

Dec. 13, 1927.

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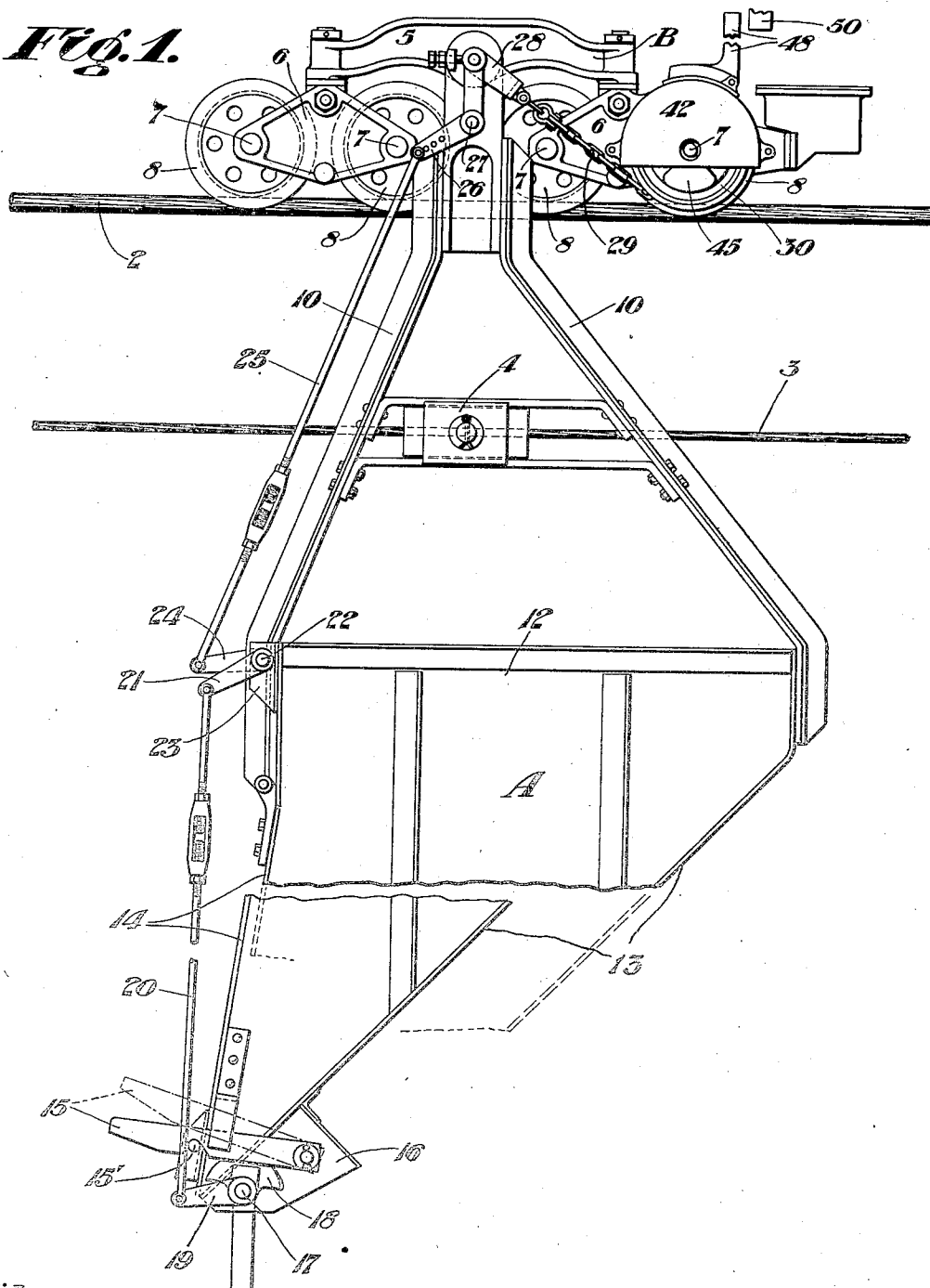
M. P. MORRISON

AERIAL TRAMWAY BUCKET

Filed Feb. 25, 1927

4 Sheets-Sheet 1

Fig. 1.



