

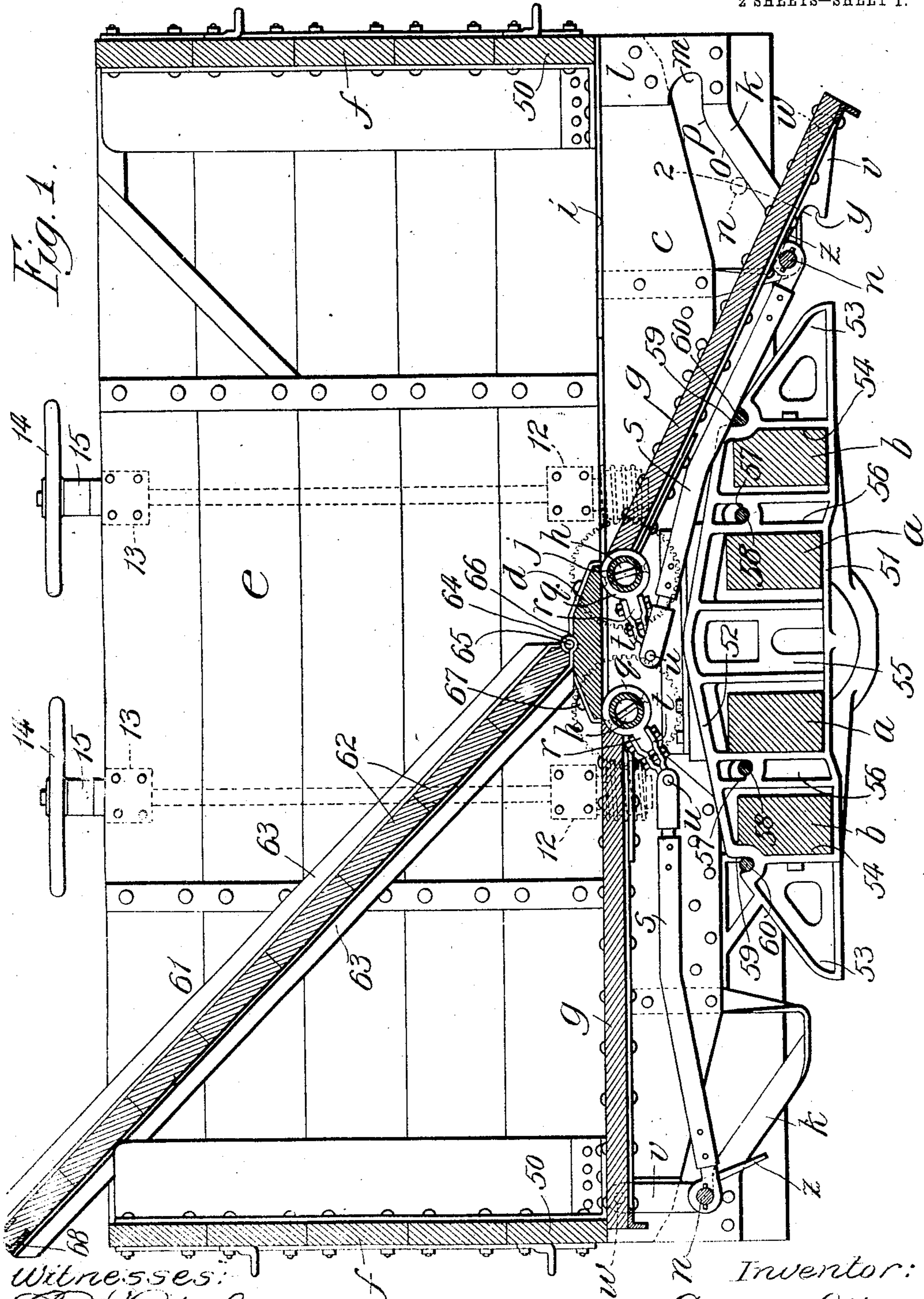
No. 814,231.

PATENTED MAR. 6, 1906.

S. OTIS.
DUMP CAR.

APPLICATION FILED OCT. 1, 1904.

