

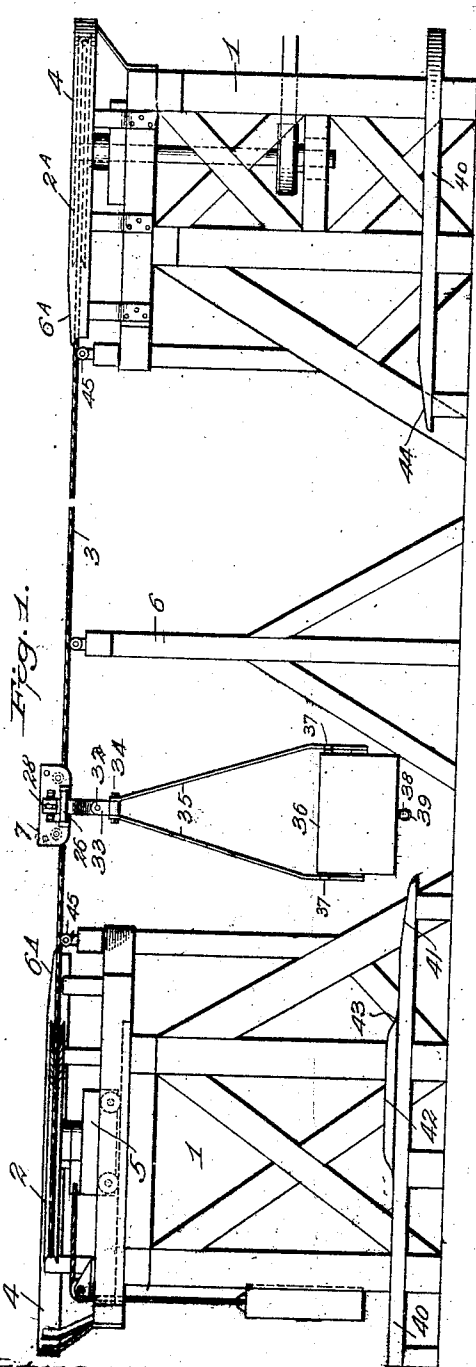
J. J. A. MILLER.
 WEIGHT ACTUATED GRIP SINGLE RUNNING ROPE TRAMWAY SYSTEM.

968,868.

APPLICATION FILED NOV. 2, 1909.

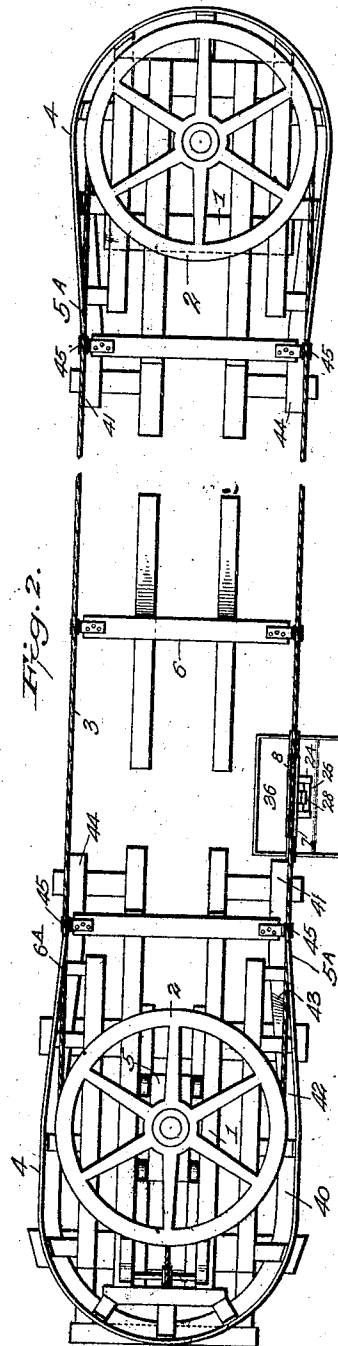
Patented Aug. 30, 1910.

2 SHEETS—SHEET 1.



Witnesses

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Fig. 3.

