S. OTIS.

DUMP CAR.

APPLICATION FILED AUG. 29, 1903.

923,695. Patented June 1, 1909.

3 SHEETS—SHEET 1.

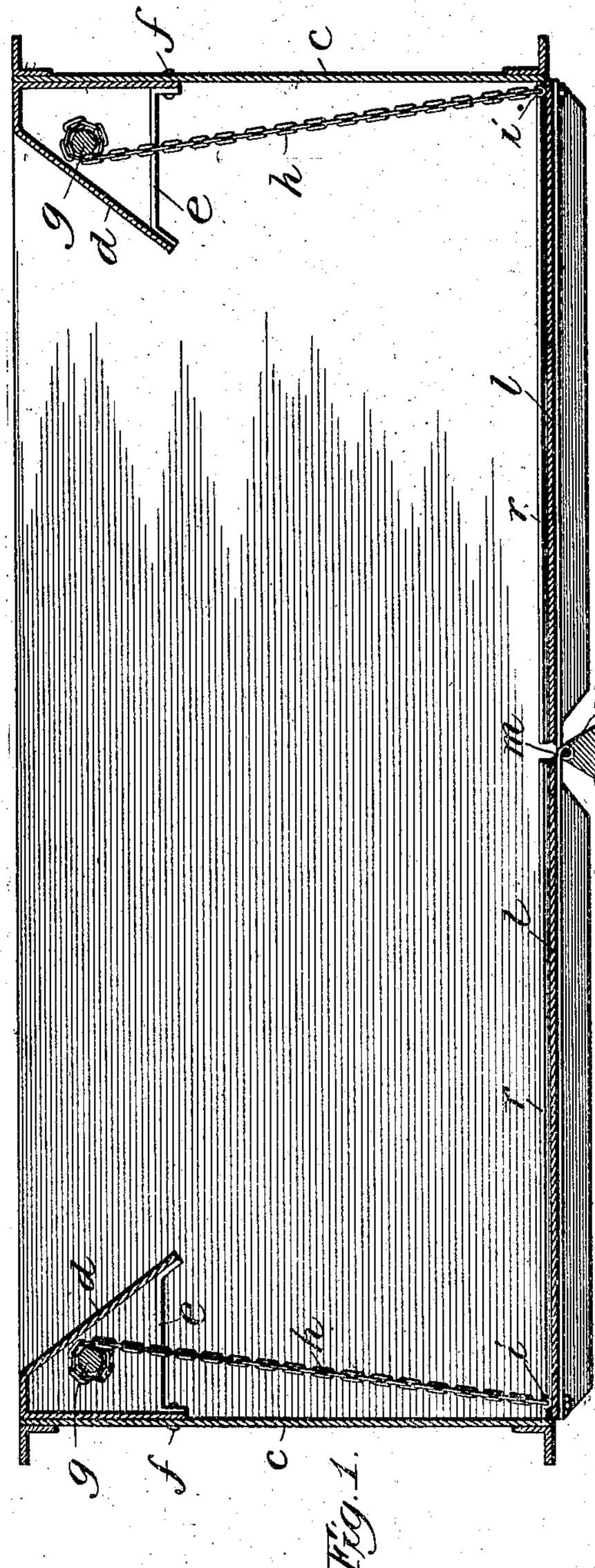

Fig. 1.

