O. V. GREENE & J. E. CHINNOCK.

CROSSOVER DUMP.

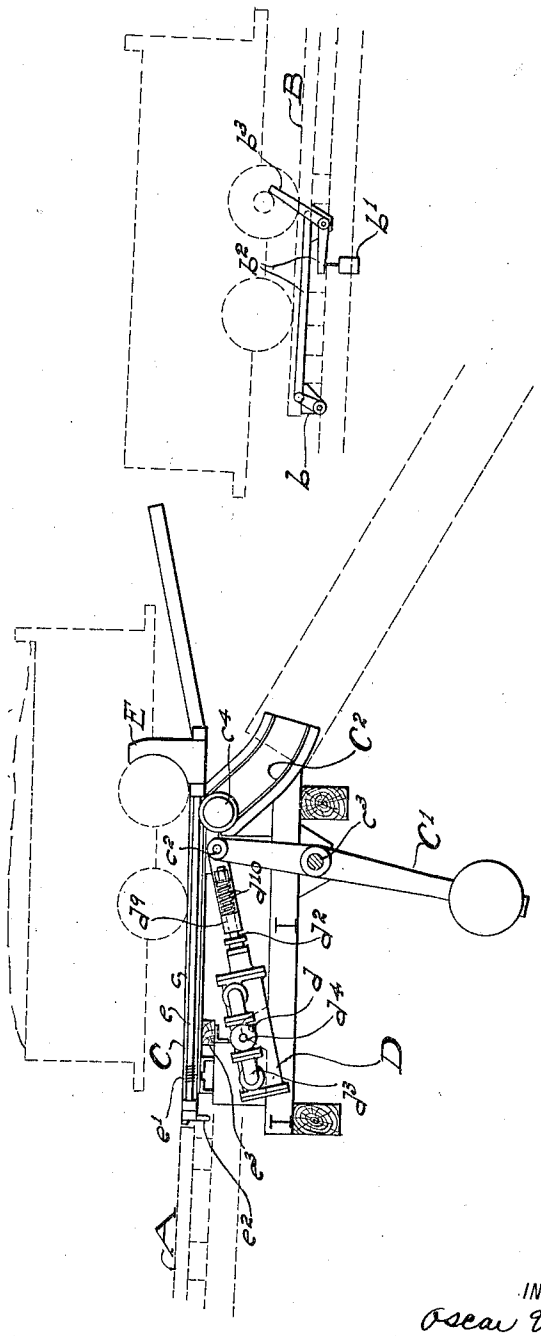
APPLICATION FILED JULY 8, 1910.

1,067,730.

Patented July 15, 1913.

4 SHEETS—SHEET 1.

FIG. 1



WITNESSES:

Robert M. Sutton

Geo. F. Oberlin

INVENTORS

Oscar V. Greene and

James E. Chinnock

By J. B. Fay

ATTORNEY

O. V. GREENE & J. E. CHINNOCK.

CROSSOVER DUMP.

