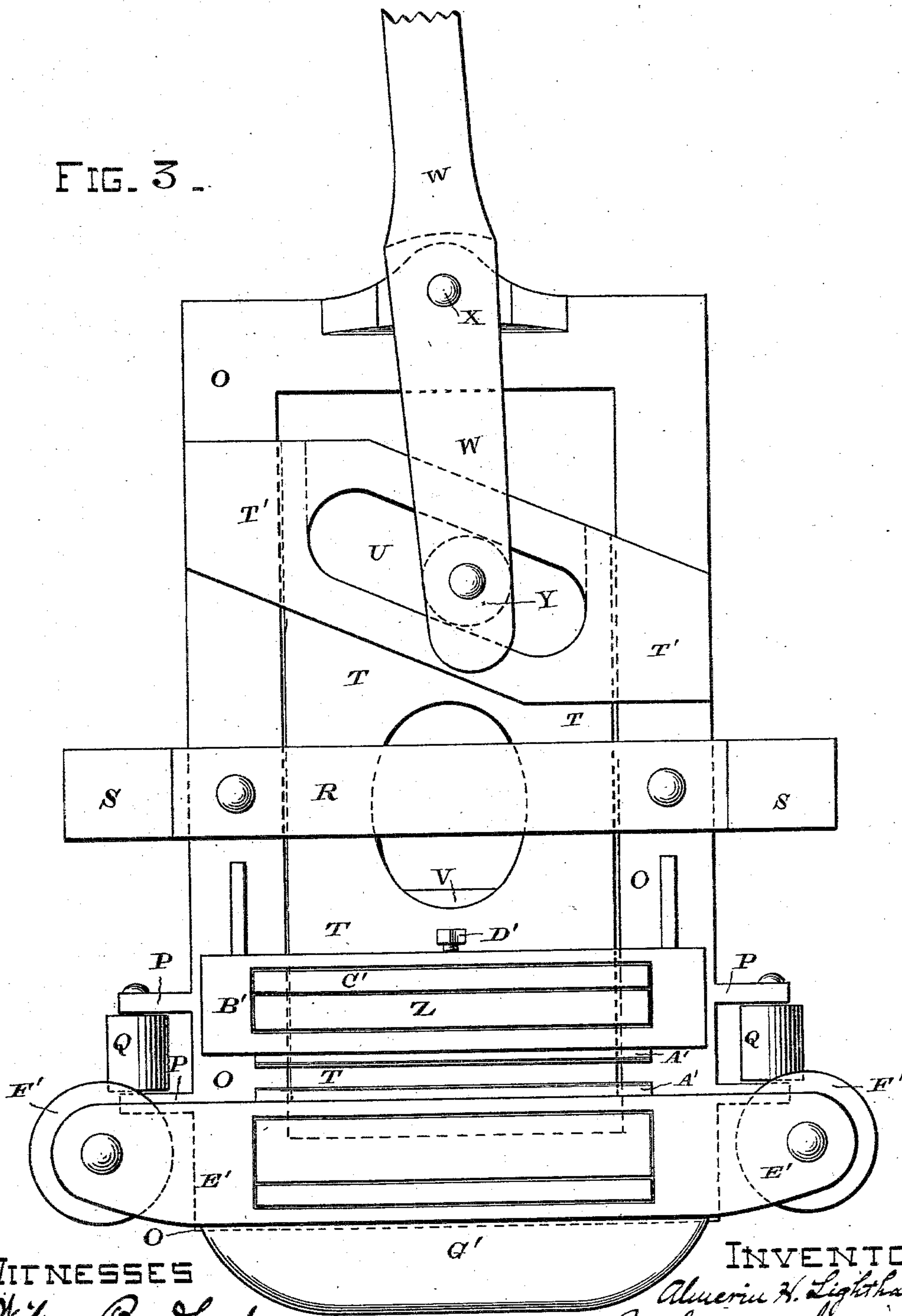
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FIG. 3.



