

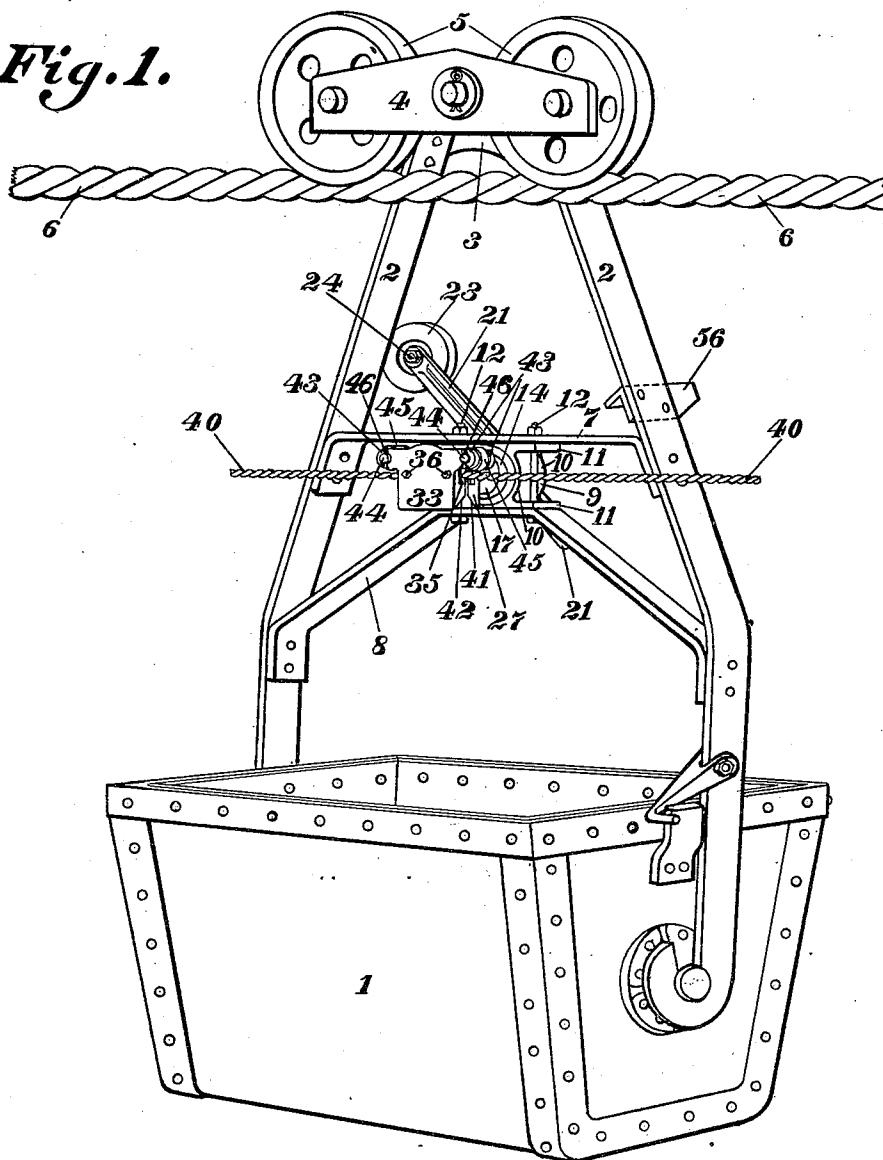
F. W. GRICE.
 TRAMWAY GRIP.
 APPLICATION FILED MAR. 13, 1911.

1,007,561.

Patented Oct. 31, 1911.

5 SHEETS—SHEET 1.

Fig. 1.



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6 SHEETS--SHEET 2.

1,007,561.

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5 SHEETS—SHEET 3.

Fig. 3.

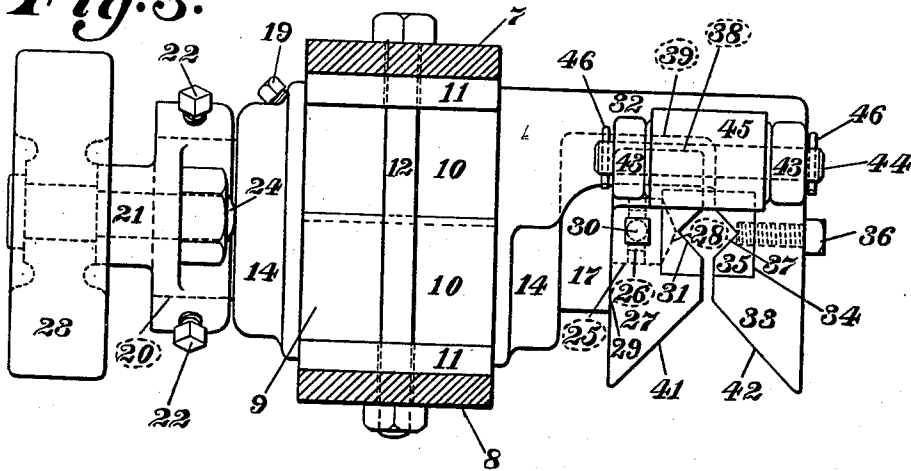


Fig. 5.

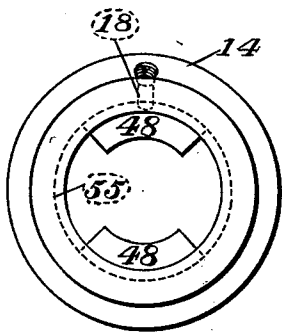
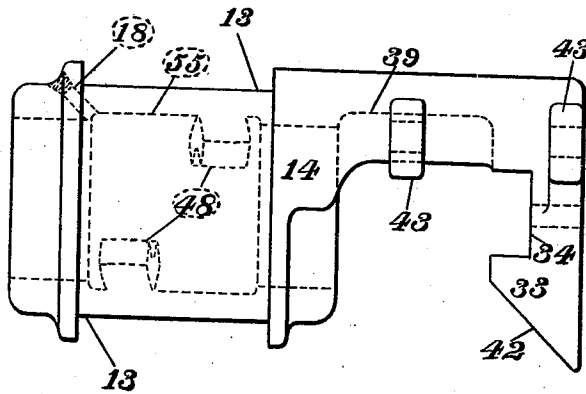


Fig. 4.



