

(No Model.)

2 Sheets—Sheet 1.

O. COPE.
CABLE RAILWAY BRAKE.

No. 407,171.

Patented July 16, 1889.

Fig. 1.

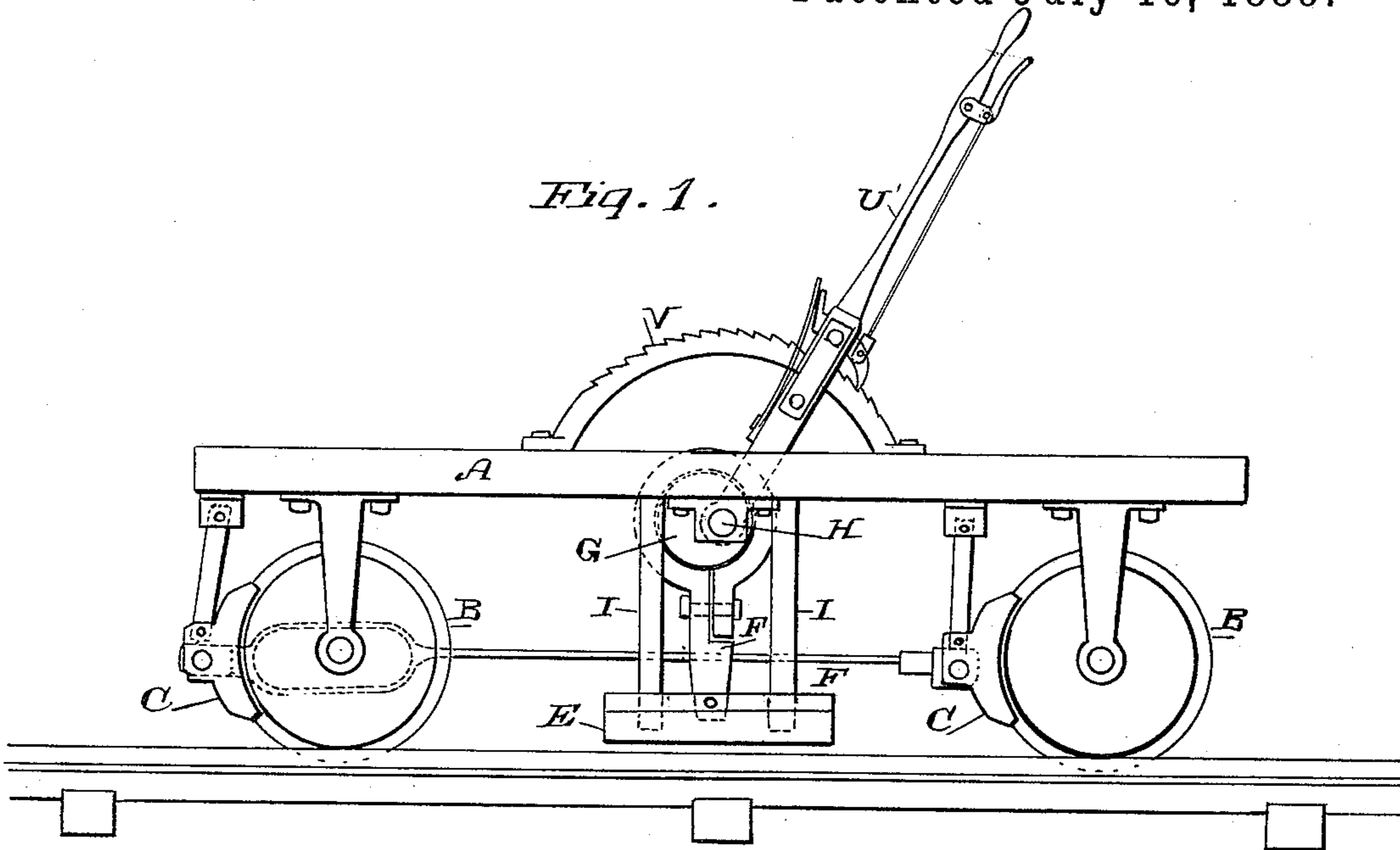
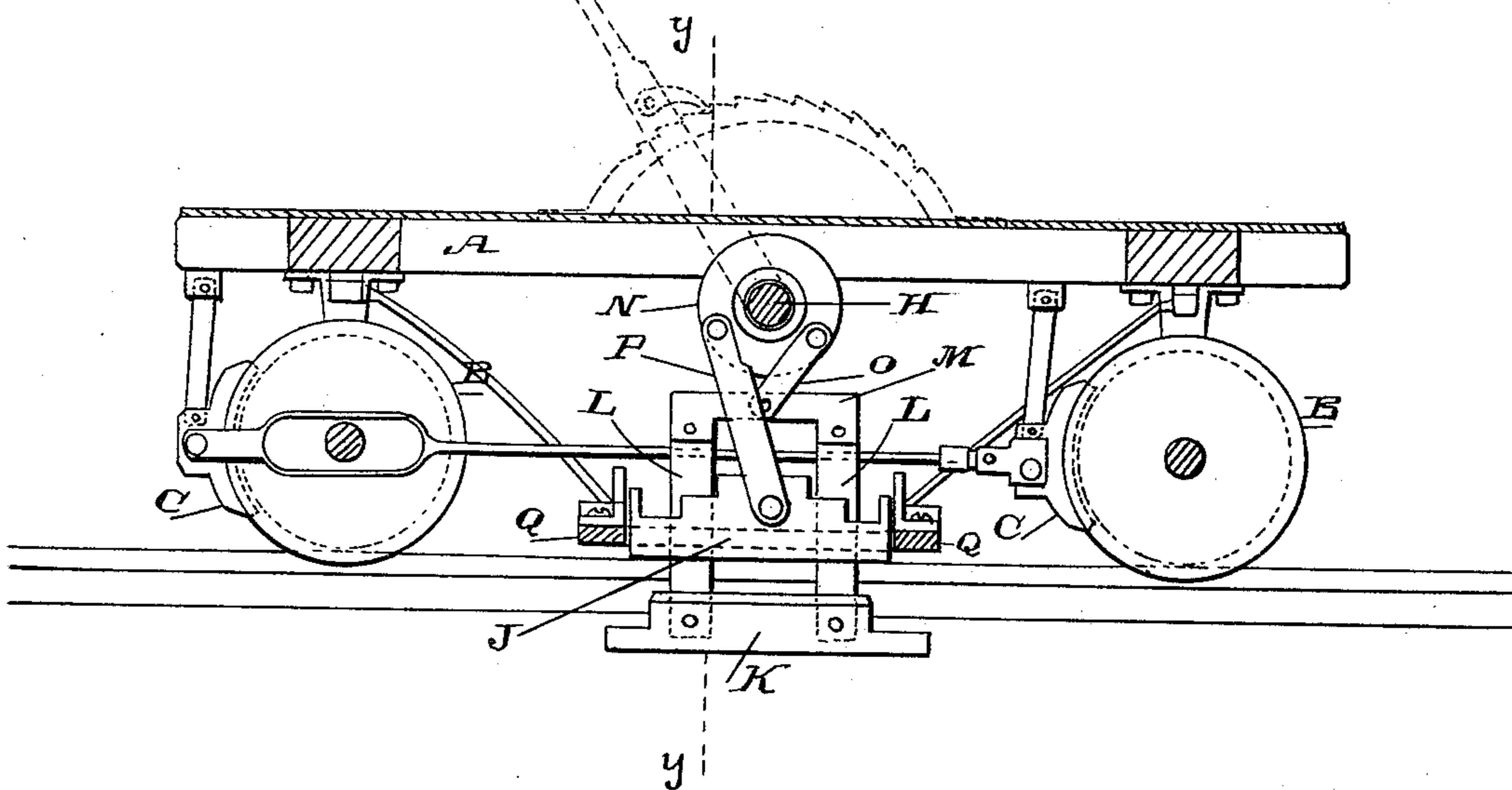