2 SHEETS—SHEET 1.



Witnesses:
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Inventor:
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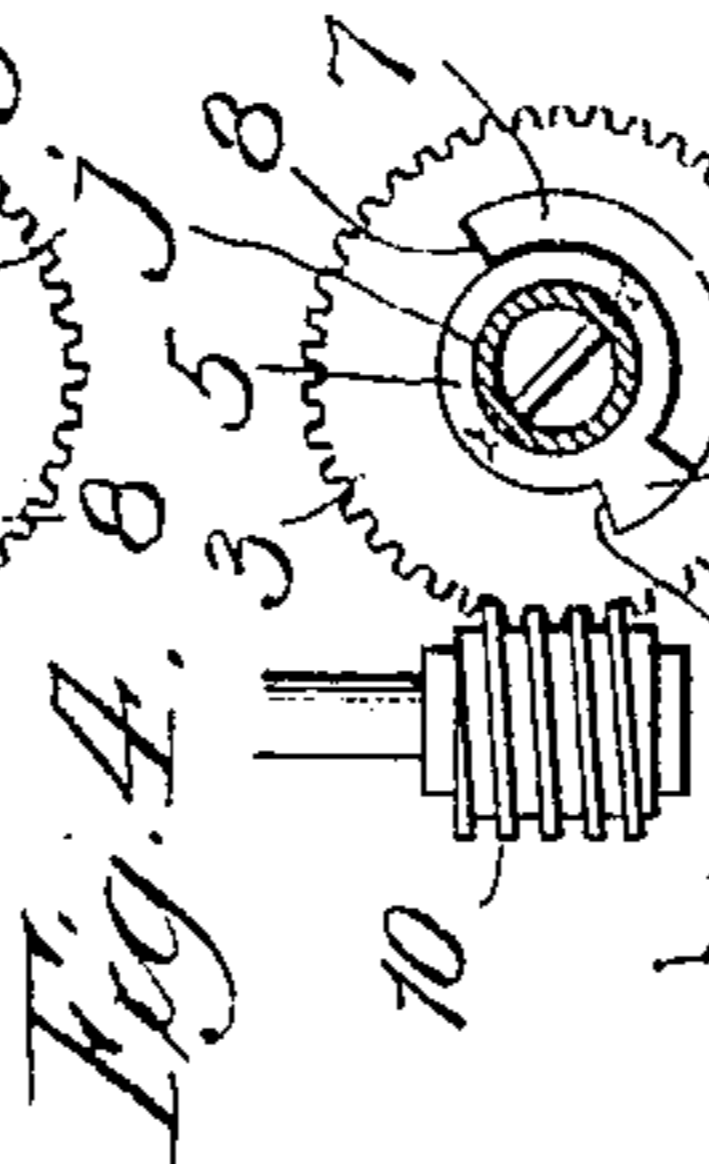
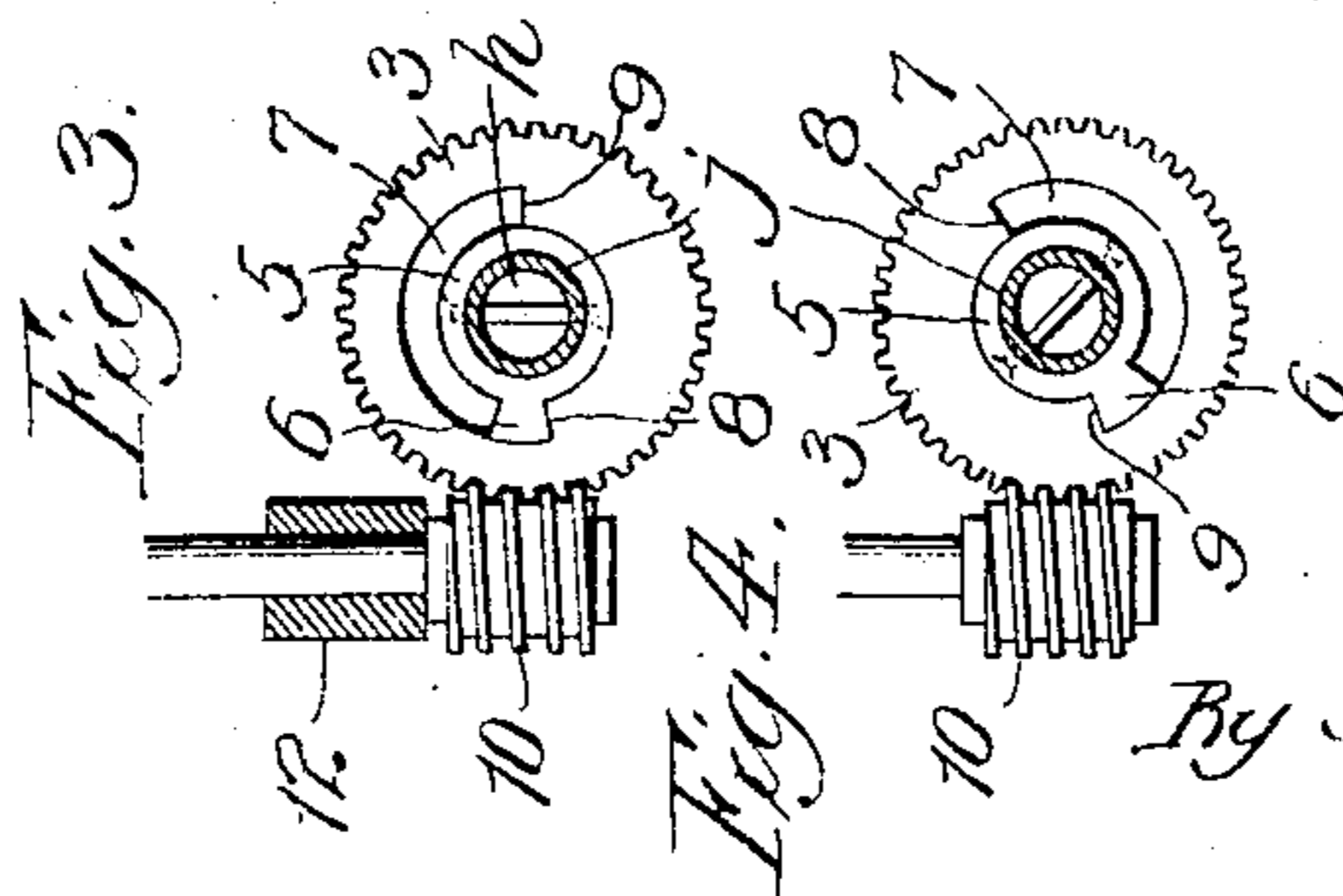
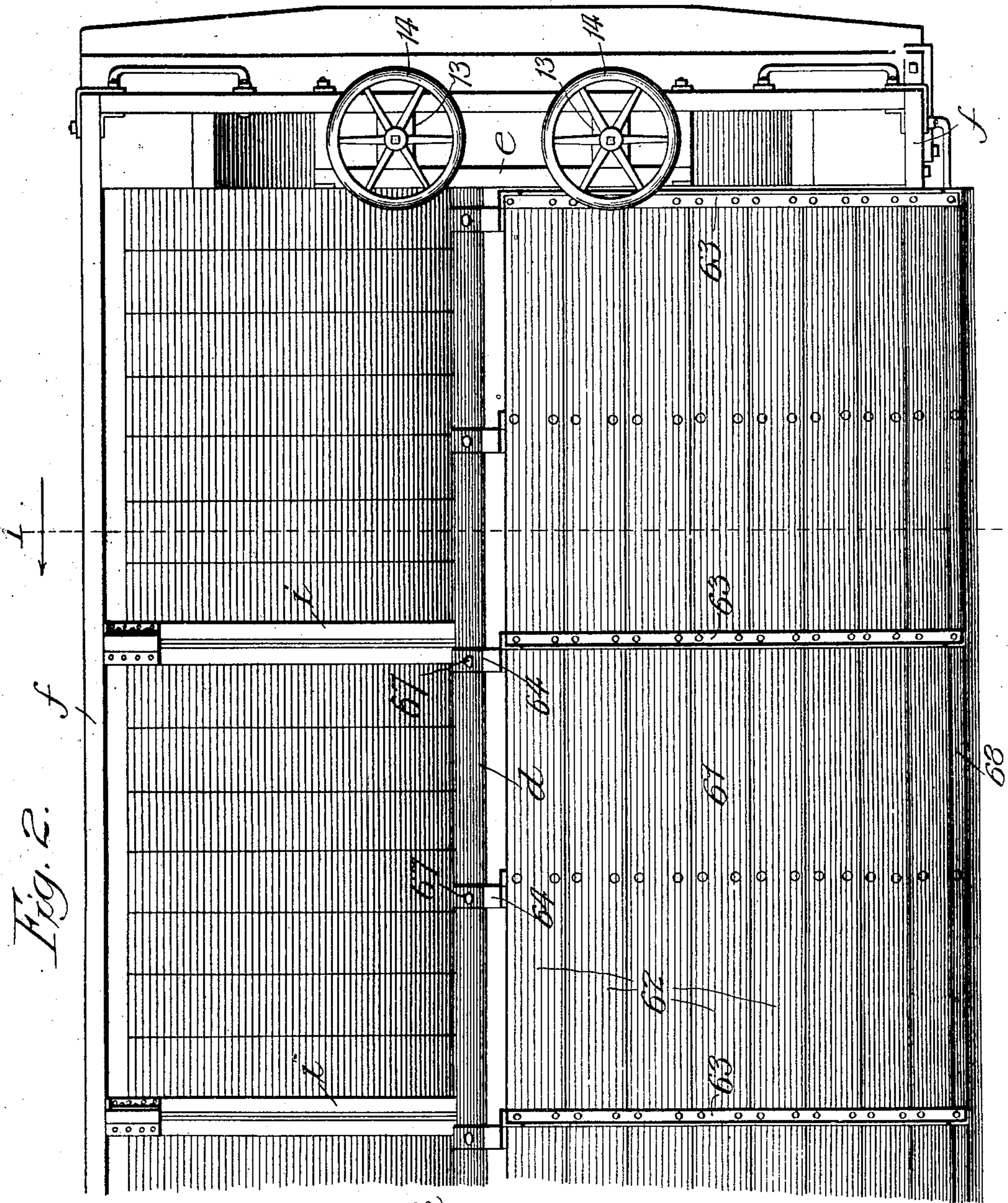
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

