

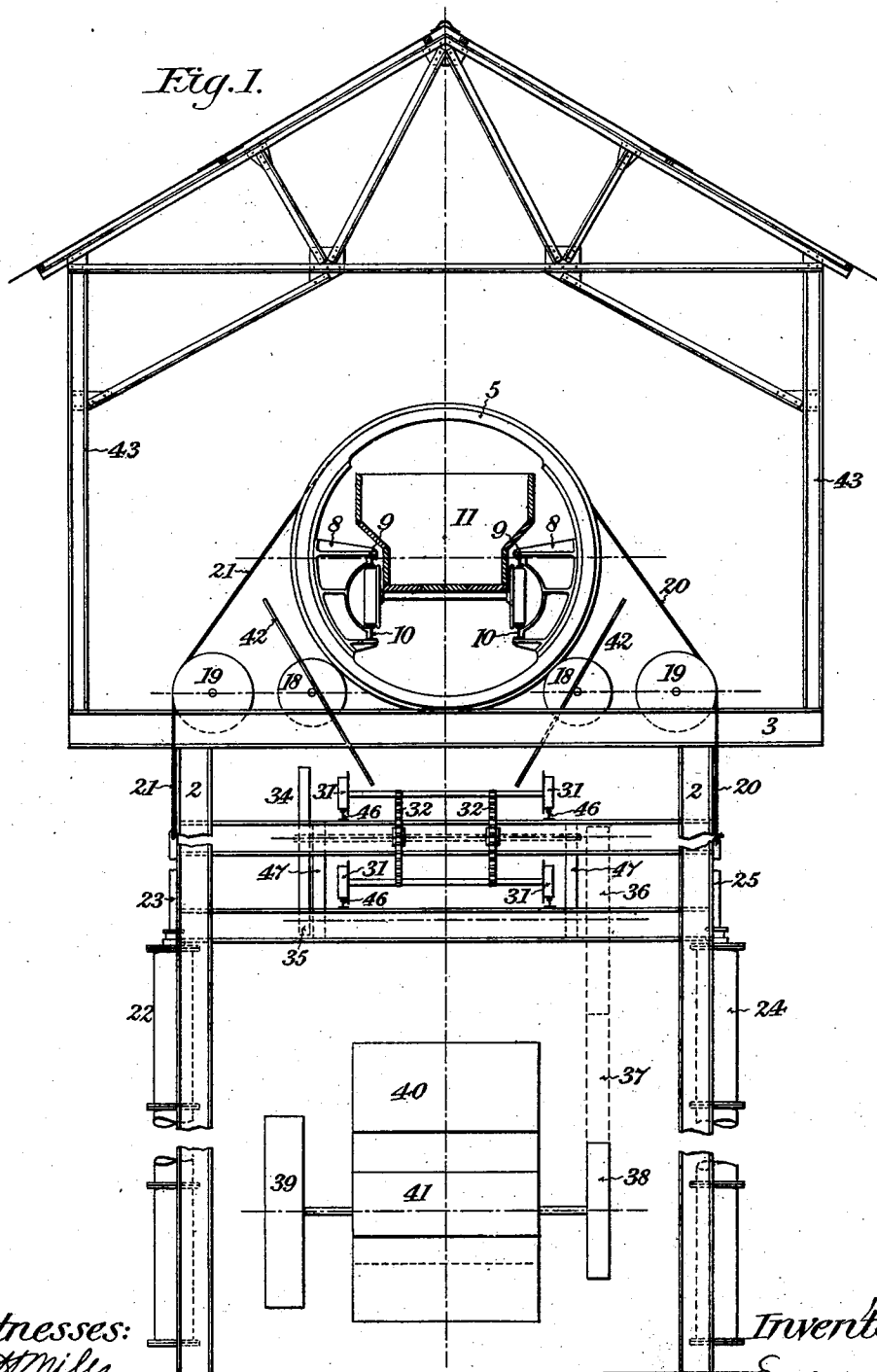
E. RAMSAY.
REVOLUBLE CAR DUMPING STRUCTURE.

(Application filed Nov. 18, 1901.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1.



Witnesses:

W. H. Mills
J. W. Buckhead

Inventor:

E. Ramsay
B. J. Stinson
his attys

E. RAMSAY.

REVOLUBLE CAR DUMPING STRUCTURE.

