

(No Model.)

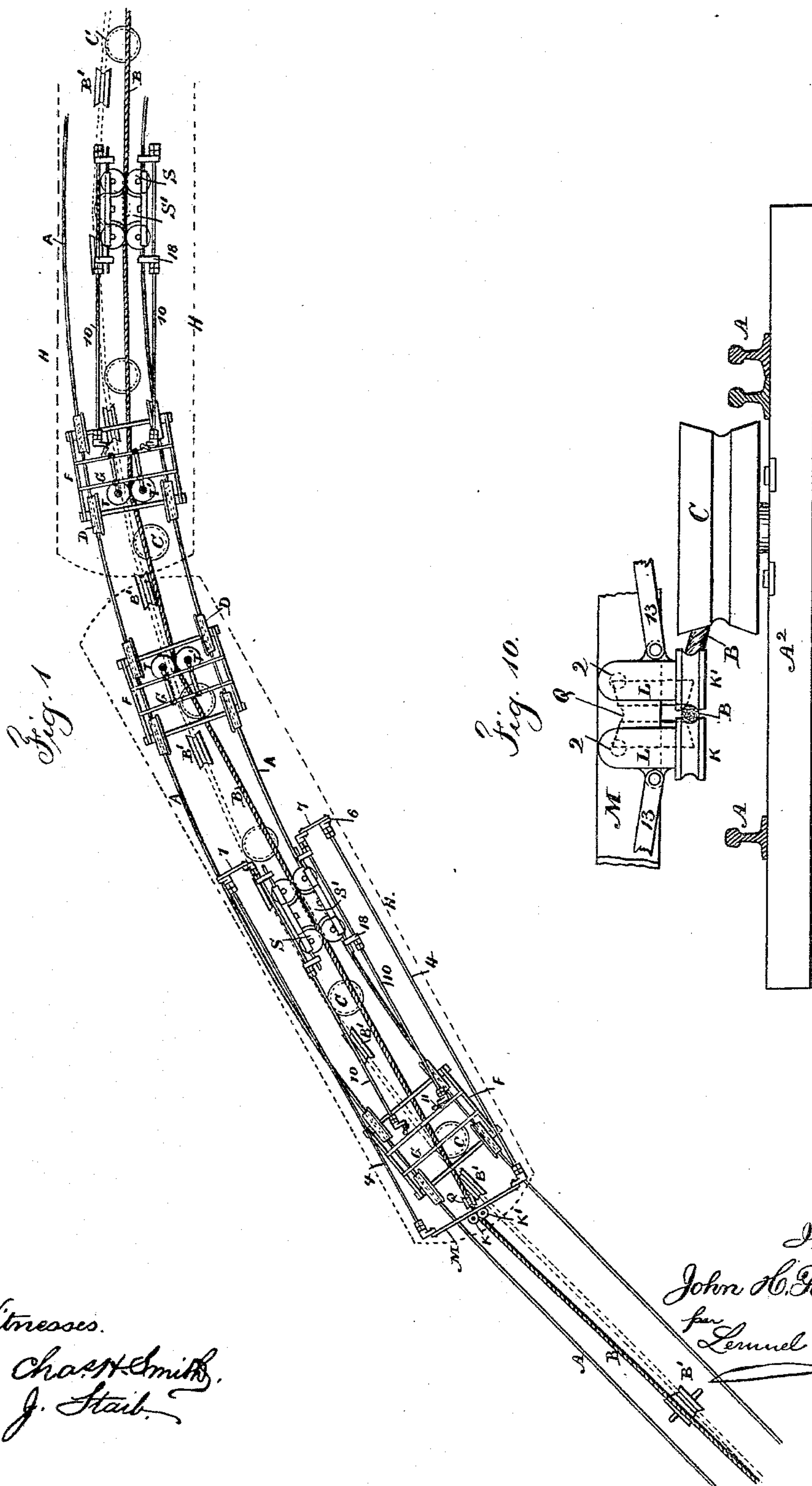
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J. H. PENDLETON.

CABLE RAILWAY.

No. 387,991.

Patented Aug. 14, 1888.



Witnesses.

Chas. H. Smith,  
J. Stair.

Inventor,  
John H. Pendleton.  
per Lemuel W. Serrell  
att.

(No Model.)

