

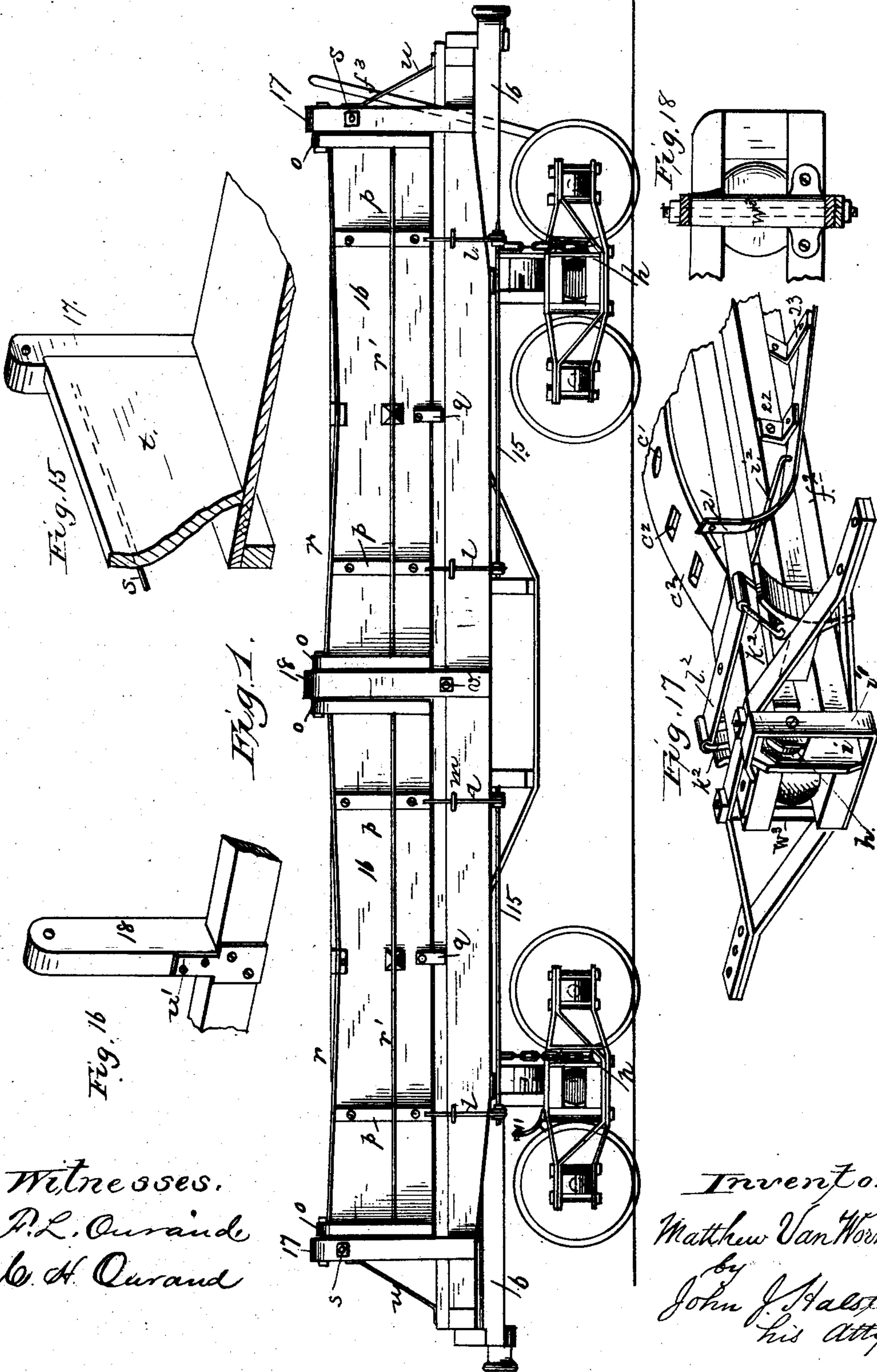
(No Model.)

4 Sheets—Sheet 1.

M. VAN WORMER.
DUMPING CAR.

No. 244,954.

Patented July 26, 1881.



Witnesses.
P. L. Ourand
C. H. Ourand

Inventor.
Matthew Van Wormer
by
John J. Halsted
his Atty.

(No Model.)