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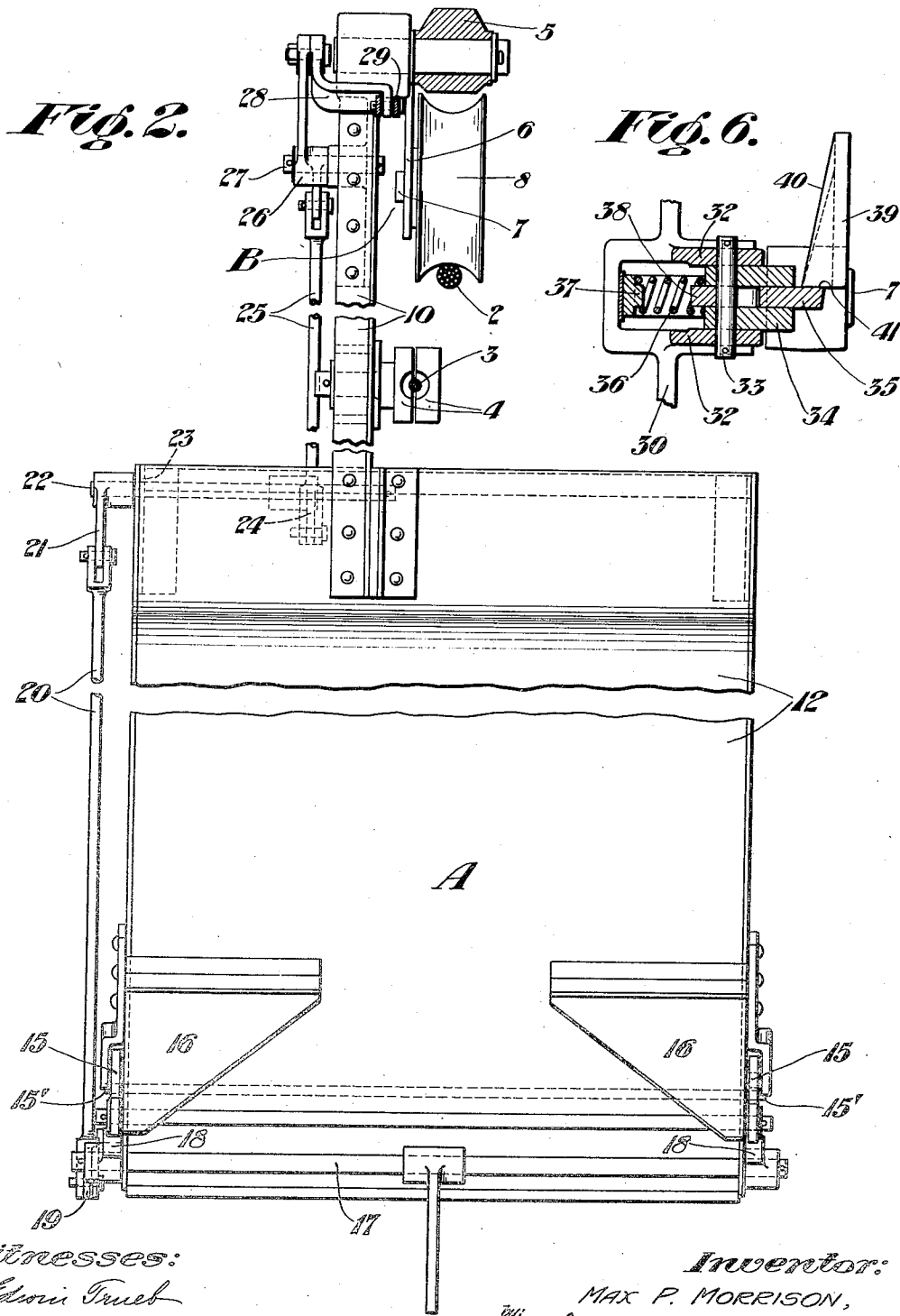
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AERIAL TRAMWAY BUCKET

