

April 7, 1925.

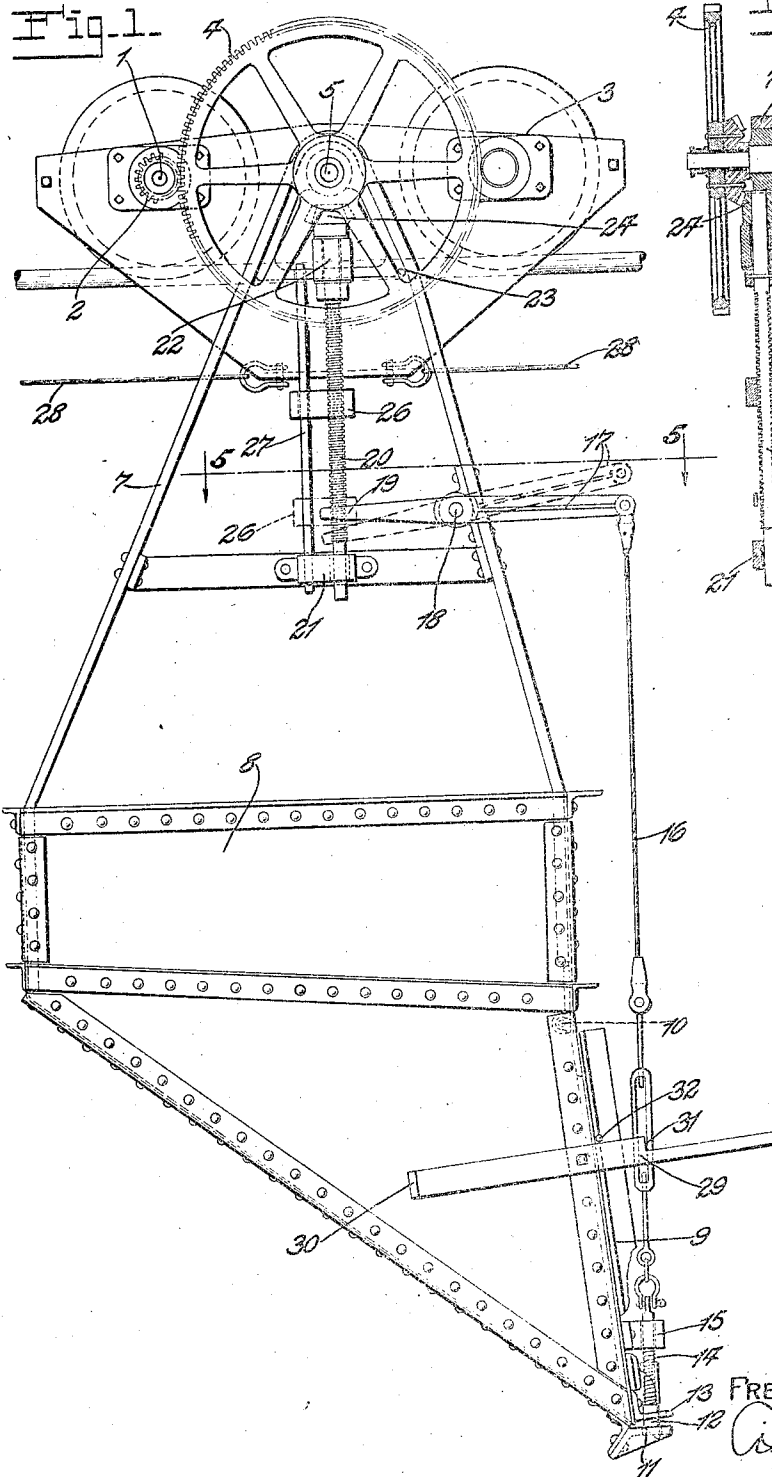
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F. W. GRICE

AUTOMATIC RELEASE FOR TRAMWAY BUCKETS

Filed Feb. 8, 1924

3 Sheets-Sheet 1



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AUTOMATIC RELEASE FOR TRAMWAY BUCKETS

