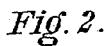
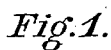


2 Sheets—Sheet 1.

No. 419,939.

Patented Jan. 21, 1890



Witnesses:
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UNITED STATES PATENT OFFICE.

JOHN M. GOODWIN, OF SHARPSVILLE, PENNSYLVANIA.

DUMPING-CAR.

SPECIFICATION forming part of Letters Patent No. 419,939, dated January 21, 1890.

Application filed June 7, 1889. Serial No. 313,524. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. GOODWIN, a citizen of the United States, residing at Sharpsville, in the county of Mercer and State of Pennsylvania, have invented certain new and useful Improvements in Dumping-Cars, of which the following is a specification, reference being therein had to the drawings accompanying the same, and forming part of this my application for Letters Patent of the United States.

My said invention relates to dumping-cars of that species in which the lading of the car is discharged or "dumped" without any careening or tipping of the body of the car; and it consists in certain new and useful dumping devices applicable to use in a car having (like that certain dumping-car which is the subject of United States Letters Patent No. 130,424, dated August 13, 1872) a cargo-box V-shaped in cross-section, discharging its load outboard over one or both of the inclined surfaces of a structure A-shaped in cross-section underlying such cargo-box, and for the simple purpose of discharging a load downward and between the sills of the car (and thence between the rails of the railway on which such car travels) effective without association with any inclined floors fixed below the cargo-box.

In the dumping-car aforesaid, subject of Letters Patent No. 130,424, the cargo-carrying floor of the cargo-box is made up of a fixed inclined floor and an adjacent inclined valve, pitching from either side of the cargo-box downward to the middle of the car. These valves, respectively, are hinged on a rod extending along the middle of the car and throughout the length of the same, and each valve is held in association with the adjacent fixed floor by detents fixed on and actuated by a shaft. In the operation of dumping all the load from one side of the car, one of these valves is freed from its detents, and, pivoting on the central rod before mentioned, falls into a position in which it is a part of a continuous inclined floor extending all across the car and descending toward the side on which the discharge is to be made with a pitch which is nowhere less steep than that of the upper fixed floors of the car. As set forth in the specification in said Letters Pat-

ent No. 130,424, the valves aforesaid might be hinged each by its outer edge to the upper fixed floor with which it is associated, and might be made to swing downward and outward for release of cargo, the space which, when the valve is "dropped," is filled by the valve itself being closed by a fixed floor; but in case such valve be directly swung from the upper fixed floor, as suggested, the lower edge of the valve, pivoting on a hinge fixed anywhere in such upper floor, will sweep below the line of the surface of the underlying fixed discharging-floor.

The specification aforesaid suggests conformation of the discharging-floor to such sweep of the valve; but such conformation (except the whole cargo-box part of the car were raised by as much as the said sweep extends below said discharging-floor surface) would produce a "hollow" in the discharging-floor, with the effect of seriously obstructing the discharge of cargo, and any raising of the cargo-box would objectionably increase the height of the car, which must not exceed a certain limit fixed by existing chutes.

The objects of my present invention are to provide, for the handling of dumpable materials, a car which, without any careening or tipping of the body thereof and without any interference of any part of the dumping apparatus with the running-gear of the car or with the track on which the car travels, will not only dump a cargo of such material, first, all outward from the car and outside the running-gear of the car on either side of the car, and, second, one half or practically one half outward from one side and simultaneously the other half outward from the opposite side of the car, as does the said dumping-car the subject of Letters Patent No. 130,424, but will furthermore dump its load, third, all downward and inside the lower frame of the car, and thence between track-rails, and, fourth, a portion (one-half and as much more as desired) downward and between the sills of the car, and the other half or the remainder outward from either side of the car, and to effect these enumerated results by apparatus so contrived that every part thereof used in any operation of dumping will move away from the load or downward or outward in the direction of discharge of the load, the mem-

bers of such apparatus corresponding to the valves, hereinbefore described, used in the dumping-car patented August 13, 1872, as aforesaid, to be so hung that in operation in the process of dumping the inboard edge of such valve will move outward and the whole valve on occasion will swing bodily outward and away from the load, but in such manner as to obviate both the hollowing of the lower discharging-floors and the increase of space between the discharging-floors and the cargo-box, one or the other of which modifications of form would, as aforesaid, be necessary in case of simply swinging the valves from the upper fixed floors or associated parts of a car of the kind in question. I attain these objects by means of the devices in car construction and dumping apparatus illustrated in the drawings accompanying this specification, in which—

Figure 1 is an elevation of an end of a car embodying my said devices—viz., that end shown in the associated Figs. 3 and 4, respectively. Fig. 2 is a vertical section across the car on the line xx of Fig. 4, the view being from that end of the car shown in said Fig. 4, with detached view of some details of valve-hangers and valve-detent. Fig. 3 is an elevation of one-half in length of the car on the side U of Fig. 2, the line mm indicating a plane midway between the ends of the car. Fig. 4 is a vertical section of half-length of car on the line zz of Fig. 2. Throughout the several views similar letters of reference indicate similar parts.