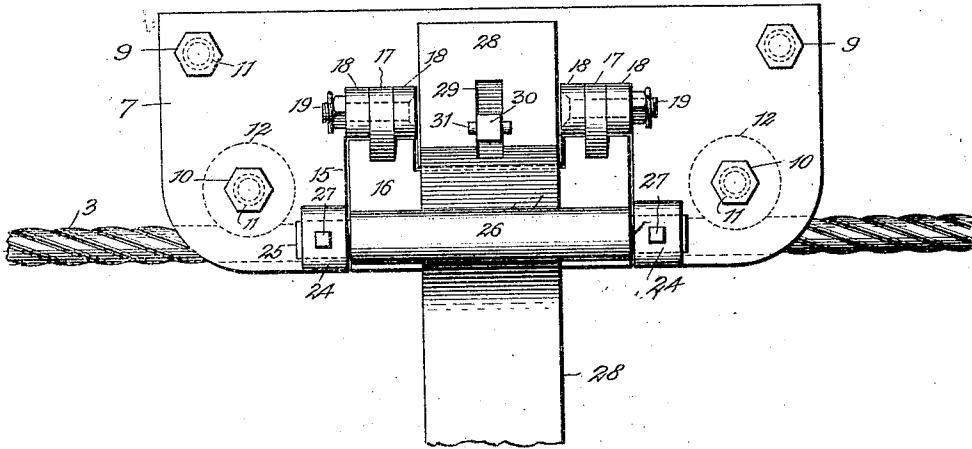


Fig. 4.

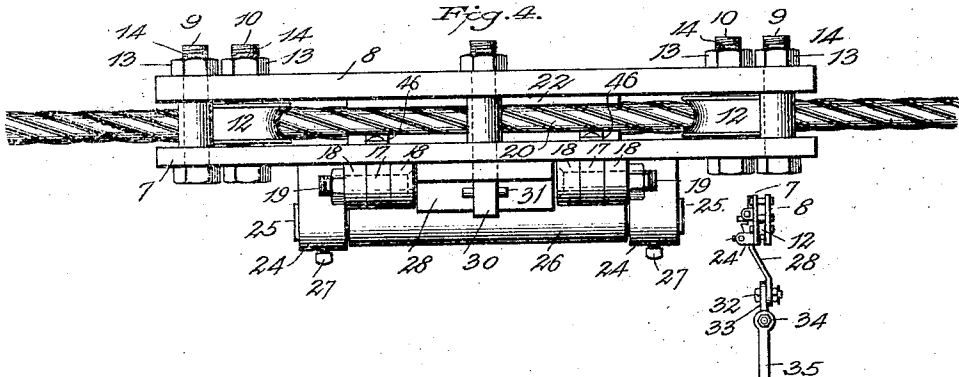


Fig. 5.

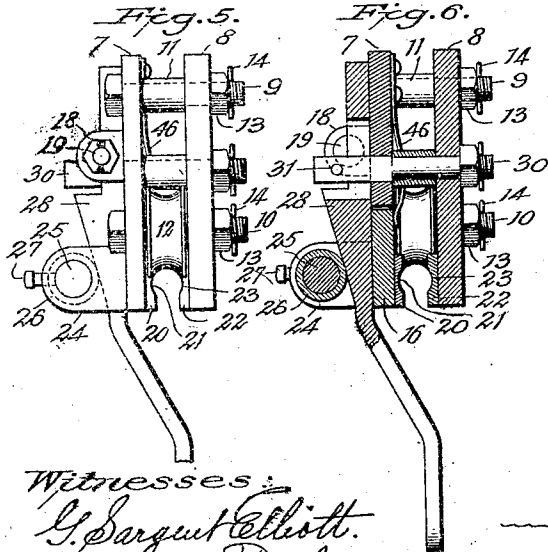


Fig. 6.

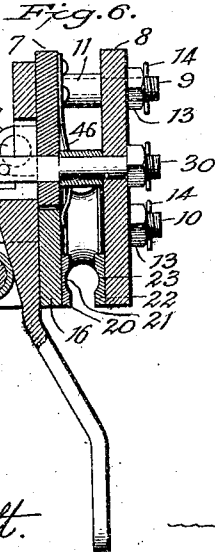
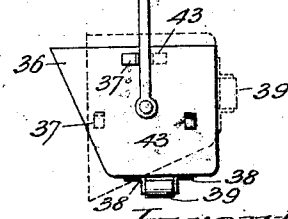


Fig. 7.



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UNITED STATES PATENT OFFICE.

JOHN J. A. MILLER, OF DENVER, COLORADO.

WEIGHT-ACTUATED-GRIP SINGLE-RUNNING-ROPE TRAMWAY SYSTEM.

968,868.

Specification of Letters Patent. Patented Aug. 30, 1910.

Application filed November 2, 1909. Serial No. 525,898.

