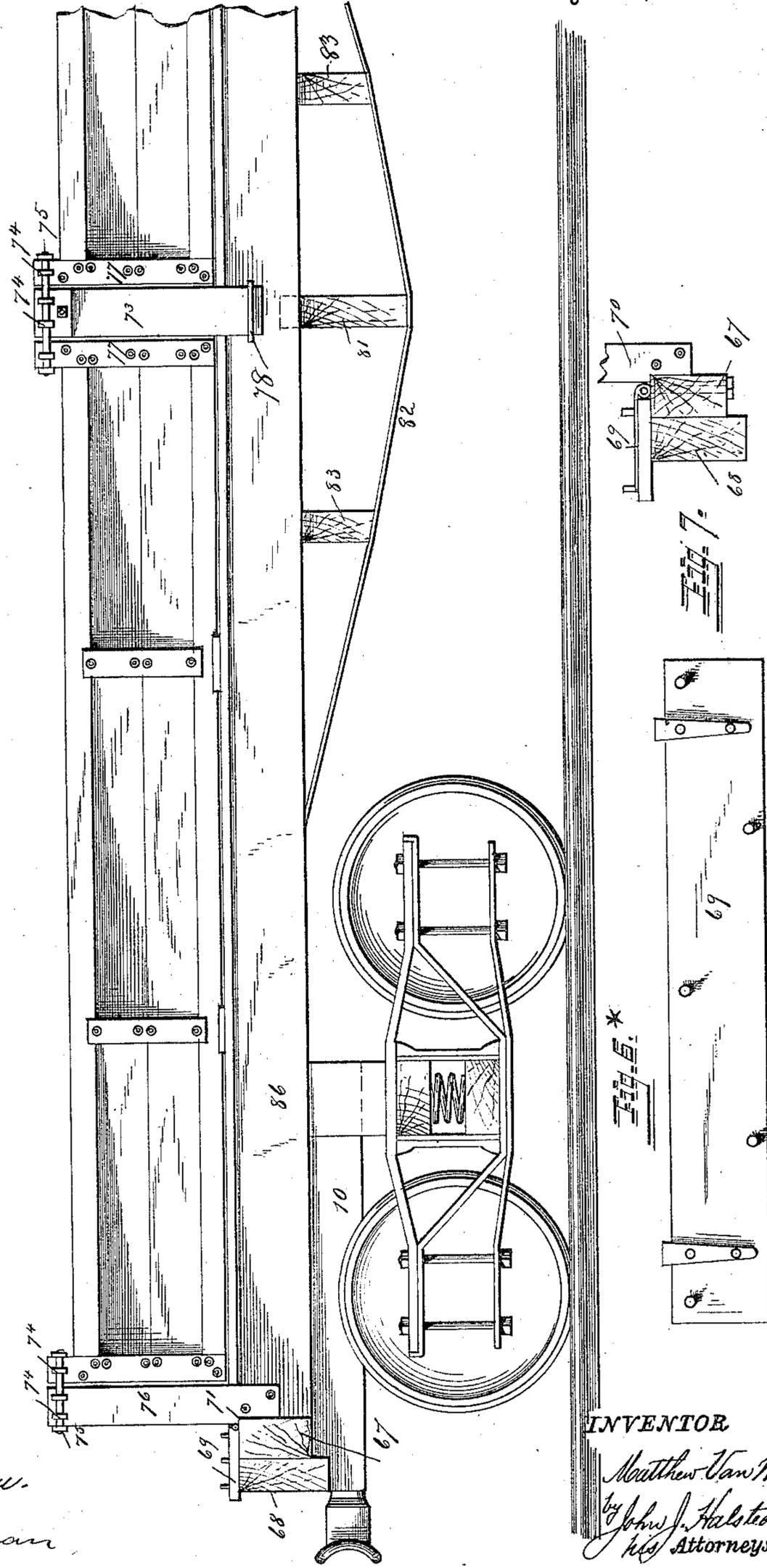


M. VAN WORMER.

DUMPING CAR.

No. 302,605.

Patented July 29, 1884.



WITNESSES
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INVENTOR
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(No Model.)