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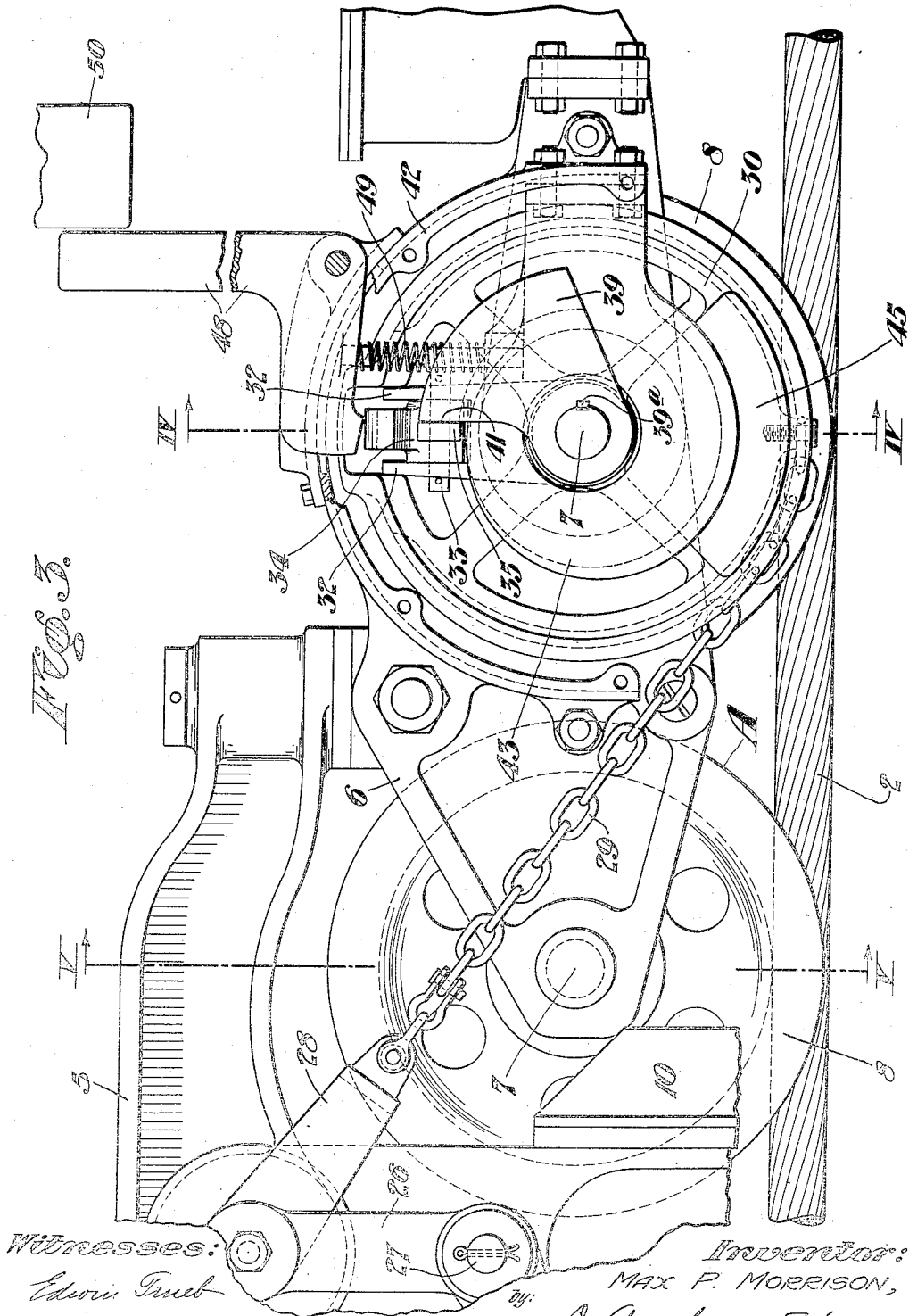


Fig. 3.

