

F. C. & O. V. GREENE.
CAR DUMPING MECHANISM.
APPLICATION FILED JUNE 10, 1907.

988,462.

Patented Apr. 4, 1911.

5 SHEETS—SHEET 1.

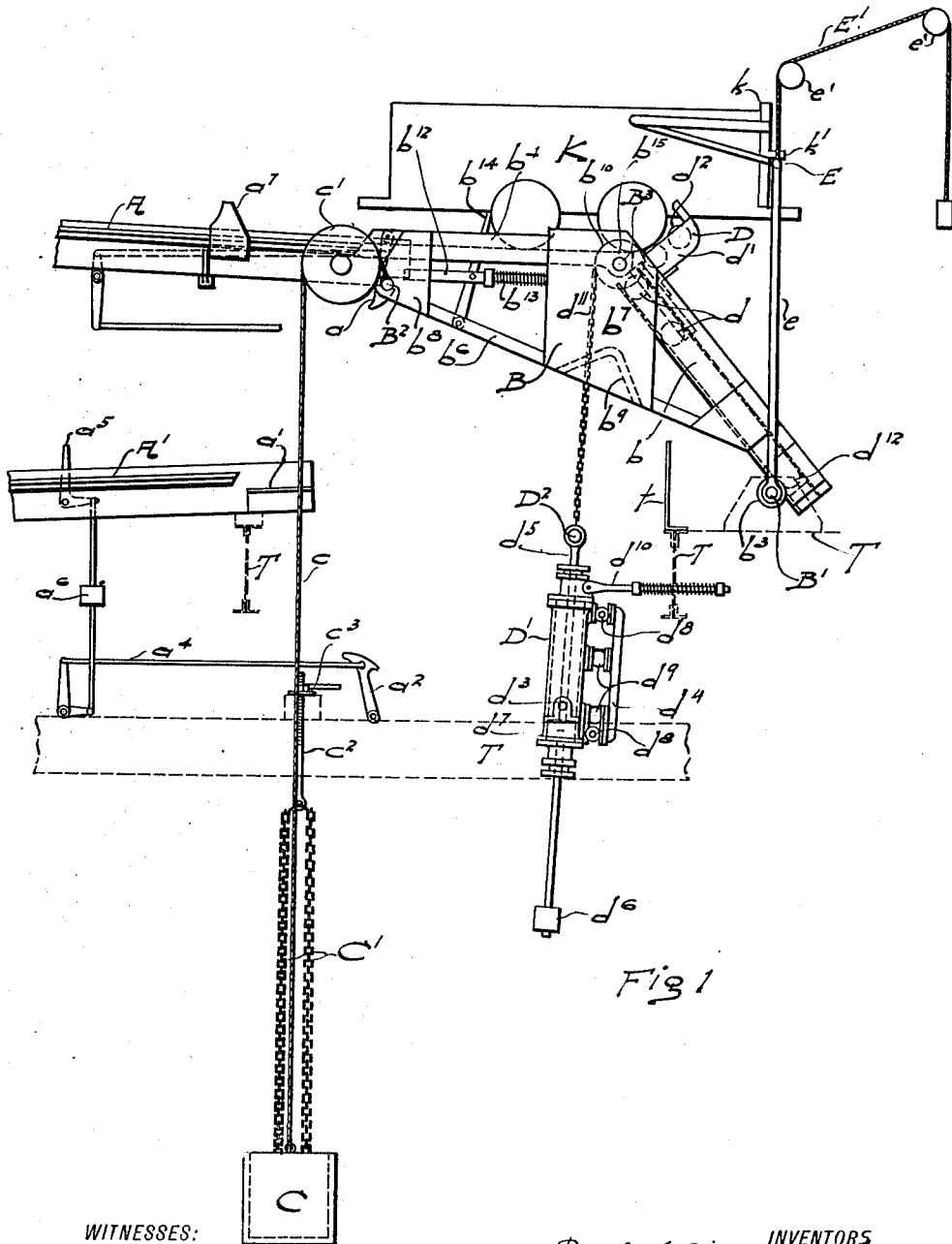


Fig 1

WITNESSES:

J. E. Hinnoch
Jno. T. Oberlin

INVENTORS

Frank C. Greene
Oscar V. Greene
BY *J. B. Fay*
ATTORNEY

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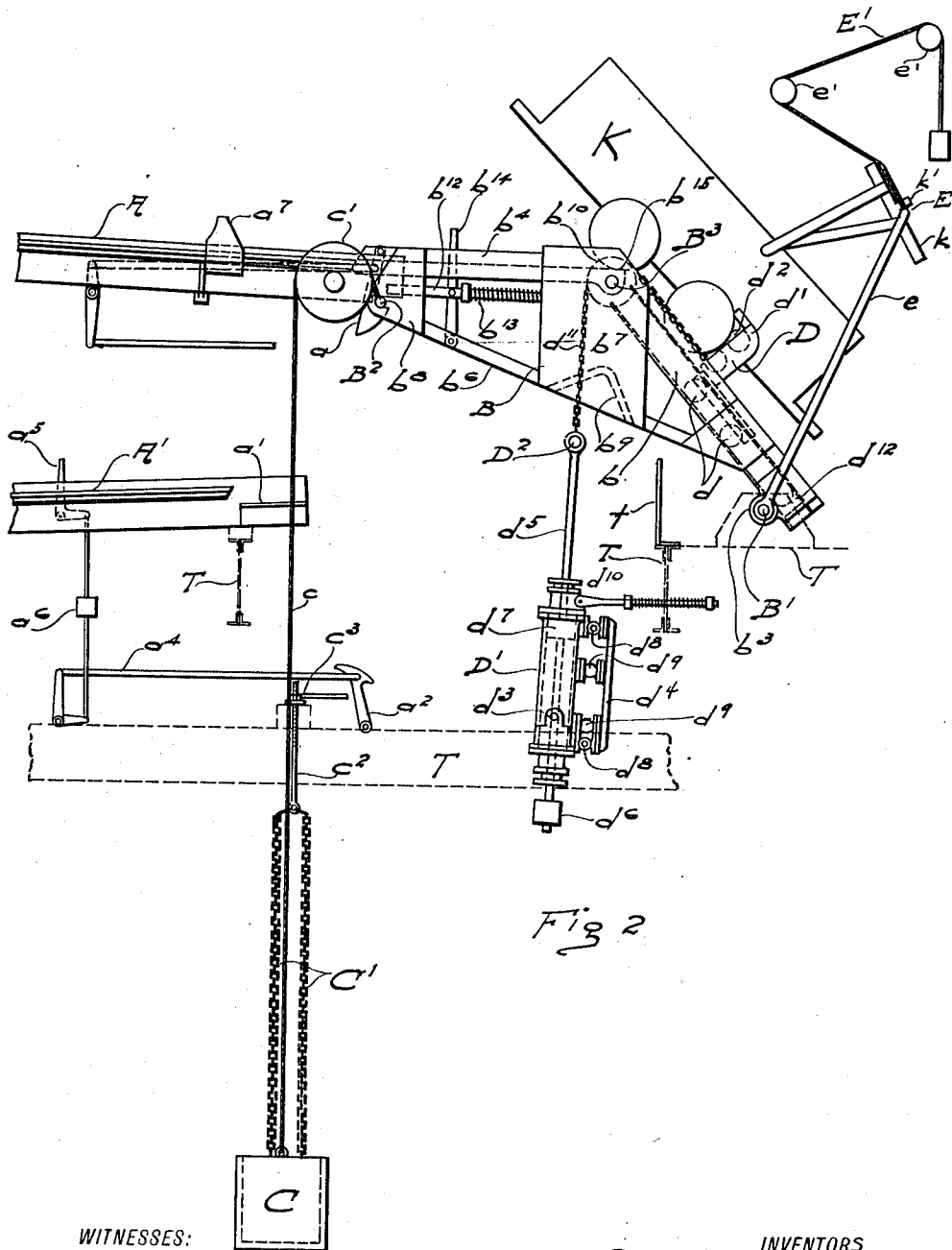