Fig. 2.



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Fig. 3.

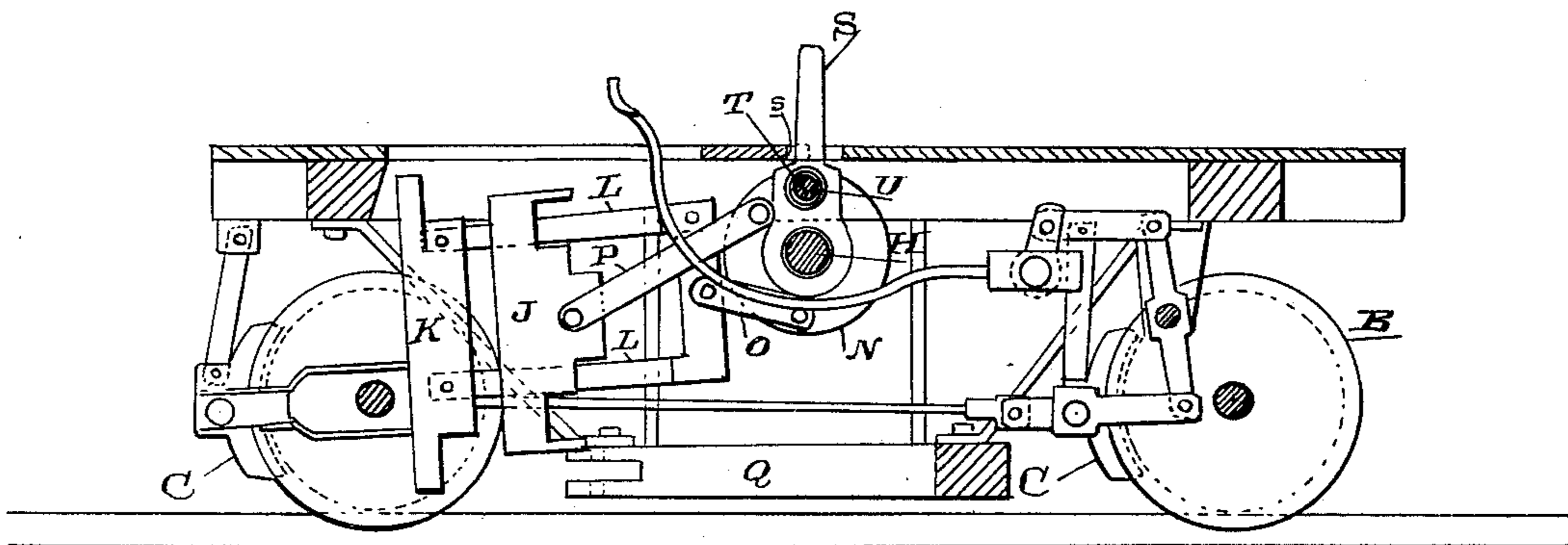


Fig. 4.

