

No. 647,601.

Patented Apr. 17, 1900.

J. M. HARTMAN.
CINDER CAR.

(Application filed Oct. 13, 1899.)

(No Model.)

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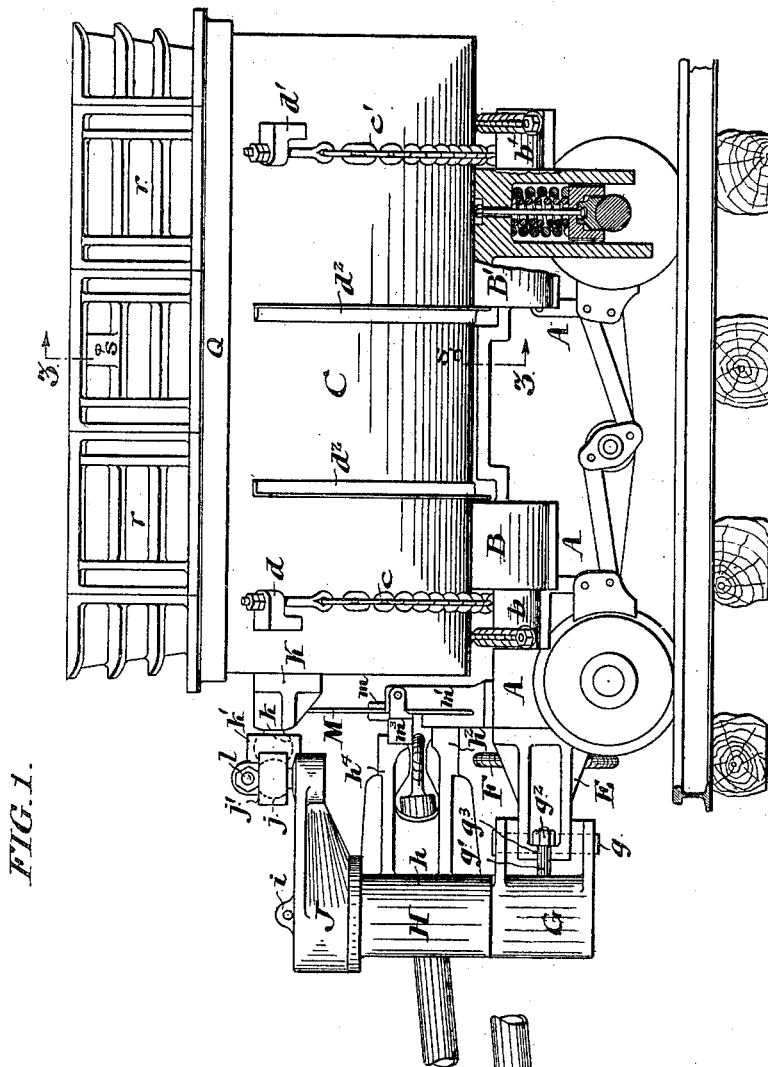


FIG. 1.

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3 Sheets—Sheet 3.

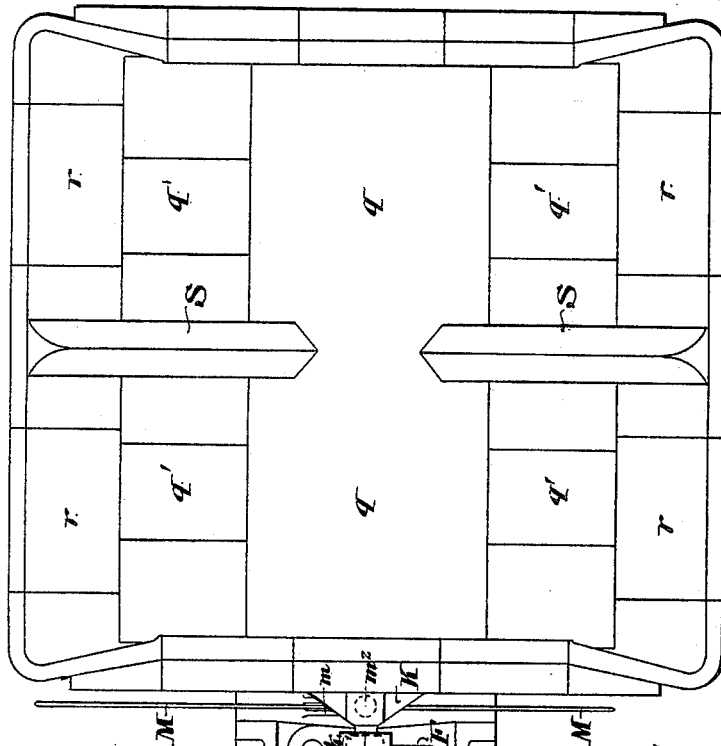


FIG. 5.