Fig 2

WITNESSES:

J. E. Chinnock
Jno. T. Oberlin

INVENTORS
Frank B. Greene &
Oscar V. Greene,
BY J. B. Fay
ATTORNEY

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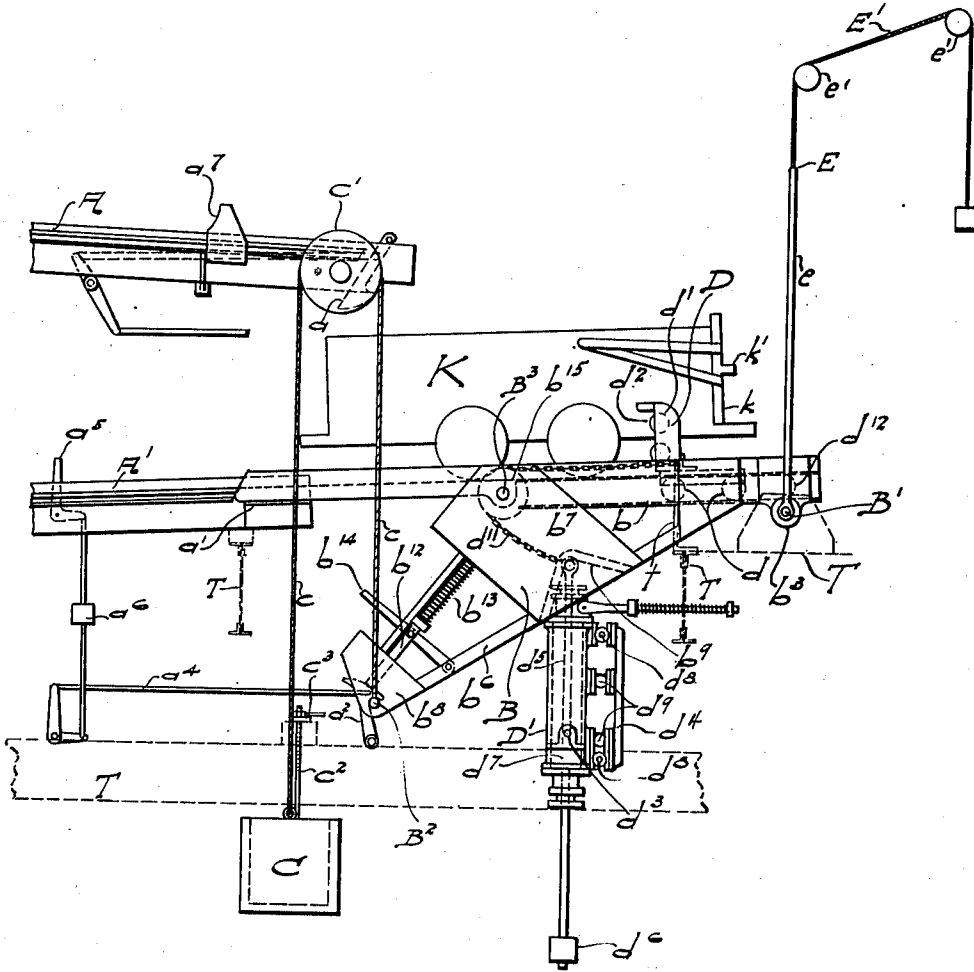


Fig. 3

WITNESSES:

J. E. Simmons
Jno. T. Oberlin

INVENTORS

Frank C. Greene and
Oscar V. Greene,
BY *J. B. Fay*
ATTORNEY

F. C. & O. V. GREENE.
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6 SHEETS—SHEET 4.

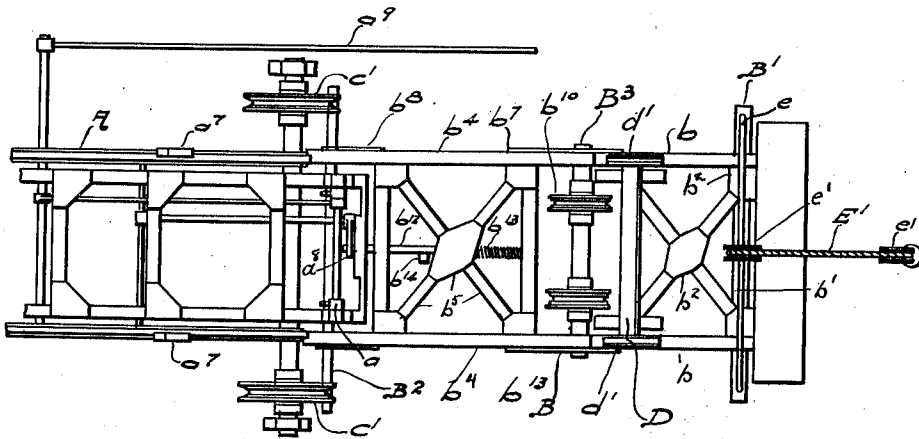


Fig 4

WITNESSES:

J. H. Kinnock

Jno. F. Oberlin

INVENTORS

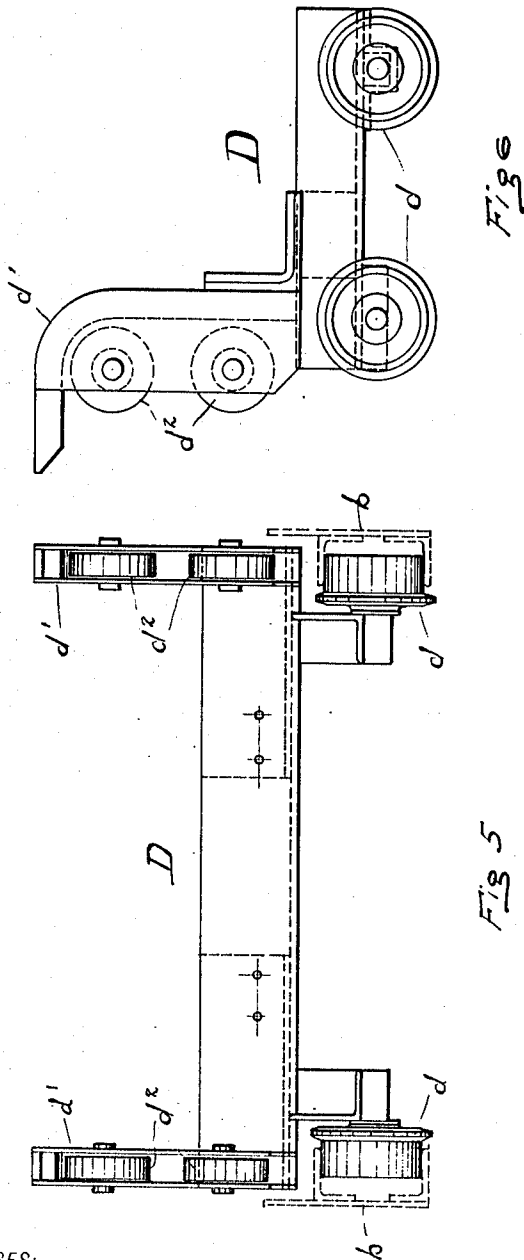
Frank C. Greene and
BY *Oscar V. Greene*
J. B. Day
ATTORNEY

F. C. & O. V. GREENE.
CAR DUMPING MECHANISM.
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6 SHEETS—SHEET 5.



WITNESSES:

Wm. C. Kinnock
Jno. F. Oberlin

INVENTORS

Frank C. Greene
BY *Oscar V. Greene*
J. B. Lutz
ATTORNEY

UNITED STATES PATENT OFFICE.

FRANK C. GREENE AND OSCAR V. GREENE, OF CLEVELAND, OHIO; SAID OSCAR V. GREENE ASSIGNOR TO SAID FRANK C. GREENE.

CAR-DUMPING MECHANISM.

988,462.

Specification of Letters Patent.

Patented Apr. 4, 1911.

Application filed June 10, 1907. Serial No. 378,122.

To all whom it may concern:

Be it known that we, FRANK C. GREENE and OSCAR V. GREENE, citizens of the United States, residents of Cleveland, county of Cuyahoga, State of Ohio, have jointly invented a new and useful Improvement in Car-Dumping Mechanisms, of which the following is a specification, the principle of the invention being herein explained and the best mode in which we have contemplated applying that principle, so as to distinguish it from other inventions.

Our invention relates to unloading mechanism and particularly to track-end dumps such as find use, among other places, in the tipples of collieries for discharging the mine cars of their contents.

The invention is designed more particularly for use in superposed track systems where the cars are brought to the dumping station on one track, and transferred, incidentally to the dumping operation, to the other track.

The object of the invention is the provision of means for rendering the handling of cars in the manner described more rapid and easy than has heretofore been attained in devices of this class and furthermore entirely automatic.

To the accomplishment of these and related ends said invention consists of means hereinafter fully described and particularly pointed out 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:—Figure 1 represents in side elevation a dumping rig particularly designed for use in handling mine cars and embodying the several improvements comprehended in our invention, the parts of such rig being shown in the positions assumed previous to and pending the reception of a car thereon; Fig. 2 is a similar side elevational view, except that such car is shown in its initial dumping position; Fig. 3 shows the same as the car, after being dumped, is discharged from the rig onto the discharge tracks of the tipple; Fig. 4 is a plan view of the rig with the parts disposed as in Fig. 1; while Fig. 5 is a front elevation and Fig. 6 a side ele-

vation of a carriage that travels on the dumping frame and forms a movable stop for controlling the movement of the car thereon.

While, as has been indicated, our improvements relate especially to a track-end dump for use in a superposed track system, it is contemplated that at least certain of the various features involved in the construction of such rig may be availed of in connection with other types of dumps and related mechanisms. For the purpose of illustration, however, the particular adaptation of the invention noted in the description of the drawings, has been chosen as possibly best presenting the several details thereof and their relation to each other.

In the several figures of the drawings, then, A and A' designate respectively the upper and the lower of the two superposed tracks composing the track system. These, along with the other parts of the rig hereinafter to be described, are suitably supported in the frame of the tipple, broken sections of such supporting structure, designated by T, appearing in the various figures as will be seen on reference thereto. Tracks A and A' preferably respectively incline toward and away from the dumping station in order that movement of the cars therealong may be by gravity alone. The central feature of the dumping mechanism proper is a frame B pivotally mounted at one end on a transverse shaft B' about which it is allowed a limited oscillatory movement. Associated with this frame are various accessory parts the principal of which are the retarding mechanism for controlling the oscillation of such frame and the movement of cars thereon, a novel form of pick-up weight for counter-balancing, and thus normally positioning said frame, and means for engaging and raising the end-gates of successive cars as they are received on the dump. The structure of these various elements will now be taken up and considered separately and more or less in the order named. Finally the manner in which they cooperate in the handling of the cars will be briefly indicated.

Oscillatory frame B to which allusion has been made comprises in the preferred form shown two side members b of channel cross-section with the channels turned in, such members being either integral or built up

of plates and angle bars attached thereto. These members are secured together by means of cross-bars b' , Fig. 4, gusset plates b^2 being employed to stiffen the whole. On the under side of the members and near their lower ends are secured journal boxes b^3 that are mounted on shaft B' aforesaid. Such channel members b are so spaced relatively as to form a track-section upon which the car to be dumped may be received and are designed in the normal position of the frame to incline at such an angle as to cause the contents of the car to be discharged therefrom by gravity. An angle of approximately forty-five degrees has been found the proper one to employ in the particular connection here considered, *i. e.*, in dumping coal. The other portion of the frame B consists of members b^4 , Figs. 3 and 4, braced by cross-bars or lacing b^5 so as to form a track-section continuous with that formed by members b . The ends of members b^4 adjacent to members b are hinged to the latter so that the two track-sections form in effect one continuous section made up of two parts, one rigidly, the other pivotally, mounted on the frame B.

In the normal position of the frame, wherein, as has been explained above, that part of the track-section formed by members b inclines downwardly with respect to upper track A, the pivotally mounted part of the track-section is designed to be supported in substantial alinement with the same track. To this end, rearwardly extending arms b^6 are secured to members b , being strongly braced by side plates b^7 disposed as shown. Arms b^6 are of such a length as to just swing free of the terminus of car delivery track A, and the outer ends thereof, forming thus the free end of the frame B considered as a whole, are united by a transverse shaft B^2 , and are further provided with upwardly projecting plates b^8 adapted to receive and support the outer, or free, end of pivotally mounted part b^4 of the track-section borne by frame B. A latch or hook a , pivotally mounted at the terminus of such upper track A, is adapted to engage transverse shaft B^2 and thus retain the oscillatory frame and its track-section against movement from their normal position, in which position the pivotal part of such track-section registers closely with car-delivery track A so that a car may be received from the latter directly onto such pivotally mounted part and thence upon the rigidly mounted part. The latter, it will be recalled, is sharply inclined with respect to the horizontal in this position of the frame, so that the car as it turns down the same will discharge its contents upon the screen or into such chute, not shown, as may be provided for the grading of the coal and its conduct to the bins beneath.