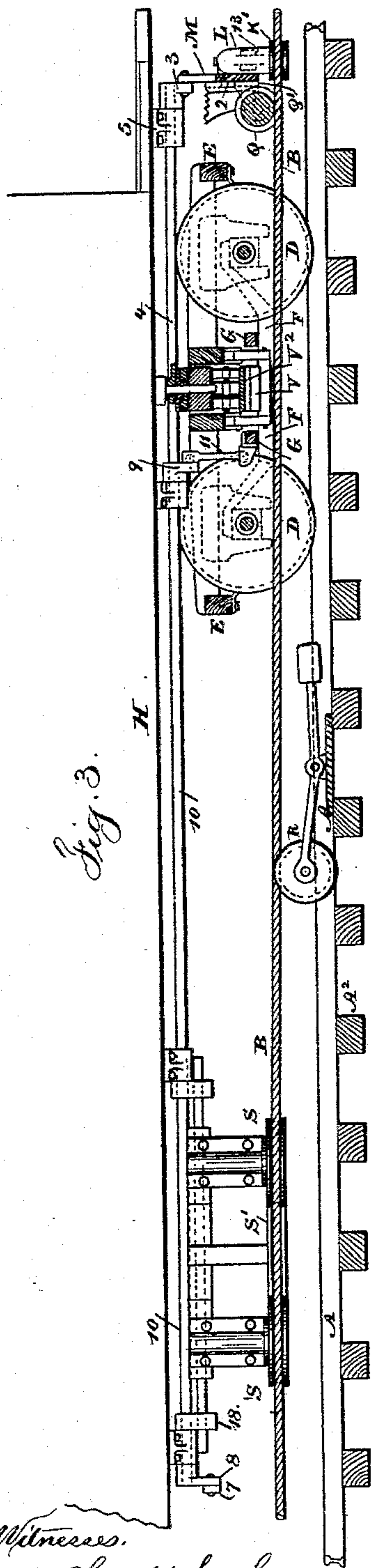
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J. H. PENDLETON.

CABLE RAILWAY.

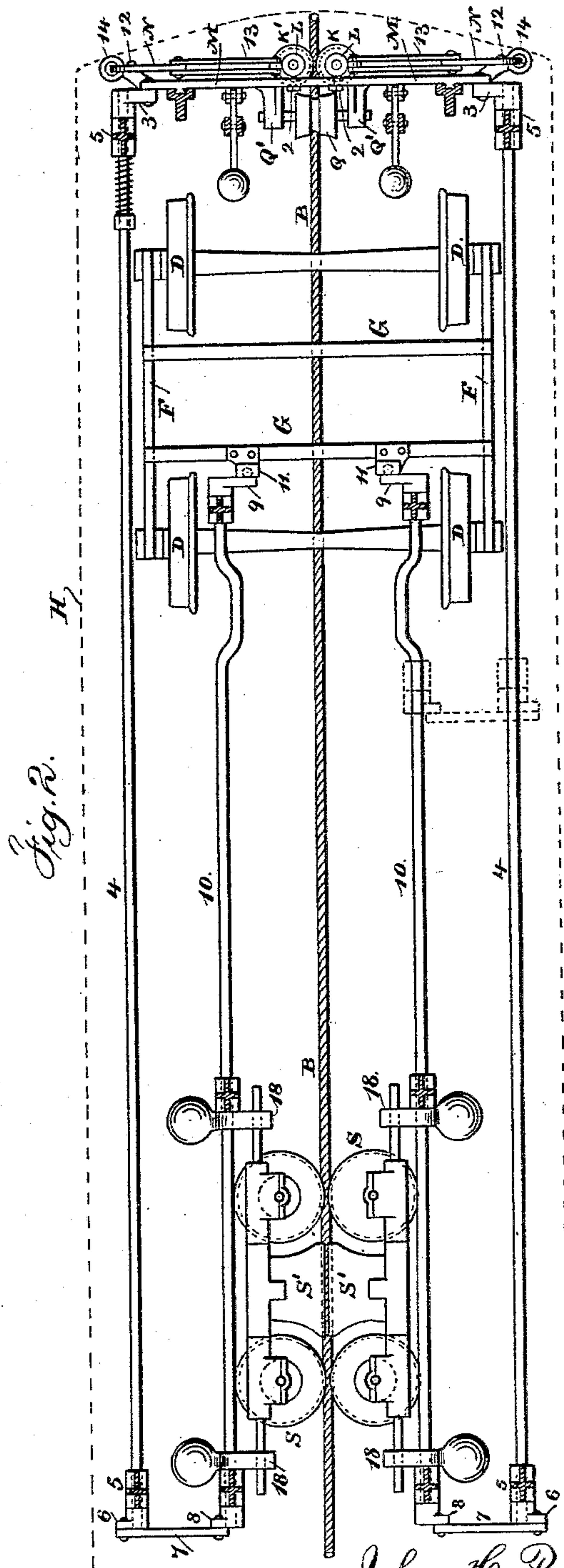
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Witnesses.

