

964,965.

O. V. GREENE.
CROSSOVER DUMP.
APPLICATION FILED APR. 13, 1908.

Patented July 19, 1910.

4 SHEETS—SHEET 1.

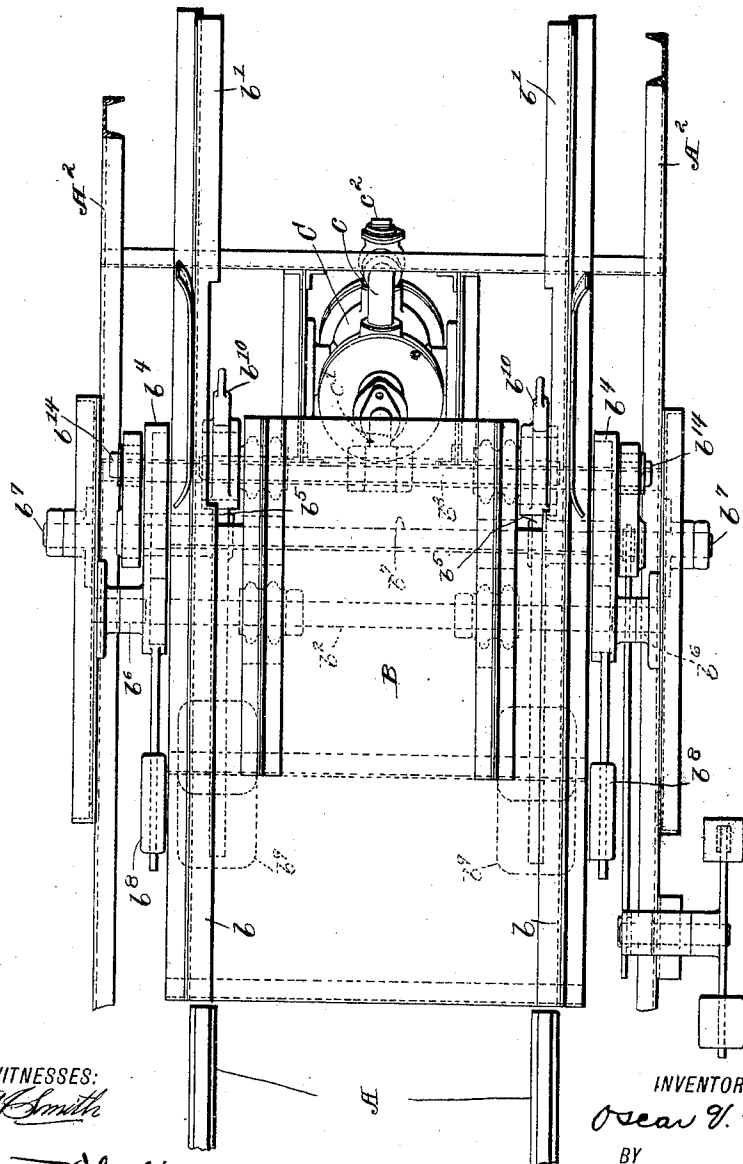
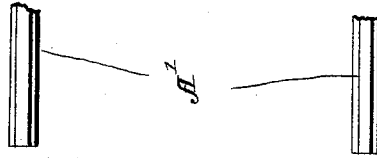


Fig. 1.

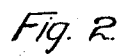
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CROSSOVER DUMP,

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4 SHEETS--SHEET 2.



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4 SHEETS—SHEET 3.

