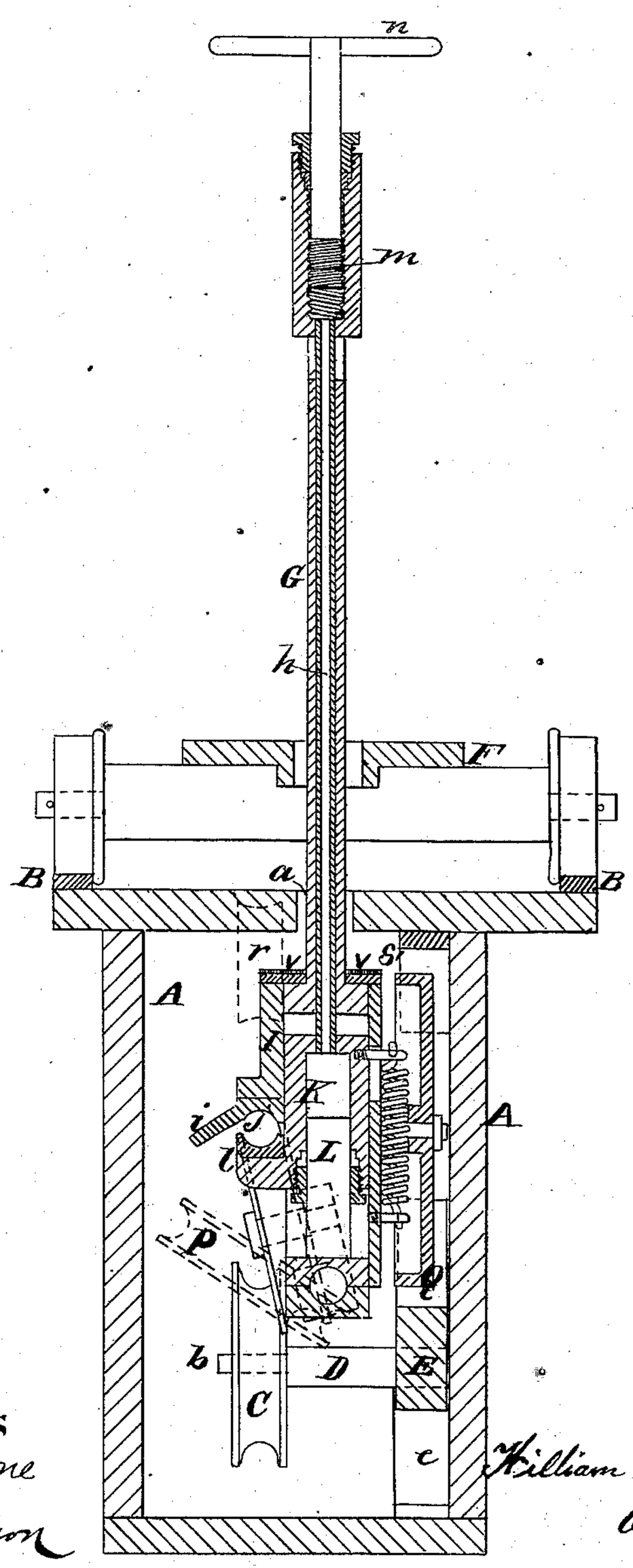
2 Sheets--Sheet 1.

W. EPPELSHEIMER.

Clamp-Apparatus for Connecting Street-Cars, &c., with Endless Traveling-Devices.

No. 160,757. Patented March 16, 1875.

Fig. 1.



