F. C. GREENE.

END GATE FOR MINE CARS.

APPLICATION FILED JUNE 19, 1907.

916,401.

Patented Mar. 23, 1909.

2 SHEETS—SHEET 1.

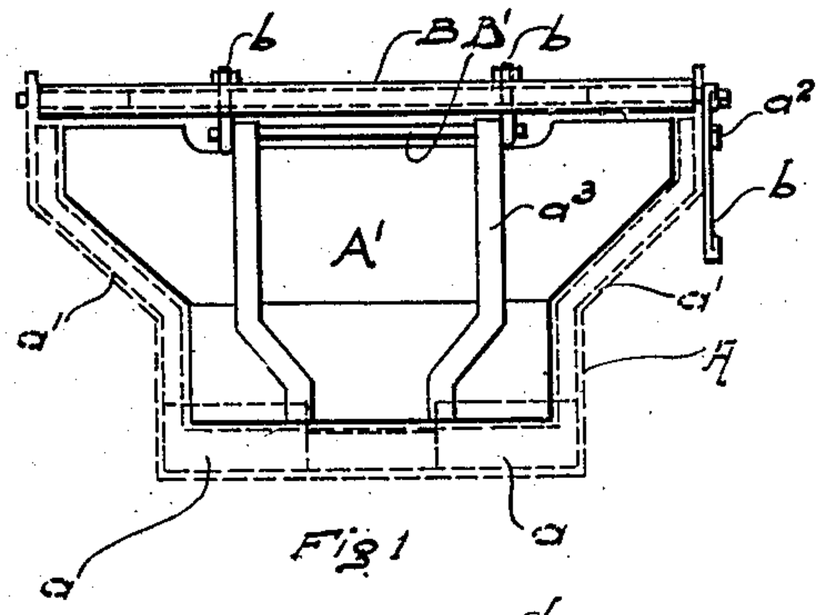

Fig 1

