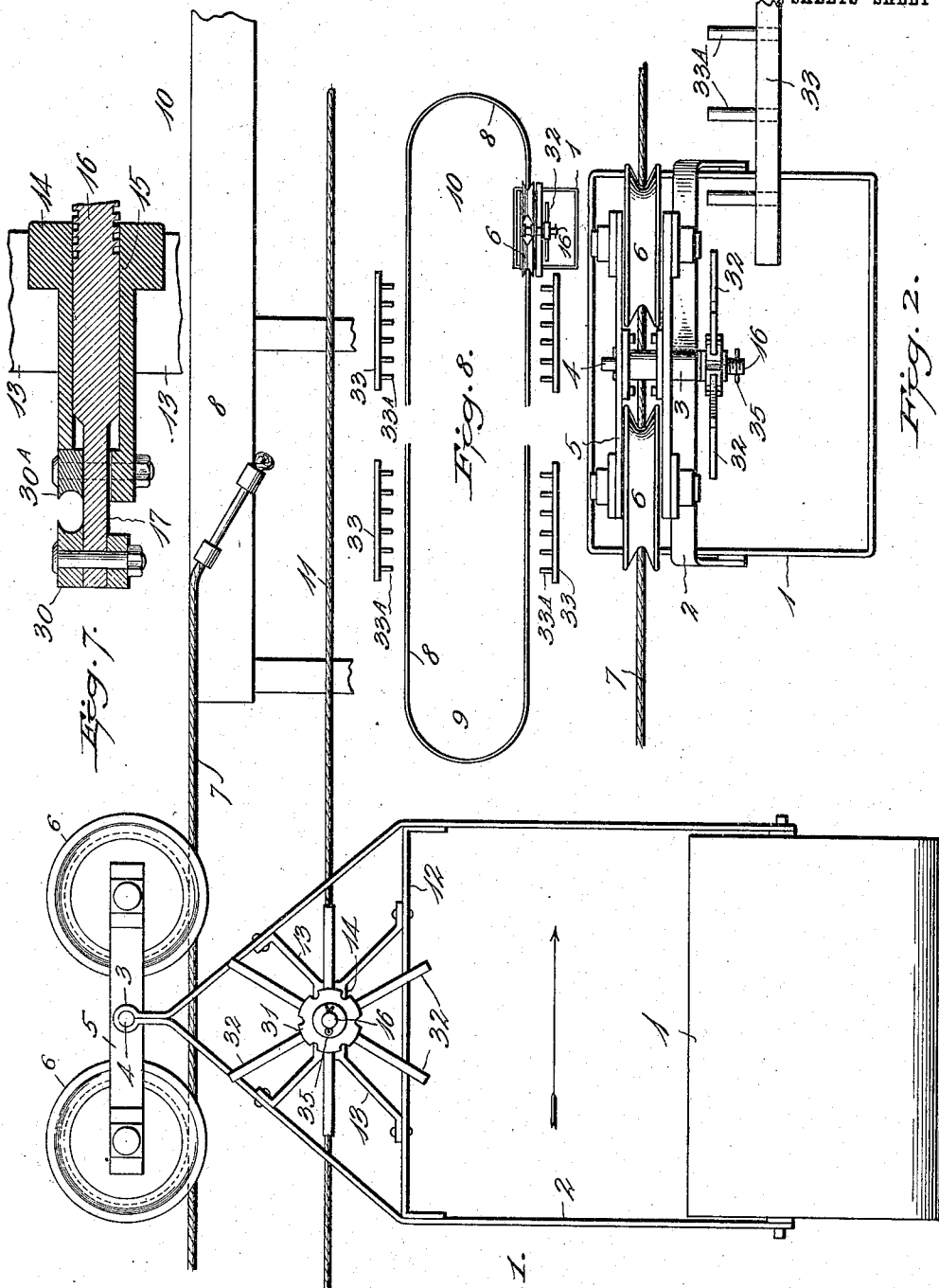


J. H. MONTGOMERY.
 ROPE GRIP FOR AERIAL WIRE ROPE TRAMWAYS.
 APPLICATION FILED JUNE 15, 1909.

937,319.