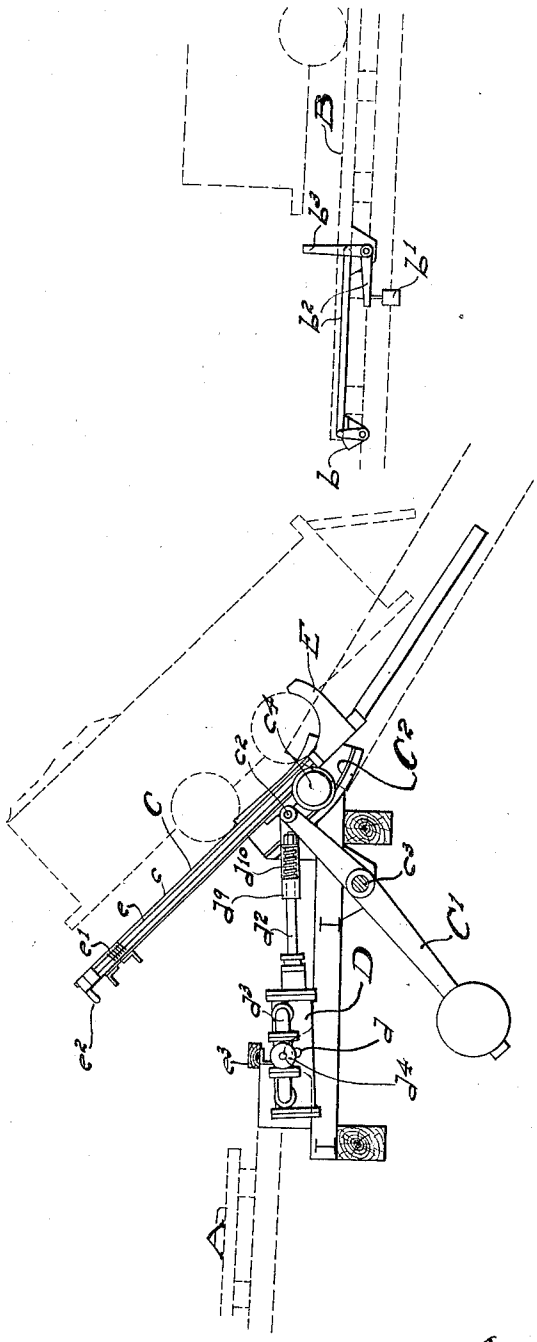
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4 SHEETS—SHEET 2.

FIG. 2



WITNESSES:

Robert M. Sage

Jno. F. Oberlin

INVENTORS

Oscar V. Greene and

James E. Chinnock

BY

J. B. Fay

ATTORNEY

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

O. V. GREENE & J. E. CHINNOCK.

CROSSOVER DUMP.

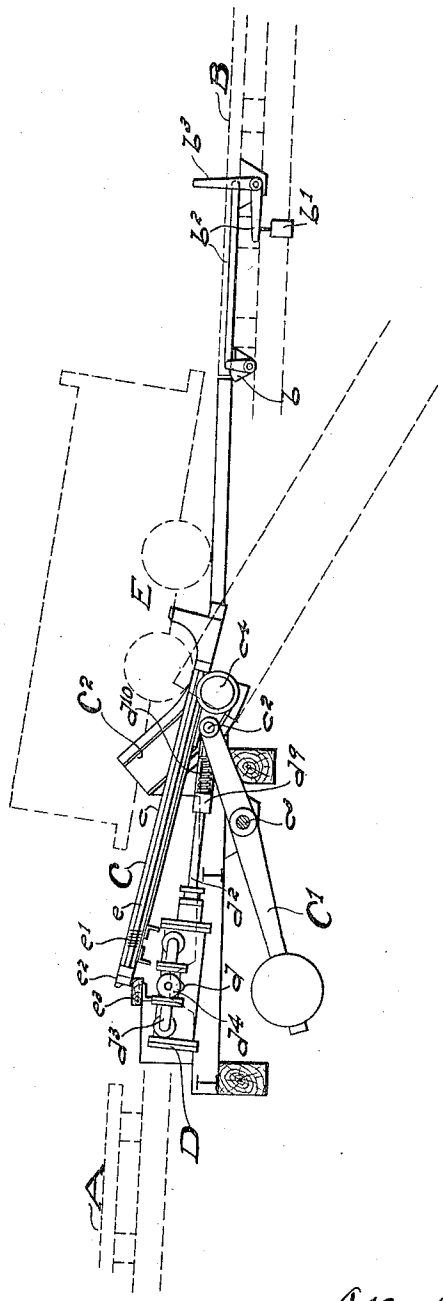
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4 SHEETS—SHEET 3.

FIG. 3



WITNESSES:

Robert M. Sutton

Jno. F. Oberlin

INVENTORS

Oscar V. Greene and

James E. Chinnock

BY

J. B. Fay

ATTORNEY

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

O. V. GREENE & J. E. CHINNOCK.

CROSSOVER DUMP.

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4 SHEETS—SHEET 4.