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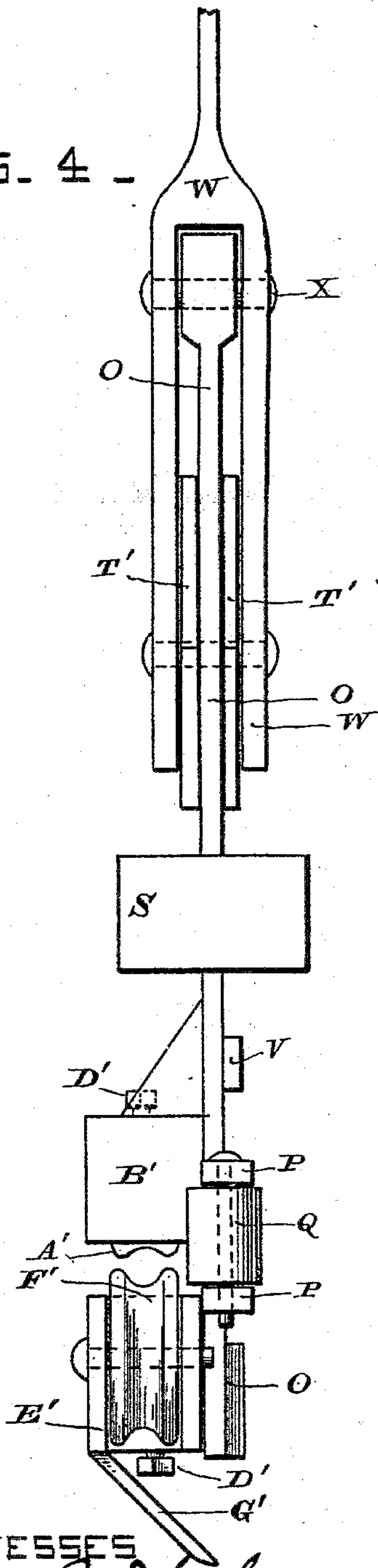
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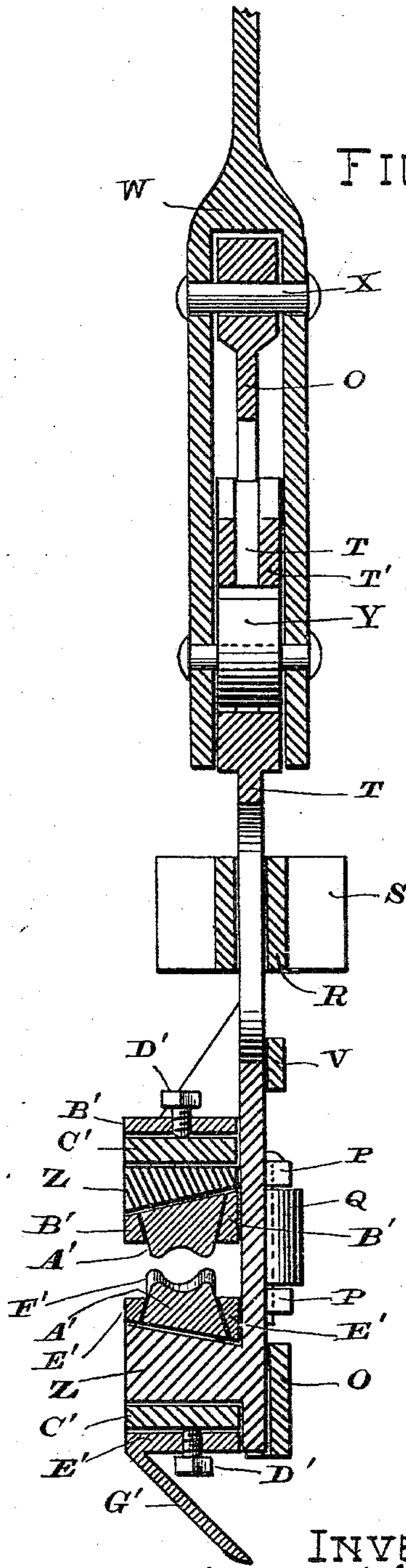
FIG. 4 -



WITNESSES

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FIG. 5 -



INVENTOR

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UNITED STATES PATENT OFFICE.

ALMERIN H. LIGHTHALL, OF SAN FRANCISCO, CALIFORNIA.