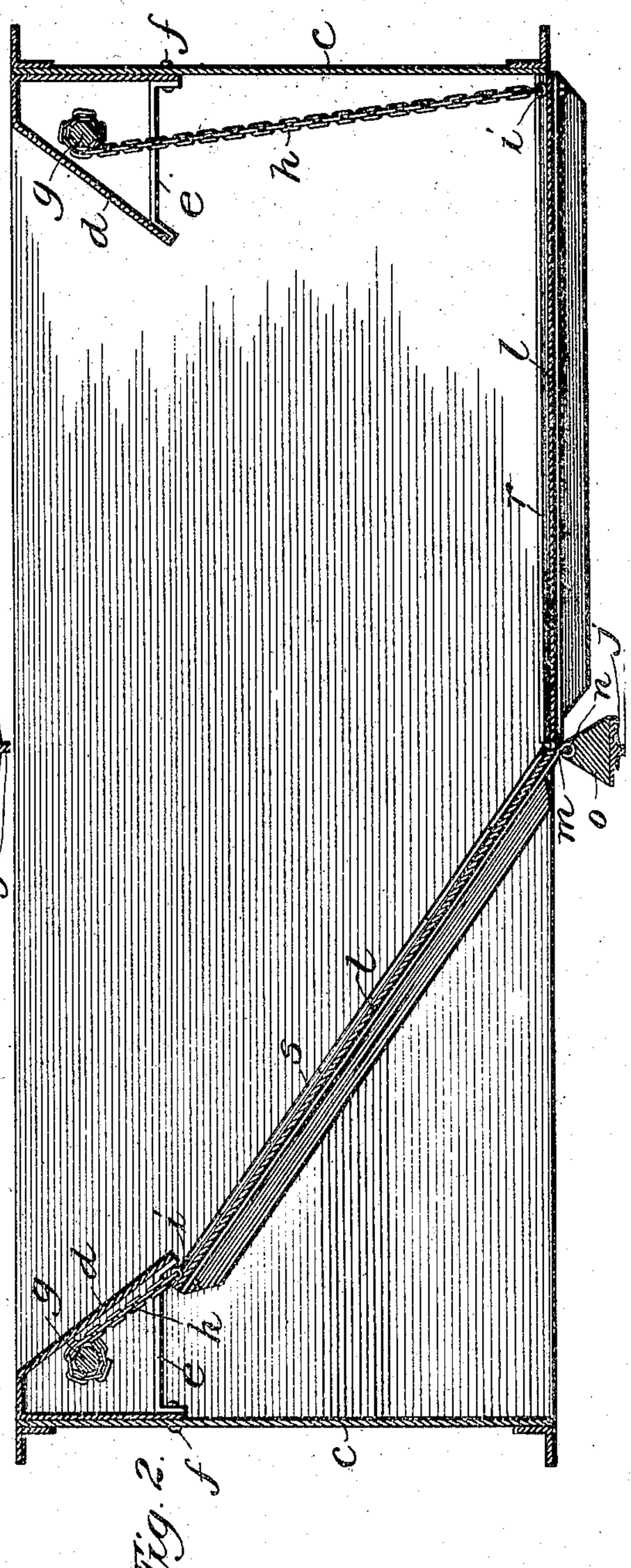

Fig. 2.

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Spencer Otis.
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3 SHEETS—SHEET 2.

Fig. 3.

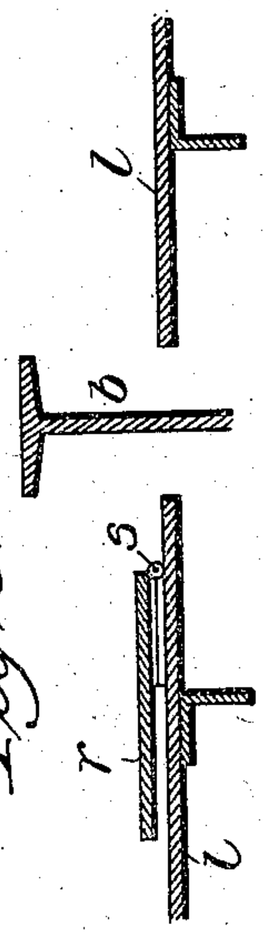

Fig. 5.

Fig. 4.

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3 SHEETS—SHEET 3.