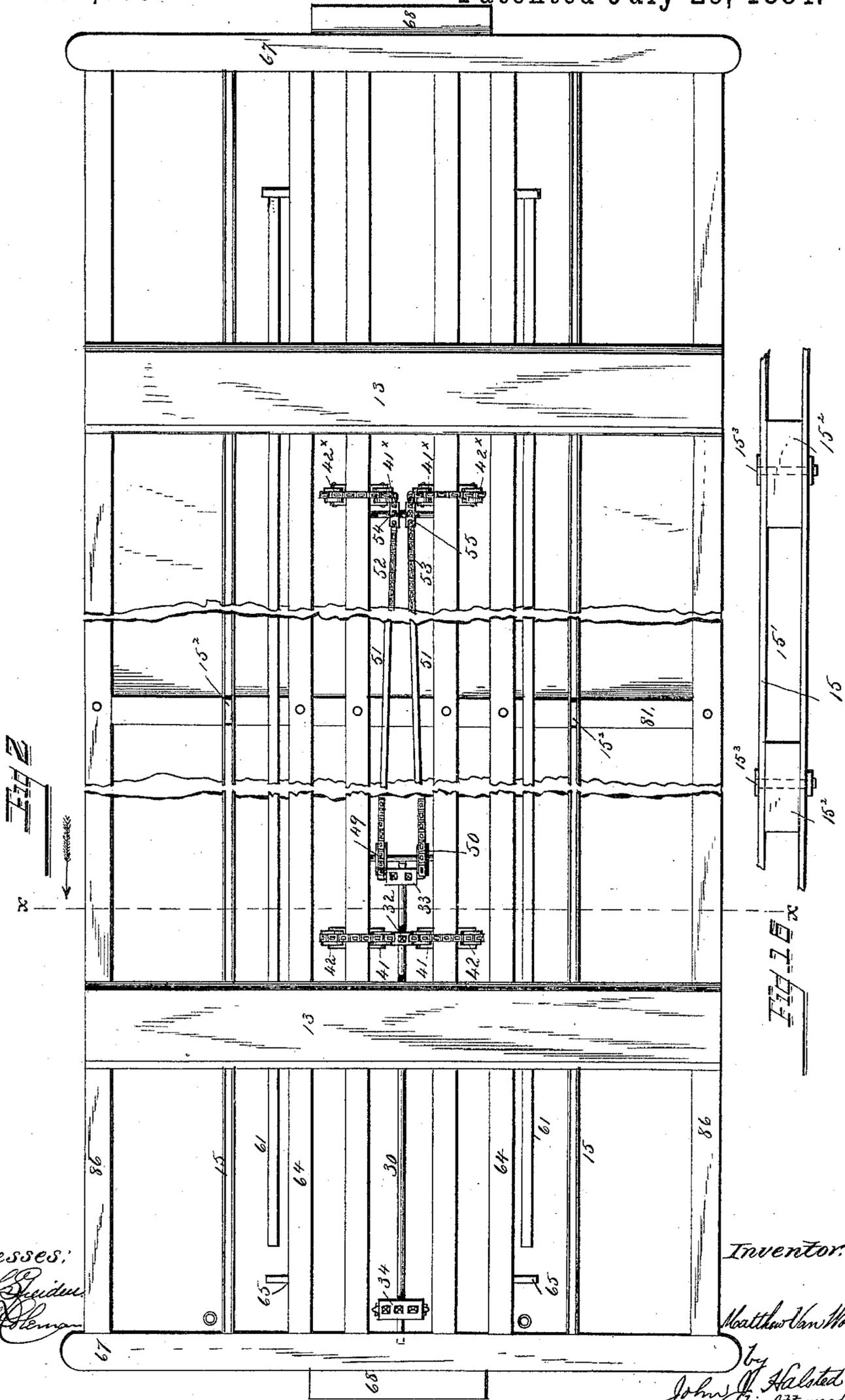
5 Sheets—Sheet 2.

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(No Model.)

5 Sheets—Sheet 3.

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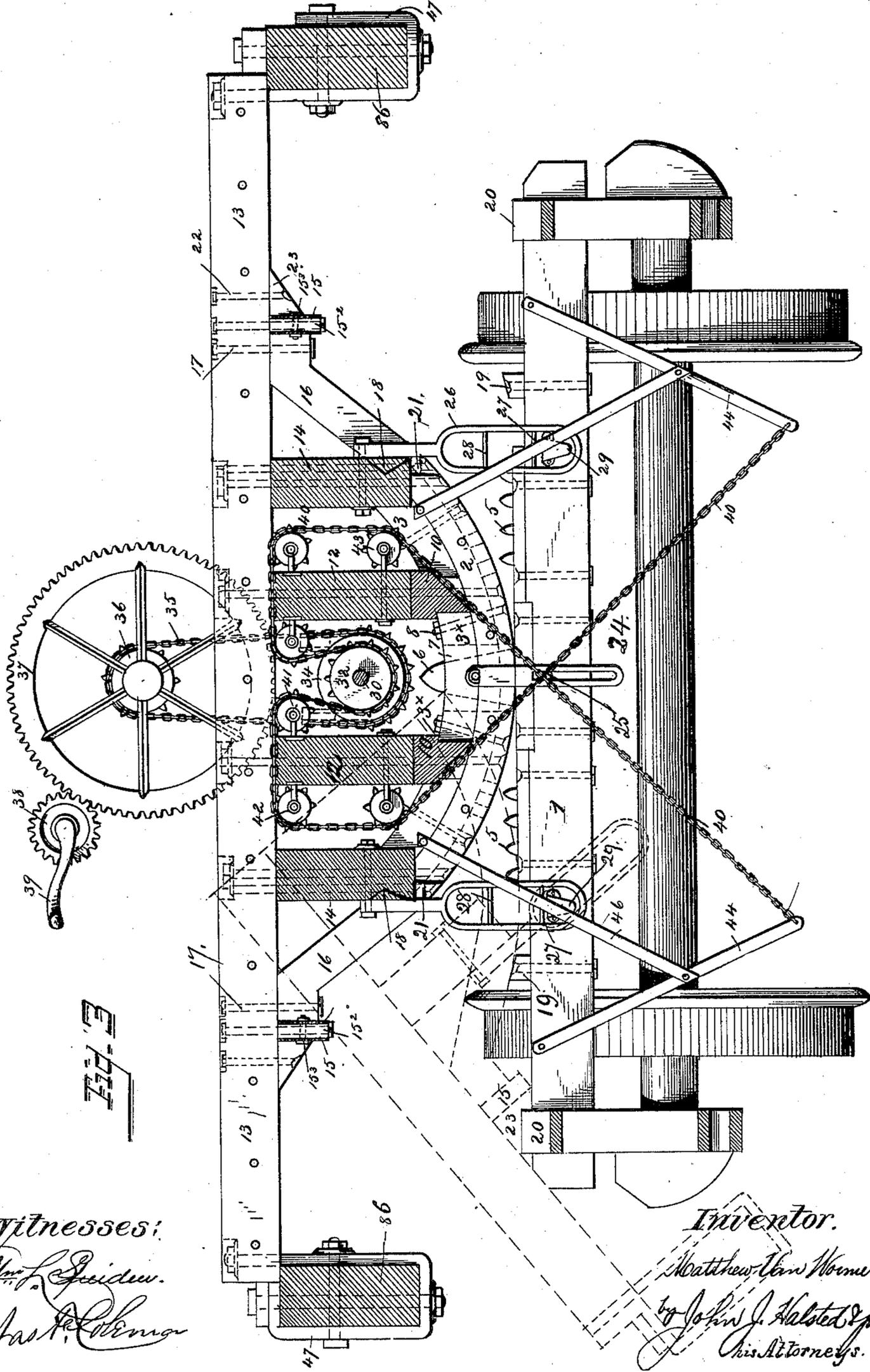


