(No Model.) 3 Sheets—Sheet 1.

J. J. SOUDER.

DUMPING CAR.

No. 464,639. Patented Dec. 8, 1891.

Fig. 1.

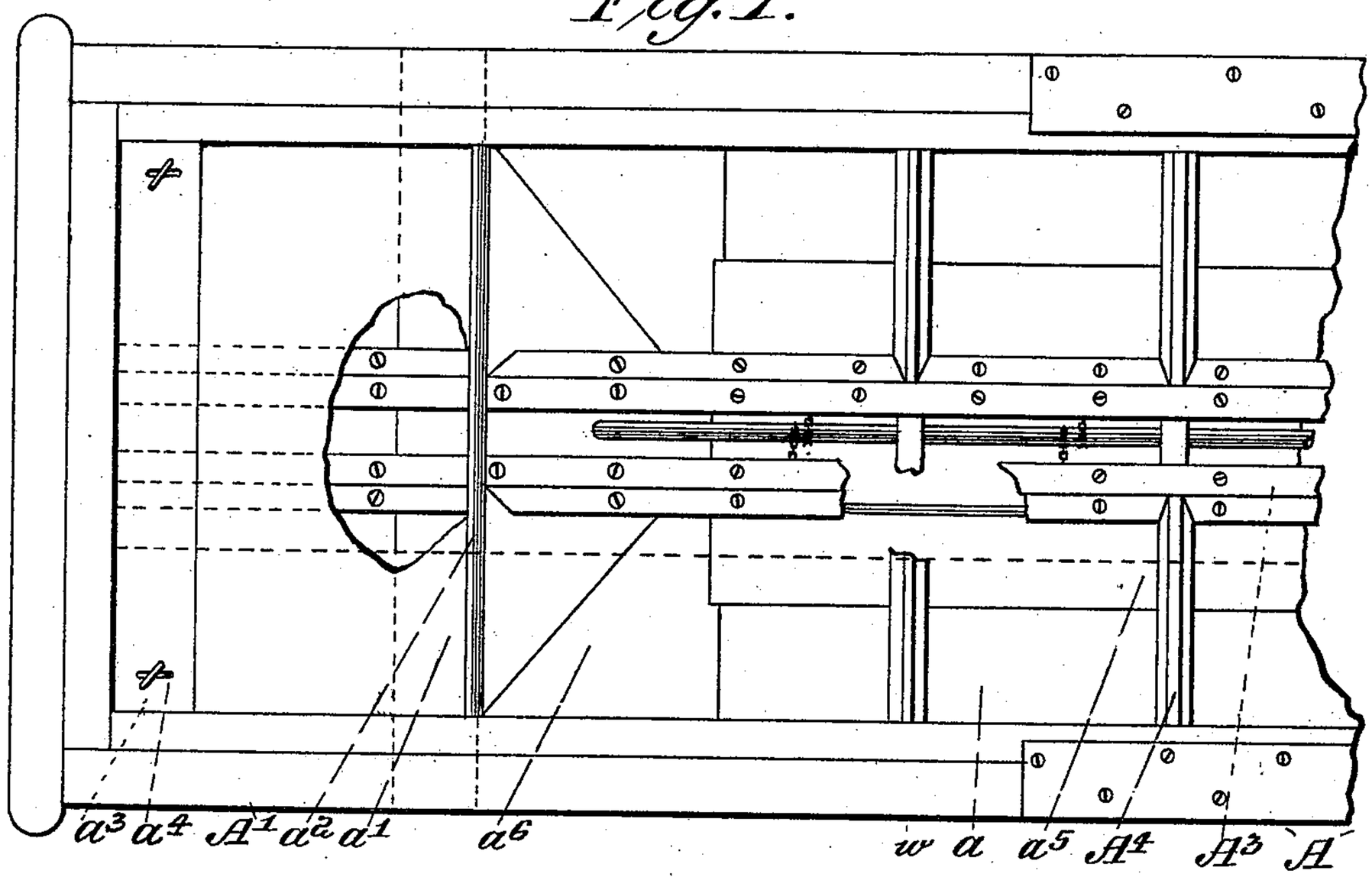
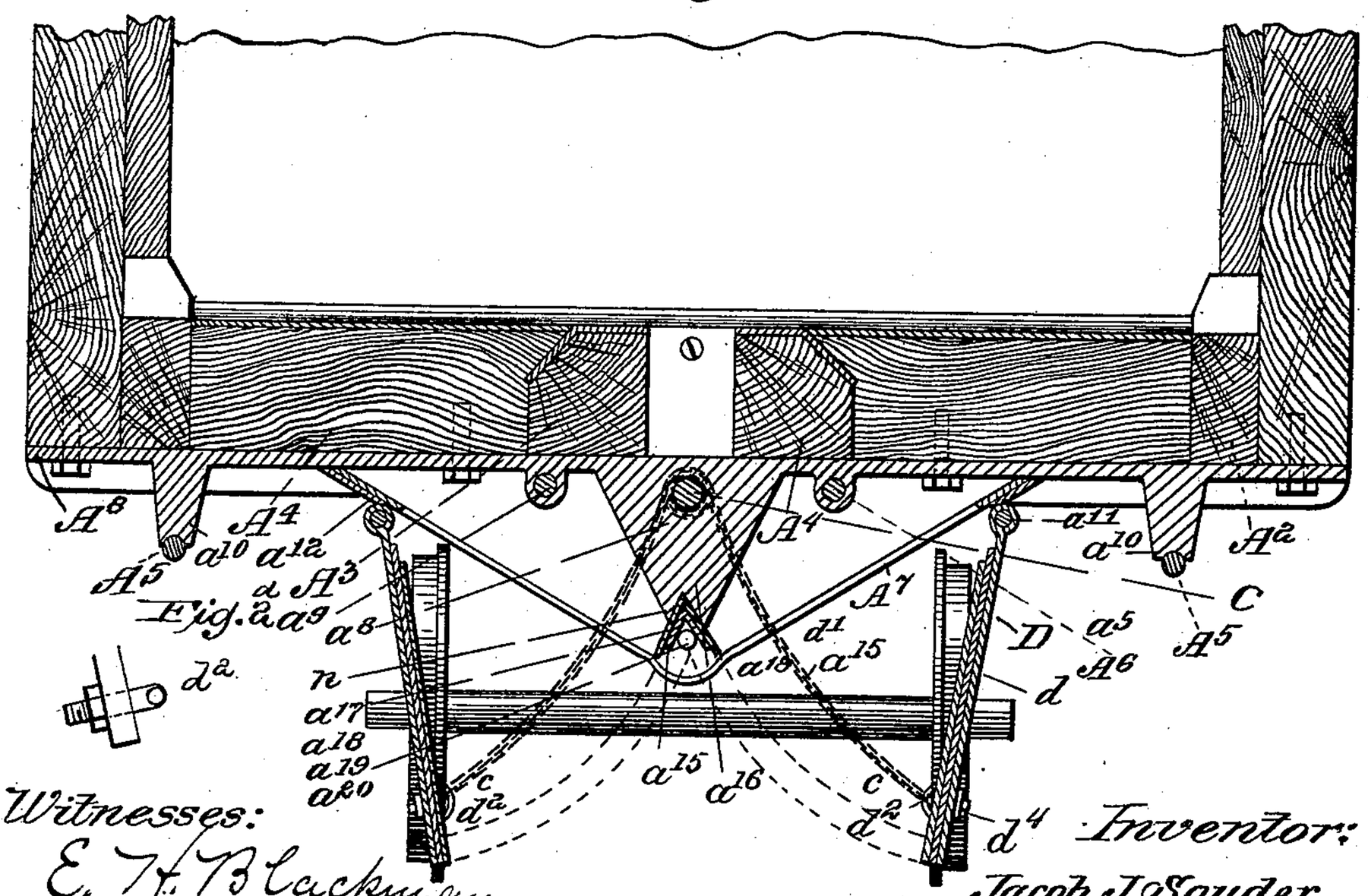


Fig. 2.