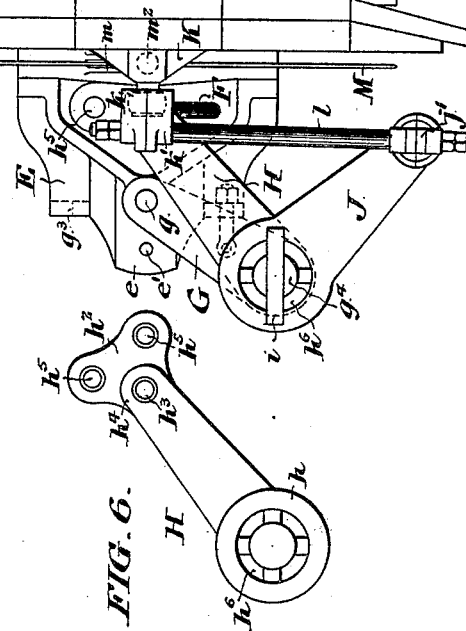


FIG. 6.

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UNITED STATES PATENT OFFICE.

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CINDER-CAR.

SPECIFICATION forming part of Letters Patent No. 647,601, dated April 17, 1900.

Application filed October 13, 1899. Serial No. 733,490. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. HARTMAN, of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Cinder-Cars, of which the following is a specification, reference being had to the accompanying drawings.

In said drawings, Figure 1 is a side elevation of a car constructed in accordance with my invention. Fig. 2 is a front end elevation of such a car. Fig. 3 is a partial cross-section of the body of my car along the line 3 3, Fig. 1. Fig. 4 is a cross-section of the split bar S. Fig. 5 is a plan view of my cinder-car. Fig. 6 is a detached view of the pushing-arm H, Fig. 5.

My invention relates to a car for carrying and dumping fluid cinder, the body of which consists of a laterally-rocking tank, the contents of which may be dumped out at either side, according to the direction in which it is rocked. It includes apparatus for effecting the dumping of the car by the motion of the engine and certain details in the construction of the car and of the tank whereby facility in dumping is obtained and the tank is rendered efficient for the carrying of so highly destructive a material as melted cinder.

The dumping of a cinder-car by hand is a slow and sometimes a dangerous operation. Such cars adapted to be so dumped are now customarily operated by a worm-gear. In dumping, the workmen must stand alongside of the tank in order to turn the hand-wheel attached to the worm and are liable to be burned by the intense heat during the pouring of the cinder, especially when the wind blows toward them. During wet weather the cinder splutters and falls over them. Furthermore, dumping by hand is a slow process, and consequently the skull tends to remain in and stick to the tank, needing time and trouble to clean it out. The slow flow often favors chilling of the cinder and prevents it from spreading as far over the ground as is desirable. In my previous patent, No. 443,574, dated December 30, 1890, I describe a cinder-car, which to some extent overcame these objections, in the form of an end-dump car rocking on its housing and capable of being dumped by a draw-bar attached to the engine.

My present invention relates to a side-dump car. I find that a side-dump car fills up a greater amount of space with its contents than the end-dump car, with which the current of cinder must divide and flow in each direction.

Referring to the drawings, A A represent the housings of a car, to which the axle-boxes, brakes, &c., of the car are attached. Each housing carries on top of it a projecting wing plate B B'. The outline of the forward wing plate B is seen in Fig. 2. Both have the same general outline. In front of the wing plate B is the narrow chain-plate *b* of approximately the same outline, but with its upper surface a short distance below the upper rocking surface of the wing plate. Similarly the wing plate B' has a chain-plate *b'* immediately in its rear. Upon these wing plates rests the iron tank C, the shape of which admits of its rocking on the wing plates to either side. It is held in place by two pairs of crossing chains *c c'*, seated on the chain-plates *b b'*. The upper ends of these chains are bolted to the outside of the tank through lugs *d d'*, affixed thereto, while their lower ends after running beneath the car are attached to the chain-plates *b b'* near their outer edges. The tank is thus held firmly to its seat upon the wing plates, while at the same time it can rock freely from side to side. Parallel flanges *d² d²*, which bear upon the edges of the wing plates, guard against any forward or backward movement of the tank as it rests upon the wing plates and also insure its rocking with a perfectly-true motion.