GRIP FOR CABLE RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 288,180, dated November 6, 1883.

Application filed February 3, 1883. Renewed October 9, 1883. (No model.)

To all whom it may concern:

Be it known that I, ALMERIN H. LIGHTHALL, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful improvements in grips for endless-cable railroads and means for attaching such grips to the dummy or car, of which the following is a specification.

The objects of my improvements are, first, to provide a grip for endless-cable railroad cars or dummies which will be certain in its action, and which may be produced at a very low cost of manufacture; second, to provide an endless wire-cable grip with removable gripping-dies; third, to provide a means for attaching the grip to the body of the dummy, so that it may be easily removed therefrom whenever necessary; fourth, to provide a means whereby the sudden jar imparted to the dummy or train of cars, when the gripping-jaws close upon the moving cable, may be avoided; fifth, to provide an improved form of construction for the supporting frame-work of the dummy-car and grip-carrying frame. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of the supporting frame-work of the dummy, showing the grip and its cushions or buffer-head attachments in position; and Fig. 2 is a central vertical longitudinal sectional view of the same. Fig. 3 is a front elevation of the grip. Fig. 4 is an edgewise view, and Fig. 5 is a central vertical sectional view of the same.

Similar letters of reference are used to designate like parts throughout the several views.

A A represent two parallel strips or lengths of angle-iron, to the under side of which I bolt the boxes B B of the car-wheel axles C C, and which also support the car floor or platform a. (Shown by dotted lines in Fig. 2.)

Near each end of the two side beams, A A, I bolt the transverse angle-irons D D, and upon these beams are bolted the angle-irons E E, which are placed but a short distance apart and support the sliding grip-carrying frame F. This grip-carrier is cast in one piece, and is provided upon each side with two projecting arms, G G, which enter slots cut in the angle-iron beams E E.

The draw-bars H H are extended through the transverse angle-beams D D, and are provided upon their inner ends with semi-oval or disk-shaped heads I I, the outer or rounded surface of each of which rests against the end of the grip-carrying frame F, while the inner surface forms a thrust-bearing for one end of the coiled spring J, which surrounds the draw-bar, while the opposite end of the spring rests against the transverse beam D. Upon the opposite side of these beams D D, and likewise surrounding the draw-bars, I place the coiled springs K K, confined in position by the heads or collars L L.

The grip-carrying frame F is made rectangular in plan, and with a central opening, M, to receive the grip. The ends of this frame are made thicker than the sides, and are provided upon their upper faces with dovetailed recesses N N, the object of which will be hereinafter more fully explained. When the gripping-jaws are clamped upon the moving cable, the grip-carriage will be suddenly forced against the forward one of the springs J; but as the compression of the spring is gradual no jar will be felt by the passengers on the dummy. The car following and attached to the dummy by the rear draw-bar will be started without any jerk, by reason of the gradual compression of the rearmost one of the springs J. In stopping the train the rear spring, K, will prevent any jarring or bumping of the dummy and car against each other. The springs K K are, however, mainly intended to equalize the action of the springs J J. The grip is constructed of an inclosing rectangular frame-work, O, cast in one piece, and upon each side, near the lower end, are formed lugs P P, carrying anti-friction rollers Q Q, which serve to guide the grip when traveling around a curve in the roadway. At any suitable point about midway of the height of this frame, and upon both sides thereof, I bolt the cross-bar R, the outer ends of which are made flaring, so as to form dovetail tenons S, which fit within the dovetail mortises N in the sliding grip-carrying frame F, and are secured therein by set-bolts or any other well-known means. This cross-bar also forms a retaining-guide for the flat plate T, which carries the lower grip-die, and which is contained within the frame O.

Near the upper end of the plate T, I cut an inclined slot, U, and strengthen this part by a double thickness of metal, which is projected beyond the sides of the sliding plate and overlap the framing O, thus forming a guide for the upper part of the plate. A cross-piece, V, is cast upon the lower end of the said plate for the same purpose.