In practice a brake-standard is fixed at one end of the car, as indicated in Fig. 3. The brake-gear, other than the standard, lies below the sills of the car, and is not shown in the drawings. Excepting the single detail of the brake-standard, the two ends of the car are alike, and the valves and detents are to be operated from either end or both ends of the car.

In the several figures, $S S^2$ are the main sills of the car. $S' S^3$ are intermediate sills. $DS DS'$ are draw-bar cheek-pieces. $T T'$ are trusses extending across the car between the main sills and resting on the intermediate sills, fashioned as shown, carrying cast-metal valve abutments or pedestals $P P'$.

Throughout the space between the end bulk-heads of the car the main sills are beveled, each from its inner upper edge downward and outward, with a pitch corresponding with that of the adjoining cross-trusses $T T'$. On each sill thus beveled, and on the trusses and extending outside the sill, where it is supported by several brackets, as Z , a floor lf^2 is fixed.

On each side of the car a removable floor, as lf , rests upon the said trusses. Each such removable floor is cleated with metal straps, which extend over the upper edge of the floor, and are at said edge turned downward to form hooks, as $q q'$, which, when such floor is withdrawn (from the position in which lf is shown)

into the position in which the like floor lf' is shown, engage the upper edge of the associated fixed floor lf^2 and prevent further slipping downward of the said removable floor. These two removable floors, when both in position, as at lf , meet along the vertical plane indicated by the line zz in Fig. 2.

Each of the two top sides of the car has a depth preferably about six times its thickness. In the drawings each such top side is shown as made up of two pieces of timber t' and t^2 . Each end of each top side is supported by a metal bracket, as b or b' , which is fixed upon the corresponding corner-post of the car, as shown.

Upon the inboard face of each top side upper-floor brackets, as $c c$, are planted, preferably disposed in pairs, as indicated in the detached sketch in Fig. 2. The plates $k k$ of these brackets extend entirely, or almost entirely, across the inboard face of the top side, and bolted to the top side serve to combine the members thereof and to stiffen the top side. Bolts, as tb , are further used to truss the top sides.

On the top flanges r of the brackets $c c$ an upper floor $uf uf'$ is fixed.

The vertical web of each bracket c , appropriately locally re-enforced by a boss, is perforated to admit and carry a rod, as $R R'$, which extends throughout the length of the car and beyond the corner-post at either end thereof. Each such rod serves as a rocker-shaft for handling a valve of the car. At each projecting end aforesaid it is shaped to receive a wrench-lever.

Along the lower edge of the web of each bracket-casting c a rib projects laterally, and with two of these castings associated, as shown in said detached sketch, these projecting ribs together form a slideway for a valve-detent d , one such detent being used in association with each pair of upper-floor brackets. These detents, T-shaped as shown, hang in the slideways aforesaid and collectively support the upper edge of a valve of the car, as v' , in position in which it appears in Fig. 2. Each detent is held in position for supporting its valve by a spring set between the detent and the plate k of the bracket c . The detents are withdrawn to release the valve by operation of a rod w or w' , which revolved by a lever, as ll or ll' , winds chains or cords attached to the detents severally.

Upon each rod or rocker-shaft $R R'$ bent crank-arms, as $y y y' y'$, are keyed or otherwise suitably fixed, one alongside each upper-floor bracket. Each pair of such arms carries a pin, as $p p'$, which is the hinge-pin of a hinge h , fixed under the upper part, or on a cleat, as n or n' , of the associated valve. These valves $v v'$ are respectively formed, preferably, of planks lying edge to edge athwartwise of the car and combined as a valve by cleats, as g and n , and g' and n' , one along the lower and one along the upper side or edge of the valve; but they may be made of metal.

A valve, when in place to retain a load in the cargo-box, rests, as shown in Fig. 2, with its lower edge supported by the abutments or pedestals $P P'$, and its upper edge supported by the valve-detents d .