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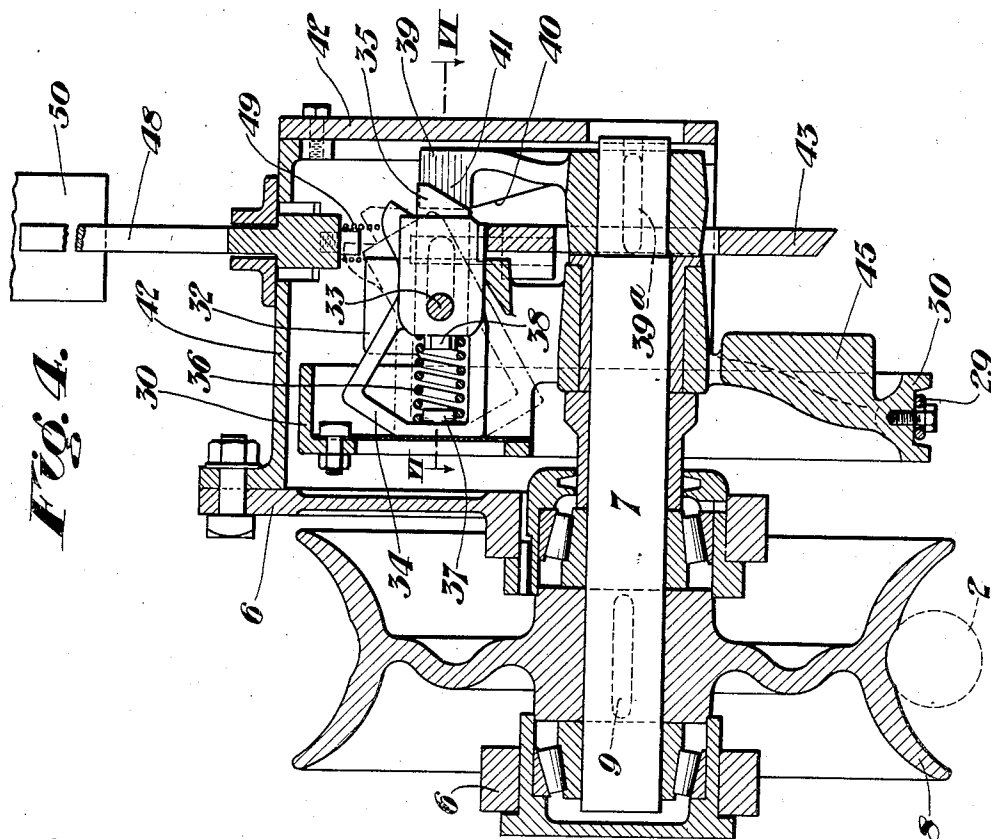
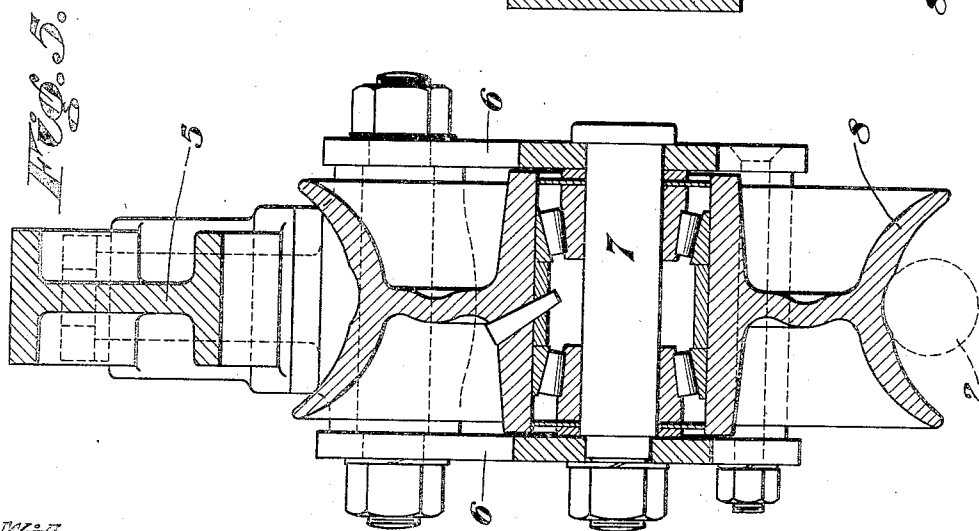
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AERIAL TRAMWAY BUCKET

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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE.

MAX P. MORRISON, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO THE AMERICAN STEEL AND WIRE COMPANY OF NEW JERSEY, A CORPORATION OF NEW JERSEY.

AERIAL-TRAMWAY BUCKET.

Application filed February 25, 1927. Serial No. 170,862.

This invention relates to aerial tramways and more particularly to aerial tramway buckets, and has for one of its objects the provision of an improved tripping mechanism for tripping the locking latches on such buckets automatically upon a reverse movement of the bucket on the tramway, thus dispensing with the use of the usual release devices heretofore employed.

Another object is to provide an improved tripping mechanism which may be tripped at any desired point along the length of the tramway selected by the operator without adjusting or resetting the mechanism.

A further object is to provide an improved tripping mechanism having the novel design, construction, and combination of parts hereinafter described and illustrated in the accompanying drawings.

