(No Model.)

J. H. POLHEMUS.

2 Sheets—Sheet 1.

CABLE GRIP.

No. 312,507.

Patented Feb. 17, 1885.

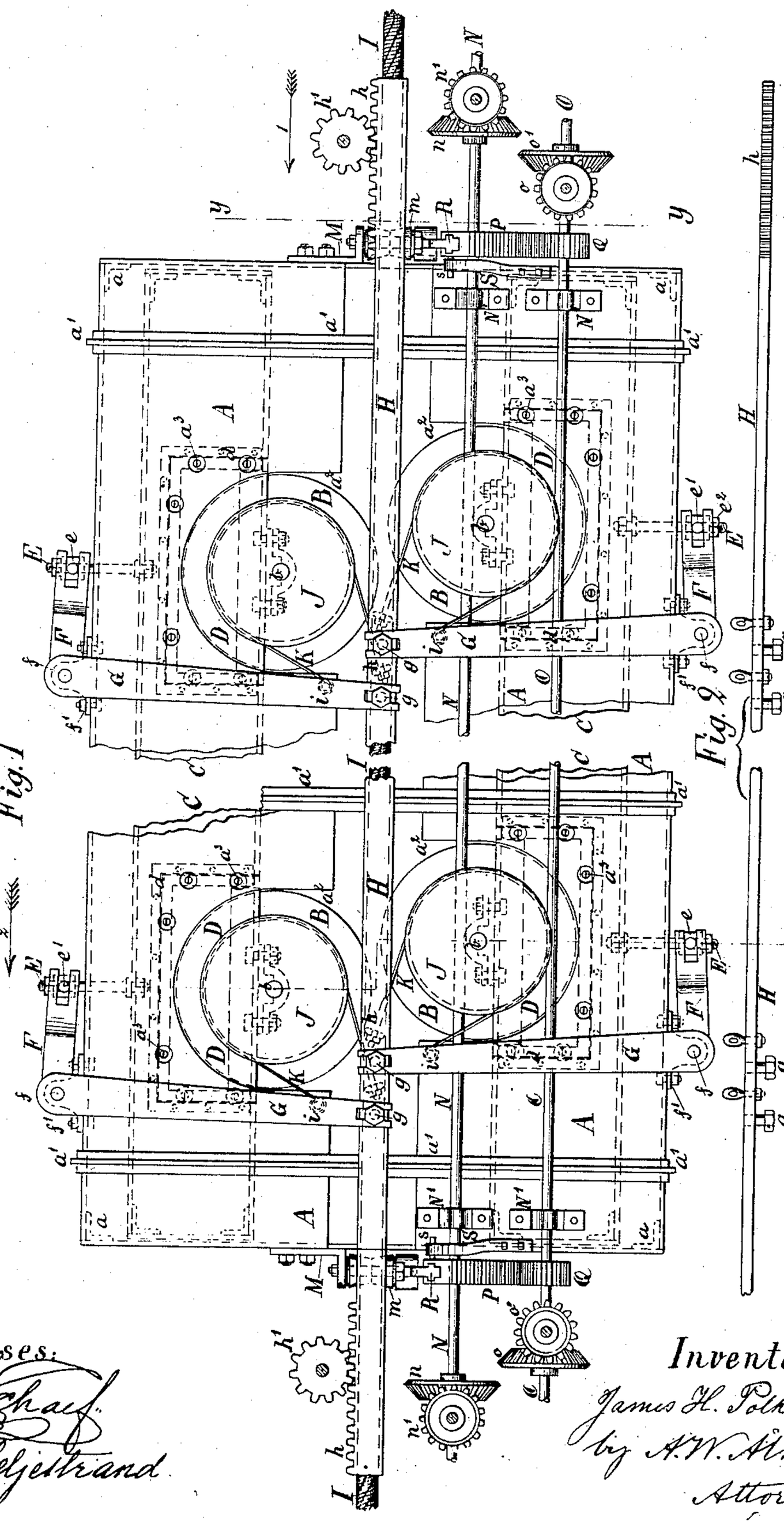

Fig. 1

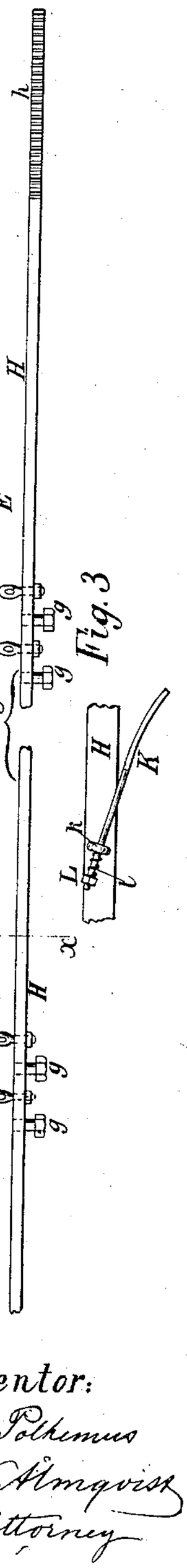

Fig. 3

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Inventor:

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(No Model.)