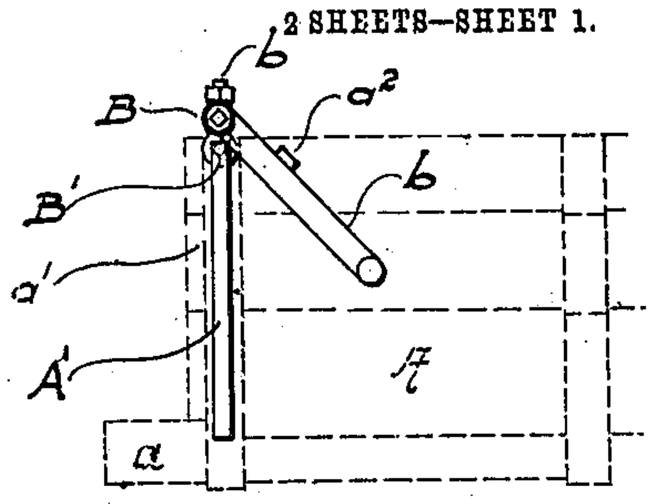

Fig 2

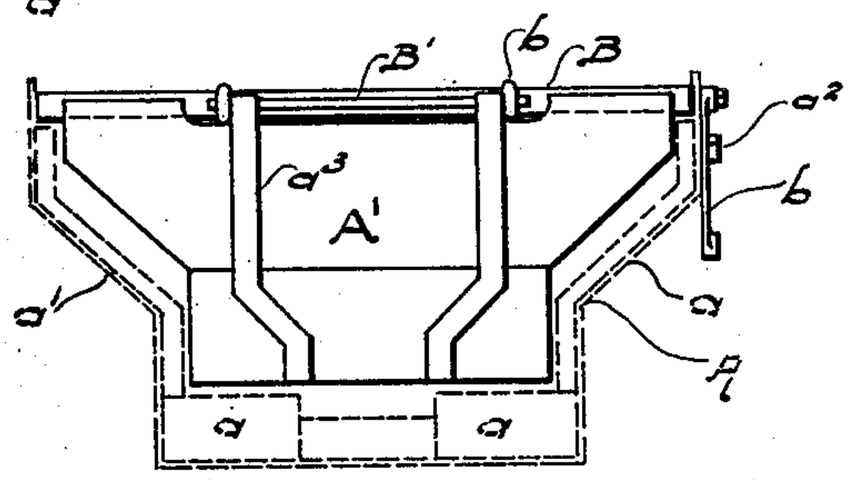

Fig 3

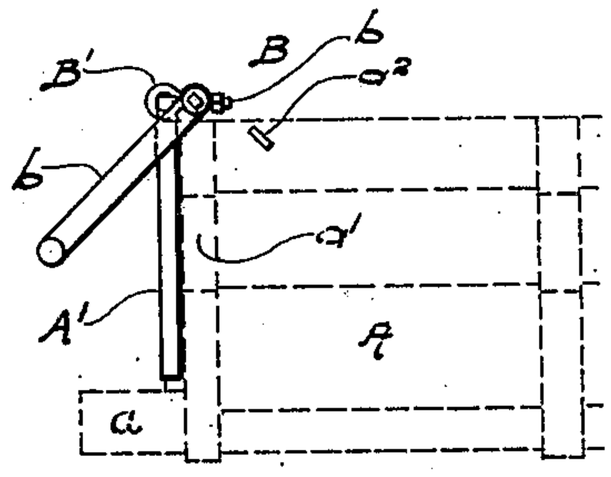

Fig 4

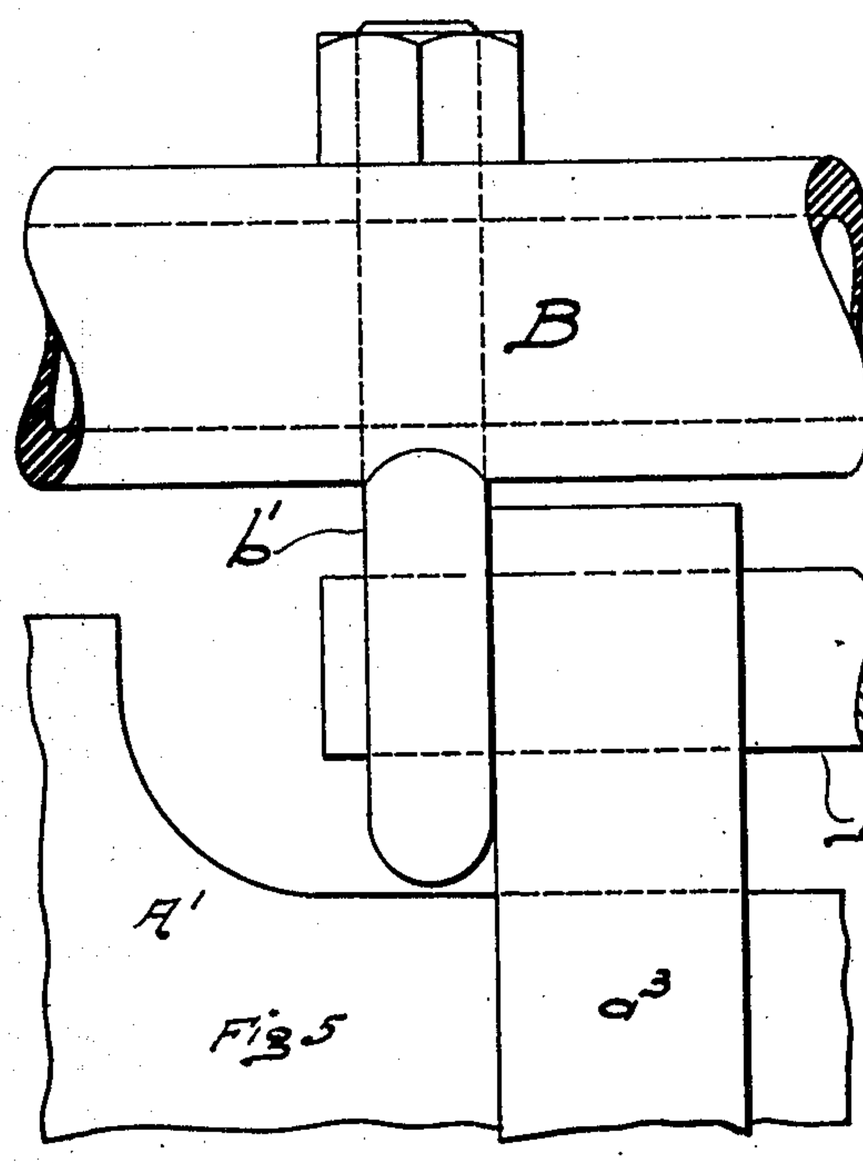