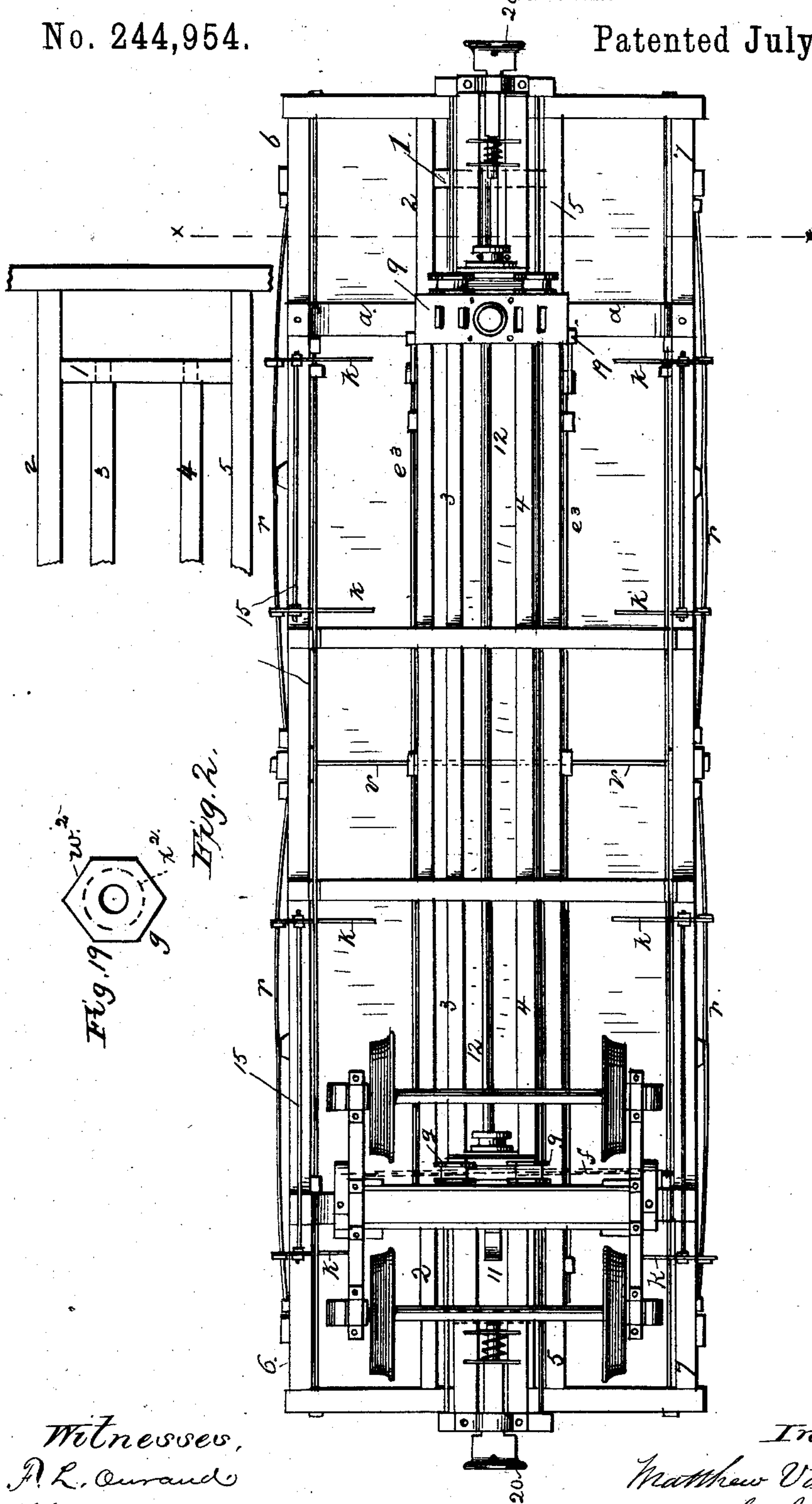
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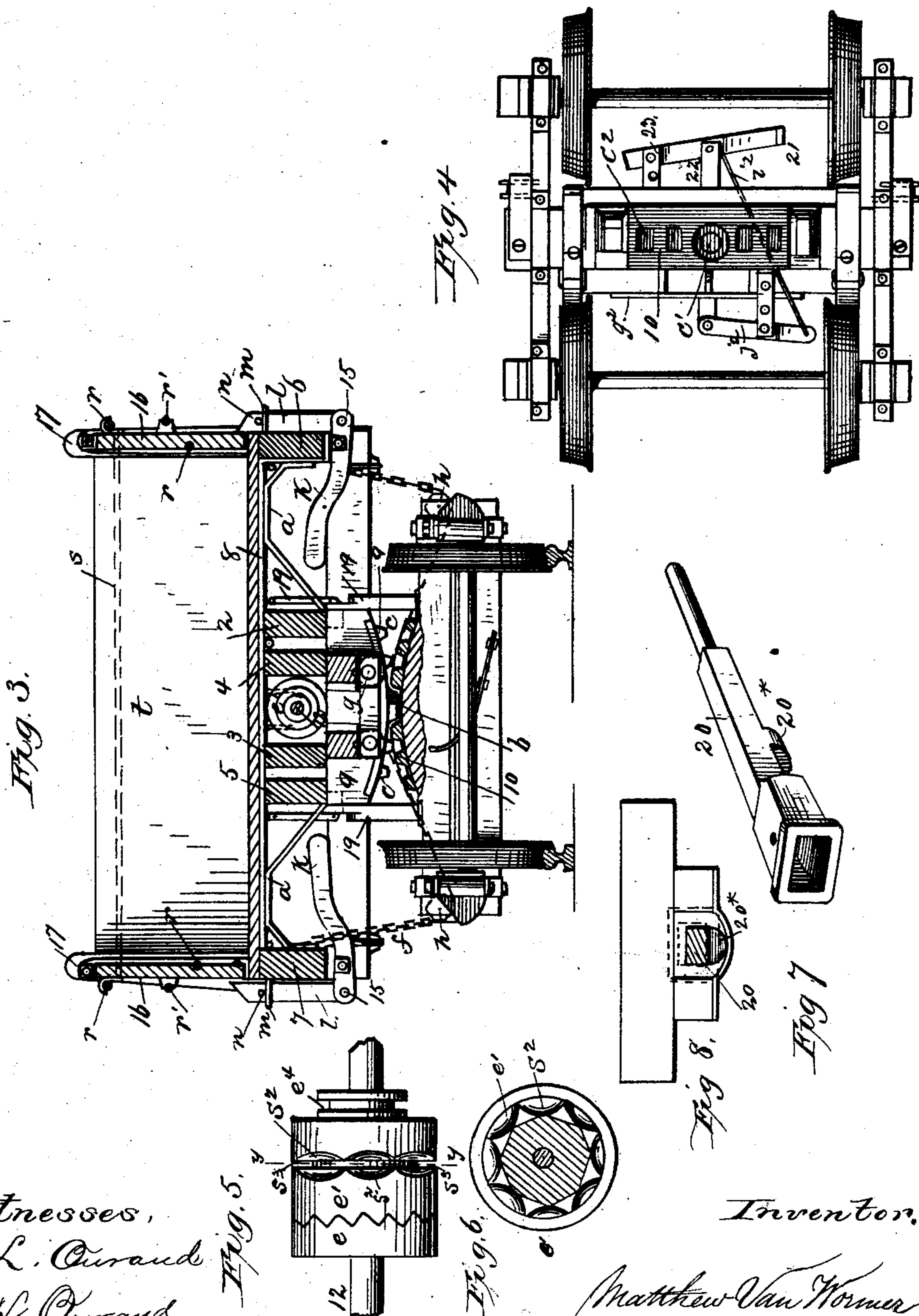