The cross-section of the tank-body is not, as will be noted, a true semicircle, but flares markedly at the sides. Less sidewise motion is thus required to affect the dumping of the contents. Corresponding to this shape of the tank the wing plates are given a curved contour, which can only be defined by reference to the drawings. The two curved surfaces are so related to each other that as the car rocks to one side or the other the center of gravity of the car and its contents are maintained nearly or quite directly over the line of contact between the two at any point, thereby causing the dumping to be effected with a minimum expenditure of energy.

I will now describe the dumping apparatus.

To the front end of the housing A is attached a bracket E. The front center of this bracket forms a draw-head e , into which a draw-bar or link may be inserted and secured by a pin passing through the hole e' . The bracket partially surrounds the hand brake-wheel F, by which the brakes of the car are operated. This wheel is centrally situated at the forward end of the housing, but projects sufficiently above and below the bracket to allow it to be operated by hand from either side of the car. Attached to this bracket is a heavy swinging link-piece G, which is pivoted to the bracket centrally by the pin g . The other end of this link-piece is made very large and massive. It may be swung upon the pivot g so that its large end is at either side of the center of the car. When it has been so swung as to occupy the position seen in Fig. 5 or the corresponding position upon the other side of the car, it is firmly secured in place by a bolt g' . The forward end of this bolt is pivoted to the link-piece, as seen in Fig. 2. The other end, as seen in Fig. 1, carries a nut g^2 , by means of which it is made fast to the bracket at either side, for which purpose the bracket is provided with slots g^3 , into which the bolt enters. Upon the swinging end of the link-piece G is supported an upright shaft g^4 . This shaft carries two swinging arms—a pushing-arm H and a dumping-arm J—both of which oscillate upon it.

The pushing-arm H is a massive casting. Fig. 6 is a top view of this casting. The rear end of it consists of a sleeve h , surrounding the vertical shaft g^4 . The rest of this piece is in the shape of a split bracket, the upper jaw of which h^1 is somewhat shorter than the lower jaw h^2 . Through both jaws runs a pin-hole h^3 , at which point the jaws are far enough apart to form a draw-head. The lower jaw, as seen in Fig. 6, projects farther and divides, so as to carry the right and left pin-holes h^5 . One of these pin-holes is always idle, according to the position in which the link-piece G is swung; but the one which is nearest to the tank-body is normally engaged by a chock-pin m^2 , as will hereinafter be explained. The dumping-arm J also fits upon and swings freely on the upright shaft g^4 above the pushing-arm H. The sleeve of the pushing-arm carries an upwardly-projecting collar h^6 , immediately surrounding the vertical shaft g^4 and projecting up flush with the top of the dumping-arm J. This collar is surrounded by the dumping-arm J. A cross-key i fits into slots cut in the top of the sleeve h^6 and also in the dumping-arm, locking the pushing-arm and the dumping-arm together at right angles with each other, in which position they are still free to swing together upon the shaft g^4 , which is cut off below the cross-key.

The extended end of the dumping-arm J carries a pin with a bearing-ball j . This is surrounded by a split socket-block j' , forming a universal joint. A similar split socket-block k' surrounds a bearing-ball k , mounted

upon a bracket K, projecting centrally from the front of the tank and affixed thereto. The socket-blocks k' and j' are united by a link l , either end of which may be adjusted through the blocks by nuts upon the ends of the link. There is a shoulder upon the link at either end where it enters the socket-block. By screwing up the nut on the end of the link the split blocks may be tightened or loosened.