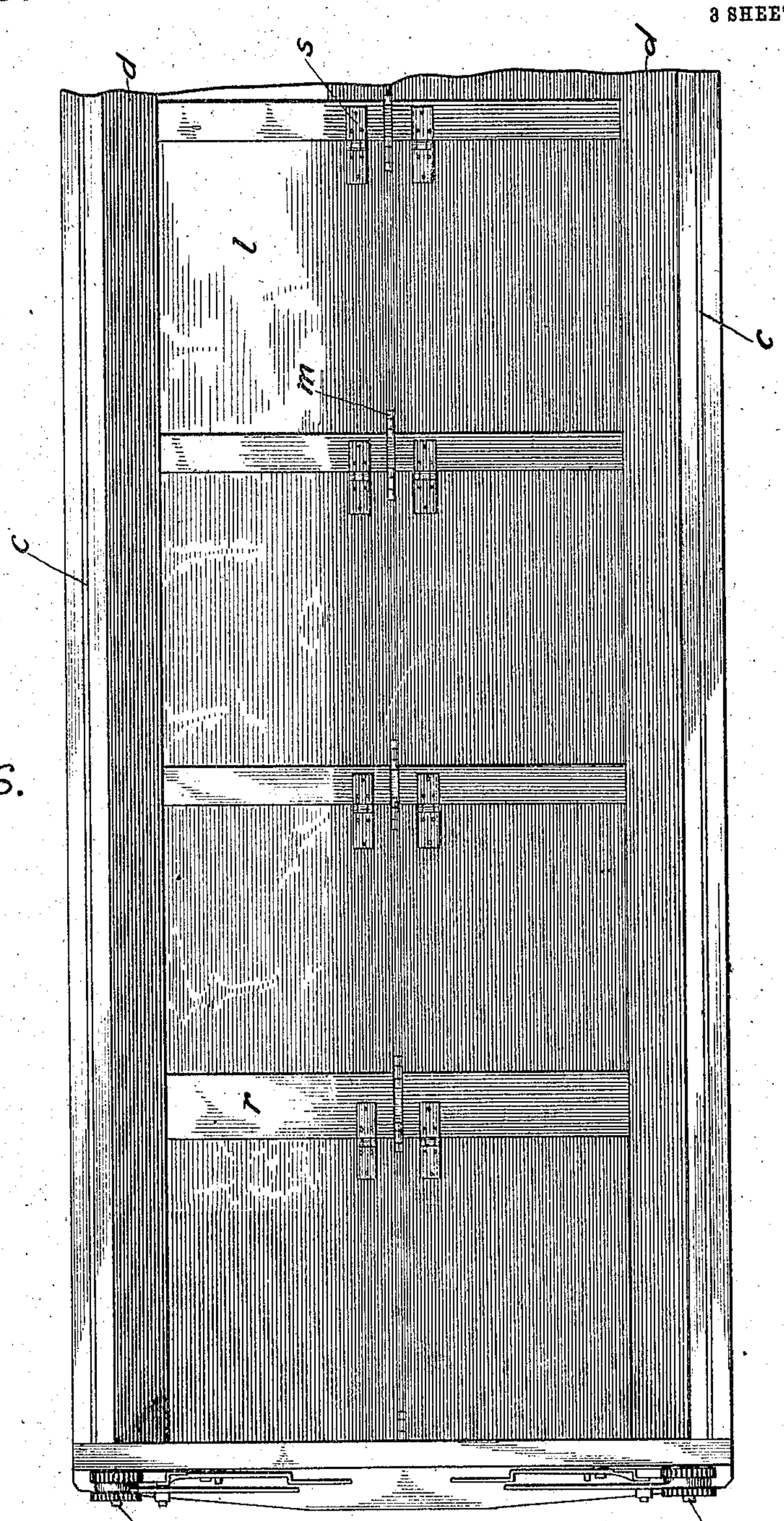

Fig 6.

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UNITED STATES PATENT OFFICE.

SPENCER OTIS, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO NATIONAL DUMP CAR COMPANY, A CORPORATION OF MAINE.

DUMP-CAR.

No. 923,695. Specification of Letters Patent. Patented June 1, 1909.

Application filed August 29, 1903. Serial No. 171,214.

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, am the inventor of 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 swinging dumping bottom sections pivotally mounted at or near the longitudinal center of the car each movable into a horizontal closed position to form a flat bottom car, and movable to an inclined position above the floor level, or downwardly and outwardly inclined position below the floor level or point of pivotal connection with the car frame, whereby the entire load may be dumped upon either one side or the other of the car, as desired, or partly upon one side or partly upon the other.

A further object of my invention is to so arrange the under frame and the doors in relation thereto as to provide ample clearance for the lowering of the doors to their downwardly inclined open position.

The above mentioned and other objects of my invention will appear more clearly from the following description and claims, together with the accompanying drawings, in which—

Figure 1 is a sectional elevation of a car provided with my improvements showing the dumping doors in position to form a flat bottom car; Fig. 2 a similar view showing one of the swinging bottom sections in horizontal closed position and the other in inclined closed position above the floor level; Fig. 3 a similar view showing one of the swinging bottom sections in inclined closed position and the other in inclined open position; Fig. 4 a detail sectional elevation, taken on line 4 of Fig. 3 looking in the direction of the arrow, showing the flap for closing the openings between the ends of the swinging sections over the deck beams; and Fig. 5 a detail sectional elevation, taken on line 5 of Fig. 3 looking in the direction of the arrow, showing the flap folded back over the swinging bottom section to permit it to swing into open inclined position to dump the load; Fig. 6 is a plan view of a half of a car constructed according to my invention.

