Aug. 14, 1923. 1,465,005

G. N. SIMPSON

CAR UNLOADING APPARATUS

Filed Feb. 27, 1918 3 Sheets-Sheet 1

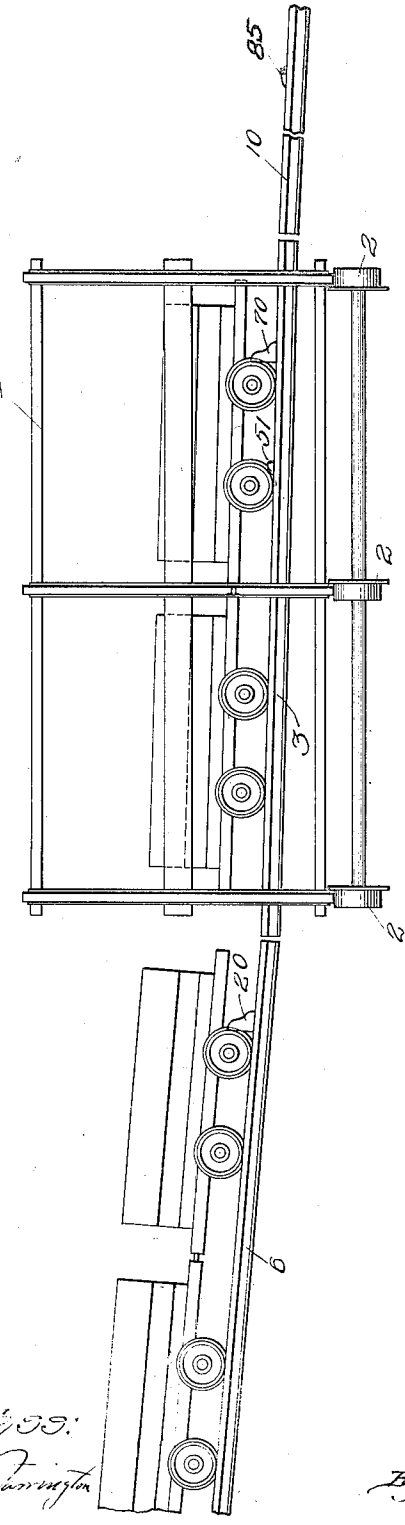


Fig. 1.

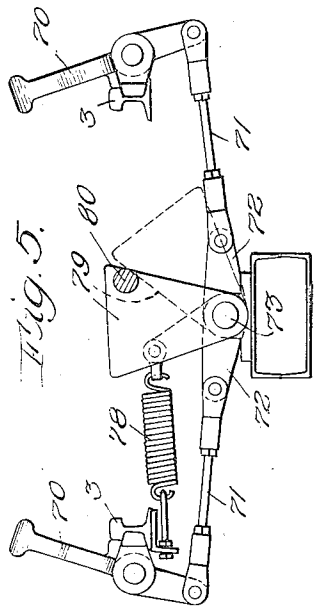


Fig. 5.

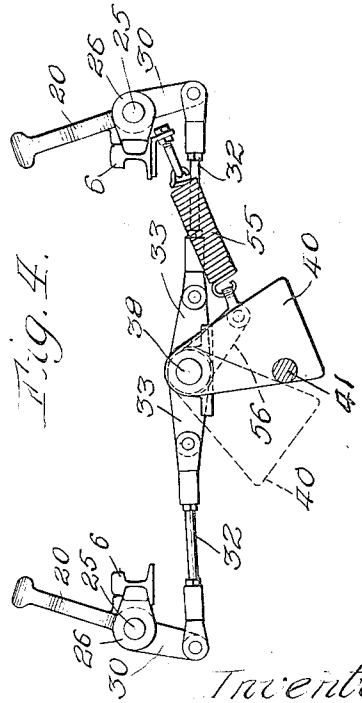


Fig. 4.