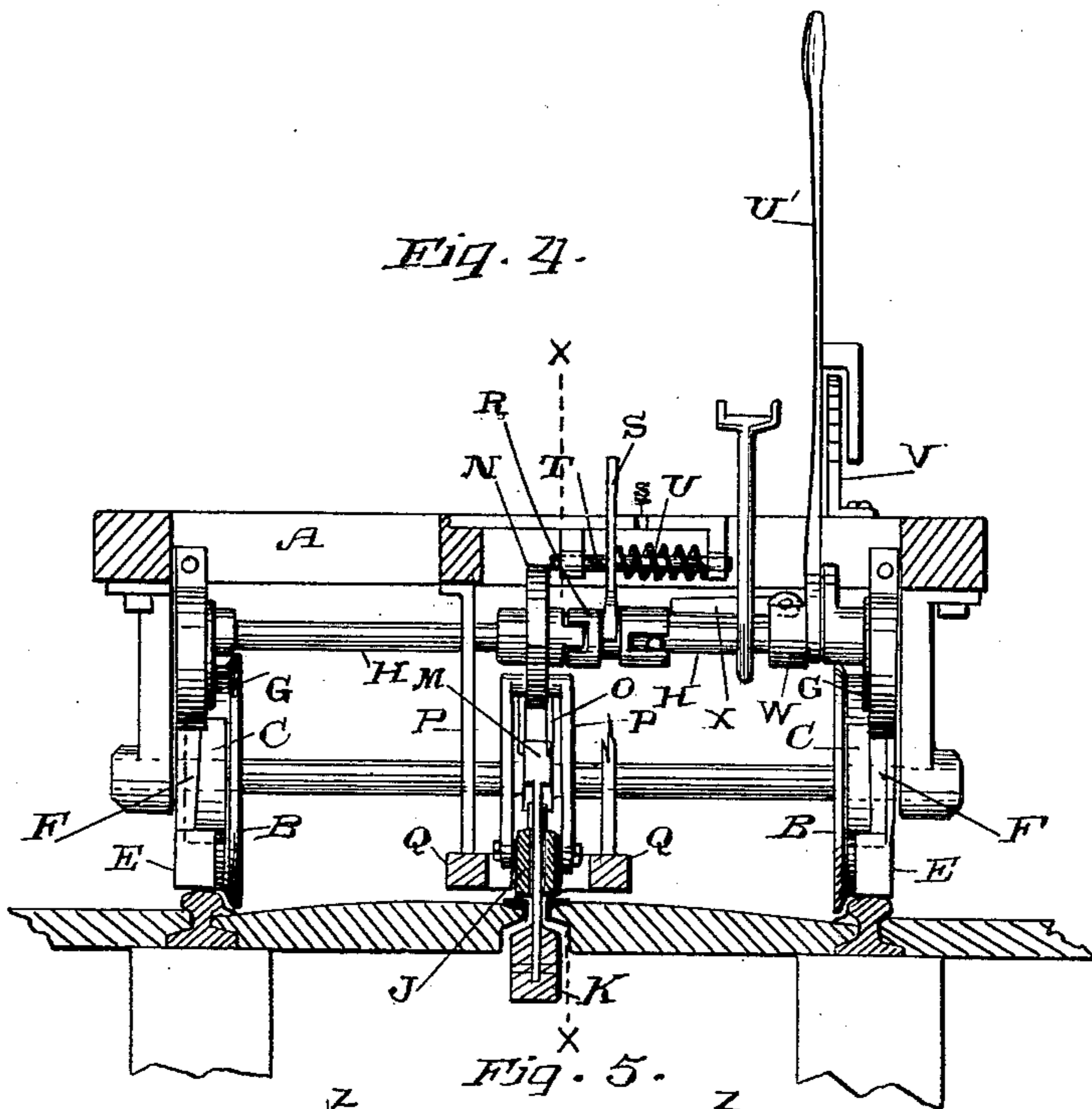
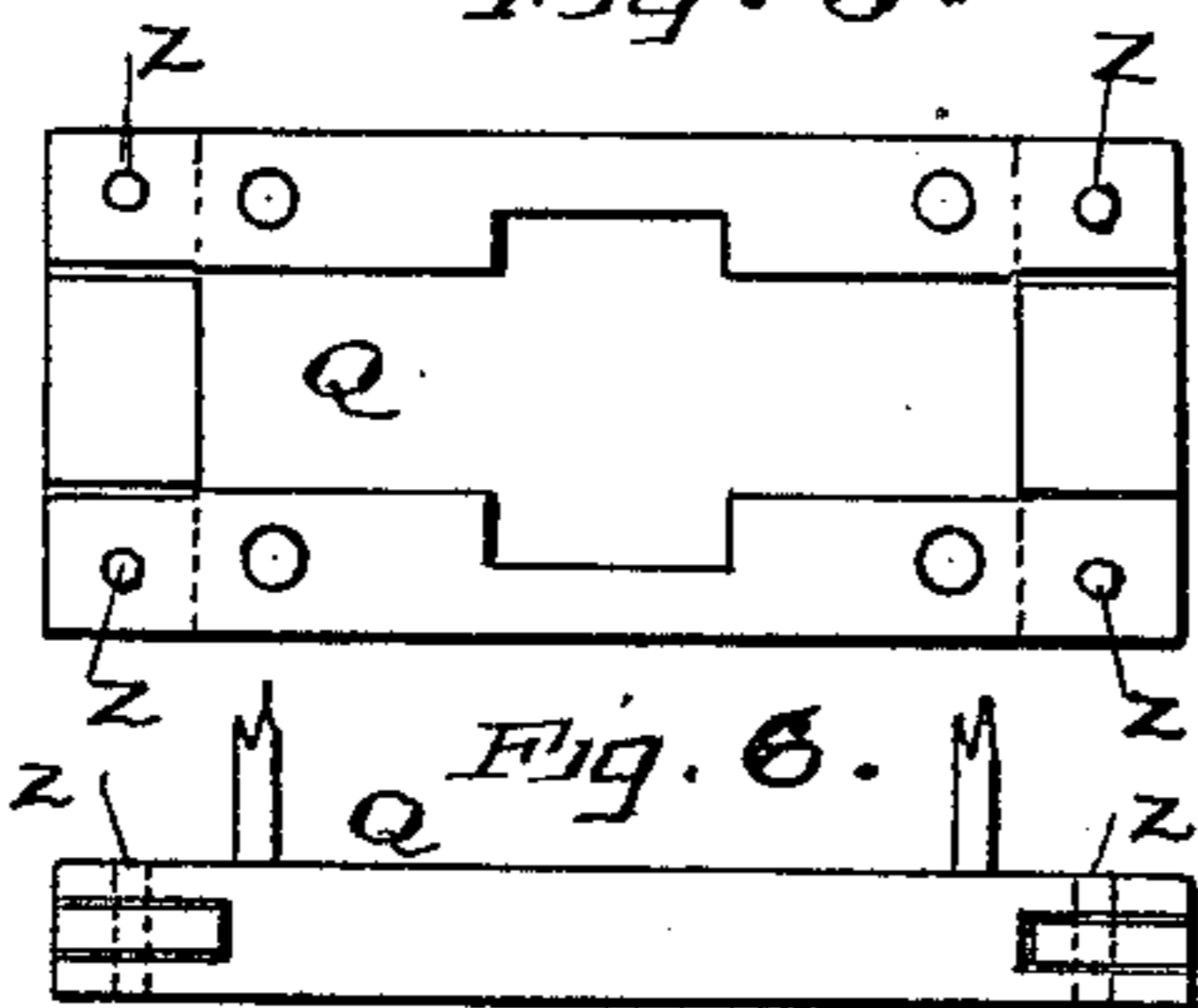


