(No Model.) 4 Sheets—Sheet 1.

M. VAN WORMER.

DUMPING CAR.

No. 316,507. Patented Apr. 28, 1885.

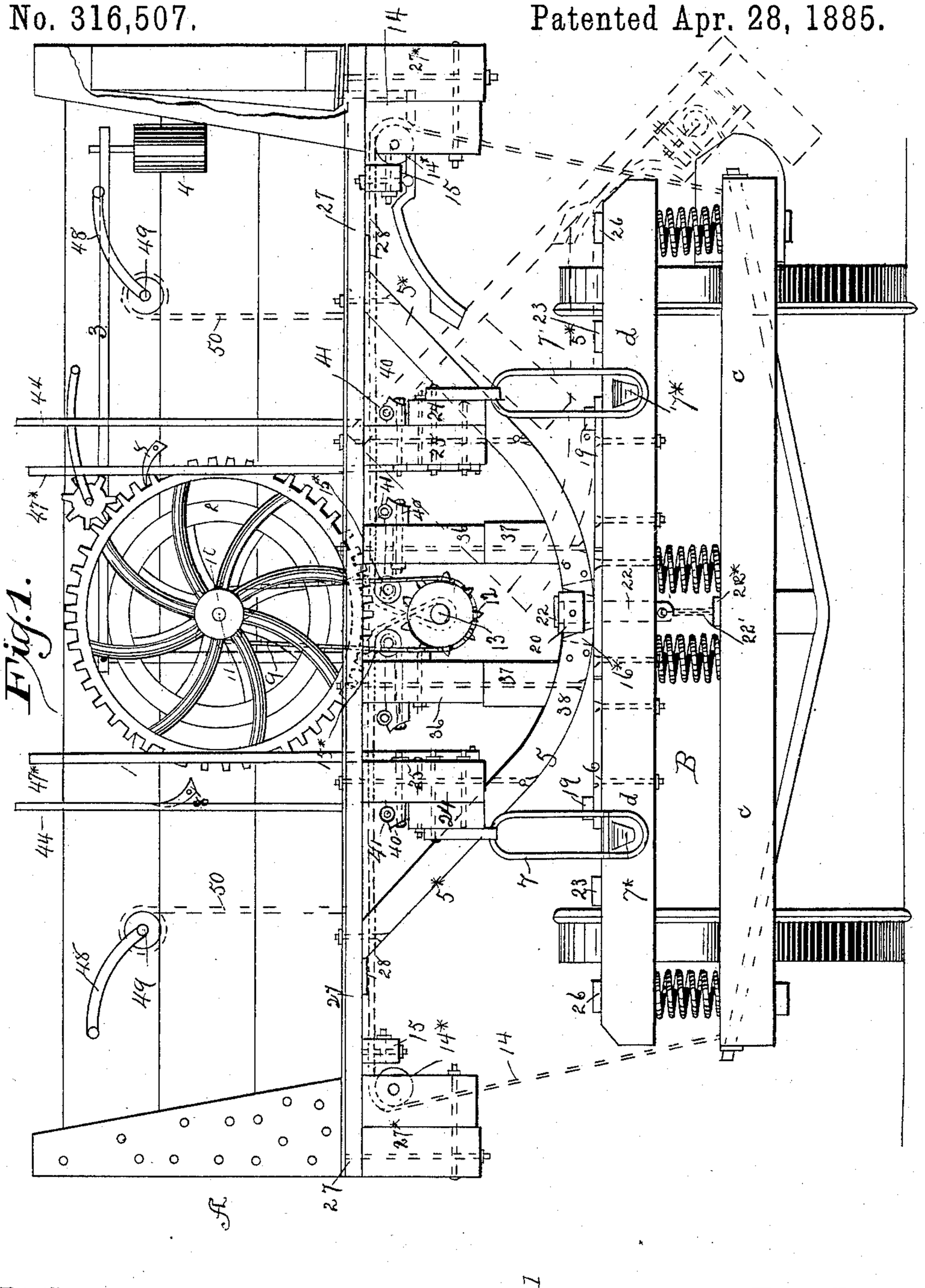

Fig. 1.