Witness:
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CAR UNLOADING APPARATUS

Filed Feb. 27, 1918 3 Sheets-Sheet 2

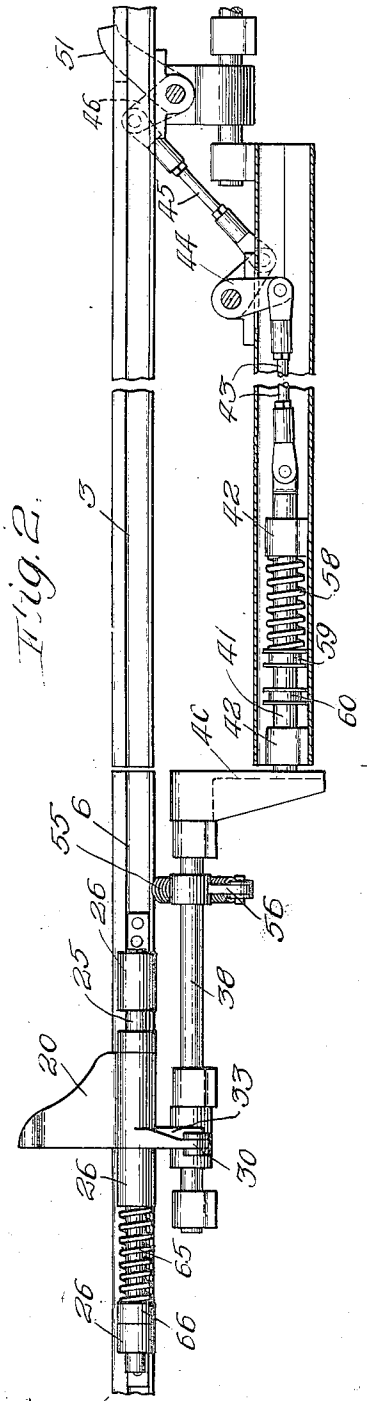


Fig. 2.

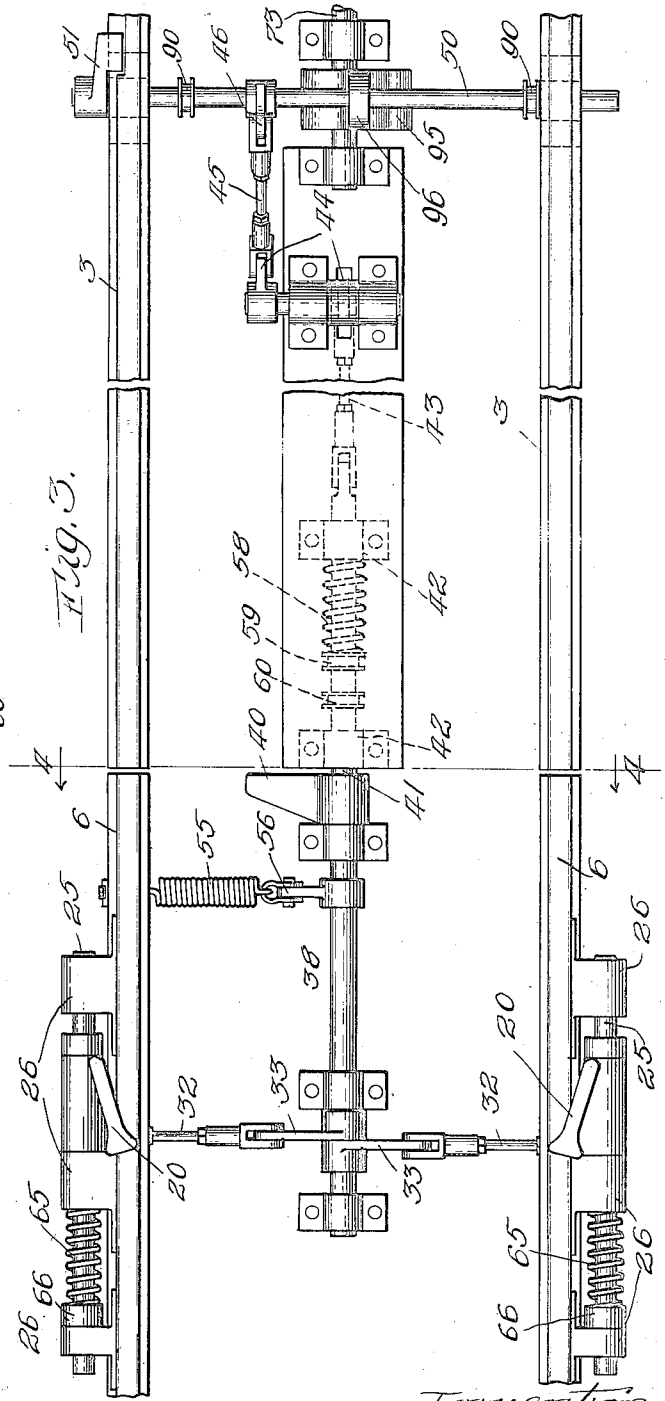


Fig. 3.