(Application filed Nov. 18, 1901.)

(No Model.)

4 Sheets—Sheet 2.

Fig. 3.

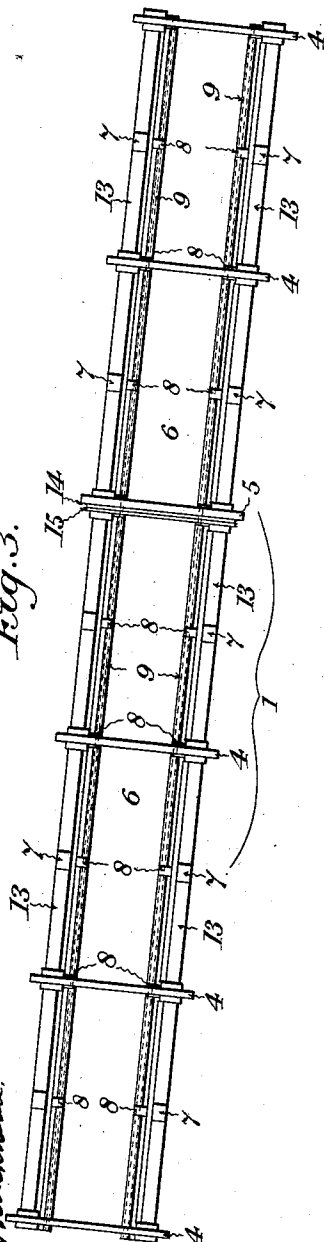
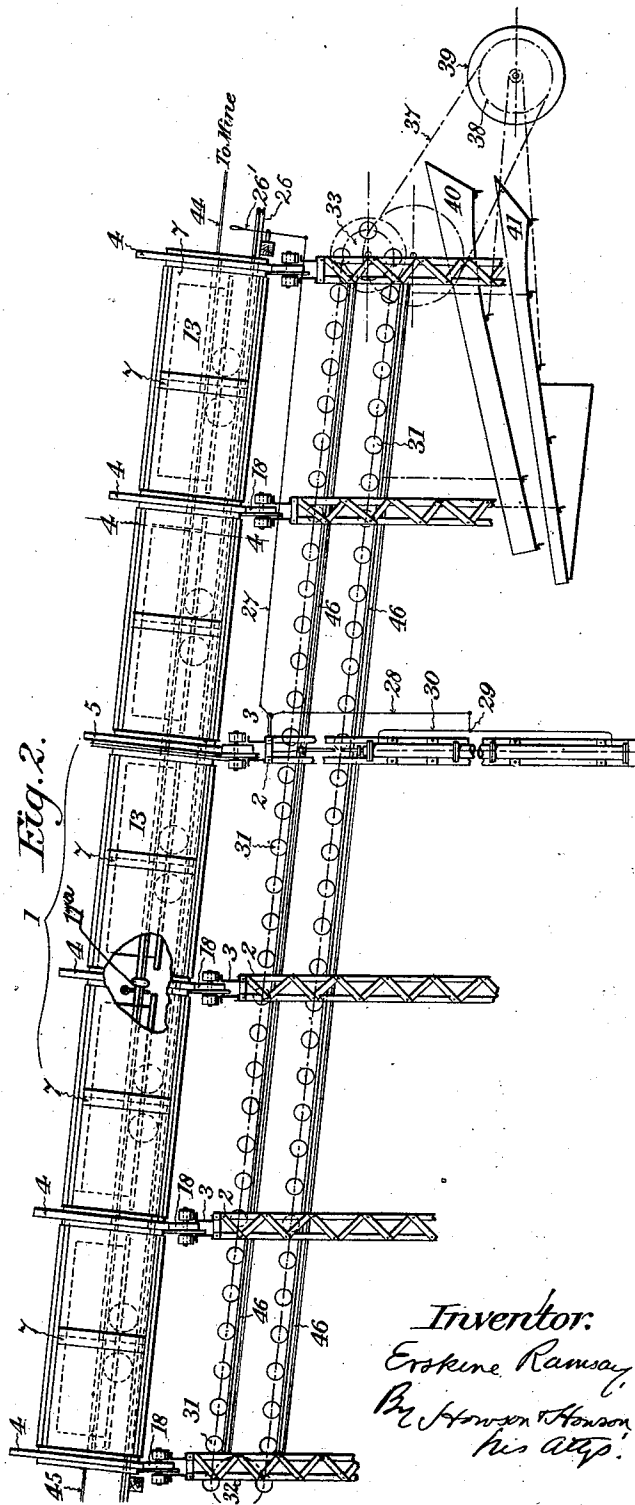


Fig. 2.



