3 Sheets—Sheet 1.

M. VAN WORMER.

Dumping-Car.

No. 199,761. Patented Jan. 29, 1878.

Fig. 1.

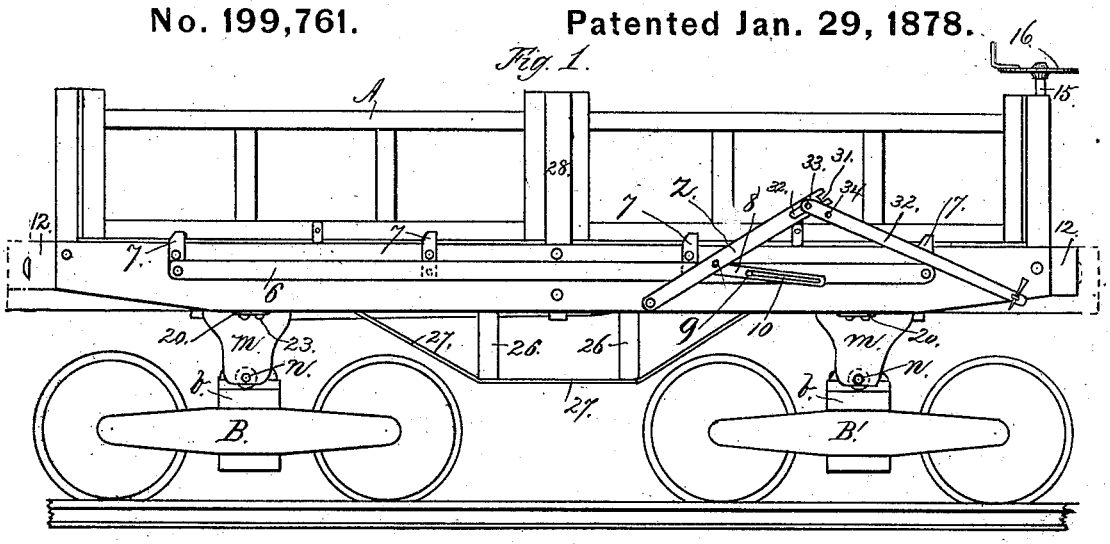
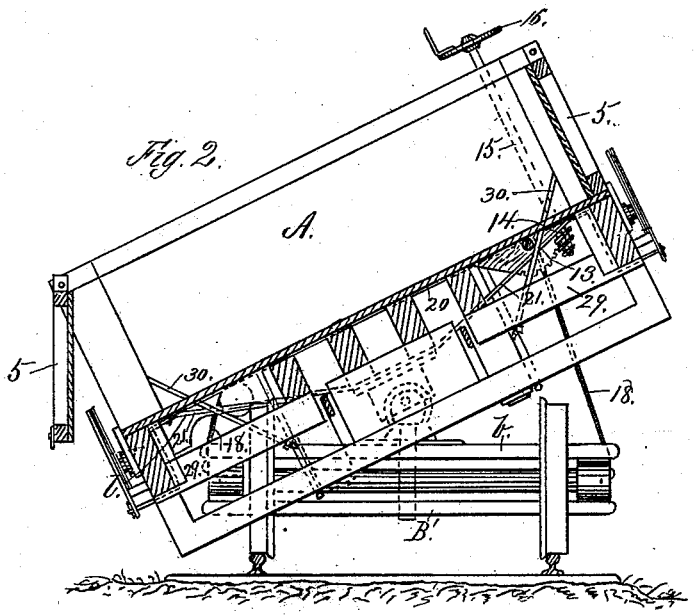


Fig. 2.