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5 SHEETS—SHEET 4.

Fig. 8.

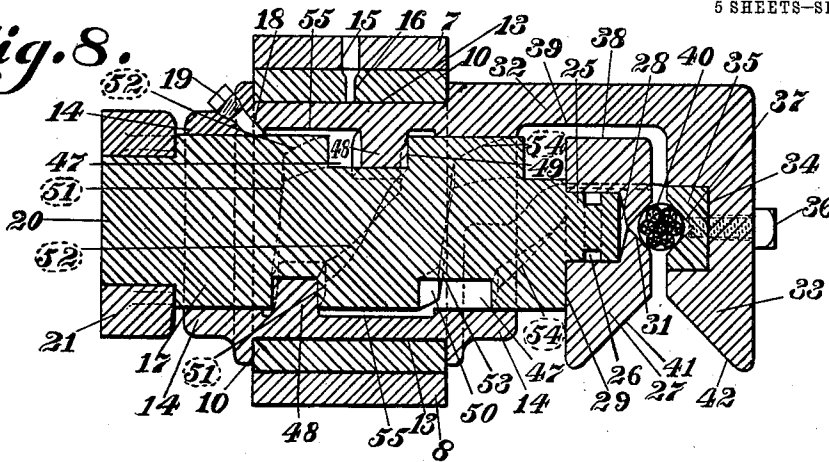


Fig. 6.

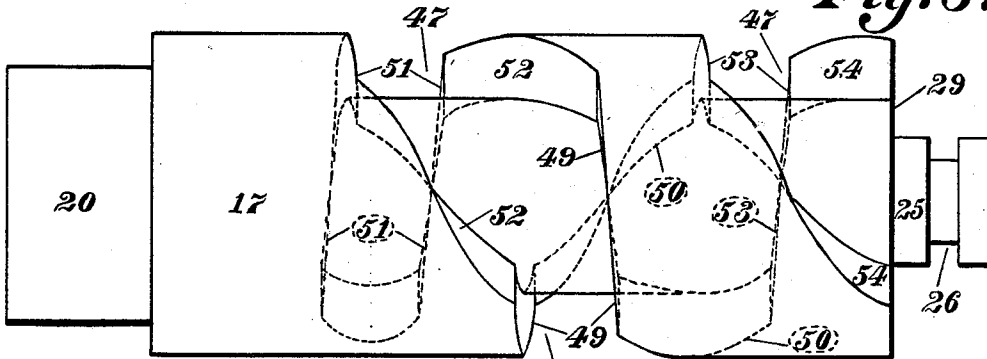
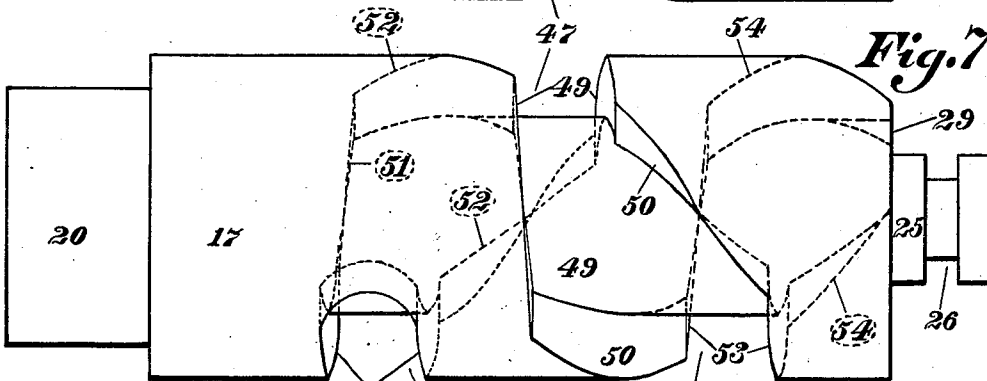


Fig. 7.



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5 SHEETS—SHEET 5.

Fig. 9.