Fig 5

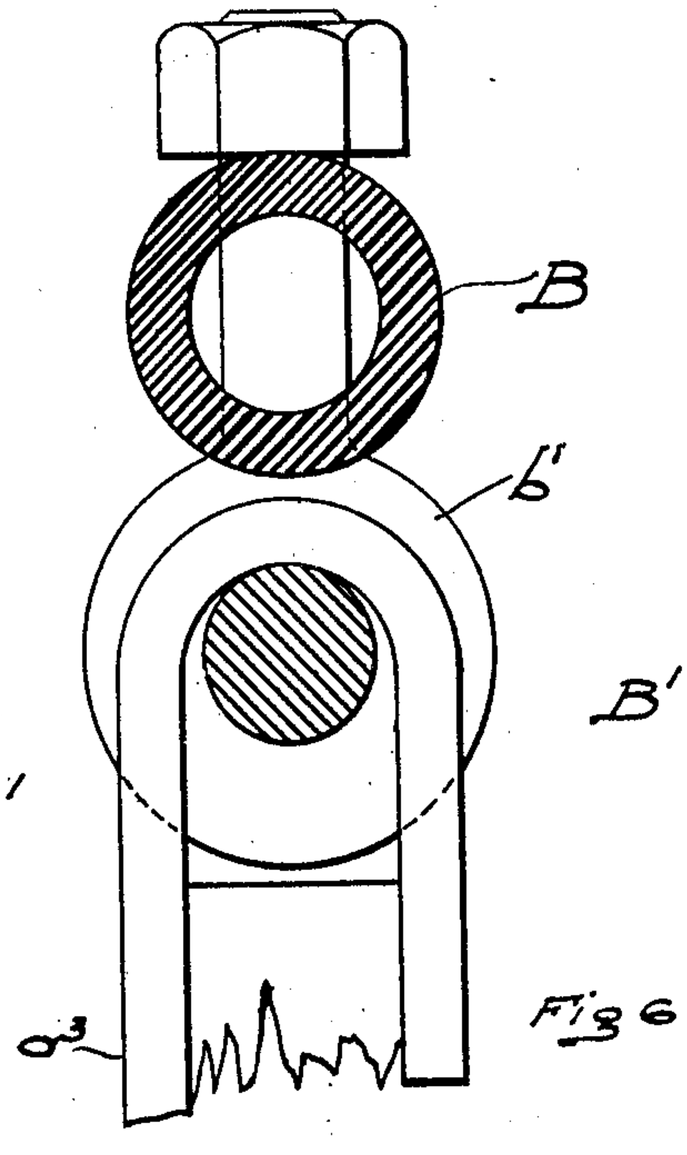

Fig 6

WITNESSES.

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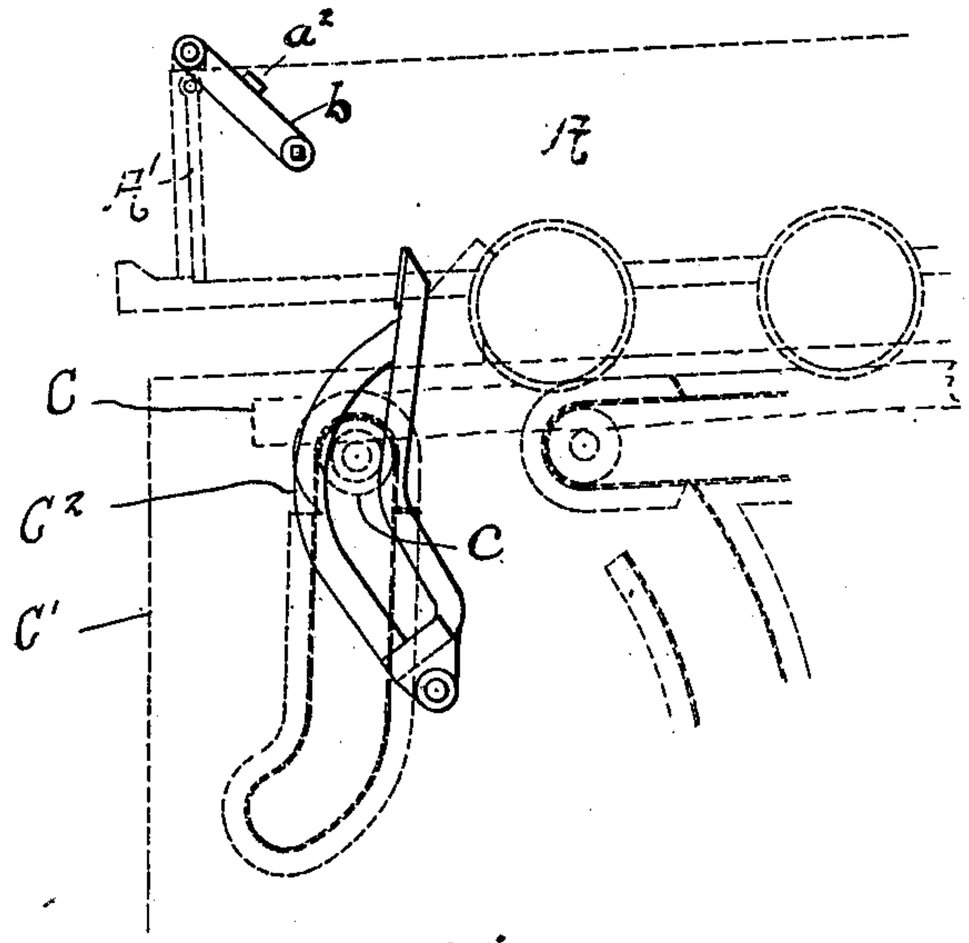