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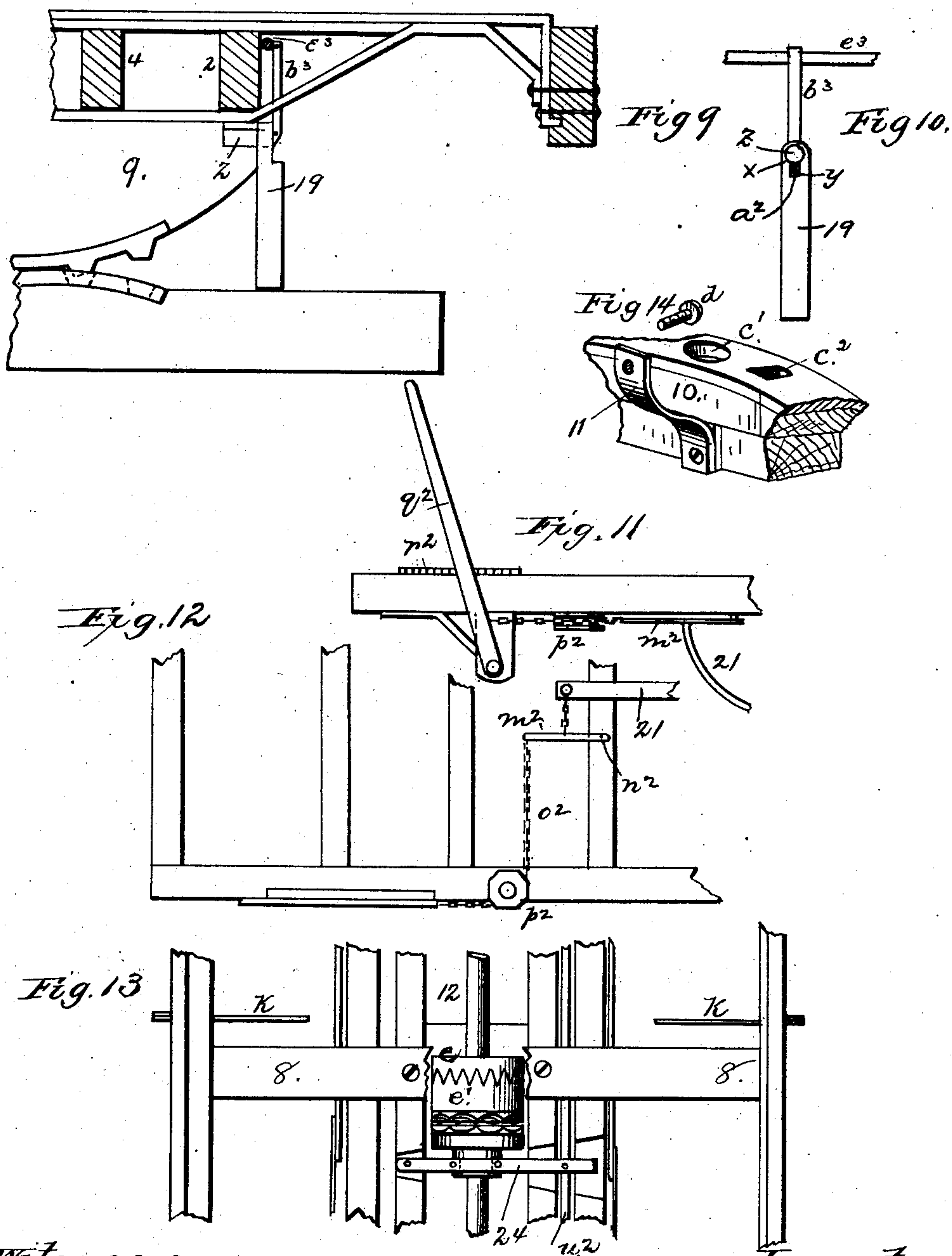
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UNITED STATES PATENT OFFICE.