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2 SHEETS—SHEET 1.



Witnesses:
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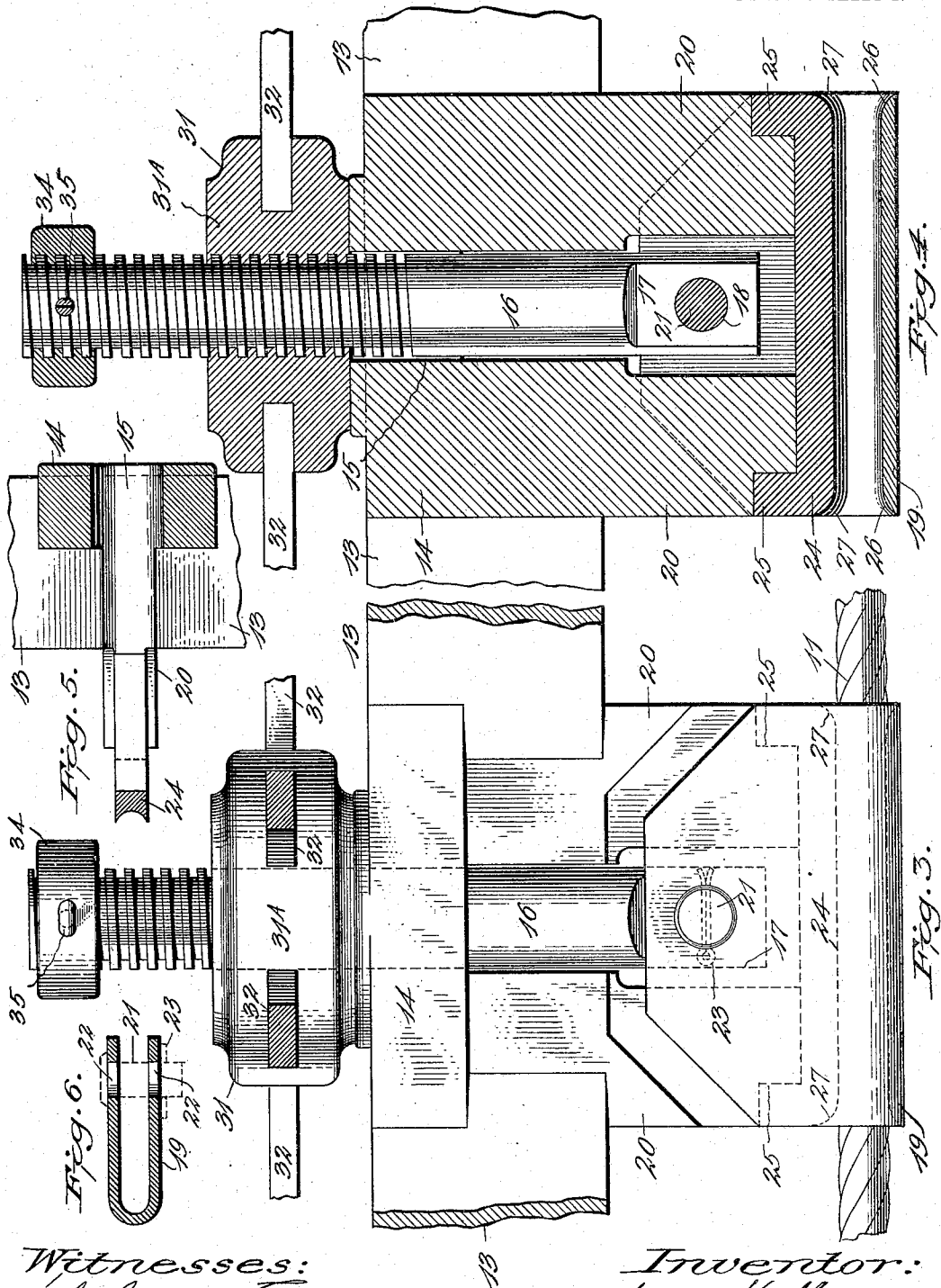
Fig. 1.
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 By James H. Montgomery.
 H. S. Bailey. Attorney

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UNITED STATES PATENT OFFICE.