Attest:
Geo. T. Smallwood Jr.
Pamm & Halsted

Inventor:
Matthew Van Wormer
per J. J. Halsted.
Atty

3 Sheets—Sheet 2.

M. VAN WORMER.

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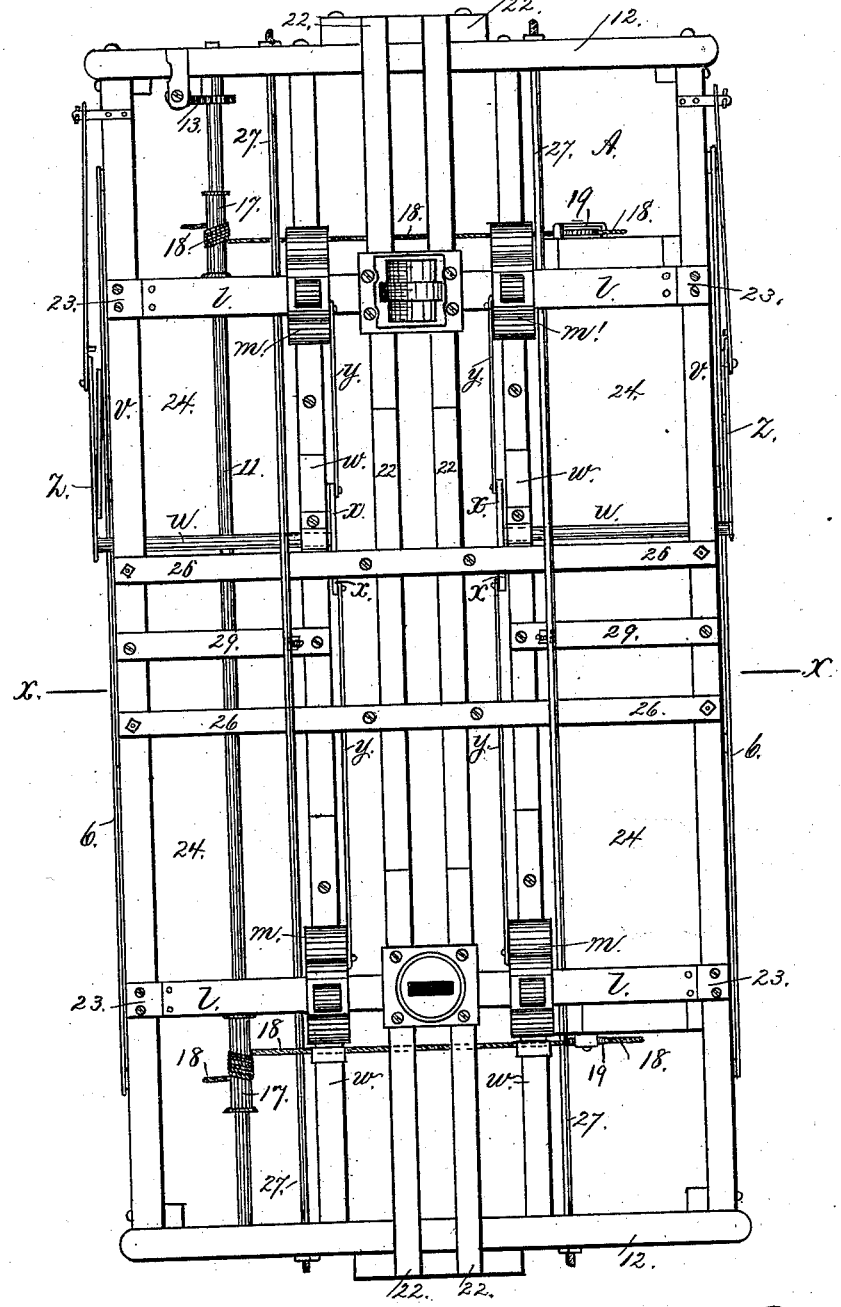
Fig. 3.



Attest

Geo. T. Smallwood Jr.

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Inventor.

Matthew Van Wormer

By J. J. Halsted.

Atty.

3 Sheets—Sheet 3.

M. VAN WORMER

Dumping-Car.

No. 199,761. Patented Jan. 29, 1878.

Fig. 4.

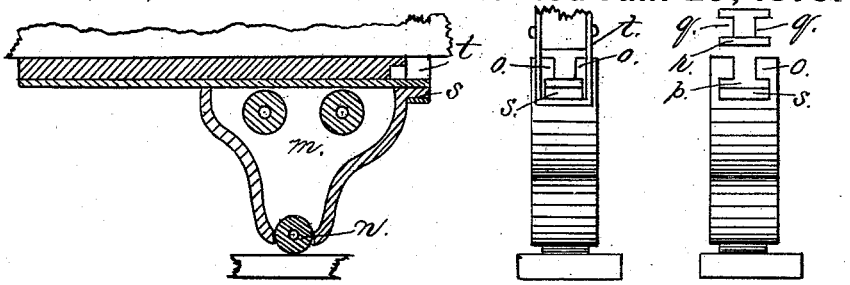


Fig. 5.

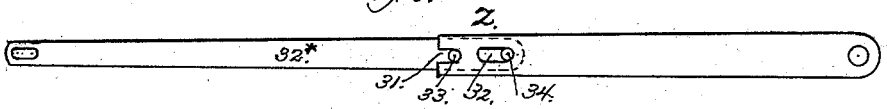


Fig. 11.

