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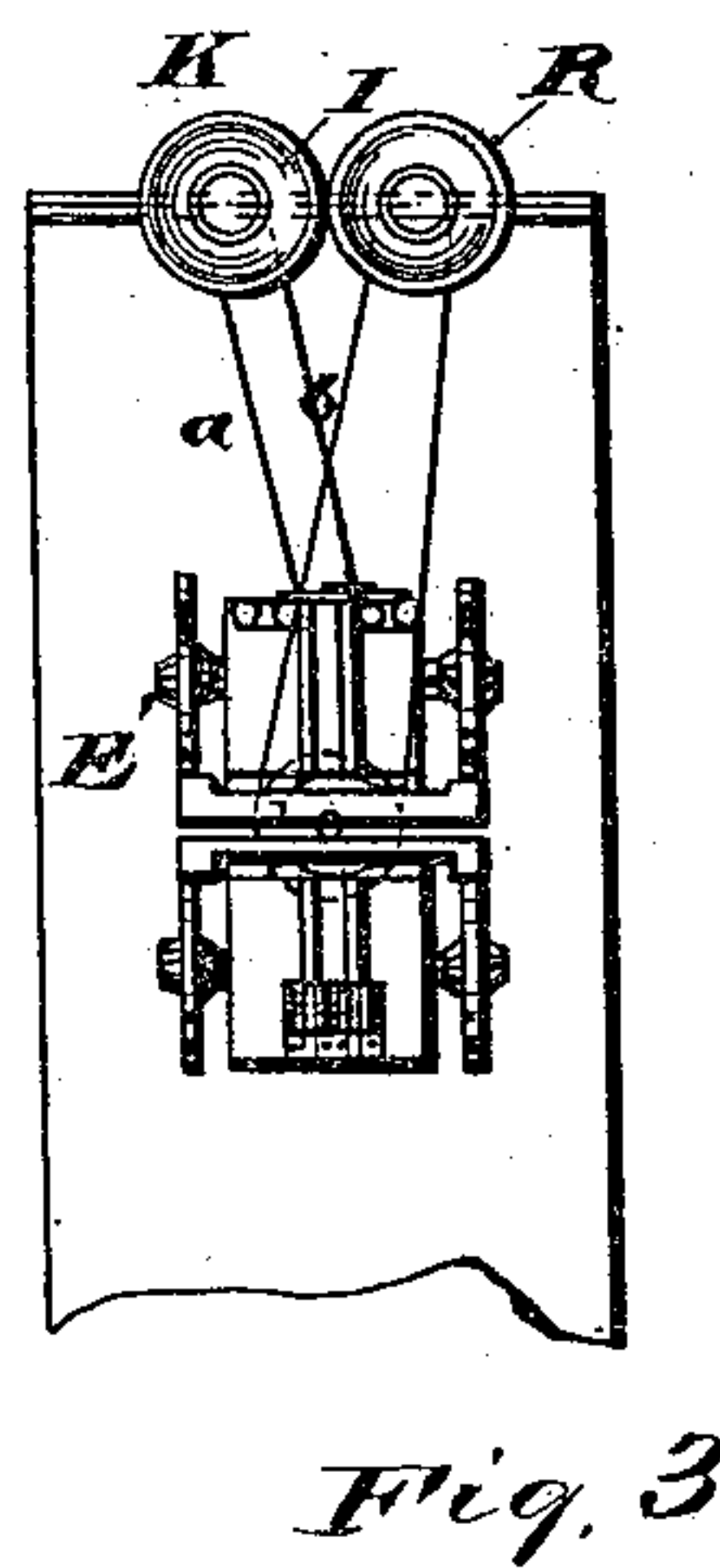
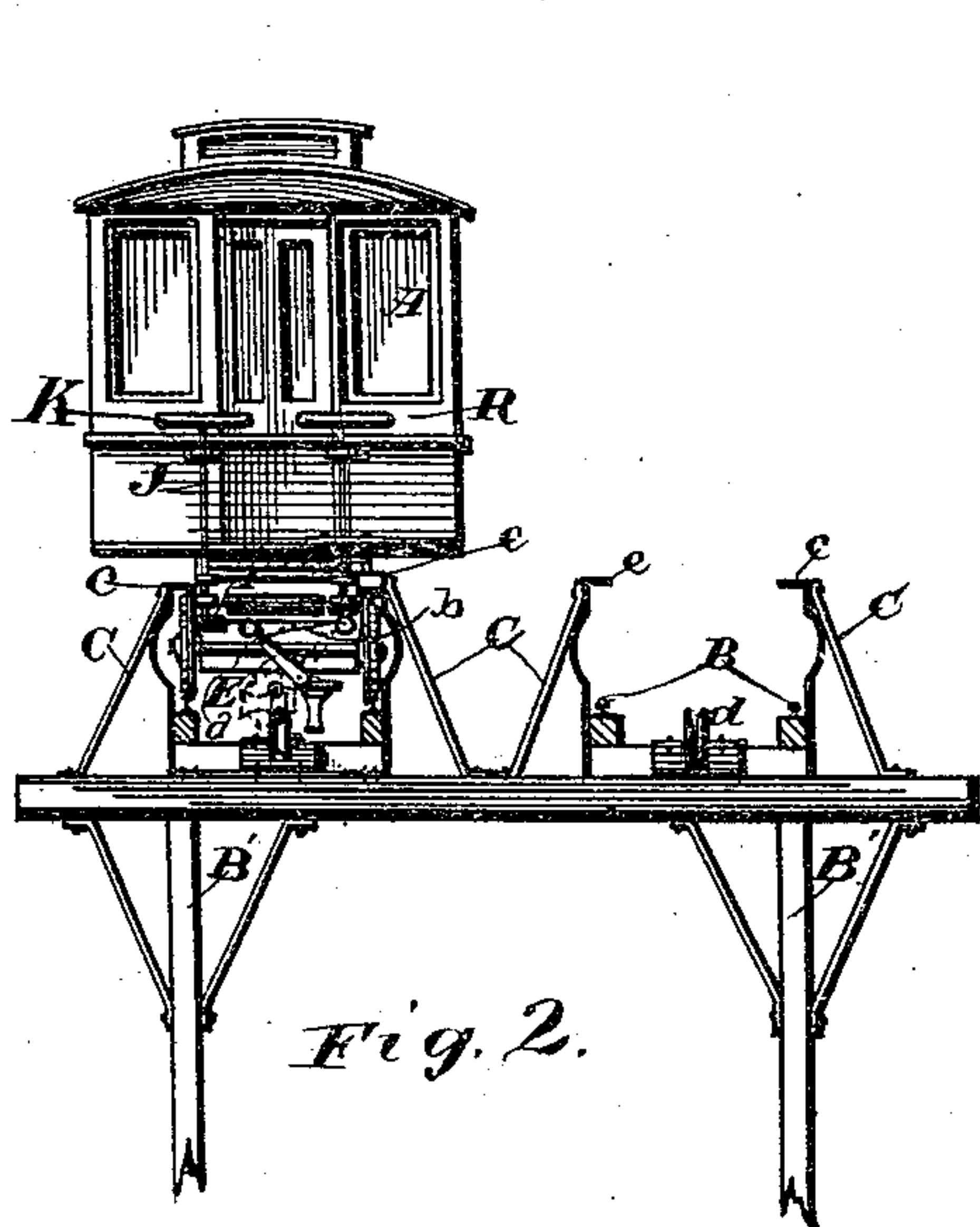