FIG. 4

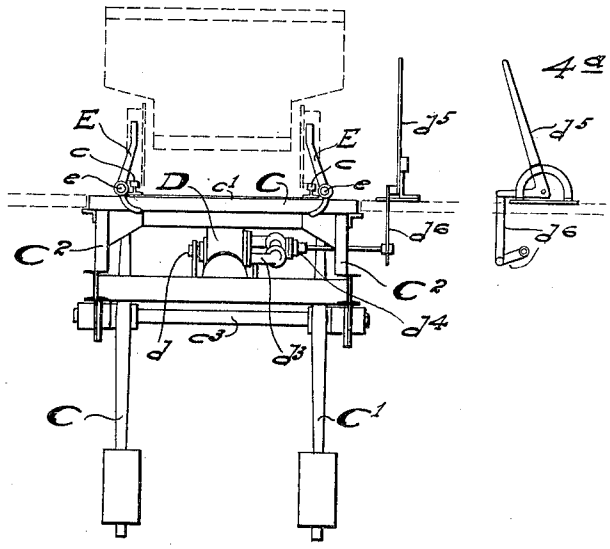


FIG. 5

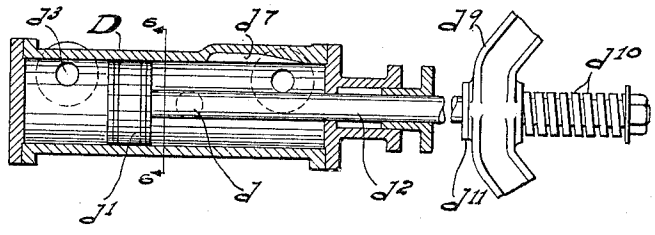
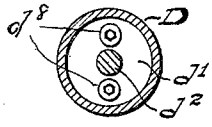


FIG. 6



WITNESSES:

Robert M. Sutz

Jno. F. Oberlin

INVENTORS

Oscar V. Greene and

James E. Chinnock

BY

J. B. Fay

ATTORNEY

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

OSCAR V. GREENE AND JAMES E. CHINNOCK, OF CLEVELAND, OHIO, ASSIGNORS TO FRANK C. GREENE, OF CLEVELAND, OHIO.

CROSSOVER-DUMP.

1,067,730. Specification of Letters Patent. Patented July 15, 1913.

Application filed July 8, 1910. Serial No. 570,924.

To all whom it may concern:

Be it known that we, OSCAR V. GREENE and JAMES E. CHINNOCK, citizens of the United States, and residents of Cleveland, county of Cuyahoga, State of Ohio, have jointly invented a new and useful Improvement in Crossover-Dumps, 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 present invention, relating as indicated to car dumping mechanism, has regard more particularly to that type of car dump known as a cross-over dump. As distinguished from the superposed track type of dumping mechanism, where the tilting platform or track-section utilized to dump the car is located at the end of the car delivery track, such cross-over dump is characterized by having said tilting track-section interposed between the two portions of a discontinuous track. Such track is preferably inclined so that the movement of the cars therealong will be occasioned by gravity, and thus the one track part, corresponding to the car-delivery track of the superposed system, will be higher than the other part, whereon the empty car is received at the completion of the dumping operation. The interposed tilting track section then normally registers with the higher portion of the main track, but is depressible into register with the lower portion thereof, its oscillation, or tilting, to discharge the car's contents occurring incidentally to such depression.

The object of the present invention is the provision of a simple and compact structure for the supporting and tilting of such track section, whereby its movement, while entirely automatic under the load of the car, may nevertheless be regulated with the greatest nicety and exactness, so as to properly dump the car and secure the discharge of its contents in a thin sheet over the screws, such as is desirable in order to thoroughly eliminate all slack.

To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

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

In said annexed drawings:—Figure 1 is a side elevational view of our improved car dumping mechanism in its normal, or car receiving, position, a loaded car being shown thereon in dotted outline, while an empty car is similarly shown on the car discharge track as it would appear just following the return of the track-section to such normal position; Fig. 2 is a view similar to Fig. 1, but showing the tilting track-section in its dumping position; Fig. 3 is again a view similar to Fig. 1, but showing the aforesaid track-section in its car discharging position; Fig. 4 is a rear elevation of the dumping mechanism complete; Fig. 4^a is a side elevational view of a detail; Fig. 5 is a central, longitudinal section of a regulating cylinder forming a feature of the mechanism; and Fig. 6 is a transverse section of such cylinder showing the piston head in elevation.

