

(No Model.)

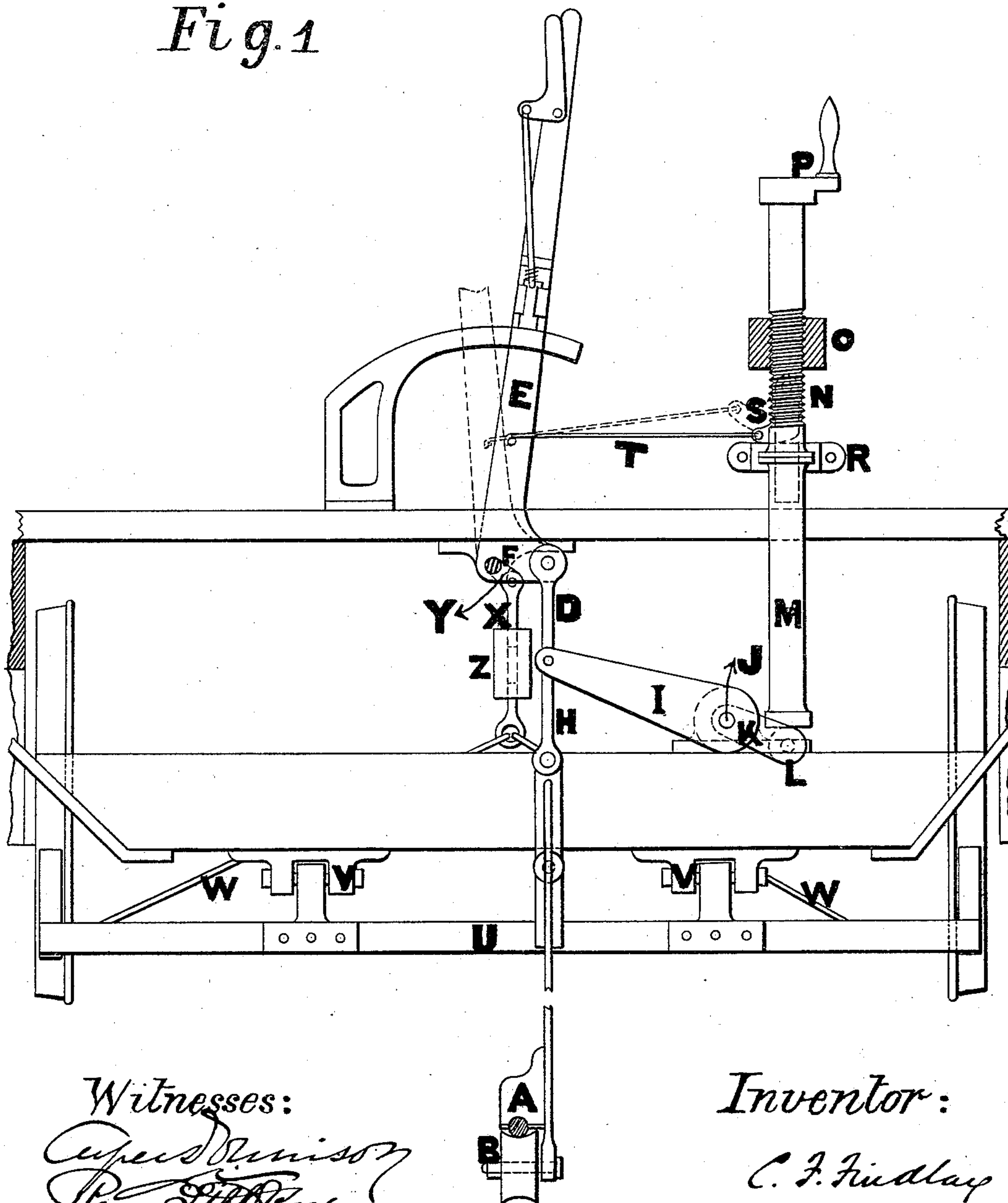
2 Sheets—Sheet 1.

C. F. FINDLAY.  
TRACTION ROPE RAILWAY.

No. 302,328.

Patented July 22, 1884.

*Fig. 1*



Witnesses:  
 Asper Minison  
 Perry L. Hays

Inventor:  
C. F. Findlay

(No Model.)