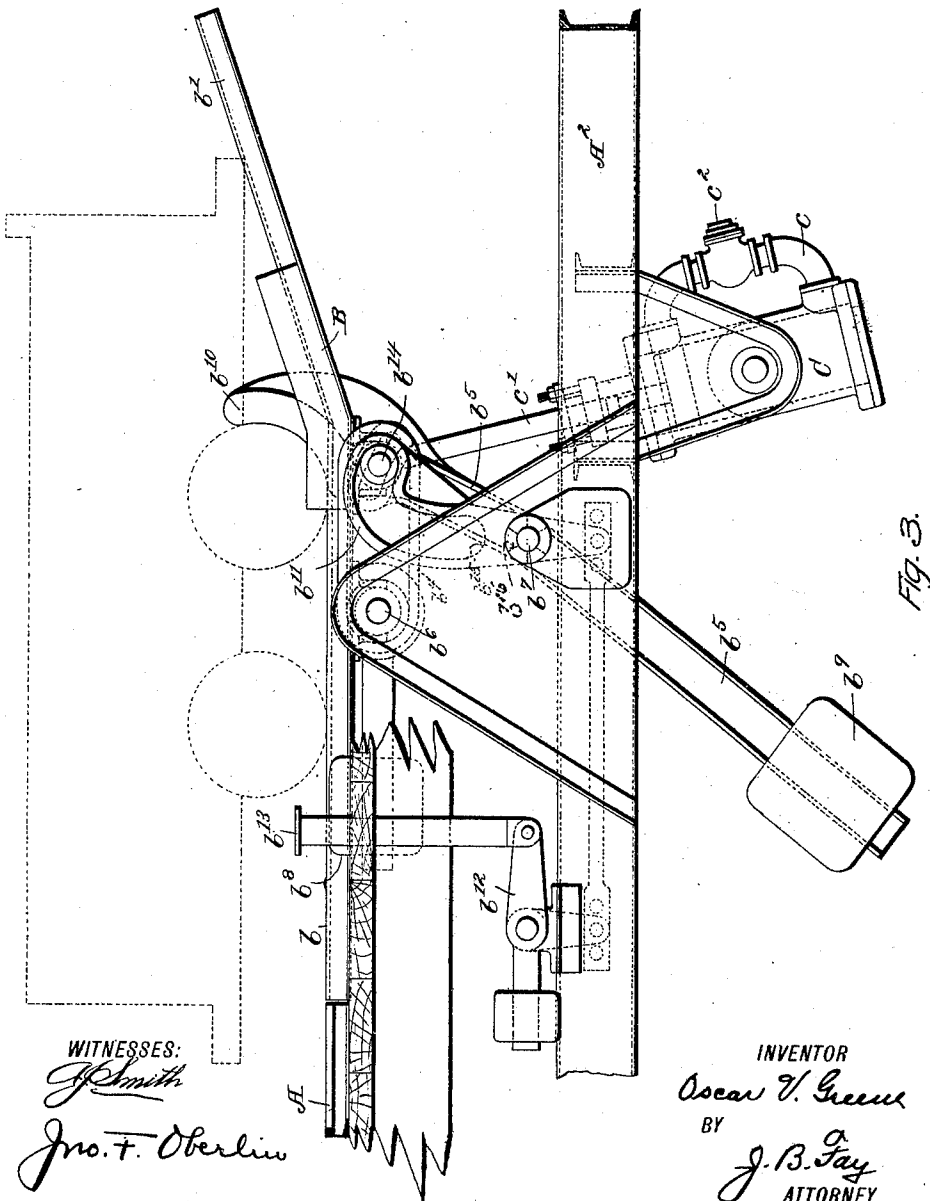
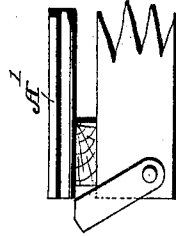


Fig. 3.

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Fig. 4.

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UNITED STATES PATENT OFFICE.

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CROSSOVER-DUMP.

964,965.

Specification of Letters Patent. Patented July 19, 1910.

Application filed April 13, 1908. Serial No. 426,716.

To all whom it may concern:

Be it known that I, OSCAR V. GREENE, citizen of the United States, resident of Cleveland, county of Cuyahoga, and State of Ohio, have 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 I have contemplated applying that principle, so as to distinguish it from other inventions.

The subject-matter of this present invention is a dump particularly designed for use in connection with the dumping of mine cars such as are employed in coal mines and the like. It will of course be understood that such dumping mechanism by suitable modification, all within the spirit of the invention, may be adapted equally well for the handling of cars of various kinds and sizes other than those just referred to. So, too, it will be clear that while, as illustrated, such dumping mechanism is shown as especially adapted for use in connection with a "cross-over dump," it may be easily adapted for use with a superposed track system without any departure from the principle of operation exemplified herein. This principle of operation may be stated as in effect the same as that disclosed and broadly claimed in a pending application of Frank C. Greene, filed August 15, 1906, Serial No. 330,652. In illustration of this principle of operation the present invention, in common with the one disclosed in the application to which reference has just been made, comprises a vertically reciprocable track-section oscillatory about two independently movable axes. By properly controlling the movement of such axes, the track-section is not only made to incline to correspond with the direction of inclination of the car delivery and car discharge tracks with which it is alternately brought into register, but is also made to tilt, incidentally to its reciprocation, at an angle such as to cause the contents of a car placed thereon to be discharged or dumped.