JAMES H. MONTGOMERY, OF DENVER, COLORADO.

ROPE-GRIP FOR AERIAL WIRE-ROPE TRAMWAYS.

937,319.

Specification of Letters Patent.

Patented Oct. 19, 1909.

Application filed June 15, 1909. Serial No. 502,249.

To all whom it may concern:

Be it known that I, JAMES H. MONTGOMERY, a citizen of the United States of America, residing in the city and county of Denver and State of Colorado, have invented a new and useful Rope-Grip for Aerial Wire-Rope Tramways, of which the following is a specification.

My invention relates to improvements in rope grips for aerial wire rope tramways; and the object of the invention is to provide a rope grip for tramway buckets which cannot become disconnected from the traction rope when not gripped thereto, and which may be operated to grip or release the rope either manually or automatically.

A further object of the invention is to provide a grip comprising a supporting block secured to the bucket bail, having a shoe, a clip surrounding the traction rope; a bolt extending through the block and connected to the clip, and means whereby the bolt and clip are automatically operated to grip or release the rope relatively to the shoe.

I attain these objects by the mechanism illustrated in the accompanying drawings, in which:

Figure 1, is a front elevation of a portion of a tramway showing a bucket mounted on the track rope and equipped with the improved grip. Fig. 2, is a plan view of the same, showing the pins which are engaged by the spokes of the grip-operating hub at the terminals of the tramway. Fig. 3, is an enlarged plan view of the grip, showing the same in engagement with a traction rope. Fig. 4, is a horizontal sectional view thereof. Fig. 5, is a vertical longitudinal sectional view through the grip block and rope shoe. Fig. 6, is a sectional view through the rope clip. Fig. 7, is a vertical, longitudinal sectional view of a modified form of grip. And Fig. 8, is a reduced plan view, showing the tramway terminals and the pins which automatically operate the grip.

Similar letters of reference refer to similar parts throughout the several views.

Referring to the drawings, the numeral 1, designates an aerial wire rope tramway bucket, and 2 designates the bucket bail, which is pivotally attached to the sides of the bucket. The upper end of the bail is provided with an eye portion 3, in which is secured a pin 4, that is pivotally mounted in the side bars of a trolley frame 5, the

sheaves 6 of which are pivotally mounted in the ends of the trolley frame. These sheaves are adapted to run on a wire rope 7, called the stationary rope, and on the tracks 8 of the terminal stations 9 and 10, of aerial wire rope tramways. Around the terminals 9 and 10 passes a running rope 11, called the traction rope, which is an endless running rope, and is, with the stationary rope, supported at the opposite ends of the tramway by the said terminals, and intermediate of the terminals by towers, which I do not illustrate, as they do not form any part of my present invention.

To the upper portion of the bucket bail 2, is secured a cross bar 12, and to this cross bar and the converging members of the bail are riveted arms 13, which are secured to or form an integral part of a housing block 14. This housing block forms a part of my improved friction grip, and is provided with an aperture 15, through which a bolt 16 extends loosely. One end of this bolt is provided with a flattened end portion 17, through which an aperture 18 is formed, and a yoke or U-shaped rope clip 19 extends over the flattened end 17 of the bolt 16, and over members 20, which form an integral part of the block 14, and which lie on each side of the bolt, and parallel thereto. The clip 19 is pivotally secured to the flattened end of the bolt by a headed pin 21, which passes through apertures 22 in the clip, and through the bolt, and is secured to the bolt and clip by a split pin 23, which is extended through its lower end. The members 20 of the block extend beyond the end of the bolt 16, and a rope wearing shoe 24 is placed across and against its end. This rope wearing shoe comprises a bar of metal that fits closely but is movable in the rope clip, and extends through it and is provided with short bent-over end portions 25 that are arranged to extend into recesses formed in the opposite corners of the members 20 of the housing block to receive them. The U-shaped rope clip is curved to fit the curvature of the size of rope 11 to be used, and the opposite end portions 26 of this curved rope engaging wall are chamfered outwardly to prevent the edges from wearing or cutting off the rope. The rope engaging side of the shoe is also provided with a concaved surface, adapted to fit the circumferential curve of the size of rope used, and its opposite ends 27 are also rearwardly chamfered to prevent its edges