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3 Sheets-Sheet 2

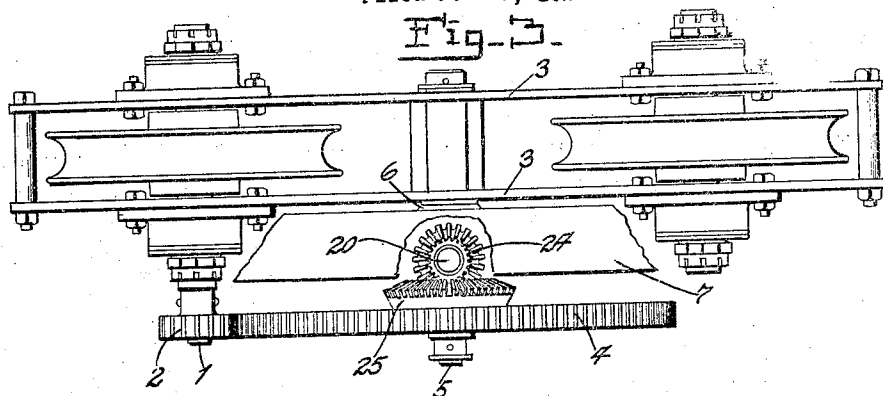


Fig. 4.

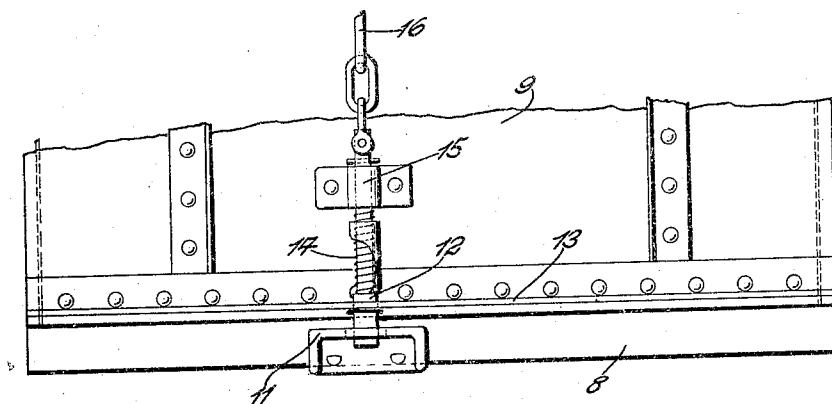
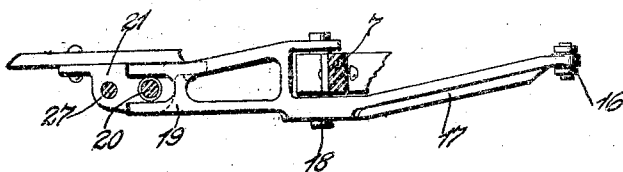


Fig. 5.



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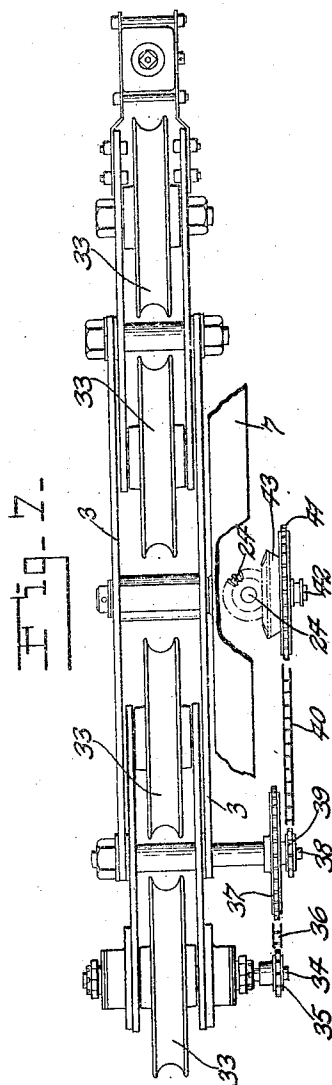
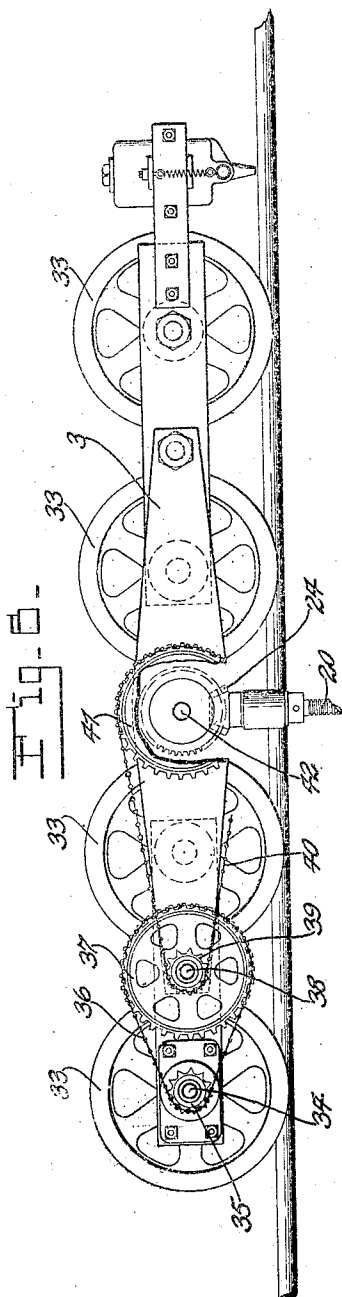
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AUTOMATIC RELEASE FOR TRAMWAY BUCKETS