The present invention has as its object the substitution for the guide-ways, employed in the device illustrated in the application of record, of other means whereby the oscillation of the track section incidentally to its reciprocation may be more simply had.

To the accomplishment of this and related

objects, 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 plan view of a cross-over dump embodying my several improvements; Fig. 2 is a front elevation thereof, having regard to the direction of discharge of such dump; Fig. 3 is a side elevation of the same in its normal operative position in which it is adapted to receive a car from the car delivery track; and Fig. 4 is a similar side elevation showing the mechanism, however, in the dumping position, the final position thereof, wherein the car is adapted to be discharged onto the car discharge track, being shown in dotted outline.

My improved dump when it is employed as a cross-over dump, is designed to be interposed in an inclined discontinuous track and consists essentially of a tilting track-section adapted to register with the two portions A A' of such track, respectively. Of such portions, the one portion A leading to the dumping station I shall term the car delivery track, the portion A' leading therefrom, the car discharge track. Not only are the two track portions similarly inclined, but the latter, the car discharge track, is also preferably lowered a trifle below the plane that it would otherwise occupy were it exactly in alinement with the car delivery track. The interposed track-section B is not designed at any time to fully bridge the gap between such two track portions. In its normal upper position, the rear end of such track-section registers with the car delivery track A. Upon being suitably depressed from its normal position, the front end of the track-section is designed to similarly register with the car discharge track A', while intermediate between these two positions and incidentally to its movement from the one to the other, it is tilted at a sharp angle, approximately 45 degrees, whereby a car placed thereon, as has been stated, may be discharged of its contents.

The track-section itself consists of two

portions b b' corresponding with its respective ends and slightly inclined the one to the other. Such track-section further includes two spaced, transversely disposed, shafts b^2 b^3 that are supported by means of two sets of lever arms b^4 b^4 and b^5 b^5 upon a suitable framework A^2 constituting, in the case in hand, a part of the same tippie structure upon which the track portions A A' are borne. The common axis of one set b^4 b^4 of such lever arms, the set connected with the rearmost, or b^2 , of the two transverse shafts, is located on a plane higher than the axis b^7 of the other set b^5 b^5 , and a short distance to the rear thereof, as shown. The axis of such rear set of lever arms is formed by alined pins b^6 b^6 and such arms b^4 b^4 have a sliding pivotal connection with the shaft b^2 in question. They bear in addition suitable counterweights b^8 upon their rearwardly extending ends. The forward lever arms b^5 b^5 are similarly counterweighted (the weights being designated by reference letters b^9 b^9) but they have direct pivotal connection with the corresponding shaft b^3 . The front ends of such forward lever arms furthermore are prolonged so as to form dogs b^{10} that, in the normal raised position of the track-section, project above the same and act as stops for a car received thereon.

Oscillatorily supported below the axis of lever arms b^5 is a dash pot in the form of a cylinder C provided with a by-pass c . In this cylinder reciprocates a piston c' , the upper end of which is directly pivotally connected with the same track section shaft b^3 wherewith such forward lever arms are connected. As shaft b^3 oscillates about the fixed axis b^7 of the lever arms, the piston c' will obviously be forced to reciprocate within the cylinder, and by placing in the latter a quantity of dead oil, or other suitable liquid, and properly adjusting a valve c^2 in the by-pass, such oscillation may be regulated as desired.

The effect of the weights b^8 borne by the rear lever arms b^4 is obviously to maintain the track section in its upper position, such tendency being augmented by the weights b^9 borne by the forward lever arms, which latter further tend to force the track section to the rearmost position permitted by the sliding connection had with such rear set of lever arms. The position of parts illustrated in Fig. 3 is accordingly the position to which they naturally return, by reason of such weighted arms, when the dump is left to itself. In this position, the rearmost set of lever arms are locked against oscillation by catches b^{11} borne by the same shaft b^7 which serves as the pivotal axis for the front set of lever arms. This shaft is adapted to be rocked by means of a counterweighted operating lever b^{12} . As illustrated, such handle is designed to be directly oper-

ated by pressure of the foot on a trip b^{13} , but, of course, such operation may be had by suitable connecting means from any operating station, or may be automatically controlled, as by the passage of the cars along either track portion. The effect of depression of the trip b^{13} , is to swing catches b^{11} forwardly so as to release the lever arms b^4 , by permitting pins b^{14} on the outer faces of said arms to drop, free of said catches, into the position shown in dotted outline in Fig. 4, said arms swinging thus downwardly until the pins b^{14} engage with stops b^{15} formed in the same catches b^{11} . Arms b^5 , are not absolutely freely oscillatory about shaft b^7 , but have a clutch connection b^{16} , Fig. 2, with catches b^{11} whereby such arms upon resuming their normal positions serve simultaneously to restore such catches into place to again lock arms b^4 in place.