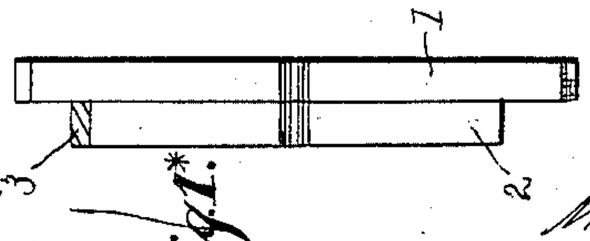

Fig. 2.

Witnesses:

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Inventor:

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(No Model.) 4 Sheets—Sheet 2.

M. VAN WORMER.

DUMPING CAR.

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Fig. 2.*

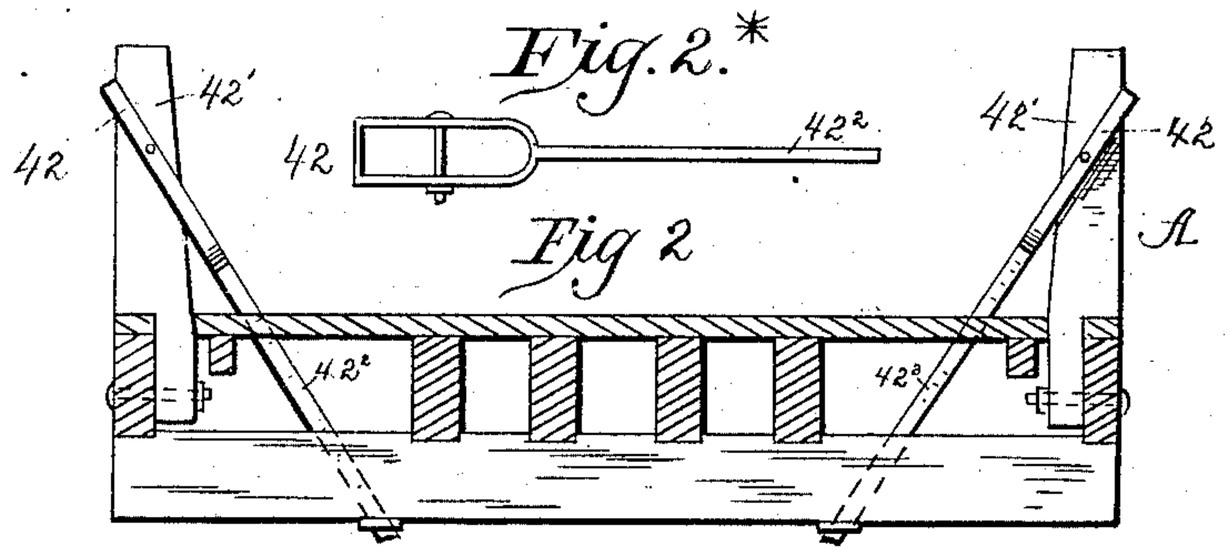


Fig 2

Fig. 3.

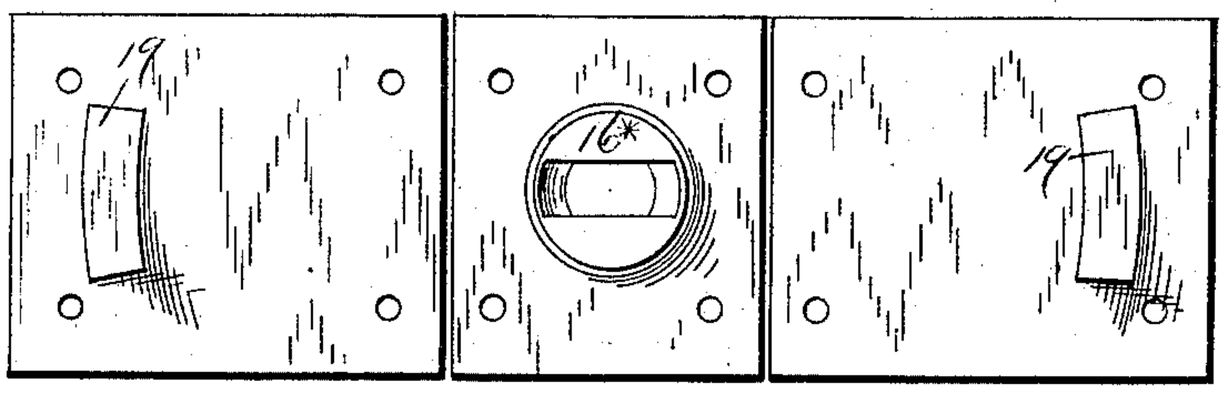


Fig. 4.