Suppose both valves v and v' to be in position to retain a load in the cargo-box, in which case the valve v in Fig. 2 will occupy a position corresponding to that in which v' is shown in said figure, and suppose the movable floor lf to be in position, as shown in Fig. 2, and the movable floor lf' to be likewise in position against the valve-pedestals of the car, when its edge will abut the opposing edge of lf , as aforesaid. Then to discharge all the load of the car on the side D of Fig. 2 the valve-detents on that side are withdrawn, whereupon the arms $y y$, &c., swing downward until the hinge-pins, as p , are in the line $i i$. The inboard extremity of the valve v will then have slipped or dragged down along the floor lf to the point ve . Then, applying a wrench-lever to one of the aforesaid projecting heads of the rod or rocker-shaft R, the operator will turn the rod R so as to carry the bent arms y , &c., outward. About one-seventh part of a complete revolution of the rod R will carry p to the point vo , and when p reaches that point the lower extremity of the valve v will pass clear of the floor lf^2 and the valve will swing bodily outward. Continued like revolution of R will carry the valve still farther outward. The cleat n fetching up against d , &c., will cause the lower extremity of the valve still to swing outward. The load, following the valve, will pass out of the car on the side D.

Suppose all parts in place as at the beginning of the above-described operation. Then, to discharge part of the load outward on the side D and the remainder on the side U, release the valve v , as before. It will recede to ve . Release v' , it will recede to a point corresponding to ve . Then operate R and R' either simultaneously or otherwise, thereby swinging the valves outward. The load will then be discharged part on the side D and part on the side U.

All parts being in place as at beginning of first operation, then to dump part of the load downward through the car-frame and between railway-rails, and the remainder outward on the side D, withdraw the movable floor lf' to the position in which it appears in Fig. 2; release the valve v' ; it will recede as before. Continue the motion of R' till p' reaches j . Then the cleat g' will lie against q' , and portions of the load will descend through the space between the valve v' and the top of $P P'$ —a space which in the car shown is about twenty-seven inches in width, extending the whole length of the cargo-box. The entire load will descend through this opening if no other outlet be made; but as some part of the load is in this case to go out on the side D, we, immediately upon having released v' , release v . Then after having swung v' out to j ,

as before, we swing v outward as soon as the desired amount of material shall have descended along v' . A similar series of movements will effect like discharges of a part of the load downward alongside of sill S' and a part outward on the side U of the car.

If expeditious discharge of the entire load downward be desired, withdraw both movable floors lf and lf' and place the valve v' in position j , and the valve v in corresponding position. Then the whole space between the lower fixed floors lf^2 lf'^2 (less the thickness of v and v') will be open for descent of load. In the car shown the clear opening between sills S' and S^2 is something more than three feet.

To replace a valve, as v' , into position in which it appears in Fig. 2, rotate R' so as to swing p' up to the point a . Thereupon the lower edge of the valve will swing clear of the lower floor and the pedestals $P P'$, so that, the detents of the valve having been released and sent home by their springs, the lower edge of the valve may be swung inboard beyond the valve-pedestals of the car.

With the valve-hinge at the point a , the lower edge of the valve to pass inboard beyond the middle of the car must swing through an arc of something more than two feet in extent. The operation of thus swinging the valve may be readily performed by a man standing on the ground beside the car and pushing the valve inward with a suitable short staff; but, in order that one man may, unassisted, perform all the operations necessary to replacing the valves and movable floors of the car, I provide for swinging the valve inboard, as aforesaid, the center rod cr , operated by a hand-wheel, as crw in Fig. 1, angle-irons, as vb , set on the outboard face of each valve, preferably two on each valve, and chains, as vc , one fixed on the rod cr opposite each of the angle-irons on a valve. Then, a valve, as v' , being suspended from the point a , the chains, as vc , are unwound off cr , and the free end of each is hooked onto the appropriate angle-iron on the valve, whereupon, the rod cr being suitably revolved, the said chains are wound up and the lower edge of the valve is drawn inboard until it has passed the line of the middle of the car, as zz , Fig. 2. The rod R' being then released, the upper edge of the valve v' settles into position in which it appears in Fig. 2.

In order that the chains vc , &c., may be operated when a movable floor, as lf , is in place, as on the side D of Fig. 2, a slot, as vcb , Fig. 4, is made in the edge of each movable floor opposite the angle-irons vb , respectively, for passage of said chains. These chains and the rod cr serve also to replace a movable floor, as lf' , the hook with which vc is equipped being made to take hold on a cross-pin fixed for that purpose in each slot vcb .

The car is shown in the drawings as mounted

on four wheels. It may be mounted on trucks in eight-wheeled form without impairing the effectiveness of the apparatus; but in an eight-wheeled car the dumping of material through the bottom throughout the length of the car would objectionably precipitate portions of such material upon the trucks of the car, and in order to adapt the car to use on trucks I restrict the use of the removable floors lf and lf' to that portion of the length of the car which lies between the trucks.