A lever-handle, W, is pivoted by a bolt, X, to the upper part of the grip-frame, and its lower end is forked and provided with an anti-friction roller, Y, which traverses the slot U. As the lever W is moved forward or backward, the roller Y is caused to travel back and forth within the inclined slot U, and the plate carrying the lower die is by this means raised and depressed.

The gripping-jaws are placed at the lower end of the device, the upper or fixed jaw being attached to the frame O, and it consists of a sustaining cross-bar, Z, extending from side to side of the frame-work. This cross-bar is given an inward bevel upon its under face, in order that the grip-die may be firmly held in place. The grip-die A' is hollowed out upon its under face to conform to the curvature of the traction-cable, and is made beveled upon its sides and top, as shown in Fig. 5. Before being placed in position upon the grip, the die is inserted into an open frame-work, B'. (Seen in front elevation in Fig. 3 and in cross-section in Fig. 5.) This frame is then placed upon the horizontally-projecting cross-bar Z, with the top of the die next below the cross-bar. A quoin, C', is then inserted into the frame above the cross-bar, which brings the die up close against the under beveled surface of the bar. The set-screw D', which passes through the top side of the frame, is then tightened up and the whole firmly clamped into position.

The construction of the lower die, which is carried by the movable plate T and its adjacent parts, is the same as that of the upper die, except that the beveled surfaces are inclined inward and downward. The two ends of the lower die's frame E' are extended out to form bearings for the hollowed rollers F' F', over which the cable passes when not held by the gripping-dies, and as the upper edge of these rollers are raised above the top edge of the lower die, it will be seen that the cable is permitted to pass through the grip when the dummy is standing still, and to do so without abrading itself against the rigid portions of the grip. An inwardly-beveled flange, G', is cast upon the lower side of the frame E'. In order that when the cable is to be "picked up" and the lower jaw is depressed for that purpose, the cable will be deflected outwardly and will be enabled to rise upon the open side of the grip.

It is obvious that the flange or guard G' instead of being cast upon the frame E' may, if desired, be cast upon the lower quoin C', and made to curve around the edge of the frame E' without affecting the functions of the parts.

The form of this guard-flange is shown in Figs. 3, 4, and 5, and is such as to enable the grip to be kept clear of the carrying-pulleys in case the shank of the grip should become bent or otherwise injured.

I am aware that grip-carrying frames have been provided with springs adapted to lessen or obviate jar when the grip is made to close upon the cable; but this I do not claim, broadly. By arranging the grip-carrying frame and its springs in connection with double-acting draw-heads, as shown, the gripping jar, as well as that due to concussion by the draw-heads of the dummy and adjacent cars, is entirely taken up and not communicated to the bodies of the dummy or cars.

Owing to the manner in which my grip is constructed, I am enabled to cast each separate frame in one piece and avoid the necessity of using bolts and screws to hold them together; and, further, that by the employment of a sliding grip-carrying frame whose forward and backward movements are controlled by the buffer heads or collars and coiled springs upon the draw-bars I am enabled to avoid the sudden jar given to the dummy and train when the gripping-jaws close upon the cable.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The grip-carrying frame F, supported upon a suitable open frame-work and controlled in its forward and backward movements by the action of coiled springs J and K, surrounding the draw-bars H, and held to place by suitable fixed bars, disks, or collars, substantially in the manner and for the purpose herein set forth and described.

2. In a grip for cable railroads, the combination of the horizontally-projecting beveled cross-bars Z Z, gripping-dies A' A', die-frames B' E', quoins C' C', and set-screws D' D, substantially as shown, and for the purpose set forth.

3. The combination of the grip-carrying frame F, having beveled rabbets N N, with a grip having a carrying-bar, R, provided with tenons S S, adapted to fit into said rabbets, substantially as described.

4. The combination, with the grip frame or plate T, having beveled projection Z, of the lower die, A', frame E', carrying rollers F' F', the quoin C', and the set-screw D', whereby the rollers F' and die A' are detachably connected to their supporting-frame, substantially as described.

5. The combination, with the frame of a cable-grip, of an inwardly-beveled guard-flange G', having rounded ends, substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand and seal.

ALMERIN HUBBELL MIGHTHALL. [L. S.]

Witnesses:

F. H. SCHOTT,
WM. H. BATES.