Fig. 5.



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UNITED STATES PATENT OFFICE.

OLIVER COPE, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-THIRD
TO JAMES OTIS, OF SAME PLACE.

CABLE-RAILWAY BRAKE.

SPECIFICATION forming part of Letters Patent No. 407,171, dated July 16, 1889.

Application filed February 26, 1889. Serial No. 301,252. (No model.)

To all whom it may concern:

Be it known that I, OLIVER COPE, of the city and county of San Francisco, State of California, have invented an Improvement in
5 Cable-Railway Brakes; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a novel cable-railway brake; and it consists of the combination, with a car or dummy which is adapted to travel upon the rails of a cable railway, of a gripping mechanism traveling above and below the slot-irons of the cable tube or tunnel, a mechanism whereby the jaws of the
15 grip may be made to approach each other and clasp the jaws of the slot-irons or recede from each other, so as to release them.

It also consists of a horizontal shaft extending across the car-frame, carrying mechanism whereby this grip-brake is operated, and also eccentrics by which the track-brakes are operated simultaneously therewith.

It further consists in a mechanism for disengaging the grip-brake at will, and a means
25 for detaching and swinging the brake up clear of the slot-irons and the track, and in certain details of construction, all of which will be more fully explained by reference to the accompanying drawings, in which—

30 Figure 1 is a side elevation showing the track and wheel brakes and mechanism at one side of the car only. Fig. 2 is a longitudinal vertical section taken through xx of Fig. 4. Fig. 3 is a longitudinal vertical section particularly showing the grip-brake
35 turned up out of the slot. Fig. 4 is a transverse vertical section taken through yy , Fig. 2. Fig. 5 is a top view of the frame Q. Fig. 6 is a side view of the same.

40 A is the frame or truck of the car or dummy having wheels B, flanged or otherwise adapted to travel upon the rails of the track, and having the brakes C, and the foot-lever by which they are applied to the peripheries of
45 the wheels.