SPENCER OTIS, OF CHICAGO, ILLINOIS, ASSIGNOR TO NATIONAL COAL DUMP CAR COMPANY, OF RAPID CITY, SOUTH DAKOTA, A CORPORATION OF SOUTH DAKOTA.

DUMP-CAR.

No. 814,231.

Specification of Letters Patent.

Patented March 6, 1906.

Application filed October 1, 1904. Serial No. 226,820.

To all whom it may concern:

Be it known that I, SPENCER OTIS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Dump-Cars, of which the following is a specification.

My invention relates to that class of dump-cars having dumping-doors on both sides, means for operating such dumping-doors, and means for enabling the entire load contained in the car to be dumped on one side of the center of the car, as desired.

The principal object of my invention is to provide a simple, economical, and efficient dump-car.

A further object of the invention is to provide in a dump-car suitable means for enabling the entire load to be dumped upon one side of the car.

A further object of the invention is to provide in a dump-car suitable means for enabling the entire load to be dumped upon one side of the car throughout the entire length thereof, including that portion over the bolsters and trucks, without the necessity of removing any part of the load by manual labor.

A further object of the invention is to provide a dump-car with suitable means for enabling the entire load to be dumped upon either side of the car or part upon one side and part upon the other, according to the manner of adjusting the mechanism for governing the dumping of the load before the car is loaded.

A further object is to provide a dump-car with means whereby the entire load may be dumped upon one side or the other, according to the adjustment of the mechanism for governing the dumping of the load, and whereby such load may be built up above the top of the side frames upon the more lightly loaded side of the car to equalize the weight thereof.

A further object of the invention is to provide in a dump-car suitable means for enabling the entire load to be dumped upon one side of the car throughout the entire length thereof, including that portion over the bolsters and trucks, without the necessity of removing any part of the load by manual labor, in combination with suitable means for affording the largest possible outlet-opening

between the dumping-doors and the bottoms of the side frames when desired.