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(No Model.) 3 Sheets—Sheet 2.

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Fig. 3.

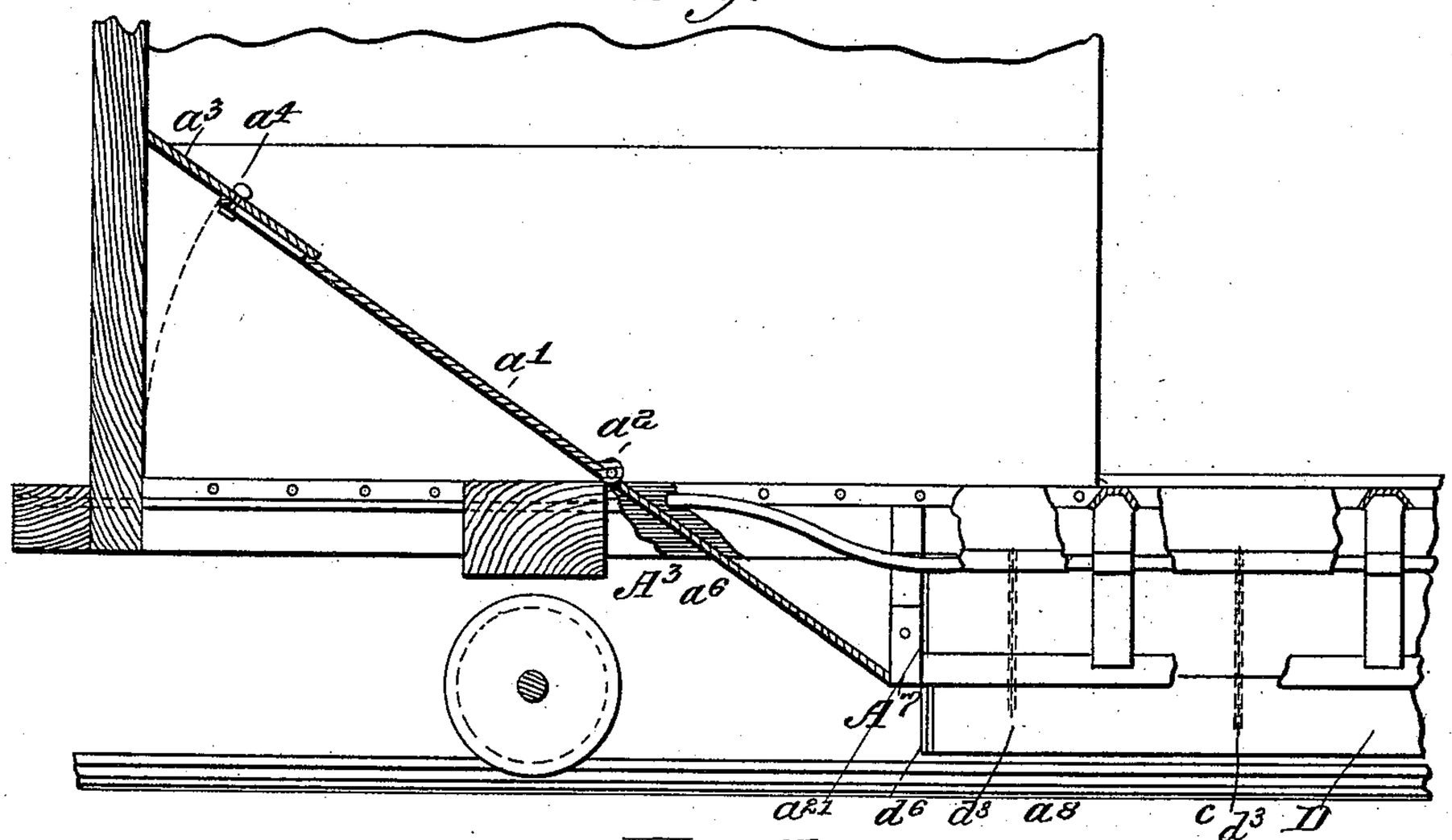
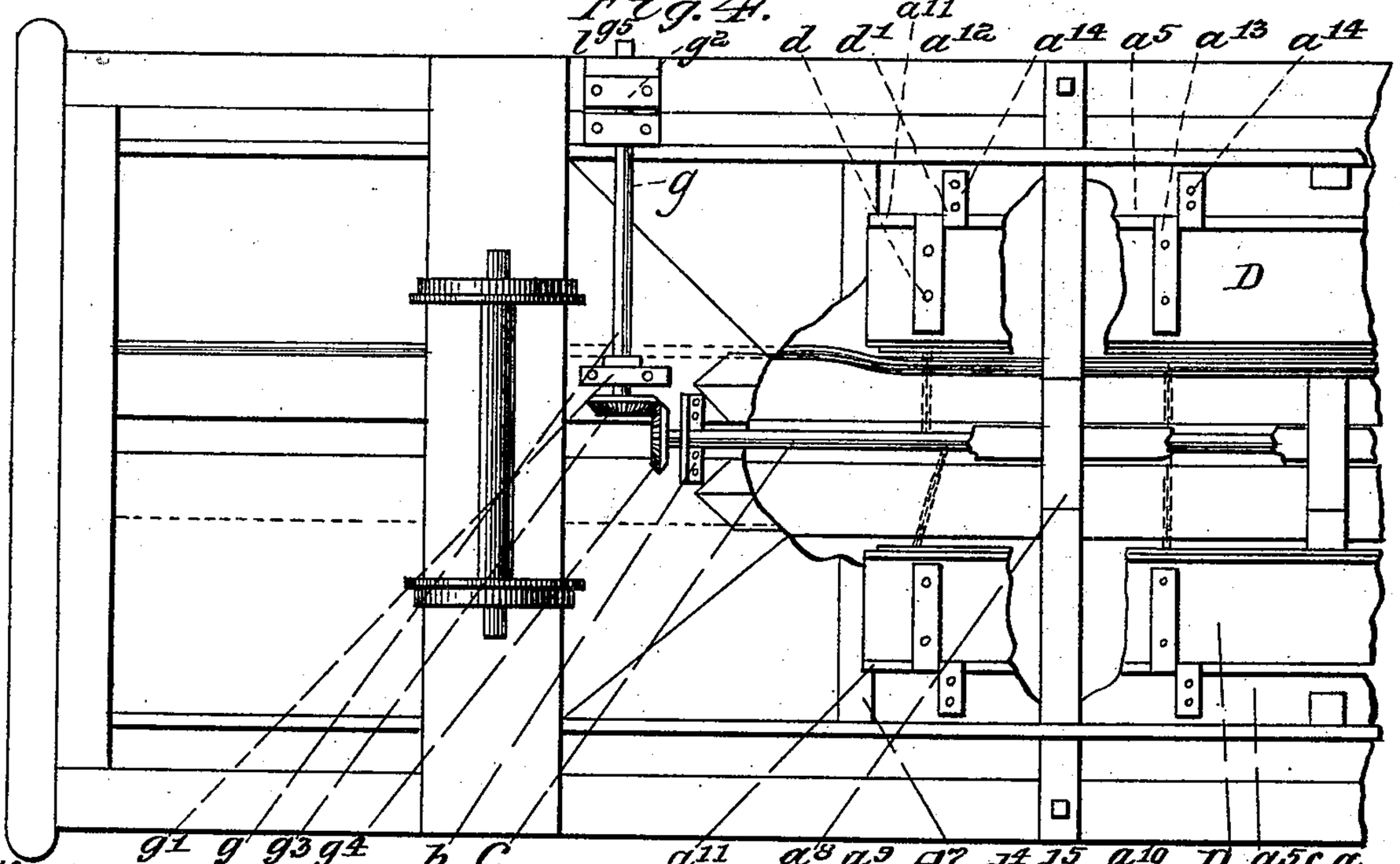