Having thus described with sufficient detail the construction of my improved dump, its operation may be briefly set forth. In its position in register with the upper track, already pointed out as being the one normally maintained by the counterweights borne by the respective sets of lever arms, the rearmost b of the two relatively inclined portions, constituting the track-section B, is in substantial alinement with the track portion A constituting the car delivery track. A car freely moving on the latter will hence pass directly onto the track-section, being stopped thereon by engagement with the upper or projecting ends b^{10} of the forward set of lever arms. The weight of the car, loaded as it is, will suffice to overcome the counterweights and cause the depression of the track-section from such normal position. The rear set of lever arms being locked against movement, the first effect of such depression will be the oscillation of the forward set of arms and movement of the rear axis of the track section along the rearmost set of arms, until the parts are positioned as shown in Fig. 4, wherein the track section inclines at the necessary angle to cause discharge of the car's contents. As soon as such discharge has been effected, the trip b^{13} is depressed, and the rear lever arms being now left free to oscillate, the track section swings about the forward shaft as an axis, which at the same time is depressed a short distance farther, until the parts assume the positions shown in dotted outline in Fig. 4. In this position the forward portion b' of the track-section B is substantially alined with the track portion A' constituting the car discharge track, while its rear portion b upon which the car has thus far rested, inclines at a sufficient angle thereto to cause such car to move promptly off the track-section onto the discharge track. This movement is unhindered, for the reason that the forward

lever arms now lie in a substantially horizontal position in which their normally projecting ends b^{10} lie below the level of the track-section and hence no longer serve as stops. The track section being relieved of the weight of the car, is at once returned to its upper position by the counterweighted lever arms, as has already been described. The operation of the retarding device, consisting specifically of the cylinder and bypass, has already been indicated with sufficient detail to render the mode of its co-operation in the foregoing movements of the track section so obvious as to require no further description.

As has been stated in the introductory paragraph, the present invention, while illustrated as adapted for operation as a cross-over dump, is equally well adapted for use in a superposed track system. It has not been deemed necessary to illustrate such adaptation since the only changes necessary to accomplish this result would be in length of lever arms and relative disposition of axes such that the necessary range of vertical movement would be given the track-section to enable it to register with the two superposed tracks instead of with two tracks, the level of which differs by the smaller amount here shown. Such disposition of axes can of course be arranged with a view to inclining the track section in the opposite direction from that here shown when in its final operative position, as may be desired or found necessary.

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 car-dumping mechanism, the combination with two oscillatory supports, of a track-section independently oscillatory about the same, respectively.

2. In car-dumping mechanism, the combination of two oscillatory supports, a track-section oscillatory about the same, respectively, and means normally positioning said supports.

3. In car-dumping mechanism, the combination of two oscillatory supports, a track-section oscillatory about the same, respectively, and means regulating the movement of said supports.

4. In car-dumping mechanism, the combination of two oscillatory supports, a track-section oscillatory about the same, respectively, means regulating the movement of said supports, and means normally positioning the same.

5. In car-dumping mechanism, the combi-

nation with two movable supports, of a track-section pivotally attached to one, and having a sliding pivotal connection with the other, of said supports.

6. In car-dumping mechanism, the combination with two oscillatory supports, of a track-section pivotally attached to one, and having a sliding pivotal connection with the other, of said supports.

7. In car-dumping mechanism, the combination of two oscillatory supports, a track-section pivotally attached to one, and having a sliding pivotal connection with the other, of said supports, and counterweight means normally positioning one of said supports and thereby said track-section.

8. In car-dumping mechanism, the combination of two oscillatory supports, a track-section pivotally attached to one, and having a sliding pivotal connection with the other, of said supports, and an automatic retarding device connected with one of said supports for regulating the movement of said track-section.