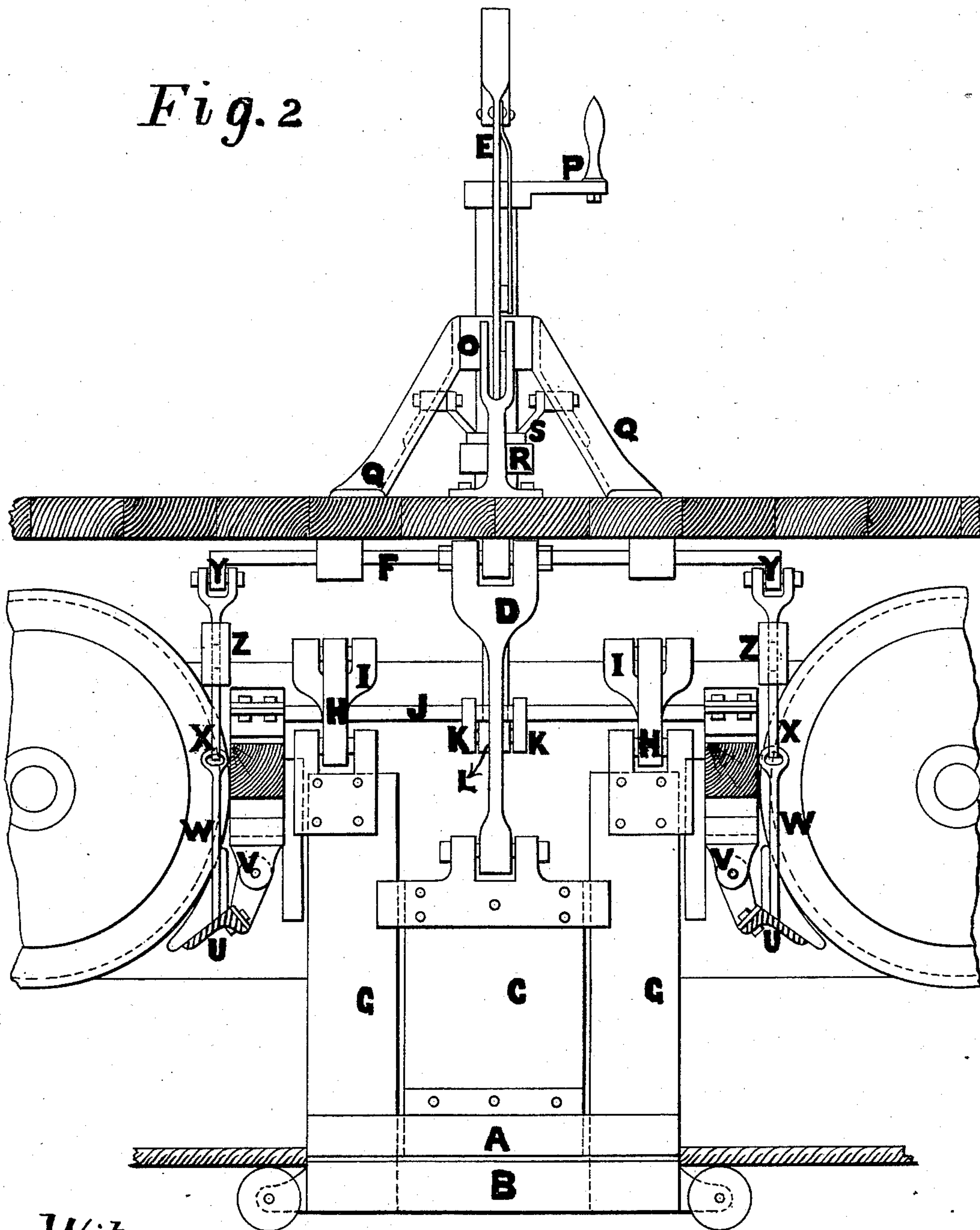
2 Sheets—Sheet 2.

C. F. FINDLAY.  
TRACTION ROPE RAILWAY.

No. 302,328.

Patented July 22, 1884.

*Fig. 2*



Witnesses:  
*Asper D. ...*  
*Percy ...*

Inventor:  
*C. F. Findlay*



# UNITED STATES PATENT OFFICE.

CHARLES F. FINDLAY, OF LONDON, COUNTY OF MIDDLESEX, ENGLAND.

## TRACTION-ROPE RAILWAY.

SPECIFICATION forming part of Letters Patent No. 302,328, dated July 22, 1884.

Application filed September 29, 1883. (No model.) Patented in England March 6, 1883, No. 1,201.

*To all whom it may concern:*

Be it known that I, CHARLES FARQUHAR FINDLAY, a subject of the Queen of Great Britain, residing at London, in the county of Middlesex, England, have invented a new and useful Gripping Apparatus for Traction-Rope Railways, (for which I have obtained a patent in Great Britain, No. 1,201, bearing date March 6, 1883,) of which the following is a specification.

The forms of gripping apparatus hitherto invented for use on traction-rope railways may be broadly divided into two classes—first, those in which, when the car stops, the rope can be entirely released from the grip, provision being made for lowering the grip to attach it to the rope, and again raising it to the level where it will clear the supporting-pulleys of the rope; and, secondly, those in which the rope is retained in the grip throughout the journey and runs over small wheels suitably arranged in the grip when the car is at rest. There are objections to both these classes of apparatus—to the former that there is a danger of the car being started before the grip has been raised to its proper level, and to the latter that there is an excessive wear, both of the rope and the grip, by the friction of the rope running through the grip during long stoppages.