The double lever M is pivoted between lugs m , projecting upwardly from a bracket m' , mounted on the forward end of the front housing above the bracket E. The pivot is somewhat to one side of the center of the car, and from the lever there hangs at the center of the car a chock-pin m^2 , which by the depression of the proper end of the lever is dropped through a hole in the bracket m' and simultaneously passes through the pin-hole h^5 upon the lower jaw h^2 of the pushing-arm H. A weighted catch m^3 holds the lever down when the pin is in place. The operation of this part of my device is as follows: The car being loaded is drawn to the place where it is desired to dump it, for which purpose it may be attached to an engine or to other cars, either by the draw-head e or by the draw-head formed by the jaws of the pushing-arm H. Upon reaching the place of dumping the catch m^3 is thrown back, the double lever M being carried so as to withdraw the pin m^2 . The wheels of the car being locked by the brake-wheel F, the engine then starts away from the car, its draw-bar being still united to the pushing-arm H by a pin at h^3 . The removal of the pin m^2 allows the pushing-arm to swing upon the vertical shaft g^4 . The dumping-arm J necessarily swinging with the pushing-arm has its smaller extremity thrown toward the center of the car, thereby, through the action of the link l , forcing the center of the car over and compelling it to rock upon the wings B B' until its contents are emptied.

It will be noticed from the drawings that as the parts are placed they only provide for rocking in one direction and that the opposite one from that side of the car upon which the massive castings G H J are situated. Thus in the position shown they act as a counterweight to keep the car upon the track when the car, with its contents, is rocked to the other side. If it is intended to dump the car upon the opposite side, the position of the pieces G H J must be reversed—that is to say, the link-piece G is swung to the opposite side and there secured to the bracket E by the bolt g' . The pushing-arm H thereupon assumes the reverse position, so that the other pin-hole upon its lower jaw is engaged by the pin m^2 than that shown in the drawings. The position of the dumping-arm J and link connections is then completely reversed, for which purpose the cross-key is removed and reinserted. By this readjustment of the parts the car is prepared for dumping in the opposite direction, the entire counterweight being thrown to the other side of the car.

Certain details of the car-body should now be described. The body of the tank C is of iron furnished with a rim Q, bolted around its upper edge. At the bottom the tank is reinforced inwardly by a layer of fire-brick *q*. Above this layer of fire-brick a series of iron lining-plates *q'* is placed within the tank, being held in position by the rim Q, which is in the shape of a T-iron and which laps over the upper edge of these plates, as seen in Fig. 3. These plates do not lie directly against the iron bed of the car, but are provided with air-spaces upon their outward surface. Above the rim is mounted a row of top plates *r*. These are fastened to the top of the rim. They have exterior flanges running both vertically and horizontally and are bolted together upon the outside by a series of bolts uniting the vertical flanges both of the neighboring plates and also the flanges of the same plates, as seen in Fig. 2, thus making a continuous binding of bolts along the side. The corner-plates do not crack and require no such binding. The side plates crack across vertically at times; but the plate answers as well cracked as not, if it can be held together, which the system of bolting that I have shown accomplishes. Inside the tank along its central line are placed two triangular split bars S, bolted in an upright position. These split bars are hollow and are fastened to the tank-body by hollow bolts *s s*, communicating with the internal cavity of the split bars, so as to maintain free circulation of air through the same. The purpose of these split bars is to split into two parts the skull from the chilled cinder, which always sticks more or less to the sides of a car below the top plates after a few trips and which has to be broken off by crowbars. This skull contracts in cooling, and the split bar compels it to divide into two pieces, thus loosening it and cracking it, so that it may be quickly cleared out of the tank.

Having thus described my invention, I claim—

1. In a dumping-car, the combination of bilateral wing plates mounted upon the housings; a car-body resting on the wing plates, the bottom of which has a curved outline bilaterally symmetrical with reference to its long axis; and crossing chains secured at their upper ends to the sides of the car-body and at their other ends to the extremities of the wing plates, whereby the car-body is secured to the wing plates with equal freedom to swing and dump on either side thereof, substantially as described.

2. In a dumping-car, the combination of bilateral wing plates mounted upon the housings; a car-body resting on the wing plates, the bottom of which has a curved outline bilaterally symmetrical with reference to its long axis; crossing chains secured at their upper ends to the side of the car-body and at their other ends to the extremities of the wing plates, whereby the car-body is secured to the

wing plates with equal freedom to swing and dump on either side thereof; and flanges, d^2 , d^2 , affixed to the bottom of the car-body at right angles to the long axis thereof and bearing upon the edges of the wing plates, substantially as described.