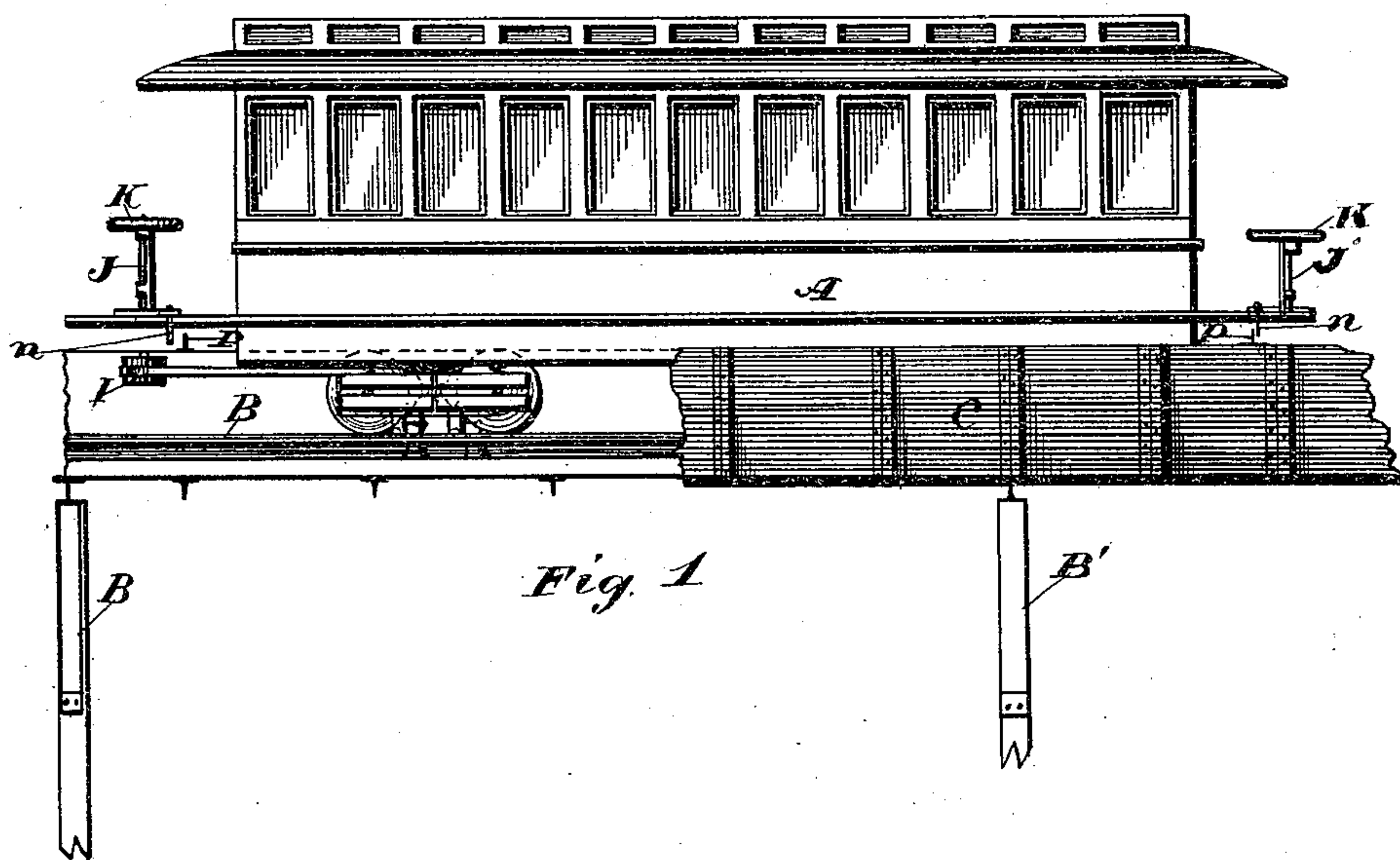
2 Sheets—Sheet 1.