MATTHEW VAN WORMER, OF DAYTON, OHIO.

DUMPING-CAR.

SPECIFICATION forming part of Letters Patent No. 244,954, dated July 26, 1881.

Application filed May 7, 1881. (No model.)

To all whom it may concern:

Be it known that I, MATTHEW VAN WORMER, of Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Dumping-Cars; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My present invention is an improvement on the inventions set forth in the following-named patents issued to me, namely, No. 193,101, dated July 17, 1877; No. 199,761, dated January 29, 1878, and No. 200,813, dated February 26, 1878; and it relates to the construction of the car-bed; to the transoms; to the construction of the rockers and means whereby the car, after dumping, shall right itself up again; to a device for preventing the separation of the car-bed from the trucks; to the mechanism for dumping at either side of the car; to the means for fastening pulleys to the ends of the truck timbers; to the mechanism for fastening and unfastening the doors of the car; to the construction of the doors; to the end posts and the means for fastening the same to the car-bed; to the center posts and the means for fastening them to the car-bed; to the side bearings and their application, so as to keep the car-bed in position and to prevent undue friction while the car is moving around curves of the track; in combining with the draw-bar a rocker, whereby the dumping may take place with the ordinary draw-bar without need of uncoupling the car from the other cars of the train; in an improved brake mechanism; in a special construction of clutch-pulley with grooves and sockets adapted to receive and hold the links of the chain, and whereby the revolving of the pulley to gradually tilt the car will operate the chain and prevent its slipping; in means for dumping either slowly or suddenly, as desired; in a special construction of guide-rollers for the chains; in combining the shaft of the clutch-coupling pulleys and their chain and its guide-pulleys with a worm-gear or screw-lever for operating the

same, and in other particulars hereinafter set forth.

In the drawings, Figure 1 is an elevation of my improved dump-car; Fig. 2, a bottom view with one truck removed; Fig. 3, a cross-section through line *xx* of Fig. 2; Fig. 4, a top view of one of the trucks; Fig. 5, a plan of the couplers, and Fig. 6 a section through *yy*; Figs. 7 and 8, details of the draw-head and its rocker; Figs. 9 and 10, details, showing the side bearings; Figs. 11 and 12, brake mechanism; Fig. 13, partial top view, parts being broken away, showing the coupler-pulleys and their connections; Fig. 14, fragment enlarged of convex stationary bed; Figs. 15, 16, 17, 18, and 19, details.