In the drawings—

Figure 1 is a side elevation of a tramway bucket having my invention applied thereto.

Figure 2 is a forward side elevation of the bucket of Figure 1, with the carriage sectioned to show details of construction.

Figure 3 is an enlarged partial side elevation of the bucket carriage.

Figure 4 is a sectional elevation taken on the line IV—IV of Figure 3.

Figure 5 is a sectional elevation taken on the line V—V of Figure 3.

Figure 6 is a fragmentary sectional plan taken on the line VI—VI of Figure 4, showing the tripping pawl and ratchet mechanism.

Referring more particularly to the drawings, the numeral 2 designates the aerial tramway track cable on which the bucket A is adapted to be propelled by a traction or haulage rope 3 which rope is secured by a clamp 4 to the bucket A.

The bucket A comprises a wheeled carriage B composed of a saddle frame 5 supported on truck frames 6 in which are journaled axle shafts 7. The axle shafts 7 have grooved wheels 8 thereon. The front axle shaft 7 in the forward truck of the carriage serves as the operating shaft for the tripping mechanism (to be described) and, therefore, the wheel 8 on this shaft at least is keyed thereto by a key 9 so that the shaft will rotate as the carriage moves along the cable 2.

A pair of bucket supporting hangers 10 are suspended from the saddle frame 5 and

rigidly support a bucket body 12 having an inclined bottom 13 and a hinged back wall 14 adapted to be swung outwardly by the weight of the load in the bucket when the load is discharged.

The back wall 14 is normally locked in closed position by latches 15 which are pivotally mounted on brackets 16 secured to the bottom wall of the bucket and which engage latch pins 15' on the back wall 14. A latch operating shaft 17 is journaled in the brackets 16 and carries cam members 18 which are secured thereto and are adapted to engage and raise the latches 15 when the shaft 17 is rotated. An operating lever 19 is mounted on the shaft 17 and bolted or otherwise secured to one of the cam members 18. The lever 19 has its one end pivotally connected to a link 20 which in turn is connected to a lever 21 keyed or otherwise secured to a shaft 22 journaled in brackets 23 at the top of the bucket body. A second lever 24 is also keyed or otherwise secured to the shaft 22 and connected by a link 25 to one arm of a crank lever 26 mounted on a supporting pivot pin 27. The other arm of the crank lever 26 is connected to a connecting link 28, which in turn is connected to one end of a chain 29, the other end of which is secured to a chain wheel 30 journaled on the front axle shaft 7.

When the wheel 30 is rotated in a counter-clockwise direction it will take up the chain 29 so as to pull on the crank 26 thus lifting link 25 and lever 24 and rocking shaft 22 so as to raise lever 21 and link 20. The link 20 in turn will raise the lever 19 and rock the shaft 17 so as to cause the cam members 18 to engage and raise the latch members 15 and release the back wall 14 of the bucket body.

The front axle shaft which has its wheel 8 keyed thereon serves as the power or operating shaft for operating the tripping mechanism and, therefore, is of materially greater length than the other axle shafts. The chain wheel 30, which is journaled for free rotation on the front axle shaft, is provided with a pair of spaced brackets or ears 32 which are apertured to receive a pivot pin 33. A pawl housing 34 is mounted between the ears 32 and pivotally supported on the pivot pin 33. A pawl 35 is reciprocably mounted within and projects through the open end of the housing 34 and

is slotted to clear the pivot pin 33. A coil spring 36 is mounted within the housing 34 and has one end engaged on a guide lug 37 formed integral with the housing, while its other end is engaged over a guide lug 38 on the end of the pawl 35. The spring 36 is adapted to normally hold the pawl 35 in extended position.

A one-tooth ratchet member 39 is keyed on the front axle shaft by a key 39^a and is adapted to engage and force the pawl 35 inwardly against the spring 36 so as to ride past the pawl when the bucket is propelled in the forward direction, due to the beveled face 40 of the ratchet. The ratchet member 39 is also provided with a square face or tooth portion 41 which, when the bucket is moved in the reverse direction, will engage the pawl 35 and cause the pawl to move therewith. When the pawl 35 is rotated with the ratchet 39 the housing 34 and consequently the chain wheel 30 will be rotated therewith so as to take up the chain 29 and operate the lever mechanism to release latch members 15.

A housing 42 is mounted on the forward truck and encloses the upper portion of the chain wheel 30 and its associated mechanism.