C. LEAVITT.

GRIPPING DEVICE FOR CABLE RAILWAYS.

No. 336,245.

Patented Feb. 16, 1886.



WITNESSES

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Geo. W. King

INVENTOR

Charles Leavitt.

by  
Leggett and Leggett. ATTORNEYS.

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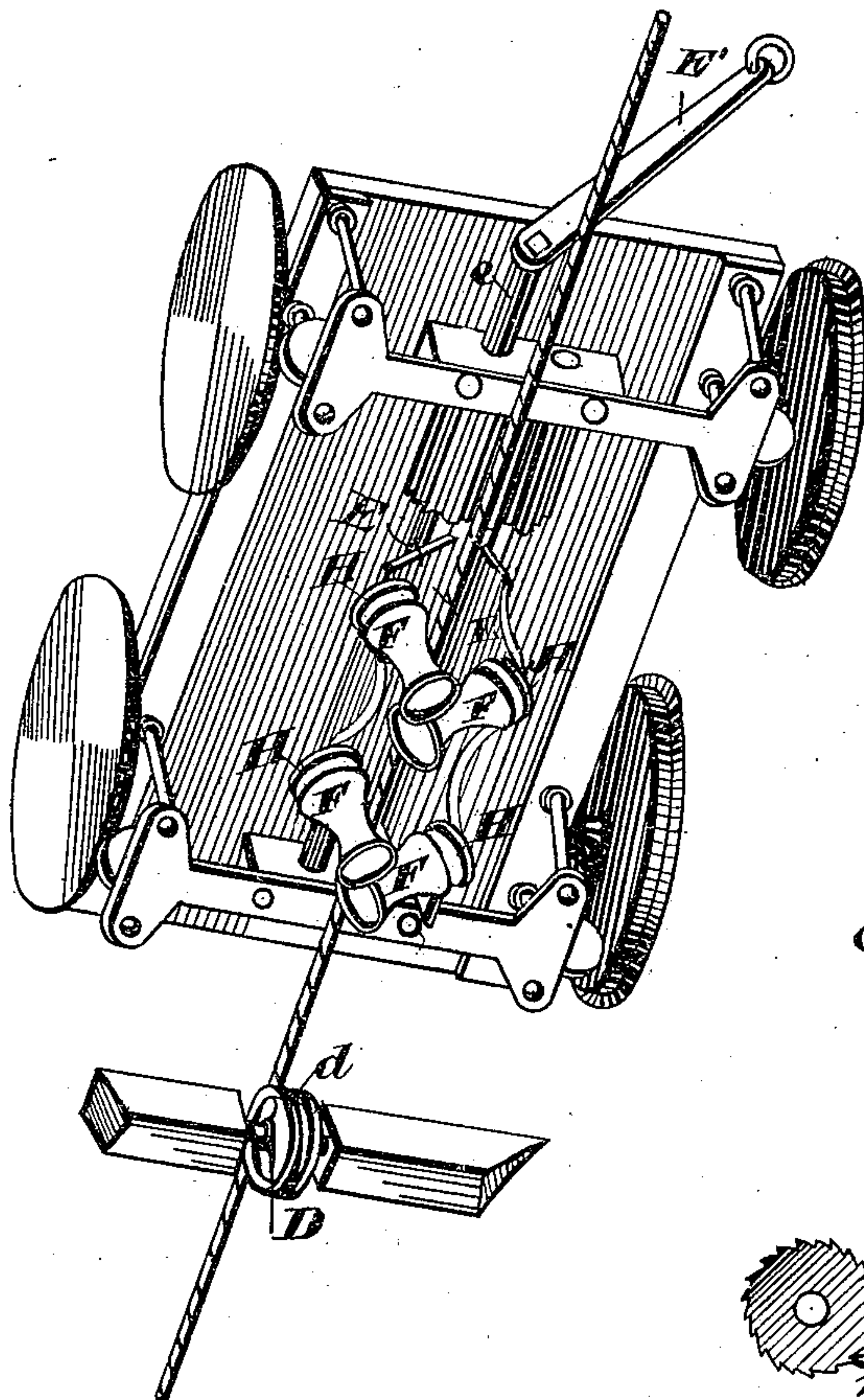


Fig. 4.