J. H. POLHEMUS.

2 Sheets—Sheet 2.

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Fig. 4

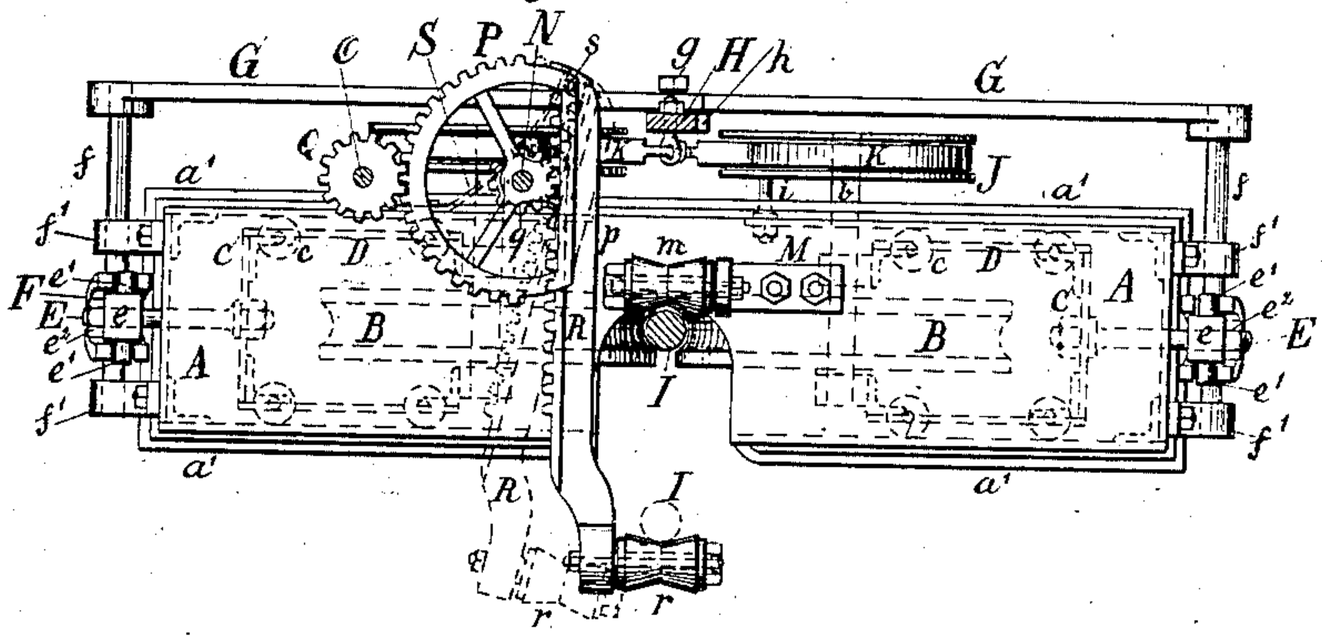

Fig. 5

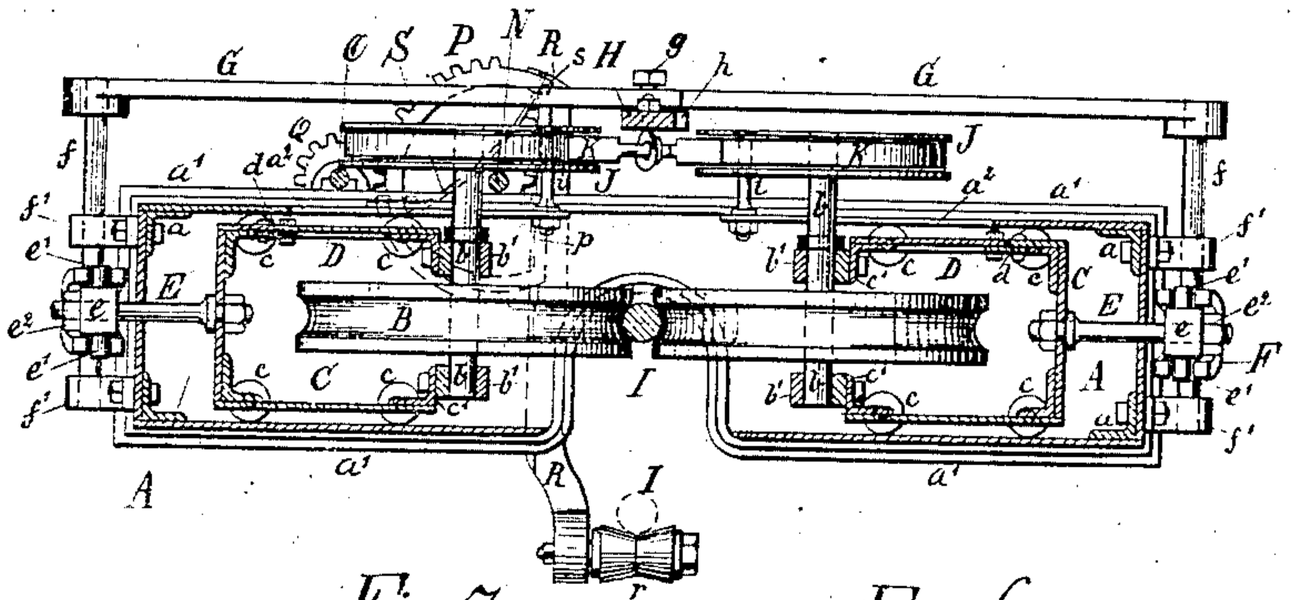

