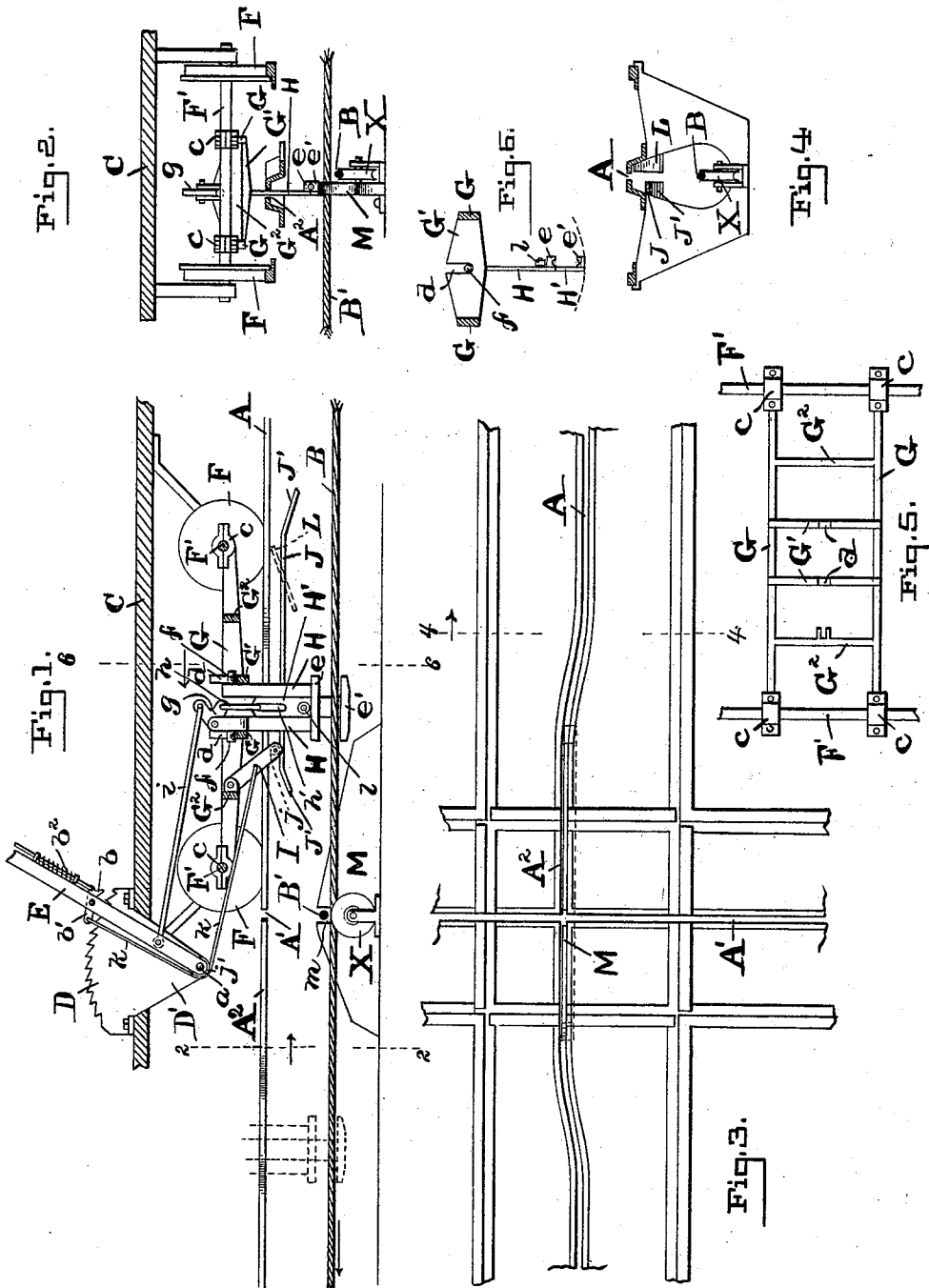


(No Model.)