As has been indicated, our improved dump is designed to be interposed in an inclined, discontinuous track of which the one portion A leading to the dumping station may be called the car delivery track, and the other portion B leading therefrom, the car discharge track. While these two track portions are similarly inclined as though forming semi-detached portions of one continuous track, such lower portion is also preferably on a slightly lower level than it would occupy were it exactly in alinement with the car delivery track. The interposed track-section C, which constitutes the main element of the dumping mechanism proper, is not designed at any time to fully bridge the gap between such two track portions. In its normal upper position, shown in Fig. 1, the rear end of such track-section registers with the car delivery track; while, upon being suitably depressed from its normal position, the front end of such track-section similarly registers with the car discharge track; and intermediately between these two positions, and incidentally to its movement from the one to the other, it is tilted at a more or less sharp angle, one sufficient, in other words, to discharge a car resting thereon of its contents. The two rails *c* of the track-sec-

tion C are joined together by means of plates c' or other suitable frame structure so as to constitute, in effect, a platform, and such rails are furthermore bent in a vertical plane so as to constitute the track section of two portions corresponding with its respective ends slightly inclined, the one to the other. The track section, thus constructed, is oscillatorily supported upon a transverse shaft c^2 suitably secured to its under side and a point somewhat to the rear of the bend in the rails, such shaft being carried in turn by the upper ends of two similar counterweighted arms C′ oscillatory about a second shaft c^3 that is journaled in the frame work of the tipple or other structure, wherein the dumping mechanism is installed. It is, of course, immaterial what form such counterweighted arms are given, or whether they be thus directly joined to the cross-shaft c^2 of the track section. About an axis forwardly of this shaft c^2 two rollers or wheels c^4 are rotatably attached to the track-section, one on each side, such rollers operating in correspondingly disposed guide-ways C^2 conveniently formed by sections of angle-iron secured to the faces of vertical plates likewise incorporated in the main supporting structure. These guide-ways incline downwardly and forwardly and also curve outwardly, as clearly appears in Fig. 1 above referred to, and their effect, taken in conjunction with the counterweighted lever arms C′, is to variously incline the track-section C as said arms are oscillated about their supporting shaft c^3. Thus in Fig. 1, the track-section is maintained by the aforesaid means in a substantially horizontal position, so that the forward portion of such section inclines upwardly; while in Fig. 2, the whole track-section tilts sharply forward; and in Fig. 3, the forward portion of the track-section is disposed substantially horizontal, so as to correspond with the discharge track, while the rear portion is inclined upwardly. The effect of the counterweights on the arms C′ is, of course, to normally retain the track section in the first of these positions, but the relative arrangement of the two axes, one fixed and the other movable, defined by the shaft c^3 and the rollers c^4, respectively, is such that when a car is received on the track-section, it will serve to overbalance the aforesaid counterweights and cause the track-section automatically to move through the position of Fig. 2 into the position of Fig. 3. This movement, to be sure, requires to be regulated, such regulating means in their preferred construction, illustrated, comprising a liquid-containing cylinder D oscillatorily mounted about an axis d below the rear portion of the track-section when in its normal raised position, and a piston d' reciprocable in said cylinder and having its piston-rod d^2 pivotally connected with the shaft, and thus with the track-section. The detailed construction of this cylinder and piston is more fully shown in the sectional view of Fig. 5. From an inspection of this figure and the first three, it will be seen that the respective ends of the cylinder are connected by an external by-pass d^3 so as to permit the flow of a liquid, such as dead oil, wherewith the cylinder is filled, to take place from in front of the piston to its rear end, as such piston moves within the cylinder. The flow of the oil through the by-pass and thus the movement of the cylinder is controlled by means of a valve d^4, which is operated by a suitable hand-lever d^5 conveniently located adjacent to the dumping station and connected to the stem of the valve by a system of levers and links d^6. In addition to the by-pass thus manually controlled, a slot or longitudinal recess d^7 is formed on the inner face of the cylinder wall near its forward end which permits the by-passing of the liquid, as the piston nears the corresponding limit of its stroke, with the result that such movement is temporarily accelerated. The recess in question, however, is formed so as to be of gradually diminishing cross-section from the outer to the inner end of the cylinder, thus decreasing the flow of liquid therethrough, as such stroke limit is reached, and finally cutting off such flow entirely.