Of the timbers of the car-frame, 1 1 represent cross-sills or headers extending from the longitudinal sills 2 and 5, and framed or secured into the same. 3 and 4 represent shorter sills framed into the cross-sill or header 1, and not as long as the outside sills, 6 7, or the sills 2 5, the objects of making them shorter being for the purpose of giving space or room for the worm and gear of the screw-lever or other appropriate mechanism which operates the chain-shaft hereinafter described, and also to allow sufficient space without weakening the car-bed for such bed to dump over the wheels, oil-boxes, and truck-timbers without coming in contact with any of them.

An iron or wood transom, 8, is applied to run above the top or upper portion of the sills of the car, and even with or above the top of the floor, and it may make a part of said floor; and other iron bars or wood transoms, *a*, passing underneath the inside sills of the car and passing up in the shape of a brace between the respective outside sills, 6 7, and the sills 2 5, are fastened to the transom 8, making a sufficient space between the lower sides of these transom-braces *a* and the truck-timbers or truck-irons to give the car-bed more and ample dumping-room without coming in contact with such timbers or irons or with the oil-boxes when discharging any material from the car. These transoms or braces *a* also make the construction strong and safe.

The rockers and their arched beds are such that after dumping the car-bed will right itself up again, and they are constructed as follows,

9 representing the rockers, their stationary convex beds being shown at 10: Each may be all of iron, or of iron and wood. The rockers 9 have each a short central downwardly-projecting stud or boss, *b*, which may be of ball shape, if desired, and also a series of stout strong cogs, *c c*, on both sides of this stud, and the convex beds (see Figs. 3 and 14) have each a central shallow socket, *c'*, to receive the stud or boss *b*, and also a series of sockets, *c² c²*, adapted to receive the cogs *c c*, the object of this being that when the car is turned or dumped they will prevent the car-bed from getting out of position, and at the same time permit the tilting of the bed far enough over and to a degree of pitch sufficient to discharge coal or other material without the risk of coming in contact with either the trucks, truck-irons, oil-boxes, or wheels, and also to permit the car to right itself up after dumping. The car or car-bed will automatically right itself after dumping, because when it is tilted or turned over to dump, and is left free to return by disengagement of the V-shaped couplings on the shaft, (or shafts,) 12, hereinafter described, the fulcrum or bearing-point of the rocker is no longer at the boss *b* and its central socket, but has been shifted to one or more of the cogs and to their sockets, thus giving a long leverage for that side of the car or bed which is for the time being raised up, and this causes that side to fall by its own weight till the car is again level. It will be seen that any mechanical equivalent of these sockets, teeth, or cogs, and boss which will allow the same action and result may be substituted for them. A bar of iron or wood represented at 11 is designed to hold the car-bed from separating from the trucks while the car is in transit or motion. It is bolted or fastened to the truck-timber or to the lower convex bed, 10, and extends upward to be attached to either the upper rocker, 9, or to the car-bed, or to a cross-sill, and is provided with a bolt, for connecting it to such part, or to any iron or wood fastened thereto. A shaft, (or shafts, if desired,) marked 12, runs lengthwise of the car under its floor, either its full length or a sufficient distance for receiving at its end or ends coupling-pulleys *e e'*, having V-shaped teeth on their adjacent sides, for engaging with each other. On this shaft 12 (if but one be used) are affixed permanently one near each end, and to revolve with it, two clutches, *e*, having V-shaped teeth, as shown, designed each to be engaged or disengaged at will from its fellow, which is provided with similar V-shaped teeth, and placed loosely upon the shaft, and adapted to be shifted in or out of engagement with the fixed clutch *e*. (See enlarged views, Figs. 5 and 12.) This coupling apparatus is to be located beneath the transom 8, so that the latter shall in no wise interfere with its free revolution. A chain, *f*, Figs. 1 and 2, passing over and clinging to the loose pulley *e'*, (the particular construction of which pulley will be hereinafter fully described,) and wind-

ing partly around said pulley, passes thence under guide-pulleys *g g*, adjustable, if desired, secured to the rocker or to the timbers of the car-bed. This chain also passes under guide-pulleys *h h*, (see Figs. 1, 3, and 17,) attached, respectively, to the opposite ends of the truck-timbers or frame; thence the ends of the chain respectively pass up to and are fastened upon the car-bed, or upon the outside sills, 6 7, or to the car-floor.