Fig. 7

Fig. 6

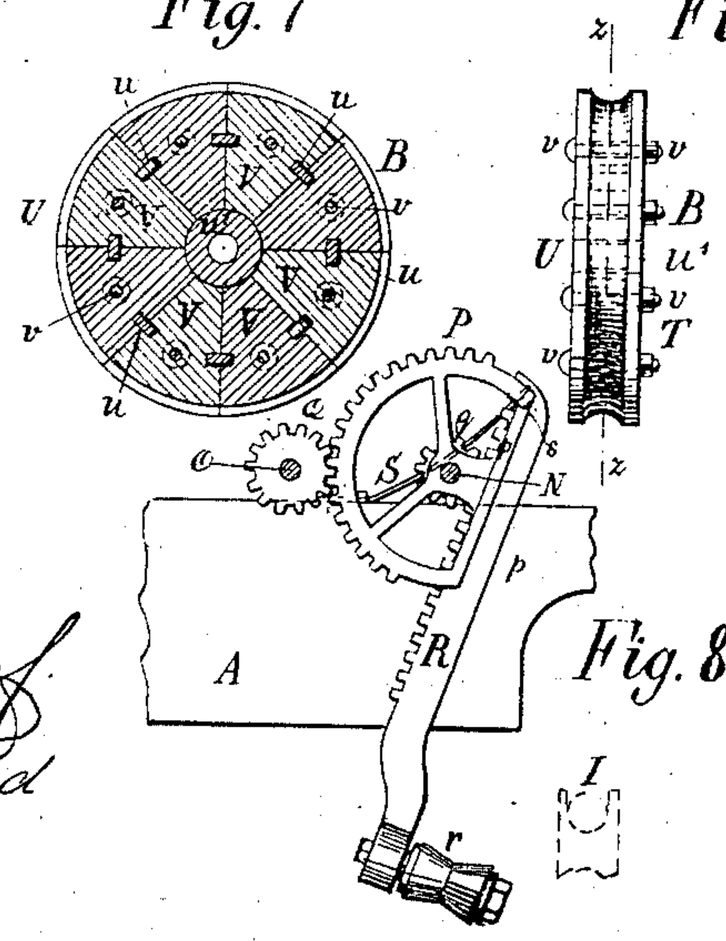

Fig. 8

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UNITED STATES PATENT OFFICE.