Fig. 3

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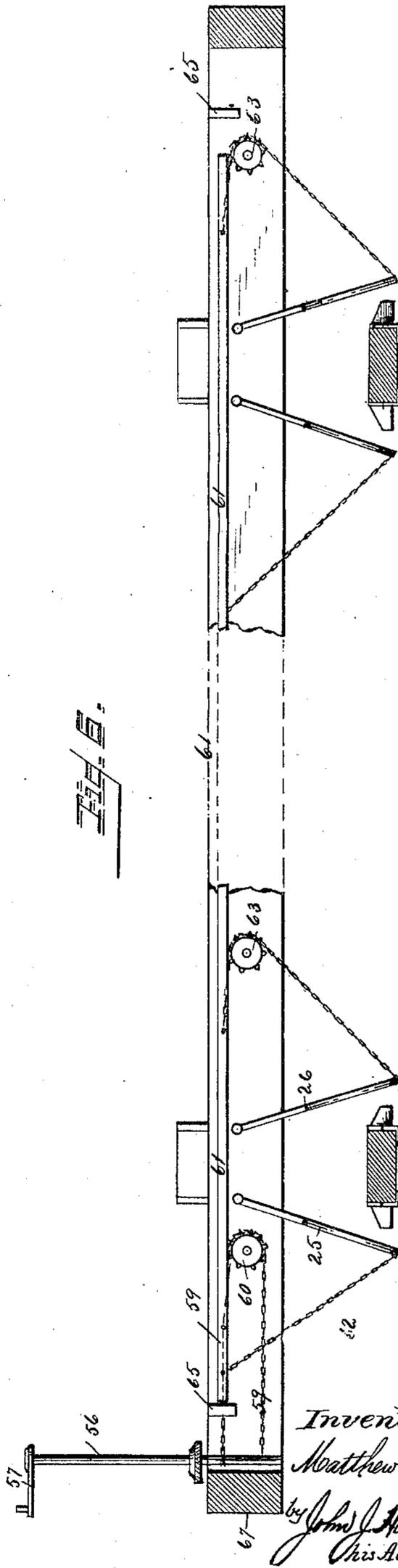
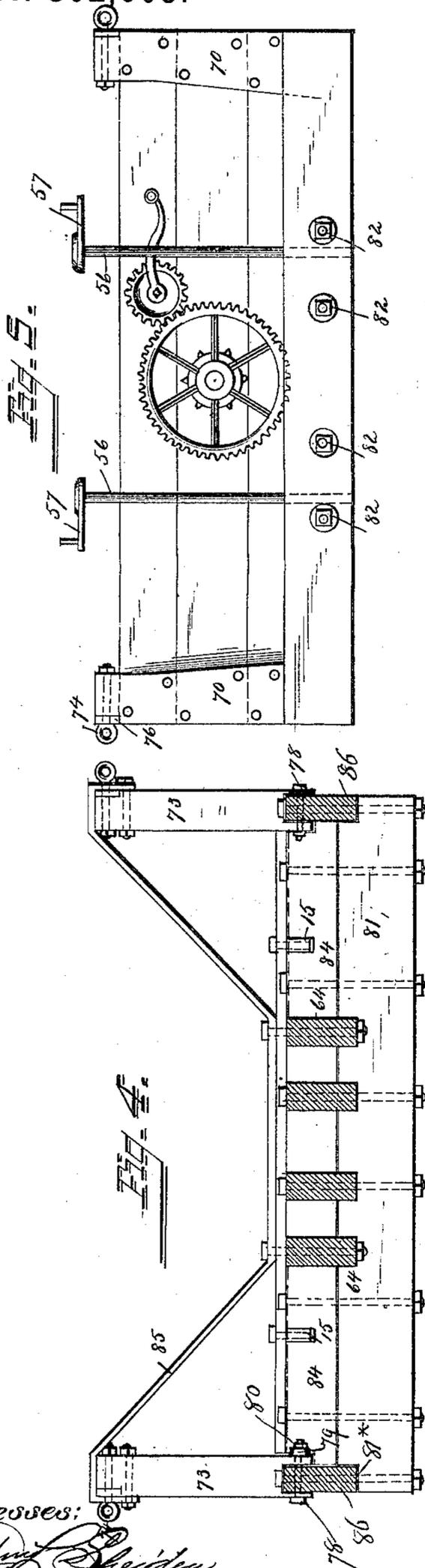
5 Sheets—Sheet 4.