For the purpose of applying the pulleys *h h* to the outer ends of the truck-timbers, so as not to interfere with the proper action of the car-springs, I fasten to the end of the under truck-timber a strap or bar, *i*, (see Fig. 17,) of wood or iron, and connect it to the upper truck-timber by bolts extending into or through such truck-timber and through a slot in said strap or bar *i*, such slot allowing the springs between the two truck-timbers to work the same as though said strap or bar were not there. The slot may be in either end of the bar *i*. Another strap or bar, *i'*, of iron, (or of wood,) is bolted to the lower end of the bar *i*, (or to the truck-timber, to which it is firmly attached,) and extends outward sufficiently to admit the pulley *h* between the bars *i* and *i'*, the axis or journal of said pulley *h* being supported by the two straps *i i'*.

I will now describe the manner and the means of fastening and unfastening the doors automatically.

A bar or rod of iron, 15, fastened or suspended to the outside sills respectively of the car, have thereon one or more dogs or levers, *k*, (see Fig. 3,) and to the outer ends of such levers are pivoted one or more upright slides or latches, *l*, adapted to extend a little above the floor of the car, sufficient to catch, latch, and hold down the swinging doors 16, which latches run in appropriate guides or staples *m*. The levers *k* are so constructed that when the car is being dumped their long arms will come in contact with or strike the truck-timber or truck-irons at the appropriate time and unlatch the doors 16. Each latch *l* is provided with a hole, in which a pin, *n*, may be inserted to lock them when desired. When these pins are removed the latches are ready for their automatic action upon tilting the car, as above stated.

Each door 16 (see Fig. 1) is a batten-door, mortised in timbers or iron *o* at each end, and swinging on pivots at their upper ends. These doors are also supplied with and strengthened by metal cross-bars or straps *p* secured thereto, the lower ends of which are so beveled or turned under at an incline as to allow them readily to pass the upper beveled ends of the latches *l* in the act of closing the doors. The weight of the levers *k* tends to throw up the latches *l* and to automatically fasten the doors when they shall have passed the latches. One or more straps, *q*, of wood or iron, fastened on the outside of the door, and extending below its lower line, serves to prevent the door from swinging too far in. The door is also provided

with one or more truss-rods, r or r' , either inside or out, or both, for the purpose of strengthening it and holding it properly to place.

The upright end posts, 17, of the car and their connections are as follows: They rest, respectively, upon the outside sills, 6 7, and extend down on the side thereof a sufficient distance to admit of being strongly secured thereto by bolts or otherwise, and extend far enough above the doors to permit the same to be hinged or attached thereto. Said posts 17 are grooved or recessed on their inner corners (see Fig. 15) to receive the end board of the car, so as to leave the inner face of said board or plank flush or even with the inside of the post, thereby preventing any obstruction when unloading, and also to make the car more firm and strong. A rod, s , of metal or wood, extends across the end of the car and through both these posts to hold them and the end plank or board, t , firmly in their places. There is also an iron or wooden brace, u , extending from each post to the end sill or floor, to aid in bracing and holding said post 17 to its place. The upright center posts, 18, also rest and are secured, respectively, upon the outside and top of a sill, and each is further secured by a metal plate, u' , which extends down and is fastened to the inside of the outside sills of the car, as seen in Fig. 16. A metal rod, v , passes through both these opposite center posts, 18 18, under the floor and above the sills, and is tightened by appropriate nuts or equivalent means for firmly holding the posts in place.

The side bearings for holding the car and keeping it in position are represented at 19 in Fig. 3 and in an enlarged view in Figs. 9 and 10, and are as follows: They severally consist of a bar of iron or wood adapted to rest on the truck-timber, and extending upward and movably secured to the rocker or to the sills or transoms or floor of the car. Through a hole, x , having a slot or keyway, y , in the upper end of each side bearing, passes a shaft or bolt, z , with a key or pin, a^2 , thereon. This shaft is secured to the car as above named. It is represented in the drawings as attached to an end of the rocker. This slot y allows the side bearing to play at its upper end, and thus prevent that friction which it would otherwise have if compelled to travel or move rigidly upon the truck-timber when the car is moving around curves.

The outer end of the shaft or bolt z receives an arm, b^3 , secured to it by a pin or screw for the purpose of permitting the said shaft and bearing to be moved by appropriate connections, extending upward, and connecting with a rod, e^3 , which extends and is attached to both side bearings on one side of the car on the front and rear trucks, said rod extending to the end of the car, and being there attached to a lever, f^3 , for the purpose of operating both side bearings which are upon one side of the car at one act by the same lever, to allow the dumping. Similar side bearings and attachments are on the other side of the car.