Witnesses:
M. A. Milco
J. W. Buckhead.

Inventor:
Erskine Ramsay
By *Johnson & Johnson*
his attys.

No. 701,764.

Patented June 3, 1902.

E. RAMSAY.
REVOLUBLE CAR DUMPING STRUCTURE.

(Application filed Nov. 18, 1901.)

(No Model.)

4 Sheets—Sheet 4.

Fig. 7.

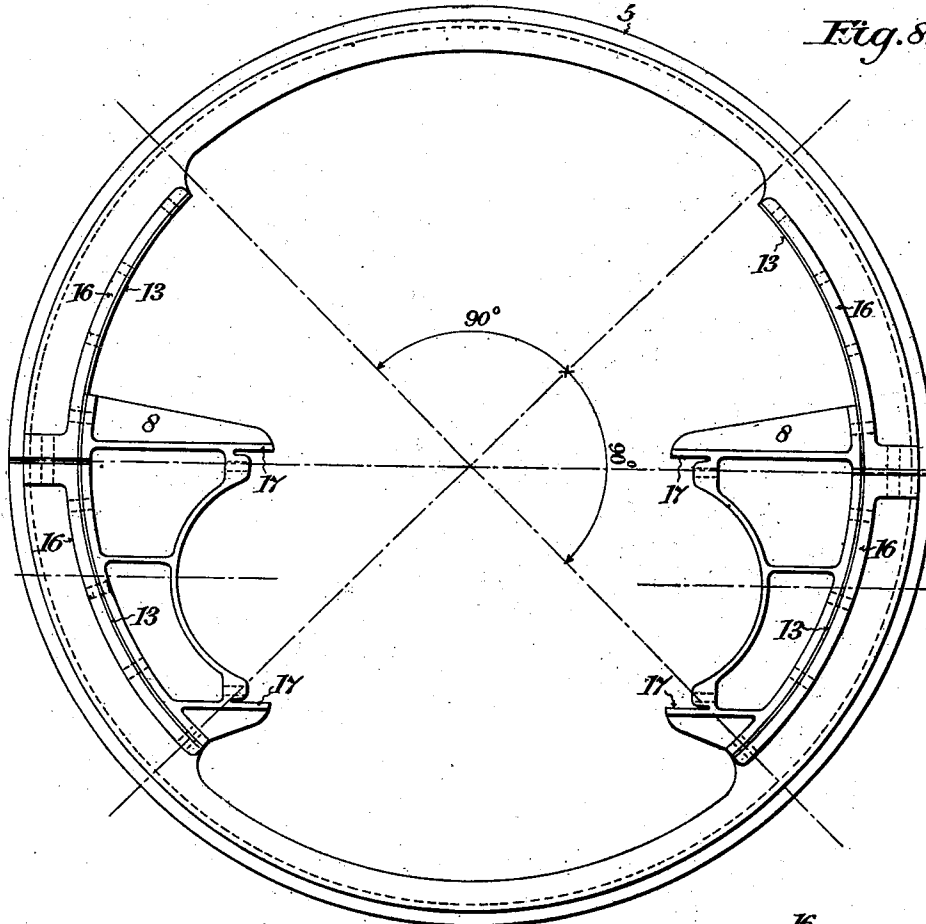


Fig. 8.

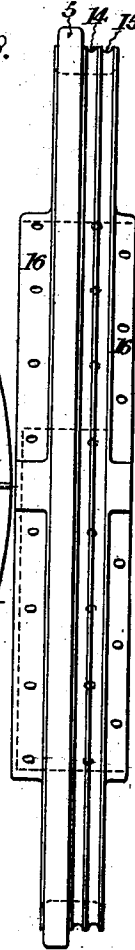


Fig. 9.

