(No Model.)

3 Sheets—Sheet 1.

S. A. COONEY.

CABLE RAILWAY.

No. 564,184. Patented July 21, 1896.

Fig. 1.

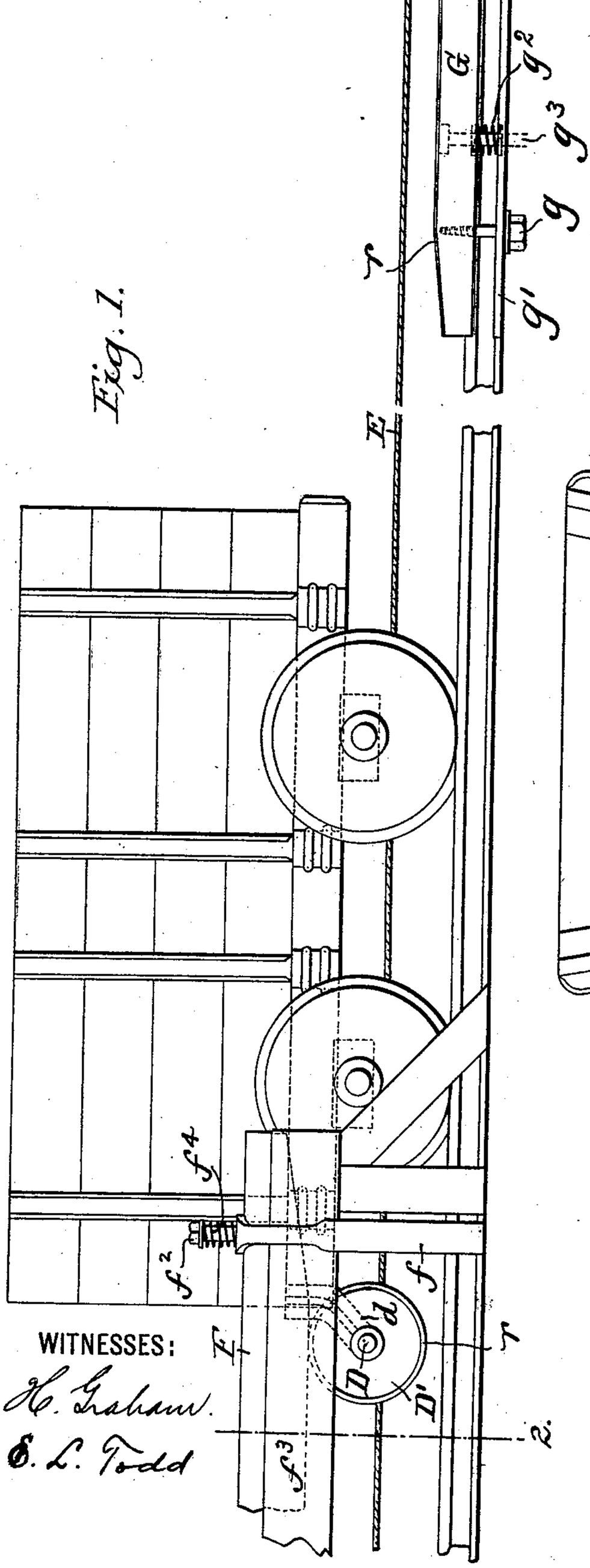
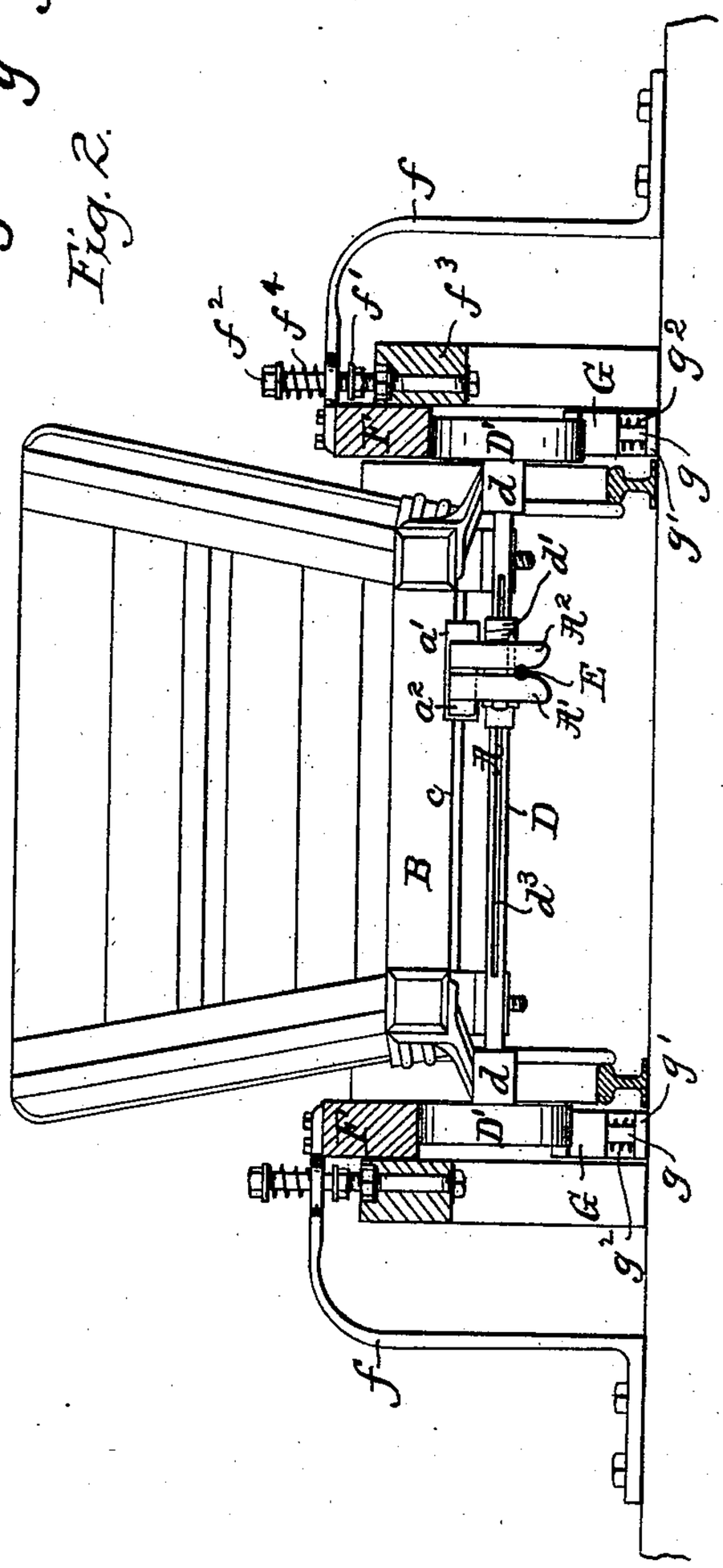