from cutting or wearing away the rope. The clip preferably surrounds permanently the traction rope, which runs constantly through it, but if desired this clip can be made with an open slot 29 as shown in Fig. 7, so that the rope can be disengaged from it when desired, and in this form the end of the bolt 16 has a gripping jaw 30, secured to its outer end, which is adapted to act in conjunction with a fixed jaw 30^A, which is bolted to the forward extensions of the block 14. The opposite end of the bolt 16 extends beyond the end of the block, and its end is threaded to receive a manually and automatically operated wheel 31, which I term the grip operating wheel, and which comprises a hub portion 31^A, that is provided with a threaded bore which fits to rotate freely on the threaded end portion of the bolt, and a plurality of wrought iron or steel spokes 32, which are cast into or are otherwise secured to the hub. These spokes preferably comprise straight bars of a length to give sufficient screw tightening power to cause the clip to grip the wire rope tight enough to prevent its slipping through the grip, and I preferably illustrate the hub provided with six of these spokes.

My improved grip is adapted to be operated to grip and also to release the traction or running rope automatically, though in gripping the bucket to the rope the hub is turned manually to cause the grip to engage the rope with sufficient force to be carried with the said rope, and as the bucket moves out of the terminal, the hub is turned automatically to securely lock the grip to the rope. I preferably accomplish the automatic gripping and releasing of the traction rope by securing at the in-coming and outgoing end of each terminal a horizontal bar 33, having a plurality of arms or pins 33^A, which are arranged in the path of the spokes 32, and are also spaced at a distance apart to be engaged by the spokes of said grip operating wheel to move said spokes to operate the grip, either to engage or release the traction rope, and when the bucket travels in the direction of the arrow, Fig. 1, the pins 33^A are arranged to engage the spokes 32, above the axial center of the hub, in releasing the grip, and below the axial center of the hub in setting the grip. The bars 33 can be secured to the frame work of the terminals 9 and 10 in any suitable manner, in a position to allow the arms to engage the spokes of the grip operating wheel.

The operation of my improved grip is as follows: After a bucket has been filled at a terminal, the loading attendant grasps a spoke of the operating wheel and gives it a twirl, which tightens the clip against the traction rope by drawing the bolt 16 toward the wheel and drawing the clip and rope against the wearing shoe 24, which acts as

a fixed abutment for the rope to bear against, and when the operating wheel is screwed against the adjacent end of the housing block, the traction rope is clamped by the clip against the shoe. Consequently when the operator turns the operating wheel, he gives it at first a movement sufficient to start the bucket out of the terminal on the stationary rope, and just before the bucket reaches the end of the terminal he either gives it an additional turn to securely clamp the rope to the grip, or if the automatic operating wheel engaging arms are used, they engage the spokes of the wheel, as it is moved out of the terminal by the traction rope, and tighten the grip sufficiently to hold the bucket and its load to the traction rope, and when the bucket reaches the opposite end of the tramway, the grip is loosened from the traction rope either by an operator or automatically by the pins 33^A. The curved wall of the clip forms a rope gripping jaw portion on the clip. The clip overlies the wearing shoe and the members 20, which support the said shoe, and it is held by the said members against rotative movement.

Upon the terminal threaded end of the bolt, I thread a collar 34, which I secure thereto by a split pin 35, which is extended through an aperture formed through both collar and bolt, as shown in Figs. 3 and 4. This collar prevents the hand wheel from accidentally turning off from the bolt, but if desired I may dispense with the collar, and use the split pin only, as shown in Figs. 1 and 2.

My invention provides a positively operating traction rope gripping grip for aerial wire rope tramways, that is simple, strong, durable, and practical.

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

1. A rope grip for tramways, comprising a block, a threaded bolt slidably mounted in said block, a rope receiving clip secured to said bolt, a rope wearing shoe in said clip abutting against said block, said clip and shoe being arranged to receive between them a running rope, and a wheel threaded to said bolt and arranged to screw against said block and draw said bolt and clip to clamp said rope against said shoe.