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE.

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AUTOMATIC RELEASE FOR TRAMWAY BUCKETS.

Application filed February 8, 1924. Serial No. 691,512.

To all whom it may concern:

Be it known that I, FREDERICK W. GRICE, a citizen of the United States, residing at St. Louis, Missouri, have invented a new and useful Automatic Release for Tramway Buckets, of which the following is a specification.

This invention is an automatic release for tramway buckets.

An object of the invention is to provide an improved mechanism for releasing the discharge door of a tramway bucket to permit the material to be discharged from the bucket, and automatic means for operating said mechanism during the travel of the bucket to the place of discharge, thus dispensing with the use of the usual release devices heretofore employed.

Another object of the invention is to provide mechanism, supported by the trolley beam or carriage from which the bucket is suspended, operated for releasing the discharge door of the bucket at any selected distance from the starting point.

Another object of the invention is to provide mechanism adjustable and operable to release the discharge door of the bucket after the bucket has traveled in any predetermined distance from its starting or loading point.

Other objects will appear from the following description, reference being made to the drawings in which—

Fig. 1 is a side elevation of the invention mounted in connection with a tramway bucket and the carriage therefor.

Fig. 2 is a sectional view showing a part of the gearing for operating the discharge door release device.

Fig. 3 is a plan view of a part of the invention shown in Fig. 1.

Fig. 4 is a view showing the door latch that is released by the present invention.

Fig. 5 is a sectional view on the line 5—5 of Fig. 1.

Fig. 6 is a side elevation of an alternative form of the invention.

Fig. 7 is a plan view of the alternative form shown in Fig. 6.

In the invention shown in Figs. 1 to 5 inclusive the axle member 1 of one of the carriage sheave wheels has a pinion 2 attached thereto outside of the carriage frame 3. The pinion 2 meshes with a large gear

wheel 4 rotative upon a support 5 about midway between the ends of the carriage. The support 5 on which the wheel 4 is mounted also supports a block 6 over which the bucket hanger 7 passes. The bucket 8 supported by the hanger 7 is provided with a door 9 hinged at 10 and provided with a latching device which holds the door closed during loading and during movement of the bucket to the place of discharge.

In the embodiment shown the latching device for the door 9 comprises a bracket 11, a latch bolt 12 supported by the door 9 and movable into and out of latching engagement with the bracket 11, and connections for operating the latch bolt. The lower edge of the door 9 is provided with a transverse angle iron reinforcing member 13 through which the latch bolt 12 operates. A coiled spring 14 of the expansion type encircles the latch bolt 12 and (as shown Fig. 4) actuates the latch bolt into latching engagement with the bracket 11, one end of said spring bearing against a shoulder on the latch bolt and the other end of said spring bearing against a bracket 15 in connection with the door 9.

A flexible connection 16 from the latch bolt 12 to one end of a lever 17 operatively supported on a pivot 18 provides means for releasing the latch bolt at the proper time to discharge the load from the bucket. The lever 17 has a bifurcated portion 19 embracing a threaded shaft 20. The lower end of the shaft 20 is mounted in a bearing 21 supported by the hangers 7, while the upper end of said shaft is mounted in a bearing 22 supported from the block 6 and operatively connected with the hangers 7 by arms 23. Thus the shaft 20 is maintained in permanent relationship with the bucket irrespective of the oscillation of the bucket.