Fig. 2.



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(No Model.) 3 Sheets—Sheet 2.

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Fig. 3.

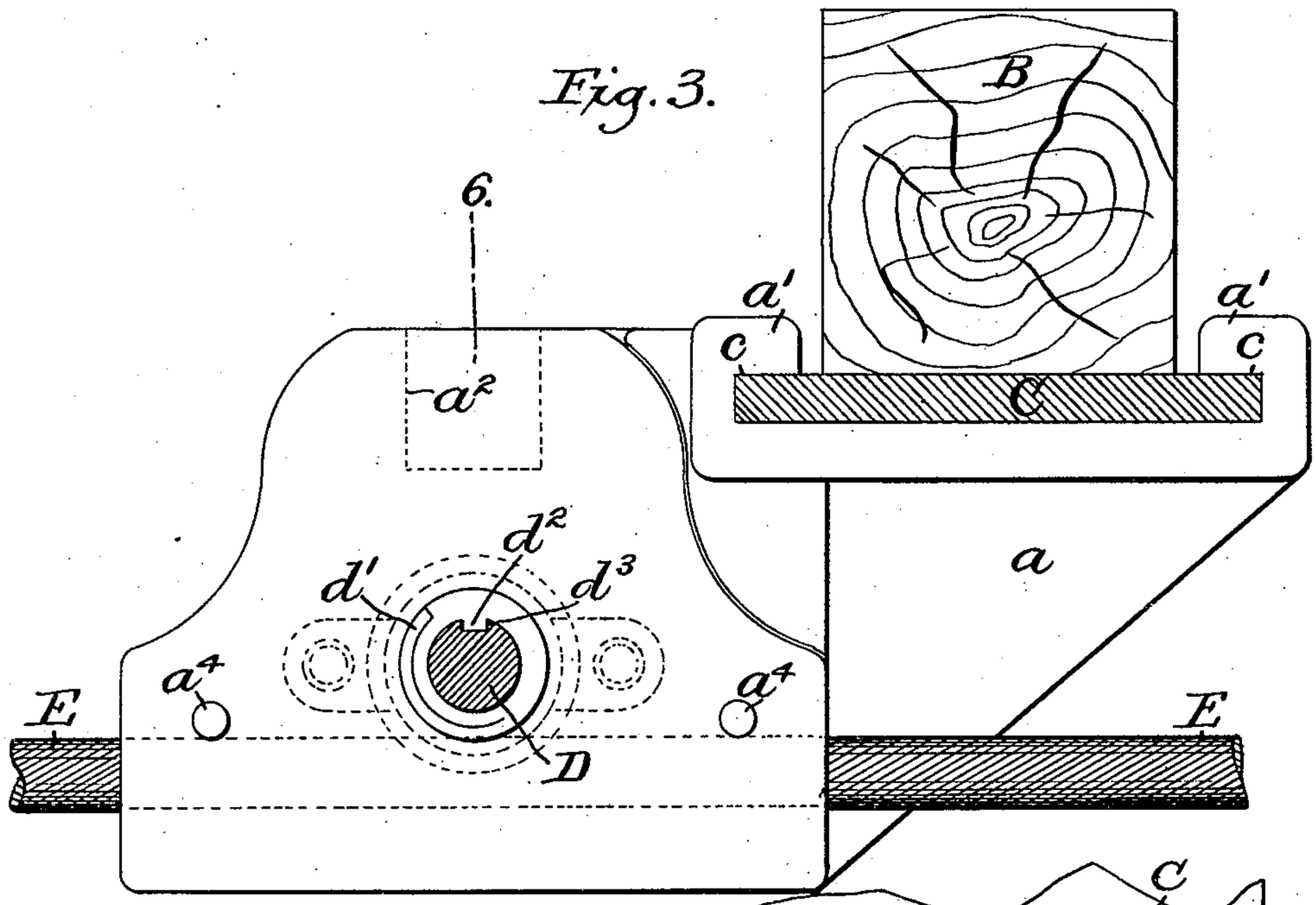

Fig. 4.