Other and further objects of the invention will appear from an examination of the drawings and the following description and claims.

The invention consists in the features, combinations, and details of construction hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a sectional elevation of a car constructed in accordance with my improvements, showing the centrally-pivoted partition extending upward and outward at an incline on one side of the car and the dumping-door on the opposite side of the car in open position, so as to dump the entire load upon the side having the open dumping-door; Fig. 2, a plan view of a car constructed in accordance with my improvements; Fig. 3, a detail of one of the worm-wheels and worms for operating the main operating-shafts, and thereby the dumping-door mechanism connected therewith, showing the worm-wheel in the position in which it would appear upon closing the door shown at the left of Fig. 1; and Fig. 4, a similar detail view of the worm and worm mechanism shown in Fig. 3, the worm-wheel being in position to release the door and permit it to swing to open position, the stud upon the operating-shaft being shown in full lines at the point where the releasing of the door would take place and in dotted lines at the point which such stud would reach upon permitting the door to swing to open position.

In constructing a dump-car in accordance with my improvements I provide longitudinal center sills *a* and parallel longitudinal sills *b*, arranged on each side of such center sills, transverse beams *c*, supported by such longitudinal sills extending transversely across the car at suitable intervals and having a central car-bottom portion *d* mounted thereon, end frames *e*, and side frames *f*. Dumping-doors extend longitudinally of the car throughout its entire length between the transverse beams and are pivotally mounted upon main operating-shafts *h*, so as to swing upward transversely of the car to closed position, between the transverse beams and in contact with flanges *i*, which project outwardly beyond the sides of the transverse beams. These dumping-doors are provided with hinges *j*,

by means of which they are pivotally connected with the main supporting and operating shafts *h* already described, so as to swing outward laterally of the car from their pivotal points to closed position and to inclined open position. The main operating-shafts are rotatable independently of the doors mounted thereon and extend, preferably, the entire length of the car, so that each supports one side of all the doors on its side of the car and serves to operate such doors by means of the mechanisms hereinafter described. There is of course a main operating-shaft for each side of the car, and the entire mechanisms for operating the doors on one side of the car are identical with those for operating those on the opposite side. It is therefore deemed necessary to describe only one set of such mechanisms and in connection with one or more doors on one side of the car in order to enable the invention to be understood by those skilled in the art.

The transverse beams *c* comprise two side members provided with a space therebetween, and between the side members of each transverse beam is mounted a rigid loop *k*, formed of metal, which is riveted between the side portions of the transverse beam. Plates *l* are mounted on the outside of these loops or straps and riveted to both the transverse beams and straps, such plates being provided with a recess *m* for receiving a shaft *n*, which extends beneath all of the doors on one side of the car and is movable backward and forward or reciprocatingly inside of the loops through which it extends. Each of these loops is provided with an inclined portion *o*, which extends upwardly and outwardly at an incline from the lower portion of the loop to a point *p*, the supporting upper face of the loop being substantially horizontal from such point outward to the extreme limit of the loop, as shown in Fig. 1. The lower end of the loop limits the movement of the shaft *n* in the releasing direction and supports it, and thereby the door, in open dumping position.

A plurality of collars *q* are mounted upon each of the main operating-shafts in fixed relation thereto, each provided with a stud or crank-arm *r*, and lever-arms *s* are pivotally connected at one end to such crank-arms by means of clips *t* and pins *u* and at the other end to one of the shafts *n*, already described. These levers *s* and loops *k* are arranged at suitable intervals throughout the entire length of the dumping-doors and are all alike.