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No. 302,605.

Patented July 29, 1884.



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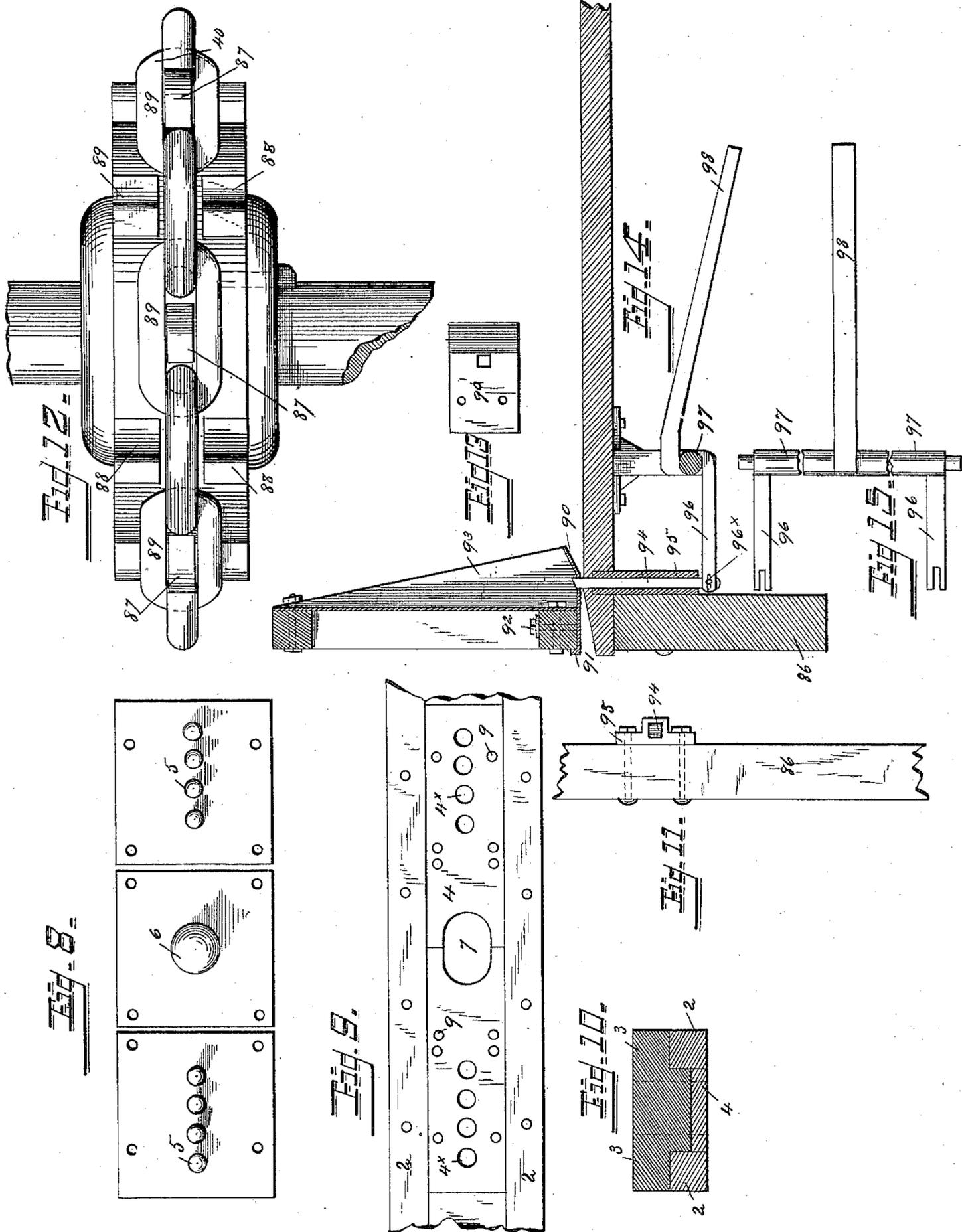
5 Sheets—Sheet 5.