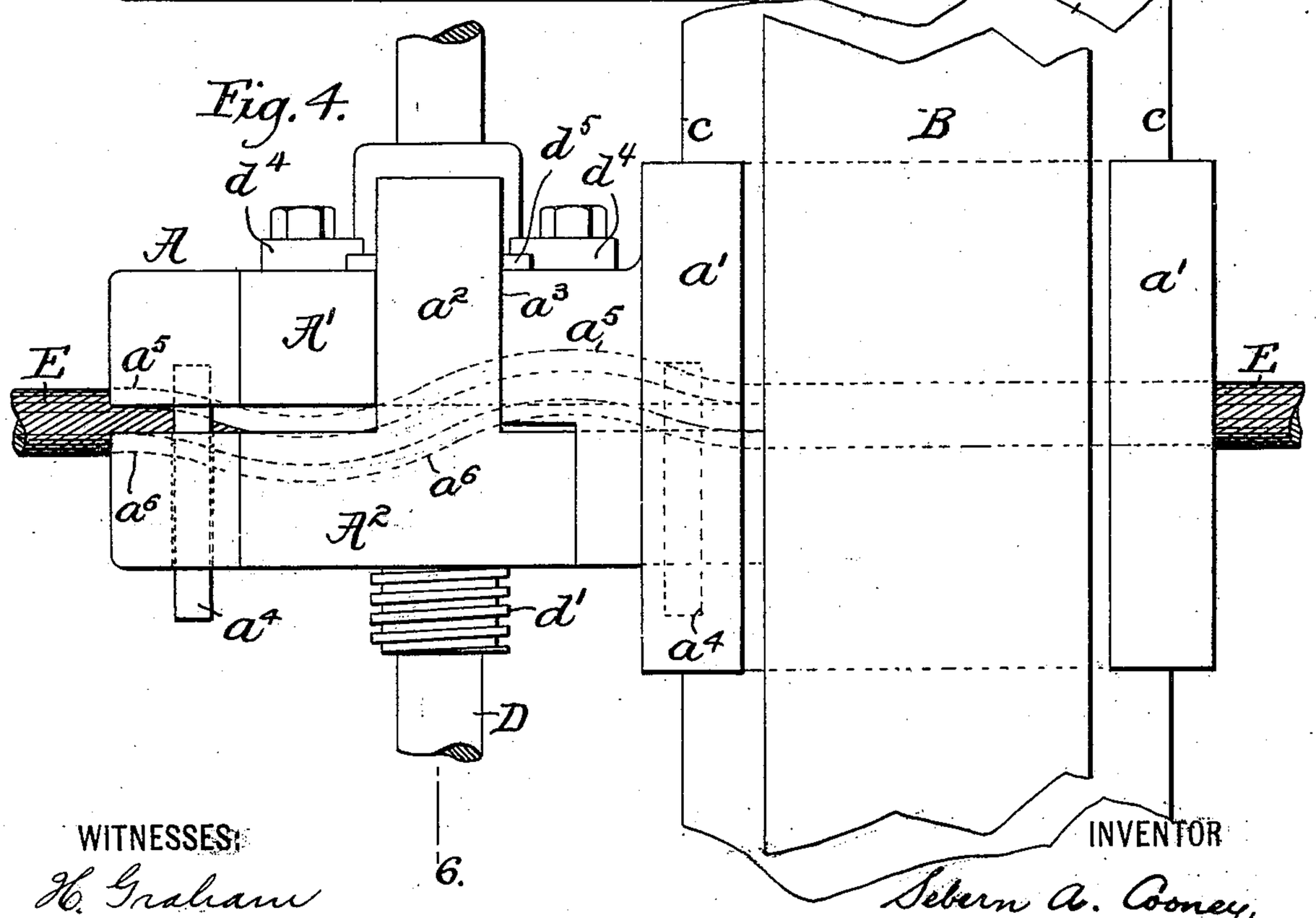

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Fig. 5.