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CAR UNLOADING APPARATUS

Filed Feb. 27, 1918 3 Sheets-Sheet 3

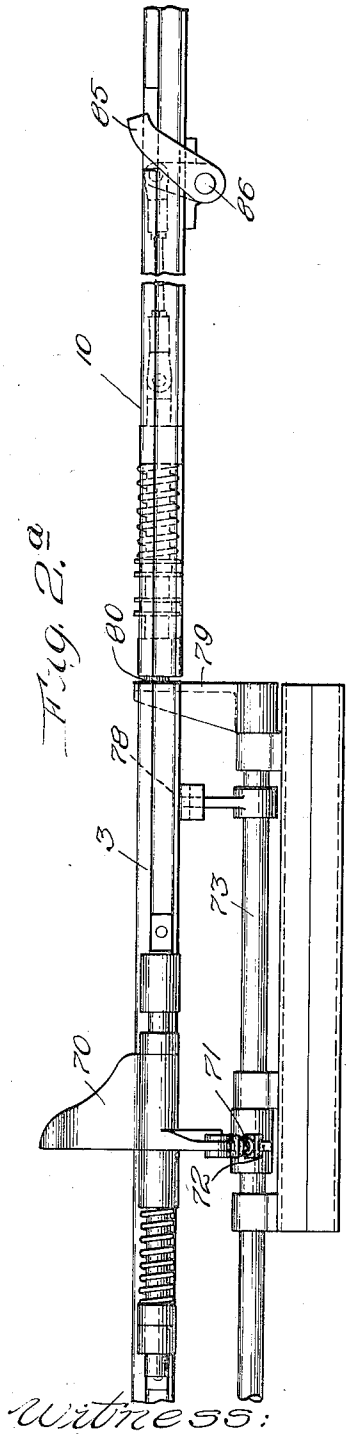


Fig. 2a.