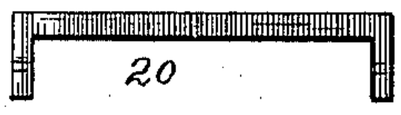


Fig. 5.

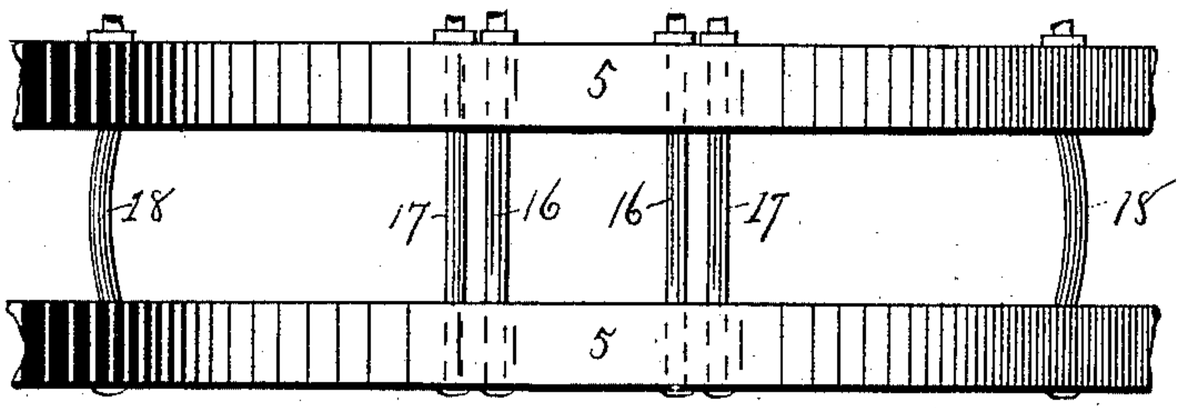
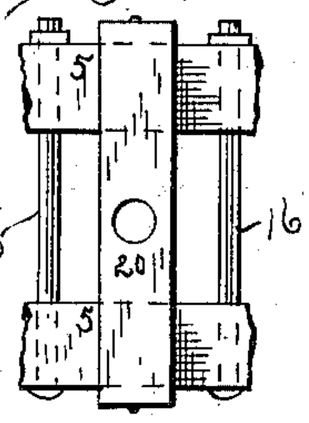


Fig. 5.*



Witnesses:

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John J. Halsted

Inventor:

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(No Model.) 4 Sheets—Sheet 3.

M. VAN WORMER.

DUMPING CAR.

No. 316,507. Patented Apr. 28, 1885.