Fig 7

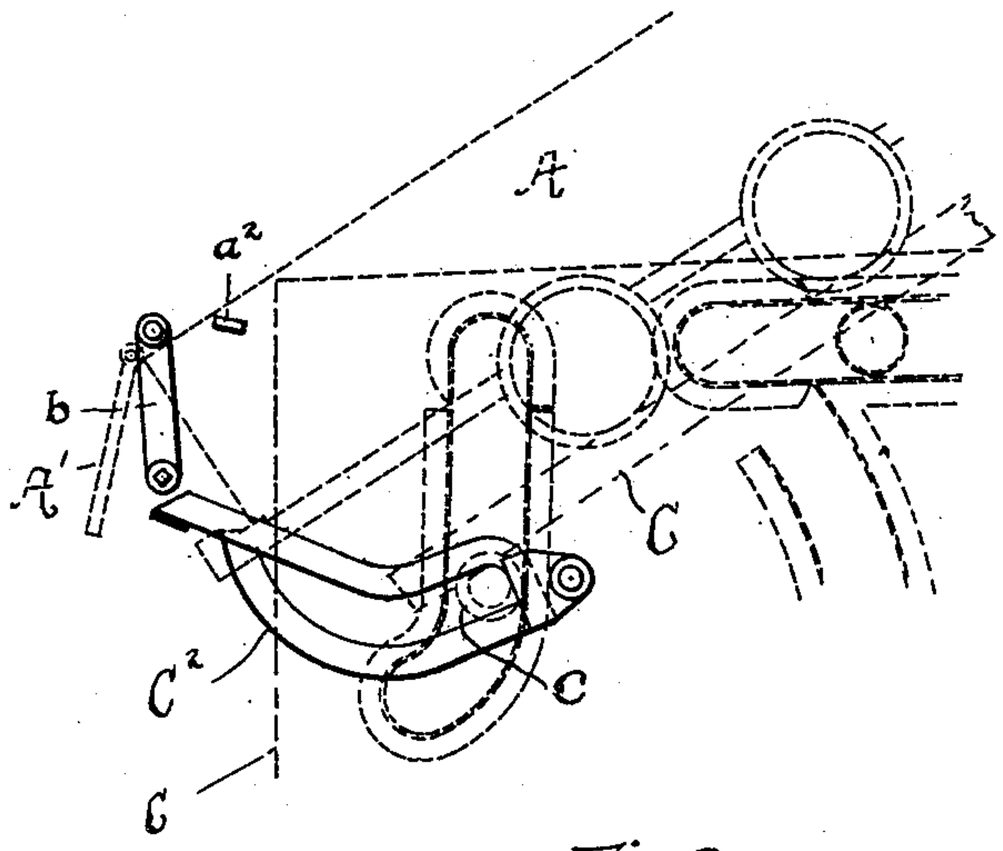

Fig 8

WITNESSES:

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UNITED STATES PATENT OFFICE.

FRANK C. GREENE, OF CLEVELAND, OHIO.

END-GATE FOR MINE-CARS.

No. 916,401. Specification of Letters Patent. Patented March 23, 1909.

Original application filed August 15, 1906, Serial No. 330,652. Divided and this application filed June 19, 1907. Serial No. 379,692.