Fig. 4.



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(No Model.) 3 Sheets—Sheet 3.

J. J. SOUDER.

DUMPING CAR.

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Fig. 5.

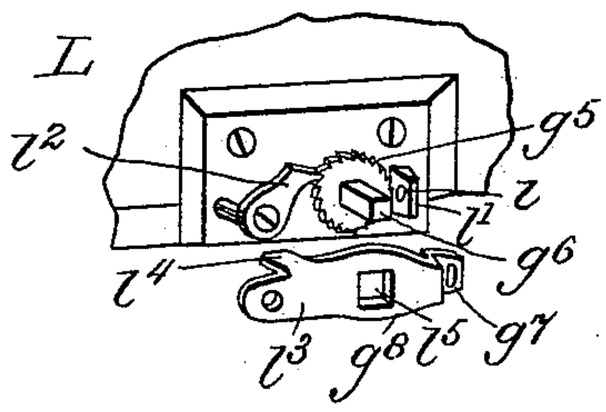


Fig. 6.

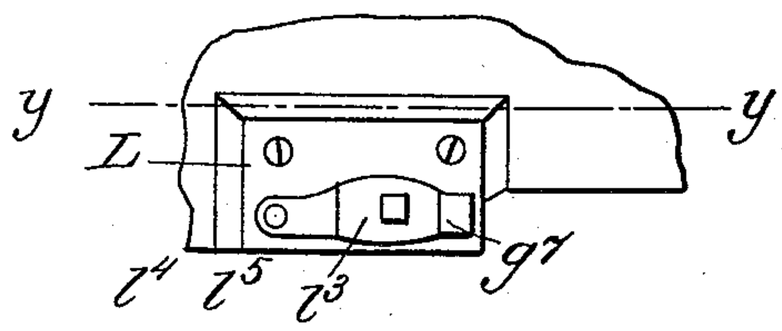


Fig. 7.

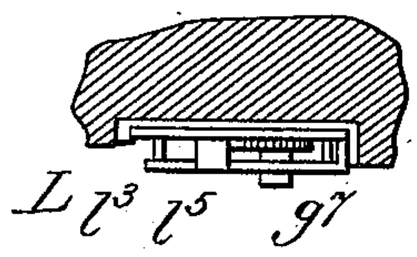


Fig. 8.

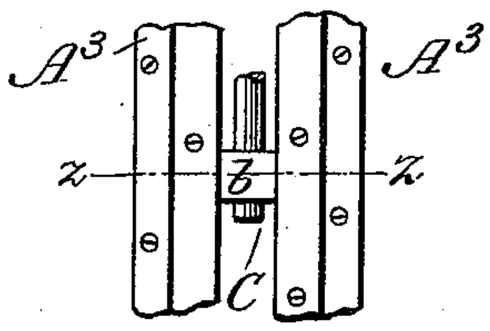
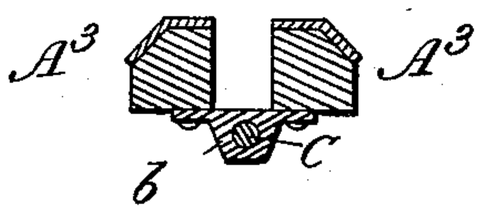


Fig. 9.



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Inventor:
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UNITED STATES PATENT OFFICE.

JACOB J. SOUDER, OF WASHINGTON, DISTRICT OF COLUMBIA.

DUMPING-CAR.

SPECIFICATION forming part of Letters Patent No. 464,639, dated December 8, 1891.

Application filed March 30, 1891. Serial No. 387,068. (No model.)

To all whom it may concern:

Be it known that I, JACOB J. SOUDER, a citizen of the United States, residing in Washington, in the District of Columbia, have invented a new and useful Dumping-Car for Railways, of which the following is a description.

The invention has general relation to that class of railway-cars which are designed mainly for the transportation of granular material in bulk; and it relates particularly to a car of this character which is adapted for use upon what is known as "narrow-gage" railways, although in all the essential features thereof it is applicable to cars of any dimensions whatever.

The invention consists, in general, in a railway-car which has a bottom of hopper-like construction which extends from end to end of the car, and which is provided with drop-doors which extend lengthwise of the car and which are adapted in discharging the contents of the hopper to turn upon their hinge-rod from an inclined to a perpendicular position and to cause a directly-downward discharge of such contents.