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Attys

2 Sheets--Sheet 2.

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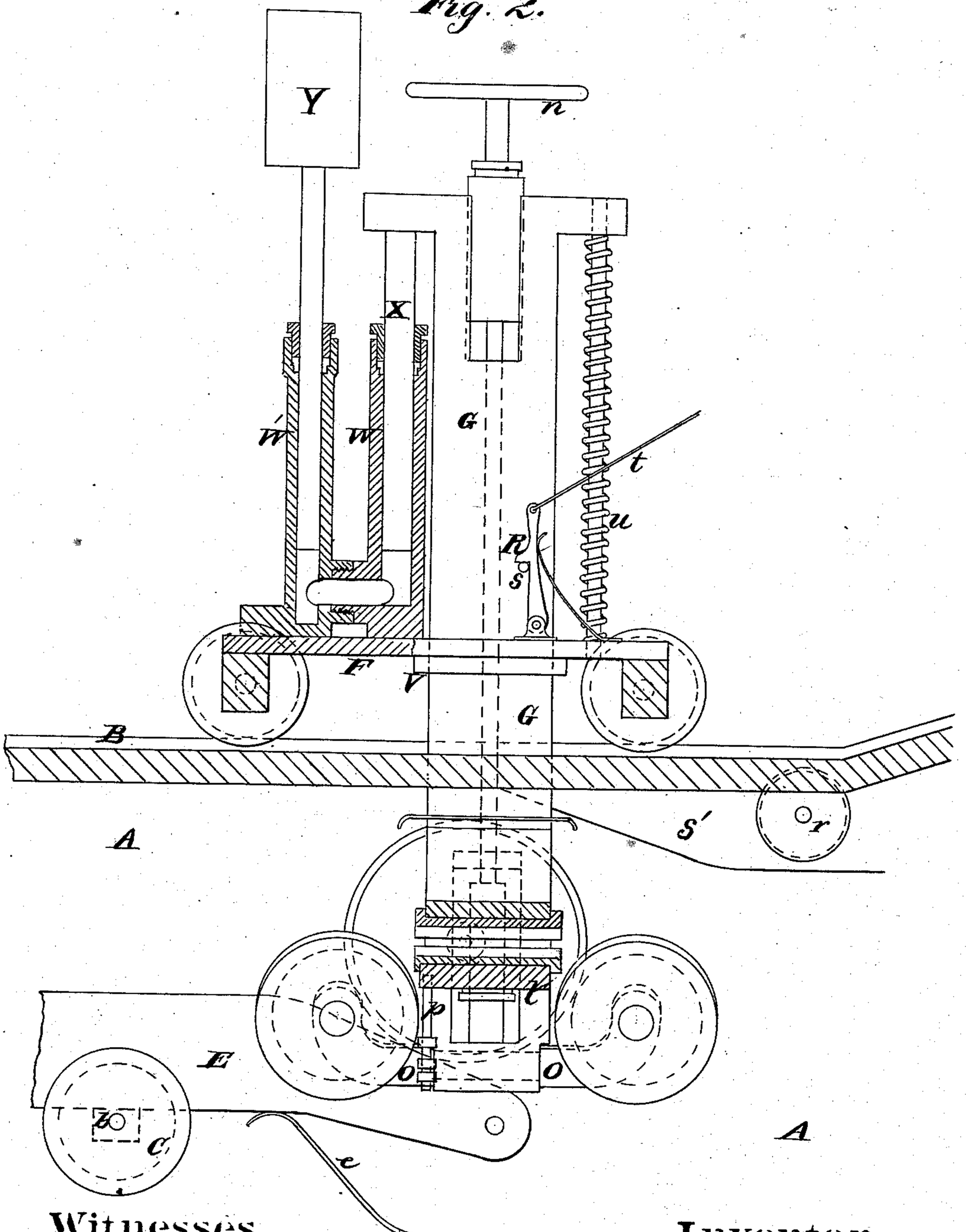
Fig. 2.



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UNITED STATES PATENT OFFICE.

WILLIAM EPPELSHEIMER, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN CLAMP APPARATUS FOR CONNECTING STREET-CARS, &c., WITH ENDLESS TRAVELING DEVICES.

Specification forming part of Letters Patent No. **160,757**, dated March 16, 1875; application filed August 13, 1874.

To all whom it may concern:

Be it known that I, WILLIAM EPPELSHEIMER, of San Francisco city and county, State of California, have invented an Improved Rope-Griping Apparatus; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention or improvement without further invention or experiment.

My invention relates to improvements in that class of griping devices which is employed for connecting street or other vehicle or vessel with an endless moving rope, for the purpose of propelling the car along a track or tracks.

My improvement consists in an improved arrangement for supporting the endless wire-rope which performs the traction; and, secondly, of an arrangement for converting the griping device into a safety-brake, in case an accident should occur on a hill-side, by which the car or vehicle would be in danger of running away.