E are the track-brakes, consisting of shoes pivoted to the arms F, which connect with the straps of the eccentrics G, there being
50 one of these track-brakes and a corresponding operating-eccentric upon each end of the

horizontal shaft H, which is journaled across the frame A.

I I are vertical guides upon which these brake-shoes move up and down when the eccentric-shaft is rotated for that purpose. 55 When this shaft is turned in one direction, the eccentrics will raise the shoes clear of the track to allow the car to move freely. When turned in the opposite direction these shoes will be forced downward until they press 60 upon the track with any desired degree of force, even to the point of raising the car-wheels from the track and supporting the whole weight upon these shoes. Being pivoted to their operating-arm, they will adapt 65 themselves to any little irregularities caused by the position of the car with relation to the rails, so that their whole surface will be applied upon the rails to act as a brake.

It often occurs that the rails are in the condition known as "greasy," by reason of rain or dense fog, with clay or mud or foreign substances, so that neither the wheel-brakes nor the track-brakes will suffice to hold the car upon a steep grade. A device upon which I 75 rely most strongly for this purpose consists of the shoes J and K. The shoe J is fitted to travel above the irons between which the slot is formed and through which the grip-shank passes from the car. The slot-irons 80 have various forms, but all of them have a considerable surface exposed at the top and also beneath or within the tunnel. The shoe K is fitted to press against the bottom or inside of the flanges of these slot-irons and is 85 provided with the broad thin plates or bars L, which extend up through the slots and connect with the yoke M beneath the car.

Upon the horizontal shaft H is a disk N, and a pin upon one side of the center serves 90 as an attachment for a pitman or connecting rod O, the lower end of which is attached to the yoke M, so that when the disk is turned by means of this connecting-rod it will raise the yoke, and with it the shoe K. Upon the 95 opposite side of the shaft an arm P is connected with the shoe J, so that the turning of the disk to raise the shoe K and cause it to press against the bottom of the flanges of the slot-irons will at the same time force 100

downward the shoe J and cause it to press upon the top of the slot-irons, thus gripping the irons between these two shoes with any desired degree of force. The shoe J is guided
 5 by a parallelogram or frame Q of sufficient thickness, this parallelogram being firmly supported from the frame A of the car, and the shoe J is of sufficient length to just fit into the opening in the central portion of the
 10 parallelogram and be guided in its vertical movements by it. The shanks of the shoe K pass up through slots made through the shoe J, or in an equivalent manner, and the shoe K is thus guided by the same frame in its
 15 vertical movements. The disk N is fitted loosely upon the shaft H and is thrown into or out of engagement with the shaft by means of the sliding clutch-ring R, which travels upon a feather or other equivalent device
 20 on the shaft H, and has lugs at its ends to engage corresponding ones upon the hub of the disk N, so that when the clutch is moved into contact and the lugs are caused to engage those upon the disk N the rotation of
 25 the shaft H will, through this clutch, move the disk N and thus operate the slot-brake. When, however, it is desired to throw this out of operation, it is done by means of an arm S, Fig. 4, which extends up through the frame-
 30 work or floor of the car to within reach of the driver. This arm is fixed to a horizontal shaft T, which is journaled so as to have an end movement, and the spring U upon this shaft, pressing against the lever S, forces it toward
 35 the disk N. The lower end of the lever S is formed so as to engage the groove or channel turned in the clutch-sleeve R, and this clutch-sleeve is thus moved simultaneously with the lever S, the spring forcing it into contact with
 40 the disk N when the lever S is released from its holding-catch. When it is desired to throw it out of contact by pushing the lever S away from the disk N, it carries the clutch-sleeve with it until it is clear of the corresponding
 45 notches in the hub of the disk N and the lever is dropped into a notch or catch s on the frame, which holds it in this position until it is desired to use the grip-brake, when the lever may be disengaged and the clutch al-
 50 lowed to again engage that of the disk.

The shaft H is turned by means of a lever U', extending upward within the body of the car within convenient reach of the gripman, and this lever is provided with the usual
 55 pawl to engage the segment-rack V and hold the lever at any desired point. A collar W is fixed upon the shaft near the lever, and it has a hinged arm or pawl X, which drops by gravitation, so as to engage the end of the
 60 clutch-sleeve when the clutch is engaged with the disk and thus prevent it from being thrown out of engagement. This pawl may be raised by a connecting-arm, either independently or united to the lever, so as to be oper-
 65 ated simultaneously with the movement of the latter.