To all whom it may concern:

Be it known that I, JOHN J. A. MILLER, 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 Weight-Actuated-Grip Single-Running-Rope Tramway System, of which the following is a specification.

My invention relates to a new and improved system of aerial wire rope tramways, and the objects of my invention are: First—to provide a gravity or weight operating single rope tramway. Second—to provide a single rope tramway, in which a running or traction rope is the only rope employed, and in which a gravity or weight operating rope grip is attached to the bucket and is operated to grip the rope automatically by the weight of the bucket; and third—to provide a very simple, inexpensive and perfectly practical single rope tramway system. I may attain these objects by means of any suitable endless running or traction rope tramway and an automatic gravity or weight operating bucket grip, but I preferably employ, in carrying out this feature of my invention, the weight operating rope gripping device and a single endless bucket carrying wire rope and the fixed terminal station and intermediate supporting station illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a tramway, embodying my improved system. Fig. 2 is a plan view thereof. Fig. 3 is a side elevation of the grip used in connection with the improved system. Fig. 4 is a plan view thereof. Fig. 5 is an end elevation of the same. Fig. 6 is a central, transverse, sectional view thereof; and Fig. 7 is an end elevation of the grip and bucket, showing the bucket tipped in dotted lines.

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

In the present state of the aerial wire rope tramway art single and double rope tramways are in common use, in which the buckets are releasably secured to the running ropes by manually operating bolts and grips and by automatically locking and releasing clips.

My present system is an improvement on the present single rope systems, inasmuch as I employ an endless running rope and an automatic weight operating rope gripping grip attached to the bucket, which I term

a bucket grip, inasmuch as the grip is attached to and is carried by the bucket. The weight of the bucket is sufficient to cause the grip which is attached to the bucket to grip the rope and which acts to grip the rope with greater pressure the heavier the load in the bucket is, and the buckets of which are automatically released at either terminal by lifting the weight of the bucket and its load from the grip.

My invention contemplates the use of any weight substituted for and that takes the place of the bucket, such as log or stone hooks or special forms of cradles of any form for carrying special forms or character of material that may be attached to the grip itself or the pendants or bail of the bucket.

My improved system requires the use of terminals 1, which support rope sheaves 2 at the opposite ends of a tramway, which support the traction or endless running rope 3 at its opposite ends. These sheave wheels may be rope gripping wheels, if desired, and the terminals, which are supporting structures for the sheaves, are each provided with a semicircular stationary track 4, upon which the buckets run and on which they enter the terminals from one side of the running rope and run around them and after being loaded or unloaded pass out on the running rope again to the opposite terminal, where they are again loaded or unloaded, and around which they pass in the same manner. A suitable tension device 5 is used to tighten the running or traction rope whenever it stretches and becomes too slack on the terminals, and at intervals between the terminals suitable towers 6 are employed to support the running or traction rope at a suitable distance above the ground. These towers 6 may be of any suitable construction to operatively support both sides of the traction or running rope.

My improved system contemplates the cooperative use of a single rope, which must be a running or traction rope, and a gravity or weight actuating rope gripping device, commonly called a rope grip. My improved rope grip depends upon and is so arranged that it is operated to grip the running or traction rope by the weight of the bucket with sufficient force to grip and clamp and hold the bucket to the rope when the bucket is empty and with increasing pressure as the bucket is loaded, and the bucket and grip

is released from the rope by raising the weight of the bucket from the rope. This gravity or weight operating grip, which I term a bucket grip, is also provided with trolley sheaves or grooved rollers, which are mounted on the rope and also run on the tracks of the terminals. This gravity or weight operating grip forms the essentially new feature of my new and simple tramway system, and it comprises a pair of plates 7 and 8, which are connected by bolts 9 and 10, spacing sleeves 11 being placed upon the bolts to hold the plates a suitable distance apart, the ends of the sleeves forming shoulders against which the plates bear, as will be understood. Upon the sleeves of the two lower bolts 10 are mounted grooved rollers 12, which normally rest upon the rope and help support the weight of the bucket, but when the clip is switched off upon the stationary track these rollers act as trolley wheels and support the entire weight of the bucket and enable it to be rolled around the track and on to the rope again, as will hereinafter fully appear. The bolts 9 and 10 are secured by nuts 13, which are retained upon the bolts by cotter-pins 14.

