Oct. 25, 1932. E. G. MORGAN 1,884,111

CAR TRIPPER

Filed May 27, 1930 2 Sheets-Sheet 1

Fig. 3.

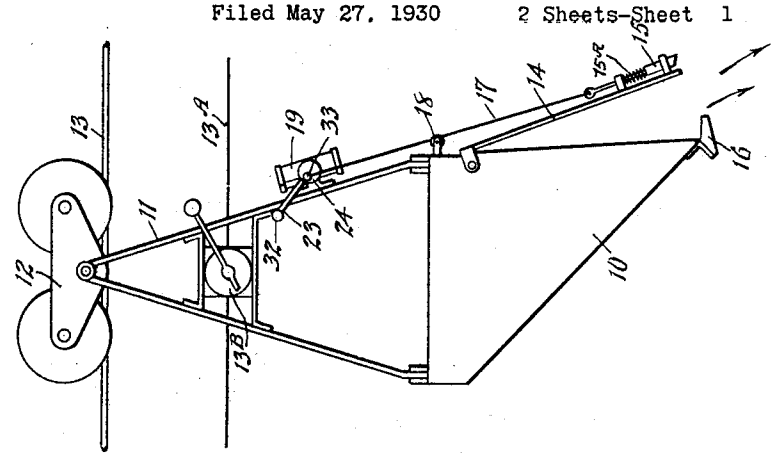


Fig. 2.

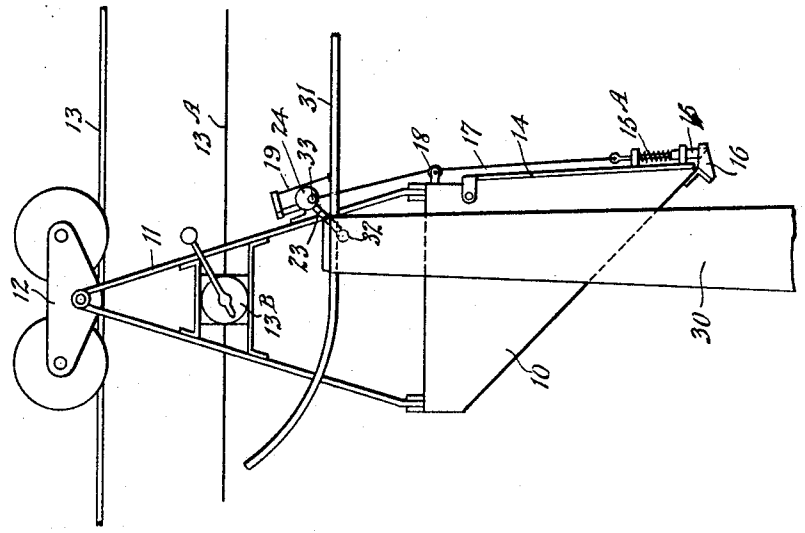
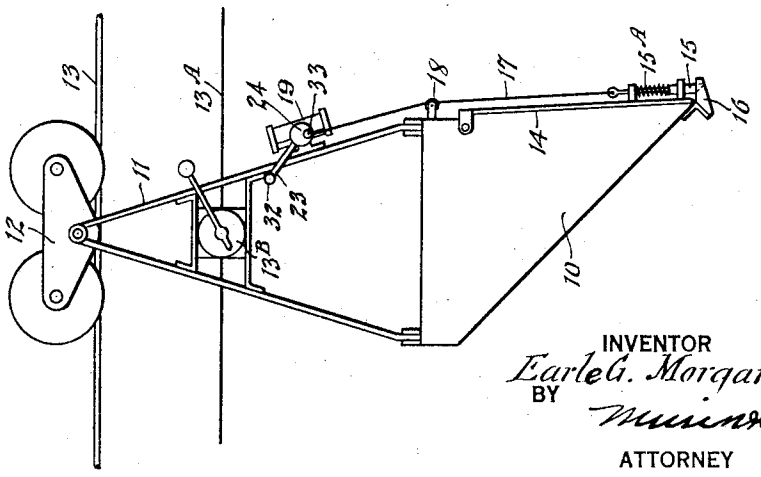


Fig. 1.



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Filed May 27, 1930 2 Sheets-Sheet 2

Fig. 6.