JAMES H. POLHEMUS, OF BROOKLYN, NEW YORK.

CABLE-GRIP.

SPECIFICATION forming part of Letters Patent No. 312,507, dated February 17, 1885.

Application filed November 15, 1884. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. POLHEMUS, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Cable-Grips, of which the following is a specification.

My invention relates to means for attaching and detaching railway-cars to and from an endless cable, when such is used for propelling the car.

The object of the invention is to provide a cable-grip of an improved construction, whereby the cable may be taken hold of at any point of the track and raised and then entered between the grip-wheels, and when so gripped the lifter is swung laterally out of range of the cable and pulleys, so as to prevent accident by getting between the cable and the return pulleys at the ends of the track; also, to afford a firm grip, not liable to slip, and yet tightening gradually, and a cheap construction of grip-wheels calculated, better than those now in use, to withstand wear.

The invention will be hereinafter fully described, and specifically pointed out in the claims, reference being had to the accompanying two sheets of drawings, in which—

Figure 1 represents a top or plan view of my improved cable raising and gripping device. Fig. 2 is a detail edge view of the operating rack-bar. Fig. 3 is a partial detail view of the under side of the rack-bar, showing the manner of attaching to it the brake-bands. Fig. 4 is an end elevation, seen in the direction of arrow 1 from the section-line *y y* of Fig. 1. Fig. 5 is a vertical section taken on the line *x x* of Fig. 1, the wheels J B being left whole, and seen in the direction of arrow 2. Fig. 6 is an edge or face view of one of the grip-wheels. Fig. 7 is a section of the same taken on the line *z z* of Fig. 6. Fig. 8 is a detail view, seen in the direction of arrow 1, explanatory of how the lifter when released is thrown out of the way of the cable.

Like letters of reference indicate like parts in the several figures.

A is the main frame or casing, in and to which the gripping machinery is arranged and attached. This frame is made in the shape of a low flat box of sheet-iron, joined at the corners by angle-irons *a*, and strengthened by transverse T-iron bands *a'*, which surround the said box. The box is open along the middle, and the T-irons *a'* are bent upward or inward on the under side to form an arch in shape of an inverted U, as shown in Figs. 4 and 5, to allow of lifting and introducing the cable between the grip-wheels. The frame A is further provided with suitable openings and holes, a^2 a^3, to allow of mounting the grip-wheels in their bearings, and to gain access to insert and remove the screws which hold the grip-wheel bearing-plates to the slide-frames.

B are the grip-wheels. These are arranged in sets of two or more, preferably five, at each of two opposite sides of the cable, which sets are mounted in vertical bearings *b'* in a sliding frame, C. These sliding frames extend about the whole length of the main frame or box A, and are fitted to slide between the top and bottom plates of the frame A, the contact surfaces being formed by means of rollers *c* to reduce friction. The bearings *b'* for the shaft *b* of the wheels B are bolted to angle-plates *c'*, fastened to the top and bottom plates of the slide-frame C, which latter, like the frame A, is made of iron plates joined at the corners by angle-irons.

In order to allow of the insertion and removal of each grip-wheel B, the angle-iron *c'*, which holds its upper bearing, is secured to a separate removable plate, D, which is securable by bolts or screws to a strip of iron, *d*, riveted to the edge of the permanent part of the top plate of the slide-frame C, in the usual manner of "breaking joints" (or making joints) when joining iron plates edge to edge to get their main surfaces flush with each other.

To allow of sliding the frame C, it is provided opposite the shaft *b* of each wheel B with a short rod, E, which is secured to the side wall of the box-frame C, and projects through a hole in the opposite side wall of the main frame A. The said rod is threaded on its outer end, and a bored and threaded block, *e*, having opposite pins, *e'*, is screwed upon the threaded end to adjust the length of the acting part of the rod—that is, the distance from the slide-frame C to the center of the pins *e'*—and is secured in the adjusted position by a

jam-nut, e^2, at one or both sides of the block *e*. The pins *e'* of the block *e* work in the slotted jaw of a forked arm, F, which is secured on a vertical shaft, *f*, mounted in bearings *f'* upon the side wall of the frame A.

