(No Model.)

M. A. MICHALES.

TRACTION GRIPPER FOR CABLE RAILWAYS.

No. 406,928. Patented July 16, 1889.

Fig. 1.

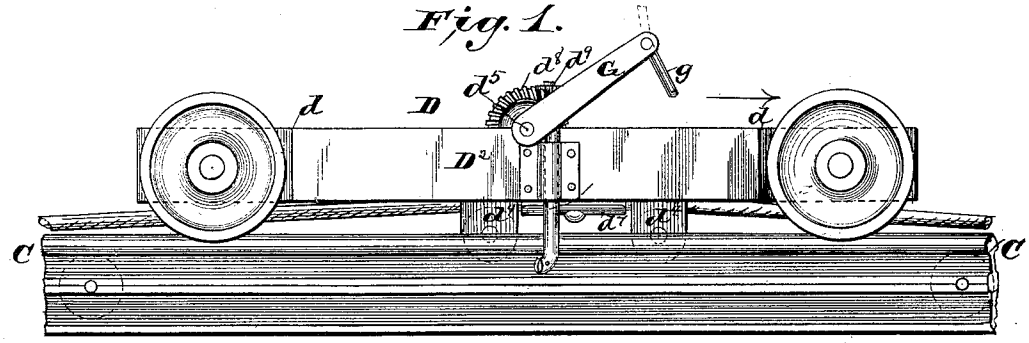


Fig. 2

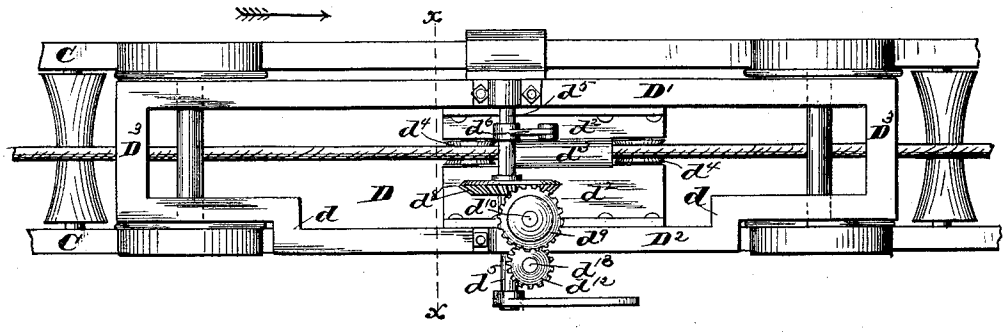


Fig. 3

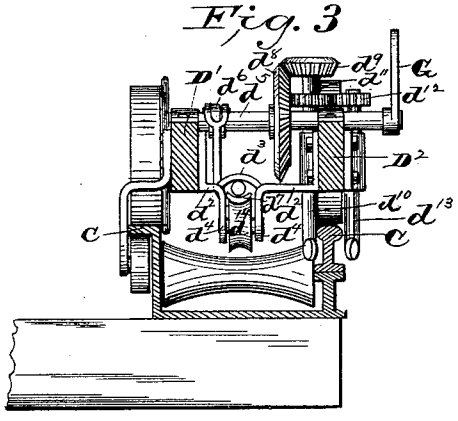


Fig. 4.

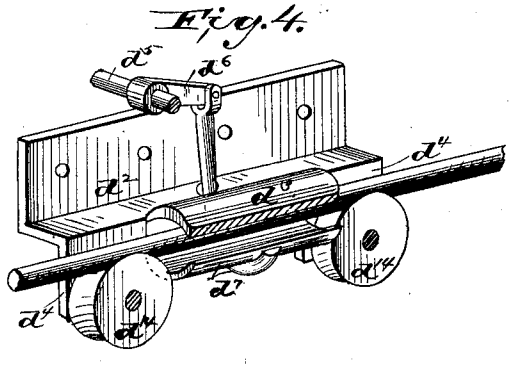
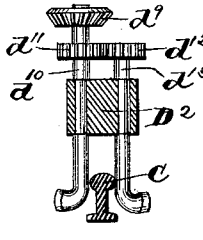


Fig. 5



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UNITED STATES PATENT OFFICE.

MOSES A. MICHALES, OF ALLEGHENY, ASSIGNOR OF ONE-HALF TO JOHN T. MOORE, OF PITTSBURG, PENNSYLVANIA.

TRACTION-GRIPPER FOR CABLE RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 406,928, dated July 16, 1889.

Original application filed May 15, 1888, Serial No. 273,951. Divided and this application filed July 10, 1888. Serial No. 279,515. (No model.)

To all whom it may concern:

Be it known that I, MOSES A. MICHALES, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Traction-Grippers for Cable Railways; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, wherein—

Figure 1 is an elevation of a portion of a track and a truck having applied thereto a combined gripper and brake embodying my invention. Fig. 2 is a plan or top view of the same. Fig. 3 is a vertical transverse section of Fig. 2 on the line $x\,x$, looking in the direction of the arrow. Fig. 4 is a detached sectional perspective view of the cable-grip, showing the cable released. Fig. 5 is a detached view of the rail-brake.

Like letters refer to like parts wherever they occur.

The present invention is a division of application, Serial No. 273,951, filed May 15, 1888, which relates more especially to the construction of tracks and trucks for elevated railroads, and is intended to cover all such features of grippers and combined gripper and brake therein shown and described, but not claimed, as are of general utility in any cable road.

The main feature of the present invention consists in the combination of a cable-grip, a rail-grip, and intermediate rock-shaft and gear mechanism common to both, whereby the two are simultaneously and reversely operated, while minor features of said invention relate to the particular construction of the grip, whereby the combination is effected and the wear and cutting of the cable are avoided, all as will hereinafter more fully appear.