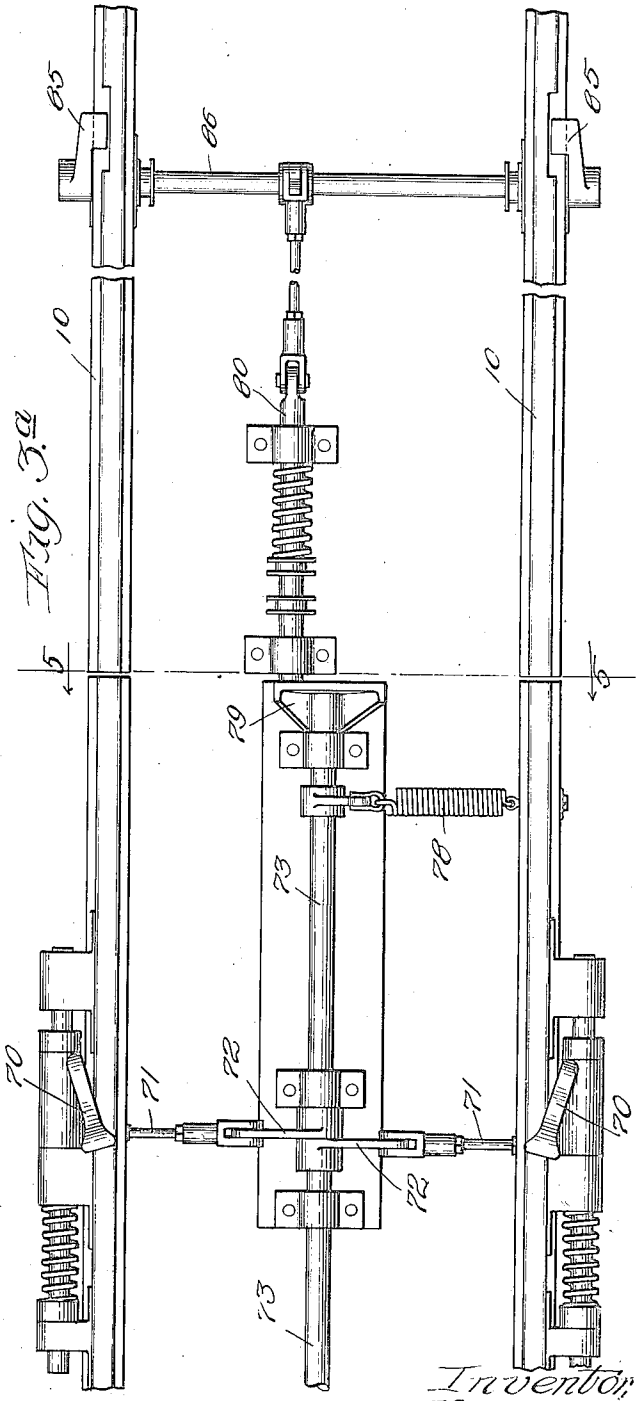


Fig. 3a.

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Patented Aug. 14, 1923. 1,465,005

UNITED STATES PATENT OFFICE.

GEORGE N. SIMPSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO WOOD EQUIPMENT COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

CAR-UNLOADING APPARATUS.

Application filed February 27, 1918. Serial No. 219,534.

To all whom it may concern:

Be it known that I, GEORGE N. SIMPSON, a citizen of the United States, residing in Chicago, in the county of Cook, State of Illinois, have invented new and useful Improvements in Car-Unloading Apparatus, of which the following is a specification.

This invention relates to improvements in car unloading apparatus and more especially to certain improvements in connection with a rotating car dump for controlling a train of cars in such a manner that one or more of them may be overturned and unloaded in each operation of the dumping device to discharge their contents. In a well known form of apparatus known as a rotary car dump there is provided a cylindric structure adapted to rotate about a horizontal axis, with rails in its lower part to receive a loaded car or cars and an opening in its upper part so that as the cars are passed through the structure, either one at a time or in trips of two or more, the cars may be overturned to discharge their contents into a hopper, bin or other receptacle.

In connection with this form of apparatus I have devised an improved means for handling a train of cars in such manner that they may be passed through the dump as expeditiously as possible for unloading, it being designed further that the proper moving, stopping and starting of the cars shall be entirely controlled by automatic devices which are operated by the movement of the rotating dump, thus effecting a saving in time and labor.

A complete apparatus embodying the principles of the invention is illustrated in the accompanying drawings in which:

Figure 1 is a view of the apparatus in side elevation.

Figures 2 and 2A together are a complete view in side elevation on a larger scale showing the details of the mechanism.

Figures 3 and 3A together are a similar complete view showing the same parts in top plan.

Figure 4 is a transverse vertical section on the line 4—4 of Figure 3.

Figure 5 is a similar section on the line 5—5 of Figure 3A.

As shown in said drawings, the rotating car dump comprises an open ended horizontal cylindric structure 1, which is journaled on rollers or wheels to adapt it to rotate about a horizontal axis. In the lower part of the structure is built a track, 3, to receive the loaded cars, and means not here shown are provided for rotating the cylinder about its axis to overturn the cars sidewise and to return them to their upright position after their unloading; the contents of the cars, in the overturning operation, being discharged through the open upper part of the structure. These parts of the apparatus as here shown are made in accordance with well known principles of construction and their particular design or construction is no necessary part of the present invention.

For the proper movement of the cars through the dump in the unloading operation, the section of track, 3, within the rotating structure is downwardly inclined from its receiving end to its discharge end, and leading to the dump is a fixed section of approach track, 6, which is also on an incline and preferably of a steeper grade than the section of track 3. Likewise, leading from the discharge end of the dump is a fixed section of receiving track, 10, to carry away the empty cars; so that except as controlled by the devices hereinafter described the cars may enter the dump, pass through it, and beyond it, entirely by gravity.