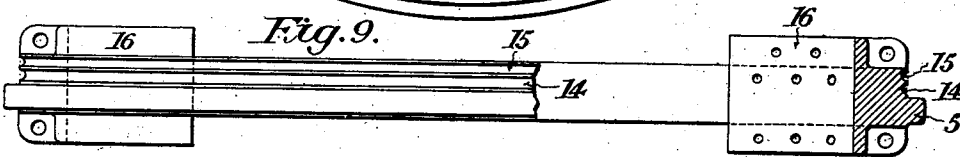
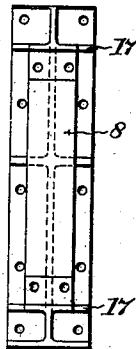


Fig. 10.



Witnesses:
W. H. Miles,
T. W. Buckhead

Inventor:
Erskine Ramsay,
By J. H. Johnson & Son,
his Attys.

UNITED STATES PATENT OFFICE.

ERSKINE RAMSAY, OF BIRMINGHAM, ALABAMA.

REVOLUBLE CAR-DUMPING STRUCTURE.

SPECIFICATION forming part of Letters Patent No. 701,784, dated June 3, 1902.

Application filed November 18, 1901. Serial No. 82,753. (No model.)

To all whom it may concern:

Be it known that I, ERSKINE RAMSAY, a citizen of the United States, residing at Birmingham, county of Jefferson, State of Alabama, have invented certain new and useful Improvements in Revolvable Car-Dumping Structures; of which the following is a specification.

My invention relates to revolving car-dumps; and my object is to provide a dumping structure by which a plurality of cars loaded with material—such as ore, coal, &c.—may be dumped by revolving a structure into which the cars are conveyed from the mine or other place and held in fixed relation thereto, thus turning the cars upside down and discharging the contents thereof into a bin or screen or upon a conveyer, whence the material is either conducted to a crusher of any suitable size or first to a screening apparatus and thence to a crusher or bins or loaded upon cars and conveyed to the blast-furnace ovens or other place.

Prior to my invention it has been the usual practice to employ hopper-bottom cars, or the whole trip, consisting of several cars, has been conveyed from the mines to the tippie, where the cars were detached from the hoisting-rope, uncoupled, and switched singly upon the dumping-track and dumped one at a time, and then made up into empty trips. In such practice there are serious objections encountered, which it is the object of my invention to overcome, among which objections may be enumerated the following: the complicated character of the cars necessitated by the construction of means for opening the bottoms, the height of the cars incident to such construction, the liability of accidents due to the accidental opening of drop-bottoms and end-gates, and the spilling of the mineral along the tracks leading from the mines, thereby causing wrecks on the hauling-ways, the necessity of frequent repair, entailing considerable cost, and the higher first cost of such cars. In addition to these objections considerable expense is entailed in keeping the tracks in order because of the deposit of the mineral along the route as it escapes from the hopper-bottoms or end-gates accidentally opened, and, besides, a considerable waste of the mineral results from such

deposit along the tracks. Moreover, in the use of the hopper-bottom cars there is not only a more expensive car to build, entailing greater expense in repairs, but greater expense of time and labor is involved in the dumping and a heavier and more bulky and cumbersome car is necessary, thus making it more difficult for the miner to load and push, and in all cars where the dumping is effected by singly switching the cars on the old "horn" tippie there is great wear and tear, due to the shock and jar which the cars receive, besides consuming considerable time waiting for cars to be switched and dumped and in changing the rope from the loaded to the empty trip.

It is the principal object of my invention to overcome these and other objections by the provision of a revolving dumping structure capable of dumping at one time a trip consisting of a plurality of cars, without detaching from the rope, as they are received from the mines, and in which a car of the simplest construction and least height may be used, and I attain this object by the construction hereinafter described with reference to the accompanying drawings and more particularly pointed out in the claims.

In the drawings, Figure 1 is an end elevation, partly sectional, looking toward the left of Fig. 2 and with a part of the revoluble structure removed. Fig. 2 is a side elevation, partly broken away to show the car-couplings, with the inclosing superstructure removed. Fig. 3 is a top plan view of the revoluble structure. Fig. 4 is a vertical section on the line 4 4, Fig. 2, showing one of the rings forming a support for the component parts of the revoluble structure. Fig. 5 is a side view thereof. Fig. 6 is a top plan view thereof, partly sectional. Fig. 7 is a front elevation of one of the rings provided with grooves for the operating-ropes. Fig. 8 is a side view thereof. Fig. 9 is a top plan view, partly sectional. Fig. 10 is a front view of the track-supporting bracket, and Fig. 11 is a detail view of a modified form of such bracket.