M. VAN WORMER.

DUMPING CAR.

No. 302,605.

Patented July 29, 1884.



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UNITED STATES PATENT OFFICE.

MATTHEW VAN WORMER, OF MELROSE, MASSACHUSETTS.

DUMPING-CAR.

SPECIFICATION forming part of Letters Patent No. 302,605, dated July 29, 1884.

Application filed August 23, 1883. (No model.)

To all whom it may concern:

Be it known that I, MATTHEW VAN WORMER, of Melrose, in the State of Massachusetts, have invented certain new and useful Improvements in Dump-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 improvements relate to the construction of the rocker and to its connection with adjacent parts; to a combination of the sills with the transom, braces, small iron stringers, and inclined blocks; to combining with the rocker a pendent slotted bar working on a fixed pin; to combining with the rocker peculiarly-constructed stirrups pivoted thereon, and provided with cross-bars and a horn or horns on the truck; to devices for actuating these stirrups; to combining certain braces on the car-body with certain blocks on the truck-bolster; to combining with the arch-bar of the truck inclined blocks on the transom; to the combination, with a system of toothed wheels and their car-tilting chain, of a peculiar system of levers and rods for pushing over the rocker; to the combination, with the transoms of the car-body, of metal hangers secured to their ends and supporting the outside sills; to the combination, with end sill and with the bumper, of a hinged platform adapted to be held up in an upright position; to a special combination, with the center cross-sill and outside sills, of certain blocks and middle posts and their fastening-yokes; to the combination, with the middle posts and with the car-bed, of an iron brace secured to the posts and floor; to a special construction and arrangement for hanging the swinging gates; to a novel means for automatically latching and unlatching these gates; to the means for operating the chain and levers for tilting the car, and to other devices more fully hereinafter explained.

Figure 1 is a partial side elevation of a dump-car, showing some of my improvements; Fig. 2, a plan of the car-frame, a portion of the frame being broken away; Fig. 3, a view

showing a cross-section of the car-body to illustrate the dumping mechanism; Fig. 4, a central cross-section through the body of the car; Fig. 5, an end view; Figs. 6 to 16, inclusive, details.

The top bolster, 1, of the truck is combined with a center plate, having integral with it an upwardly-extending projection of sugar-loaf form, in combination with the rocker composed of two curved bars, 2, about square in cross-section, and separated by a wooden arched piece, 3, projecting partly through the space between them, a narrow metal piece, 4, having holes 4* for pins 5, being placed on the convex face of arch 3 and between the bars 2. The pieces or plates 4 reach to the opening or socket 7, left for the sugar-loaf-shaped projection 6, which keeps the rocker and the car-body from shifting out of place laterally, and the bars 2 prevent any endwise movement and permit this sugar-loaf-shaped projection (as strong pins) to draw the load, thus serving the duty of a "center bearing" on an ordinary car. The bolts 8 pass through the bars 2 and the piece 3, and hold them firmly together, as if they were one piece. The plates 4 are bolted (see Fig. 9) to and through the part 3.

10 10 are the draft-timbers, which are fastened at their ends to the cross-sills, and they are also bolted to the middle stringers, 12, which rest directly on them, the bolts running through the transoms 13 and down through the rockers. These timbers are set into the arched piece 3, and are notched or recessed, as shown at 3*, to rest solidly upon corresponding parts of the piece 3. The lower faces of these draft-timbers rest directly on the top edges of the metal bars 2. This gives great strength to the end of the car, and holds the draft-timbers firmly. These draft-timbers extend from the end of the car through the rocker. The stringers 14 rest directly on the horizontal ends of the rocker, and these stringers are placed nearer than customary to the center of the car for this purpose, and so that the outer sides of the stringers need not be cut off and weakened to make room for the arch of the rocker. The stringers are thus left in their full strength.

15 are iron stringers to strengthen the floor in

the intermediate space between the outside sills and the stringers 14. These stringers 15 are each composed of two parallel metal strips placed edgewise, and with an open space, 15',
5 between them, except where they are connected to the center or other bolsters or end sills, and at those points iron blocks 15² are placed between them and bolted to them, and bolts 15³ pass through the bolsters and through
10 these blocks and hold the whole to place.

Braces 16 are to strengthen or support the transoms 13. Bolts 17 connect the braces with the transoms, and these braces are let a little into the side of the stringer, as at 18, for the purpose of strengthening it, when in dumping it strikes a block, 19, on top of the bolster 1. These blocks 19 are between the wheels, so that when the dumping takes place this blow tends to hold the truck down, while in former constructions, where the blow is upon the arch-bar 20 at a point outside the wheels, the tendency is to tip and capsize the truck. The reduced end 21 of the braces 16 rests under the stringer 14 and between the adjacent bars of
15 the rocker, and is bolted by a bolt extending up through the stringer 14 and transom 13.