At the foot of the incline 6 and immediately in advance of the receiving end of the dump 1 there is fixed to the track rails a pair of automatic horns or stops, 20, to arrest and hold the loaded train while one or more detached cars are being unloaded in the dump, these horns or stops being constructed as follows:

Along the outside of each rail 6 is arranged a parallel shaft, 25, journaled in brackets, 26, bolted to the sides of the rails, and on these shafts are mounted the horns, 20, so that they may be raised or lowered by rotating about a horizontal axis. Each horn consists of a heavy, triangular, upwardly projecting part which is made integral with a downwardly extending arm, 30, for imparting the necessary pivotal movement to it to bring the two horns together above the rail and arrest the movement of the cars; or to spread them apart and release the cars. Each arm, 30, is connected through a yoke-ended rod, 32, with one of two oppositely extending crank arms, 33, which are fixed on a longitudinal shaft, 38, in the center of the track, so that by the rotative movement

of this shaft the horns are actuated and their positions controlled. There is also fixed to the end of the shaft, 38, adjacent to the rotating dump structure a segmental shaped lever or crank arm, 40, and in the lower part of the dump below the rails, 3, is journaled an endwise sliding shaft or bar 41, adapted to extend beyond the end of the structure and engage with the crank arm, 40, in the rotation of the dump, or to be withdrawn and released from engagement therewith. The bar or shaft, 41, is mounted in journals, 42, and connected at its inner end through a yoke-ended rod, 43, a bell-crank lever, 44, and a second yoke-ended rod, 45, with a crank arm, 46, on a transverse, horizontal trigger shaft, 50, at one end of which is a trigger lever, 51, projecting upward over one of the rails, 3, and adapted for engagement by a car wheel passing over the rail to depress the trigger and, through its movement, slide the shaft or bar, 41, endwise and withdraw it from engagement with the segmental lever, 40. The operation of these parts is as follows:

It being assumed that the dump is in an overturned position and the shaft or bar 41 separated from the segmental-shaped crank 40, the horns 20 are closed, being automatically set through the action of a spring, 55, engaging a crank arm, 56, on the shaft, 38. In this position also the bar, 41, will be extended endwise through the action of a spring, 58, engaging against a collar, 59, fixed on the bar, so that as the dump returns to its horizontal position the end of the bar, 41, will engage against the crank arm, 40, and rotate the shaft, 38, to throw the horns or stops open and permit the first car or cars in the train to enter the dump. As soon as the desired number of cars, according to the capacity of the structure, have entered the dump the front wheels of the leading car will engage the trigger lever, 51, and depress it to withdraw the bar, 41, endwise from engagement with the crank arm, 40, and permit the spring, 55, to act and close the horns, 20, and stop the car immediately following the last one to enter the dump; means also being provided, as will be hereinafter further described, to withhold the trigger lever, 51, from engagement by any of the carwheels on the empty cars leaving the dump until the desired number of following loaded cars have entered the structure. When the shaft, 38, is rotated through the action of the spring, 55, to set the horns, upon the withdrawal of the bar, 41, from engagement with the side of the segmental crank arm, 40, the bar slides back as soon as the carwheel has passed over the trigger, 51, and rests against the end face of the crank arm, 40, as shown in Figure 3, thus leaving the dump structure free to rotate; and as soon as the structure is overturned the bar is again projected outward through the action of the spring, 58, and into position to again engage the crank arm, 40, upon the return of the dump to its horizontal position. The sliding movement of this shaft is limited by a collar, 60, which is fixed to it.

In order to cushion the shock of engagement of the car wheels against the horns, 20, each shaft, 25, is arranged to slide endwise a small distance against the resistance of a spring, 65, coiled about the shaft and engaging against a collar, 66, so that the force of impact is absorbed in compressing these springs.

Within the rotating dump structure is a pair of horns or stops, 70, which are similar in all respects to the horns or stops 20, above described, being actuated through a pair of yoke-ended rods, 71, and a pair of oppositely directed crank arms, 72, on a longitudinal shaft, 73, in the same manner as above described. Likewise these latter horns are automatically set by a spring, 78, and are opened by the engagement of a segmental lever or crank arm, 79, with an endwise sliding shaft or bar, 80, in the fixed section of the track, 10; and upon the travel of the leading pair of car wheels over a pair of trigger levers, 85, on a transverse shaft, 86, the bar, 80, is withdrawn in the same manner as above described to release the segmental crank arm, 79, and permit the spring, 78, to set the horns, 70, against the first car to reach them.