The frame B with the track structure borne thereby is retained in the normal position just described and returned to such position after being depressed therefrom by means of a counterweight. This counterweight is desirably of pick-up type and as shown consists of a trough C connected with the transverse shaft B^2 in the free end of the frame by two cables c passing around sheaves c' mounted on each side of track A. The weight of trough C, which may be varied by addition to or subtraction from its contents, is designed to be just sufficient to balance the dump, that is, frame B, alone. Adjustably suspended over trough C by means of a threaded rod c^2 supported by a nut c^3 in a portion T of the tippie frame, is a heavy chain C' . Such chain, in the lower position of the trough, hangs pendent; but as the latter is elevated, upon oscillatory frame B being depressed from its normal position, the said chain is gradually gathered in or picked up by the trough. In this way a gradually increasing counterweight effect is had, the length and weight of the chain being gaged so as to add to the original weight of the trough just sufficient weight to balance the empty car when such chain has been all picked up. By proper adjustment of the original weight of the trough and of the height of the chain, it will be obvious that the movement of frame B can be regulated with considerable nicety and a desirable degree of celerity of movement obtained without damage of racking and damaging the mechanism by the impact at the close of the movement.

Movement of the car down the rigidly mounted part of the oscillatory track-section when such part occupies its normal inclined position, is controlled by means of a movable stop D. This stop, of which the structural details appear most clearly in Figs. 5 and 6, consists essentially of a dilly carriage the flanged wheels d of which are adapted to run in the inwardly turned channels of frame members b . Such dilly carriage bears outwardly projecting horns d' , or stop members proper that are positioned to engage the treads of the car wheels as the latter enters upon the part of the track-section in question. In order that the car wheels may continue to revolve and not merely slide, owing to the braking action of such horns, the latter are provided on their engaging faces with rollers d^2 or equivalent anti-friction devices. Oscillatorily mounted beneath frame B on trunnions d^3 is cylinder D' provided with a pass-pipe d^4 . Reciprocally mounted in cylinder D' is a piston d^5 both ends of which project without the corresponding ends of the cylinder. To the lower of such ends is attached a counterweight d^6 sufficient to effectually overbalance the dilly carriage D.

Cylinder D' is designed to be filled with dead oil or like liquid which flows from one end to the other of the cylinder, as the head d' is moved up and down, by way of pass-pipe d⁴. Such flow is regulated by means of globe valves d⁵ and adjustable check valves d⁶ inserted in the connections between the pass-pipe and cylinder as will be readily understood. Excessive oscillation of the cylinder is prevented and its normal substantially erect position maintained by means of a rod d¹⁰ connected with its upper end, said rod being resiliently supported in a conveniently adjacent member T of the tippie frame.

The upper end of piston d⁵ bears a short transverse shaft or cross-head D² of length and disposition adapted to permit engagement of the ends thereof by pockets b⁹ in frame B, as the latter is depressed from its elevated position. These pockets are conveniently formed by short sections of L or angle iron bent in the shape of inverted V's and riveted to the inner faces of plates b⁷. Such cross-head D² is furthermore connected with dilly D by means of chain cables d¹¹ guided about sheaves b¹⁰ in frame B. Such sheaves are mounted on a transverse shaft B³ that is utilized at the same time to form the pintle of the hinge, wherewith the two parts of the jointed track-section borne by frame B are held together. The length of this connecting chain d¹¹ is so gaged to that chain d¹¹ that movement of the frame in its normal position is arrested before its completion, see Fig. 2, by engagement of piston head d' with the upper end of the retarding cylinder D'. Obviously, however, upon depression of the frame, the movement in question will be completed, that much of the slack of the chain being thus taken up. The function subserved by this arrangement will appear later. The cross-head D² is depressed from the extreme upper position into which it is thus raised by the action of the dilly, by the engagement of pockets b⁹ with its ends when the frame B is permitted to swing down from its normal position under the weight of the superposed car. This engagement, which does not take place until after the frame is well under way as will be evident from an inspection of Fig. 2, is adapted to assist the pick-up counterweight in controlling the movement of the frame, and to avoid unnecessary shock as it sinks to its lowermost position, Fig. 3. As the frame thus swings downwardly blocks or rests a' adjacent to the terminus of the lower, or car-discharge, track engage free ends of members b⁴ forming the pivotally mounted part of the track-section borne by frame B. Further movement of the frame has the effect of straightening out this part so that

in the frame's final position, Fig. 3, the two parts of the track-section are supported in substantial alinement with each other and with the car-discharge track. The frame is secured in this position by means of a hook or latch a² similar to latch a of the upper track and like it adapted to engage transverse shaft B². Connected with said latch by a system of levers and rods a⁴ is a trip arm a⁵ that projects upwardly above track A' far enough to be engaged by the car passing thereon as it leaves the dumping frame. The connection is such that this engagement will actuate latch a² to release the frame. Upon being thus released the frame is returned to its initial position by the trough counterweight C. A suitable counterweight a⁶ affixed to one of the rods a⁴ serves normally to position latch a² to engage the frame in the manner described.

To control the admission of cars onto the dumping frame the following mechanism is provided: Laterally of the rails of upper track A and removed a suitable distance from the end of such track are horns or stop-members a⁷ oscillatory about axes parallel with such track. Weighted arms a⁸, Fig. 4, normally operatively position these stops to engage the oncoming car upon the delivery track. Reciprocally mounted in the rear or free end of frame B is a rod or bar b¹² the outer end of which is normally positioned by a spring b¹³, or equivalent resilient means in position to engage with the free ends of weighted arms a⁸ as the frame rises from its lower to its upper position. The effect of such actuation is to rock horns a⁷ out of the path of the car in question which thereupon is urged by gravity down the slope of the track and onto the frame. Pivotaly mounted in such frame is a trip arm b¹⁴ connected with reciprocable bar b¹², that is adapted to be engaged by such entering car and thereby actuated to withdraw the bar from beneath weighted arms a⁸. The latter thus freed again operatively position horns a⁷ whereby the next succeeding car is intercepted, while bar b¹² is prevented from returning to its normal position by the interposition of the arms in question. Upon depression of the frame, however, it is at once extended by action of spring b¹³.

In order to give the car a slight jar as it passes over the hump of the jointed track-section, and thereby facilitate the discharge of the coal from the car, the hinge end of the pivotal part of such section is found to provide an off-set or knuckle b¹⁵, Fig. 1. This knuckle also serves the further purpose of preventing any premature return movement of the car as the frame oscillates, escape of the car being possible, only after the track-section has been straightened out, Fig. 3.