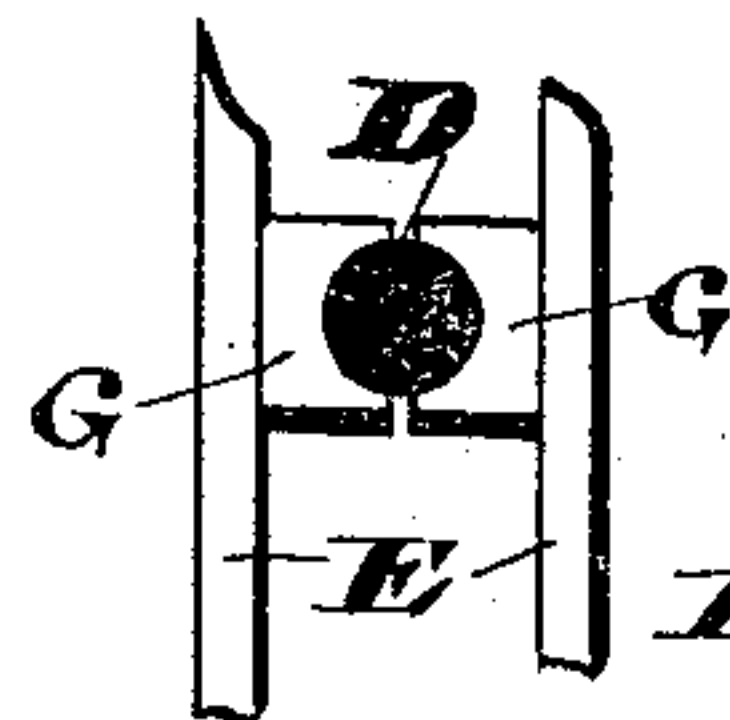
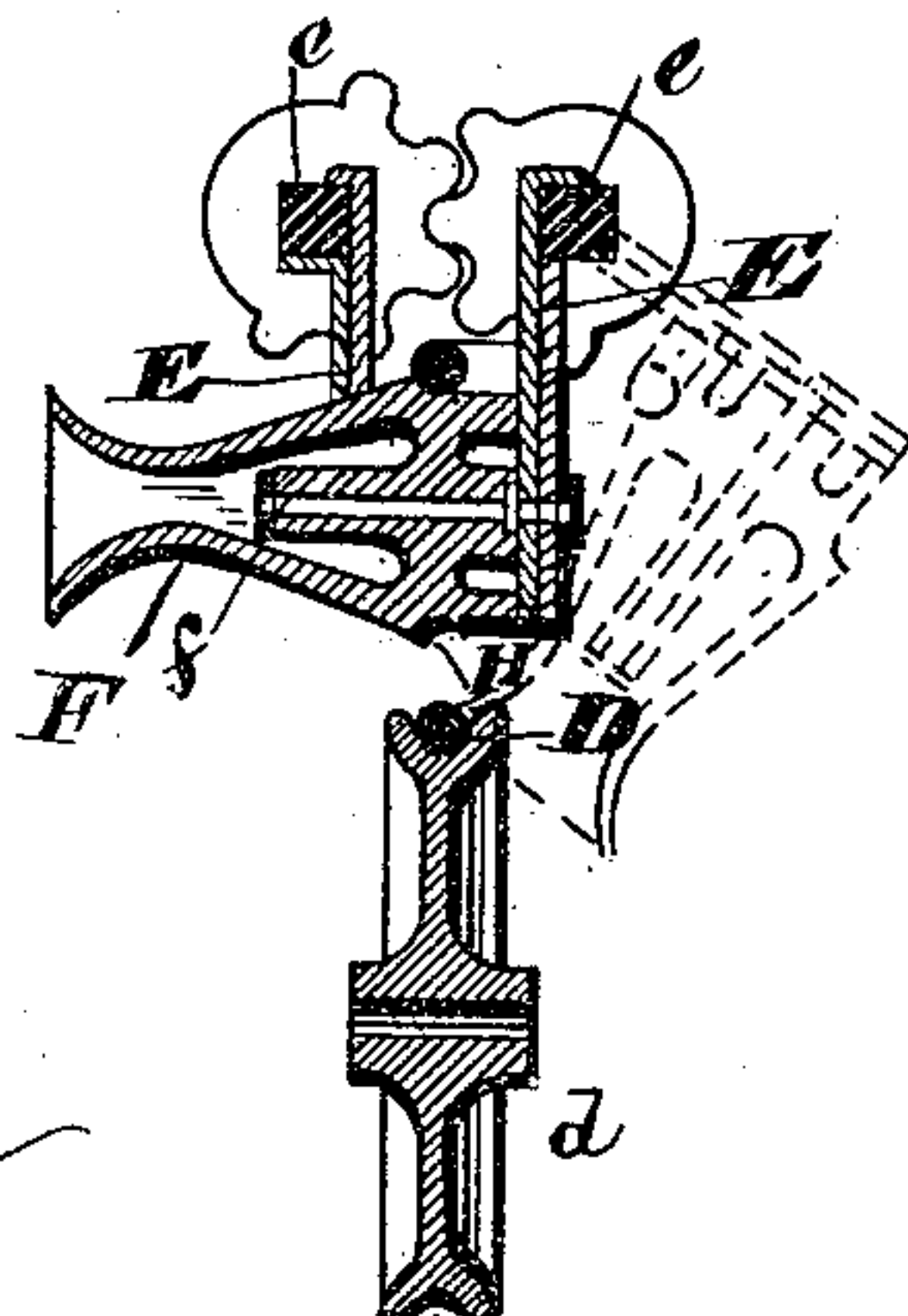


Fig. 6.