The upper end of the shaft 20 has a pinion 24 (Figs. 2 and 3) attached thereto and meshing with a pinion 25 attached to the gear wheel 4. A block 26 is screwed upon the shaft 20 and has a hole through which a rod 27 extends, such connection preventing the block 26 from turning when the shaft 20 rotates during travel of the bucket to and from loading position.

The connections 28 may be utilized to move the bucket from and to loading positions.

From the foregoing it will be seen that as the bucket moves from loading position to discharge position the shaft 20 will be rotated, causing the block 26 to be moved downwardly until the lever 17 is operated to release the latch 12. The block 26 may be positioned upon the shaft 20 so that it will operate the lever 17 at the proper time to release the door latch to discharge the material from the bucket at any desired distances from loading position. The block 26 may be adjusted upon the shaft 20 by turning the gear wheel 4 to rotate the shaft 20 and at the same time holding the device as a whole from movement along the supporting rope or cable until the block 26 has been moved to proper position. To hold the door 9 open until all of the material has been discharged from the bucket an appropriate holding device may be utilized. One such holding device is shown in Fig. 1, comprises a lever 29 pivoted to the bucket and having a weighted end 30 which will raise the outer end of said lever 29 to bring a shoulder 31 on the lever to position for engagement with a projection 32 on the door 9. Obviously this will prevent the door from closing, with the result that all of the material will be discharged from the bucket.

In the embodiment of the invention shown in Figs. 6 and 7 the carriage 3 includes four wheels 33, the axle 34 of one of which has a sprocket wheel 35 thereon. A chain 36 engages the sprocket wheel 35 and a sprocket wheel 37 on a supporting shaft 38. A sprocket wheel 39 on the shaft 38 is engaged by a sprocket chain 40 which also engages a sprocket wheel 41 on a supporting shaft 42. A pinion 43 in connection with the sprocket wheel 41 meshes with the pinion wheel 24 on the shaft 20, with the result that the operative devices for releasing the latch 12 will be operated the same as described in connection with the description of the mechanism shown in Figs. 1 to 5 inclusive. This is one of the many variations of the invention which may be made without departure from the nature and principle thereof and in suggesting this single variation I do not in any way disclaim any variations of the invention within the scope of the appended claims.

What I claim and desire to secure by Letters Patent is:—

1. The combination with a tramway bucket, a discharge door for the tramway bucket, and a carriage for the tramway bucket, of mechanism supported by the carriage and operated constantly during and as an incident to the travel of the carriage for unlatching the tramway bucket.

2. The combination with a tramway bucket, a discharge door for the tramway bucket, and a carriage for the tramway bucket, and

a latch for holding the discharge door closed, of mechanism supported by the carriage and operated constantly during and as an incident to the travel of the carriage for releasing said latch to permit said door to open to discharge material from the bucket.

3. The combination with a tramway bucket, a discharge door for the tramway bucket, and a carriage for the tramway bucket, and a latch for holding the discharge door closed, of a shaft supported by the carriage, mechanism for rotating said shaft during and as an incident to the travel of the carriage from loading position, and a device operated by said shaft for releasing said latch to permit the load of the tramway bucket to discharge.

4. The combination with a tramway bucket, a discharge door for the tramway bucket, and a carriage for the tramway bucket, and a latch for holding the discharge door closed, of a shaft supported by said carriage, mechanism for rotating said shaft in one direction as an incident to travel of the carriage from loading position and for rotating said shaft in the opposite direction as an incident to travel of the carriage to loading position, and a device operated by said shaft for releasing said latch at discharge position of the bucket.

5. The combination with a tramway bucket, a discharge door for the tramway bucket, a carriage for the tramway bucket, and a latch for holding the discharge door closed, of gearing supported by the carriage, and a device operated by said gearing for releasing said latch.

6. The combination with a tramway bucket, a discharge door for the tramway bucket, a carriage for the tramway bucket, and a latch for holding the discharge door closed, of gearing supported by said carriage, and a device operated by said gearing for releasing said latch after said carriage has traveled a predetermined distance from the loading point.