A plurality of levers or depending supporting-arms *v* are pivotally mounted upon the doors near the outer swinging edges thereof by means of suitable pivots *w* and are provided at or near their swinging ends with a hook or loop portion *y*, which forms the base upon which they rest. A projecting guard portion *z* extends beyond such hook, loop, or

base portion, so as to be at all times above the shaft *n* and serve as a guide to cause the arms and shaft to be properly connected in operation. The hook or loop portions of the levers engage the shaft *n* when such shaft is moved from the point at which it is shown in full lines in Fig. 1 to the point where it is shown in dotted lines in said figure, such point being indicated by the intersection of the dotted line 2 with the upper edge of the inclined loop *k*. A further movement raises the door upon the arm, which is moved to upright position beneath it. By this arrangement it will be readily seen that the rotation of the main operating-shaft, with its crank mechanism, from the position shown at the left of Fig. 1 to that shown at the right of said figure will release the door and permit it to swing open. The door being in open position, as shown at the right of Fig. 1, the movement of the main operating-shaft, with its crank mechanism, in the direction necessary to close the door will cause the shaft *n* to pass upward along the inclined portion of the loops, raising the door and coming in contact with the hook or base portion of the levers *v* when such shaft reaches the point shown in dotted lines at the right of Fig. 1. The continuation of the rotation of the main operating-shaft will cause the shaft *n* to swing the levers *v* upon their pivots until said shaft reaches the top of the inclined portion of the loops and until the levers *v* have at that point reached almost a vertical position. After the shaft upon which the arms *v* rest has reached the top of the inclined portion of the loops a further movement will throw the levers *v* to a substantially vertical position, as shown at the left of Fig. 1, so as to support the doors firmly in closed position. When the parts are in this position, the shaft *n* rests upon the horizontal portion of the loops. In order to release it, and thereby the supporting-levers *v* and the dumping-doors, so as to permit such doors to swing open, it is only necessary to swing this reciprocating shaft *n* toward the center of the car past the horizontal portion of the loops and onto the inclined portions thereof, from which point the weight of the load upon the door will cause it to swing to open position.

In order to provide suitable means for rotating the main operating-shafts so as to operate the lever mechanisms above described, and thereby the dumping-doors, and to enable the main operating-shafts to be released so as to swing freely with the doors independently of the mechanism for operating such main operating-shafts, I provide each main operating-shaft with a suitable gear, preferably comprising a worm-wheel 3, mounted loosely upon such main shaft, so as to rotate independently thereof. This wheel is held in position so as to prevent its play longitudinally of the shaft by means of a col-

lar 5, secured to the shaft on one side of such worm wheel or gear and by means of an ordinary collar (not shown) rigidly secured to such main operating-shaft upon the opposite side thereof in any ordinary manner. This collar 5 is provided with a stud 6, and the collar and stud enter a suitable recess 7 in the wheel. The recess in the worm-wheel has a central annular portion which extends entirely around the shaft, so as to receive the collar 5 in engagement with its inner surface, and also an outer portion in the form of a segmental slot into which the stud 6 extends, as shown in Figs. 3 and 4. Shoulders 8 and 9 form the ends of the segmental or outer portion of this slot or recess and are adapted to engage the stud, so as to move it, and thereby the main operating-shaft to which it is connected, in either direction. In Figs. 3 and 4 this gear is shown as it would appear in elevation on the left of Fig. 1—in other words, the recessed side of the worm-wheel 3 is shown in both these figures. In Fig. 4 the gear-wheel is shown in the position in which it would appear after being turned to the left in the figure, with the shoulder 9 in engagement with the stud 6 until the shaft *n* had moved toward the center of the car or in releasing direction to the top of the inclined portion of the loop. This would permit the door to swing to open position without further movement of the worm-wheel. The swinging of the door to open position would bring the stud to the position shown in dotted lines in Fig. 4, to which position it is free to turn independently of the gear-wheel. The rotation of the gear-wheel to the right from the position shown in Fig. 4 will cause the shoulder 8 to engage the stud when it reaches the point where such stud is shown in dotted lines in Fig. 4, and the rotation being continued will cause the main operating-shaft, with its stud, to be turned to the position shown in Fig. 3, at which point the door will be in closed position, as shown in Fig. 1.

I provide a worm 10 the threads of which mesh with the teeth of the worm-wheel already described, such worm being mounted upon and in fixed relation to a rotatable shaft 11, which is in turn rotatably mounted in suitable bearings 12 and 13 upon the car-frame. A hand-wheel 14 is mounted, preferably, at the upper end of this shaft in fixed relation thereto, and a collar 15 is mounted intermediate such hand-wheel and the bearing 13, so as to prevent the downward movement of the shaft, the collar being in engagement with the bearing. The upward movement of the shaft is prevented by the lower bearing, which is in engagement with the worm.