3. In a dumping-car, the combination of bilateral wing plates mounted upon the housings, the outer surfaces of which are downwardly curved symmetrically in either direction from the long axis of the car; a car resting on said wing plates, the bottom of which has a curved outline which is bilaterally symmetrical with reference to the long axis; the opposing curved surfaces of the wing plates and the bottom of the car-body having a corresponding curvature, whereby as the car-body rocks upon the wing plates in either direction the center of gravity of the body and its mobile contents are always maintained approximately over the point of contact between the car-body and the wing plates, substantially as described.

4. In a dumping-car, the combination of a car-body mounted upon the housings of the car and rocking thereon laterally in either direction; a swinging link-piece, G, pivoted centrally in front of the fore housing; a vertical shaft mounted on the swinging end of the link-piece, G; means for securing the link-piece in position at either extremity of its swing; a pushing-arm, H, oscillating upon the said vertical shaft; a dumping-arm, J, also oscillating on said vertical shaft; means for uniting the pushing-arm, H, and the dumping-arm, J, so that their oscillations coincide; and a hinged connection between the free extremity of the dumping-arm, J, and the car-body, whereby the oscillation of the dumping-arm rocks the car-body in the direction toward which it is to be dumped, substantially as described.

5. In a dumping-car, the combination of a car-body mounted upon the housing of the car and rocking thereon laterally in either direction; a swinging link-piece, G, pivoted centrally in front of the fore housing; a vertical shaft mounted on the swinging end of the link-piece, G; means for securing the link-piece in position at either extremity of its swing; a pushing-arm, H, oscillating upon the said vertical shaft; a dumping-arm, J, also oscillating on said vertical shaft; the parts of the link-piece, G, pushing-arm, H, dumping-arm, J, which are in proximity to the swinging vertical shaft being of massive size so as to create a counterbalance on the side opposite from that on which the car is to be dumped; means for uniting the pushing-arm, H, and the dumping-arm, J, so that their oscillations coincide; and a hinged connection between the free extremity of the dumping-arm, J, and the car-body, whereby the oscillation of the dumping-arm rocks the car-body in the direction toward which it is to be dumped, substantially as described.

6. In a dumping-car, the combination of a

car-body mounted upon the housings of the car and rocking thereon laterally in either direction; a swinging link-piece pivoted centrally in front of the fore housing and car-
 5 rying upon its free end a vertical shaft; a dumping-arm oscillating upon said shaft; connections between the free end of the dumping-arm and the car-body, whereby the rocking of the dumping-arm dumps the car; a
 10 pushing-arm which oscillates upon the vertical shaft in connection with the dumping-arm; means for uniting the free end of the pushing-arm to the housing; and alternate means for disuniting the free end of the pushing-arm
 15 from the housing and connecting it to the draw-bar of an engine, substantially as described.

7. In a dumping-car, the combination of a car-body mounted upon the housing of the
 20 car and rocking thereon laterally in either direction; an oscillating dumping-arm pivoted to one side of the center of the car; means for effecting the oscillation of the dumping-arm; and connections between the
 25 free end of the dumping-arm and the car-body, consisting of a bearing-ball mounted upon the free end of the dumping-arm, another bearing-ball mounted upon the front end of the car-body and a link with adjustable socket-blocks at either end which surround the bearing-balls, substantially as described.

8. A dumping-car, the body of which is formed of iron; means for rocking the car-
 35 body upon its housings to either side; a layer

of fire-brick protecting the bottom of the car-body; a series of metal top plates fastened on top of and around the rim of the car; vertical flanges formed on the exterior of these top plates; and a series of bolts uniting not only
 40 the flanges of the neighboring plates but also the parallel flanges of the same plate, substantially as described.

9. A dumping-car, the body of which is of substantially-semicylindrical shape; means
 45 for rocking said body so as to dump on either side; and one or more triangular split bars fastened to the inside of the car-body along a line at right angles to its axis, substantially
 50 as described.

10. A dumping-car, the body of which is of substantially-semicircular shape; means for rocking said body so as to dump on either
 55 side; and one or more hollow triangular split bars fastened to the inside of the body along a line at right angles to its axis; and means for maintaining circulation of air through the split bars, substantially as described.

11. In a dumping-car, the combination of a rocking car-body; a series of metal top
 60 plates fastened on top of and around the rim of the car; vertical flanges formed on the exterior of these top plates; and a series of bolts uniting not only the flanges of the neighboring plates but also the parallel flanges of the
 65 same plates, substantially as described.

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Witnesses:

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