Referring to the accompanying drawing, Figure 1, Sheet 1, is a sectional elevation of the griping apparatus and tube. Fig. 2, Sheet 2, is a side sectional elevation of the same.

A is the tube or tunnel through which the endless traction-rope passes, and which has a longitudinal slot, *a*, along its top, through which the shank of the griping attachment passes. This tube I have represented with straight sides, but its form is immaterial. B B are the tracks upon which the wheels of the car move, and which are usually placed one upon each side of the slot *a*, and equidistant from it, although in some instances the tube may be placed at one side of the track, or other place, for convenience. The traction-rope I support upon pulleys C, which are placed at suitable intervals apart inside of the tube A. Each of these pulleys is mounted upon a journal, *b*, at the end of an arm, D, and the arm D is secured at right angles to the free end of a pivoted spring-lever, E. This lever has one end pivoted to the side of the tube A, and is supported by a spring, *e*, which is of sufficient strength to support the weight which will come upon the pulley, and the arm D is long enough to support the pulley near the middle line of the tube.

My object in thus mounting the pulley will be shown hereafter.

F is the frame of the small car or dummy, which is usually employed for carrying the griping attachment, and with which the car to be propelled is connected, it having been found more convenient to employ such a traction-car than to attach the griping device directly to the passenger-car; but, if desired, the dummy-car can be dispensed with, and the device attached directly to the passenger-car. The shank G of the griping device is secured vertically in the frame F of the car, so that its lower end will pass through the longitudinal slot in the tube A, while its upper end extends far enough above the platform of the car to be easily reached by a person standing on the platform. The shank G has a pipe, *h*, passing lengthwise entirely through it. The lower end of the shank inside of the tube A is enlarged, and formed into an inverted cup or cylinder, I, the lower end of which is open. The lower edge of one side of this cylinder is formed into a jaw, J, which forms the permanent or stationary griping-jaw of the apparatus. Inside of this inverted cup or cylinder is another smaller inverted cup or cylinder, K, which fits down over a piston, L, so that it can move up and down the piston inside of the cylinder I. The tube *h* extends through the upper end of the inverted cylinder I, and is screwed into the upper end of the inside cylinder K, so that when the liquid is forced down through the tube *h* into the chamber, between the piston L and cylinder K, the pressure will force the inside cylinder K and pipe *h* upward.

This movable cylinder K has a projecting flange, *l*, extending out below the fixed jaw J of the cylinder I, and this flange forms the movable griping-jaw, being properly constructed to gripe the rope between it and the upper jaw. The upper end of the tube H is formed into a short upright cylinder in which a screw, *m*, is turned. This screw is operated by means of a hand-wheel, *n*, or any convenient device which will act as a force-pump can be applied

instead of this screw and wheel. The tube *h* I keep continually filled with water or other liquid, preferably glycerine, so that by operating the screw *m*, or other force at the upper end of the shank, the liquid will be forced down through the pipe *h* into the chamber between the upper end of the fixed piston L and the head of the inside moving cylinder K, and by creating a pressure in this chamber lift the movable cylinder K until its flange or jaw *l* closes against the fixed jaw J, or until the rope is clamped between the two jaws. A spring separates the jaws the instant that the hydrostatic pressure is removed, or a downward pressure applied to the tube *h* will move its back to its depressed position.

The upper or fixed jaw J has a guiding-flange, *i*, projecting from it at an angle by which the rope is guided to its proper seat when the griping-jaws are lowered upon it, and which prevents it from becoming displaced when the griping-jaws are separated so as to allow it to move between them.

The lower end of the griping attachment is formed into a box in which a journal which is formed on the middle of a bar, O, is secured. The ends of this bar extend out on each side of the attachment, and to each of its ends is secured a pulley, P. These pulleys stand at a slight inclination, but have their faces in line with the seats in the griping-jaws, so that the rope will rest in the grooves in their faces when the lower jaw is lowered. The bar O is connected with the lower or movable jaw by a rod, *p*, so that the bar is partially rotated by the raising and lowering of the movable jaw; thus, when the jaw is slightly lowered, the pulleys support the rope and prevent it from wearing on the under jaw when the car is standing still and the rope is moving between the two jaws, but when the jaws are widely separated the rod *p* causes the bar O to partially rotate, so as to carry the rope-supporting or upper edge of the pulleys outward and downward, while the curve described by the upper edges of the pulleys will cause them to carry the rope with them in their outward movement free from the jaws. The rotary movement of the bar O and its pulleys is not necessary, as I will, in most instances, secure the bar immovably to the jaw, so that its pulleys will merely support the rope.