9. In car-dumping mechanism, the combination of two oscillatory supports, a track-section pivotally attached to one, and having a sliding pivotal connection with the other, of said supports, counterweight means normally positioning the latter of said supports and an automatic retarding device connected with the former of said supports, whereby said track-section is normally positioned and its movement controlled, respectively.

10. In car-dumping mechanism, the combination with a reciprocable track-section, of an externally supported lever arm pivotally connected with said track-section and adapted to oscillate the same pending its reciprocation.

11. In car-dumping mechanism, the combination with a reciprocable track-section, of an externally supported lever arm having sliding pivotal connection with said track-section and adapted to oscillate the same pending its reciprocation.

12. In car-dumping mechanism, the combination with a reciprocable track-section, of two externally supported lever arms respectively directly pivoted to, and having sliding pivotal connection with, said track-section and adapted to oscillate the same pending its reciprocation.

13. In car-dumping mechanism, the combination of a reciprocable track-section, means normally positioning the same, and an externally supported lever arm pivotally connected with said track-section and adapted to oscillate the same pending its reciprocation.

14. In car-dumping mechanism, the combination of a reciprocable track-section, means normally positioning the same, and an externally supported lever arm having slid-

ing pivotal connection with said track-section and adapted to oscillate the same pending its reciprocation.

15. In car-dumping mechanism, the combination of a reciprocable track-section, means normally positioning the same, and two externally supported levers respectively directly pivoted to, and having sliding pivotal connection with, said track-section and adapted to oscillate the same pending its reciprocation.

16. In car-dumping mechanism, the combination of a reciprocable track-section, means adapted to regulate such reciprocation, and an externally supported lever pivotally connected with said track-section and adapted to oscillate the same pending its reciprocation.

17. In car-dumping mechanism, the combination of a reciprocable track-section, means adapted to regulate such reciprocation, and an externally supported lever having sliding pivotal connection with said track-section and adapted to oscillate the same pending its reciprocation.

18. In car-dumping mechanism, the combination of a member oscillatory about a fixed axis, a track-section pivotally supported by said member and bodily movable therewith, and means for bodily moving said track-section.

19. In car-dumping mechanism, the combination of a member oscillatory about a fixed axis, a track-section pivotally supported by said member and bodily movable therewith, and means for vertically reciprocating said track-section.

20. In car-dumping mechanism, the combination of a member of unvarying length, oscillatory about a fixed axis, a track-section pivotally supported by said member and bodily movable therewith, and means adapted to regulate oscillation of said support.

21. In car-dumping mechanism, the combination of a member of unvarying length, oscillatory about a fixed axis, a track-section pivotally supported by said member and bodily movable therewith, and means directly connected with said track-section and adapted to regulate the movement thereof.

22. In car-dumping mechanism, the combination of a member of varying length, oscillatory about a fixed axis, a track-section pivotally supported by said member and bodily movable therewith, and automatic retarding means directly connected with said track-section and adapted to regulate the movement thereof.

23. In car-dumping mechanism, the combination of a member of varying length, oscillatory about a fixed axis, a track-section pivotally supported by said member and bodily movable therewith, a cylinder

and piston, said cylinder having pass-pipe means whereby the movement of the piston is controlled, and a member directly connecting said piston with said track-section.

24. In a car-dumping mechanism, the combination of a depressible track-section, a member pivotally connected therewith and oscillatory about a fixed axis, and means normally retaining said track-section in elevated position, the weight of a car thereon serving to depress the same.

25. In car-dumping mechanism the combination of a depressible track-section, a member pivotally connected therewith and oscillatory about a fixed axis, means normally retaining said track-section in elevated position, the weight of a car thereon serving to depress the same, and means adapted to regulate such depression.

26. In car-dumping mechanism, the combination of a support oscillatory about a fixed axis, a track-section pivotally attached to said support at one point, and means movably pivotally supporting said track-section at another point.

27. In car-dumping mechanism, the combination of a support oscillatory about a fixed axis, a track-section pivotally attached to said support at one point, means movably pivotally supporting said track-section at another point, and means for bodily moving said track-section.

28. In car-dumping mechanism, the combination of a support oscillatory about a fixed axis, a track-section pivotally attached to said support at one point, means movably pivotally supporting said track-section at another point, and means for vertically reciprocating said track-section.