Referring now to the drawings, in which the same reference characters relate to the same or corresponding parts in all the views, the numeral 1 indicates the revoluble struc-

ture which is adapted to receive the cars and to be rotated so as to discharge the contents therefrom. This structure comprises a series of cast-steel or cast-iron rings 4, disposed at suitable intervals, which rings are united by side plates 13, riveted to lateral flanges 12 of the rings, the ends of which plates are united by butt-strips 7 between adjacent rings, thus constituting a rigid structure having openings at the top and bottom throughout the entire length, for the side plates 13, of steel or other suitable material, it will be observed by reference to Figs. 3, 4, and 7, extend about ninety degrees on the opposite sides of the rings, thus leaving the top and bottom of the structure open, as indicated at 6. This revoluble dumping structure is supported upon suitable rollers or wheels 18, mounted in bearings on the sills 3 and supported by the columns 2, constituting the supporting-frame, the said wheels or rollers being disposed on each side of the dumping structure and forming roller-bearings for the rings 4 and 5, which support the revoluble dumping structure and permit the same to be rotated, as hereinafter indicated, and the whole is surmounted by a super-structure 43, which incloses and covers the dump.

Disposed at a suitable point in the revolving dumping structure 1 is a ring 5, provided with lateral flanges 16, to which the plates 13 and brackets 8 are riveted, and having a bearing-surface for the rollers 18 similar to the ring 4, which ring 5 is also provided with two grooves 14 and 15. In one of each grooves is secured a wire rope 20, which passes over an idler 19, forming a guide-pulley for the rope, to the piston-rod 25 of a piston operating in a motive-power cylinder 24. The other rope 21 is secured in the other groove and passing over a similar idler 19 is secured to the piston-rod 23 of a motive-power cylinder 22, the two ropes thus leading in opposite directions from the periphery of the revoluble structure. Each of these ropes is attached at such point in its groove that one movement of the piston in its respective cylinder from one end to the other will cause a complete revolution of the dumping structure. For example, as the piston in the cylinder 24 makes its downward stroke the rope 20 will cause the dumping structure 1 to make a complete revolution, while the rope 21 will be wound in its groove and will raise the piston in its cylinder 22 to the upper end. The next operation will be effected by the movement of the piston in the cylinder 22 to the lower end of the cylinder, thereby unwinding the rope 21 from its groove and causing the complete revolution of the dumping structure in the opposite direction to that effected by the rope 20, and thus each rope alternates in effecting the rotation of the dumping structure. The provision of the two ropes and two cylinders is simple and it effects an expeditious revolution of

the revoluble structure, as the movement in either direction is effected by a single stroke of the piston in its cylinder.

The numeral 26 indicates the course of the fixed track leading from the mines, and in alinement with the rails of said track are the track-rails 10 in the revolving dumping structure, which rails are supported by the brackets 8, secured to the inside of the dumping structure by rivets or bolts at the points indicated, upon which rails the cars are drawn by the hoisting or hauling rope 45, leading to the hoisting-engine, the rope 44 being attached to the tail end of the trip of cars leading to the mines where the grade is not sufficient to cause the cars to drop by gravity. I have shown a trip of five cars 11 in place on the rails 10 of the revoluble structure, which cars, it will be noted, are of the simplest and cheapest kind and of the least height and size for a given capacity.

In order to maintain the cars in fixed relation to the dumping structure as the latter is revolved and the cars inverted, I provide guard-rails 9, carried by the brackets 8 and adapted to engage with the wheels or hubs of the cars. The rails 9 and 10 are bolted to flanges on the ledges or shelves 17 of the brackets 8.

I have shown in the drawings a rotary dumping structure designed to operate in connection with a gravity-return to the mine, and thus the structure is indicated as inclined in the direction of the mine; but it is obvious that where the tail or endless-rope-haulage system is employed the dumping structure may be mounted upon a level plane instead of an inclined one.