Referring now to the means for arresting the operation of the trigger arm, 51, so that after the release of the first emptied car by the horns, 70, the rear wheels of the same car, or the wheels of the car immediately following in the case of a trip of two or more cars will not actuate the trigger, 51, and set the horns, 20, until the required number of car wheels have passed; the shaft, 50, is arranged to slide endwise a small distance, as limited by a pair of collars, 90, to shift the trigger arm, 51, laterally out of the vertical plane of the rail 3; so that it can not be engaged by a passing car wheel until it has been shifted back into its position above the rail, as shown in Figure 3. This shifting of the trigger arm, 51, is effected through the movement of the shaft, 73, above described, which latter is extended in length and provided with a fixed, radially projecting fork, 95, engaging a collar, 96, on the shaft, 50, so that in the movement of the shaft, 73, imparted to it through the engagement of the bar, 80, with the segmental lever, 79, on the return of the dump to its horizontal position the trigger arm, 51, is shifted sidewise and remains out of engagement with the passing car wheels until the first pair of wheels of the empty car or cars leaving the dump

have set the horns, 70, through their engagement with the trigger arm, 85; when the same movement of the shaft, 73, which operates the horns, 70, also shifts the trigger lever, 51, back into its operative position so that the next wheel to follow will engage it and set the horns, 20.

It will thus be seen that the operation of the horns is entirely automatic. The return of the dump to its horizontal position after an overturning operation acts to release both pairs of horns and permit the empty car or cars to leave the dump and the following car or trip of cars to enter it. As soon as the first empty car engages the triggers, 85, which latter are spaced a distance from the end of the dump according to the number of cars it is intended to handle in a single dumping operation, the horns, 70, are set to hold the next car approaching them, and at the same time the trigger, 51, is brought into its operative position so that the rear wheels on the same car will set the stops, 20, against the train following and hold them on the grade while the detached car or cars in the trip are being unloaded. Thus the setting of the horns is controlled in every case through the movement of the first car in a train or trip; the first loaded car entering the dump setting the horns, 20, behind it and the first empty car leaving the dump setting the horns, 70, behind it, with the addition that the action of the trigger, 51, is delayed and the action of the second pair of horns, 20, is correspondingly delayed until after the operation of the first pair of horns, 70. After the dumping operation the horns are all released by the return of the track to its level position as above described.

I claim as my invention:

1. In a car unloading apparatus, the combination with a rotatable car dump structure having a track, with fixed, approach and receiving tracks connecting therewith, of a movable stop within the dump structure to hold a loaded car for dumping and a movable stop in the fixed approach track to hold a following car above the dump structure, a trigger located in the fixed receiving track to set the first stop upon the travel of a car over such trigger, a trigger located in the dump structure to set the second stop through the travel of a following car, and means for withholding the second trigger from engagement by a moving car until after the setting of the first stop.

2. In a car unloading apparatus, the combination with a rotatable car dump structure having a track to receive a loaded car and fixed approach and receiving tracks connecting therewith, of movable stops in the dump structure and in the approach track above it to arrest and hold the cars, means acting yieldingly to set both stops, means acting in the return movement of the dump structure after an overturning operation to withdraw both stops and release the cars, and means acting progressively in the movement of the cars, to set the stop in the dump structure and thereafter the stop in the approach track.

3. In a car unloading apparatus, the combination with a rotatable car dump structure having a track to receive a loaded car, and fixed approach and receiving tracks connecting therewith, of movable stops located respectively in the dump structure and in the approach track above it to arrest and hold the cars, means located beyond the respective stops for setting the stops through the movement of the cars, and means for withholding the setting of the second stop until after the setting of the first stop.

4. In a car unloading apparatus, the combination with a rotatable car dump structure having a track to receive a loaded car, and fixed approach and receiving tracks connecting therewith, of a movable stop in the dump structure and means acting yieldingly to set the same, a movable stop in the approach track above the dump structure and means acting yieldingly to set the same, means acting in the return movement of the dump structure after an overturning operation to withdraw both stops and release the cars, and means acting in the movement of the cars to release both stops and permit them to be re-set.