Opening of the end-gate k of the car, such end-gate being of the usual pivotally hung type, is effected incidentally to the movement of the car down the inclined part of the track-section by engagement with a pin k' on the face of the gate of a member E mounted so as to be oscillatory about an axis located below the point of such engagement. In practice I utilize for such member E the cross-bar of a frame whose side members e are pivotally on the same shaft B' about which frame B is oscillatory. The upper end, or cross-bar, of such frame is properly positioned to engage the pin k' of the gate in the manner described by a counterweighted cable E' passing over pulleys e' .

The operation of the several parts of our improved dumping and rig have been more or less fully set forth in connection with the preceding description of their construction. It hence only remains to indicate briefly the manner in which their respective operations are correlated. In the normal position of the apparatus there will be an empty car upon the inclined track-section part, Fig. 2, and the several elements will occupy positions as there shown. Assuming further that a train of cars are awaiting their turn upon car-delivery truck A, the oscillatory frame will be released by the operator in charge withdrawing latch a . As shown a handlever a^3 , Fig. 4, is provided for this purpose; if desired, however, such latch may be so connected as to be operable from a station removed from the dump as for example the weigh office. The weight of the car upon the frame will considerably overbalance the counterweight C and movement of such frame downward hence begins at once. This movement is initially accelerated by the fact that not until after the latch a is withdrawn does dilly D, which holds the car, complete its run to the end of the inclined track-section. The weight of the car is thus applied to the end of this section and a desirable celerity of movement on the part of the frame at once secured. The amount of this acceleration can be exactly controlled by shifting an adjustable stop d^{12} that limits the downward movement of the dilly carriage. Further movement of the frame effects the engagement thereof with piston D^2 , to the retarding effect of which is added that of the increasing weight of the pick-up counterweight C. Accordingly the frame in spite of the rapidity with which its movement is properly begun is caused to assume its final position gently and without any unnecessary racking or wear. Incidental to the movement in question the jointed track-section is straightened out and the empty car permitted to pass off onto the discharge track. Passing over trip arm a^5 , the frame, temporarily secured by

catch a^2 , is again freed and under the counterbalancing action of weight C swung back to its normal position. The effect of the pick-up arrangement is here exactly the reverse of that just witnessed, the weight decreasing as the frame nears the end of its oscillation. To this retarding effect is added that of dilly D which is restored to its initial position at the top of the inclined position at the top of the inclined track-section by the pull of cable d^{11} and counterweighted piston d^5 . Premature return of such dilly while the section in question is inclined downwardly toward the discharge track is prevented by an arm t supported exteriorly of the frame and so disposed as to intercept the dilly as the frame is depressed. The frame, upon returning to its normal position, automatically admits the first of the waiting cars which passes onto the dumping frame, has its end-gate opened, is dumped of its contents, and then awaits the will of the operator, who by a slight movement of lever a^3 sets the apparatus for a repetition of the operation just described.

By the several improvements embodied in such rig it will hence be evident that we secure rapidity of movement where such rapidity is desirable while at the same time eliminating it where its results are apt to be harmful. In other words the operation of the dump, while wholly automatic, is so affected by the easily made adjustments of its various parts as to cause it to respond thereto with a nicety and ease not to be achieved even by attentive manual control.

Other modes of applying the principle of our 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 employed.

We therefore particularly point out and distinctly claim as our invention:—

1. In mechanism of the class described, the combination with superposed tracks, of a track-section shiftable into working relation with each of said tracks, said track-section comprising parts movable with respect to each other.

2. In mechanism of the class described, the combination with superposed tracks, of a track-section shiftable into working relation with each of said tracks, said track-section comprising parts adapted in different positions of said section as a whole to occupy different positions with respect to each other.

3. In mechanism of the class described, the combination with superposed tracks, of a track-section shiftable into working relation with each of said tracks, said track-section comprising parts adapted in one position of said section as a whole to be angu-

larly disposed with respect to each other and in another position of said section to be longitudinally extended.

4. In mechanism of the class described, the combination with two superposed tracks, of an oscillatory track-section adapted to register with each of said tracks, respectively, said track-section comprising parts movable with respect to each other.

5. In mechanism of the class described, the combination with two superposed tracks, of an oscillatory track-section adapted to register with each of said tracks, respectively, said track-section comprising parts adapted to occupy different positions with respect to each other when said section registers with the upper and the lower of said tracks, respectively.

6. In mechanism of the class described, the combination with two superposed tracks, of an oscillatory track-section adapted to register with each of said tracks, respectively, said track-section comprising parts adapted to be angularly disposed with respect to each other, and to be longitudinally extended, when said section registers with the upper and the lower of said tracks, respectively.

7. In mechanism of the class described, the combination of two superposed tracks, an oscillatory frame; and a track-section borne by said frame, said track-section comprising two parts, one part rigidly, the other pivotally, mounted on said frame, said pivotally mounted part being adapted in different positions of said frame to register with each of said tracks, respectively.

8. In mechanism of the class described, the combination of two superposed tracks; an oscillatory frame; and a track-section borne by said frame, said track-section comprising two parts, one part rigidly, the other pivotally, mounted on said frame, said pivotally mounted part being adapted in different positions of said frame to register with each of said tracks, respectively; means adapted to support said pivotally mounted part substantially in alinement with said other part in one such position; and means adapted to support the same at an angle to said other part in another such position.

9. In mechanism of the class described, the combination of two superposed tracks; an oscillatory frame; and a track-section borne by said frame, said track-section comprising two parts, one part rigidly, the other pivotally, mounted on said frame, said pivotally mounted part being adapted in different positions of said frame to register with each of said tracks, respectively, and external means adapted to support said pivotally mounted part, when thus in register with the lower of said tracks, substantially in alinement with said other part, said frame being adapted to support said pivot-

ally mounted part, when in register with the upper of said tracks, at an angle to said other part.

10. In mechanism of the class described, the combination of two superposed tracks, an oscillatory frame; and a track-section borne by said frame, said track-section comprising two parts, one part rigidly, the other pivotally, mounted on said frame, said pivotally mounted part being adapted in different positions of said frame to register with each of said tracks, respectively; and said rigidly mounted part being disposed to incline downwardly from the upper of said tracks and to incline downwardly to the lower thereof when said pivotally mounted part is thus in register with said tracks, respectively; and external means adapted to support said pivotally mounted part in substantial alinement with said rigidly mounted part in the second of such positions, said frame being adapted to support said pivotally mounted part at an angle to said other part in the first of said positions.

11. In mechanism of the class described, the combination with a movably mounted track-section comprising relatively movable parts; of means adapted to variously position such parts with respect to each other during the movement of said track-section.

12. In mechanism of the class described, the combination with an oscillatory mounted, jointed track-section; of means adapted to variously position the parts of said track-section with respect to each other during the oscillation of said section.

13. In mechanism of the class described, the combination of a movable frame; a track-section pivotally mounted thereon and normally supported thereby; and means adapted to engage the free end of said track-section during the movement of said frame.

14. In mechanism of the class described, the combination of an oscillatory frame; a track-section pivotally mounted thereon and normally supported thereby; and means adapted to engage the free end of said track-section during the oscillation of said frame.