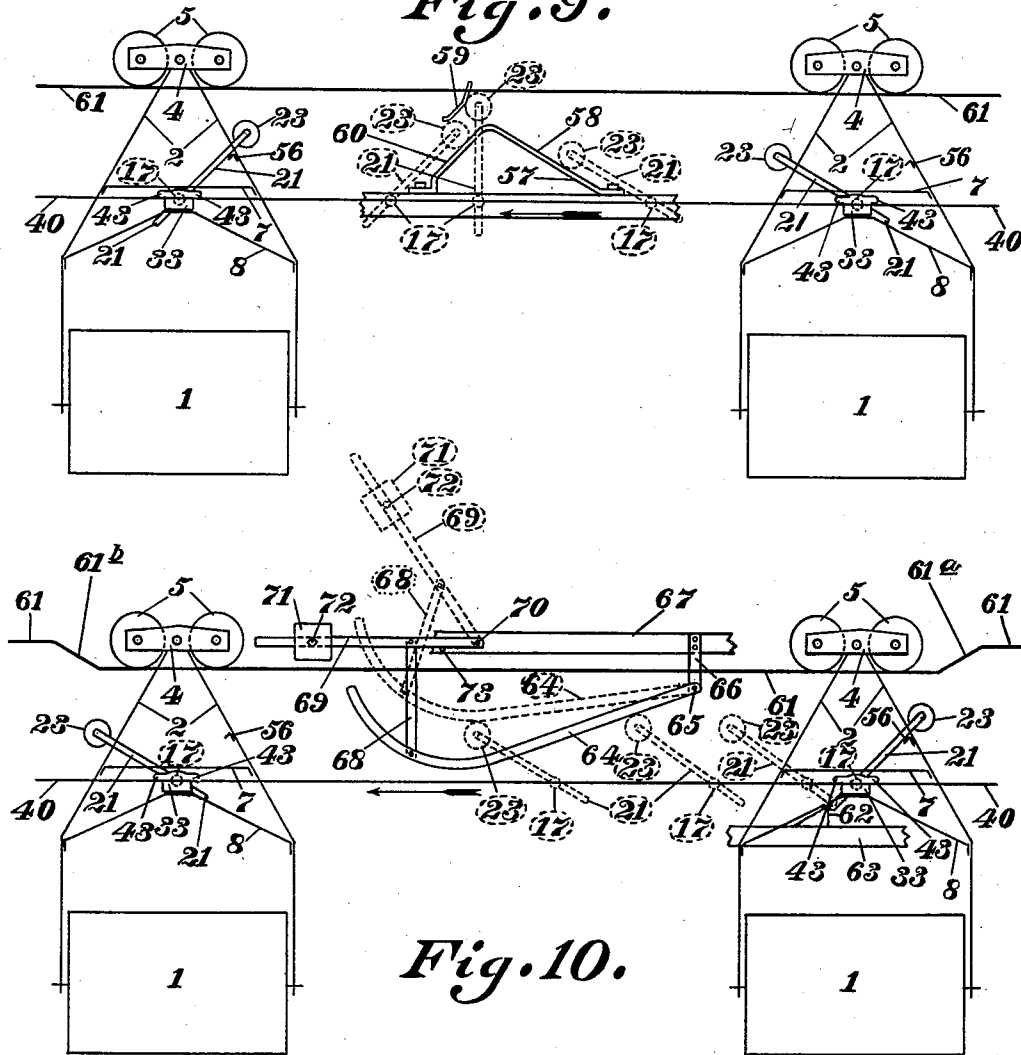


Fig. 10.

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UNITED STATES PATENT OFFICE.

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TRAMWAY-GRIP.

1,007,561.

Specification of Letters Patent.

Patented Oct. 31, 1911.

Application filed March 13, 1911. Serial No. 614,003.

To all whom it may concern:

Be it known that I, FREDERICK W. GRICE, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Tramway-Grips, of which the following is a specification.

This invention relates to improvements in grips for tramway-buckets, and has for its primary object to provide an improved grip of this character that is adapted for automatically gripping and, also, for automatically releasing the traction-rope of an aerial tramway.

Another object of the present invention resides in the provision of positive means for causing the grip to clamp the traction-rope.

Further this invention consists of the novel construction and arrangement of parts, hereinafter more fully described and pointed out in the claims.

In the accompanying drawings forming part of this specification, in which like numbers of reference denote like parts wherever they occur, Figure 1 is a perspective view of a tramway-bucket having my improved grip attached thereto; Fig. 2 is a front elevation, on an enlarged scale, of the grip and part of the bucket-frame; Fig. 3 is a side elevation of same, the bucket-frame being shown in section; Fig. 4 is a side elevation of the drum or grip-body; Fig. 5 is an end elevation of same; Fig. 6 is a top plan view, on an enlarged scale, of the shaft; Fig. 7 is a side elevation of same; Fig. 8 is a sectional view on the line 8—8, Fig. 2; Fig. 9 is a diagrammatical view showing means for automatically uncoupling the grip from the traction-rope; and Fig. 10 is a diagrammatical view showing means for automatically coupling the grip to the traction-rope and, also, positive means for causing the grip to clamp the traction-rope tightly.

The bucket 1, which may be of any desired construction, is supported by pendants 2 that are secured to the pendant-head 3 by any ordinary means, said pendant-head being fastened to the trolley-beam 4 to which the trolley-sheaves 5 that travel upon the track-cable 6 are attached in the usual manner. Braces 7 and 8 connect the pendants 2

and thereby strengthen the structure, being riveted or otherwise secured to said pendants and being spaced apart so as to allow a journal-bearing 9 to be located therebetween. Said journal-bearing preferably consists of two parts 10 that bear flanges 11, and is preferably located centrally between the braces 7 and 8. Bolts 12 or the like connect the braces 7 and 8 and pass through openings in the flanges 11 of parts 10 of the journal-bearing 9, thereby not only securing said journal-bearing firmly to said braces, but holding the parts 10 of said journal-bearing firmly together. The parts 10 of the journal-bearing 9 fit in an annular groove 13 that is formed in the periphery of the hollow cylindrical drum or grip-body 14 and thereby prevent longitudinal movement of said drum in said journal-bearing. The drum 14 is capable of revolving in the journal-bearing 9, and, in order that said journal-bearing can be lubricated, perforations 15 and 16 are formed in brace 7 and one of the parts 10 of said journal-bearing, respectively, said perforations, of course, communicating with each other.

A shaft 17 extends through the hollow drum 14 and is not only capable of rotating but can move longitudinally in said drum in the manner hereinafter described. Said drum contains a perforation 18 to permit the shaft 17 to be lubricated, said perforation being screw-threaded to receive a plug 19, which prevents dirt and grit from entering said perforation. One end of shaft 17 bears a reduced projection 20 which extends through an opening in lever 21, said opening being preferably nearer the lower end of said lever than the upper end thereof. The lever 21 is adjustably secured to the projection 20 by a set-screw or set-screws 22 or other suitable means, and affords a means by which the shaft 17 is rotated. A roller or counterweight 23 is pivotally attached to the upper end of the lever 17 by a bolt 24 or other suitable means. The other end of the shaft 17 bears a reduced projection 25 in which an annular groove 26 is formed in the periphery thereof. A jaw 27, which extends transversely of the end of the shaft 17, contains a depression or opening 28, in which the projection 25 extends, and fits against

the shoulder 29 on said shaft. Said jaw is revolvably mounted on the projection 25, and is held in place thereon by a bolt or screw 30 or a plurality of such bolts or screws, each of said bolts or screws being arranged so that one end thereof projects into the groove 26 in said projection 25. A groove 31, which is preferably V-shaped, is formed longitudinally in the face of the jaw 27 and is preferably arranged to extend through and, also, transversely to the axis of rotation of shaft 17.