Since regulation of the track section's oscillation is more difficult during the depression and tilting of the track section than during its return movement, we furthermore provide puppet valves d^8 in the piston head, as shown in Fig. 6, whereby the return of the piston is rendered correspondingly easy with the minimum of retardation owing to the presence of oil in the cylinder.

The piston-rod d^2 is not connected directly with the track section C or rather shaft c^2 forming a part of such section, but by means of a yoke d^9, Figs. 1, 2 and 3. As appears in Fig. 5, the rod passes through such yoke and beyond so that a compression spring d^{10} may be interposed between its end and the yoke. Normally such spring will retain the yoke in contact with a collar d^{11} on the rod that forms a stop, limiting relative movement in one direction; but upon the reception of the car on the track, the jar that is imparted to such car is taken up by the spring, thus saving the cylinders and connections from shock and obviating the necessity of using any resilient stop, with corresponding complication, on the track-section itself. For stop means on the track-section, then, we use two upwardly projecting horns E that are carried by means of shaft e disposed longitudinally of the upper or main portion of the track-section, one on each side. These horns are

disposed substantially at the bend in the rails of the track-section so as to position the car, when received on the latter, in the fashion previously described. With the shafts, coil springs e', or like means are provided which tend to rotate the same, so as to normally position the horns E in vertical position, where they serve to stop the car, as shown in Figs. 1 and 2. Inwardly directed arms e^2, however, are provided at the rear ends of the respective shafts e, the disposition of which is such, that as the track-section assumes its discharge position (Fig. 3), they engage with a plate or shelf e^3 rigid with the supporting structure, and are actuated so as to throw the horns outwardly, thus freeing the car and permitting it to run off the track-section onto the car-discharge track. Upon the track-section being raised preliminarily to its return movement, the horns of course, at once spring back into place and are thus ready to stop the succeeding car, when received thereon in the normal position of the track section.

As the tilting track-section settles into the car-discharge position of Fig. 3, its forward end is brought into engagement with a latch b normally maintained in operative position by a counter-weight b' that acts through a system of connecting levers and links b^2. Such a latch is necessary, since otherwise, as the car ran off the track-section, the forward end in question might be depressed by its weight below the discharge track B and furthermore a very considerable strain would be imposed upon the pivotal connections and the track-section itself. Since, however, the track-section in rising to its normal position must necessarily repeat the movements previously described, but in reverse order, such latch requires to be withdrawn, before return movement can begin. Withdrawal of the latch is accomplished automatically by the car, as it passes onto the discharge track, engaging the upwardly extending end of a lever b^3 forming part of the system previously referred to, and thus operatively connected with the latch. The effect of such engagement is clearly illustrated in Fig. 1, where, furthermore, the track-section is shown in its fully raised or normal position.

The general cycle of operations alone need be presented in review, since the mode of operation of the several component parts of the mechanism should be fully apparent from what has already been said. The loaded car is received onto the track-section C and there held by engagement of its forward wheels with horns E that are operatively positioned for this purpose. The by-pass d^3 in the controlling cylinder is closed at this stage and no movement of the track section need hence follow the reception of the car thereon, other than that incidental to the taking up of the shock of stopping the car, which may cause a compression of the spring d^{10} connecting the piston-rod with the track-section. Whether the by-pass be opened simultaneously or subsequently, the effect of such opening is next to permit the floating track-section to tilt forwardly, thus dumping the car of its contents. The progress of this movement may be arrested at any stage by the control exercised over the by-pass, until near its end, when the supplementary internal by-pass d^7 comes into play. Ordinarily, however, the manually-controlled by-pass will be opened and the operation allowed to proceed without further attention. As the emptying of the car is completed and the track-section swings back into its lower horizontal position in register with the discharge track, the horns are thrown out, and the car allowed to proceed, under the influence of gravity, onto such discharge track. The latch being withdrawn by the car, the counterweights now become again effective, and the track-section is swung back into its normal position, ready to receive another loaded car.