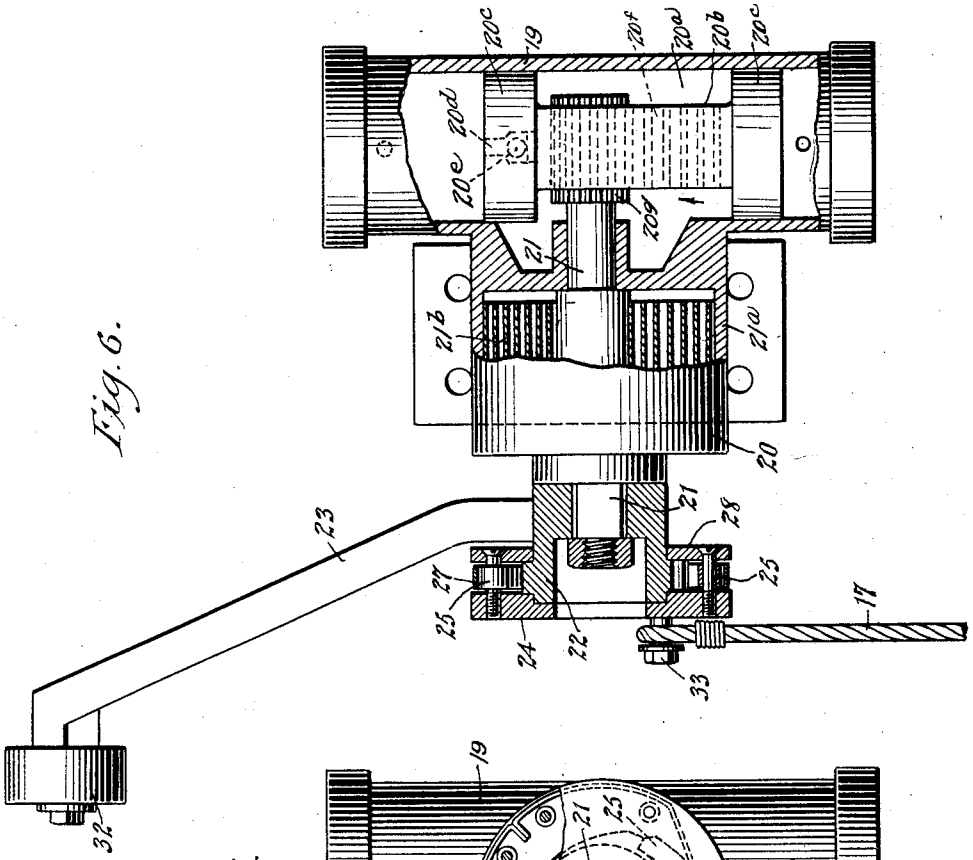


Fig. 5.

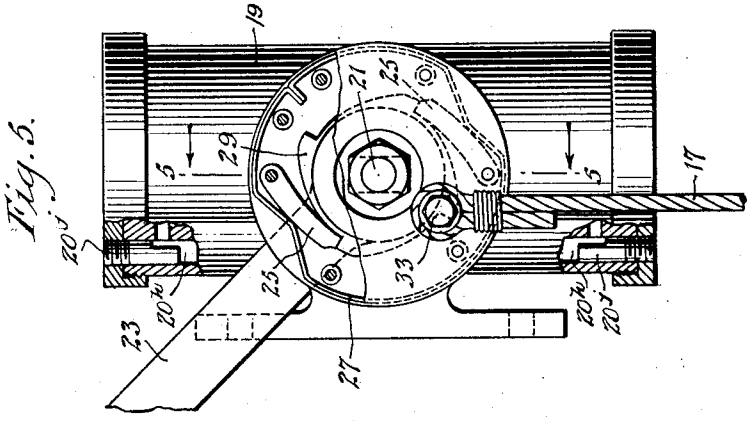
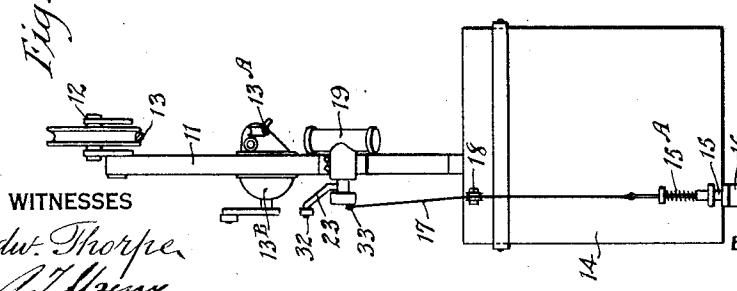


Fig. 4.



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UNITED STATES PATENT OFFICE

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CAR TRIPPER

Application filed May 27, 1930. Serial No. 456,092.

This invention relates to aerial tramways and more particularly to aerial tramway buckets, and aerial tramway systems for dumping along the line of travel of the buckets. The usual procedure in aerial tramways using continuous carriers for disposal purposes has been to employ a tripping device suspended from the track cables, these tripping devices being cumbersome, unwieldy and not readily movable.