An extension 32 from the drum 14 extends over the jaw 27 and bears a jaw 33, which extends transversely of the end of shaft 17. The jaw 33 faces the jaw 27 and contains a groove 34, which extends longitudinally in the face thereof. A lining or block 35 fits in the groove 34 and is held in place therein by a bolt or bolts 36. A groove 37, which is preferably V-shaped, is formed in the face of said lining or block and extends longitudinally thereof, being preferably arranged to extend through and, also, transversely to the axis of rotation of shaft 17. A projection or enlargement 38 borne by the jaw 27 protrudes into a depression 39 in the lower face of the extension 32, and the sides of said extension extend over the ends of said jaw and, also, in close proximity thereto so as to hold said jaw in such position that the groove 31 in said jaw is at all times substantially parallel to the groove 37 in the lining 35. The traction or pulling rope 40 extends longitudinally between the jaws 27 and 33, and is held firmly in the grooves 31 and 37 in the manner hereinafter described. In order that the rope 40 can readily enter the space between the jaws 27 and 33, the lower edges of the faces of said jaws are beveled at 41 and 42, respectively. Due to the fact that the grooves 31 and 37 extend through the axis of the shaft 17, the rope 40, also, extends through the axis of said shaft and, by this arrangement, said rope is prevented from exerting any torsional stresses upon said shaft. Lugs 43 project from opposite sides of the extension and support a pair of pins 44, each of said pins having a roller 45 mounted thereon and being held in place by a cotter or cotters 46 or other suitable means. The rollers 45 extend transversely over the rope 40 and touch or nearly touch same when said rope is clamped in the grooves 31 and 37. By reason of the jaw 27 being swiveled to the end of shaft 17 and, also, of the drum 14 being revolvable in the journal-bearing 9, the jaws 27 and 33 are free at all times to adjust themselves to the rope 40, *i. e.*, while the rope 40 is gripped between the jaws 27 and 33, said jaws remain parallel to the rope 40, whether said rope travels horizontally or inclines at an angle to the horizon, or whether said rope changes the direction of its course of travel.

When the rope 40 enters the space between the jaws 27 and 33, the rollers 45 ride upon said rope and thereby adjust the positions of said jaws so that said rope can readily find its place in the grooves 31 and 37. The jaw 27 and the lining 35 can be removed so that another jaw 27 having a larger or smaller groove 31 and another lining 35 having a larger or smaller groove 37 can be substituted therefor, in order to afford means for gripping a larger or a smaller rope 40.

A helical groove 47, which is formed in the periphery of the shaft 17, extends from one end of said shaft to within a short distance of the other end thereof and, at a point or points on the periphery of said shaft, said groove changes from a fine pitch to a coarse pitch. The coarse pitch of the groove 47 is preferably wider than the fine pitch of said groove, in order to allow the lug or lugs 48, projecting from the inner face of drum 14, to pass from the fine pitch into the coarse pitch and vice versa. It is preferable, however, to provide the drum 14 with a pair of lugs 48, one of said lugs being located in the upper part of said drum and being arranged to extend between either the sides 49 of a fine pitch part of groove 47 or the sides 50 of a coarse pitch part of said groove, and the other of said lugs being located in the lower part of said drum and being arranged to extend between either the sides 51 of another fine pitch part of groove 47 or the sides 52 of another coarse pitch part of said groove. The sides 52 connect with the sides 49, and the sides 50 connect with the sides 53 of a third fine pitch part of groove 47, said sides 53 connecting with the sides 54 of a third coarse pitch part of said groove that extends to the end of shaft 17, in order to allow said shaft to be inserted into or removed from the drum 14. The lugs 48 are arranged so that, when the shaft 17 is rotated, the sides 49 and 50 move in engagement with the upper lug 48 at the same time the sides 51 and 52 move in engagement with the lower lug 48, respectively. An annular groove 55 is formed in the inner surface of drum 14, and communicates with the perforation 18 in order to allow the lubricant that enters said perforation to flow to both lugs 48. The lever 21 is so arranged relative to the groove 47 that, when the lever is rotated in a clockwise direction from the horizontal position to the vertical position or in a counter-clockwise direction from the vertical position to the horizontal position, Fig. 2, the sides 49 and 51 of the fine pitch parts of the groove 47 move in engagement with the lugs 48, thereby causing the jaw 27 to move slowly away from or toward the jaw 33, in order to diminish or increase the pressure of said jaws upon the rope 40. When the lever is rotated in a clockwise direction from the vertical position, Fig. 2, until lim-

ited by the stop 56 borne by a pendant 2 or, when said lever is rotated in a counter-clockwise direction from said stop to the vertical position, the sides 50 and 52 move in engagement with the lugs 48, whereby the jaw 27 is moved quickly away from or toward the jaw 33, so as to release or grip the rope 40. When the rope 40 is released the lever 21 rests on the stop 56, which is preferably arranged so that said lever inclines approximately at an angle of forty-five degrees from the horizontal, on one side of the vertical position, but, when the rope is gripped tightly between the jaws 27 and 33, the lever 21 occupies a position between the vertical and the horizontal positions, on the side of the vertical position that is opposite the stop 56, said gripping position being determined by the size of the rope 40 and, also, by the extent to which the lever 21 is depressed in the manner hereinafter described.