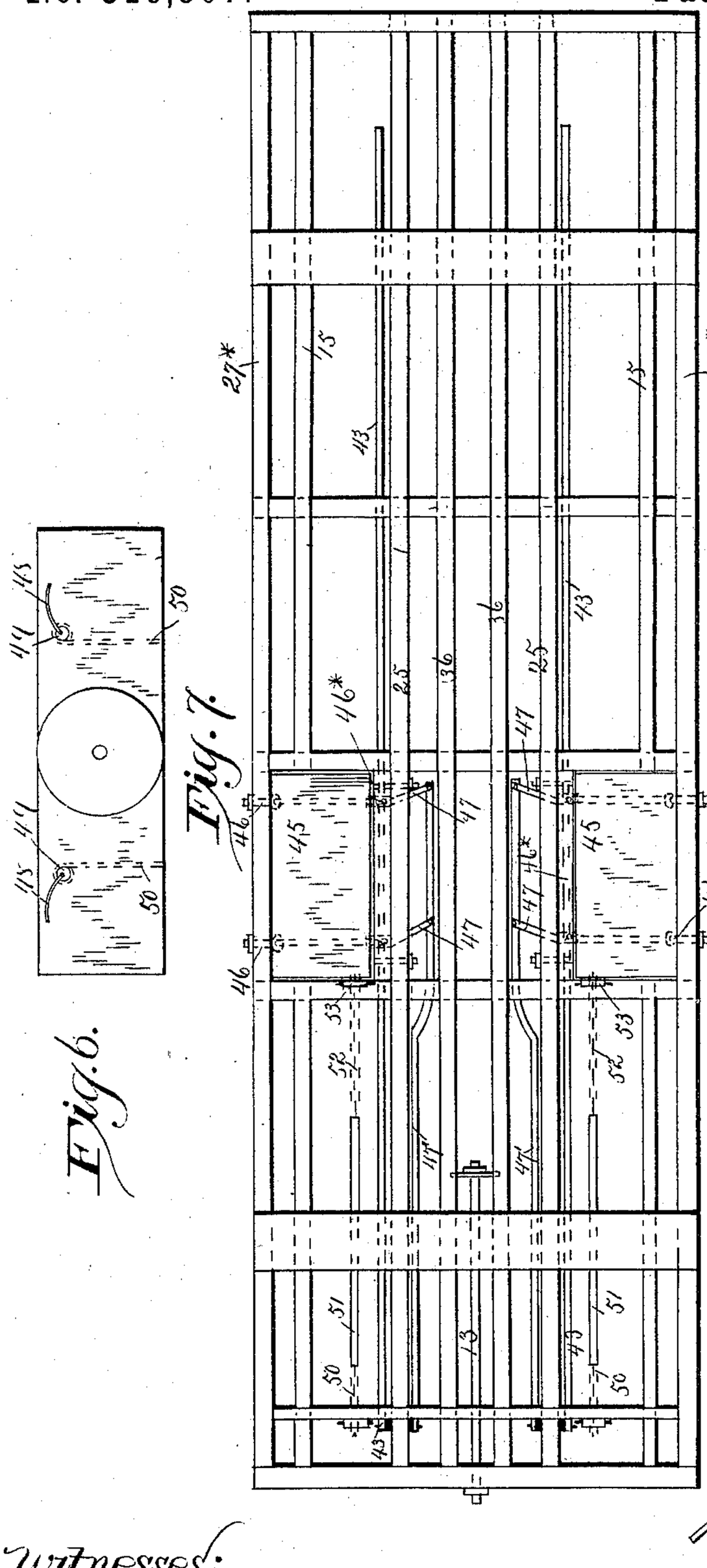

Fig. 7.

Fig. 6.

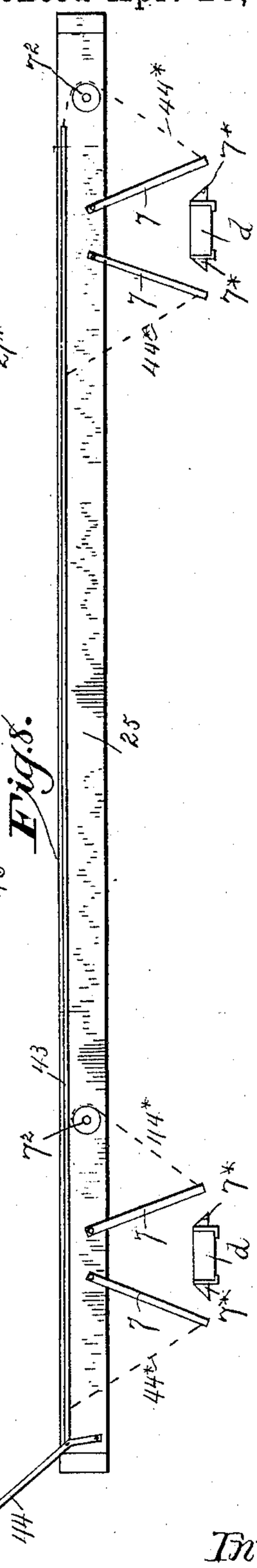

Fig. 8.

Witnesses:

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Matthew Van Wormer

(No Model.) 4 Sheets—Sheet 4.

M. VAN WORMER.

DUMPING CAR.