J. B. MAHAFFEY.
CABLE RAILWAY.

No. 483,965.

Patented Oct. 4, 1892.



WITNESSES: _____

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UNITED STATES PATENT OFFICE.

JAMES B. MAHAFFEY, OF BALTIMORE, MARYLAND, ASSIGNOR OF ONE-HALF
TO EBEN B. HUNTING, OF SAME PLACE.

CABLE RAILWAY.

SPECIFICATION forming part of Letters Patent No. 483,965, dated October 4, 1892.

Application filed July 21, 1892. Serial No. 440,749. (No model.)

To all whom it may concern:

Be it known that I, JAMES B. MAHAFFEY, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Cable Railways, of which the following is a specification.

This invention relates to an improvement in cable-railway systems; and the object is to provide a practically-operative automatic arrangement for jumping over a crossing cable, a gripper of the well-known type employing two grip-bars engaging the upper and lower sides of the cable, one of said bars vertically movable. With this class of grippers, to clear a gripper of its cable the said gripper must move to one side, and it is a desideratum that this movement should be free and easy and take place without binding of the parts at any point; that the gripper should release automatically and pass over the crossing cable easily and not contact with it, and then after the cable is crossed that the gripper should return to a position where it will again take its own cable. My invention is designed to accomplish all this in a practical manner and is illustrated in the accompanying drawings, in which—

Figure 1 shows a longitudinal section of the car floor and truck, with a side elevation of the gripper about to jump the crossing cable. Fig. 2 shows a cross-section on line 2 2, Fig. 1, looking in the direction of the arrow, the lever connections for operating the gripper being removed for the sake of clearness. Fig. 3 shows a plan view of the tracks at the crossing. Fig. 4 shows a section on line 4 4 of Fig. 3, looking in the direction of the arrow. Fig. 5 shows a plan view of the rectangular supporting-frame which is mounted on the axles of a truck of a car. Fig. 6 shows a section on line 6 6 of Fig. 1, illustrating the manner of suspending the gripper from the rectangular frame.

The letter A designates the slot of one track, and A' the slot of the crossing track.

B designates the cable of one line, and B' the cable of the other line.

C designates the floor of a car; D, a ratchet-rack fastened on said floor and having a tri-

angular-shaped part D' extending below it; E, a lever pivoted at the point *a* to the lower extremity of said triangular-shaped part D' and carrying a pawl which is pivoted to it at a point intermediate of its ends, and with one end *b* adapted to engage the rack and thrown into engagement therewith by a spring *b*², and the other end *b'* of said pawl projecting on the opposite side of the lever E.

F designates the wheels of the truck, and F' the two axles. A rectangular supporting-frame is mounted horizontally between said two axles and comprises side bars G, having bosses *c* on the ends, which bosses fit around the axle, so as to slide thereon, and connecting cross-bars G' G²—four in number. The gripper is mounted between the two middle bars G', which have elongated notches or depressions *d* in the upper side with rounded bottoms, and said gripper comprises two parts, one made up of the two outer pieces H, which carry the top grip-bar *e* and are connected together thereby, and the other part being the middle piece H', which is mounted to slide between the two outer pieces and carries the bottom grip-bar *e'*. The two outer pieces H each have an outward-projecting trunnion *f*, which seats in one of the notches *d* in the cross-bars G' and may turn in the rounded bottom thereof.

The two parts of the grip are connected by an angle-lever *g*, which is pivoted to one of the outside pieces H and has one end connected by a link *h* with the middle plate H', said link engaging an elongated slot *h'* in the latter, and the other end connected by a rod *i* with the lever E.

A depending arm I is pivoted to one of the outer cross-bars G² of the rectangular supporting-frame and carries an antifriction-roller *j* at its lower end. The lever E has a pulley *j'* at its pivoted end and mounted on the pivot *a*, and the projecting end *b'* of the pawl and said depending arm I are joined by a flexible connection *k*, running over said pulley *j'*. A deflector-plate is stationed in the conduit in the path of the roller *j* on the depending arm I and comprises a central horizontal portion J and inclined end portions J'. Another deflector-plate L is located in

the opposite side of the conduit, and the central sliding piece N' of the gripper has a roller *l*, which is arranged to encounter the said plate L.