Upon the upper end of the shaft *f* is secured, at about right angles to the arm *f*, the outer end of another arm, G, whose inner end is slotted and embraces a suitable pin or bolt, *g*, secured to project from the upper side of a bar, H, which latter is arranged along and centrally above the frame A, and has racks *h*, at either end, by which and a pinion, *h'*, (upon a vertical shaft operated by a hand-wheel on the platform of the car,) the bar H is movable back and forth to apply or release the grip, as the case may be. It will be seen that by this construction the arms G F and rock-shaft *f* form together an elbow-lever, which, when the bar H is moved in the direction of arrow 1, will cause the frame C to approach simultaneously and grasp with their wheels B the cable from opposite sides. The grip-wheels B are arranged in a sort of zigzag juxtaposition, as shown in Fig. 1---that is to say, in such position that a straight line connecting the centers of two nearest adjacent wheels at opposite sides of the cable will intersect the center line of the cable at oblique angles. It will be seen that by this arrangement the wheels B, in tightening the grip, will have a tendency to bend the cable in a series of short bends in opposite directions, and thus insure a much firmer grip upon it than if the cable tangented said wheels in the aforesaid line uniting their centers. The end of each grip-wheel shaft *b* projects outside of the frame A, and is provided with a band-wheel, J. This is surrounded with a brake-band, K, one end of which is fastened to a stud, *i*, secured to the frame A, and the other end is fastened to a stud, *k*, on the under side of the bar H, in such position that when the bar H is moved in the direction of arrow 1 to tighten the grip on the cable the brake-bands K will be pulled proportionally tighter on the wheels J, to prevent the grip-wheels from turning.

In order to take up the wear of the bands, the connection between each band K and its stud *k* is made by forging upon the end of the band a rod, *j*, which is passed through an eye in the stud, and provided on its outer threaded end with a nut, L, a spiral spring, *l*, surrounding the rod *j*, being interposed between the stud and the nut, as shown in Fig. 3.

Upon each end wall of the frame A is fastened a plate, M, carrying upon a horizontal stud a roller, *m*, in position, as in Fig. 4, to act as a stop against the raising of the cable higher than just opposite to the faces of the grip-wheels B.

Having described the machinery by which the grip on the cable is obtained, I will now explain the device for bringing the cable between the grip-wheels.

N and O are shafts mounted in bearings N' O' upon the frame A, and extending from one platform of the car to the other, being provided at the ends with bevel-wheels *n o*, which gear with other bevel-wheels, *n' o'*, on vertical shafts, turnable by means of hand-wheels upon the platforms in the ordinary manner of car-brakes. The vertical platform-shafts—necessarily those of the pinions *h'* and bevel-wheels *n'*—are provided with the usual ratchet, acted on by a foot-pawl on the platform, said pawls, ratchets, and car-platform being old and well known, and therefore omitted in the drawings to better show my invention.

At each end wall of the frame A is a cog-segment, P, centered to turn easily upon the shaft N, and having in its chord *p* an upright groove or way, in which a tooth-bar or rack, R, is fitted to slide up and down, being moved by a pinion, *q*, which meshes in the rack and is keyed on the shaft N. The segment is turnable on the shaft N by means of a pinion, Q, which meshes with it, and is keyed on the shaft O. A roller, *r*, tapering from both of its ends toward its middle, is mounted to turn on a stud secured to the lower end of the rack R. A spring, S, secured upon the frame A, presses with its free end upon a pin, *s*, attached to the segment P, so as to always (when the pawl is off the ratchet on the shaft of the bevel-wheel *o*) keep the roller *r* out of range of the cable I, or in the normal position, as in Fig. 8, whether the cable be in or out of the grip.

Referring to Fig. 8, when it is desired to raise and attach the cable, the shaft O and pinion Q are revolved, by the proper hand-wheel on the car-platform, sufficiently to turn the segment P so that the roller *r* will move to the right into a position directly underneath the cable I. By the respective hand-wheel on the platform the shaft N and pinion *q* are then revolved to raise the rack R and lift the cable I, by means of the roller *r*, until it reaches the upper stationary roller, *m*. The rack is retained in the raised position until the grip applied has got a firm hold upon the cable, after which the foot-pawls on the platforms (by which the pinions Q *q* are kept from turning) are released, when the springs S swing the rack R and roller *r* into the normal position out of range of the cable, without rendering it necessary to turn the pinion Q by hand to effect that result. The rack R is of course lowered as well as raised by the pinion *q*.