Fig. 7.

Fig. 5.



WITNESSES

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# UNITED STATES PATENT OFFICE.

CHARLES LEAVITT, OF CLEVELAND, OHIO.

## GRIPPING DEVICE FOR CABLE RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 336,245, dated February 16, 1886.

Application filed March 3, 1884. Serial No. 122,916. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES LEAVITT, of Cleveland, in the county of Cuyahoga, and State of Ohio, have invented certain new and  
5 useful Improvements in Gripping Mechanisms for Cable Roads; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable  
10 others skilled in the art to which it pertains to make and use the same.

My invention relates to railroads operated with endless cables, but more especially to the mechanism for raising, grasping, and releasing the cables.

15 The object of my invention is to provide rollers of such shape and operated in such a manner that the cable may be lifted thereby, and held in position subject to the action of the clutch, with the least possible friction.

20 A further object is to provide a clutch that will grasp the cable in the position to which it is raised by the roller.

A further object is to so arrange or combine the parts that the lifting-rollers and clutch  
25 may be operated by the same mechanism.

A further object is to provide mechanism by means of which the cable may be automatically dropped as the car approaches  
30 curves or other places where it is required to drop the cable.

With these objects in view my invention consists in certain features of construction and in combination of parts hereinafter described, and pointed out in the claims.

35 With the class of railroads aforesaid the cable is usually supported on sheaves or grooved wheels midway between the tracks and midway between the cross-ties and the bottom of the car-track. Some means must be employed  
40 for clutching or grasping the cable, so that the car will be propelled by the cable. This clutching mechanism must be located so far above the grooved wheels that support the cable as not to come in contact therewith.

45 It has been found difficult to provide means of raising a quick-running cable to the position required to engage the clutch without causing so much friction as would soon destroy alike the lifting mechanism and the cable.  
50 I have therefore invented a system of lifting-

rollers journaled in a suitable manner that they may revolve easily, and curved, grooved, and operated in such a manner that the cable may be lifted and held in position, subject to the action of the clutch, with an amount of  
55 friction that is merely nominal.

Wherever the track curves the cable does not follow the line of the track, but is passed around lateral wheels that may be located  
60 some distance outside of the track. As the car approaches these curves, it is necessary to drop the cable and again lift and clutch it after the car by its momentum has passed the curve.

My invention embraces mechanism by means  
65 of which the cable is automatically dropped as it approaches a curve.

In the accompanying drawings, Figure 1 is a side elevation of a car to which my improved lifting apparatus, clutch, and other mechanism are attached; also is shown a portion of the track and side plates that support the track  
70 between posts. Fig. 2 is an end elevation of the same. Fig. 3 is a view of the bottom of a portion of the car. Fig. 4 is an enlarged view in perspective of the bottom of the track with  
75 my new device attached. Fig. 5 is an enlarged vertical section in detail. Fig. 6 is an end elevation of the clutch. Fig. 7 is a plan view of the ratchet-wheel and pawl.  
80

A represents the car, B the track, B' the supporting-frame work, and C the side plates that support the track between the posts, and to the top of which are attached the overhanging plates *c*, that extend over the car  
85 wheels and in such close proximity thereto that the wheels cannot leave the track. In place of the plates C any suitable truss may be used.

D is the cable, supported on the grooved  
90 wheels *d*.

E are pendent parallel swinging plates extending lengthwise of the car and secured, respectively, to the shafts *e*, that are journaled in suitable boxes attached to the bottom of  
95 the truck. These shafts are intergeared, as shown in Figs. 4 and 5, so that the plates move simultaneously either toward or from each other. One of these shafts is provided with the lever E', to the end of which are attached  
100



the ropes or chains *a* and *b*, leading in opposite directions and around guiding-pulleys, and from thence to the drum I, that is secured to an upright shaft, J, provided with a hand-wheel, K, like the ordinary brake-wheels on cars. To the plates E, and at right angles thereto, are attached the studs *f*, upon which are journaled the rollers F. (Clearly shown in Fig. 5.)