The invention consists also in various other novel parts and novel combinations of parts in a dumping-car, as will be hereinafter described and claimed.

In the drawings, Figure 1 represents a top plan view of one-half the car, the body being removed, portions being broken out and the center of the car being indicated by the line *v v*. Fig. 2 is a transverse vertical section on the line *w w* in Fig. 1, portions being broken out the more fully to show the construction. Fig. 2ª is an enlarged detail of means for equalizing the tension of the elevating-chains. Fig. 3 is a longitudinal vertical section on the line *x x* in Fig. 1, a portion of one of the longitudinal central sills being broken out. Fig. 4 is a partial bottom plan view showing portions of the mechanism by which the drop-doors are simultaneously elevated to their closed position, and showing also the continuous hinge-rod of such drop-doors. Fig. 5 is a detail of the covering-plate which secures the winding-shaft and its pawl in position. Fig. 6 is a detail side elevation. Fig. 7 is a detail plan view, looking down upon a section taken in the line *y y* of Fig. 6. Fig. 8 is a detail top plan view at the ungeared end of the chain-shaft by which the drop-doors are elevated. Fig. 9 is a section on the line *z z* of Fig. 8, looking in the direction of the arrow seen in that figure.

In the provision of dumping-cars for the transportation of fine granular material upon railways of standard gage it is not difficult to so construct them that the material may be discharged by its own gravity wholly outside the track-rails and upon either side of the car; but in cars for narrow-gage roads it has been found that the elevation of the bed-frame above the trackway is too slight to permit a construction in which the inclination from the bottom of the hopper shall be sufficient to insure the discharge of the material outwardly by its own gravity, and in my present construction I have accordingly provided for a directly-downward discharge of the entire contents of the car.

As will be seen in the drawings, the hopper *a* of the car A extends from end to end and from side to side of the bed-frame A′: The end sections *a′* of the hopper may be pivotally attached by hinges a^2, and may have a slidable extension a^3, adjustable by pinch-screws a^4. The central portion of the hopper is composed of the sections a^5 a^5, which are suitably secured to the outer longitudinal sills A^2 A^2 of the bed-frame A′ and of the hinged sections or drop-doors D D. The intermediate sections a^6 a^6 are so formed as to incline, in the ordinary manner of a hopper, from the foot of the end sections and from the inner and upper extremities of the longitudinal sills of the bed-frame. Central longitudinal sills A^3 A^3, transverse half-sills A^4 A^4 A^4, and longitudinal truss-rods A^5 A^5 and A^6 A^6 are provided, substantially as described in an application filed by me in the United States Patent Office simultaneously herewith and lettered "B." At the junction of the central section with the intermediate sections transverse supporting-bars A^7 A^7, bent to conform to the configuration of the hopper, are secured to such hopper and to the exterior longitudinal sills. Sill-plates A^8 A^8 A^8 are secured to the bottom surface of the longitudinal sills A^2 and A^3 and to the transverse half-sills A^4, and each of these sill-plates is provided with a central loop or bearing a^8 and a bottom notch *n* for a chain-shaft