It will be seen by this construction that the

track-brakes upon each side are operated by the eccentrics G, fixed upon the shaft H, and the slot-grips are simultaneously operated by
 70 means of the disk N upon the same shaft, so that one lever is sufficient to operate all the brakes, if needed. The slot-grip brake is easily disengaged by means of the clutch mechanism above described, and is not used
 75 except upon steep or dangerous grades, where it may be necessary.

When the car is to leave the main line to go into the car-house, or for certain purposes, it is necessary to turn up the grips, so as to be
 80 clear of the road-bed, this is done by hinging them, and appropriate openings are made at certain points through which the grip may be taken out from the cable tube or tunnel. In the use of my slot-grip brake it will also
 85 be necessary to remove the lower jaw partly for the same reason. This is done by making one end of the parallelogram guide-frame Q independent of the rest of the frame, and it is connected therewith by mortising it into
 90 the ends and uniting it by pins Z. These pins may then be removed and this end will then slip out, thus allowing the grip-brake shoes to turn about their points of suspension and swing up beneath the body of the car and
 95 entirely clear of the road-bed, thus allowing the car to move anywhere that may be necessary without reference to the slots in the track.

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

1. The vertically-moving grip-shoes, one above and one below the slot-irons of a cable-railway tube or tunnel, a guide upon the car
 105 through which the shoe shanks or connections move, a horizontal shaft journaled upon the car, having a disk mounted thereon, and connecting-rods extending from opposite sides of said disk to the shoes or their connecting-
 110 yokes, so that the rotation of the disk will move the shoes in opposite directions, substantially as described.

2. A horizontal shaft journaled upon a cable-railway car or dummy, having a disk upon it
 115 and a lever by which the shaft and disk may be rotated, gripping-shoes supported, respectively, above and below the slot-irons of the cable-railway tube or tunnel, and the links connecting said shoes with a disk upon the oppo-
 120 site sides of the rotary shaft, whereby the rotation of the shaft will cause the gripping-shoes to approach to or recede from each other, substantially as described.

3. The slot-iron gripping-shoes, the con-
 125 necting-links, and rotary shaft and disk whereby they are actuated, in combination with the fixed guide supported from the car-body, whereby the shoes are caused to retain their position and are guided in their move-
 130 ments, substantially as described.

4. The vertically-moving gripping-shoes, with the connecting-links, and a disk fitted loosely upon the horizontal shaft which is

journalled across the car-frame, in combination with a clutch-sleeve traveling longitudinally upon a feather upon the shaft and having its end adapted to engage the disk, and
5 a lever whereby said clutch-sleeve is moved upon the shaft, substantially as described.

5. The vertically-moving brake-shoes, the disk fitted loosely upon a horizontal shaft journalled across the car-frame, said disk connected with the shoes by links, whereby they
10 are actuated, a clutch-sleeve traveling longitudinally upon a feather upon the shaft, a lever by which said sleeve is moved in one direction, and a spring acting against said
15 lever or the sleeve, so as to throw it into engagement with the disk when released, substantially as described.

6. The loose spring-actuated sleeve fitted upon the horizontal shaft which is journalled
20 to the car-frame, the clutch connected therewith and moved to engage with the disk, and

a pawl or stop acting against the end of the clutch-sleeve when the latter is in engagement with the disk, so as to prevent its becoming disengaged, substantially as described. 25

7. A brake mechanism for cable-railway cars, consisting of the vertically-moving slot-iron grip-shoes, the track-brake consisting of shoes adapted to be pressed downward upon the track, a horizontal shaft journalled across
30 the frame and having a central disk by which the grip-shoes are actuated, and eccentrics upon its outer end, whereby the track-brakes are actuated simultaneously with the slot-grip
35 by the rotation of the shaft, substantially as described.

In witness whereof I have hereunto set my hand

OLIVER COPE.

Witnesses:

S. H. NOURSE,
H. C. LEE.