In order to uncouple the grip from the rope 40 or to couple same to said rope, the lever 21 may be rotated either automatically or manually. In Fig. 9, a means for automatically rotating the lever 21 in the proper direction to uncouple the grip from the rope 40 is depicted for the purposes of illustration, but it should be understood that any other suitable means may be provided. The rope 40 travels in the direction indicated by the arrow, Fig. 9, and draws the bucket 1 in the same direction, when the lever 21 occupies a position to cause the jaws 27 and 33 to grip said rope tightly, as hereinabove described. At the point where the grip is desired to release the rope 40, an inclined guide rail 57 or the like is disposed in the path of travel of the roller 23. The rail 57 is bent to slope upwardly from both ends thereof to the middle or nearly the middle part of same so that when the roller 23 reaches the rail 57, said roller rides up the inclined surface 58 of said rail and thereby rotates the lever 21 in a clockwise direction, Fig. 9, until same reaches the vertical position, at which time the roller 23 engages the deflector 59, which causes the lever 21 to rotate further in a clockwise direction, in order to allow said roller to ride down the inclined surface 60 of said rail. When the lever 21 is rotated to the vertical position, by reason of roller 23 riding up the inclined surface 50, the pressure of the jaws 27 and 33 upon the rope 40 is only diminished, but, when the lever 21 is rotated from the vertical position, by reason of roller 23 riding down the inclined surface 60, the jaws 27 and 33 release the rope 40, as hereinabove described, whereby the bucket is free to remain at rest and, also, the rope 40 is free to travel without pulling the bucket with same. After the rope 40 is released, the bucket 1 is free to be moved upon a switch-rail 61, the ends of which connect with the track-rope or track-

ropes 6, and the lever 21 rests on the stop 56 until same is rotated, in the manner about to be described, in order to couple the grip to said rope.

At any point where it is desired to couple the grip to the rope 40, a block or stop 62 is disposed in the path of travel of the lower end of the lever 21. With the lever 21 resting on the stop 56, the operator moves the bucket 1 in the same direction in which the rope 40 travels, as indicated by the arrow, Fig. 10, in order to bring the lower end of the lever 21 into engagement with the block 62 borne by a suitable support 63. Adjacent the point where the grip is coupled to the traction-rope 40, the switch-rail 61 slopes downwardly at 61^a and extends parallel or nearly parallel to said rope and then slopes upwardly at 61^b. The traction-rope 40 travels parallel or nearly parallel to the switch-rail proper, and, when the bucket 1 is moved along said rail so as to travel down the inclined part 61^a, the traction-rope 40 enters the space between the jaws 27 and 33 and the rollers 45 come in contact with said traction-rope, whereby said rope finds its place between the grooves 31 and 37, in the manner hereinabove described, before the lower end of lever 21 engages the block 62. The engagement of the block 62 with the lower end of lever 21 causes the lever to rotate in a counter-clockwise direction, Fig. 10. When the lever rotates from engagement with the stop 56, to the vertical position, the jaw 27 forces the rope 40 in place in the grooves 31 and 37. After the lever passes to the left of the vertical position, the roller 23, by its weight and, also, by its momentum acquired by reason of lever 21 being rotated as just described, causes said lever to rotate further, in order to cause the jaw 27 to move closer to the jaw 33, thereby clamping the rope 40 tightly in the grooves 31 and 37 until the friction between said rope and said grooves becomes sufficient to cause said rope to pull the bucket 1 with same. A member 64 is pivoted at 65 to a member 66 fastened to a suitable support 67, and, from said member 66, the member 64 slopes downwardly in the path of travel of the roller 23. The free end of member 64 curves upwardly in order to extend out of the path of travel of the roller 23, and is supported by a link 68, which is pivotally attached thereto and, also, to a lever 69, pivoted at 70 to the support 67. A weight 71 is slidably mounted on the lever 69 and is held in any desired position thereon by means of a set-screw 72. The weight 71 holds the lever 69 normally against a pin or stop 73 that is attached to the support 67 and thereby holds the member 64 in the path of travel of the roller 23. After the rope 40 is clamped between the jaws 27 and 33, as hereinabove described, same pulls the bucket in the direction indicated by the arrow, Fig. 130

10, with the result that roller 23 passes beneath the member 64 and, also, in engagement therewith, thereby raising said member, which, in turn, forces the link 68 and lever 69 upwardly. While the roller 23 passes beneath the member 64 the weight 71 presses downwardly upon the member 64 and thereby depresses the roller 23, with the result that the lever 21 is rotated further in the proper direction to cause the jaws 27 and 33 to clamp the rope tighter. By reason of the free end of member 64 being curved as hereinabove described, the pressure of said member upon the roller 23 is released gradually while said roller passes out of engagement with same, the result being to leave the lever 21 in position to clamp the rope firmly between the jaws 27 and 33. When the roller 23 passes out of engagement with the member 64, said member is returned to its normal position by the pressure of weight 71. Due to the fact that the weight 71 is adjustably attached to lever 69, same can be moved toward or away from the fulcrum point 70, in order to diminish or to increase the pressure upon the roller 23. The member 64 thus affords a means by which the lever 21 is rotated sufficiently to clamp the rope 40 firmly between the jaws 27 and 33, in case the roller 23 does not cause said lever to rotate to the proper position to clamp the rope tightly between the jaws 27 and 33 in the manner hereinabove described.