The present invention has for one of its objects the provision of an improved tripping mechanism as part of the bucket structure for tripping the locking latches on such buckets automatically after the bucket or buckets have passed some predetermined point in their line of travel, thus dispensing with the use of the usual release devices heretofore employed.

Another object of the present invention 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 by a simple adjustment of the tripping mechanism on the bucket framework while the buckets are at any convenient position along the length of the tramway.

A further object of the present invention 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 which

Figure 1 is a side elevation showing one form of the present invention as applied to one type of tramway bucket with a door, the bucket being illustrated in position before it reaches a means for actuating the tripper;

Fig. 2 is a similar view showing the bucket at the point where an actuating means, in this case consisting of a shoe, is actuating the tripper;

Fig. 3 is a similar view showing the release of the latch of the bucket by the tripper mechanism;

Fig. 4 is a front elevation of the same bucket, being illustrated in position before reaching the actuating mechanism;

Fig. 5 is a detail side elevation of the spring fluid tripper mechanism, and

Fig. 6 is a plan view partly in section showing the tripper mechanism.

Referring more particularly to the drawings, the numeral 13 designates the aerial tramway track cable on which the bucket 10 is adapted to be propelled by a traction or haulage rope 13A, which rope is secured by a grip 13B to the bucket 10.

The bucket 10 comprises a wheeled carriage 12, a pair of bucket supporting hangers 11 being suspended from the wheeled carriage 12 and rigidly supporting a bucket body having an inclined bottom and a hinged front door 14 adapted to be swung outwardly by the weight of the load in the bucket when the load is discharged. The front door 14 is normally locked in closed position by a longitudinally movable spring urged keeper 15 mounted on the door for movement therewith. The keeper engages an apertured latch block 16 mounted on the lower edge of the bucket.

In order to provide means for releasing the latch 15, use is made of an actuating cable 17 which is connected at one end to said latch, and which cable is trained over a guide 18 mounted on the upper portion of the bucket 10. A device 19, such as a door closer or its equivalent, forms a part of the release means, and said device includes a substantially T-shaped casing 20 which defines a dashpot cylinder 20*a* within which a piston or plunger 20*b* is mounted for reciprocatory movement, the piston or plunger having spaced heads 20*c*, each of which is provided with a port 20*d* controlled by a check valve 20*e*, the said check valves functioning to open upon upward movement in the direction of the arrow in Figure 5 and to close upon downward or reverse movement. The plunger or piston 20*b* is provided with rack teeth 20*f* which mesh with the teeth of a pinion 20*g* on a rotary shaft 21 which extends through the boss 21*a* of the casing, said boss also housing a spiral spring 21*b* which is anchored at one extremity to the boss 21*a* of the housing or casing and anchored at its opposite extremity to the shaft 21, said spring 21*b* being so ar-

ranged that when the shaft turns in a direction to move the plunger or piston 20*b* upwardly in the direction of the arrow in Figure 5, the said spring is wound up and placed under tension. The casing 20 is formed with a by-pass 20*h* having a controlling valve 20*j* which is adjustable, and the casing is filled with an incompressible fluid which freely passes through the piston or plunger head ports 20*d* when the piston or plunger moves upwardly in the direction of the arrow in Figure 5. A ratchet sleeve 22 is secured to said shaft for turning movement therewith and a radial arm 23 is secured to the ratchet sleeve. The cable 17 is eccentrically secured at the point 33 to a dog plate 24 upon which pivoted dogs 25 are mounted. The dogs 25 are normally urged inwardly toward the ratchet of the sleeve 22 by an encircling spring 27. The dog plate assembly further includes an inner securing plate 28, the dogs being mounted between the inner plate and the outer plate 24. The sleeve 22 is formed with ratchet teeth 29 disposed between the plates 28 and 24, the plates being retained on the sleeve 22 by virtue of their engagement with the opposite sides of the extending ratchet teeth. The eccentric point of connection 33 of the cable 17 with the dog plate 24 is normally disposed at bottom dead center when the latch 15 is projected by its spring to active latching position.