23 23 are inclined blocks (metal or wood) resting against the iron stringers 15 and against the transom, and bolted up through
30 the transom for the purpose of strengthening the transom, and the inclined faces of these blocks, when the car is dumped, rest squarely on the arch-bar 20, the corners of the bolster being cut off to permit a sufficient tilting, and
35 to permit these inclines so to rest on the arch-bar. The stringers 14 being set nearer the car center than usual, in order to rest squarely on the horizontal ends of the rocker, leave a large space between these stringers and the
40 outside sills, 48. The intermediate stringers, 15, between these sills must be of much less depth than the other sills to avoid coming in contact either with the wheel or with the bolster 1. I therefore make them of iron instead of wood, and thus get all the requisite strength without their interfering in the least with tilting the car to its utmost limit.

24 is a slotted metal bar bolted at its upper end loosely on the rocker. A pin or bolt, 25,
50 secured in the bolster 1, projects through this slot. When the car is fully tilted, (no matter how violently,) the terminus or end of this slot is held by this bolt 25, and renders it impossible for the car-body to leave the
55 truck, while, as above stated, the blow or concussion in dumping the brace 16 on block 19, tending to keep the car on the track, aids in accomplishing this result.

In my present construction I do not use what
60 are known as "side bearings;" but I employ instead the following devices for holding the car in position when under way or in transit.

26 is a hanging stirrup, pivoted at its upper end to the stringer 14. It has two cross-bars,
65 27 28.

29 is a horn or tongue fixed to the bolster

1, and adapted to project into and through the stirrup and to hold the same in its vertical position.

Inasmuch as the trucks are shown as turning on centers, it is advisable sometimes, if thought best, to place these stirrups in pairs or on opposite sides of the bolster, so that if in turning a short curve it should chance that one of the pair should be shifted off its tongue
75 29 the same motion would cause its fellow stirrup to hug more closely upon its own tongue. The tongues 29 should be inclined at their two sides and at their top, but be horizontal at the bottoms, so that the stirrups may
80 (when not purposely set free) hold their position thereon, and may also, when descending, allow the cross-bars 27 and 28, respectively, to ride on the inclines to be set free. The lower ends of the stirrups are adapted to catch
85 against the horizontal or under side of the projecting tongues or horns 29; but when the car-bed is strictly horizontal these lower ends are not in direct contact with the tongues, there being a little space or play between
90 them, so as to allow the bed a little requisite movement or play, that it may not be held too rigidly, and also the more easily to let the stirrup free itself when required. When the car is partly tilted and the tongue shall have entered between the bars 27 and 28, and in case
95 part only of the load has been dumped, the bar 27 will hold the car in position and prevent its going back and the risk of breaking the mechanism. Upon further tilting, the bar
100 28 passes, frees the stirrup, and the tongue may then enter.

A shaft, 30, supported in proper bearings, extends from one end of the car to and beyond the first bolster, 31. Near the inner end of
105 this shaft is a toothed pulley, 32, and at its inner end is another toothed pulley, 33, and near its outer end another toothed pulley, 34. This shaft and its pulleys receive motion from a linked endless chain, 35, which passes around
110 pulley 34 and a toothed pulley, 36, on the shaft of a cog-wheel, 37, which is driven by a small pinion or cog wheel, 38, operated by a hand-crank, 39, giving great power by this series of gears. A linked chain, 40, passes
115 around pulley 32, and up and over the toothed guide-pulleys 41 41, 42 42, and 43 43, and thence, crossing itself, its ends are connected, respectively to the ends of the levers 44.

It will be evident that the cog-wheels 37 and
120 39 may be dispensed with, and a crank like 39, but longer, to give more power, may be applied directly to the shaft of the toothed or sprocket pulley 36. Pulleys 41 and 42 are respectively hung in eyebolts which are secured to plates 45, these plates being bolted
125 to the respective stringers 12. Pulleys 43 are each in an eyebolt extending through these stringers. The levers 44 are pivoted to the bolster 1, and the rods 46, pivoted to the
130 rocker, are also connected by a pivot to the levers 44. When the car is tilted, the chain

being assumed to be always taut, as it is pulled up it pulls upward the rod 46 at that side of the rocker, and this rod pushes up the rocker at that side, while the other side of the rocker
5 pushes down the other rod 46, which then pushes the rod 44, to which the chain is attached, and keeps the chain taut.

The transoms 13 do not extend over across all the top of the outside sills 86, but rest upon
10 the same, and these sills are held up to these transoms by metal hangers 47, which are bolted to and through the transoms, and the sills are bolted to the hangers. It will be evident that the form of these hangers may be varied as
15 desired.

49 and 50 are toothed pulleys over which a chain, passing under the toothed pulley 33, is conducted. This chain is of sufficient length for all the traverse it requires, and its ends
20 are connected to rods or chains 51, which run lengthwise of the car beneath its bed, and their other ends are connected near the other truck of the car to other chains, 52 53, which pass under toothed pulleys 54 55, and thence
25 over pulleys 41* 42*, which are similar to pulleys 41 and 42, thence over the other pulleys, like 43, not necessary to be repeated, and thence to the ends of levers like those shown at 44 and which are connected with the truck
30 and with the rocker in the manner already described.