29. In a car-dumping mechanism, the combination of a support oscillatory about a fixed axis, a depressible track-section pivotally attached to said support at one point, means movably pivotally supporting said track-section at another point, and means normally retaining said track-section in elevated position, the weight of a car thereon serving to depress the same.

30. In car-dumping mechanism, the combination of a support oscillatory about a fixed axis, a depressible track-section pivotally attached to said support at one point, means movably pivotally supporting said track-section at another point, means normally retaining said track-section in elevated position, the weight of a loaded car thereon serving to depress the same, and means adapted to regulate such depression.

31. In car-dumping mechanism, the combination of a reciprocable track-section, automatic retarding means adapted to regulate such reciprocation, and two externally supported lever arms respectively directly pivoted to, and having sliding pivotal con-

nection with, said track-section and adapted to oscillate the same pending its reciprocation.

32. In car-dumping mechanism, the combination of a reciprocable track-section, means normally positioning the same, means adapted to regulate such reciprocation, and an externally supported lever pivotally connected with said track-section and adapted to oscillate the same pending its reciprocation.

33. In car-dumping mechanism, the combination of a reciprocable track-section, means normally positioning the same, means adapted to regulate such reciprocation, and an externally supported lever arm having sliding pivotal connection with said track-section and adapted to oscillate the same pending its reciprocation.

34. In car-dumping mechanism, the combination of a reciprocable track-section, means normally positioning the same, automatic retarding means adapted to regulate such reciprocation, and two externally supported lever arms respectively directly pivoted to, and having sliding pivotal connection with, said track-section and adapted to oscillate the same pending its reciprocation.

35. In car-dumping mechanism, the combination with a reciprocable track-section, of an externally supported counterweighted lever arm pivotally connected with said track-section, said lever arm being adapted to maintain said track-section in normal position and to oscillate the same upon its being moved from such position.

36. In car-dumping mechanism, the combination with a reciprocable track-section, of an externally supported counterweighted lever arm having sliding pivotal connection with said track-section, said lever arm being adapted to maintain said track-section in normal position and to oscillate the same upon its being moved from such position.

37. In car-dumping mechanism, the combination of a reciprocable track-section, two externally supported lever arms, one directly pivoted to said track-section, the other being counterweighted and having a sliding pivotal connection with said track-section, said lever arms being adapted to maintain said track-section in normal position and to oscillate the same upon its being moved from such position.

38. In car-dumping mechanism, the combination of a reciprocable track-section including two spaced transversely disposed shafts, two sets of externally supported lever arms directly pivoted to, and having sliding pivotal connection with said shafts, respectively, and counterweights for such latter set of lever arms adapted to maintain said track-section in elevated position, the other set of lever arms being adapted to

support said track-section substantially horizontally when thus normally positioned and to oscillate the same upon its being depressed from such position.

39. In car-dumping mechanism, the combination of a reciprocable track-section including two spaced transversely disposed shafts, two sets of externally supported lever arms, one set being directly pivoted to said front shaft and the other having sliding pivotal connection with said rear shaft, counterweights for such latter set of lever arms adapted to maintain said track-section in elevated position, the other set of lever arms being adapted to support said track-section substantially horizontally when thus normally positioned and to oscillate the same upon its being depressed from such position, and automatic retarding means connected with the front shaft of said track-section to regulate the movement of the latter.

40. In car-dumping mechanism, the combination of a reciprocable track-section including two spaced transversely disposed shafts, two sets of externally supported lever arms, one set being directly pivoted to said front shaft and the other having sliding pivotal connection with said rear shaft, counterweights for such latter set of lever arms adapted to maintain said track-section in elevated position, the other set of lever arms being adapted to support said track-section substantially horizontally when thus normally positioned and to oscillate the same upon its being depressed from such position, an oscillatorily mounted cylinder provided with a by-pass, and a piston reciprocable in said piston and pivotally connected with the front shaft of said track-section to regulate the movement of the latter.

41. In car-dumping mechanism, the combination of a reciprocable track-section including two spaced transversely disposed shafts, two sets of externally supported lever arms, one set being directly pivoted to said front shaft and the other having sliding pivotal connection with said rear shaft, counterweights for such latter set of lever arms adapted to maintain said track-section in elevated position, the other set of lever arms being adapted to support said track-section substantially horizontally when thus normally positioned and to oscillate the same upon its being depressed from such position, the upper ends of said last-named arms forming stops adapted to project above said track-section in its upper position and to lie below the same in its lower position.