The operation of the device is as follows: When it is desired to uncouple the grip from the traction-rope 40, the lever 21 is rotated in a clockwise direction, Fig. 2, from the clamping position on the left-hand side of the vertical position to the unclamping position on the right-hand side of the vertical position, *i. e.*, resting on the stop 56, as hereinabove described. The shaft 17 rotates with the lever 21 and causes the sides 49 and 51 of the groove 47 to move in engagement with the lugs 48 until the sides 50 and 52 of said groove come in contact with said lugs, after which only the sides 50 and 52 move in engagement with said lugs. While the sides 49 and 51 move in engagement with the lugs 48, the shaft 17 draws the jaw 27 slowly away from the jaw 33, with the result that the pressure of said jaws upon the rope 40 is reduced. When the sides 50 and 52 move in engagement with the lugs 48, the shaft 17 draws the jaw 27 quickly away from the jaw 33, whereby the rope 40 is released entirely. In order to couple the grip to the traction-rope 40, the lever 21 is rotated in a counter-clockwise direction, Fig. 2, from the unclamping position or position of rest upon stop 56 to the clamping position, as hereinabove described, whereby the shaft 17 rotates therewith and causes the sides 50 and 52 to move in engagement with the lugs 48 until the sides 49 and 51 come in

contact with said lugs, after which the sides 49 and 51 move in engagement with said lugs and remain in engagement with said lugs, when the lever 21 occupies the clamping position. When the sides 50 and 52 move in engagement with the lugs 48, the shaft 17 forces the jaw 27 quickly toward the jaw 33 and thereby forces the rope into place in the grooves 31 and 37, after which the sides 49 and 51 move in engagement with the lugs 48, with the result that shaft 17 presses the jaw 27 further toward the jaw 33, whereby the rope 40 is clamped firmly in the grooves 31 and 37.

I claim:

1. A tramway grip comprising a journal bearing, a hollow member revoluble therein and provided with a fixed jaw, a shaft fitted in said member and provided with a jaw arranged for coöperation with the first-named jaw, and means for imparting an endwise bodily movement to said shaft in either direction for causing the second-named jaw to approach or recede from said first-named jaw.

2. A tramway grip comprising a journal bearing, a hollow member revoluble therein and provided with a fixed jaw, a shaft revolubly fitted in said member and arranged for bodily longitudinal movement during its revolution, a jaw carried by said shaft for coöperation with the first-named jaw, and means for revolving said shaft.

3. A tramway grip comprising a hollow member provided with an integral extension formed with a jaw, a shaft revolubly fitted in said member and arranged for bodily longitudinal movement during its revolution, a jaw carried by said shaft for coöperation with the first-named jaw, and means for revolving said shaft.

4. A tramway grip comprising a hollow member provided at one end with a longitudinal extension terminating in a lateral jaw, a shaft fitted in said member and provided at one end with a jaw confronting the first-named jaw for coöperation with the same, and means for imparting an endwise bodily movement to said shaft in either direction for causing the second-named jaw to approach or recede from said first-named jaw.

5. A tramway grip comprising a hollow member having a jaw fixed thereto, a shaft having a cam groove in its periphery and being revoluble in said hollow member, a lug projecting from said member into the groove in said shaft, thereby to cause said shaft to move longitudinally when rotated, and a jaw swiveled to an end of said shaft and being movable toward and away from said fixed jaw.

6. A tramway grip comprising a hollow member having a jaw fixed thereto, a shaft having a cam groove in its periphery and

being revoluble in said hollow member, a lug projecting from said member into the groove in said shaft thereby to cause said shaft to move longitudinally when rotated, and a jaw swiveled to an end of said shaft and being movable toward and away from said fixed jaw, said swiveled jaw being detachable.

7. A tramway grip comprising a hollow member having a jaw fixed thereto, a shaft having a cam groove in its periphery and being revoluble in said hollow member, a lug projecting from said hollow member into the groove in said shaft, thereby to cause said shaft to move longitudinally when rotated, and a jaw swiveled to an end of said shaft and being movable toward and away from said fixed jaw, said groove having a fine pitch helical part and, also, a coarse pitch helical part.

8. A tramway grip comprising a hollow member having a jaw fixed thereto, a shaft having a cam groove in its periphery and being revoluble in said hollow member, said groove having fine and coarse pitch helical parts, a pair of lugs projecting from said hollow member into the groove in said shaft, thereby to cause said shaft to move longitudinally when rotated, and a jaw swiveled to an end of said shaft and being movable toward and away from said fixed jaw.

9. A tramway grip comprising a hollow member having a jaw fixed thereto, a shaft having a cam groove in its periphery and being revoluble in said hollow member, said groove having fine and coarse pitch helical parts, a plurality of lugs projecting from said hollow member into the groove in said shaft, thereby to cause said shaft to move longitudinally when rotated, and a jaw swiveled to an end of said shaft and being movable toward and away from said fixed jaw.

10. A tramway grip comprising a hollow member having a jaw fixed thereto, a shaft having a cam groove in its periphery and being revoluble in said hollow member, said groove having fine and coarse pitch helical parts, lugs projecting from said hollow member into the groove in said shaft, thereby to cause said shaft to move longitudinally when rotated, a jaw swiveled to one end of said shaft and being movable toward and away from said fixed jaw, and a lever attached to the other end of said lever for actuating same.

11. A tramway grip comprising a hollow member having a jaw fixed thereto, a shaft having a cam groove in its periphery and being revoluble in said hollow member, said groove having fine and coarse pitch helical parts, lugs projecting from said hollow member into the groove in said shaft, thereby to cause said shaft to move longitudinally when rotated, a jaw swiveled to one end of said shaft and being movable toward and

away from said fixed jaw, a lever attached to the other end of said lever for actuating same, and a counterweight borne by said lever.

12. A tramway grip comprising a hollow member having a jaw fixed thereto, said jaw having a groove in its face, a shaft having a cam groove in its periphery and being revoluble in said hollow member, said cam groove having fine and coarse pitch helical parts, lugs projecting from said hollow member into the groove in said shaft, thereby to cause said shaft to move longitudinally when rotated, and a jaw swiveled to one end of said shaft and being movable toward and away from said fixed jaw, the face of said swiveled jaw having a groove extending substantially parallel to the groove in said fixed jaw.

13. A tramway grip comprising a hollow member having a jaw fixed thereto, said jaw having its face grooved, a grooved lining removably secured in the groove in said jaw, a shaft having a cam groove in its periphery and being revoluble in said hollow member, said cam groove having fine and coarse pitch helical parts, lugs projecting from said hollow member into the groove in said shaft, thereby to cause said shaft to move longitudinally when rotated, and a jaw swiveled to an end of said shaft and being movable toward and away from said fixed jaw, the face of said swiveled jaw having a groove extending substantially parallel to the groove in said lining.