When or before the dumping structure 1 is revolved through one hundred and eighty degrees, it will be observed that ore or other mineral will be discharged from the inverted car into the hopper 42, whose sides are located in suitable position to receive the material and direct it either to a bin or to a suitable conveyer or cars located below the dumping structure, the further revolution of the structure bringing the cars to their original position. I have indicated in the drawings a conveyer-belt for receiving the discharged material and conveying it to shaking-screens, whence it may be sent to bins or crushers or cars as desired. In the drawings I have illustrated one form of conveyer mechanism which may be conveniently employed for this purpose, wherein the belt is provided with a series of guide-rollers 31, running upon tracks or rails 46 and driven by sprocket-wheels 32 33 in any usual well-known manner. Underneath the lower end of the conveyer-belt are hung the shaking-screens 40 41, the upper constituting the lump-shaking screen and the lower the nut-shaking screen, said screens being driven from the operating-shaft in any suitable way. I have conventionally indicated one means of driving the conveyer and the screens, which consists of a driving-wheel

39, receiving its power from any suitable source, and a wheel 38, which transmits motion by means of a belt 37 to a wheel 36 on a shaft mounted in suitable hangers 47 on the supporting structure, the other end of which shaft is provided with a pinion 35, which drives the gear 34, mounted upon the shaft carrying the sprocket-wheels 32 of the conveyor-belt, suitable connections being provided between the driving-shaft and shaking-screens.

It will be seen from this description that the conveyor-belt is employed to deliver the mineral to the upper screen, which acts to screen the lumps, and the lower screen 41 acting to screen the nut, and said material will be discharged from said screens into suitable bins or cars or crushers, as may be desired.

In order to uniformly feed the screens and expedite the operation of dumping the trips of cars, the speed of the conveyor-belt may be so regulated that it will make a complete traverse of the upper run between the time of dumping one trip and the arrival of the next trip.

While I have shown the dumping structure operated by means of the ropes connected to an engine, it is obvious that the dumping structure may be caused to automatically revolve by so disposing the tracks 10 within the structure as to support the cars in such position that the center of gravity of the loaded car will be to one side of the center of rotation and above the same, while the center of gravity of the empty car will be below said center of rotation—as, for example, as indicated in Fig. 4, the line *a a* is a central vertical line of the dumping structure passing through the center of rotation A and the line *b b* indicates the position which the center of gravity of the car should occupy in such case with respect to the center of rotation, the letter B indicating the center of gravity of the loaded car and the letter B' the center of gravity of the empty car. Such a disposition will be effected, it is obvious, by simply shifting the rails to one side, as to the right, the distance indicated, and so locating them on the brackets as to bring the center of gravity of loaded car at B and the center of gravity of the empty car at B'.

In some cases where cars are provided with certain kinds of brakes the position of the rail 9 would have to be changed and the shape of the bracket 8, supporting the same, correspondingly altered to accommodate this change. In Fig. 11 I have indicated such a change, where the rail 9 is supported by the bracket 8 in such position as to engage the hub of the car-wheel instead of the periphery of said wheel.

In operating the construction shown where the cylinders are employed the valves of the cylinders for admitting and exhausting the motive fluid—for example, steam—may be controlled by a lever, as 26, located at the front end of the dump, such lever having suitable

connecting-rods 27 and 28 to a valve 29 in the pipe 30 of the cylinder, the links and lever being conventionally shown in the drawings, as they may be of any construction suitable for the purpose and well understood by those skilled in the art.

I have shown in the drawings a revoluble structure whose capacity is sufficient to accommodate a trip of five cars; but it is obvious that a greater or less number may be employed, and, furthermore, in cases where it is not thought desirable to dump the whole of a trip the trip may be dumped in sections without uncoupling the cars by using the ordinary swivel-couplings between cars, thus enabling two or more cars to be dumped, while two or more remain stationary on the fixed track in front of the entrance to the revoluble structure and with the hoisting or hauling rope 45 still attached, as hereinbefore indicated. This will be evident by reference to Fig. 2, where it will be seen that the coupling-points of the hoisting-rope and the cars substantially coincide with the axis of rotation of the dumping structure, the rails 10 being so arranged in relation to said axis of rotation as to bring the coupling-points 11^a of the cars and the hauling or hoisting rope in this position. Again, while I have shown one structure for dumping a single trip of cars it is evident that two or more such structures may be placed side by side, conforming to the number of hauling-tracks, so that the whole run of the mines may be dumped by judicious management of a single operator to manipulate the levers, &c., controlling the dumping means.