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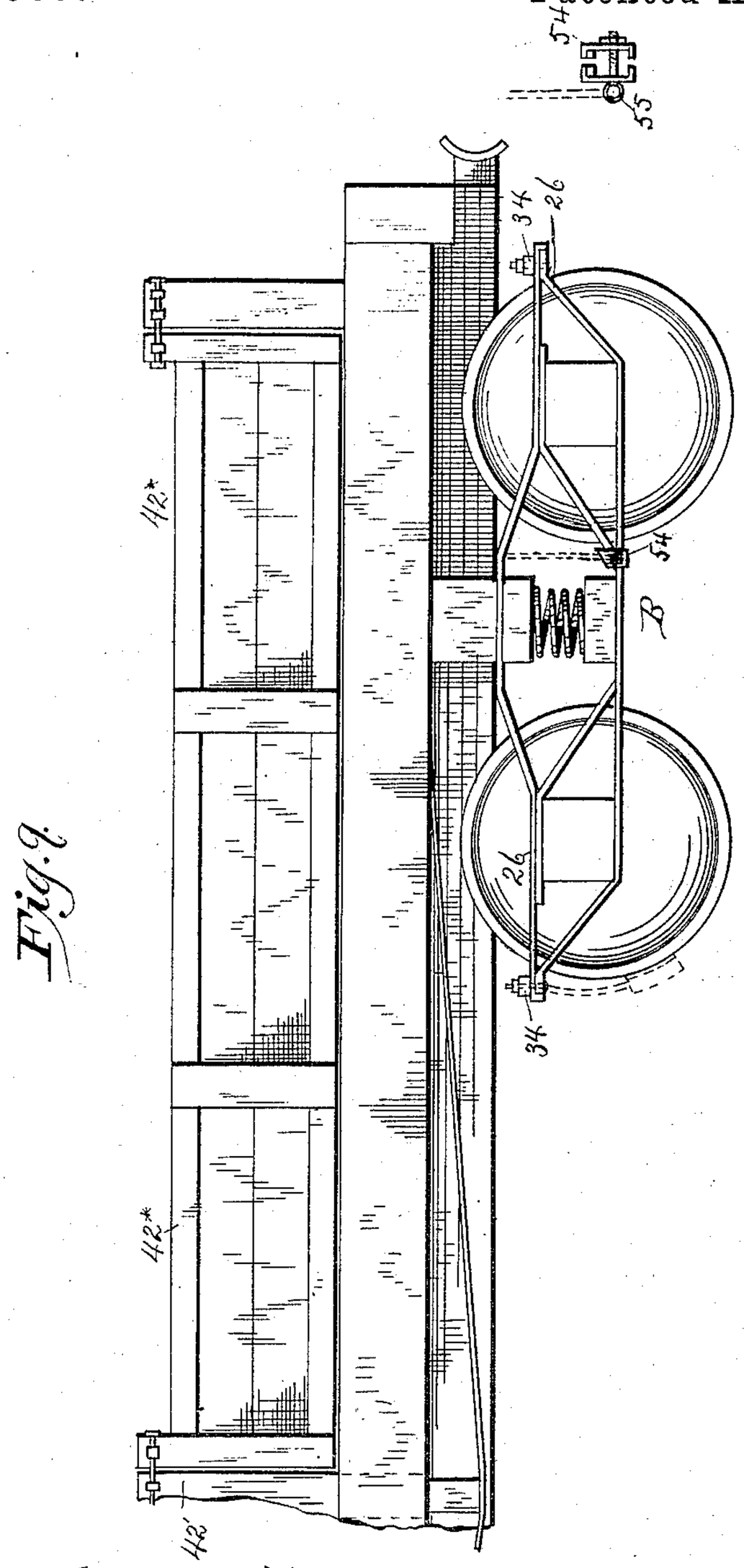

Fig. 1.

Witnesses:

Charles T. Stevens
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by Attorneys

UNITED STATES PATENT OFFICE.

MATTHEW VAN WORMER, OF MALDEN, MASSACHUSETTS.

DUMPING-CAR.

SPECIFICATION forming part of Letters Patent No. 316,507, dated April 28, 1885.

Application filed May 19, 1884. (No model.)

To all whom it may concern:

Be it known that I, MATTHEW VAN WORMER, of Malden, in the county of Middlesex and State of Massachusetts, 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 improvements relate more particularly to eight-wheeled cars, the leading novel features being a weighted lever to permit, control, or prevent the dumping; the construction and arrangement of the chains or ropes and adjacent devices for dumping; the construction of the rocker; the construction of the king-bolt and connections; the construction of the top transoms and their relation to the rockers; to the arrangement of trap-doors in the car-floor, and whereby the car may automatically dump itself at either side on dropping some of the load at the opposite side; an improved construction of the arch-bars of the truck; a novel means for bracing the center posts of the car-body; devices for operating and for latching and unlatching the trap-doors, and other particulars which will clearly appear in the following description.