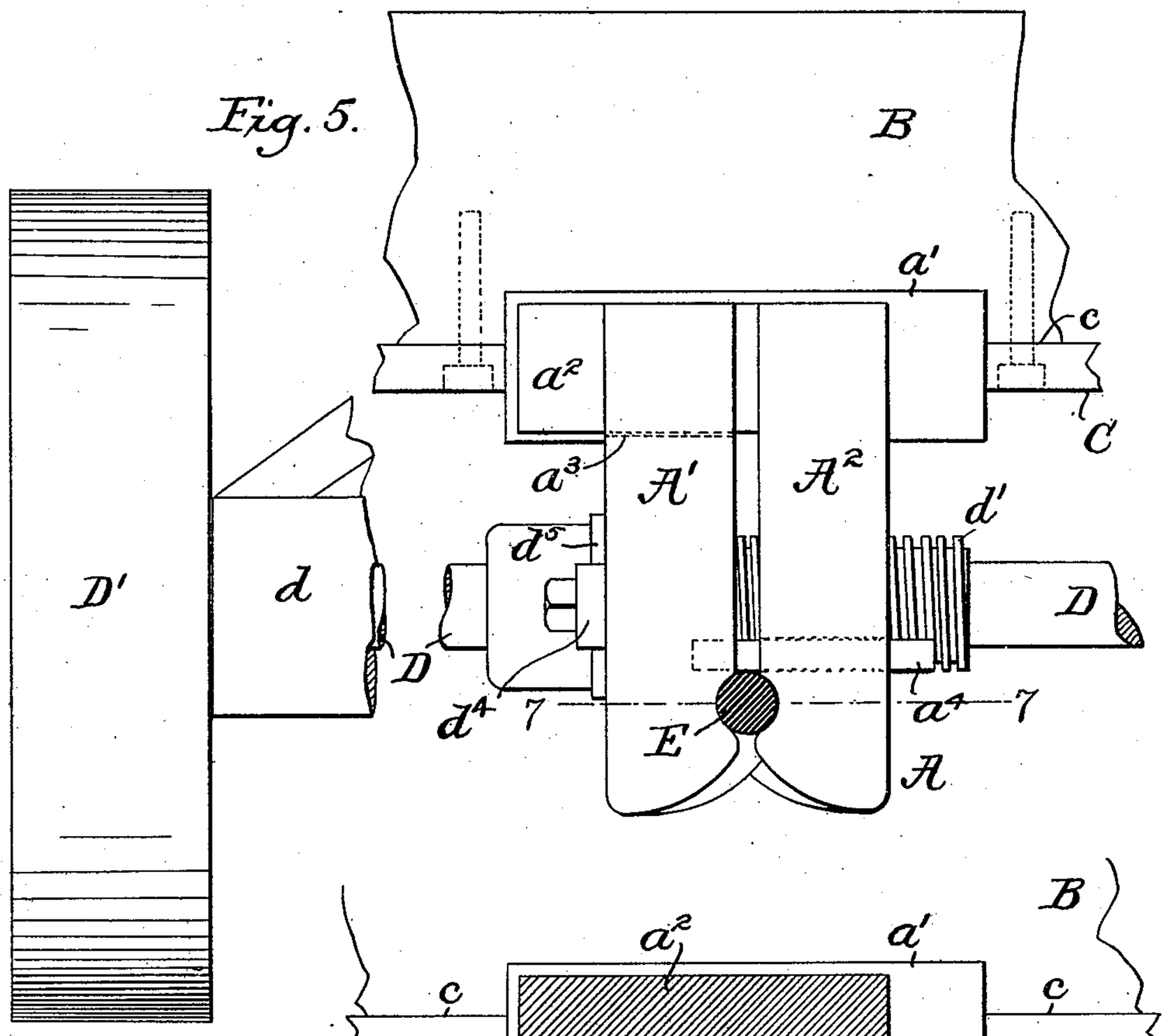
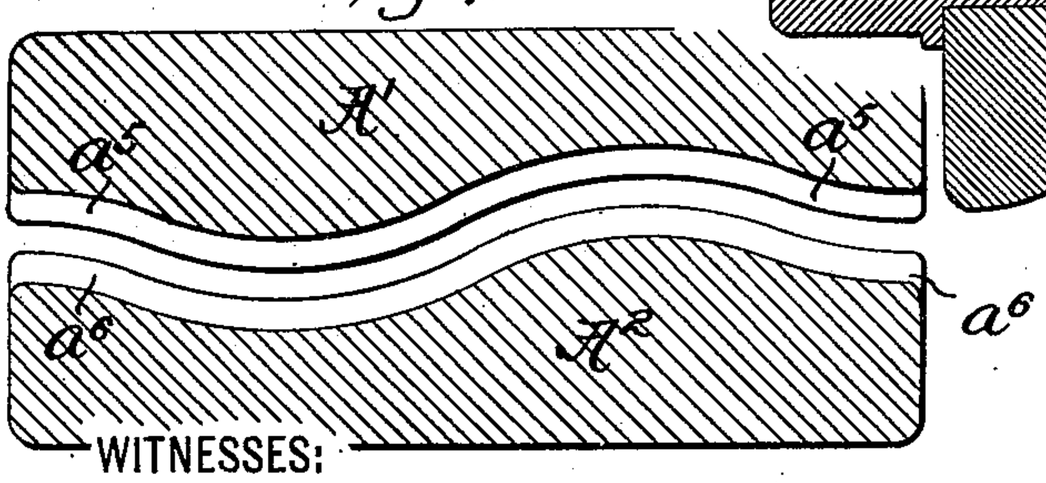
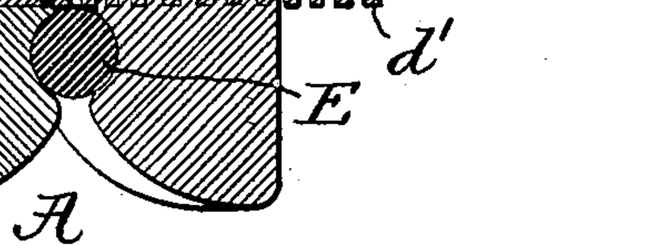


Fig. 6.

Fig. 7.