15. In mechanism of the class described, the combination of an oscillatory frame; means normally positioning said frame; a track-section, comprising relatively movable parts, mounted upon said frame and adapted to receive the car to be dumped, the weight of such car tending to oscillate said frame; and means adapted to variously position such track-section parts with respect to each other during the oscillation of said frame.

16. In mechanism of the class described, the combination of an oscillatory frame; means normally positioning said frame; a track-section, comprising two parts, one rigidly, the other pivotally mounted on said frame, and adapted to receive the car to be dumped, the weight of such car tending to

oscillate said frame; and means adapted to engage the free end of said pivotally mounted track-section part upon such oscillation, said part being supported by said frame in the normal position of the latter.

17. In mechanism of the class described, the combination of two superposed tracks; an oscillatory frame; a track-section comprising two parts, one rigidly, the other pivotally, mounted on said frame; a counterweight normally maintaining said frame in position to incline said rigidly mounted part downwardly from the upper of said tracks, the weight of a car being adapted to depress said frame to incline said part downwardly to the lower of said tracks; and a rest adapted to engage the free end of said pivotally mounted track-section part upon such depression and support the same in substantial alinement with said lower track, said frame being adapted when normally positioned to support said part in substantial alinement with said upper track.

18. In mechanism of the class described, the combination of two superposed tracks, the upper inclining toward, the lower inclining from, the dumping station; an oscillatory frame; a track-section comprising two parts, one rigidly, the other pivotally, mounted on said frame; a pick-up counterweight normally maintaining said frame in position to incline said rigidly mounted part downwardly from the upper of said tracks, the weight of a car being adapted to depress said frame to incline said part downwardly to the lower of said tracks; and a rest adapted to engage the free end of said pivotally mounted track-section part upon such depression and support the same in substantial alinement with said lower track, said frame being adapted when normally positioned to support said part in substantial alinement with said upper track.

19. In mechanism of the class described, the combination of two superposed tracks, the upper inclining toward, the lower inclining from, the dumping station; an oscillatory frame; a track-section comprising two parts, one rigidly, the other pivotally, mounted on said frame; means normally positioning said frame to incline said rigidly mounted part downwardly from the upper of said tracks, the weight of a car being adapted to depress said frame to incline said part downwardly toward the lower of said tracks, said positioning means comprising a counterweight, a suitably guided cable connecting said weight with the free end of said frame, and a pendent chain disposed to be picked up by said weight upon movement of the latter; and a rest adapted to engage the free end of said pivotally mounted track-section part upon such depression and support the same in substantial alinement with said lower track, said frame being

adapted when normally positioned to support said part in substantial alinement with said upper track.

20. In mechanism of the class described, the combination of two superposed tracks, the upper inclining toward, the lower inclining from, the dumping station; an oscillatory frame; a track-section comprising two parts, one rigidly, the other pivotally, mounted on said frame; means normally positioning said frame to incline said rigidly mounted part downwardly from the upper of said tracks, the weight of a car being adapted to depress said frame to incline said part downwardly toward the lower of said tracks, said positioning means comprising a counterweight, a suitably guided cable connecting said weight with the free end of said frame, and a chain hung at an adjustable height and adapted to be picked up by said weight upon movement of the latter; and a rest adapted to engage the free end of said pivotally mounted track-section part upon such depression and support the same in substantial alinement with said lower track, said frame being adapted when normally positioned to support said part in substantial alinement with said upper track.

21. In car-dumping mechanism, the combination with an oscillatory, normally inclined track-section adapted to receive the car to be dumped; of means for applying the weight of such car to the end of said track-section for the purpose of oscillating the same, irrespective of the position of said car thereon.

22. In car-dumping mechanism, the combination with a movable, normally inclined track-section adapted to receive the car to be dumped; of means adapted to restrain the movement of such car upon said track-section except upon movement of the latter.

23. In car-dumping mechanism, the combination with an oscillatory, normally inclined track-section adapted to receive the car to be dumped; of means adapted to restrain the movement of such car upon said track-section except upon oscillation of the latter.

24. In car-dumping mechanism, the combination with an oscillatory, normally inclined track-section adapted to receive the car to be dumped; of an externally secured cable guided in said track-section and adapted to restrain the movement of such car down the latter, except upon oscillation thereof.

25. In car-dumping mechanism, the combination with a movable, normally inclined track-section, adapted to receive the car to be dumped; of means adapted to regulate the movement of such car upon said track-section; and means adapted to prevent the completion of such movement except upon movement of said track-section.

26. In car-dumping mechanism, the combination with an oscillatory, normally inclined track-section adapted to receive the car to be dumped; of means adapted to regulate the movement of such car upon said track-section; and means adapted to prevent the completion of such movement except upon oscillation of said track-section.

27. In car-dumping mechanism, the combination with an oscillatory, normally inclined track-section adapted to receive the car to be dumped; of an externally secured cable guided in said track-section and adapted to regulate the movement of such car upon said track-section and to prevent the completion of such movement except upon oscillation of said track-section.

28. In car-dumping mechanism, the combination with an oscillatory, normally inclined track-section adapted to receive the car to be dumped; a stop movably mounted on said track-section; and a cable guided in the free end of said track-section and adapted to restrain the movement of said stop while said track-section maintains its normal position, and to permit such movement upon oscillation of the latter.

29. In car-dumping mechanism, the combination with an oscillatory, normally inclined track-section adapted to receive the car to be dumped; a stop movably mounted on said track-section; and a cable having one end externally secured at a point below said track-section and the other attached to said stop, said cable being guided in the free end of said track-section and being of a length sufficient to permit movement of said stop to the lower end of said section only upon depression of the latter from its inclined position.

30. In car-dumping mechanism, the combination with an oscillatory, normally inclined track-section adapted to receive the car to be dumped; a stop movably mounted on said track-section; a counterweighted cable guided in the free end of said track-section and connected with said stop; and means limiting the movement of said cable.

31. In car-dumping mechanism, the combination with an oscillatory, normally inclined track-section adapted to receive the car to be dumped; a stop movably mounted on said track-section; a counterweighted cable guided in the free end of said track-section and connected with said stop; means adapted to regulate the movement of said cable; and means adapted to arrest such movement before said stop reaches the bottom of said track-section in the latter's inclined position.

32. In car-dumping mechanism, the combination with an oscillatory, normally inclined track-section adapted to receive the car to be dumped; a stop movably mounted on said track-section; a counterweighted

cable guided in the free end of said track-section; means including a cylinder and pass-pipe for regulating the movement of said cable; and means adapted to arrest such movement before said stop reaches the bottom of said track-section in the latter's inclined position.

33. In car-dumping mechanism, the combination with an oscillatory, normally inclined track-section adapted to receive the car to be dumped; a stop movably mounted on said track-section; a cylinder provided with a pass-pipe; a counterweighted piston working in said cylinder; and a cable guided in the free end of said track-section and connecting said stop with said piston, movement of said stop being arrested by engagement of said piston with the cylinder end before said stop reaches the bottom of said track-section in the latter's inclined position.