On the side of the attachment opposite the griping-jaws I mount a large wheel, Q, next to the side of the tube A, in the proper position to move over and depress the inclined spring-lever E, which carries the rope-supporting pulley C. This wheel depresses the rope-supporting pulley and holds it down while the griping attachment is passing over it, and releases it after the attachment has passed, so that it can resume its former position and support the rope.

In passing from an incline to a level the propelling-rope will press upward against a pulley, *r*, which is secured to the upper side of the tube. The pulley Q will move over an inclined projection, S′, and thus lower the whole griping device.

This griping attachment I also employ as a brake to stop the car, in case of accident on a hill-side, by the following means: When in ordinary use for griping the rope, the attachment is held down to its proper position on the car or dummy by a spring-dog, R, which has one end secured by a pivot or equivalent hinge-joint to the platform of the car. The upper end of this dog latches over a pin, *s*, on the side of the shank G, and a cord, *t*, is secured to its upper end and carried back into the car, or connected with a centrifugal governor, so that a pull upon the cord will release the dog from the pin. A spiral spring, U, is arranged around a spindle which extends upward from the platform and passes through an arm at the upper end of the shank. This spring is condensed when the dog R is caught over the pin *s*, so that when the dog is released the energy of the spring will be exerted to force the entire attachment upward until the shoulder V, which is formed on the shank inside of the tube by the upper end of the enlargement or cylinder I, presses against the under side of the top of the tube A, and thus serves as a brake to stop and hold the car. If desired, a separate shank without the griping-jaws can be employed as a safety-brake.

Instead of employing the shoulder on the inside of the tube A as a brake, a shoulder could be formed on the shank above the tube, and hydrostatic pressure applied to force the shank downward against the upper surface of the top of the tube, and thus provide the necessary friction.

I have also represented a hydrostatic press, consisting of two barrels, W W′, in one of which is a piston, X, the upper end of which bears against a projecting arm on the upper end of the shank, while the piston of the opposite cylinder has a heavy weight, Y, secured to its upper end, so that, if necessary or required, hydrostatic pressure can be applied to lift the attachment and cause it to act as a brake.

Either or both of these devices can be used, but generally either will act sufficiently powerful, as a minimum pressure applied in this way will serve to stop and hold the car firmly, owing to the large extent of surface in frictional contact.

By the above-described mechanism I provide a greatly-improved griping attachment for the propulsion of the cars, which can be operated vertically, horizontally, or at any angle from the car.

Its operation is simple, and there is very little danger of its getting out of order.

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

1. The shank G, having the stationary cylinder I, with its fixed jaw J, in combination with the tube *h*, screw *m*, and hand-wheel *n*, and the movable cylinder K with its movable

jaw *l*, substantially as and for the purpose described.

2. In combination with the lower jaw *l*, the transverse bar O, with its vertical rope-supporting pulleys P, substantially as described.

3. The pivoted spring-lever E, with its arm D, to carry the rope-supporting pulley C, in combination with the wheel Q on the shank G, for lowering the pulley as the shank passes, substantially as specified.

4. The shank G, having an enlargement inside of the tube A, to form a shoulder, V, in combination with the spring U, for the purpose of converting the griping device into a brake, by drawing said shoulder V up against the under side of the top of the tube A, substantially as specified.

5. The spring-latch R, having one end hinged to the platform of the car, and its opposite end engaged with a pin, *s*, on the shank G, combined to be operated by a cord, *t*, substantially as and for the purpose described.

6. The projecting flange *i* on the upper jaw J, substantially as and for the purpose described.

In witness whereof I hereunto set my hand and seal.

WILLIAM EPPELSHEIMER. [L. S.]

Witnesses:
JNO. L. BOONE,
C. M. RICHARDSON.