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UNITED STATES PATENT OFFICE.

SEBERN A. COONEY, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO THE JOHN A. ROEBLING'S SONS COMPANY, OF TRENTON, NEW JERSEY.

CABLE-RAILWAY.

SPECIFICATION forming part of Letters Patent No. 564,184, dated July 21, 1896.

Application filed August 9, 1894. Serial No. 519,898. (No model.)

To all whom it may concern:

Be it known that I, SEBERN A. COONEY, a citizen of the United States of America, residing at the city, county, and State of New York, have invented certain new and useful Improvements in Cable-Railways, of which the following is a specification.

This invention relates, generally, to cable-railways, and more particularly to the grip and automatic grip-operating devices for trucks employed in mining operations and the like.

As is now well understood in mining operations, a track, usually inclined, extends from the mine or tunnel to the ore house or works, and the trucks adapted to such tracks are propelled by a cable. Each truck is therefore provided with a grip to grip the cable, and as there is considerable danger incident to the handling of such trucks, especially when loaded, in descending the inclined track, and also when it is advantageous to dispense with all unnecessary labor, it is of importance to provide means by which the grip of the truck shall be capable of operation entirely automatic and irrespective of an attendant, both to grip the cable at the start and to release the cable at or near the terminus of the track. In such instances, also, it is essential that the grip shall be simple and inexpensive, and at the same time be as safe and reliable as is possible to construct it.

With these ends in view, the present improvements consist in the novel constructions, combinations, and arrangements of parts hereinafter fully set forth.

The accompanying drawings illustrate a practical embodiment of the invention as applied to an ore or coal truck and railway therefor, it being understood, however, that its application in practice is not necessarily limited thereto.

In said drawings, Figure 1 is a side elevation of a cable-railway, showing portions of its two ends with a truck on the railway near one end, its grip having about completed its gripping of the cable. Fig. 2 is a transverse sectional elevation of the railway, taken on the line 2 of Fig. 1, and through the grip-closing device at one end of the railway, showing in end elevation the grip-opening device at the other end of the railway. Fig. 3 is an enlarged side elevation of the grip and a portion of the cable being gripped, and a portion of the car or truck-body to which the grip is connected. Fig. 4 is a plan view of the same. Fig. 5 is an end view looking from the left of Figs. 3 and 4, the cable being in cross-section; and Fig. 6 is a vertical cross-section on the line 6 6 of Figs. 3 and 4. Fig. 7 is a horizontal section on the line 7 of Fig. 5, omitting the cable.

For convenience of description the grip will be first described, followed by a description of the automatic devices for closing and releasing the grip upon and from the cable.

The grip A is preferably connected with one of the transverse end beams B of the truck or car framing, or it may be to the frame of a trolley. The beam B carries an iron or wrought-iron plate C, firmly secured to its under surface, to provide opposite projecting flanges *c*, which plate, to enable the grip to be shifted or adjusted to any position transversely of the truck or car, preferably extends more or less the width of the truck.

The grip is formed of two members A' A^2. The member A' in the preferred form is fixed and the other member A^2 is movable from and toward the fixed member. The fixed grip member A' is formed integral with a forwardly-extending bracket *a*, that is provided with oppositely-extending long clips a', which embrace the flanges *c* of the plate C, and thus firmly support the grip and adapt it to be adjusted along said plate to any desired position. The movable grip member A^2 is substantially a counterpart of the fixed member lacking the bracket and its clips, and is supported and carried by the fixed member by a laterally-extending arm a^2, fitting a recess a^3 in the upper portion of the fixed member, and is also guided in its movements to and from said fixed member by said recess aided by one or more pins a^4, projecting from the fixed member into holes in the movable member. The pins a^4 also are so positioned with respect to the gripping-surfaces of the grip members that the cable is prevented from rising above the plane of such surfaces, as seen in Fig. 4. Both of the grip members are broad faced at their lower portion, and on their

opposed or contiguous surfaces are provided with grooved or semicircular gripping-recesses a^5 a^6, extending longitudinally in a serpentine or waved line, as seen in Figs. 4 and 7, so that in gripping the cable E said cable is bent to conform to said gripping-recesses, which impart thereto one or more bends and provide a very firm mode of gripping the cable. As seen in Fig. 7, it will be noticed that the gripping-recesses extend horizontally from a point in line with the normal position of the cable and then bend in concave and convex curves to the end of the grip where the recesses again coincide with the normal position of the cable, and thus the cable outside the grip is in its original alinement, while inside the grip the cable is bent to both sides of its longitudinal axis, and hence the gripping surface and power is increased.