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 desclosed, provided the means stated by any one of the following claims or the equivalent of such stated means be employed.

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

1. In a cross-over dump, the combination with a discontinuous track; of an interposed tilting track-section normally in register with one portion of said track, but bodily movable into register with the other portion thereof; a lever member connected therewith and oscillatory about a fixed axis; and relatively fixed guide means adapted to oscillate said track-section with respect to said member upon such bodily movement of the section.

2. In a cross-over dump, the combination with a discontinuous track; of an interposed tilting track-section normally in register with one portion of said track, but bodily movable into register with the other portion thereof; a lever member connected therewith and oscillatory about a fixed axis; and a relatively fixed guideway adapted to oscillate said track-section with respect to said member upon such bodily movement of the section.

3. In a cross-over dump, the combination with a discontinuous track; of an interposed tilting track-section; a counterweighted lever arm connected therewith and pivotal about a fixed axis, said lever arm normally retaining said track-section in register with one portion of said track, but said track-section being bodily movable into register

with the other portion thereof; and relatively fixed guide means adapted to oscillate said track-section with respect to said lever-arm upon movement of said section.

4. In a cross-over dump, the combination with a discontinuous track; of an interposed tilting track-section; a counterweighted lever arm connected therewith and pivotal about a fixed axis, said lever arm normally retaining said track-section in register with one portion of said track, but said track-section being bodily movable into register with the other portion thereof; and relatively fixed guideways adapted to oscillate said track-section with respect to said lever-arm upon movement of said section.

5. In a cross-over dump, the combination with an inclined discontinuous track; of an interposed tilting track-section; a counterweighted lever arm connected therewith and pivotal about a fixed axis, said lever arm normally retaining said track-section in register with the higher portion of said track, but said track-section being depressible into register with the lower portion thereof; and a relatively fixed, forwardly and downwardly inclining guideway engaging said track-section and adapted to oscillate the same with respect to said lever arm upon movement of the latter.

6. In a cross-over dump, the combination with an inclined discontinuous track; of an interposed tilting track-section; a counterweighted lever arm connected therewith and pivotal about a fixed axis, said lever arm normally retaining said track-section in register with the higher portion of said track, but said track-section being depressible into register with the lower portion thereof; and a relatively fixed, forwardly and downwardly inclining, outwardly curved guide-way engaging said track-section and adapted to oscillate the same with respect to said lever arm upon movement of the latter.

7. In a cross-over dump, the combination with a discontinuous track; of an interposed tilting track-section normally in register with one portion of said track, but bodily movable into register with the other portion thereof; a lever member connected therewith and oscillatory about a fixed axis; relatively fixed guide means adapted to oscillate said track-section with respect to said member such bodily movement of the section; and means adapted to regulate such oscillation.

8. In a cross-over dump, the combination with a discontinuous track; of an interposed tilting track-section normally in register with one portion of said track, but bodily movable into register with the other portion thereof; a lever member connected therewith and oscillatory about a fixed axis; a relatively fixed guide-way engaging said track-section and adapted to oscillate the same with respect to said member upon such bodily movement of the section; and retarding means connected with said member and adapted to regulate such oscillation.

9. In a cross-over dump, the combination with a discontinuous track; of an interposed tilting track-section normally in register with one portion of said track, but bodily movable into register with the other portion thereof; a lever member connected therewith and oscillatory about a fixed axis; relatively fixed guide means adapted to oscillate said track-section with respect to said member upon such bodily movement of the section; a cylinder provided with a by-pass; and a piston in said cylinder connected with said member, whereby such oscillation may be controlled.