14. A tramway grip comprising a hollow member having a jaw fixed thereto, said jaw having its face grooved, a grooved lining removably secured in the groove in said jaw, a shaft having a cam groove in its periphery and being revoluble in said hollow member, said cam groove having fine and coarse pitch helical parts, lugs projecting from said hollow member into the groove in said shaft, thereby to cause said shaft to move longitudinally when rotated, and a jaw swiveled to an end of said shaft and being movable toward and away from said fixed jaw, the face of said swiveled jaw having a groove extending substantially parallel to the groove in said lining, the grooves in said lining and said swiveled jaw being arranged to extend through and substantially at a right-angle to the axis of rotation of said shaft.

15. A tramway grip comprising a hollow member having an extension from one end thereof, a jaw borne by said extension, a shaft having a cam groove in its periphery and being revoluble in said hollow member, lugs projecting from said hollow member into the groove in said shaft, thereby to cause said shaft to move longitudinally when rotated, and a jaw swiveled to an end of said shaft and being movable toward and

away from said fixed jaw, the sides of said extension being disposed over the ends of said swiveled jaw, thereby holding said swiveled jaw substantially parallel to said fixed jaw.

5 16. A tramway grip comprising a hollow member having an extension from one end thereof, a jaw borne by said extension, a shaft having a cam groove in its periphery and being revoluble in said hollow member, 10 lugs projecting from said hollow member into the groove in said shaft, thereby to cause said shaft to move longitudinally when rotated, a jaw swiveled to one end of said shaft and being movable toward and away 15 from said fixed jaw, both of said jaws having their lower edges beveled to allow the rope to enter therebetween, said extension being arranged to hold said swiveled jaw substantially parallel to said fixed jaw.

20 17. A tramway grip comprising a journal-bearing, a hollow member revoluble therein, a jaw fixed to said hollow member, a shaft having a cam groove in its periphery and being revoluble in said hollow member, lugs 25 projecting from said hollow member into the groove in said shaft, thereby to cause said shaft to move longitudinally when rotated, and a jaw swiveled to an end of said shaft and being movable toward and away from 30 said fixed jaw.

18. A tramway grip comprising a journal-bearing, a hollow member revoluble therein, a jaw fixed to said hollow member, a shaft having a cam groove in its periphery and 35 being revoluble in said hollow member, lugs projecting from said hollow member into the groove in said shaft, thereby to cause said shaft to move longitudinally when rotated, a jaw swiveled to an end of said shaft and being 40 movable toward and away from said fixed jaw for clamping and releasing the traction-rope, and rollers carried by said hollow member adapted to ride upon the traction-rope, thereby to hold said jaws parallel 45 to the traction-rope.

19. A tramway grip comprising a journal-bearing, a hollow member revoluble therein, a jaw fixed to said hollow member, a shaft having a cam groove in its periphery and being 50 revoluble in said hollow member, lugs projecting from said hollow member into the groove in said shaft, thereby to cause said shaft to move longitudinally when rotated, a jaw swiveled to one end of said shaft and being 55 movable toward and away from said fixed jaw, and a lever adjustably secured to the other end of said shaft for actuating same.

20. A tramway grip comprising a journal-bearing, a hollow member revoluble therein, a jaw fixed to said hollow member, a shaft having a cam groove in its periphery and being 60 revoluble in said hollow member, lugs projecting from said hollow member into the groove in said shaft, thereby to cause said

shaft to move longitudinally when rotated, a jaw swiveled to one end of said shaft and being movable toward and away from said fixed jaw, a lever adjustably secured to the other end of said shaft for actuating same, 70 and a counterweight borne by said lever.

21. The combination of a tramway bucket, a frame supporting same, a journal-bearing secured to said frame, a hollow member revoluble in said journal-bearing, a jaw fixed to 75 said hollow member, a shaft having a cam groove in its periphery and being revoluble in said hollow member, lugs projecting from said hollow member into the groove in said shaft, thereby to cause said shaft to move 80 longitudinally when rotated, a jaw swiveled to one end of said shaft and being movable toward and away from said fixed jaw for clamping and unclamping the traction-rope, and a lever attached to the other end of said 85 shaft for rotating same.

22. The combination of a tramway bucket, a frame supporting same, a journal-bearing secured to said frame, a hollow member revoluble in said journal-bearing, a jaw fixed to 90 said hollow member, a shaft having a cam groove in its periphery and being revoluble in said hollow member, lugs projecting from said hollow member into the groove in said shaft, thereby to cause said shaft to move 95 longitudinally when rotated, a jaw swiveled to an end of said shaft and being movable toward and away from said fixed jaw for clamping and unclamping the traction rope, a lever attached to the other end of said 100 shaft for rotating same, and a revoluble counterweight borne by said lever.

23. The combination of a tramway bucket, a frame supporting same, a journal-bearing secured to said frame, a hollow member revoluble in said journal-bearing, a jaw fixed to 105 said hollow member, a shaft having a cam groove in its periphery and being revoluble in said hollow member, lugs projecting from said hollow member into the groove in said 110 shaft, thereby to cause said shaft to move longitudinally when rotated, a jaw swiveled to one end of said shaft and being movable toward and away from said fixed jaw for clamping and unclamping the traction rope, 115 a lever attached to the other end of said shaft for rotating same, a revoluble counterweight borne by said lever, and a member attached to said frame for supporting said lever, when said lever is in position for holding 120 said swiveled jaw out of engagement with the traction-rope.

24. The combination of a tramway bucket, a frame supporting same, a hollow member revolvably supported by said frame, a jaw 125 fixed to said hollow member, a shaft revoluble in said hollow member, means for moving said shaft longitudinally when rotated, a jaw swiveled to one end of said shaft and being movable toward and away from said 130

fixed jaw, thereby to clamp and release the traction-rope, a lever attached to the other end of said shaft for rotating same, a revoluble counterweight borne by said lever, and means for actuating said lever.