On the under side of each draw-bar 20 is an arched or curved rocker, 20*, the object of which is to permit the car to be tilted for dumping or otherwise without the need of uncoupling any car from the other cars of the train. (See Figs. 7 and 8.) This rocker may rest on a curved bed, as shown in Fig. 8.

I will now describe my improved brake mechanism, consisting of a combination of levers, chains, and pulleys, as follows, referring more particularly to Figs. 4 and 17: A bar, 21, of metal or wood, attached to the truck-timber by an arm, 22, and bolts or screws, is also attached to the brake rod or bar f^2 by an arm, 23, and bolts or screws. The two brake-bars of each truck act coincidentally upon the inner perimeter of all the wheels of each truck by means of the following connections: This bar or lever 21, which is connected to and immediately operates one of the brake-bars, and which, as above stated, is fulcrumed upon the lower truck-beam, is also connected by means of a rod or bar, i^2 , with one end of a lever, j^2 , at the opposite side of said truck-beam, the other end of said lever connecting with the other brake-bar g^2 , which acts upon the other two wheels of the same truck, thus giving a movement in opposite directions at the same time to the two brake-bars. Provision is made for adjusting the throw of the levers which actuate the brakes. The brakes and their bars are suspended by links k^2 k^2 from springing or yielding straps l^2 , secured upon the truck-beams. This affords a yielding and play to meet varying exigencies and a self-adaptation to the curvature of the wheel.

To the upper end of bar 21 (see Figs. 11 and 12) is attached a chain, (or a rod,) which connects with a lever, m^2 , one end of said lever being fastened to the sill or floor of the car, as shown at n^2 , and the other end being connected to a chain, (or rod,) o^2 , running in a direction lengthwise of the car, such chain passing around a pulley, p^2 , on or near the end of the car, and fastened at its extremity to an upright hand-lever, which lever is pivoted to the sill or below the sill of the car. By operating this lever the brakes are brought into action, and the lever may be held to any desired position by means of a rack or ratchet, r^2 , with the teeth of which it may engage and be held.

The loose coupling-pulley e' has cavities on its periphery precisely adapted to receive and hold positively therein the successive links of the chain f . These cavities may be described as follows, in general terms: A series of oval-shaped depressions or sockets, s^2 , (see Figs. 5 and 6,) to receive those links which lie flat, such oval sockets communicating only by deep narrow cuts or grooves s^3 , sufficient to receive edgewise those links which connect the alternate flat-lying ones. Each flat-lying link is sunk below the periphery of the pulley or wheel. A pull upon the chain would therefore revolve the wheel. Consequently the revolution of this coupling-pulley e' must posi-

tively and without any chance of slipping pull the chain in the direction of its revolution and thereby tilt the car. The chain being properly applied in the first instance with sufficient slack at its opposite ends to permit the greatest degree of tilting ever required, this proper relation is always under control. The chain is thus always self-holding to its pulley and can never slip, although the chain is, as it needs to be for this purpose, a loose one.

For connecting and disconnecting these couplers e e' there is an annular groove, e^1 , around the periphery of the loose pulley e' , into which projects a pin, upon a shifting-lever, 24, (see Fig. 13,) pivoted to a rod, u^2 , extending lengthwise of the car, for operating both couplings, if desired, said rod being actuated by means of a hand-lever at the end of the car or other convenient place. When, by means of this lever, the couplings are disengaged or uncoupled the pulley e' may revolve suddenly, as a loose pulley, in order to allow the car-bed to discharge its load itself, when it will come back or return of itself to its upright position. When the coupling-pulleys are coupled or engaged then the car may be tilted slowly. This capacity for sudden dumping is important when clay, damp coal, or other damp or adhesive material constitutes the load, so as to discharge it with a jar or "thud;" but with other materials which might be damaged by such jars or shocks, or when it is desired to deliver gradually, the V-couplings, when in engagement, afford full control to tilt the car as far or as slowly as may be advisable.

The guide-pulleys g for the chain f are hexagonal on their peripheries, thus presenting six flat surfaces of a size adapted to the flat-lying links of the chain, and a peripheral groove, x^2 , adapts them for receiving the intermediate or edgewise-lying links. (See enlarged view, Fig. 19.) Thus these pulleys fit all the surface of the chain and prevent its getting off. They may be flanged, also, if desired. Instead of being hexagonal, these pulleys may have eight or more peripheral faces. The pulleys h are circular, but with an annular groove to receive the edges of alternate links of the chain.