It will be seen that by my invention I am enabled to employ the lightest, simplest, and cheapest form of car and one which has the least height for a given capacity, thereby overcoming the objections hereinbefore noted and contributing to the most expeditious handling of the cars in transporting, loading, and unloading.

I am aware that it has been proposed to dump a single railway or mine car by causing the said car to be turned upside down, and hence I do not broadly claim a construction for inverting such a care to dump the same; but

I do claim as my invention—

1. The combination with fixed track-rails, of a rotatable car-dumping structure provided with rails in alinement with the fixed track-rails and so arranged with relation to the axis of rotation of said dumping structure that the coupling-points of the cars will substantially coincide with the said axis of rotation, a hauling-rope connected to the cars substantially in line with said coupling-points, means for holding the cars in fixed relation to the dumping structure, and means for rotating said structure whereby one or more cars may be dumped by rotation of the dumping structure without uncoupling said cars from other cars, substantially as described.

2. The combination with fixed track-rails, of a rotatable car-dumping structure provided with rails in alinement with the said fixed track-rails and so arranged with relation 5 to the axis of rotation of the said dumping structure that the coupling-points of the cars and the hauling-rope will substantially coincide with the axis of rotation of the dumping structure, a hauling-rope connected to the 10 cars substantially in line with said coupling-points, means for holding the cars in fixed relation to the dumping structure, and means for rotating said structure whereby one or more cars may be dumped without detach- 15 ment from the hauling rope or other cars, substantially as described.

3. The combination in a revolving car-dumping structure, of a revoluble structure consisting of a series of rings, side plates extending partly around and uniting said rings into a rigid structure of sufficient length to receive and hold one or more cars, a series of independent brackets secured to the opposite 20 sides of the interior of said structure and having rail-supporting ledges thereon, track-rails supported by ledges on said brackets, guard-rails carried by other ledges on the said brackets for holding the cars in fixed relation to the revoluble structure as it revolves, and 30 means for causing said structure to revolve and dump the cars, substantially as described.

4. The combination, in a revolving car-dumping structure, of a revoluble structure having rails therein for receiving and holding 35 a plurality of cars and guard-rails for holding the cars in fixed relation to the structure as the latter revolves, a ring on said structure, two ropes attached to the periphery thereof and leading in opposite directions, and a 40 motor-cylinder having its piston-rod connected to one of the ropes on each side of the structure, substantially as described.

5. The combination, in a revolving car-dumping structure, of a revoluble structure 45 comprising a series of rings, side plates extending partly around and uniting said rings into a rigid structure having an opening for the passage of material, brackets secured to the inside of the structure, track-rails mounted upon the brackets upon which the cars 50 may be run, guard-rails for maintaining said

cars in fixed relation to the structure, a ring on said structure provided with grooves, ropes secured to said grooves and leading in opposite directions, a fixed frame upon which 55 the revoluble structure is rotatably mounted, guide-wheels over which the ropes lead, and a motor on each side of the structure having its piston-rod connected to one of the ropes, substantially as described. 60

6. The combination of a revoluble car-dumping structure adapted to receive and hold a plurality of cars mounted upon a suitable frame and having an opening through which the material may pass from the cars, 65 rails in said structure for receiving the cars, means for holding the cars in fixed relation to the structure, a conveyer-belt operating below the structure to receive the material as it is dumped from the cars when the structure 70 is revolved, and means for revolving the structure, substantially as described.

7. The combination of a revoluble car-dumping structure adapted to receive and hold a plurality of cars mounted upon a suitable frame and having an opening through 75 which the material may pass from the cars, rails in said structure for receiving the cars, means for holding the cars in fixed relation to the structure, a conveyer-belt operating 80 below the structure to receive the material as it is dumped from the cars when the structure is revolved, screens for receiving the material from the conveyer, and means for revolving 85 the structure, substantially as described.

8. A revoluble car-dumping structure comprising a series of rings having internal lateral flanges at opposite sides, each extending partly around the periphery of the ring, plates secured to said flanges and uniting the rings 90 into a rigid structure, brackets secured to the flanges of the rings and to the plates and having rail-supporting shelves or ledges, rails secured to said shelves or ledges, substantially as described. 95

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ERSKINE RAMSAY.

Witnesses:

A. R. FORSYTH,

A. W. FOSTER.