In those parts of the car lying immediately above the trucks I carry the fixed discharging-floors, as lf^2 , up to the middle line of the car, at the same time making the valves v and v' in sections, each section corresponding in length with the floors, fixed or removable, as the case may be, lying below it. Then, in dumping, say, one-half of the load of the car between rails and the remainder outside, the material dumped between rails will go mainly from that part of the car situate between the trucks, and not, as in the four-wheeled car, from the ends as well as from midway of the length of the car. Having dumped the middle half and something in excess of that proportion of the load between rails by an operation precisely similar to that performed for dumping between rails in the four-wheeled car, further rotation of a rocker-shaft, as R or R' , or of both of them, as hereinbefore described, will cause discharge of the remainder of the load outward on one side, or part on one side and part on the opposite side, as predetermined.

In an eight-wheeled car of length largely in excess of that of the four-wheeled car a bulk-head would preferably be placed across the cargo-box, midway of its length, dividing said box into two equal sections, and each such section would then be equipped and operated as a distinct cargo-box.

In view of said Letters Patent No. 130,424, I do not herein broadly claim as of my present invention, the combination, in a dumping-car, of inclined floors made up of fixed portions and interposed valves and Λ -shaped floor carrying cross-trusses operating to discharge a load from either side of the car without any careening of the body of the car; but,

Having described my said present devices and the manner of using the same, what I do claim, and desire to secure by Letters Patent, is—

1. The improved dumping-car herein described, comprising the top sides supported, proportioned, built up, and trussed substantially as specified, the valves each hinged upon arms fixed upon and actuated by a rocker-shaft, the sectional lower discharging-floors, the valve-operating rocker-shafts with their hinge-carrying arms, the sliding valve-detents, the auxiliary valve-replacing gear consisting of the central winding-rod and its attached chains, and the corresponding angle-irons fixed upon the valves, respectively,

and the valve-pedestals constructed, used, and operating substantially as described, for the purposes set forth.

2. In a dumping-car of the species herein described, the valves each hinged to arms fixed upon and actuated by a rocker-shaft, and adjustable and operative so that it (a) forms a portion of the cargo-carrying floor of the car, and, (b), for the purpose of discharge of all or a part of the cargo of the car through a passage-way formed by withdrawal of the removable portion of a sectional discharging-floor downward and between the sills of the car, recedes from its cargo-carrying position, and rests with its lower edge against the fixed portion of such lower discharging-floor, then forming a chute and guide for such discharge of cargo, and, (c), for the purpose of discharge of all or a part of a cargo outboard from that side of the car with which it is associated, recedes in the direction of the intended discharge of cargo, first, by a movement in which its hinged edge swings downward and outward with the sweep of the arms to which it is hinged, while the opposite edge drags downward along the subjacent inclined lower discharging-floor, and, finally, by swinging bodily outward and away from the discharging-floor, constructed and operating substantially as and for the purposes set forth.

3. In a dumping-car of the species herein described, the sectional inclined lower discharging-floors respectively composed of a fixed lower and outer section and an upper removable section, a withdrawal of which upper section downward and outboard of the car leaves an opening beside and along the middle of the car for passage of cargo downward and between the sills of the car, constructed and operating substantially as and for the purposes set forth.

4. In combination, in a dumping-car of the species herein described capable of discharging a load laterally and outside the outer sills of the car, all on either side, or part on one side and simultaneously the other part on the opposite side of the car, as a means for discharging all or portions of a cargo downward and between the sills of the car, the valves hinged each upon arms fixed on a rocker-shaft and in such operation of discharge of cargo downward moving downward and outward in the direction of discharge of cargo, and the sectional inclined lower discharging-floors, in each of which the withdrawal of its removable upper section makes a passage-way for such downward discharge of cargo, substantially as described.

5. In a dumping-car having cargo retaining and releasing valves hinged upon crank-arms and for discharge of cargo moving bodily outboard as a means for carrying a valve inboard for replacement in position for retaining cargo, the combination of the rocker-shaft, (in the process of such replacement of a valve actuated by a wrench-lever applied at one end, or by two such levers applied one

at each end thereof,) the elbowed crank-arms thereon fixed and shaped and hung substantially as shown at *y* in Fig. 2, and the valve-hinges carried by the crank-arms, associated
5 and operating substantially as and for the purposes set forth.

6. In a dumping-car having valves of which, respectively, when in place to retain cargo, one edge rests upon supports for that
10 purpose fixed along the middle of the car, and in operation of discharge of cargo descends and moves outboard, as a means for replacing such valve-edge in position on its said supports, the combination of the winding-rod
15 extending lengthwise of the car journaled in

the pedestals forming the valve-supports aforesaid and carrying chains, as *vc*, and the angle-irons, as *vb*, appropriately fixed on each valve, substantially as described.

7. In combination, in a dumping-car of the 20 species herein described, the top sides proportioned, trussed, and carried, substantially as specified, and the brackets planted upon and extending across the inboard face of the top sides, respectively, substantially as and 25 for the purposes set forth.

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