My object in the present invention is to provide an apparatus which, while it will be equally simple in construction and working with those now in use, will avoid the inconveniences above described. I also provide a simple means of operating the brakes at the same time as the grip and by the same motion. I attain these objects in the manner set forth in the accompanying drawings, of which—

Figure 1 is a side view of the gripping apparatus, and Fig. 2 an end view, in which similar parts are denoted by the same letters.

The rope is gripped between an upper jaw, A, and a lower jaw, B. The jaw A is attached to a plate, C, which plate has a vertical motion by means of the link D and hand-lever E. The lever E is keyed to a shaft, F, firmly supported from the frame of the car. The lower jaw, B, is attached to plates G G, which are suspended by links H H from the ends of the levers I I, where necessary guides,

G' G', may also be fixed to the frame-work of the car, as shown in Fig. 2, so as to preserve the plates G in their proper vertical positions. The levers I I turn with a shaft, J, to which they are rigidly attached, and which is carried by bearings supported from the frame-work of the car.

On the shaft J are short levers or cranks K, through the ends of which passes a pin with a loose sleeve, L, on it. The sleeve L is depressed by means of a shaft, M, raised and lowered by the screw N, turning in nut O, by means of hand-wheel P. The nut O is supported by a fixed frame or bracket, Q Q. The shaft M is in two parts, flanged, and connected by a collar, R. The lower part of the shaft is square, and passes through a square opening in a plate let into the floor of the car. The lower part of the shaft M has thus a vertical motion with the screw, but does not revolve.

S is a stop suspended from the frame Q, and connected by a link, T, to the hand-lever E. When the lever E is in the position shown in Fig. 2, the stop rests on the collar R, and the screw cannot be raised; but when the lever is drawn back the link T draws the stop S aside into the position shown by the dotted lines in Fig. 1, and the screw is free to rise.

I connect the brakes to the hand-lever E in the following manner: The brake-blocks are attached to bars U U, suspended from and turning about pins carried in fixed bearings V V. The bars U U are raised by rods W W, connecting them to links X X, attached by pins to the lugs or eccentrics Y Y, which are rigidly attached to or form part of the shaft F. The links X X are divided, and have adjusting-screws Z Z to take up the wear of the brake-blocks.

The action of the mechanism above described is as follows: In the ordinary working of traffic, the stops of the car being short, the hand-wheel P will not be used; but the pressure on the cable will be removed by drawing to the left the lever E, which action at the same time, if carried far enough, applies the brakes by raising the links X X, and by them lifting the bars U U, which carry the blocks. When, however, a longer stop has to be made, (as, for instance, on single-track roads at passing-places, or in many other contingencies



which often occur,) the brakes will first be applied by the lever E, and then by turning the hand-wheel P, to raise the screw N, the lower jaw, B, with the cable, will be allowed to fall  
 5 by its own weight until the weight of the cable is taken off the jaw. The stop S prevents the screw being raised by any mistake without the brakes having been first applied to stop the car and the jaw A raised, and when the jaw  
 10 B has once been lowered it is seen that the car cannot be started until it has been again raised to the proper level.

I am aware that other means of connecting the gripping apparatus of a traction-rope railway to the car-brakes, so as to operate both  
 15 by the same motion, have been proposed heretofore, and in this part of my invention I only claim as new the special means I employ for the purpose.

20 What I claim as my invention, and desire to secure by Letters Patent of the United States, is as follows:

1. In the gripping apparatus of a traction-rope railway, the combination, with the movable upper jaw, A, of a lower jaw, B, having  
 25 an independent vertical motion apart from that of the upper jaw, substantially as described.

2. In the gripping apparatus of a traction-

rope railway, in combination with two jaws, 30 A and B, the link H, lever I, shaft J, and crank K, substantially as described.

3. In the gripping apparatus of a traction-rope railway, the combination of a hand-lever, E, shaft F, and link D, for applying pressure 35 to the cable, with a hand-wheel, P, screw N, and nut O, for raising and lowering the cable, substantially as described.

4. In the gripping apparatus of a traction-rope railway, the combination, with the upper 40 jaw, A, of a lower jaw, B, links H, levers I and K, shaft M, and screw N, substantially as described.

5. In combination with devices for operating the jaws of a cable-grip, the link T and 45 stop S, substantially as described.

6. The combination, with the hand-lever E, operating the gripping apparatus of a traction-rope railway, of links X, rods W, and bars U, for operating the brakes, substantially 50 as set forth.

London, August 18, 1883.

C. F. FINDLAY.

Witnesses:

ALFRED DONNISON,

PERCY L. M. KEY,

*Both of 71 Cornhill, London.*