and for a meeting bar, respectively, with side loops or bearings a^9 a^9 for the inner longitudinal truss-rods, and with studs or braces a^{10} a^{10} for the exterior longitudinal truss-rods. A hinge-rod a^{11}, secured by its ends in bearings a^{12} upon the bottom of the transverse supporting-bars A^7, extends through hinge-bearings a^{14} in hinge-straps a^{13} upon the bottom of the fixed central sections a^5 of the hopper, and through corresponding bearings d' in the upper extremity of the hinge-straps d of the drop-doors D. Longitudinally along the lowest portion of the hopper-opening extends a meeting bar a^{15}, which in this instance is composed of two acutely-bent angle-plates a^{16} a^{17}, nested one within the other in such manner as to form between them grooves a^{18} a^{18}, as shown. Preferably a bar a^{19} will extend along the recess in the lower angle-plate, being secured in bearings a^{20} a^{20} upon the supporting-bars A^7 A^7, to impart firmness to the meeting bar. A chain-shaft C, journaled at its ends in fixed bearings b, secured upon the bottom of the central longitudinal sills, has bearings also in the loops a^8 of the transverse sill-plates A^8, and at one end it is provided with a gear-wheel g^4, which is engaged by a corresponding pinion or wheel g^3 upon the inner extremity of a transversely-placed winding-shaft g, which is supported in a bearing g' upon an interior longitudinal sill and in a bearing g^2 upon an exterior longitudinal sill. Chains c, of uniform length and in any desired number, are secured by one end to the chain-shaft C, while the opposite end is connected to a short bolt d^2 in a perforation d^3 of the drop-door, the exterior and threaded end of each of such bolts being provided with a nut d^4, by which the tension of the several chains c may be made uniform.

Each of the drop-doors D is provided upon its upper face with a longitudinal flange d^5 and with transverse flanges d^6 d^6, which, when the doors are closed, enter, respectively, the groove a^{18} in the meeting bar and the grooves a^{21} a^{21}, which are formed in the intermediate hopper-sections a^6.

The winding-shaft g receives upon its outer end a locking-plate L and a ratchet wheel or pinion g^5. The locking-plate, which is suitably secured in a recessed portion of the body or of the bed-frame of the car, is provided with a locking-lug l, which has a perforation l', with a pawl l^2, and with a pivoted covering and securing bar or plate l^3, which has a downturned flange or holding-lug l^4 for engagement behind the pawl, a perforation l^5 to engage the squared winding end or arbor g^6 of the winding-shaft, and an end flange or lug g^7, having a perforation g^8 corresponding to the perforation l' in the lug l of the locking-plate and adapted to receive, in connection with such lug, the holding-arm of any ordinary or suitable padlock.

It will be apparent that a winding-shaft may be applied, in connection with the chain-shaft, at each extremity of the hopper or at any intermediate point, and it will also be apparent that, if desired, the car and its hopper and the drop-doors of such hopper may be divided transversely, and a separate chain-shaft and winding mechanism may be provided for each receptacle.

It will be seen that the provision of a hopper which extends from end to end of the car, and which has oppositely-placed drop-doors which extend lengthwise of the car and are hinged at their outer edges so as to fall apart or away from each other when opened, insures complete and instantaneous clearance of the car, while by reason of the co-operative relation of the open doors and the track-rails, as seen in Fig. 2, no portion of the contents of the car can fall outside of or upon the rails.

As will be seen in the drawings, the hopper of the car is composed of metal, the better to resist abrasion in receiving, conveying, and discharging hard and rough substances, such as mineral coals, limestone, and ores; but the car is none the less adapted to use as a grain-car, the provision of the flanges upon the face of the doors, each projecting preferably an inch or more, in connection with the corresponding grooves in the meeting bar and in the body of the hopper, insuring entire security against the escape of any portion of even the most diminutive cereals.

It will be apparent that the chain-shaft might extend to or nearly to the end of the bed-frame, and that the crank or winch might be applied directly to such shaft instead of employing the transverse shaft and intermediate gearing, as shown; but in most cases the construction already described will be found preferable.

The provision of the slidable extension a^3 upon the pivoted end sections a' of the hopper adapts such sections for close adjustment with the end wall w of the car either in an inclined or in a horizontal position, as may be desired, the beveled edge e of the extension fitting continuously against such wall when the section is elevated to its inclined position, and the upper extremity only of such edge resting in contact with such wall when the section is in its horizontal position. This vertically-adjustable end section is thus adapted either to form an inclined continuation of the hopper to the extreme end of the car or to constitute a horizontal continuation of a horizontal floor, whether formed in adjustable intermediate sections, as in United States Patent No. 371,224, issued to me October 11, 1887, or otherwise.