To adjust the movable grip member to and from the fixed grip member, there is provided a transverse shaft D, supported in bearings d, provided by brackets secured to the truck-frame, (see Figs. 1, 2, and 5,) which shaft passes through both of the grip-members A′ A². The fixed member A′ carries a screw-threaded sleeve d', surrounding the shaft D, having a key or feather d^2, that fits a longitudinal keyway d^3 in the shaft, and its threaded end projects through and engages with female threads in the movable grip member A², which thus forms the nut for the screw-sleeve. The screw-sleeve d' is rotatively connected to the fixed grip member A′ by a pair of clips d^4, which embrace opposite sides of a circular flange d^5 on the head out of the sleeve, preventing longitudinal movement of the sleeve with respect to the fixed grip member, but allowing the sleeve to turn freely in its bearings in the fixed member. The construction is such that when the shaft D is rotated in one direction, rotating also the screw-sleeve d', the member will be moved through the screw-threaded sleeve, say away from the fixed member, and the grip be open to release the cable; and on rotating the shaft D in the reverse direction the movable member will be moved toward the fixed member to grip the cable.

Such mode of adjusting one grip member toward and from the other grip member to grip and release the cable renders it possible to provide exceedingly simple means for operating the movable member automatically. Thus the transverse shaft D may carry at one or both ends, preferably the latter, a wheel or pulley D′, which may coact with stationary automatic operating devices alongside of the track or way in the plane of movement of the wheel to rotate it one way or the other as the car or truck travels among the track or way. In the present instance these coacting devices consist of a closing bar, beam, or timber F in one case, and an opening or releasing bar, beam, or timber G in the other case, either one or both of which may be employed in the operation of the railway. The closing-bar F (see Figs. 1 and 2) is arranged to overlie and bear upon the wheel or pulley D′ above its axis and is supported longitudinally of and parallel with the track by one or more arms f, that are secured to and rise from a cross-timber of the track, such arm or arms f being preferably of spring metal so as to yield upwardly with the bar when the wheel or pulley D′ rides frictionally against its under surface. The one or both ends of the closing-bar F will be inclined, as shown at one end in Fig. 1, to render the contact or leaving of the wheel D′ less abrupt. To regulate the vertical position of the bar within certain limits with respect to the wheel D′, one or each of the arms f normally rests on an adjustable nut f' carried by a vertical bolt f^2, projecting from a supporting-beam f^3 through an eye in the arm f. (See Fig. 2.) A spring f^4, encircling the upper end of the bolt and bearing upon the arm f, aids in returning the closing-bar F to its normal position resting on the nut f', and may also supplement the spring of the arm f in holding the closing-bar in firm frictional contact with the wheel or pulley D′, so that as said wheel passes along and in contact with said bar its rotation will be insured and the grip thus be closed to grip the cable.

It will be observed that the springs f^4 and their adjusting devices form a means for increasing or diminishing the resistance of the spring-arms f to the movement of the automatic grip-operating bar or device F. When the bar is in normal position, with the springs f^4 under tension, the springs f and f^4 are oppositely acting, the former tending to lift and the latter to depress the bar.

The opening-bar G in its action is a counterpart of the closing-bar F, operating on the wheel or pulley D′ below its axis, so as to rotate it in the movement of the truck, car, or trolley in the reverse direction to that imparted by the bar F, so as to open the grip and release the cable.

The opening-bar G is arranged longitudinally alongside of the track with one or both of its ends inclined to lessen the abruptness of contact of the wheel D′, as in Fig. 1, and is carried by one or more vertical bolts g, rising from a base-plate g', the heads of said bolts limiting the upward position of the bar G, said bolt being arranged to move vertically with respect to said base-plate. The opening-bar is supported and held yielding at the limit of its upward movement by a suitable spring or springs g^2, interposed between the base-plate and the closing-bar and encircling-bolts g^3, the tension of the spring or springs g^2 being sufficient to press the opening-bar firmly against the wheel D′ in the travel of the truck, so that said wheel will be rotated by its contact with the bar.