10. In a cross-over dump, the combination with a discontinuous track; of an interposed tilting track-section; a counterweighted lever arm connected therewith and pivotal about a fixed axis, said lever arm normally retaining said track-section in register with one portion of said track, but said track-section being bodily movable into register with the other portion thereof; relatively fixed guide means adapted to oscillate said track-section with respect to said lever-arm upon movement of said section; a cylinder provided with a by-pass; and a piston in said cylinder connected with said lever arm, whereby such oscillation may be controlled.

11. In a cross-over dump, the combination with an inclined discontinuous track; of an interposed tilting track-section; a counterweighted lever arm connected therewith and pivotal about a fixed axis, said lever arm normally retaining said track-section in register with the higher portion of said track, but said track-section being depressible into register with the lower portion thereof; a relatively fixed guideway engaging said track-section and adapted to oscillate the same with respect to said lever arm upon movement of the latter; a cylinder provided with a by-pass; a piston in said cylinder connected with said lever arm; and manually operable means for controlling such by-pass, whereby such oscillation may be variably regulated.

12. In a cross-over dump, the combination with a discontinuous track; of an interposed tilting track-section normally in register with one portion of said track, but bodily movable into register with the other portion thereof; a lever member connected therewith and oscillatory about a fixed axis; relatively fixed guide means adapted to oscillate said track-section with respect to said member upon such bodily movement of the section; a cylinder provided with a by-pass; and a piston in said cylinder resiliently connected with said member, whereby

oscillation of said track-section is controlled by the reciprocation of said piston.

13. In a cross-over dump, the combination with a discontinuous track; of an interposed tilting track-section; a counterweighted lever arm connected therewith and pivotal about a fixed axis; said lever arm normally retaining said track-section in register with one portion of said track, but said track-section being bodily movable into register with the other portion thereof; relatively fixed guide means adapted to oscillate said track-section with respect to said lever-arm upon movement of said section; a cylinder provided with a by-pass; a piston in said cylinder; and resilient connections between said piston and lever arm, whereby the oscillation of said track-section is controlled by the reciprocation of said piston.

14. In a cross-over dump, the combination with a discontinuous track; of an interposed tilting track-section normally in register with one portion of said track, but bodily movable into register with the other portion thereof; a lever member connected therewith and oscillatory about a fixed axis; relatively fixed guide means adapted to oscillate said track-section with respect to said member upon such bodily movement of the section; a cylinder provided with two by-passes; manually operable means for controlling one of said by-passes; and a piston in said cylinder connected with said member, whereby the oscillation of said track-section is controlled by the reciprocation of said piston.

15. In a cross-over dump, the combination with an inclined discontinuous track; of an interposed tilting track-section; a counterweighted lever arm connected therewith and pivotal about a fixed axis, said lever arm normally retaining said track-section in register with the higher portion of said track, but said track-section being depressible into register with the lower portion thereof; a relatively fixed guide-way engaging said track-section and adapted to oscillate the same with respect to said lever arm upon movement of the latter; a cylinder provided with two by-passes; manually operable means for controlling one of said by-passes; a piston in said cylinder; and resilient connections between said piston and lever arm, whereby the oscillation of said track-section is controlled by the reciprocation of said piston.

16. In a cross-over dump, the combination with an inclined discontinuous track; of an interposed tilting track-section; a counterweighted lever arm connected therewith and pivotal about a fixed axis, said lever arm normally retaining said track-section in register with the higher portion of said track, but said track-section being depressible into register with the lower portion thereof; a relatively fixed guide-way engaging said track-section and adapted to oscillate the same with respect to said lever arm upon movement of the latter; a cylinder provided with an external by-pass and an internal by-pass; a manually operable valve controlling such external by-pass; a piston in said cylinder automatically controlling such internal by-pass; and connections between said piston and lever arm, whereby oscillation of said track-section is controlled by the reciprocation of said piston.

17. In mechanism of the class described, the combination with a tilting track-section; of means for controlling oscillation thereof, said means comprising a cylinder, a piston and piston rod reciprocable within said cylinder, a yoke slidably mounted upon said piston rod and pivotally connected with said track-section, and a compression spring interposed between said yoke and the end of said piston rod.