G are the clutch-blocks, attached, respectively, to the plates E, and grooved on their faces for embracing the cable, as shown in Fig. 6.

The rollers F are curved, as shown, and are each provided with a groove, H. When the rollers are idle, they are about in the position of the one shown in dotted lines in Fig. 5, but should be swung back a little farther, so they will not come in contact with the wheels *d*. When the rollers, by means of the lever E' and the hand-wheel K, aforesaid, are swung toward each other, their flange-like ends pass under the cable, as shown in Fig. 4.

As the plates E are drawn near together, the rollers F assume a horizontal position, like the one shown in Fig. 5, the rollers attached to the respective plates passing by each other and extending in opposite directions. Meantime the cable has passed up along the surface of the rollers until it rests in the grooves H. When the cable is in this position, it is at the same height of the grooves in the blocks G, and the relation of parts is such that these blocks embrace the cable as nearly as possible without actual contact. A still farther slight movement of the hand-wheel K will cause these blocks or clamps to grasp the cable so that the car will be carried along with the cable. A slight reverse movement of the hand-wheel will release the cable from the clutch, leaving it still in the groove H.

It will be seen by the position of parts shown in Fig. 5 that when the cable is in the groove H its vertical position will not be perceptibly changed by the slight movement necessary in grasping or loosening the cable by the clutch, so that the cable, when in the groove H, is also substantially in a central position in the grooves of the clutch. It will therefore be seen that the car may be stopped or started at will of the operator without dropping the cable, and that when the clutch is not grasping the cable it may pass almost frictionless over the rollers F, as, in fact, it does from the time the rollers first engage the cable until it is finally dropped.

The second rope, *b*, leading from the lever E' to the drum I, is merely to keep the slack from the rope *a*, so that the device will be under perfect control. The shaft J, to which the drum I and the hand-wheel K are attached, is also provided, in the usual manner of brake-wheels, with a ratchet-wheel, L, and a pawl, *m*. (Shown more clearly in Fig. 7.) The pawl

engages the ratchet in the direction that holds the clutch in contact with the cable, and is provided with a lever, *n*, extending beyond the pivoted point, so that it will engage the stops P, that are located at the commencement of curves in the track, and by means of such engagement the pawl will be drawn back so as to release the ratchet-wheel. When this occurs, the cable, by reason of its own weight and the weight of the rollers F, will be instantly dropped. After the car has passed around the curve the brakeman may again raise the cable at any place between two of the wheels *d*.

R is the brake, which is operated in the usual manner for stopping the car. As the two wheels K and R are located side by side, the brakeman has full control of the car.

I may add that the lower edges of the plates E are curved downward, forming pendent ears at the points where the studs *f* are attached, so that the rollers, when brought to a horizontal position, extend under the opposite plates and without contact therewith.

What I claim is—

1. The curved rollers F, provided with the groove H, and arranged and operated substantially as described.

2. The pendent swinging parallel plates E, intergeared so that they will simultaneously move in opposite directions toward or from each other, and provided on their inner faces, respectively, with the blocks G, adapted to form a clamp for grasping the cable, substantially as set forth.

3. The combination of the plates E, the blocks G, and the rollers F, so arranged that the cable, when lifted by the rollers so as to engage the groove H, will be in position to be grasped by the blocks G, forming the clutch, and that when the cable is released from the clutch it may still be held by the rollers and travel in the groove H and in position for re-engagement with the clutch, substantially as set forth.

4. The combination, with clutch, drum I, and rollers F, as aforesaid, and suitable connecting mechanism by means of which the clutch and attachments may be operated by a hand when on the platform of the car, of the ratchet L, the pawl *m*, provided with the lever *n*, and the stops P, located at or near the commencement of curves of the track, and by means of which the cable may automatically be dropped as the car approaches the curves, substantially as set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 31st day of January, 1884.

CHARLES LEAVITT.

Witnesses:

CHAS. H. DORER,  
ALBERT E. LYNCH.