25. The combination of a tramway bucket, a frame supporting same, a hollow member revolubly supported by said frame, a jaw fixed to said hollow member, a shaft revoluble in said hollow member, means for moving said shaft longitudinally when rotated, a lever attached to one end of said shaft for rotating same, a jaw swiveled to the other end of said shaft and being movable toward and away from said fixed jaw, thereby to clamp the traction-rope, when said lever occupies a clamping position, and to release the rope when said lever occupies an unclamping position, a revoluble counterweight borne by said lever, a support borne by said frame for supporting said lever in the unclamping position, means for rotating said lever from the unclamping position to a clamping position.

26. The combination of a tramway bucket, a frame supporting same, a hollow member revolubly supported by said frame, a jaw fixed to said hollow member, a shaft revoluble in said hollow member, means for moving said shaft longitudinally when rotated, a lever attached to one end of said shaft for rotating same, a jaw swiveled to the other end of said shaft and being movable toward and away from said fixed jaw, thereby to clamp the traction-rope, when said lever occupies a clamping position, and to release the rope when said lever occupies an unclamping position, a revoluble counterweight borne by said lever, a support borne by said frame for supporting said lever in the unclamping position, means for rotating said lever from the unclamping position to a clamping position, and means for depressing said lever after same has been rotated to a clamping position, thereby to clamp the traction-rope tighter.

27. The combination of a tramway bucket, a frame supporting same, a hollow member revolubly supported by said frame, a jaw fixed to said hollow member, a shaft revoluble in said hollow member, means for moving said shaft longitudinally when rotated, a lever attached to one end of said shaft for rotating same, a jaw swiveled to the other end of said shaft and being movable toward and away from said fixed jaw, thereby to clamp the traction-rope, when said lever occupies a clamping position, and to release the rope when said lever occupies an unclamping position, a revoluble counterweight borne by said lever, a support borne by said frame for supporting said lever in the unclamping position, means for rotating said lever from the unclamping position to a clamping position, and means for depress-

ing said lever after same has been rotated to a clamping position, thereby to clamp the traction-rope tighter, said depressing means consisting of a pivoted member extending into the path of travel of said counterweight and having its free end weighted.

28. The combination of a tramway bucket, a frame supporting same, a hollow member revolubly supported by said frame, a jaw fixed to said hollow member, a shaft revoluble in said hollow member, means for moving said shaft longitudinally when rotated, a lever attached to one end of said shaft for rotating same, a jaw swiveled to the other end of said shaft and being movable toward and away from said fixed jaw, thereby to clamp the traction-rope, when said lever occupies a clamping position, and to release the rope when said lever occupies an unclamping position, a revoluble counterweight borne by said lever, a support borne by said frame for supporting said lever in the unclamping position, means for rotating said lever from the unclamping position to a clamping position, and means for depressing said lever after same has been rotated to a clamping position, thereby to clamp the traction-rope tighter, said depressing means consisting of a pivoted member extending into the path of travel of said counterweight, the free end of said pivoted member being weighted and curved to extend out of the path of travel of said counterweight.

29. The combination of a tramway bucket, a frame supporting same, a hollow member revolubly supported by said frame, a jaw fixed to said hollow member, a shaft revoluble in said hollow member, means for moving said shaft longitudinally when rotated, a lever attached to one end of said shaft for rotating same, a jaw swiveled to the other end of said shaft and being movable toward and away from said fixed jaw, thereby to clamp the traction-rope, when said lever occupies a clamping position, and to release the rope, when said lever occupies an unclamping position, a revoluble counterweight borne by said lever, a support borne by said frame for supporting said lever in the unclamping position, means for rotating said lever from the unclamping position to a clamping position, a support, a member pivoted to said support and extending into the path of travel of said counterweight, thereby to depress said lever in a clamping position, an arm pivoted to said support, a weight borne by said arm, a link attached to said arm and supporting the free end of said pivoted member, and a stop borne by said support for limiting the movement of said arm.

30. The combination of a tramway bucket, a frame supporting same, a hollow member revolubly supported by said frame, a jaw fixed to said hollow member, a shaft revol-

ble in said hollow member, means for moving said shaft longitudinally when rotated, a lever attached to one end of said shaft for rotating same, a jaw swiveled to the other
 5 end of said shaft and being movable toward and away from said fixed jaw, thereby to clamp the traction-rope, when said lever occupies a clamping position, and to release the rope, when said lever occupies an un-
 10 clamping position, a revoluble counterweight borne by said lever, a support borne by said frame for supporting said lever in the unclamping position, means for rotating said lever from the unclamping position to a
 15 clamping position, a support, a member pivoted to said support and extending into the path of travel of said counterweight, thereby to depress said lever in a clamping position, an arm pivoted to said support, a
 20 weight borne by said arm, a link attached to said arm and supporting the free end of said pivoted member, and a stop borne by said support for limiting the movement of said arm, said weight being adjustably at-
 25 tached to said arm.

31. A tramway grip comprising a hollow member provided at one end with a longi-

tudinal extension terminating in a lateral jaw, a shaft revolubly fitted in said member and arranged for bodily longitudinal move- 30
 ment during its revolution, a jaw swiveled to one end of said shaft and confronting the first-named jaw for coöperation with the same, and means for revolving said shaft, 35
 both of said jaws being provided with grooves adapted to receive the traction-rope, said grooves extending through and at substantially a right angle to the axis of said shaft.

32. A tramway grip comprising a hollow 40
 revoluble member provided with a fixed jaw, a shaft revolubly fitted in said member and arranged for bodily longitudinal movement during its revolution, a jaw carried by said shaft for coöperation with the first 45
 named jaw, and means for revolving said shaft.

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

FREDERICK W. GRICE.

Witnesses:

GEORGE G. ANDERSON,
 GLADYS WALTON.