18. In mechanism of the class described, the combination with a tilting track-section; of means for controlling oscillation thereof, said means comprising a cylinder provided with two by-passes, a manually operable valve for controlling one such by-pass, and a piston in said cylinder connected with said track-section and automatically controlling the other by-pass.

19. In mechanism of the class described, the combination with a tilting track-section; of means for controlling oscillation thereof, said means comprising a cylinder provided with an external by-pass and an internal by-pass, a manually operable valve for controlling such external by-pass, and a piston in said cylinder connected with said track-section and automatically controlling such internal by-pass.

20. In mechanism of the class described, the combination with a tilting track-section; of means for controlling oscillation thereof, said means comprising a cylinder provided with an external by-pass and a by-pass formed in the inner face of the cylinder wall and of varying cross-section longitudinally of the latter, a manually operable valve for controlling such external by-pass, and a piston in said cylinder connected with said track-section and automatically controlling such internal by-pass.

21. In mechanism of the class described, the combination with a tilting track-section; of means for controlling oscillation thereof, said means comprising a cylinder provided with an external by-pass and a by-pass formed in the inner face of the cylinder wall and of diminishing cross-section from the outer to the inner end of the latter, a manually operable valve for controlling such external by-pass, and a piston in said cylin-

der connected with said track-section and automatically controlling such internal by-pass.

22. In mechanism of the class described, the combination with a tilting track-section; of means for controlling oscillation thereof, said means comprising a cylinder provided with a by-pass formed in the inner face of the cylinder wall and of varying cross-section longitudinally of the latter, and a piston in said cylinder connected with said track-section and automatically controlling such by-pass.

23. In mechanism of the class described, the combination with a tilting track-section; of means for controlling oscillation thereof, said means comprising a cylinder provided with a by-pass formed in the inner face of the cylinder wall and of diminishing cross-section from the outer to the inner end of the latter, and a piston in said cylinder connected with said track-section and automatically controlling such by-pass.

24. In a cross-over dump, the combination with a discontinuous track; of an interposed tilting track-section adapted to register with either portion of said track; means tending to retain said track-section in register with one such track-portion; and a locking member adapted to secure said track-section in register with the other track portion, said last-named means being rendered inoperative by the passage of a car on such other track-portion.

25. In a cross-over dump, the combination with a discontinuous track; of an interposed tilting track-section adapted to register with either portion of said track; counterweight means tending to retain said track-section in register with one such track portion; and a latch adapted to secure said track-section in register with the other track portion, said latch being rendered inoperative by the passage of a car along such other track portion.

26. In a cross-over dump, the combination with an inclined discontinuous track; of an interposed tilting track-section adapted to register with either portion of said track; counterweight means tending to retain said track-section in register with the higher track portion; and a latch adapted to retain said track-section in register with the lower track portion, said latch being rendered inoperative by the passage of a car along such lower track portion.

27. In a cross-over dump, the combination with an inclined discontinuous track; of an interposed tilting track-section adapted to register with either portion of said track; counterweight means tending to retain said track-section in register with the higher track portion; and normally operative means adapted to retain a car on said track-section, said means being rendered inoperative when said track-section registers with the lower track portion.

28. In a cross-over dump, the combination with an inclined discontinuous track; of an interposed tilting track-section adapted to register with either portion of said track; counterweight means tending to retain said track-section in register with the higher track portion; stop-members on said track-section normally positioned to retain a car thereon; and means adapted to render said members inoperative upon said track-section coming into register with the lower track portion.

29. In a cross-over dump, the combination with a discontinuous track; of an interposed tilting track-section normally in register with one portion of said track, but bodily movable into register with the other portion thereof; a lever member connected therewith and oscillatory about a fixed axis; and fixed guide means adapted to oscillate said track-section with respect to said member upon bodily movement of the section, said guide means being interposed between said lever member and the discharge portion of said discontinuous track.

Signed by us this 27th day of June 1910.

OSCAR V. GREENE.
JAMES E. CHINNOCK.

Attested by—
ANNA L. GILL,
JNO. F. OBERLIN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."