To all whom it may concern:

Be it known that I, FRANK C. GREENE, a citizen of the United States, resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in End-Gates for Mine-Cars, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention relates to dump-cars, such for example as are used in connection with mining operations, and has regard more particularly to the provision of an improved end-gate for use on cars of this class, this case being divided out of my co-pending application filed August 15, 1906, Serial No. 330,652. By the invention it is sought to render the doors of such cars of simple construction, and yet adapt them to be operated either manually or else automatically in connection with a variety of dumping mechanisms.

To the accomplishment of these and related ends said invention consists of means hereinafter fully described and particularly set forth in the claims.

The annexed drawings and the following description set forth in detail certain means embodying the invention, such disclosed means constituting but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings: Figures 1 and 2 are respectively a front and side elevation of a mining car in which has been incorporated my improved type of end-gate; Figs. 3 and 4 are respectively a front and side elevation of the same, but showing the door in a different operative position from that shown in the first two figures; Fig. 5 is a front elevation of a detail of the hinge whereby the end-gate is hung from the car-body; Fig. 6 is a side elevation and partial cross-section of such detail; while Figs. 7 and 8 are side elevations of one type of car dumping mechanism together with a device designed to operate in conjunction therewith to automatically raise the end-gate shown in the preceding figures, such device being shown in two different stages of its operation in the respective figures named.

The car illustrated in the figures of the drawings just described is intended to be merely typical; being of the form commonly employed in coal mines in this country. The body A thereof, shown in dotted outline, accordingly appears with the flaring sides and other features of construction characterizing the cars in question. The end-gate or door A′ of the car is designed in its closed position to fit snugly between the sides of such car-body A and to rest with its lower edge behind blocks or keeps *a* projecting a short distance above the level of the floor of the car. Mounted so as to lie directly above the door in its normal closed position is a rock shaft B, preferably consisting for the sake of lightness of a section of pipe. The ends of this shaft are suitably journaled in bearings provided in the upper ends of the metal frame member or support *a′* of the car side and on one such end is rigidly mounted a lever arm *b* by means of which such shaft may be oscillated when desired. Such oscillation is limited in a rearward direction by means of a stop a^2 affixed to the side of the car-body A.

From rock shaft B, end-gate A′ is eccentrically hung by means clearly shown in Figs. 5 and 6. These comprise two eye-bolts *b′* mounted in said shaft near each end of the same that are so disposed as to project directly down when arm *b* rests against stop a^2, Figs. 1 and 2. Securely held in the eyes of such bolts *b′* is a smaller shaft or rod B′ that serves as a pintle for the U-shaped strap irons a^3 forming the frame or binding members of the end-gate A′. A hinge joint is thus in effect formed whereby the door is eccentrically hung, as first stated, from rock shaft B.

Upon swinging arm *b* forward through an angle of approximately forty-five degrees, Figs. 3 and 4, it will be obvious, in view of the foregoing construction, that the door will be raised an amount corresponding with the throw of eye-bolts *b′*. This is designed to be sufficient to allow the lower edge of the door to readily clear keeps or blocks *a*. In other words in this position of the parts the door is left free to swing outwardly, and if the car be now tilted, as in the operation of dumping, its contents will be forthwith discharged. Such actuation of arm *b* may be effected manually; or it may be effected automatically as an incident to the tilting of the car in dumping where a track end dump is employed or to its entrance upon a particular

section of track where the dump is of the cross-over type. As illustrative of one such method of automatic actuation I have shown in more or less diagrammatic fashion, Figs. 7 and 8 mechanism designed to operate in conjunction with one approved type of track end dump to thus release the end-gate of a car positioned on said dump. In such figures, C represents the tilting track section whereon the loaded car is received and retained pending the dumping operation. Of such two figures, the first shows the track section in its normal or receptive position, while the second shows the same in its final or full dump position. Pivotally mounted in the frame C′, whereby this track section is supported, and on the side of such frame corresponding to the lever-bearing side of successive cars when the latter are properly positioned thereon, is an arm C^2, that when oscillated, is adapted to engage and actuate the lever arm *b* of a car on track section C. This arm is connected directly or otherwise with the tilting track-section so as to be operated simultaneously with the same. Such operative connection is easily made by forming the arm of two portions so as to provide a cam way within which a roller *c* or the like, mounted upon the tilting track-section, is adapted to travel. By properly disposing the pivotal axis of the arm C^2 with respect to that of the tilting track-section, as also by varying the contour of the cam way, such throw may be imparted to the arm as will be required to effect the release of the end-gate at the proper moment. Thus the arm, which in the normal position of the dump lies entirely out of the way of a car as the latter comes onto track-section C, will overtake the same and throw the gate actuating arm *b* forwardly and so permit the car to dump, Fig. 8. When the track section C is returned to its normal position the arm C^2 is likewise raised and the operation just described may thereupon be repeated with the succeeding car.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed provided the means stated by any one of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:

1. In a car or the like, the combination with a rock shaft, of an end-gate for said car, said gate being connected with said shaft so as to be raised upon oscillation thereof.