I will now proceed to describe my invention more fully, so that others skilled in the art to which appertains may apply the same.

In the drawings, C indicates the track, and D a truck adapted thereto, said truck being formed with side sills D′ and D^2 and end sills D^3. One of the sills D^2 may have an angular bend or offset d, as shown in Fig. 2, or in lieu thereof a bracket, to provide a support for the rail-brake in line laterally with the gripper and directly over one of the rails C.

Bolted securely to the inner faces of the side sills of the truck, about midway between the ends, is an angle-plate d^2, the central part or web of which is provided at its under side with a groove d^3 to form the upper or fixed half of a cable-grip, while at each end of this grooved web are downwardly-projecting ears d^4, in which the ends of the axles of the cable guide-rolls d^{14} are journaled.

On the upper faces of the side sills of the truck are secured journal-boxes, in which is mounted a transverse shaft d^5, provided with a crank-arm d^6, to the end of which is pivoted the upper end of a rod which passes through an opening in the angle-plate d^2, and carries at its lower end a grooved shoe d^7, forming the lower or movable part of the cable-grip, which shoe d^7 is arranged to rise and fall vertically between the cable guide-rolls d^{14}, so that when the shoe d^7 is depressed to loosen the grip or hold on the cable the cable will travel upon the anti-friction guide-rollers d^{14}.

It will be observed from the above construction that when the grip is released it is entirely freed from the cable, so there is no chance for wear or cutting of either cable or grip by the friction of one upon the others.

To the center of the shaft d^5 is keyed a beveled skew-gear d^8, meshing with a similar gear d^9, keyed to a vertical brake-shaft d^{10}, journaled in a bearing secured to the inner face of the sill D^2 of the truck. This brake-shaft is also fitted with a rigidly-secured pinion d^{11}, meshing with a similar pinion d^{12}, keyed on another vertical brake-shaft d^{13}, journaled in a bearing secured to the outer face of said side sill D^2. The lower ends of these brake-shafts d^{10} and d^{13} are preferably cranked or bent rearwardly and provided with brake-shoes designed to grasp or be brought in frictional contact with the web of the rail by rotation of the shafts d^{10} and d^{13}, and it is to afford facility for this construction and op-

eration chiefly that the sill D^2 of the truck is provided with the angle bend or offset *d*. On the shaft d^5 is also a crank-arm G, to which is secured one end of a rod *g*, the other end of rod *g* being secured to an operating-lever fulcrumed in bearings on the platform of the car (not shown) with which the above-described devices are employed.

The devices being constructed and combined substantially as hereinbefore specified, will operate as follows: The car being at rest, the brake-shoes attached to or operated by shafts d^{10} and d^{13} will be in frictional contact with the track-rail, and the cable released or running free, as indicated in Fig. 4. If now the crank-arm G be moved by means of rod *g* from an operating-lever placed on the platform of the car, the shaft d^5 will be rotated, and through the medium of skew-gearing d^8 and d^9 and pinions d^{11} and d^{12} will rotate the vertical shafts d^{10} and d^{13}, releasing the brakes. By the same rotation of the shaft which releases the brakes the crank-arm d^6 is raised, thereby lifting the grooved shoe d^7, forming the lower member of the grip, which raises the cable off the guide-rolls d^{14} and clamps it against the fixed member d^3 of the grip. The reverse movement of shaft d^5 releases the cable and simultaneously applies the brake.

It is evident that the brakes need not necessarily be formed on or with the vertical shafts d^{10} and d^{13}, as shown, but may be independent brakes actuated therefrom, as the main object of the combination is to insure the application of the brakes at the instant and by the motion which releases the grip on the cable.

I do not herein claim the construction of track and truck chosen for purposes of illustration and shown in the drawings, as the same forms the subject-matter of an application, Serial No. 273,951, filed May 15, 1888; nor do I herein claim the particular construction of brake shown, as the same forms the subject-matter of an application, Serial No. 279,514, filed of even date herewith; but,

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

1. The combination, with a grip rail-brake having rotating brake-shaft, of a cable-grip and an interposed rock-shaft having a gearing, and a crank-arm for simultaneously and reversely operating both the grip and brake, substantially as and for the purposes described.

2. In a combined grip and brake mechanism for cable roads, the combination, with a bar which actuates the grip and a grip rail-brake, of an interposed rock-shaft for simultaneously and reversely operating both the grip and brake mechanism, substantially as and for the purposes described.

3. The combination of a grip mechanism, a brake mechanism, and an interposed rock-shaft connected with the gripper-bar, and skew-gearing for connecting the rock-shaft with the rotating shaft which actuates the rail-brakes, substantially as and for the purposes described.

4. In a gripping mechanism for cable railways, the combination of an angle-iron having a rigid jaw, cable-supporting rollers journaled in the ends of said angle-iron, and a movable jaw located beneath said rigid jaw intermediate of said rollers, substantially as and for the purposes specified.

5. In a cable-grip, the combination of the angle-plates d^2, having the fixed half-grip d^3, the cable guide-rollers d^{14}, and the intermediate movable shoe d^7, substantially as and for the purposes specified.

6. In a combined cable-grip and brake mechanism, the combination of the angle-plates d^2, having fixed half-grip d^3, movable shoe d^7, vertical brake-shafts d^{10} d^{13}, shaft d^5, and suitable gearing for connecting the parts, substantially as and for the purposes specified.

In testimony whereof I affix my signature, in presence of two witnesses, this 7th day of July, 1888.

MOSES A. MICHALES.

Witnesses:
JNO. B. DIAMOND,
CHARLES LARGE.