To increase durability of the grip-wheels over those now in use and cheapen and facilitate their removal when too much worn, I construct them, as shown in Figs. 6 and 7, of two cast-iron disks, T U, bolted together and to sectoral blocks V, of hard rubber or hard wood, interposed between them. The blocks are made in the shape of circle-sectors, as just stated, about eight, more or less, in number, and butt with their inner ends against the circumference of a hub, *u'*, cast upon one of the disks or plates U. The said disk U has also

cast upon it retaining stops or projections *u*, which are arranged in the dividing-lines between each two adjoining sectors, and coincide with notches in both of the said adjoining sectors, as shown in Fig. 7, to keep them in place.

T is simply a plain disk, which, after arranging the blocks V in position upon the disk U, is placed upon them and the hub *u'*, all being then secured together by bolts *v*, one for each block V, passing through the two disks U T and the blocks V simultaneously. This construction allows of easily replacing any one of the sectors V, when too much worn, without disturbing the others. The same construction is evidently also well adapted for the ordinary wheels or pulleys, which support the cable.

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

1. In a cable-gripping device, the combination of the box-frame A, having longitudinally an opening for the cable, with the frames C, having grip-wheels B, and movable within the frame A simultaneously against opposite sides of the cable, substantially as specified.

2. The combination, with the box-frame A and cable I, of the frames C, having grip-wheels B and movable in the frame A simultaneously from opposite sides, to impinge, with the said grip-wheels, upon the cable at obliquely opposite points, for the purpose set forth.

3. The combination, with a main frame, A, and cable I, of frames C, having grip-wheels B, and brakes J K upon the grip-wheel shafts and movable in the frame A simultaneously against opposite sides of the cable, the said brakes being also applied simultaneously with the said movement, substantially as specified.

4. In combination with the main frame A and cable I, the slide-frames C, having grip-wheels B, and brakes J K upon the grip-wheel shafts, the longitudinally-movable bar H, and the elbow-levers G F, connected at one end to the frames C and at the other end to the bar H, the brake-bands K being fastened with one end to the stationary frame A and with the other end to the movable bar H, for the purpose of simultaneously gripping the cable and preventing the grip-wheels from turning, substantially as specified.

5. The combination, with the cable I and grip-wheels B, of the oscillatory sliding rack or bar R, provided with stud or roller *r*, for attaching and introducing the cable between the said wheels, substantially as specified.

6. The combination, with the grip-wheels B, cable I, and sliding rack R, carrying the roller *r*, of the stationary roller *m*, to gage the elevation of the cable, substantially as specified.

7. In combination with the oscillatory sliding rack R, for raising the cable to the grip-wheels, the spring S, tending to swing the rack out of range of the cable, for the purpose set forth.

8. The combination of the shafts N O, having pinions *q* Q secured upon them, respectively, the segment P, movable upon the shaft N, in gear with the pinion Q, and having guides or ways in its chord *p*, the rack R, having stud or roller *r*, and fitted to slide in the said guides in gear with the pinion *q*, the grip-wheels B, and cable I, all substantially as and for the purpose set forth.

9. The combination of the shafts N O, having pinions *q* Q secured upon them, respectively, the segment P, movable upon the shaft N in gear with the pinion Q, and having guides or ways in its chord *p*, and a pin or shoulder, *s*, the spring S, secured to the frame A and pressing with its free end upon the said pin or shoulder, the rack R, having stud or roller *r*, and fitted to slide in the said guides in gear with the pinion *q*, the grip-wheels B, and cable I, all substantially as and for the purpose set forth.

10. In combination with the frame A, sliding frame C, grip-wheel B, having brake-wheel J, lever G F, and slide-bar H, the band K, secured with its ends to the frame A and bar H, respectively, one end of the band projecting through an eye in the fastening-stud, and having a nut or stop-shoulder, L, and a spiral spring, *l*, interposed between the said stud and shoulder to take up the wear of the band, substantially as specified.

11. The cable or grip-wheels B, consisting of the disk T, the disk U, having hub *u'* and projections *u*, the notched sectoral blocks V, fitted, as shown, to the said hub and projections and interposed between the said disks, and the bolts *v*, passing through the said disks and interposed blocks simultaneously, for the purpose set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 5th day of November, 1884.

JAMES H. POLHEMUS.

Witnesses:
A. W. ALMQVIST,
C. V. HELJESTRAND.