34. In car-dumping mechanism, the combination of a pivotally mounted track-section; means normally positioning the same; a movable stop on said track-section adapted to engage a car; and means for regulating the motion of said track-section and said stop, such regulating means including a retarding device and means connecting the same with said movable stop whereby such device is positioned to engage said track-section by the movement of said stop, said connecting means being adapted to permit completion of said stop's movement only upon movement of said track-section from its normal position.

35. In car-dumping mechanism, the combination of a pivotally mounted track-section; means normally retaining the same in an inclined position; a movable stop on said track-section adapted to engage a car; and means for regulating the motion of said track-section and stop, such means comprising a cylinder provided with a pass-pipe, a piston working in said cylinder, and means connecting said piston with said movable stop whereby said piston is positioned to engage said track-section by the movement of said stop, said connecting means being adapted to permit completion of said stop's movement only upon depression of said track-section from its inclined position.

36. In car-dumping mechanism, the combination of a pivotally mounted track-section; means normally retaining the same in an inclined position; a movable stop on said track-section adapted to engage a car; and means for regulating the motion of said track-section and stop, such means comprising a cylinder provided with a pass-pipe, a piston working in said cylinder, and a cable connecting said piston with said movable stop whereby said piston is positioned to engage said track-section by the movement of said stop, said cable being of a

length sufficient to permit movement of said stop to the lower end of said track-section only upon depression of the latter from its inclined position.

37. In car-dumping mechanism, the combination of a pivotally mounted track-section; means normally maintaining the same in an inclined position, the weight of a car being adapted to depress said track-section from such position; and means for regulating the motion of said track-section, such means comprising an oscillatorily mounted cylinder provided with a pass-pipe, resilient means normally positioning said cylinder about its axis of oscillation, and a piston working in said cylinder and adapted to engage said track-section.

38. In car-dumping mechanism, the combination of a pivotally mounted track-section; means normally maintaining the same in an inclined position, the weight of a car being adapted to depress said track-section from such position; a movable stop on said track-section adapted to engage such car; and means for regulating the motion of said track-section and said stop, such means comprising an oscillatorily mounted cylinder provided with a pass-pipe, resilient means normally positioning said cylinder about its axis of oscillation, a piston working in said cylinder, and means connecting said piston with said movable stop whereby said piston is positioned to engage said track-section by the movement of said stop.

39. In car-dumping mechanism, the combination of a pivotally mounted track-section; means normally maintaining the same in an inclined position, the weight of a car being adapted to depress said track-section from such position; a movable stop on said track-section adapted to engage such car; and means for regulating the motion of said track-section and said stop, such means comprising an oscillatorily mounted cylinder provided with a pass-pipe, resilient means normally positioning said cylinder about its axis of oscillation, a piston working in said cylinder, and means connecting said piston with said movable stop whereby said piston is positioned to engage said track-section by the movement of said stop, said connecting means being adapted to permit completion of said stop's movement only upon depression of said track-section from its normal position.

40. In mechanism of the class described, the combination of two superposed tracks; an oscillatory frame; a track-section borne by said frame, said track-section comprising two parts, one part rigidly, the other pivotally, mounted on said frame, said pivotally mounted part being adapted in different positions of said frame to register with each of said tracks, respectively; means adapted to prevent the completion of the movement

of a car upon said track-section except upon oscillation of said frame.

41. In mechanism of the class described, the combination of two superposed tracks; an oscillatory frame; a track-section borne by said frame, said track-section comprising two parts, one part rigidly, the other pivotally, mounted on said frame, said pivotally mounted part being adapted in different positions of said frame to register with each of said tracks, respectively; means adapted to regulate the movement of a car upon said track-section; and means adapted to prevent the completion of such movement except upon oscillation of said frame.

42. In mechanism of the class described, the combination of two superposed tracks; an oscillatory frame; and a track-section borne by said frame, said track-section comprising two parts, one part rigidly, the other pivotally, mounted on said frame, said pivotally mounted part being adapted in different positions of said frame to register with each of said tracks, respectively; means adapted to support said pivotally mounted part substantially in alinement with said other part in one such position; a stop movably mounted on said rigidly mounted track-section part; a counterweighted cable guided in the free end of said frame and connected with said stop; and means limiting the movement of said cable.

43. In mechanism of the class described, the combination of two superposed tracks; an oscillatory frame; and a track-section borne by said frame, said track-section comprising two parts, one part rigidly, the other pivotally, mounted on said frame, said pivotally mounted part being adapted in different positions of said frame to register with each of said tracks, respectively; means adapted to support said pivotally mounted part substantially in alinement with said other part in one such position; a stop movably mounted on said rigidly mounted track-section part; a counterweighted cable guided in the free end of said frame and connected with said stop; means adapted to regulate the movement of said cable; and means adapted to arrest movement of said stop before its completion except upon oscillation of said frame.

44. In mechanism of the class described, the combination of two superposed tracks, an oscillatory frame; a track-section comprising two parts, one part rigidly, the other pivotally, mounted on said frame, and adapted to receive the car to be dumped; means normally maintaining said frame in position to incline said rigidly mounted track-section part downwardly from the upper of said tracks, the weight of a car being adapted to depress said frame to incline said part downwardly to the lower of said tracks; a rest adapted to engage the free end of said

pivotally mounted track-section part upon such depression and support the same in substantial alinement with said lower track, said frame being adapted when normally positioned to support said part in substantial alinement with said upper track; and means for regulating the movement of a car down said rigidly mounted part in the normal position of said frame.

a movable track-section adapted to register with said tracks, respectively; and means, including a pick-up counterweight normally retaining said track-section in register with the upper of said tracks.

45. In mechanism of the class described; the combination of two superposed tracks, an oscillatory frame; a track-section comprising two parts, one part rigidly, the other pivotally, mounted on said frame, and adapted to receive the car to be dumped; means normally maintaining said frame in position to incline said rigidly mounted track-section part downwardly from the upper of said tracks, the weight of a car being adapted to depress said frame to incline said part downwardly to the lower of said tracks; a rest adapted to engage the free end of said pivotally mounted track-section part upon such depression and support the same in substantial alinement with said lower track, said frame being adapted when normally positioned to support said part in substantial alinement with said upper track; a stop movably mounted on said rigidly mounted track-section part; a counterweighted cable guided in the free end of said frame and connected with said stop; and means limiting the movement of said cable.

48. In mechanism of the class described, the combination of two superposed tracks; an oscillatory track-section adapted to register with said tracks, respectively; and means normally retaining said track-section in register with the upper of said tracks, such means comprising a counterweight, a suitably guided cable connecting said weight with the free end of said track-section, and a pendent chain disposed to be picked up by said weight upon movement of the latter.