5. In a car unloading apparatus, the combination with a rotatable car dump structure having a track to receive a loaded car, and fixed approach and receiving tracks connecting therewith, of a movable stop in the dump structure, means acting yieldingly to set the stop, a movable part connected with the stop mechanism and adapted to open the stop, a part located in the stationary track adapted for engagement by the movable part in the return movement of the dump structure after an overturning operation to withdraw the stop and release the car, and means acting in the movement of a car to disengage the part in the stationary track from the movable part in the dump structure and permit the stop to be re-set.

6. In a car unloading apparatus, the combination with a rotatable car-dump structure having a track to receive a loaded car and fixed approach and receiving tracks connecting therewith, of movable stops in the dump structure and in the approach track to arrest and hold the cars, means acting yieldingly to set the stop in the dump structure, means acting yieldingly to set the stop in the approach track, a movable part in the dump structure adapted for engagement with a part located in the fixed receiving track in the return movement of the

dump structure after an overturning operation to withdraw the stop in the structure and release the cars, a movable part located in the fixed approach track connected with the stop in the fixed approach track and adapted for engagement by a part carried by the dump structure in the return movement of the latter after an overturning operation to withdraw the stop in the fixed approach track and release the cars, means acting through the movement of a car over the fixed receiving track beyond the dump structure to release the movable part in the dump structure from engagement with the part located in the fixed receiving track to permit the stop in the dump structure to be set, and means located within the dump structure and acting through the movement of a car over the track in said dump structure to release the movable part in the fixed approach track from engagement with the part in the dump structure to permit the stop in the fixed approach track to be set.

7. In a car unloading apparatus, the combination with a rotatable car-dump structure having a track to receive a loaded car and fixed approach and receiving tracks connecting therewith, of movable stops in the dump structure and in the approach track to arrest and hold the cars, means acting yieldingly to set the stop in the dump structure, means acting yieldingly to set the stop in the approach track, a movable part in the dump structure adapted for engagement with a part located in the fixed receiving track in the return movement of the dump structure after an overturning operation to withdraw the stop in the structure and release the cars, a movable part located in the fixed approach track connected with the stop in the fixed approach track and adapted for engagement by a part carried by the dump structure in the return movement of the latter after an overturning operation to withdraw the stop in the fixed approach track and release the cars, means acting through the movement of a car over the fixed receiving track beyond the dump structure to release the movable part in the dump structure from engagement with the part located in the fixed receiving track to permit the stop in the dump structure to be set, means located within the dump structure and acting through the movement of a car over the track in said dump structure to release the movable part in the fixed approach track from engagement with the part in the dump structure to permit the stop in the fixed approach track to be set, and means for withholding the stop setting parts located in the dump structure from operation until after the setting of the first mentioned stop.

8. In a car unloading apparatus, the combination with a rotatable car-dump structure having a track to receive a loaded car, and fixed approach and receiving tracks connecting therewith, of a movable stop in the approach track, means acting in the return movement of the dump structure after an overturning operation to withdraw the stop and release the cars, means for resetting the stop, said means adapted to be set into motion by engagement of a moving car with a trigger located in the dump structure, means for holding said trigger from engagement by a car, and means acting through the movement of a car further in advance for restoring the trigger to an operative position for engagement by a passing car.

9. In a car unloading apparatus, the combination with a rotatable car-dump structure, having a track to receive a loaded car, and fixed approach and receiving tracks connecting therewith, of movable stops in the dump structure and in the approach track to arrest and hold the cars, means acting yieldingly to set the stop in the dump structure, means acting yiedingly to set the stop in the approach track, means acting in the return movement of the dump structure after an overturning operation to withdraw the stop in the dump structure and release the cars, means acting in the return movement of the dump structure after an overturning operation to withdraw the stop in the approach track and release the cars, means for setting the stop in the fixed approach track, said means adapted to be set into motion by engagement of a moving car with a trigger located in the dump structure, such trigger being adapted for movement into an inoperative position, means for setting the stop in the dump structure, said means adapted to be set into motion by engagement of a moving car with the trigger located in the fixed receiving track, and means acting through the movement of the stop in the dump structure to move the trigger in the dump structure into and out of its operative position.