In the operation of the device, the bucket loaded and with the door latched, is moved over the cable 13 until it reaches the actuating mechanism indicated in Fig. 2 by the numeral 31. This actuating mechanism consists of a shoe 31 supported either by a member 30 which supports the tramway track cable 13 or an independent stationary support. The arm 23 of the latch controlling mechanism includes an inwardly turned end or a roller 32 which is engageable with the shoe 31 whereby movement, as in the right direction in Fig. 2, will move downwardly the arm 23 thus turning it with the sleeve 22 and shaft 21 in counter-clockwise direction without turning the dog plate 24 which is held against movement by the cable 17, while the ratchet teeth 29 freely ratchet past the dogs 25. The counter-clockwise turning of the shaft 21 as viewed in Figure 4 places said shaft under the tension of the spring 21*b* and when the roller 32 of the arm 23 passes from under the shoe 31, the spring 21*b* exerts a force on the shaft to turn the same in a clockwise direction. This turning movement under the tension of the spring is retarded by the dashpot plunger or piston 20*b*, due to the fact that the return or downward movement of the plunger or piston 20*b*, as shown in Figure 4, effects the closing of the check valves 20*e* and the fluid in the dashpot can only circulate at a predetermined speed through the by-pass 20*h* as regulated by the adjustable by-pass valves 20*j*. It will thus be seen that the speed of the return movement may be regulated by the adjustable by-pass valve. During the return clockwise movement of the sleeves 22, the dogs 25 will be engaged by the ratchet teeth 29, thereby turning the dog plate 24 in a clockwise direction to exert an upward pull on the cable 17 for effecting the release of the latch mechanism immediately prior to the point of connection 33 reaching the upward limit of its movement. When the latch 15 is released, the weight of the load within the bucket 10 will force the door 14 outwardly to an open position so that the material will be gravitationally discharged, as indicated by the arrows in Figure 3. After the release of the latch, the shaft 21 will continue its clockwise movement until the point of connection 33 passes slightly beyond upper dead center, whereupon the latch 15A will exert a downward pull on the cable 17, causing the dog plate 24 to be returned to its normal position with the point of connection 33 at its lower dead center position while permitting the return slam of the door 14 to re-engage the latch 15 in the latch block 16, thereby locking the door in closed position in readiness for subsequent reloading.

By the present construction it will be seen that the time consumed by the retarded clockwise movement of the sleeve to a position to release the latch may be easily adjusted by setting the venting valve of the dash pot or by controlling the tension of the spring fluid assembly; thus the arrangement provides for the actuation of the tripper mechanism at varying distances beyond the shoe 31 to the discharge of material from the bucket 10 at any desired point. The utility of such an arrangement will be obviously seen when it is considered that in most instances it is desired to discharge the material from several buckets continuously following each other at predetermined points in a span between structures supporting the track cable which ordinarily can only be accomplished by positioning of a trip mechanism approximately at the point of dumping. By the present invention the tripping mechanism actuating shoe may be mounted directly on any supporting structure, while variation in the point of discharge may be made by an adjustment of the venting valve of each bucket device.

It will be understood that the present invention is not specifically confined to the tramway system and type of tramway bucket details herein presented, but that numerous changes, modifications, and the full use of equivalents may be resorted to without departing from the spirit or scope of the present invention as outlined in the appended claims.

I claim:

1. In a tramway car, the combination with a door and latch member therefor, of means

for operating said latch member comprising a delay mechanism, said mechanism including an actuating arm, an actuating disk and interconnecting means between said arm and disk for rotating said disk in response to rotation of said arm after a predetermined lapse of time after movement of said arm, said interconnecting means including a spring fluid check mechanism, a ratcheted sleeve slowly rotatable in opposite direction to the actuated rotation of said arm, and dogs carried by said disk for engagement with the ratchets of said sleeve for rotating said disk upon slow rotation of said sleeve.

2. In a tramway car, the combination with a door and latch member therefor, of means for operating said latch member comprising a delay mechanism, said mechanism including an actuating arm, an actuating disk and interconnecting means between said arm and disk for rotating said disk in response to rotation of said arm after a predetermined lapse of time after movement of said arm, said interconnecting means including a spring fluid check mechanism, a ratcheted sleeve slowly rotatable in opposite direction to the actuated rotation of said arm, and dogs carried by said disk for engagement with the ratchets of said sleeve for rotating said disk upon slow rotation of said sleeve, said dogs being arranged to permit fast rotation of said sleeve in one direction with respect to said disk.

3. An aerial tramway system including a bucket having a door, a latch for locking said door in closed relation, supporting and propelling cables for said bucket, an actuating mechanism and a support for the same, a latch tripper mechanism carried by said bucket for releasing said latch at a predetermined distance past the actuating mechanism, said tripper mechanism including an arm movable by passage of said bucket past said actuating mechanism, and a cable actuated by said arm for releasing said latch, and dash pot means for controlling movement of said cable after movement of said arm, a disk operatively connected with the dashpot means and movable in one direction by movement of said arm and movable with respect to said arm in the opposite direction.