Figure 1 represents an end view of the car and truck, being the end at which the operation of dumping is effected; Fig. 2, a central cross-section through the car-body; Fig. 2*, a detail showing a plan of the brace in Fig. 2; Fig. 3, a top view of the plates on the bolsters; Fig. 4, an edge view of a bracket spanning the rocker centrally on its upper side, and through which the king-bolt is passed and by which it is suspended; Fig. 5, a top view of the arched portion of the rocker; Fig. 5*, a detail of the same in part, showing its yoke-plate thereon; Fig. 6, a detail reduced of the end or bulk-head of the car-body; Fig. 7, a top view of the bottom of the frame of the car-body, showing the devices beneath it and showing its trap-doors; Fig. 8, a side view of one of the stringers and its attachments for operating the side supports, and Fig. 9 is a side view of one end of the car.

A indicates the car-body, and B its truck.

The car is arranged for dumping at either side, and is substantially self-dumping, as follows: A large cog-wheel, 1, is mounted on a short shaft on the outside of the end or bulk-head of the car. The same wheel has cast with or secured to it a smaller wheel, 2, having a smooth perimeter, or, rather, having no teeth, and serving as a friction-surface, on which bears a weighted lever, 3, provided with an adjustable weight, 4, and the length of the lever and the character of the weight are such as to prevent the turning of the wheel until the lever is lifted by hand to a degree to let this wheel be free to obey other means of actuating it, and which in the present case consists in letting out from either side of the car-bottom enough of the dirt, coal, or other load to permit the opposite side to descend by its own gravity, as will presently be described. The rockers permit this dumping at either side, and when the car has been rocked fully over to either side its then point of rest or support, which is, in fact, a shifting fulcrum, causes the car to right itself up again to its level or horizontal position, when the friction-lever 3 is raised, and it will be observed that by means of this lever, always under the control of the operator, the dumping as well as the righting-up again may be as sudden or abrupt or as gradual as may be desired, and as circumstances or the character of the load may require. The rocker rests on a straight bed, 6. The weighted lever can hold the car firmly in its dumped position, as partially shown in dotted lines in Fig. 1, until the whole load is fully discharged, and without any effort of the operator, and with this weighted lever bearing on the wheel, even though all the side supports, 7, were loosed or unhooked, yet the car could not accidentally dump itself nor be dumped until the lever should first be lifted or the force of its weight lessened. Pawls or detents 8 serve to prevent the wheel 1 from turning in the wrong direction, and by hand may be made to engage or disengage the teeth at option. An endless chain, 9, adapted for a sprocket or toothed wheel or gear, 10, on the axis of the wheel 1 connects this wheel 1 with a sprocket or toothed wheel, 12, on a short shaft, 13, on the car-body, and a twisted chain or wire rope, 14, secured, as shown, at both

its ends to the truck passing beneath the car-bed and over guide-pulleys 14*, and over the extra stringers 15, and over other guide-pulleys, 15*, crosses itself and is coiled around the shaft 13, to give it all the requisite hold without slipping. Because of this coiling and of the consequent changing of the line or direction of pull in coiling and uncoiling, I do not use pulleys for guiding the cord or chain, but instead thereof I employ rollers, which allow the chain to play or shift laterally on them to coincide with the changing position of the coils on the shaft.