10. In combination with a rotary dump and a trackway, stops on the dump, stops on the trackway at the entrance end of the dump, means for normally holding the dump stops closed, means for normally holding the trackway stops closed, means for opening the dump stops and the trackway stops upon return of the dump from dumping to loading position, means at the exit end of the dump positioned and adapted to be operated by a car leaving the dump for releasing the dump stops so as to permit return of the same to closed position, and means moved into operative position by closing of the dump stops and actuated by a car entering the dump for releasing the trackway stops so as to permit closing of the same.

11. In combination with a rotary dump

and a trackway, stops on the dump, stops on the trackway at the entrance end of the dump, means for normally holding the dump stops closed, means for normally holding the trackway stops closed, a tripping arm connected to the trackway stops for opening the same, a normally projected tripping member carried by the dump at one end thereof and positioned to contact with said arm and move the same in stop opening direction when the dump is returned to normal position, a tripping arm connected to the dump stops for opening the same, a normally projected tripping member on the trackway at the exit end of the dump positioned to contact with the arm connected to the dump stops so as to open said stops when the dump is returned to normal position, means operated by a car leaving the dump for retracting the trackway tripping member, and means moved into and out of operative position by closing and opening of the dump stops and operated by a car entering the dump for retracting the dump carried tripping member, said arms being adapted to hold the tripping members retracted when the stops are closed and the dump is in normal position.

12. In combination with a rotary dump and a trackway, stops on the trackway at the receiving end of the dump, a shaft rockably mounted on the trackway and connected to said stops for opening and closing the same, means for rocking said shaft in stop closing direction, a segmental arm secured on the shaft, a normally projected tripping member carried by the dump at the receiving end thereof and positioned to contact with said arm and rock the shaft in stop opening direction when the dump is returned to normal position, stops on the dump, a shaft rockably mounted on the dump and connected to the dump stops for opening and closing the same, a segmental arm secured theron, a normally projected tripping member on the trackway at the exit end of the dump positioned to be struck by the arm on the shaft connected to the dump stops and to rock said shaft in stop opening direction when the dump is returned to loading position, means operated by a car leaving the dump for retracting the trip member at the exit end of said dump, trip means on the dump adapted to be operated by a car entering the dump for retracting the trip member at the receiving end of the dump, and connections between the dump carried trip means and the dump stops for moving said dump carried trip means into and out of operative position in accordance with closing and opening of the dump stops.

13. In combination with a rotary dump and a trackway, stops on the trackway adjacent to the receiving end of the dump, a shaft rockably mounted on the trackway and connected to the stops, means for rocking said shaft in stop closing direction, a segmental arm secured on the shaft at the receiving end of said dump, a tripping pin slidably mounted on the receiving end of the dump and positioned when projected to contact with said arm when the dump is returned to loading position and to rock the shaft in stop opening direction, means for projecting said pin, a trip shaft rockably mounted on the dump and slidable toward and away from one of the rails and provided at its outer end with an element for contact with a car entering the dump to rock said trip shaft when it is projected, connections between said pin and the trip shaft for retracting the pin upon actuation of the trip shaft by an entering car, stops mounted on the dump, a shaft rockably mounted on the dump and connected to the dump stops, means for rocking the dump stop shaft in stop closing direction, a segmental arm secured on said dump stop shaft at the exit end of the dump, a trip pin slidably mounted on the trackway at the exit end of the dump and positioned when projected to be struck by the arm of the dump stop shaft and to rock said shaft in stop opening direction when the dump is returned to loading position, means for projecting the pin at the exit end of the dump, and means operated by a car leaving the dump for retracting said pin at the exit end of the dump, the segmental arms being of such width as to hold the trip pins retracted when the stops are closed and the dump is in loading position.

14. In combination with a dump and a trackway, stops on the trackway at the entrance end of the dump, stops on the dump, means for normally holding the stops closed, means for opening all of said stops when the dump is returned to loading position, means operated by a car leaving the dump for releasing the dump stops so as to permit closing of the same, means operated by a car entering the dump for releasing the trackway stops so as to permit closing of the same, and connections between the dump stops and the means for releasing the trackway stops for moving said trackway stop releasing means into and out of operative position in accordance with closing and opening of the dump stops.

In witness whereof, I have hereunto subscribed my name this twenty-fifth day of February 1918.

GEORGE N. SIMPSON.