2. In a car or the like, the combination of a rock-shaft, an end-gate hung therefrom so as to be raised upon oscillation of said shaft, and means adapted to secure said gate when in its lower position.

3. In a car or the like, the combination with oscillatory supporting means, of an end-gate eccentrically secured to said means so as to be raised upon oscillation thereof.

4. In a car or the like, the combination with a rock-shaft, of an end-gate eccentrically pivoted thereto.

5. In a car or the like, the combination of a transversely disposed rock-shaft, an end-gate eccentrically pivoted thereto, a keep adapted to engage the lower end of said gate, and means adapted to rock said shaft to raise said gate out of engagement with said keep.

6. In a car or the like, the combination of a transversely disposed rock-shaft, arms projecting therefrom, an end-gate pivotally hung from said arms, a keep adapted to engage the lower end of said gate, and a lever-arm mounted upon said shaft and adapted when swung, to rock the same to raise said gate out of engagement with said keep.

7. In a car or the like, the combination of a transversely disposed rock-shaft, eye-bolts mounted therein, a rod secured in the eyes of said bolts, an end-gate, strap irons attached to said gate and passing around said rod, whereby said gate is pivotally hung therefrom, a keep adapted to engage the lower end of said gate, and a lever-arm mounted upon the end of said shaft and adapted, when swung, to rock the same to raise said gate out of engagement with said keep.

8. In a car or the like, the combination of a transversely disposed rock-shaft, eye-bolts mounted therein, a rod secured in the eyes of said bolts, an end-gate, strap irons attached to said gate and passing around said rod, whereby said gate is pivotally hung therefrom, a keep adapted to engage the lower end of said gate, a lever arm mounted upon the end of said shaft and adapted, when swung, to rock the same to raise said gate out of engagement with said keep, and a stop limiting the movement of said arm when said gate is closed.

9. The combination with a car provided with a movable end-gate of a tilting track-section; and a movable member operatively connected with said track-section and adapted to positively move the end-gate of a car on said track-section upon movement of the latter.

10. The combination with a car provided with a movable end-gate; of a tilting track-section; and a movable member apart from but operatively connected with said track-section, said member being adapted to positively move the end-gate of a car on said track-section upon movement of the latter.

11. The combination with a car provided with movable end-gate opening means; of a tilting track-section; and a movable member apart from but operatively connected with said track-section and adapted to en-

gage and actuate the end-gate opening means of a car on said track-section upon movement of the latter.

12. The combination of a car provided with movable end-gate opening means; of a tilting track-section; and a movable member adapted to engage and actuate such end-gate opening means pending the dumping of such car, said member being connected with said track-section to operate simultaneously therewith but at a different rate of speed.

13. The combination of a car provided with a transversely disposed rock-shaft, an end-gate eccentrically hung therefrom, and means for rocking said shaft; a tilting track-section; and a movable member operatively connected with the latter and adapted to engage and actuate the shaft-rocking means of a car being dumped on said track-section.

14. The combination of a car provided with a transversely disposed rock-shaft, an end-gate eccentrically hung therefrom, and a lever-arm mounted on said shaft and adapted, when swung, to rock the same; a tilting track-section; and a movable member operatively connected with the latter and adapted to engage and swing the lever-arm of a car being dumped on said track-section.

15. In car-dumping mechanism, the combination with a car provided with a transversely disposed rock-shaft, an end-gate eccentrically hung therefrom, and a lever-arm mounted on said shaft and adapted, when swung, to rock the same; of a tilting track-section, and a pivotally mounted arm adjacent to said track-section and adapted to engage and swing the lever-arm of a car being dumped on said track-section, said arm being connected with said track-section to operate simultaneously therewith but at a different rate of speed.

Signed by me, this 6th day of June, 1907.

FRANK C. GREENE.

Attested by—

E. R. RODD,

JNO. F. OBERLIN.