A brake-staff, 56, (on each side of the car,) with appropriate handle, 57, serves to pull the stirrups off from the horns 29, and by so
35 doing relieve the car and allow it to dump. 58 is an ordinary brake-wheel to prevent the turning back of the brake-staff, and it should have the usual pawl for this purpose. To this staff are connected chains 59, which pass around
40 a pulley, 60, one chain winding in one direction on the staff 56 and the other winding on it in the reverse direction. Both these chains also are connected to a slide-rod, 61, which operates the stirrups on the opposite
45 end of the car. Chains 62 and 62* connect this rod with the stirrups, as shown, those marked 62* passing over pulleys 63 on the outside of stringers 64. Stops 65 65 serve to limit the endwise movements of this slide-rod. These devices may, if desired, be placed
50 on the inside of the stringers instead of on the outside; but I prefer them on the outside.

The horns 29 may not only be bolted to the side of the bolster 1 by as many bolts as may
55 be desired, but in some cases I also make them with their back plate or base extending downward, then horizontally a short distance under the bolster 1, and then upward, projecting a short distance into the bolster, as shown
60 at 66.

69 is a hinged platform for the operator. It is furnished with one or more upwardly-projecting pins to give him a secure foothold, and it may be hinged either to the cross-sill or to
65 the floor, and when in use it may rest both on the end sill and on the bumper 68; but, inas-

much as the platform needs to be broader than the bumper, it may sometimes be desirable to place brackets or supports on the end sills at each side of the bumper to give a firmer sup-
70 port to this platform. A great advantage incident to hinging the platform when it is connected to the car-body is that the body of the car may be left of its full length, as in ordinary freight-cars, or even longer, because the
75 end posts, 70, need not, as in my Patent No. 244,954, be set back from the end of the car in order to leave a part of the car-bed for a platform, but, on the contrary, may be put at the extreme end of the car, and may be re-
80 cessed, as shown at 71, so as actually to make the carrying capacity as great or greater than that of ordinary freight-cars. The notch or recess 71 also gives a support to the end posts, which thus rest on the end sills, 67; and this
85 arrangement also permits the bolting of these parts to these end sills, 67, as well as to the outside sills, 86. By hinging the platform on the car it may be raised and held up out of the way of any one coming between two cars
90 to couple or uncouple them, or for any other purpose.

The end pieces, 77, of the gates or doors, the central side posts, 73, as also the end posts,
95 70, on which the doors swing, are provided with eyebolts, the eyes being on the outside of the posts and of the doors, the bolts 75 passing through these eyes, and with them constituting hinges. This permits the doors to give a quicker, easier, and wider opening
100 when the car is tilted than they could have if the doors were hung at points farther inward; and it entirely avoids putting the hinging-bolt through the posts, and thus weakening them. Metal plates 76 should preferably be
105 employed, as shown, and through which the eyebolts pass. Instead of the eyebolts, plates having eyes to receive the bolt 75 may be substituted, and such plates may be bolted to the
110 outside of the posts and doors.

The lower end of each of the middle posts, 73, is slotted to straddle the outside sill, 86, as seen in Fig. 4. An iron yoke, 78, spans the post at its bottom. The legs of this yoke pass through the sill 86, and at its ends receive a
115 connecting-bar, 79, which is tightened and held to place by nuts 80.

I use in my present construction a central cross-sill, 81, of greater depth than the usual cross-sills, 83 83, and under all three of these
120 cross-sills pass the truss-rods 82 82, which bear on all these sills. The advantages of this are that the sill 81, being central, gives a support to the central or weakest part of the body; next, being some inches deeper than the sills 83, it
125 has greater strength than they; and, lastly, as the lowest point of the truss-rod 82 at its bend is immediately under this sill 81, the tension or strain of this rod is exerted upward directly against the bottom of this sill.
130

Blocks 84 84 are placed between the outside sills, 12, and the stringers 64, abutting against

both. They are recessed on the top, as shown, to receive the iron stringers 15, and the inner part of the bottom of the posts 73, thus serving to prevent the stringers 15 from springing either downward or sidewise, and to prevent the top of the posts from springing outward.

The posts 73 may also, if desired, be further braced by an iron brace, 85, which laps the outside of these posts at their tops, extends over these tops and then down to the car-floor, where it is bolted through the stringers 64 64, as shown.

The iron stringers 15 15, which, as before stated, are each composed of two parallel pieces, having blocks between them at intervals, are secured to the transom and floor by bolts, as shown.

The outside longitudinal sills of the car are shown at 86 as let into rabbets 81* made in the ends of sill 81.

All the wheels over which the chains pass are similarly constructed for linked chains. Fig. 12 shows an edge view of one of these wheels with the chain thereon. The wheel has not only the usual series of pins, 87, for entering the links, but has in addition other projections, 88, placed in couples and near together to admit the thickness but not the breadth of a link between them. These projections form positive stops against the slipping of the chain in case one of the pins 87 should break with the strain, because the space between each pair of projections 88 is much less than the breadth of adjacent flat link 89, which therefore cannot pass them.