It is very desirable that means be provided whereby the outlet-opening between the dumping-door and the side sills or side frames may be made as large as possible when de-

sired, and also to provide means whereby the body-bolster may be arranged underneath the dumping-door portions in such a manner as to permit them to be opened to the desired extent. These body-bolsters should be so short as to provide a space between the ends thereof and the side sills or side frames, wherein the dumping-doors may swing to open and closed positions. In order to accomplish this, the side sills 50 or bottom portions of the side frames are mounted entirely above the transverse beams, so that they do not extend below the floor-level or bottom of the floor. In other words, the space between the ends of the transverse beams is left open in the direction of the side of the car entirely up to the floor-level. A short body-bolster is provided made, preferably, of one integral piece of cast-steel and consisting of a lower suspension portion or member 51, an upper compression portion or member 52, inclined end portions 53, forming shoulders 54, (the faces of which engage the outer surfaces of the outer pair of longitudinal sills,) a central strut portion or member 55, and intermediate strut portions or members 56. These strut portions or members are arranged at suitable distances from each other and extend from the lower suspension member to the upper compression member, forming pockets therebetween for receiving the longitudinal sills. Each of the intermediate strut portions is provided with a bearing portion or pocket 57 for receiving the truss-rods 58, and suitable bearings or pockets 59 are provided in the upper compression member outside of the intermediate strut portions for supporting the truss-rods 60. A plurality of these bolsters are arranged between the transverse beams and the end sills of the car and extend beneath the doors and at a distance from the ends thereof, so that material which may fall from the ends of the doors in dumping the load will not come in contact with or interfere with the bolsters in any way. These bolsters are of less length than the distance between the side frames and have the upper portions of each end inclined downwardly and outwardly, as shown, so as to not only provide a suitable form for resisting the stress and strains to which the bolsters are subjected, but also for the purpose of providing a sufficient space between the ends of the bolsters and the side sills or side frames for dumping the load. By being made sufficiently short these bolsters permit the dumping-doors to extend over such bolsters between the ends thereof and the side sills or side frames, as shown, and the doors have ample space between the ends of the bolsters and side frames in which to move to open or closed position. The side frames are, as already suggested, arranged upon the transverse beams, so that they and the side sills, if any, are entirely above the level of the piv-

otal point of the doors and do not extend below the bottom of the floor or central floor portion. Combined with the short bolsters this arrangement of the side rails or side frames affords a very large discharge-opening.

In order to provide suitable means whereby the entire load may be dumped at one side of the car when desired, a central swinging partition 61 is provided, which extends the entire length of the car and is formed of suitable planks 62, secured together by means of angle-irons 63, arranged on opposite sides thereof, such angle-irons being formed into loops 64, through which suitable pivot-pins 65 extend, forming pivots upon which such partition may be swung to the desired position. The lower edge of this partition is thus pivotally mounted at the center of the car, so as to extend longitudinally throughout the entire length thereof, and is secured to the central floor portion *d* or to the supporting-framework by means of suitable straps 66, having loop portions through which the pivot pin or rod 65 extends, the straps being secured to the central floor-section by means of bolts 67. These straps, together with the looped angle-irons 63 and the pivot members 65, form suitable hinges by means of which the pivoted partition may be swung into position so as to extend upward and outward at an incline from the center of the car to and beyond the top of the side frames on either side of the car, as desired. The channel-iron 68 serves to protect and strengthen the upper swinging edge of the partition, and it will be noted that the partition is of sufficient width or height to extend beyond the top of the side frames a sufficient distance to enable the load to be built up higher than the side frame on the side of the car on which such partition is arranged. This enables the weight of the load on the opposite sides of the car to be equalized to some extent without unduly lessening the pitch or incline of the partition. The partition being arranged on either side of the car, so as to extend upward and outward from the center at an incline, the opening of the dumping-doors on the opposite side will cause the entire load to be discharged at one side of the center of the car without the necessity of manually handling any part of the material to be dumped.