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Fig. 5

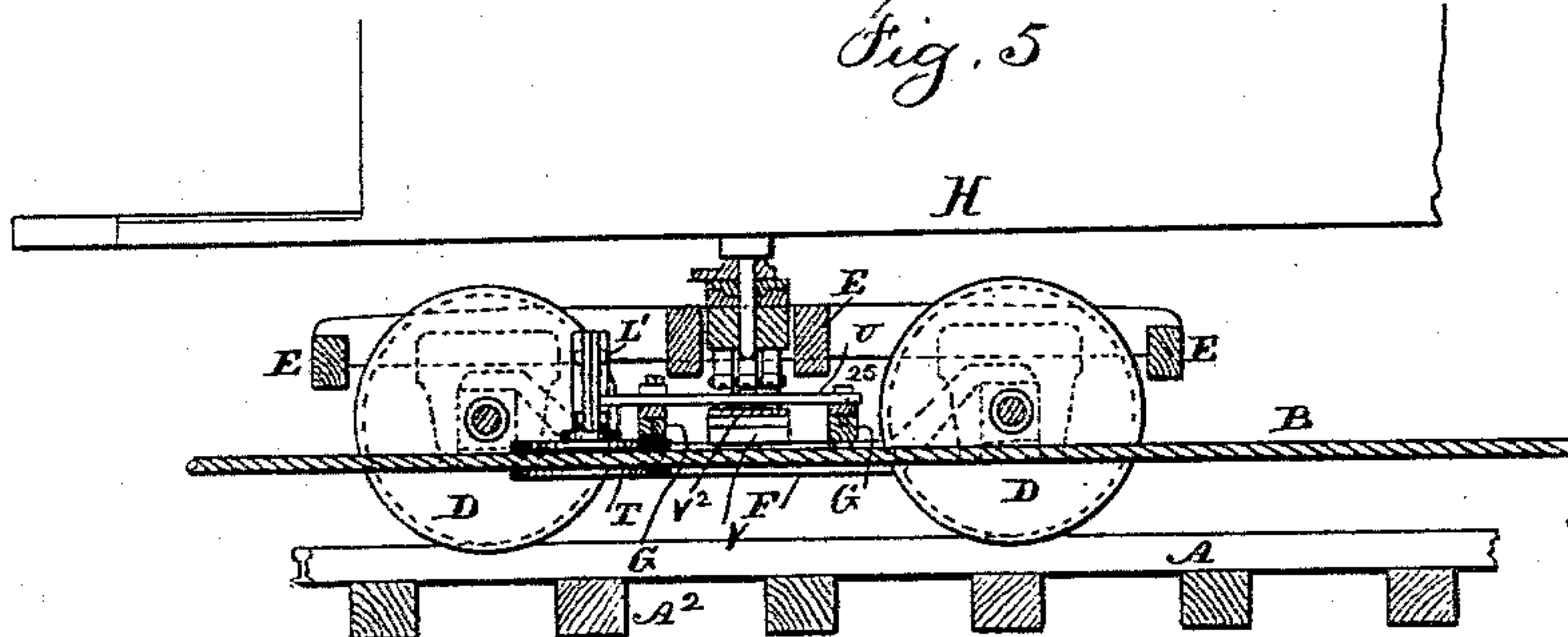


Fig. 4