It will be observed that the abruptness of contact of the wheel D′ with the automatic operating device F or G is further lessened by the cushioning effect of the spring or springs g^2.

In practice, the grip closing and opening bars F G may be faced on their active faces with some suitable material which will increase the frictional adherence of the wheel thereon. Such material may be a sheet of more or less soft rubber *r*, Fig. 1, and in lieu of this or in addition thereto the wheel D′ may be faced with similar material.

In the preferred construction a wheel or pulley D′ will be applied to both ends of the grip-operating shaft D, and the closing and opening bars F and G be arranged on both sides of the track so as to operate simultaneously on the wheel D′, and less strain be exerted on said shaft and its operation be better assured.

So far as certain features of this invention are concerned, it is obvious that other forms of grip members and modes of operation than that described may be employed with equal facility, and that these improvements herein described may be used with other forms of ways than that shown.

What is claimed is—

1. The combination of a car or moving body, a grip adapted to engage a cable and carried by the car, a rotary wheel or part for actuating said grip by its rotation, an automatic operating device for said rotary part carried by spring-arms and means for increasing or diminishing the resistance of said arms, substantially as set forth.

2. The combination of a car or moving body, a cable-grip carried thereby, a screw-shaft for actuating said grip, an automatic operating device for said shaft and oppositely-acting springs holding said device, substantially as set forth.

3. The combination of a cable-grip, a screw connected with the grip for operating it, a shaft for operating the screw, a wheel connected with said shaft, a yielding bar for operating the wheel by contact, arms carrying said bar, and springs acting on said arms, as set forth.

4. The combination in a cable-grip of a fixed grip member, a movable grip member, a screw-threaded sleeve carried by one grip member and engaging screw-threads in the other member, and a shaft within the sleeve for rotating it, as set forth.

5. The combination in a cable-grip, of the supporting-plate, the fixed grip member laterally adjustable along said plate, the movable grip member and means for opening and closing the grip, as set forth.

6. The combination in a cable-grip, of the supporting-plate, the fixed grip member adjustably supported on said plate, a movable grip member carried by the fixed member, and means for moving the movable member toward and from the fixed member, as set forth.

7. The combination of the fixed grip member having a recess and projecting pins, a movable grip member having a guide-arm entering said recess and provided with openings in which the pins project, and means for moving the movable member toward and from the fixed member, as set forth.

8. The combination in a cable-grip of a fixed grip member, a movable grip member, a screw-threaded sleeve rotatively mounted in one member, with its threads engaging threads in the other member, clips holding the sleeve to the fixed member, and a shaft splined to the sleeve for rotating it, as set forth.

9. The herein-described cable-grip members having coacting gripping-recesses arranged in a serpentine line, combined with guide-pins a^4 fixed in one grip member at the edge of said gripping-recess, substantially as set forth.

10. The combination of the cable-grip members, means for opening and closing them, a wheel or pulley connected with said means, a longitudinally-arranged yielding bar for frictional contact with the wheel for rotating it, and adjustable stops for limiting the movement of the bar upward, as set forth.

11. The combination of the cable-grip members, a shaft for opening and closing them, a wheel or pulley on the shaft, a longitudinally-arranged and vertically-yielding bar for frictional contact with the wheel for rotating it and the shaft, and oppositely-acting springs holding said bar, as set forth.

12. The combination of the cable-grip members, a shaft having a wheel or pulley for opening and closing said members, a longitudinally-arranged bar along which said wheel may travel to be rotated, a spring connected with the bar, a spring for resisting the upward movement of the bar and a limiting-stop for determining the normal vertical position of the bar with respect to the wheel, as set forth.

13. The combination of the cable-grip, the shaft having a wheel for operating said grip, a longitudinally-arranged bar along which said wheel travels to be rotated, a spring arm or arms supporting said bar, a spring resisting the upward movement of the bar, and a limiting-nut limiting its downward movement, as set forth.

In witness whereof I have hereunto signed my name in the presence of two witnesses.

SEBERN A. COONEY.

Witnesses:
GEO. H. GRAHAM,
W. H. GRAHAM.