The bottom of the rocker is composed of two iron side pieces, 5, as shown clearly in Fig. 5, connected by bolts, the bolts 16 16 at the central part being near enough together to permit the center bearing 16 of the rocker-bed 6 to enter up between them, and these bolts, in connection with the side pieces, 5, constitute or bound an opening through the rocker, serving instead of a socket to receive the center bearing. Other bolts, 17 17, serve as strengtheners, and also, being placed above the bolts 16 and at a wider distance apart, give ample room for the rocking without interference from these bolts. The bolts 18 are curved in order to clear the curved projections 19 of the rocker-bed 6 and to fall inside said projections when dumping, and which projections serve as detents or stops for the rocker in its movements, and avoiding the need of cogs or pins on the bed or corresponding holes or cavities in the rocker. The curve of the bolts is to conform them to the curve on the inner side of the projections 19, and which curves are needed in order to allow the truck to turn on its center. Across the top of the rocker, at its center, is a yoke-plate, 20, bolted to the side pieces, 5, as shown, and having a central hole to receive the king-bolt 22, the head of this bolt hanging on this yoke-plate, so that the rocking of the rocker shall lift or lower this king-bolt. The side pieces of the rocker are preferably of wrought-iron. The king-bolt has no joint, but is rigid, and it passes through the conical center bearing, 16*, and has a hole at its lower end, from which is hung a chain or link, 22′, carrying at its end a short cross-bar, 22*, and which bar, when the king-bolt is at its lowest point, will rest on the lower truck-bolster, *c*, and make the chain or link slack; and when the rocker rocks and lifts the bolt and its chain or link upward a limited distance into the upper bolster, *d*, the cross-bar then arrests any further upward motion of the king-bolt, and prevents any separation of the car-body from its truck. Safety-blocks 23 are put on the upper bolster and inside or between the track and wheels, so that when the dumping takes place the rockers in striking shall come on these blocks, instead of first striking on the arch-bar of the truck and outside of the wheels and of the track or rails of the road. I thus positively avoid any risk of lifting the wheels off the track and of upsetting the car, which is liable to occur when the striking or impact in dumping falls outside the wheels, for the impact or blow by my construction is always received at a point between the wheels, and therefore no such bad effects are possible. The arched part of the rocker extends to about the outside of the blocks 24, put on the outer or second stringers, 25, and beyond this point they are made straight, as shown. This allows the rocker when fully rocked to either side of the car to get a rest both on the safety-block 23 and on the arch-bar 26. The straight parts 5* of the rocker, and which are a continuation of the arched part and extend up to the transoms, it will be perceived by reference to dotted lines in Fig. 1, lie, when the car is dumped, for a considerable length upon the top bolster, resting on the safety-blocks 23 and on the arch-bar. They preferably, however, first come in contact with the safety-blocks. The top transoms, 27, may be of wrought-iron or of wood, and may be of one piece or of two laid side by side; and they extend straight across the car, and are secured to the outside sills, 27*, by vertical bolts, and are also secured to and through all the four middle stringers and to the rockers by means of bolts. The ends of the straight portions of the rockers are braced against cross-pieces or projections 28, welded to the transom, to stay these ends from springing crosswise of the car, and also to keep the transoms from springing downward. The transoms must of course be of sufficient strength to carry the load.

The single short shaft 13 at one end only of the car, and the single chain 14 at the same end, suffice for dumping my car, there being no need of a long shaft from end of the car to the other, or of a duplication of the devices, as the gravity of the load at one or the other side of the car after discharging a small part of the load automatically accomplishes the dumping. This initial dropping of a portion of the load is effected by means of trap-doors in the bottom of the car, one being at each side of the center, as will presently be described, the weighted lever 3 serving to hold the car against dumping itself until the operator is ready.

The arch-bar 26 extends beyond the truck-wheels, and to their extremities are attached the brake beams or bars 34, and the brakes are hung to these at the outside of the wheels, as distinguished from placing them between the wheels, and where it is difficult to get at them for repairs or otherwise, and as distinguished from hanging the brakes to the stringers of the car-body. This arrangement also permits the brakes to be located where they cannot interfere with (or be interfered with by) the plates 54 and chain 14, which are secured to the arch-bars between the wheels. The draft-timbers 37 (two at each end of the car) run under the third or middle stringers, 36, and rest on the rocker, supporting the rocker against undue pressure, and bolts 38 fasten together the rocker, draft-timbers,

stringers, and transom. Saddles 40, secured to the second stringers, 25, serve to support the ordinary truss-rods, 41, which extend from end to end of the car. A yoke-shaped iron brace, 42, adapted to surround the center post, 42′, of the car-body, on which the side gates, 42, are hung, has a bar or rod extension, 42^2, which runs down through the car-floor and through the cross ties or sills in an inclined direction. This will give great support and strength to the center posts and their adjacent parts, and also avoid any weakening of the posts, as it does not pass through them. A rod, 43, worked by hand-lever 44, actuates, by its chains 44*, the side supports, 7, and which are both by one action thus released from their horns 7* on the opposite sides of each of the upper bolsters. Similar devices are placed at each side of the car, so as to release the side supports at either side of the car, as desired. One of these chains at each end of the car passes over a guide-roller, 7^2, so that when one of the side supports is pulled in one direction its adjacent fellow one is pulled in the opposite direction. Trap-doors 45 45 are made in the bottom of the car. They are hinged or otherwise hung to the outside sills, as shown at 46, and 46* is a timber put in between the stringer and the inside edge of the door to fill the space, and to afford, if desired, pivotal bearings for the latch-levers 47, which serve to hold up these trap-doors when raised. The hinges run across and under the doors and up to the timber 46*. Beneath the door the latch-levers (which may be pivoted on the stringers) are also pivoted on the rod 47′, and by working this rod and by means of the handle 47* these latches may be readily removed from under the doors, which then fall by their own weight and drop a considerable part of the load on that side of the car. The car is then ready to dump itself at the opposite side of the car, which is now the heavier, by simply lifting the lever 3 to permit the law of gravitation to act, and, as before stated, the dumping may be abrupt or slow and gradual, as may be desired, dependent entirely on the extent to which the lever 3 relieves the wheel 2 of its frictional contact. When the trap-doors are to be raised again, one of the cranks 48 on a short shaft, 49, winds up on this shaft a chain, 50, which is connected to rod 51, whose other end has also a chain, 52, running over a roller, 53, and the other end of this chain connects to the inner part of the door and serves to lift it up to its place. Then by pushing inward the rod 47 the latches are brought under the gate to retain it in place until again released prior to dumping. The chain 14 is connected at each end to one of the arch-bars of the truck by means of plates 54, each of which has its ends made with projections at right angles to the plate, as shown, and two of these plates are placed on each side of the arch-bar with their projections toward each other, and an eyebolt, 55, passing between the arch-bars and through both plates holds the plates together upon the arch-bar by drawing the eyebolt tight by means of its nut, thus making the whole firm and solid. The chain is attached to the eye of the bolt.