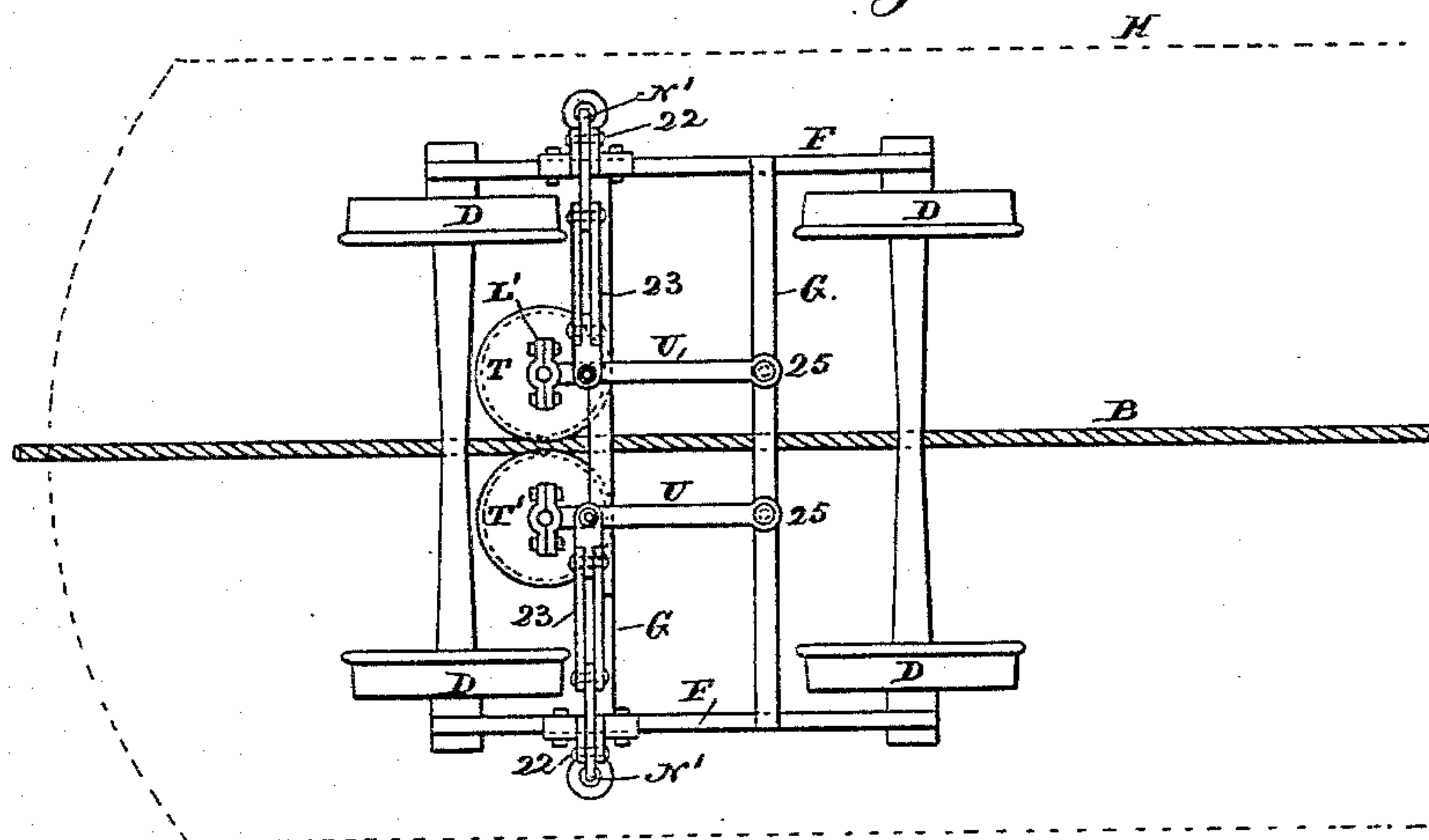


Fig. 7.

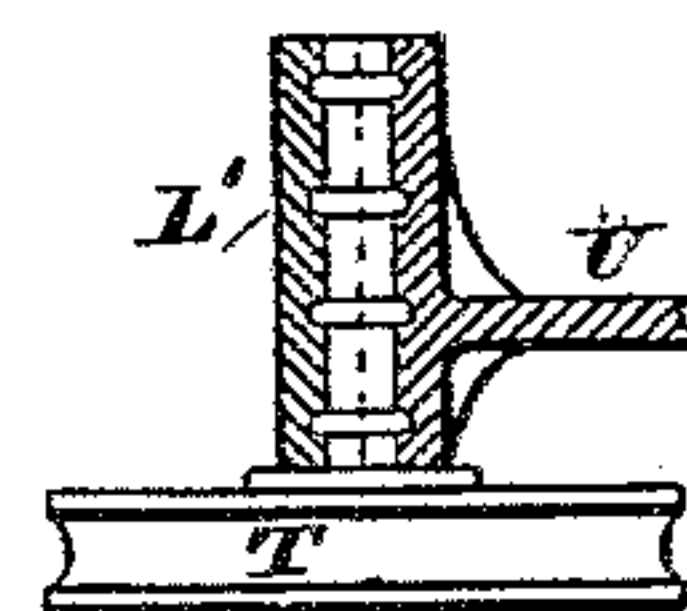
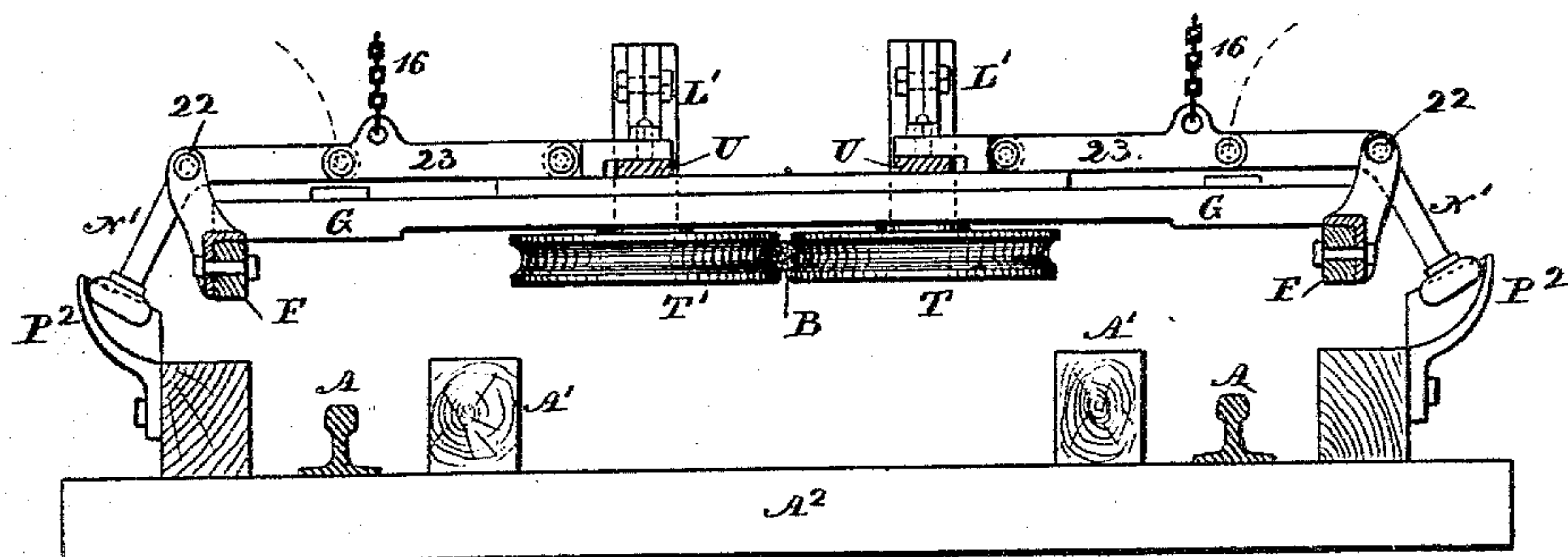


Fig. 6.