I claim--

1. The car-bed as made, with the cross-sills and headers 1 1 extended from the longitudinal sills 2 5, and which reach from end to end of the car, and framed or fastened thereon, and with the shorter longitudinal sills 3 4, framed into the headers 1 1, and with the outside sills, 6 7, the construction affording space at the ends of the car and between the sills 2 5 for the worm and gear or machinery which operates the dumping mechanism, and ample clear space at the sides for dumping, and all without weakening the car-bed.

2. The rocker 9, constructed with a short central round boss, b , and with a series of stout cogs, c c , on its under side, in combination with the convex bed 10, constructed with the shallow central socket, c' , and the sockets c^2 c^2 on

its upper side adapted for the cog-teeth c c , all as shown and described, and for the purpose of dumping the car and of permitting it to right itself up again.

3. The dumping shaft or shafts 12, extending nearly the length of the car, in combination with the clutch-pulley thereon, and with the linked chain and the described series of pulleys or devices for actuating the same, and for connection with a hand lever or wheel and a connecting worm and gear, whereby such shaft may be operated to dump either slowly or suddenly at option.

4. The combination, with the ends of the truck-timbers, of the straps i i' and their interposed guide-pulley h , these straps being constructed and applied to each other and to the truck-timbers substantially as set forth, so as not to interfere with the proper action of the car-springs.

5. In combination with the swing-doors, the bar or rod 15, one or more dogs or levers, k , beneath the car, one or more vertical slide-latches, l , and their guides, the combination and arrangement being such that the inner end of the dogs k may serve automatically to fasten or to unfasten the doors in the manner shown and described.

6. The swing-doors constructed as described—that is to say, mortised in timbers or iron supports o at each end, strengthened by truss-rods r r and by metal cross bars or straps p , having beveled lower ends for engagement with the fastening-latches, and provided with one or more straps or projections, q —as and for the purposes set forth.

7. In combination with the car-bed, the end posts, 17, resting on the outside sills and extending down and secured to the outside of the same, and extending high enough to permit the swing-doors to be attached thereto, said posts being grooved or recessed at their inner corners to receive the end board, t , of the car flush with the inside of the posts, the posts and the board being held together by a connecting-rod and braced by braces u , all substantially as shown and described.

8. The center posts, 18, made and applied to the car-bed as described, and assisting to support the swing-doors, and strengthened by an inside metal plate, u' , and by a tightening-rod, v , beneath the floor connecting the two opposite posts.

9. In combination with the car, the movable side bearings, 19, provided at their point of suspension with a slot or keyway as described, whereby, while holding the car in position during transit and adapted to be swung up for dumping, they also prevent undue friction when the car is in motion around curves.

10. In combination with the draw-bar, the the rocker or arched piece 20*, secured upon its under side, as and for the purpose described.

11. In combination with a dumping-car, brake mechanism as described, consisting of the combination of bar 21, arm 22, on the truck-timber, arm 23, brake-bars f^2 g^2 , rod or bar i^2 , lever j^2 ,

links l^2 , and yielding straps l^2 , and appropriate means for actuating the same from the car-platform.

12. In combination with a dumping-car, the pulley e' , made integral with its deep sockets s^2 and their narrow connecting-grooves, and with the V-teeth and the annular groove, as and for the purposes set forth.

13. In combination with a dumping-car, the pulley-shaft, the loose pulley e' , made integral with its deep sockets and connecting-grooves, V-teeth, and annular groove, as set forth, the pulley e and appropriate mechanism for disengaging these pulleys and to allow the car-bed to dump its load suddenly or slowly, as desired.

14. In combination with a dumping-car, and with the pulley-shaft, its fixed pulley e , and the loose pulley e' , made integral with its sockets, grooves, V-teeth, and annular groove, the shifting-lever 24, rod u^2 , and hand-lever v^2 , these devices operating as and for the purpose described.

15. In combination with the linked chain f , attached to both sides of the car-bed, the guide-pulleys g , made with the flat surfaces w^2 , adapted for the links, and with the peripheral groove x^2 , as shown and described.

16. In a dumping-car, the combination, with the pulley-shaft and with the described mechanism for operating the same, of the pulley e , the pulley e' , made integral with its sockets, connecting-grooves, V-teeth, and annular groove, the linked chain, guide-pulleys g , grooved as described, and the guide-pulleys h , made as described, the ends of the chain being fastened to the outside car sills or floor, all substantially as shown and described.

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