I claim—

1. In a dump-car, the combination of a supporting-framework provided with side and end frames, a partition member extending upward and outward at an incline from the central portion of the car and floor-level toward the side thereof, and a floor portion comprising dumping-doors pivotally mounted in the framework and extending from the bottom of such inclined partition to the side frames, substantially as described.

2. In a dump-car, the combination of a

supporting-framework provided with side and end frames, a partition member extending upward and outward at an incline from the center of the car to one of the side frames, dumping-doors pivotally mounted in the car-frame extending outward laterally on opposite sides of the longitudinal center of the car from points adjacent to the bottom of the inclined partition to the side frames when in closed position and movable upon their pivotal points to inclined open position, substantially as described.

3. In a dump-car, a supporting-framework having side and end frames, a fixed bottom portion, a dumping-door on each side of the fixed bottom portion, and a partition hinged to the fixed bottom portion to swing to either side of the car as desired.

4. In a dump-car, a supporting-framework having side and end frames, a central bottom portion, a dumping-door on each side of the central bottom portion, and a partition pivotally mounted centrally of the car and movable into inclined position on either side of the car.

5. In a dump-car, the combination of a supporting-framework provided with side and end frames, a fixed bottom portion, dumping-doors pivotally mounted in the frame of the car and movable transversely of the car on each side of the fixed bottom portion upon their pivotal points, and a partition pivotally mounted centrally and extending longitudinally of the car and movable to inclined position on either side of the center of the car, substantially as described.

6. In a dump-car, the combination of a supporting-framework provided with side and end frames, dumping-doors pivotally mounted on opposite sides of the longitudinal center of the car and movable transversely thereof upon their pivotal points, and a partition pivotally mounted intermediate the pivotal points of such dumping-doors extending longitudinally of the car and movable to inclined position on either side of the longitudinal center of the car, substantially as described.

7. In a dump-car, the combination of a supporting-framework provided with side and end frames, dumping-doors pivotally mounted on opposite sides of the longitudinal center of the car and movable transversely thereof upon their pivotal points, and a partition pivotally secured to the car-frame intermediate and above the pivotal points of such dumping-doors extending longitudinally of the car and movable to an inclined position on either side of the longitudinal center of the car, substantially as described.

8. In a dump-car, the combination of a supporting-framework provided with side and end frames, and a fixed bottom portion, dumping-doors pivotally mounted in the car-frame extending longitudinally of the car

throughout its entire length and laterally thereof from their pivotal points, and a partition pivotally mounted centrally of the car extending longitudinally thereof throughout its entire length and movable to inclined position on either side of the longitudinal center of the car, and means for operating the dumping-doors, substantially as described.

9. In a dump-car, the combination of a supporting-framework provided with side and end frames, dumping-doors pivotally mounted in the car-frame and movable transversely of the car upon their pivotal points, and a partition pivotally mounted centrally of the car movable to inclined position on either side of the longitudinal center of the car and extending above the level of the side frames in either of such inclined positions, substantially as described.

10. In a dump-car, the combination of a supporting-framework provided with longitudinal sills and a central floor portion, side frames mounted entirely above the level of the bottom of the central floor portion, dumping-doors pivotally mounted in the car-frame extending longitudinally of the car and swinging transversely thereof movable to both open and closed position below the level of the bottom of the side frames, and a partition mounted centrally of the car movable to inclined position on either side of the longitudinal center of the car, substantially as described.

11. In a dump-car, the combination of a supporting-framework provided with longitudinal sills and end frames, dumping-doors pivotally mounted in such supporting-framework extending longitudinally of the car and swinging transversely thereof, side frames mounted entirely above the level of the pivotal point of such dumping-doors, and a partition pivotally mounted above the level of the dumping-doors and extending upward and outward at an incline from the center of the car to the side thereof, substantially as described.

12. In a dump-car, the combination of a supporting-framework provided with longitudinal sills and end frames, dumping-doors pivotally mounted in such supporting-framework extending longitudinally of the car and swinging transversely thereof, side frames mounted entirely above the level of the pivotal point of such dumping-doors, a partition pivotally mounted centrally of the car extending longitudinally thereof and movable to inclined position on either side of the longitudinal center of the car, and mechanism arranged entirely beneath the dumping-doors for operating them, substantially as described.

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