In illustrating and describing my invention I have only illustrated and described that which is new together with only so much that is old and well-known in the art as is necessary to enable those skilled therein to make and practice the invention,—leaving out old and well known elements.

In the particular embodiment of my invention illustrated in the drawings the load carrying longitudinal central supporting means consists of I-beams *a*, the two I-beams adjacent the median line being connected by a cover plate *t* in a usual and well known manner. Upon the upper side of the I-beams *a*, and resting thereon, are the transverse deck beams *b*, which may also take the form of I-beams. Upon the outer ends of the deck beams are mounted suitable side frames *c*, which may be of any desired old and well-known type, and which, together with the ordinary or any desired type of end frames, form a suitable load inclosing frame. Each of the side frames is provided with suitable inwardly extending longitudinally disposed boxes formed of inclined walls *d* and suitable bottom portions *e*, adapted to provide the necessary rigidity and strength to such inclined walls, all formed preferably of metal and held in position upon the side frames by means of rivets *f* or in any ordinary and well-known manner, forming suitable guards for the rotatable operating rods *g*. These boxes extend over the edges of the swinging dumping sections when in their raised inclined position, so as to prevent the contents of the car from passing over the edges of the raised dumping sections. The operating rods have chains *h* attached thereto and also attached to the swinging sides of the dumping bottom sections hereinafter described, by means of suitable eye-bolts *i*, whereby the swinging bottom sections may be raised and lowered as desired, and each supported in either its inclined closed position, horizontal closed position or open inclined position. The rotatable operating rods are adapted to be operatively connected with any suitable old and well-known means for operating them and holding them against rotation, such for instance as lever and ratchet mechanism which being well-known in the art need not be shown nor described here.

Longitudinally disposed central I-beams *j* are mounted intermediate the deck beams already described upon the lower flanges *k* thereof and upon the cover plate *t* so as to form suitable means for pivotally supporting

such swinging dumping sections, and swinging dumping bottom sections *l* are pivotally connected to blocks *o* mounted upon such longitudinally disposed central I-beams by means of hinges *m*, having pivots *n* mounted in the blocks *o*. To provide the desired rigidity and strength for these central I-beams, suitable braces *p* are provided extending downward and outward at an incline from the upper portion of such central beams to the lower flanges of the deck beams already described to which they are firmly connected by means of rivets *q* or in any desired ordinary and well-known manner. The central I-beams with their braces form a suitable means for supporting the swinging dumping sections in the car frame and such supports may be attached to either the deck beams or longitudinal sills, though I prefer to attach them to the deck beams—as shown—such deck beams resting in their turn upon the longitudinal sills *a*. These longitudinal sills of course are mounted upon suitable bolsters which may be of any desired known type, and suitable end frames—not shown—are provided, forming with the side and bottom frames the complete car frame. These end frames and bolsters being old and well-known it is not deemed necessary to describe them here.

The operating rods *q* are adapted to be connected with suitable operating ratchet and lever mechanisms, not shown, by means of which such rods may be rotated in one direction to raise the swinging dumping sections to their closed horizontal position or their inclined closed position as desired and permit such sections on opposite sides to swing independently of each other into opened inclined position to dump the load, such ratchet mechanism being, of course, provided with ordinary pawls for holding the rotatable rods so as to prevent rotation when desired.

It is desirable to provide means for closing the openings between the ends of adjacent swinging sections when elevated above the horizontal position. In the particular embodiment of my invention illustrated in the drawings, I have shown for this purpose a suitable flap *r* pivotally mounted upon the end of each swinging section to which it is attached by means of suitable hinges *s*, so that when the swinging sections are in their elevated inclined position the openings between them over the deck beams may be closed as illustrated in Fig. 4. The flap may be folded back over the swinging section to which it is attached, as shown in Fig. 5, to permit such swinging section to move to its lower inclined position. When the swinging sections are in their horizontal position these flaps are laid over the deck beams or folded back as desired, and when the car is being used for any purpose in connection with which the openings between the ends of the swinging sections are not objectionable, the flaps may be dispensed with or folded back over the swinging sections so as to permit them to readily swing into any desired position.