Witnesses.

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Inventor.

John H. Pendleton.  
per Lemuel W. Terrell atty.

(No Model.)

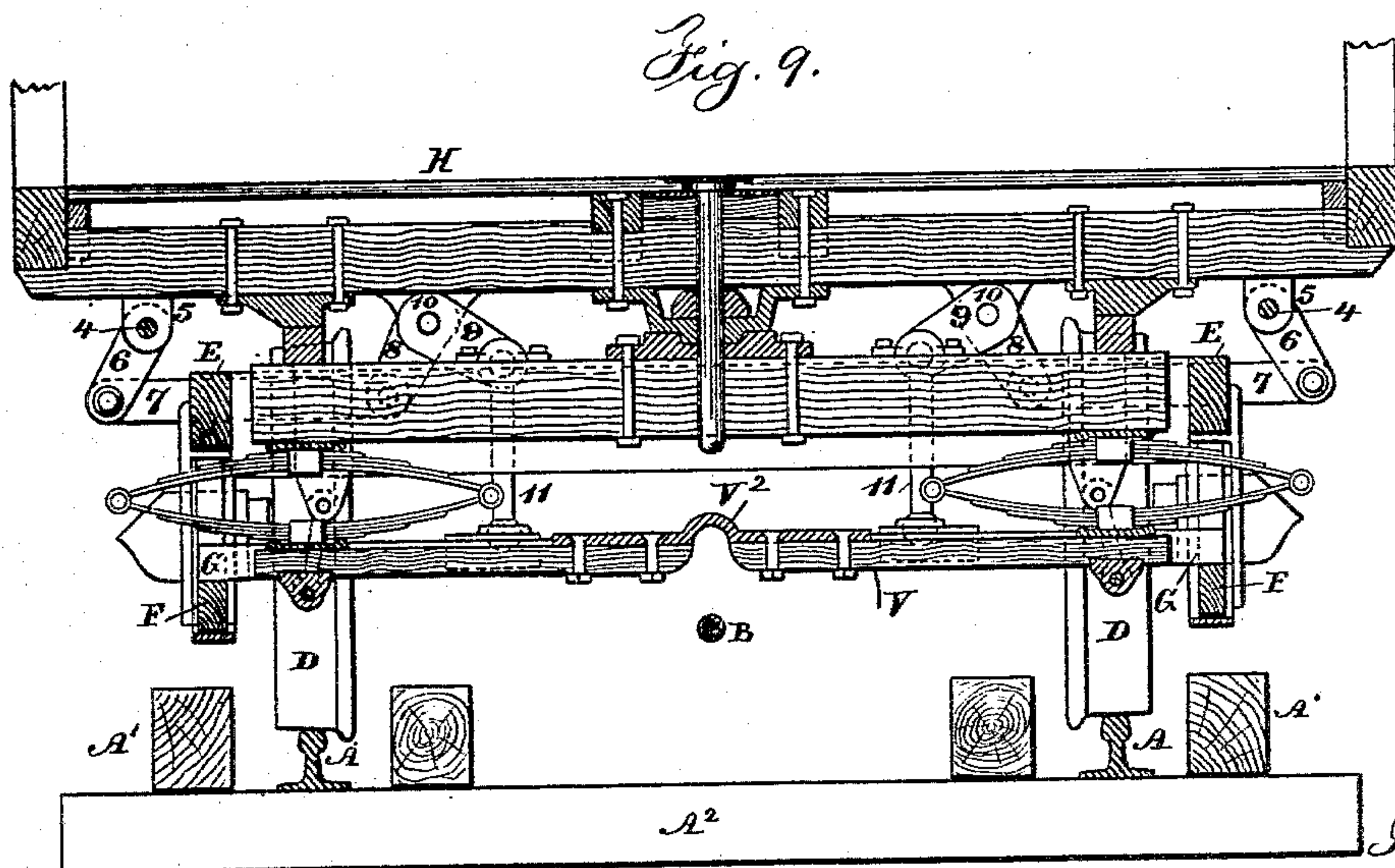
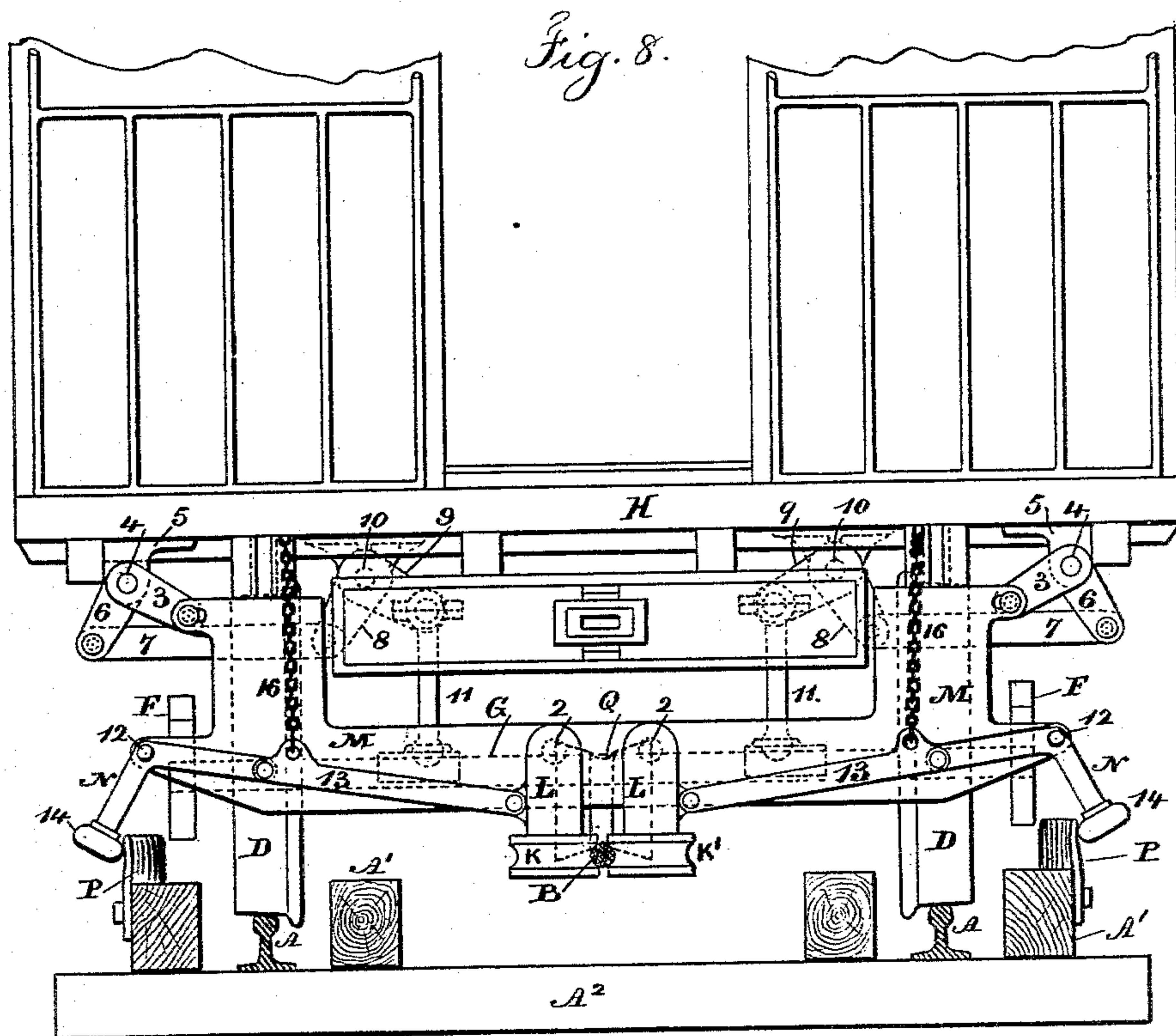
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Witnesses:

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# UNITED STATES PATENT OFFICE.

JOHN H. PENDLETON, OF BROOKLYN, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE RAPID TRANSIT CABLE COMPANY, OF NEW YORK, N. Y.

## CABLE RAILWAY.

SPECIFICATION forming part of Letters Patent No. 387,991, dated August 14, 1888.

Application filed November 5, 1886. Renewed June 13, 1888. Serial No. 276,931. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN H. PENDLETON, of Brooklyn, in the county of Kings and State of New York, have invented an Improvement in Cable Railways, of which the following is a specification.

Difficulty has heretofore been experienced in cable railways in guiding the traction-cable around curved portions of the track and in connecting such cable to the cars so that the cars will travel upon the curved track and lift up the cable properly above the guide-rollers at the advancing end of the car or train and lay the cable back into its place behind the car or train.

My present improvements are especially available with the traction-cable where the same is upon a curved track; but they are also available when the car or train is traveling upon a straight track. I make use of three guide-rollers at the advancing end of the car or train, and also at the rear end of the car or train, such guide-rollers being central with the car and near the outer end of the platform, so that as the car swings upon the king-bolt of the truck in entering or leaving a curve these guide-rollers will be moved toward the outer rail of the curve and carry with them the cable, and hence these guide-rollers will move the cable away from the horizontal guide-rollers (having vertical axis) upon the track, and as the car passes along the cable will be deposited or allowed to descend sufficiently outside of the center line of the curved track to pass properly against these horizontal guide-rollers, and in connection with these guide-rollers upon the car I make use of automatic devices that will open the guide-rollers and allow the cable to drop at the proper place and will close them automatically to again grasp the same cable or another cable at the proper places. I also make use of horizontal guide-wheels upon the trucks of the car near the king-bolt in such positions that the cable will draw in a straight line in passing through the gripping devices upon the car, and in traveling around a curved track the cable, as it is held by the respective cars of the train, will be under the same tension between one car and the next as it is upon the straight part of the

road, and the length of the cable connected to the train will correspond, or nearly so, to the length of the cable if lying upon the guide-rollers of the track, whereby the cable will not be shortened or lengthened by the train while it passes around a curve, even when all the cars of the train are connected to the cable.

In the drawings, Figure 1 is a general plan view representing the two track-rails and cable in part of a curved track, also the trucks, running-gear, and grip upon one car and part of another, the platforms of the cars being indicated by dotted lines. Fig. 2 is a plan view representing the gripping device, one truck, and the three guide-rollers at one end of the car. Fig. 3 is a longitudinal central section of Fig. 2. Fig. 4 is a plan of part of one of the trucks, showing the horizontal guide-wheels upon the same. Fig. 5 is a central section of Fig. 4 longitudinally of the car. Fig. 6 is a cross-section of the track and part of the truck and an elevation of the horizontal guide-wheels and the devices for moving the same in larger size. Fig. 7 is an elevation of one of the horizontal guide-wheels and a section of the box or bearing for the same. Fig. 8 is an elevation endwise of the car, showing the three guide-rollers and the devices for moving the same. Fig. 9 is a central section through the truck and a cross-section of the track. Fig. 10 is a cross-section of the track, showing the relative positions of the guide-roller on the track and the guide-rollers upon the car when on a curved track.

The rails A of the track, guard rails A', and cross-ties A<sup>2</sup> are of ordinary character, and B represents the traction-cable, supported upon the vertical wheels B', and C represents the horizontal wheels against which the cable moves when passing around a curve. D are the car-wheels; E, the truck-frame; F, the bearers resting upon the axle-boxes, and G cross-bearers between the bearers F. H represents the platform or body of the car. In Figs. 1, 2, and 4 the platform or body is indicated by dotted lines.

The guide-rollers K K' are upon vertical axles within the stocks L, and these are connected at their upper ends by pivot-bolts 2 to the cross-frame M. This frame may be at



tached directly to the car itself; but I have shown the same suspended by the cranks 3 upon shafts 4, having their bearings 5 upon the under side of the car, and I prefer to use  
 5 a mechanism forming the subject of a second application, Serial No. 218,032, for allowing the car-body to play up and down upon its springs without varying the height of the rollers K K' from the track. I, however, re-  
 10 mark that by the cranks 6, connecting-rod 7, cranks 8 and 9 on the shafts 10, and the connecting-rods 11 to the cross-bearer G the respective shafts 10 and 4 will be turned in their bearings as the platform H rises and falls, be-  
 15 cause the cross-bearers F receive their support from the axle-boxes and remain at a definite height from the track, and the frame M will be supported at a uniform height from the track by the cranks 3 and shafts 4, even though  
 20 the car may rise and fall upon its springs.

Upon the frame M are pivots 12 for the bent levers N and 13, the latter of which are connections to the respective stocks L, and at the lower ends of the bent levers N are rollers 14,  
 25 that can be acted upon by stationary cams P upon the guard-rails. The ends of these cams P curve inwardly, and the cams themselves are placed at the proper part of the track, so that after the cable B has been raised between the  
 30 rollers K K' the cams P operate to swing the stocks L and cause the rollers K K' to grasp the cable, and when the rollers K K' are to be separated for dropping the cable the rollers 14 run against stationary cams—such as those  
 35 shown at P<sup>2</sup>, Fig. 6—that press the rollers 14 inwardly and turn the bent levers N, so that the links 13 draw the stocks L apart. These parts may also be operated by hand, there being chains 16 or other suitable connections for  
 40 moving the links 13 and levers N.

The grooved or concave-faced roller Q is supported by brackets Q' at the back of the frame M, and the roller Q prevents the cable B from rising too high to be grasped by the rollers K  
 45 K', and I remark that the cable B at the place where it is to be connected with the car is elevated by means of weighted sheaves or rollers R, moving vertically and acting in the usual manner beneath the cable to lift the same.

50 At S, I have represented guide-rollers, and between them the gripping device S'. These parts are introduced to indicate the position in which the gripping device is applied beneath the car. The gripping device itself,  
 55 however, is to be of any desired character, and I have represented the same as suspended by the cranks 18 upon the shafts 10, so that the gripping device will remain at a uniform height above the track in a similar manner to  
 60 the frame M.