4. An aerial tramway system including a bucket having a door, a latch for locking said door in closed relation, supporting and propelling cables for said bucket, an actuating mechanism and a support for the same, a latch tripper mechanism carried by said bucket for releasing said latch at a predetermined distance past the actuating mechanism, said tripper mechanism including an arm movable by passage of said bucket past said actuating mechanism, and a cable actuated by said arm for releasing said latch, and dash pot means for controlling the movement of said cable after movement of said arm, a disk operatively connected with the dash pot means and movable in one direction by movement of said arm and movable with respect to said arm in the opposite direction, said arm being associated for movement with a ratcheted sleeve, said ratcheted sleeve and arm being restrained against movement in one direction by said dash pot means.

5. An aerial tramway bucket latch tripper including a casing, a spring and dash pot assembly within said casing, an externally ratcheted sleeve associated with said spring and dash pot assembly, an actuating arm carried by said sleeve and movable by a stationary tripper member, a plate bearing dogs engageable with the ratchets of said sleeve for rotating said plate with said sleeve in one direction and a latch actuating cable eccentrically mounted on said plate for releasing the latch upon rotation of said plate with said sleeve, the direction of rotation of said sleeve for actuating said plate being restrained by said spring and dash pot assembly.

6. In a tramway car having normally locked latch means releasable to discharge the contents of the car; a mechanism for releasing said latch means including a trip located at a fixed point alongside the tramway, a member carried by the car operable when moved in one direction to release the latch means, a device carried by the car having an arm adapted to be engaged and moved in one direction by the trip as the car passes the same and means rendered effective by the return movement of the arm to couple and move the member in a direction to release the latch.

7. In a tramway car having normally locked latch means releasable to discharge the contents of the car; a mechanism for releasing said latch means including a trip located at a fixed point alongside the tramway, a member carried by the car operable when moved in one direction to release the latch means, a device carried by the car having an arm adapted to be engaged and moved in one direction by the trip as the car passes the same and means rendered effective by the return movement of the arm to couple and move the member in a direction to release the latch, said device including means adjustable to vary the speed of the return movement of the arm whereby to regulate the point of discharge of the car contents relative to said trip.

8. In a tramway car having normally locked latch means releasable to discharge the contents of the car; a mechanism for releasing said latch means including a trip located at a fixed point alongside the tramway, a rotary member carried by the car operable when turned in one direction to release the latch means, a device carried by the car having a swingable arm adapted to be engaged and swung in one direction by the trip as the car passes the same and means

rendered effective by the return swing of the arm to couple and turn said member in a direction to release the latch.

9. In a tramway car having normally locked latch means releasable to discharge the contents of the car; a mechanism for releasing said latch means including a trip located at a fixed point alongside the tramway, a rotary member carried by the car operable when turned in one direction to release the latch means, a device carried by the car having a swingable arm adapted to be engaged and swung in one direction by the trip as the car passes the same and means rendered effective by the return swing of the arm to couple and turn said member in a direction to release the latch, said device including means adjustable to vary the speed of the return movement of the arm whereby to regulate the point of discharge of the car contents relative to the trip.

10. In a tramway car having normally locked latch means releasable to discharge the contents of the car; mechanism for releasing said latch means including a trip located at a fixed point alongside said tramway, a device carried by the car having an arm adapted to be engaged by and moved in one direction by said trip as the car passes the same, said device including means for placing the arm under tension when so moved by the trip and means adjustable for varying the speed of the return movement of the arm, a member operatively connected with the latch means and operable when moved in one direction to release the same and means rendered effective by the return movement of the arm to couple said member therewith for movement of the same in a direction to effect the release of the latch means.

11. In a tramway car having normally locked latch means releasable to discharge the contents of the car; mechanism for releasing said latch means including a device on the car having a swingable actuating arm, a trip located at a fixed point along the tramway and adapted to engage with and deflect the actuator arm, a member operable when moved in one direction to release the latch and means rendered effective by the return movement of the actuator arm after leaving the trip, for coupling said member therewith.

12. The combination with an aerial tramway car having normally locked latch means releasable to discharge the contents of the car; mechanism for releasing said latch means including a device carried by said car having a rotatory shaft provided with a radial arm which is placed under tension when moved in one direction and means for retarding the movement of the shaft and arm in the opposite direction, a member connected with the latch for moving the same to released position, interengageable coupling means on the arm and said member for moving said member with the arm when the arm is moved in said opposite direction and a stationary trip element disposed alongside the tramway to engage the arm as the car passes the trip whereby to move said arm in said first mentioned direction for placing the same under tension.

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