In order to provide openings of maximum dimensions for the discharge of the load the transverse or deck beams and the centrally disposed longitudinal beams, which support the swinging sections at the center of the car, are made of sufficient width to place the pivotal point of such swinging sections at the desired elevation above the main longitudinal sills, and at the longitudinal median line of the car. The necessary incline is thus obtained to efficiently discharge the load when the swinging sections are lowered to their open or discharging position. The construction described obviates the necessity of a stationary floor plate over the center sill, thus rendering it possible to discharge the entire contents of the car, the small quantity retained on the transverse deck beams being negligible. The pivotal point of the swinging sections is made preferably on substantially the same plane with the upper sides of the deck beams so as to afford a substantially flat bottom car when the swinging sections are in horizontal closed position between the deck beams.

I claim:

1. In a car of the class described, the combination of a center sill, a plurality of deck beams mounted transversely thereof, a suitable frame mounted upon such sill and beams, and a plurality of swinging dumping bottom sections pivotally mounted in the car frame, each movable into either inclined closed position, horizontal closed position or inclined opened position as desired and extending from their pivotal points outward transversely of the car when in each of such positions, substantially as described.

2. In a car of the class described, the combination of a center sill, a plurality of deck beams mounted transversely thereof, a suitable frame mounted upon such sill and beams, a plurality of swinging dumping bottom sections pivotally mounted in the car frame each movable into either inclined closed position, horizontal closed position or inclined opened position as desired and extending from their pivotal points outward transversely of the car when in each of such positions, and means for pivotally supporting such swinging sections, substantially as described.

3. In a car of the class described, the combination of a center sill, a plurality of deck beams mounted transversely thereof, a suitable frame mounted upon such sill and beams, a plurality of swinging dumping bottom sections pivotally mounted in the car frame each movable into either inclined

closed position, horizontal closed position or inclined opened position as desired and extending from their pivotal points outward transversely of the car when in each of such positions, and means for moving such swinging dumping bottom sections and supporting them in either of such positions as desired, substantially as described.

4. In a car of the class described, the combination of a longitudinal sill, a plurality of deck beams mounted transversely thereof, a suitable frame mounted upon such deck beams, a plurality of swinging dumping bottom sections pivotally connected to the car frame, and means for moving such swinging sections on each side independently of those on the other side into inclined closed position above the deck beams or into horizontal closed position substantially on a level with the upper side of such deck beams or into inclined open position below the upper sides of such deck beams as desired, substantially as described.

5. In a car of the class described, the combination of a longitudinal sill, a plurality of deck beams mounted transversely thereof, a suitable frame mounted upon such deck beams, a plurality of swinging dumping sections pivotally mounted in the car frame and extending along each side of the longitudinal center thereof, means for moving the swinging sections of either side of the car independently of those upon the other side thereof into inclined closed position above the deck beams, substantially horizontal closed position or inclined open position below the pivotal point of such swinging sections as desired, and means for supporting the swinging dumping bottom sections of either side in inclined closed position above the deck beams while those upon the opposite side of the car are in horizontal closed position or inclined open position, substantially as described.

6. In a car of the class described the combination of a longitudinal sill, a plurality of deck beams mounted upon the upper side of such sill and extending transversely thereof, a frame mounted upon such sill and beams, center beams mounted between such deck beams and extending longitudinally of the car for pivotally supporting the swinging sections, swinging dumping bottom sections pivotally connected to such center beams, and means for operating such swinging dumping bottom sections, substantially as described.

7. In a car of the class described, the combination of a longitudinal sill, a plurality of deck beams mounted upon the upper side of such sill and extending transversely thereof, a frame mounted upon such sill and beams, center beams mounted between such deck beams and extending longitudinally of the car, swinging dumping bottom sections pivotally connected to such center beams, means for swinging such dumping bottom sections into inclined closed position above the pivotal point thereof or into substantially horizontal position on a level with such pivotal point or into inclined open position below such pivotal point as desired, and means for supporting the dumping bottom sections upon either side of the car in either of such positions independently of the position of those upon the opposite side of the car whereby the entire contents of the car may be dumped on either desired side of the car or partly upon one side and partly upon the other as desired, substantially as described.