My latch for automatically fastening and unfastening the swing-doors of the cars is made as follows: At the bottom of the gate I secure one or more slotted iron plates, 90, which are turned up, as shown at 91, behind the gate, to relieve their fastening-bolts from strain. Braces 93, secured to the inside of the gates, rest at their bottom ends upon these plates, and sustain them firmly against any upward pressure from any source. The plates 90 also incline upward at their inner side, to insure their passing the bolt when the gates swing down to shut. The bolts 94 are also inclined at their upper ends to permit the gate-plates 90, when the gate swings down for closing, to readily ride past them and force them back a little until the slot in the plate coincides with the end of the bolt, to permit an automatic latching. A keeper-plate, 95, is secured against the inside of the outside sills, and through it the bolt 94 plays and is held in position. Each of these bolts is connected to the arm 96 by means of a pin sliding in a slot, 96*, formed in the outer end of an arm 96, connected with a journaled bar, 97, suspended or sustained from the underside of the car-floor. A downwardly-inclined iron arm, 98, is firmly secured to this bar 97, and on tilting the car this arm strikes or comes in contact with the arch-bar 20 of the car-truck, and this lifts this arm 98, rocks the bar 97 on its journals, lowers the outer ends of two arms 96, and with-

draws the bolts 94. When the car is resuming its horizontal position, the gates swing back to place and the weight of the arms 98 again forces the latch-bolts 94 into the slots of the plates. All these devices for automatically latching and unlatching the gates or doors, being on the inside of the car-body or of the gates, are free from being damaged or disarranged by anything outside, whether the car is in motion or not.

The arms 96 may be of any number, (one or more,) as desired. We have shown two, attached to the same bar, 97, adapted for two latches 90 on each gate.

All the gears and chains, excepting the whole of large cog-wheel and its driver, are behind the end sill of the car-body.

I claim—

1. In combination with the draft-timbers 10, extending through the rocker, and with the stringers and the transom 13, the curved bars 2 2 of the rocker, the wooden curved piece 3, resting on both the bars and projecting between them, and bolted thereto, and with the plates 4, placed on the convex side of the piece 3, and bolted to it, the sugar-loaf or tapering piece 6, secured to the truck-bolster, and the plates on truck-bolster provided with pins 5, the combination being substantially as and for the purposes set forth.

2. In combination with the sills 14 and with the transom 13, the braces 16, applied to these stringers, as shown and described, small iron stringers 15, and the inclined blocks 23, substantially as and for the purposes described.

3. In combination with the arched rocker of a side-dumping car, a pendent bar, 24, slotted at its lower end, and a fixed pin or bolt on the bolster of the truck projecting into such a slot, the combination serving to permit the dumping, and also to prevent the separation of the car-body from its truck.

4. In combination with the rocker, the stirrups 26, pivoted thereon, and each provided with the two cross-bars 27 and 28, the horns 29 on the truck-bolster, and devices for actuating these stirrups from the car-platform, the combination being and operating substantially as and for the purposes described.

5. As a means for actuating the stirrups 26, the combination of the brake-staff 56, chains 59, pulley 60, chain 62, pulley 63, rod 61, and stops 65 on the car-frame, all substantially as described.

6. In combination, the braces 16, constituting a part of the rocker, and the inclined-faced blocks 19, secured to the bolster 1 of the truck at points between the wheels, and serving, when the car is dumped, as rests for the rocker.

7. In combination with the arch-bar 20 of the car-truck, the incline blocks 23, secured to the transom 13, and resting against the outer sides of the iron outside stringers, 15, and arranged to rest upon the arch-bar when the car is dumped.

8. In combination with a system of toothed

wheels and a linked chain for tilting the car-body, the levers 44 44, each pivoted at their upper ends to the truck-bolster, and rods 46 46, each pivoted at one end to one of the levers 44, and at its other end to the rocker, the lower ends of each of the levers 44 being secured to the extremity of the crossing linked chain, substantially as and for the purposes set forth.

9. In combination with the transoms 13, the metal hangers 47, passing through the ends of the transoms and bolted thereto, and thence extending downward, outward, and upward, and inclosing and supporting the outside sills and bolted thereto.

10. In combination with the end sill, 71, and with the bumper of the car-body, the platform 69, hinged to the end sill, and adapted to be raised and held in an upright position.

11. In combination with the center cross-sill, 81, the blocks 84, supported thereon, the outside sills, 86, middle posts, 73, slotted at their lower ends, and the iron yokes 78, as shown and described.

12. In combination with the posts 73, and with the car-body, the brace 85, secured to the

tops of the posts, and bolted to and through the floor and stringers, all as shown and described.

13. In combination with the center post, 73, and with the end posts, 70, and with the gate-posts 77, the eyebolts 74, having their shanks extending through and secured to such posts, respectively, and with their eyes on the outside of the same, and the bolts 75 on the outside of the posts and extending through these eyes, all as shown and described.

14. As a means for automatically latching and unlatching the gates, the iron plates 90, braces 93, bolt 94, keeper 95, the journaled bar 97, and its arms 96 98, arranged and operating substantially as shown and described.

15. As a means for operating the chain 40 and lever 44 for tilting the car, the combination of the driver-wheel 38, large wheel 37, the smaller wheel 36, the endless chain 35, and wheels 32 and 34.

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