46. In mechanism of the class described, the combination of two superposed tracks, an oscillatory frame; a track-section comprising two parts, one part rigidly, the other pivotally, mounted on said frame, and adapted to receive the car to be dumped; means normally maintaining said frame in position to incline said rigidly mounted track-section part downwardly from the upper of said tracks, the weight of a car being adapted to depress said frame to incline said part downwardly to the lower of said tracks, a rest adapted to engage the free end of said pivotally mounted track-section part upon such depression and support the same in substantial alinement with said lower track, said frame being adapted when normally positioned to support said part in substantial alinement with said upper track; a stop movably mounted on said rigidly mounted track-section part; a cylinder provided with a pass-pipe; a counterweighted piston working in said cylinder; and a cable guided in the free end of said track-section and connecting said stop with said piston, movement of said stop being arrested in the normal position of said frame by engagement of said piston with the cylinder end before said stop reaches the end of said track-section part.

49. In mechanism of the class described, the combination of two superposed tracks; an oscillatory track-section adapted to register with said tracks, respectively; and means normally retaining said track-section in register with the upper of said tracks, such means comprising a counterweight, a suitably guided cable connecting said weight with the free end of said track-section, and a chain hung at the adjustable height and adapted to be picked up by said weight upon movement of the latter.

50. In car-dumping mechanism, the combination of an oscillatory, normally inclined track-section adapted to receive the car to be dumped; the weight of a car being adapted to depress said track-section; a stop movably mounted on said track-section; means controlling the forward movement of said stop in the normal position of said frame; and means retaining the same against return movement in the depressed position of said frame.

51. In car-dumping mechanism, the combination of an oscillatory, normally inclined track-section adapted to receive the car to be dumped; the weight of a car being adapted to depress said track-section; a stop movably mounted on said track-section; means controlling the forward movement of said stop in the normal position of said frame; and an arm supported externally of said track-section and adapted to intercept said stop on its return movement in the depressed position of said frame.

52. In car-dumping mechanism, the combination with an inclined track-section adapted to receive the car to be dumped; of a member adapted to engage and raise the end-gate of a car upon its entry onto such track-section, said member being oscillatory about an axis located below the point of such engagement.

53. In car-dumping mechanism, the combination of an oscillatory track-section; means normally maintaining said track-section in an inclined position, the weight of a car being adapted, however, to depress the same; and a member adapted to engage and

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raise the end-gate of a car upon its entry onto such track-section, said member being oscillatory about an axis located below the point of such engagement.

54. In car-dumping mechanism, the combination of an oscillatory track-section; means normally maintaining said track-section in an inclined position, the weight of a car being adapted, however, to depress the same; a member adapted to engage and raise the end-gate of a car upon its entry onto such track-section, said member being oscillatory about an axis below the point of such engagement; and means normally positioning said member.

55. In car-dumping mechanism, the combination of an oscillatory track-section; means normally maintaining said track-section in an inclined position, the weight of a car being adapted, however, to depress the same; a cross-bar adapted to engage and raise the end-gate of a car upon its entry onto such track-section, said bar being oscillatorily supported about an axis corresponding with the axis of oscillation of said track-section; and means normally positioning said cross-bar.

56. In car-dumping mechanism, the combination of an oscillatory track-section; means normally maintaining said track-section in an inclined position, the weight of a car being adapted, however, to depress the same; a frame pivotally mounted about the axis of oscillation of said track-section, said frame including a cross-bar adapted to engage and raise the end-gate of a car upon its entry onto such track section; sheaves; and a counterweighted cable guided over said sheaves and connected with said frame to normally position the same.

57. In car-dumping mechanism, the combination of two superposed tracks; an oscillatory track-section; means normally positioning the same in working relation with the upper of said tracks, the weight of a car being adapted to depress said track-section into such relation with the lower thereof; and means adapted to secure said track-section in each of such positions respectively, such means in connection with the upper track being manually operable, those in connection with the lower track being automatically operable by the passage of a car from said track-section.

58. In car-dumping mechanism, the combination of two superposed tracks; an oscillatory track-section; means normally positioning the same in working relation with the upper of said tracks, the weight of a car being adapted to depress said track-section into such relation with the lower thereof; and means adapted to secure said track-section in such lower position, said means being automatically operable by the passage of a car from said track-section.

59. In car-dumping mechanism, the combination of two superposed tracks; an oscillatory track-section; means normally positioning the same in working relation with the upper of said tracks, the weight of a car being adapted to depress said track-section into such relation with the lower thereof; a latch adapted to secure said track-section in such lower position; and a trip mounted in said lower track and adapted upon the passage of a car thereover to withdraw said latch.

60. The combination of a track; a movable track-section adapted to register therewith; a movable stop on said track adapted to control the admission of cars onto said track-section; a weighted arm adapted to operatively position said stop; and a bar borne by said track-section and adapted to engage and raise said arm to render said stop inoperative as said track-section comes into register with said track.

61. The combination of a track; a movable track-section adapted to register therewith; a movable stop on said track adapted to control the admission of cars onto said track-section; a weighted arm adapted to operatively position said stop; a reciprocable bar borne by said track-section and adapted normally to engage and raise said arm to render said stop inoperative as said track-section comes into register with said track; and a trip-arm on said track-section adapted to be actuated by the passage of a car thereover to reciprocate said bar to release said weighted arm.

62. The combination of a track; a movable track-section adapted to register therewith; a rock-shaft substantially parallel with said track; a horn mounted upon said shaft and adapted in one position thereof to stop a car on said track; a weighted arm mounted upon said shaft and adapted to thus operatively position said horn; a reciprocable bar borne by said track-section and adapted normally to engage and raise said arm to render said stop inoperative as said track-section comes into register with said track; and a trip-arm on said track-section adapted to be actuated by the passage of a car thereover to reciprocate said bar to release said weighted arm.

63. In car-dumping mechanism, the combination of two superposed tracks, an oscillatory track-section; means normally positioning the same in working relation with the upper of said tracks, the weight of a car being adapted to depress said track-section into such relation with the lower thereof; a movable car stop on said upper track adapted to control the admission of cars onto said track-section; a weighted arm adapted normally to operatively position said stop; a reciprocable bar borne by said track-section and adapted normally to engage and

raise said arm; and a trip-arm on said track-section adapted to be actuated by the passage of a car thereover to reciprocate said bar to release said weighted arm.

- 5 64. In mechanism of the class described, the combination of a track; and means for controlling the movement of a car along such track, such means including a carriage movable along said track and provided with
10 anti-friction means disposed to receive the wheels of such car.

65. In car-dumping mechanism, the combination of an inclined track-section adapted to receive the car to be dumped; and means
15 for controlling the movement of a car down such track-section, such means including a carriage movably mounted on the same and

provided with anti-friction means disposed to receive the wheels of such car.

66. In car-dumping mechanism, the combination of an inclined track-section adapted to receive the car to be dumped; and means for controlling the movement of a car down such track-section, such means including a carriage movably mounted on the same and
25 provided with rollers adapted to receive the wheels of such car.

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

FRANK C. GREENE.
OSCAR V. GREENE.

Attested by—

E. R. RODD,
JNO. F. OBERLIN.