8. In a car of the class described, the combination of a lower center sill extending longitudinally of the car, a plurality of deck beams mounted thereon and extending transversely thereof, a plurality of center beams mounted intermediate the deck beams centrally of the car and extending longitudinally thereof, a plurality of swinging sections pivotally mounted upon such center beams and rotatable operating rods provided with chain mechanism attached thereto and to the swinging dumping bottom sections for moving the swinging sections of either side of the car into inclined closed position above the pivotal point of such swinging sections or into substantially horizontal position with relation to such pivotal point or into inclined open position independently of the swinging sections upon the opposite sides of the car as desired, substantially as described.

9. In a car of the class described, the combination of a longitudinal sill, a plurality of deck beams mounted transversely thereof, a frame mounted upon such sill and beams, a plurality of swinging dumping bottom sections mounted in the car frame and movable between the deck beams, and a movable flap extending from the end of each of such swinging sections into engagement with the end of the next adjacent swinging section, substantially as described.

10. In a car of the class described, the combination of a longitudinal sill, a plurality of deck beams mounted transversely thereof, a frame upon such deck beams, a plurality of dumping bottom sections pivotally mounted in such frame and movable into either inclined closed position above the deck beams, substantially horizontal closed position intermediate the deck beams, or inclined open position as desired, and a flap pivotally mounted upon the end of each of such swinging sections and movable into engagement with the end of the next adjacent swinging section when such sections are in their inclined closed position or horizontal closed position, substantially as described.

11. In a car of the class described, the combination of an under frame to support the car body and to receive the draft and buffing strains, a swinging dumping bottom portion

extending on opposite sides of the longitudinal center of the car movable into position to simultaneously extend downward at an incline toward the same side of the car, and mechanism connected with such dumping bottom portions for operating them and holding them removably in position, substantially as described.

12. In a car of the class described, the combination of a supporting framework, a plurality of swinging dumping bottom sections pivotally mounted in the car frame each movable into either inclined closed position, horizontal closed position or inclined open position and extending from its pivotal point outward transversely of the car when in each of such positions, and means for supporting such swinging dumping bottom sections in either of such positions, substantially as described.

13. In a dumping car, an underframe composed of longitudinal and transverse members and having a floor substantially wholly composed of drop doors, in combination with a center sill wholly underlying the said transverse members, substantially as described.

14. A dumping car comprising longitudinal and transverse members, including an articulated center sill, in combination with a plurality of doors hinged adjacent to said articulated center sill, and a load-sustaining center sill underlying said articulated center sill, substantially as described.

15. In a dumping car, a wide center sill, in combination with side members or sills, the transverse members extending from side member to side member and overlying the said center sill, a false or articulated center sill composed of sections connecting the transverse members and overlying the said center sill, and a plurality of drop doors occupying the openings framed by said side members, said articulated center sill and said transverse members, substantially as described.

16. A car having an underframe comprising longitudinal centrally disposed supporting means, transverse beams overlying the longitudinal supporting means and resting thereon, and a floor substantially wholly composed of drop doors.

17. A car having an underframe comprising load sustaining centrally disposed supporting means, transverse beams mounted thereon and overlying the centrally disposed supporting means, an auxiliary longitudinally disposed center sill overlying the longitudinal supporting means, and doors hinged to said auxiliary sill.

18. In a dumping car, an underframe composed of transverse members in combination with a central longitudinal structure wholly underlying said transverse members and having a floor substantially wholly composed of a single set of drop doors.

19. A dumping car comprising a load-sustaining central longitudinal structure and transverse members, in combination with a plurality of drop doors hinged at the longitudinal center of the car, said load-sustaining central longitudinal structure underlying and supporting said transverse members, and means mounted above said central longitudinal structure for pivotally supporting the inner edges of said doors at the longitudinal center of the car.

20. In a dumping car, a wide central longitudinal structure in combination with side members or sills, the transverse members extending from one side member to the other side member and overlying the said central longitudinal structure, a plurality of drop doors arranged in two series, one series at each side of the longitudinal center of the car, and means mounted above said central longitudinal structure for pivotally supporting the inner edges of said doors at the longitudinal center of the car and in substantially the same horizontal plane as the tops of said transverse members.