2. A rope grip for tramways, comprising a block, a threaded bolt slidably mounted in said block, a rope receiving clip secured to said bolt, a rope wearing shoe in said clip abutting against said block, said clip and shoe being arranged to receive between them a running rope, a wheel threaded to said bolt and arranged to screw against said block and draw said bolt and clip to clamp said rope against said shoe, and means attached to said tramway for engaging said

wheel and rotating the same as said grip is moved along said tramway by said running rope to tighten or loosen said grip on said running rope.

5 3. In a rope grip for tramways, the combination with the bucket and the traction rope of a tramway, of a housing block secured to the bail of said bucket, a bolt extending through said block, a U-shaped clip
10 surrounding said rope and the end of said bolt, and pivotally secured thereto, a rope engaging shoe extending through said clip and arranged to bear against said housing block, and a spoke wheel threaded to the op-
15 posite end of said bolt.

4. In a rope grip for tramways, the combination of the bucket and traction rope, with a grip comprising a housing block secured to said bucket adjacent to said traction rope, a threaded bolt extending loosely
20 through said housing, a rope clip provided with a curved wall portion adapted to receive and bear against one side of said traction rope, a wearing bar arranged to bear
25 against said housing block on one side and to bear against said rope on its opposite side, and a manually operating wheel threaded to the opposite end of said bolt and arranged to be screwed against said block and move
30 said clip to clamp said rope against said wearing shoe.

5. In a running rope grip for tramways, the combination with the terminal, the stationary and running ropes and the bucket,
35 the bucket pendant and the bucket pendant trolley, of the cross bars attached to said pendant, the housing block secured to said cross bars provided with an aperture, a bolt slidably mounted in said aperture and ar-
40 ranged non-rotatably therein, a U-shaped clip pivotally secured to one end of said bolt and surrounding said running rope and provided with a curved wall or jaw portion adapted to fit the curvature of one side of
45 said running rope, a shoe fitting against said block and extending loosely through said clip and provided with a curved surface adapted to fit the opposite side of said rope, a hub threaded to the opposite end of said
50 bolt, a plurality of spokes radiating from said hub, and a collar removably secured to the threaded end of said bolt.

6. In a rope grip for tramway buckets as specified, a block secured to the bail of said
55 bucket; a shoe upon the outer end of the

block; a bolt extending through an aperture in the block; a clip attached to the forward end of the bolt to act in conjunction with the shoe in gripping the rope; and means for operating the bolt.

7. In a rope grip for tramway buckets as specified, a block secured to the bucket bail, having an aperture; a bolt extending through the aperture; projecting members
65 which extend from the block parallel with the bolt, said bolt lying between them; a shoe on the ends of said projecting members; a U-shaped clip which overlies the shoe and ends of the members and is secured to the end of the bolt; a hub threaded upon the
70 outer end of the bolt and adapted to bear against the block; and means for automatically turning the hub, whereby to draw upon the bolt and move the clip to act in conjunction with the shoe to grip the rope.

8. In a rope grip for tramway buckets as specified, the combination with a running rope; a track rope and terminals; a bucket having a trolley on its bail adapted to run on
80 said track rope and terminals; a grip on the bucket bail, comprising a block; a shoe on the block; a clip surrounding the running rope and adapted to act in conjunction with the shoe; a bolt secured to the clip and extending through the block; a hub threaded
85 upon the opposite end of the bolt and adapted to bear against the block; and radially disposed spokes extending from said hub; of pins supported in the path of said spokes, at the incoming and outgoing end of said terminals, which engage said spokes to turn
90 said hub whereby said bolt is operated to move the clip relatively to the shoe.

9. In a rope grip for tramway buckets as specified, the combination with the bucket
95 bail of a block secured thereto; a shoe on one end of said block; a clip adapted to surround the rope and act in conjunction with the shoe for clamping the same; a bolt extending through the block and secured between the ends of the clip; and means for
100 operating the bolt to cause the clip to move relatively to the shoe.

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

JAMES H. MONTGOMERY.

Witnesses:

G. SARGENT ELLIOTT,
ADELLA M. FOWLE.