When a single car is made use of, I apply the guide-rollers K K' Q at both ends of the car, and the traction-cable draws in a straight line between the guide-rollers K K' and through  
 65 the gripping device S S', and when the car is traveling upon a curve the guide-rollers K K'

will be considerably nearer the outer rail of the curve than the inner rail in consequence of the king-bolts of the trucks remaining central of the track while the ends of the car swing  
 70 outwardly; hence these guide-rollers K K' will carry the cable bodily toward the outer rail of the track, and as these guide-rollers K K' are nearly the same height from the track as the horizontal wheels C, Fig. 10, the cable will sag  
 75 down and draw against the guide-wheels C as the car passes along in traveling the curve, and in like manner when the guide-wheels K K' enter the curve in front of the car they move the cable away from the guide-wheels  
 80 B' C, so as to lift the same easily out from the groove in such guide-wheels.

It will be observed upon reference to Fig. 1 that the traction-cable where it passes between the rollers K K' and the grip S' is a straight  
 85 line, or nearly so, and the same forms a chord to the arc of the track, and said chord, being a shorter length than the distance occupied by the cable when resting upon the rollers, would shorten the cable and produce a looseness  
 90 therein were it not for the fact that the rollers K K' carry the cable toward the outer rail of the track, and thereby tend to tighten the same, and these two operations counteract each other, so that the cable remains in a normal  
 95 condition, or nearly so.

In many instances there are two, three, or more cars coupled up in one train, and each car has its separate gripping devices. It is  
 100 important, therefore, to maintain the same tension upon the cable from end to end of the train while running around a curve that there is when running on a straight line. With this object in view I make use of the horizontal  
 105 guide-wheels T T' upon the cross-bearers G, and provide these horizontal guide-wheels upon all the trucks of the cars except at the extreme ends of the train, where the guide-rollers K K' are applied, as aforesaid. These  
 110 guide-wheels T T' hold the rope between them at a point nearly beneath the king-bolt on the car-truck, to which king-bolt the draw-bars are usually connected. For this reason the cable between one pair of guide-wheels T T' and a similar pair upon the next car is the  
 115 same length, or nearly so, as the two draw-bars, and occupies a position immediately beneath such draw-bars. These horizontal guide-wheels T T' may be supported and opened and closed for dropping or holding the cable in  
 120 any suitable manner; but I have shown the same as actuated in a similar manner to the rollers K K' by the bent levers N', pivoted at 22, and having links 23 connecting the levers N' to the stocks L'; but I find it convenient to  
 125 mount the stocks L' upon the levers U and to pivot these levers at 25 upon one of the cross-bearers G, and to allow these levers U to rest upon the other cross-bearer G, as indicated in Figs. 4, 5, and 6, and to slide thereon when  
 130 the wheels are separated or drawn together by the action of the stationary cams P P<sup>2</sup>.



In order to prevent the bearers V coming in contact with the cable as these bearers V rise and fall partially with the car, it is preferable to employ an arched bar, V<sup>2</sup>, (see Fig. 9,) above the cross-bearer and to separate the bearer at the middle.

Upon reference to Fig. 3 it will be seen that the gripping devices S S' are at a higher elevation from the track than the rollers K K', in order to be sufficiently above the stationary rollers C on the track not to come into contact with the same, and these rollers K K', being lower than the axles of the wheels, press the cable down sufficiently to cause it to draw against the guide-rollers C in passing around a curved track, and where there are several cars in the train the cable runs along level between the gripping devices, and the rollers K K' Q are only at the end of the train.

I claim as my invention—

1. The combination, with a gripping device upon a car, of the guide-rollers K K' at or near the end of the car, whereby the cable occupies nearly a straight line from end to end of the car and said guide-rollers also carry the cable in its proper relation to the stationary guide-rollers in passing around a curve, substantially as set forth.

2. The combination, with the traveling cable and the stationary guide-rollers for the same, of a grip upon the car, the guide-rollers K K' near the end of the car, and the roller Q, adjacent to the guide-rollers and limiting the upward movement of the cable, substantially as set forth.

3. The combination, with the traveling cable and the stationary guide-rollers for the same, of a grip upon the car and the horizontal guide-rollers T T' upon the truck of the car near the king-bolt of the same, for the purposes and substantially as set forth.

4. The combination, with the traveling cable, of guide-rollers upon the truck, bearings for the axis of the same, levers for supporting the bearings, stationary cams upon the track, levers pivoted upon the truck and against which the stationary cams act, and links connecting the said levers with the bearings for the guide-rollers, substantially as set forth.

5. The combination, with the guide-rollers K, K', and Q, of the cross-frame M, the stocks L, receiving the axles of the rollers K K', the pivots connecting the stocks to the cross-frame, levers pivoted upon the cross-frames, and connecting-rods between the levers and the stocks, substantially as set forth.

6. The combination, with a traveling cable, the track, and guide-rollers for the same, of two or more cars forming a train, a gripping device for the cable upon each car, horizontal guide-wheels T T' upon the trucks of the cars near the king-bolts, and guide-rollers K K' at the extreme ends of the train, for the purposes and substantially as set forth.

Signed by me this 4th day of November, 1886.

J. H. PENDLETON.

Witnesses:

GEO. T. PINCKNEY,  
WILLIAM G. MOTT.