42. In car-dumping mechanism, the combination of a reciprocable track-section including two spaced transversely disposed shafts, two sets of externally supported

lever arms, one set being directly pivoted to said front shaft and the other having sliding pivotal connection with said rear shaft, counterweights for such latter set of lever arms adapted to maintain said track-section in elevated position, the other set of lever arms being adapted to support said track-section substantially horizontally when thus normally positioned and to oscillate the same upon its being depressed from such position, the upper ends of said last-named arms forming stops adapted to project above said track-section in its upper position and to lie below the same in its lower position, and counterweights upon the lower ends of said last-named arms.

43. In car-dumping mechanism, the combination with a tilting track-section, of stop means for retaining a car on said track-section, the operation of said means being automatically effected through, and correlated with, the movement of the latter.

44. In car-dumping mechanism, the combination with a tilting track-section, of stop means for retaining a car on said track-section, said means being operatively connected therewith.

45. In car-dumping mechanism, the combination of a reciprocable track-section, means adapted to oscillate the same pending such reciprocation, and stop means for retaining a car on said track-section, said means being operatively connected therewith.

46. In car-dumping mechanism, the combination of a depressible track-section, means adapted to tilt said track-section upon reciprocation thereof, and an externally supported lever arm pivotally connected with said track-section and adapted in the one position of the same to project thereabove, forming a stop, and in another position to lie below the same.

47. In a cross-over dump, the combination with an inclined discontinuous track, of an interposed tilting track-section normally in register with the higher portion of said track but depressible into register with the lower portion thereof.

48. In a cross-over dump, the combination of an inclined discontinuous track, an interposed tilting track-section normally in register with the higher portion of said track but depressible into register with the lower portion thereof, and means adapted to tilt said track-section upon its being thus depressed.

49. In a cross-over dump, the combination of an inclined discontinuous track, an interposed tilting track-section normally in register with the higher portion of said track but depressible into register with the lower portion thereof, and an externally supported lever arm pivotally connected with said

track-section and adapted to oscillate the same upon its being depressed.

50. In a cross-over dump, the combination of an inclined discontinuous track, an interposed tilting track-section normally in register with the higher portion of said track but depressible into register with the lower portion thereof, and an externally supported lever arm having sliding pivotal connection with said track-section and adapted to oscillate the same upon its being depressed.

51. In a cross-over dump, the combination of an inclined discontinuous track, an interposed tilting track-section normally in register with the higher portion of said track but depressible into register with the lower portion thereof, and two externally supported lever arms respectively directly pivoted to, and having sliding pivotal connection with, said track-section and adapted to oscillate the same upon its being depressed.

52. In a cross-over dump, the combination of an inclined discontinuous track, an interposed tilting track-section normally in register with the higher portion of said track but depressible into register with the lower portion thereof, means adapted to regulate movement of said track-section, and an externally supported lever arm pivotally connected with said track-section and adapted to oscillate the same upon its depression into register with such lower track portion.

53. In a cross-over dump, the combination of an inclined discontinuous track, an interposed tilting track-section normally in register with the higher portion of said track but depressible into register with the lower portion thereof, means adapted to regulate movement of said track-section, and an externally supported lever arm having sliding pivotal connection with said track-section and adapted to oscillate the same upon its depression into register with such lower track portion.

54. In a cross-over dump, the combination of an inclined discontinuous track, an interposed tilting track-section normally in register with the higher portion of said track but depressible into register with the lower portion thereof, means adapted to regulate movement of said track-section, and two externally supported lever arms respectively directly pivoted to, and having sliding pivotal connection with, said track-section and adapted to oscillate the same upon its depression into register with such lower track portion.

55. In a cross-over dump, the combination of an inclined discontinuous track, an interposed tilting track-section adapted to register with the two portions of said track respectively, said track-section including two spaced transversely disposed shafts, two sets of externally supported lever arms directly

pivoted to, and having sliding pivotal connection with, said shafts respectively, and counterweights for such latter set of lever arms adapted to maintain said track-section
5 in register with the upper portion of said track, the other set of lever arms being adapted to support said track-section substantially horizontally when thus positioned and to oscillate the same upon its being de-

pressed into register with such other track 10 portion.

Signed by me this 25th day of March, 1908.

OSCAR V. GREENE.

Attested by—

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