The plate 7 is formed with a central recess 15, which extends in a suitable distance from its lower edge, and in this recess is loosely fitted a plate 16, the upper edge of which is provided with apertured ears 17, each of which lies between a pair of apertured ears 18, which may be secured to the plate 7, but which are shown as being integrally connected therewith. Bolts 19 pass through these ears and pivotally support the plate 16. The head of each bolt is preferably countersunk in one of the ears 18, and they are secured by nuts and cotter-pins, as shown. Upon the rear side of the plate 16 is secured a shoe 20, having a longitudinal, semi-circular groove 21, and a similar shoe 22 having a groove 23 is secured to the plate 8, diametrically opposite to the shoe 20. The shoe 20 is adapted to clamp the rope between it and the shoe 22, as will presently be fully shown. Apertured lugs 24 project from the bottom of the plate 7, one on each side of the recess 15, and these lugs support a circular bar 25, upon which is mounted a tubular roller or sleeve 26, the bar being held in the lug aperture by set screws 27. A wedge plate 28 is placed between the roller 26 and the plate 16, said plate being formed with a vertically disposed rear side, which lies against the plate 16, and with an inclined front side which is adapted to contact with the roller 26, whereby when the lower end of the wedge is drawn upon the plate 16 is forced inward against the rope. The portion of the plate 28 above the head of the wedge is reduced in thickness, as shown in Figs. 5 and 6, and is provided centrally with a slot

29, through which the squared portion of a bolt 30 passes, which bolt also extends through the plates 7 and 8, and is secured by a nut and pin as shown. A pin 31 passes through the squared portion of the bolt 30 a sufficient distance from the plate 28 to permit the same to have a limited outward rocking movement, and the squared end of this bolt prevents wobbling of the plate. The portion of the wedge plate below the plate 7 inclines inward to a point in vertical line with the rope 3, and then terminates in a vertical, apertured end, through which a bolt 32 passes, upon which is pivotally supported a hanger 33, through the lower end of which passes a bolt 34 at right angles to the bolt 32, which bolt 34 also passes through the upper ends of the bails 35, which are secured at their lower ends to a bucket 36. By bending the end of the plate 28 so as to stand in line with the rope, the center of gravity of the bucket, which is suspended from said bent end, is also in vertical line with the rope, and the clip is thus supported upon the rope in an upright position. The bolt 32 permits the bucket to swing in a line parallel with the rope, while the bolt 34 permits a swinging movement at right angles to the rope, and thus the grip is relieved of all twisting or straining movement while clamped upon the rope. The pivotal axis of the bucket is slightly on one side of its vertical center and slightly above its horizontal center. By pivoting the bucket in this manner, the preponderance of weight is on one side, and in the present instance this is the rear side. The bucket when loaded would thus have a tendency to tip toward the rear or inward and to counteract this stops 37 are secured to the ends of the bucket in position to engage the bails when the bucket is on an even keel, and thus prevent the same from dumping inward. Thus, whether the bucket is empty or loaded, it will assume the position shown in Fig. 7, and after dumping it will return to this position by gravity.

The dumping of the bucket and the releasing of the grip as the bucket reaches the terminal are both effected automatically and in the following manner: Upon the bottom of the bucket are secured suitable journal bearings 38, in which is mounted a roller 39, which is of sufficient length to present a broad bearing surface, and this roller is adapted to engage and ride upon a combined bucket lifting and dumping track 40 at the entrance of the terminal, which track is arranged in the path of the said roller, and is supported in any suitable manner. The forward end or bucket lifting portion 41 of this track is far enough in advance of the switch end 5^A of the track 4 to be engaged by the roller 39 before the grip reaches the end 5^A of the said track 4.