In order to limit the rotation of the chain wheel 30, a cam member 43 is provided which is secured to the housing 42 and extends into the path of the pawl housing 34. As the ratchet 39 rotates the pawl, pawl housing and chain wheel, the pawl housing 34 will ride up on the stationary cam member 43 until it is tilted about its pivotal supporting pin 33 a sufficient amount to move the pawl 35 out of engagement with the ratchet 39 at which time the rotation of the chain wheel in a counter-clockwise direction will stop.

The chain wheel 30 is provided with an integral counterweight formed by making one segment thereof materially heavier than the remainder, as at 45. The portion 45 of the wheel 30 is normally at the bottom of the wheel and when the wheel is rotated by the operation of the ratchet 39 and pawl 35, the portion 45 will be raised, so that when the pawl 35 is released by the rocking or tilting of the housing 34, the counterweight 45 and the weight of the latch lever operating mechanism will combine to return the wheel 30 to its normal position so as to permit the latches 15 to again engage the latch pins 15' when the back wall 14 of the bucket body resumes its closed position.

After the pawl housing 34 has been tilted to free the pawl 35, it remains in its tilted position during the return movement of the chain wheel 30 and during the reverse travel of the bucket so that the pawl 35 is not operated by the ratchet during the return movement of the bucket.

A reset crank lever 48 is pivotally mount-

ed on the housing 42 and extends through a slot in the housing so that when the lever is rocked about its mounting it will engage and move the tilted pawl housing 34 back into its horizontal position, where the pawl 35 will be engaged by the ratchet 39. The lever 48 is normally held out of engagement with the pawl housing 34 by a coil spring 49.

A trip weight 50 is suspended from above the track cable 2 at the loading end of the tramway into the path of the lever 48 so that as the bucket is started on its forward or load carrying travel, the lever 48 will engage the weight 50 and be caused to rock to reset the pawl housing 34.

The present arrangement of tripping mechanism is operable at any selected point along the length of the tramway, and with the exception of the tripping weight, is all mounted on the bucket itself so as to eliminate the necessity for overhead tripping frames and the like as heretofore generally used.

While I have shown and described one specific embodiment of my invention, it will be understood that I do not wish to be limited thereto since various modifications may be made without departing from the scope of my invention as defined in the appended claims.

I claim—

1. The combination with an aerial tramway bucket, comprising the usual carriage having a bucket member suspended therefrom, supporting wheels on said carriage, shafts for said wheels, and at least one of said wheels being keyed to its shaft, of a latch and latch operating mechanism carried by said bucket, said latch operating mechanism comprising a lever mechanism, and means operable by said shaft having a supporting wheel keyed thereto for operating said lever mechanism, said means including an operating wheel journaled on said last named wheel shaft, a flexible connection between said operating wheel and said lever mechanism to release said latch when said operating wheel is rotated in a counter-clockwise direction, means operable by said last named shaft for rotating said operating wheel in a counter-clockwise direction when said bucket is moved in the reverse direction, said means being inoperative while said bucket is moving in the forward or load carrying direction.

2. The combination with an aerial tramway bucket, comprising the usual carriage having a bucket member suspended therefrom, supporting wheels on said carriage, shafts for said wheels, and at least one of said wheels being keyed to its shaft, of a latch and latch operating mechanism carried by said bucket, said latch operating mechanism comprising a lever mechanism, and means operable by said shaft having the

supporting wheel keyed thereto for operating said lever mechanism, said means including an operating wheel journaled on said last named wheel shaft, a flexible connection between said operating wheel and said lever mechanism to release said latch when said operating wheel is rotated in a counter-clockwise direction, means operable by said last named shaft for rotating said operating wheel in a counter-clockwise direction when said bucket is moved in the reverse direction, said means being inoperative while said bucket is moving in the forward or load carrying direction, means for automatically returning said operating wheel to its normal position.

3. The combination with an aerial tramway bucket, comprising the usual carriage having a bucket member suspended therefrom, supporting wheels on said carriage, shafts for said wheels, and at least one of said wheels being keyed to its shaft, of a latch and latch operating mechanism carried by said bucket, said latch operating mechanism comprising a lever mechanism, and means operable by said shaft having the supporting wheel keyed thereto for operating said lever mechanism, said means including an operating wheel journaled on said last named wheel shaft, a flexible connection between said operating wheel and said lever mechanism and adapted to operate said lever mechanism to release said latch when said operating wheel is rotated in a counter-clockwise direction, a pawl housing pivotally mounted on said operating wheel, a pawl reciprocally mounted in said housing, a ratchet carried on said last named shaft, said ratchet being adapted to reciprocate and ride past said pawl when said bucket is moved in the forward or load carrying direction, and being adapted to engage said pawl and rotate said operating wheel when said bucket is moved in the reverse direction.