5 The track-slot A has a deflected part A² where it crosses the other slot, and a bridge M is in the conduit below this deflected part of the slot. This bridge has a notch or depression *m*, through which the crossing-cable B' passes, and on each side of said notch the bridge in-
10 clines downward to a point below the line of travel of the lowest part of the gripper when the latter is released.

The operation is as follows: As the car ap-
15 proaches the crossing the roller on the lower end of the depending arm I encounters the incline J' at one end of the deflector-plate and rides up the same and onto the horizontal part J. It will be seen that this draws the flexi-
20 ble connection *k*, and thereby pulls down the projecting end *b'* of the pawl and releases the opposite end *b* of said pawl from the rack D. Just as the roller *j* arrives on the horizontal portion J of the deflector-plate the roller *l* on
25 the sliding middle piece of the gripper encounters the deflector-plate L, and the lower jaw of the gripper is thereby pushed down and the gripper released from the cable, the roller *j* remaining on the horizontal portion
30 J of the first deflector-plate while this action takes place, thus holding the pawl released and the lever E free to move. The gripper enters the deflected part A² of the slot and the supporting-frame slides over on the axles
35 of the truck, as illustrated. At the same time the gripper is free to oscillate on the pivots *f*. By the combined oscillatory and sliding motion the gripper will pass easily into the de-
40 flected portion of the slot and no binding of parts in the slot or on the axles can take place. Moreover, vibrations of the car are
45 thus taken up and do not cause a strain on the gripper of other parts. The lower jaw of the gripper rides upon the inclined surface of the bridge M and is closed up
50 against the upper jaw, the slide-piece H' moving up without affecting the lever connections for operating the gripper by reason of the slot *h'*, which the connecting-link *h* en-
55 gages. As the gripper passes the highest point of the bridge it slides upward bodily in the elongated notches *d* and jumps the crossing cable. After it has passed the bridge the lower jaw drops again, and when the gripper passes out of the deflected portion of the slot said lower jaw moves under the cable

again and the gripper may be again applied. The cable is held up at the crossing by a suitable pulley X to insure that the lower jaw of the gripper will take position under it
60 after crossing the bridge.

It will be observed that the flexible connection between the depending arm I and pawl passes over a pulley on the pivot of the lever E, and hence in any position of said le-
65 ver the relation of parts is the same. The tension of said flexible connection will not be affected by shifting said lever. Hence the release of the pawl will always take place.

I am aware various parts of the arrange-
70 ment here shown may be seen severally in prior patents, and therefore I do not claim such parts *per se*. It is the combination of elements by which I produce a complete and practically operative arrangement wherein
75 my invention chiefly resides.

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

1. In a cable system, the combination of a
80 supporting-frame mounted to slide laterally on the truck of a car, a gripper pivotally hung from said frame and vertically movable therein, said gripper having grip-bars which engage the upper and lower sides of the cable,
85 suitable appliances for operating the gripper, means for automatically releasing the same as it approaches a crossing cable, a track-slot having a deflected part at the crossing, a
90 bridge in the conduit below the deflected part of the said slot and having a depression for the crossing cable to pass through, said
95 bridge inclined downward on each side of said depression to a point below the line of travel of the lowest part of the gripper when it is released, and devices for suitably sup-
porting the cable at the crossing.

2. In a cable system, the combination of a gripper, a stationary rack, a lever pivoted at the lower end and carrying a pawl which en-
100 gages said rack, a pulley on the pivot of said lever, a deflector-plate in the conduit, a pivoted arm carried by the car and arranged to ride over said plate, and a flexible connection between said arm and the pawl and pass-
105 ing over the said pulley.

In testimony whereof I affix my signature in the presence of two witnesses.

JAMES B. MAHAFFEY.

Witnesses:

JNO. T. MADDOX,
F. PARKER DAVIS.