The end 41 inclines upward, and as the roller rides up this incline the bucket is thereby lifted and the wedge plate is raised, releasing the pressure on the gripping plate 16, so that when the grip reaches the switch 5^A it is already released from the rope and is carried up the inclined face of the said switch by the momentum of the bucket, and on to the track 4. The face of the inclined end 41 of the track is on a horizontal plane transversely of its direction, and at the point of junction of the inclined end with the bucket dumping portion 42 of the track a substantially spiral twist 43 is given to the track, which tilts the face of the said dumping portion at an angle of substantially forty-five degrees. As the roller reaches this twist, it is gradually turned from its normal horizontal position to a position conforming to the angle of the face of the dumping portion of the track, and as it turns the bucket is thereby tilted, thus shifting its center of gravity to the front side, which causes the bucket to dump automatically, and after dumping it returns to its normal position by gravity. In dumping, the bucket is prevented from turning completely over by stops 43 secured upon its ends, which engage the bails of the bucket when the bucket reaches the position shown in dotted lines, Fig. 7. The thickness of the track 4 is considerably less than the diameter of the rope, so that it will not be engaged by the gripping jaws, and thus the rollers 12 are permitted to ride freely thereon, as the bucket is moved around the terminal. The track 40, however, is extended around the terminal, in order that the roller 39 may ride thereon and take the weight of the bucket from the wedge plate 28, so that the grip will be open when it passes from the switch end 6^A onto the rope, and as the roller 39 passes off from the inclined end 44 of the track 40 the weight of the bucket again causes the wedge plate to lock the grip upon the rope. The rope is supported adjacent to the switches 5^A and 6^A by rollers 45, in order that it may be prevented from sagging at these points and thus interfere with the switching of the grip.

In operation, one of the sheave wheels is connected with a source of power in any suitable manner, whereby the rope 3 is set in motion. The buckets are then placed upon the rope at intervals by first hanging them upon the stationary track and then rolling them onto the rope, which is instantly gripped as the wedge plate 28 is drawn down by the weight of the bucket. The terminals, one of which is termed the loading terminal and the other the dumping terminal, are each equipped in the same manner, that is, with a sheave wheel, a stationary switch track concentric with and

slightly above the plane of the sheave wheel, and a combined bucket-lifting and supporting track, which is arranged in the path of the bucket roller. The buckets are loaded at the loading terminal, and on the stationary switch-track, after which they are moved, either manually or by suitable mechanism, onto the rope, which carries them to the dumping terminal. As each bucket approaches this terminal, its roller 39 engages the inclined track 41, and the momentum of the bucket carries it up this track which now supports it, and thus relieves the rope of its weight. The pull on the wedge plate 28 is not only relieved, but the said plate is pushed up by its connection with the bails as the bucket rises on the inclined track 41, so that the pressure on the hinged grip plate 16 is removed and the grip is opened and is then supported solely by the rollers 12. Thus, by the time the grip reaches the point of the switch 5^A, it has been released from the rope, and the momentum of the bucket is sufficient to carry the said grip up the inclined switch 5^A, and on to the stationary track. The lower corners of the plates 7 and 8 are curved as shown so as to offer no obstruction when the grip is switched from the rope to the track and back again to the rope. When the roller 39 encounters the spiral twist 43, the bucket is careened sufficiently to shift its center of gravity and the bucket dumps automatically and immediately thereafter rights itself by gravity. The remainder of the track 40 around to the switch 6 is on a horizontal plane, but the distance from the plane of this track to the plane of the track 4 is slightly less than the distance from the tread of the rollers 12 to the bottom of the roller 39, so that the track 40 carries the weight of the bucket, leaving the grip free to engage the rope as it passes on to the same from the switch 6^A. Springs 46 exert an outward pressure upon the grip plate 16, so that when it is released by the wedge the said springs move it out of contact with the rope.

My improved single rope gravity grip tramway system is particularly adapted for use on small tonnage capacity mining claims, and for use in carrying merchandise, as coal, rock, building stone and other material, over gulches, ravines and across country where it can be handled more economically than by pack animals or teams. It is simple and practical and will enable miners of small means to install a tramway at very much less cost than the so-called double rope and also than the single rope tramway at present in use.

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

In a tramway system, the combination of the endless running or traction rope, the

terminal stations provided with a rope connecting track, the rope supporting towers and the tension device, with a bucket provided with a roller and with a pendant or bail, a gravity or weight actuated rope grip pivotally secured to the upper end of said bucket's pendant or bail, said bucket and its pendant being arranged to operate said rope grip to cause it to grip said running rope by the weight of said bucket and its pendant, said gravity or weight operated rope grip comprising a trolley form of grip adapted to fit on said rope and run on said terminal stations rope connecting track, operatively arranged rope gripping jaws, a pressure device connected to said bucket's pendant and arranged to be moved by the

weight of said bucket and its pendant to cause said jaws to grip said rope between them, and an inclined track positioned adjacent to said terminal stations in the path of said rope carried bucket's roller arranged and adapted to be engaged by said roller and to raise said bucket and release its rope grip of its weight and thus release said running rope from said bucket at said terminal stations. 20 25

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

JOHN J. A. MILLER.

Witnesses:

G. SARGENT ELLIOTT,
ADELLA M. FOWLE.