It will be apparent that in constructing cars of the character herein described it is essential to convenient and advantageous use that the space within the upper or merchandise section thereof shall be wholly unobstructed, and it will be seen that this end is secured by the above-described construction, in which the longitudinal shaft which operates to close the drop-doors or dumping-sections is placed wholly below the plane of the

upper surface of the bed-frame. As a result of this location of the shaft or drum, it is practicable to readily, conveniently, and securely support the same in numerous bearings secured to the bed-frame, thus equalizing the strain of the burden upon the same, and to attach numerous winding-chains, thus equalizing the strain upon the various parts of the hinged sections. As a further result, the shaft being placed in coincidence with the bed-frame, it is protected thereby against possible injury through accident or otherwise, and is practically screened against contact with the contents of either of the two sections of the car. Also, under this construction it is practicable to readily apply this portion of my improvement to cars of ordinary construction without modification of the body of the same.

Having described my invention, I claim—

1. A dumping-car which is provided with a hopper-like bottom which extends from end to end of the bed-frame, and with coincident exteriorly-hinged drop-doors which extend lengthwise of the car and from the top to the bottom of the hopper, and which, when unfastened, swing away from each other and from the longitudinal center of the car toward the outside thereof into line with the car-wheels and into contact with the track-rails, substantially as and for the purposes described.

2. In a dumping-car, the hopper having grooves along the margin of its discharging-opening, the outwardly-hinged centrally-meeting doors, each having longitudinal and transverse flanges, the meeting bar having grooves, and a revoluble chain-shaft by which the doors are closed and by which the flanges upon the doors are brought into engagement with the grooves in the body of the hopper and in the meeting bar, in combination, substantially as specified.

3. In a dumping-car, the combination, with the bed-frame, of the transverse sill-plates A^8, provided with central bearing, end braces, and intermediate bearings, as described, the central bearing receiving the chain-shaft and the meeting bar, the end braces receiving the outer longitudinal truss-rods, and the intermediate bearings receiving the inner longitudinal truss-rods, substantially as set forth and shown.

4. In a dumping-car, the combination, with the hopper, of the drop-doors hinged to the outer portion of the hopper and adapted when open to rest against the inner face of the tread of the track-rails and to form, in connection with such rails, a discharging-chute for the contents of the hopper.

5. The combination, with the winding-shaft g, having ratchet-wheel and pawl, as described, of the covering and securing bar or plate l^3, having holding-lug l^4 for engagement behind the pawl when the securing-plate is in its locked position.

6. The combination, with the locking-plate L, secured to the body of the car, as shown, and having the locking-lug l, of the winding-shaft g, having ratchet-wheel and pawl, and the securing bar or plate l^3, pivoted upon the locking-plate and engaging with the pawl and with the arbor of the winding-shaft and provided with perforated end lug g^7, coincident with the lug l upon the locking-plate.

7. The combination, with the transverse supporting-bars A^7 A^7, each provided with a bearing a^{20}, of the bearing-bar a^{19} and the superposed angle-plates a^{16} a^{17}, substantially as and for the purposes set forth.

8. The combination, with the end wall of the car and with the pivoted end section a' of the hopper, of the adjustable extension a^3, whereby the pivoted extension, whether in its inclined or in its horizontal position, is in close contact with the wall of the car, substantially as shown and described.

9. In a railway-car, the combination of hinged drop-doors or dumping-sections and means for closing such doors or sections, such means embracing a winding-shaft centrally arranged longitudinally of and below the plane of the upper surface of the bed-frame of the car, substantially as described.

10. A railway-car which is provided with hinged or swinging dumping-sections and with a winding-shaft for operating such sections, arranged centrally lengthwise of the car and below the plane of the upper surface of the bed-frame thereof.

11. In a convertible dumping and merchandise car, the combination of a movable or changeable main floor, exteriorly-hinged drop-doors extending lengthwise of the car, and a central longitudinal winding-shaft below the top of the bed-frame of the car for closing such doors, substantially as set forth.

12. In a railway-car, coincident oppositely-inclined outwardly-hinged drop-doors or dumping-sections, and a central longitudinal winding-shaft below the plane of the upper surface of the bed-frame of the car, in combination.

JACOB J. SOUDER.

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