21. In a dumping car, the combination with a load-sustaining central longitudinal structure, of side members or sills, transverse members overlying and supported by said central longitudinal structure and underlying at their ends and supporting the side members, a single set of drop doors forming substantially the whole floor of the car and arranged in two series, one series at each side of the longitudinal center of the car, the individual doors occupying the openings framed by said side members and said transverse members, and means mounted above said central longitudinal structure intermediate of said transverse members for pivotally supporting the inner meeting edges of said doors at the longitudinal center of the car and in substantially the same plane as the tops of said transverse members.

22. In a car of the class described, floor sections hinged at the longitudinal median line of the car means for moving said sections to horizontal position to form a flat bottom, to upwardly inclined position to form an inclined bottom, or downwardly inclined open position, and means for retaining said sections in each position.

23. In a car of the class described, floor sections hinged at the longitudinal median line of the car, means for moving said sections to horizontal position to form a flat bottom, to upwardly inclined position to form an inclined bottom, or downwardly inclined open position, means for retaining said sections in each position, and aprons extending inwardly from the sides and adapted to coact with said hinged floor sections to form a continuation thereof when the latter are adjusted to form an inclined bottom.

24. In a car of the class described, sides,

hinged floor sections extending outwardly from their hinges toward the sides of the car, means for moving said sections to horizontal position to form a flat bottom, to upwardly inclined position to form an inclined bottom, or downwardly inclined open position, aprons extending inwardly from the sides and adapted to coact with said hinged floor sections to form a continuation thereof when the latter are adjusted to form an inclined bottom, and door operating mechanism housed beneath said aprons.

25. In a car of the class described, a lower center sill comprising longitudinal members, transverse deck beams above and resting on said horizontal members, a cover plate for said center sill, and an articulated center sill composed of sections resting on said cover plate.

26. In a car of the class described, a lower center sill, transverse deck beams above and resting on said lower center sill, an articulated center sill composed of sections resting on said lower center sill, and braces extending from said lower center sill to said articulated center sill.

27. In a car of the class described, a lower center sill comprising longitudinal members, transverse deck beams above and resting on said longitudinal members, a cover plate for said center sill, an articulated center sill composed of sections resting on said cover plate, and braces extending from said lower center sill to said articulated center sill.

28. In a car of the class described, a center sill, transverse deck beams above and resting upon said center sill, an articulated center sill above said center sill, the sections thereof extending between the deck beams, hinge blocks resting upon said articulated sill, and dump doors pivoted thereto at the median line of the car.

29. In a car of the class described, a center sill, transverse deck beams above and resting upon said center sill, an articulated center sill above said center sill, the sections thereof extending between the deck beams, wedge shaped hinge blocks resting upon said articulated sill, and dump doors pivoted at the apex of said wedge shaped blocks and in the longitudinal median line of the car.

30. In a car of the class described, a horizontal floor composed substantially wholly of drop doors, and means for inclining all of said doors toward either side of the car to form a continuous inclined floor.

31. In a car of the class described, an under frame to support the car body and to receive the draft and buffing strains, vertical end walls and a horizontal floor composed substantially wholly of drop doors hinged at the longitudinal median line of the car and extending from end wall to end wall.

32. In a car of the class described, an under frame to support the car body and to receive the draft and buffing strains, said under frame comprising a center sill, and a horizontal floor substantially wholly composed of drop doors hinged at the longitudinal median line of the car above the center sill.

33. In a car of the class described, an under frame to support the car body and to receive the draft and buffing strains, the under frame comprising a load carrying center sill, and a horizontal floor substantially wholly composed of drop doors hinged at the longitudinal median line of the car above the center sill.

34. In a car of the class described, an under frame comprising longitudinal and cross beams, hinged doors adapted to lie in the openings framed by said beams and to be inclined above and below said openings, and movable flaps above said beams and overlying the adjacent door.

35. In a car of the class described, an under frame comprising longitudinal and cross beams, hinged doors adapted to lie in the openings framed by said beams to be inclined above and below said openings, and movable flaps above said beams and overlying the adjacent doors on each side.

36. In a car of the class described, an under frame comprising longitudinal and cross beams, hinged doors adapted to lie in the openings framed by said beams and to be inclined above and below said openings, and means to close the joints between said doors and beams, said means being movable with said doors when raised.

37. A car having an under frame comprising longitudinal centrally disposed supporting means, transverse beams overlying and resting on the longitudinal supporting means, said transverse beams extending continuously from side to side of the car, and a floor composed substantially wholly of dump doors.

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