I claim—

1. In a dumping-car, the weighted friction-lever 3, in combination with a friction-wheel, 2, gear-wheel 1, gear 12, chain 9, and chain or rope 14, the combination being and operating substantially as shown and described.

2. The combination, with a side-dumping car-body supported on rockers, of trap-doors in the bottom of the car located at each side of its center, and arranged to be opened at will at either side, as set forth, and whereby, upon thus discharging a part of the load at one side only to shift the center of gravity, the car-body upon being released is left free to tilt by its own gravity and to dump at the opposite side of the car.

3. In combination, trap-doors in the car-bottom for discharging a portion of the load at either side of its center at will, a friction-wheel and friction weighted lever, and connections, substantially as described, with the car-body and with the truck, the combination permitting the dumping to be automatic and to be either abrupt or gradual by the mere lifting of the weighted lever, all as set forth.

4. In combination, the straight transom 27, extending across the car and over the outside sills, the projection 28, welded thereto at a point about midway between the outer sills, 27*, and the second stringers, 25, and the rockers having the ends abutting against these projections, all substantially as and for the purposes set forth.

5. In combination with a rocker having straight portions 5* extending beyond the arched portion, and with a horizontal rocker-bed, the safety-blocks 23 on the upper truck-bolster, and located at points inside the tracks, and the arch-bar, all substantially as and for the purposes set forth.

6. The described construction of rocker, consisting of two metallic sides connected by bolts, as set forth, and leaving the spaces between these sides open, the space between the bolts 16 16 receiving the center bearing, and the curved bolts 18 being adapted to come, when rocking, inside the inner curved face of the projections 19 on the bed, all substantially as and for the purposes described.

7. In combination with the yoke-plate 20 on the rocker, the king-bolt 22, chain or link 22′, and bar 22* thereon, this bar, when the car-body stands substantially level, resting on the upper bolster.

8. In combination with a side-dumping car having plates 54 and chain 14 secured to the arch-bar between the wheels, the arch-bars made, as shown, to extend beyond the wheels, and brakes attached to the extremities of such bars at points outside the wheels, all substantially as shown and described, and for the purposes set forth.

9. In combination with the center posts, 41,

of the car-body, the braces 42, made to surround and span the posts, and having the extension-bar 42^2 passing through the floor and cross ties or sills, as set forth.

10. In combination with the hinged trap-doors in the bottom of the car, the lever-latches 47, their rods 47′, stringers 25, and hand-levers 47*, substantially as and for the purposes described.

11. In combination with the trap-doors 45, the devices for raising the same, consisting of the hand-levers 44, chains 50 and 52, and their connecting link, rod, or chain 51, and guide-roller 53, all substantially as set forth.

12. In combination with the horns 7* on opposite sides of each of the upper truck-bolsters, *d*, the side supports, 7 7, their chains 44* 44*, guide-roller, rod 43, and operating hand-lever 44.

13. In combination with the car-body, and with the stringers 36 36, the draft-timbers 37, resting on the rockers and supporting these stringers, and bolts 38, connecting together the rocker, the transom, the stringers, and draft-timbers, all as and for the purpose described.

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