7. The combination with a tramway bucket, a discharge door for the tramway bucket, a carriage for the tramway bucket, and a latch for holding the discharge door closed, of a shaft supported by the carriage, mechanism for rotating said shaft as an incident to travel of the carriage from and to loading position, and connections operated by said shaft for releasing said latch.

8. The combination with a tramway bucket, a discharge door for the tramway bucket, a carriage for the tramway bucket, and a latch for holding the discharge door closed, of a shaft supported by the carriage, mechanism for rotating said shaft as an incident to travel of the carriage from and to loading position, and connections operated by said shaft for releasing said latch after the tramway bucket has traveled a prede-

terminated distance to a discharge position from the loading position.

9. The combination with a tramway bucket, a discharge door for the tramway bucket, a carriage from which the tramway bucket is suspended, and a latch for holding the discharge door closed, of gearing supported by the carriage, means for operating said gearing as an incident to movement of the carriage, a threaded shaft supported by the carriage, means for rotating said shaft by said gearing, a block screwed on said shaft, and means operated by said block for releasing said latch.

10. The combination with a tramway bucket, a discharge door for the tramway bucket, a latch for holding the discharge door closed, a carriage for the tramway bucket, and wheels for supporting said carriage, of gearing operated by one of said wheels, and mechanism operated by said gearing for releasing said latch.

11. The combination with a tramway bucket, a discharge door for the tramway bucket, a latch for holding the discharge door closed, a carriage for the tramway bucket, and wheels for supporting said carriage, of gearing operated by one of said wheels, mechanism operated by said gearing for releasing said latch, a lever for releasing said latch, and a device operated by said gearing for operating said lever.

12. The combination with a tramway bucket, a discharge door for the tramway bucket, a latch for holding the discharge door closed, gearing in said carriage, and means for operating said gearing as an incident to movement of the carriage, of connections for releasing said latch, and an actuator operated by said gearing for operating said connections to release said latch.

13. The combination with a tramway bucket, a discharge door for the tramway bucket, a latch for holding the discharge door closed, and a carriage supporting the tramway bucket, of connections for releasing said latch, and mechanism supported by the carriage and operating as an incident to movement of the carriage for operating said connections.

14. The combination with a tramway bucket, a discharge door for the tramway bucket, a latch for holding the discharge door closed, and a carriage supporting the tramway bucket, of connections for releasing said latch, mechanism supported by the carriage and operating as an incident to movement of the carriage for operating said connections, permitting the door to be opened by the pressure of the material in

the bucket, and means for holding the door open.

15. The combination with a tramway bucket, a discharge door for the tramway bucket, a latch for holding the discharge door closed, a carriage frame for the tramway bucket, wheels supporting the carriage frame, gearing supported by the carriage frame, of means for operating said gearing by one of said wheels as an incident to movement of the carriage frame, an actuator operated by said gearing, and connections operated by said actuator for releasing said latch.

16. The combination with a tramway bucket, a discharge door for the tramway bucket, a latch for holding the discharge door closed, a carriage frame for the tramway bucket, wheels supporting the carriage frame, gearing supported by the carriage frame, of means for operating said gearing by one of said wheels as an incident to movement of the carriage frame, an actuator operated by said gearing, connections operated by said actuator for releasing said latch permitting the door to be opened by pressure of material in the bucket, and means for holding the door open.

17. The combination with a tramway bucket, a carriage for supporting the tramway bucket, a discharge door for the tramway bucket, and a latch for holding the discharge door closed, of an actuator supported by the carriage, mechanism supported by the carriage for moving said actuator from a starting position during movement of the carriage from loading position and for moving said actuator to starting position as an incident to return movement of said carriage to loading position, and connections operated by said actuator for releasing said latch.

18. The combination with a tramway bucket, a carriage for supporting the tramway bucket, a discharge door for the tramway bucket, and a latch for holding the discharge door closed, of an actuator supported by the carriage, mechanism supported by the carriage for moving said actuator from a starting position during movement of the carriage from loading position and for moving said actuator to starting position as an incident to return movement of said carriage to loading position, and connections operated by said actuator for releasing said latch during final movement of said actuator from starting position and about the time the bucket arrives at the place of discharge.

FREDERICK W. GRICE.