4. The combination with an aerial tramway bucket, comprising the usual carriage having a bucket member suspended therefrom, supporting wheels on said carriage, shafts for said wheels, and at least one of said wheels being keyed to its shaft, of a latch and latch operating mechanism carried by said bucket, said latch operating mechanism comprising a lever mechanism, and means operable by said shaft having the supporting wheel keyed thereto for operating said lever mechanism, said means including an operating wheel journaled on said last named wheel shaft, a flexible connection between said operating wheel and said lever mechanism and adapted to operate said lever mechanism to release said latch when said operating wheel is rotated in a counter-clockwise direction, a pawl housing pivotally mounted on said operating wheel,

a pawl reciprocally mounted in said housing, a ratchet carried on said last named shaft, said ratchet being adapted to reciprocate and ride past said pawl when said bucket is moved in the forward or load carrying direction, and being adapted to engage said pawl and rotate said operating wheel when said bucket is moved in the reverse direction, means for automatically releasing said pawl from said ratchet, and means for automatically returning said operating wheel to normal position when said pawl is released from said ratchet.

5. The combination with an aerial tramway bucket, comprising the usual carriage having a bucket member suspended therefrom, supporting wheels on said carriage, shafts for said wheels, and at least one of said wheels being keyed to its shaft, of a latch and latch operating mechanism carried by said bucket, said latch operating mechanism comprising a lever mechanism, and means operable by said shaft having the supporting wheel keyed thereto for operating said lever mechanism, said means including an operating wheel journaled on said last named wheel shaft, a flexible connection between said operating wheel and said lever mechanism and adapted to operate said lever mechanism to release said latch when said operating wheel is rotated in a counter-clockwise direction, a pawl housing pivotally mounted on said operating wheel, a pawl reciprocally mounted in said housing, a ratchet carried on said last named shaft, said ratchet being adapted to reciprocate and ride past said pawl when said bucket is moved in the forward or load carrying direction, and being adapted to engage said pawl and rotate said operating wheel when said bucket is moved in the reverse direction, a housing supported on said carriage and partly enclosing said operating wheel and its associated parts, a stationary cam carried on said housing and said last named shaft, said cam being adapted to rock said pawl housing about its pivotal mounting so as to move said pawl out of engagement with said ratchet, and a counterweight for automatically returning said operating wheel to normal position when said pawl is moved out of engagement with said ratchet.

6. The combination with an aerial tramway bucket, comprising the usual carriage having a bucket member suspended therefrom, supporting wheels on said carriage, shafts for said wheels, and at least one of said wheels being keyed to its shaft, of a latch and latch operating mechanism carried by said bucket, said latch operating mechanism comprising a lever mechanism, and means operable by said shaft having the supporting wheel keyed thereto for operating said lever mechanism, said means including an operating wheel journaled on said

last named wheel shaft, a flexible connection between said operating wheel and said lever mechanism and adapted to operate said lever mechanism to release said latch when said
5 operating wheel is rotated in a counter-clockwise direction, a pawl housing pivotally mounted on said operating wheel, a pawl reciprocably mounted in said housing, a
10 ratchet carried on said last named shaft, said ratchet being adapted to reciprocate and ride past said pawl when said bucket is moved in the forward or load carrying direction, and being adapted to engage said
15 pawl and rotate said operating wheel when said bucket is moved in the reverse direction, a housing supported on said carriage and partly enclosing said operating wheel and its associated parts, a stationary cam carried on said housing and said last named shaft, said cam being adapted to rock said
20 pawl housing about its pivotal mounting so as to move said pawl out of engagement with said ratchet, a counterweight for automatically returning said operating wheel to normal position when said pawl is moved out of
25 engagement with said ratchet, and means for automatically returning said pawl housing to normal position so that said pawl will be again engaged by said ratchet.

In witness whereof, I have hereunto signed
30 my name.

MAX P. MORRISON.