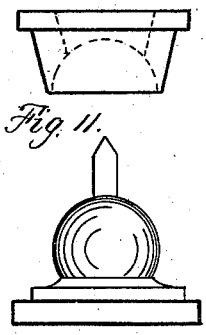


Fig. 6

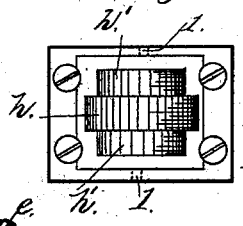
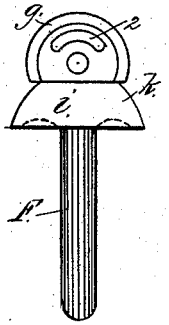


Fig. 7.



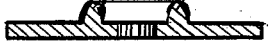


Fig. 8.

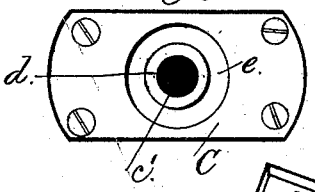


Fig. 10.

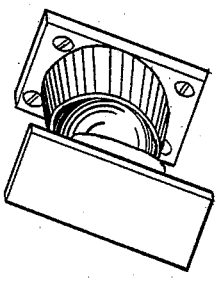
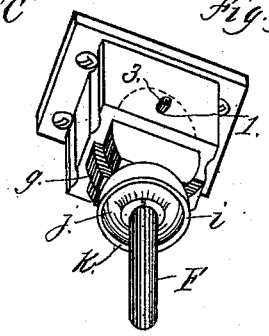


Fig. 9.



Attest.:

Geo. T. Smallwood Jr.
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Inventor.

Matthew Van Wormer
By J. J. Halsted
his Atty.

UNITED STATES PATENT OFFICE.

MATTHEW VAN WORMER, OF DAYTON, OHIO.

IMPROVEMENT IN DUMPING-CARS.

Specification forming part of Letters Patent No. **199,761**, dated January 29, 1878; application filed December 24, 1877.

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, the same being further improvements on the one patented to me July 17, 1877, No. 193,101; and I do hereby declare that the following is a full, clear, and exact description of my 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 a novel construction of and combination of king-bolt with its center bearing; to the construction of movable side bearings, and to the mechanism for operating the same; to the means for fastening and unfastening the side doors, the same means serving to actuate the side bearings; to the mechanism for dumping; to the construction of the car-bed; and to other parts, all as hereinafter more particularly set forth.

In the drawings, Figure 1 represents a side elevation of a car embodying my improvements; Fig. 2, a cross-section in the line *x x* of Fig. 3, the car being tilted for dumping; Fig. 3, an under-side view of the car, the trucks being removed; and Figs. 4 to 9, inclusive, enlarged views of separate parts in detail.

The same letters of reference indicate like parts in all the figures.

The body of the car is shown at A, and B B′ represent the two trucks for supporting the same. C is the center-bearing circular bed-plate, resting on the truck-timbers *b*, having a hole through its center and down through the truck-timbers to allow the king-bolt to pass through, and having, also, a circular groove or concavity, *d*, and a rib, *e*, on the upper side of said plate, such rib having its top edge rounded or curved, as shown, to adapt it to a corresponding curved groove in the head of the king-bolt, as hereinafter described. F is a jointed rocker-hinge king-bolt, its head being a circular rocker, with a tenon or rib, *g*, on the center of its periphery, to enable it more firmly to be held in its place in the socket *h*, and thereby bring the strain upon the strongest part of the socket and rocker, and with an arched slot, 2, on each of its sides.

On the under side of the head *i* of the king-bolt is a circular groove, *j*, rounded or curved in its cross-section to adapt it to the rounded edge of the rib *e* on the bed-plate C, and a rib, *k*, to fit into the bed-plate when the king-bolt is in its place.

While the bolt serves as the pivotal or turning center, and the circular ribs and grooves control and guide such turning movement, the rounded or curved characters of the rib and groove permit the easy movements of these parts upon each other under the varying conditions incident to the running and jolting of the cars turning around curves in the road, &c., without cutting into each other or interfering with their free action, as would be the case if the top of the rib were square or the rib angular.

There is also a socket, *h′*, fitting the head of this rocker king-bolt, provided with holes 1 in each side of said socket, corresponding in size and position to slots 2 in the head of the king-bolt, to receive a bolt or bolts, 3, for fastening together the rocker king-bolt and socket, forming thereby what I call the "jointed rocker-hinge king-bolt," and which is fastened firmly, by bolts or otherwise, securely to the under side of the bed-timbers and to the transom *l*. The lower part of the king-bolt rocker passes through a central hole, *c′*, in the circular bed-plate C, and through the truck-timbers, thereby holding the bed of the car and the trucks together as firmly as any other car which has no dumping apparatus.

The movable side bearings are shown at *m*, and they may be made of iron, and preferably with iron or steel rollers (one or more) in their upper side, and a similar roller, *n*, in their under side, and with flanges *o* and groove *p* in their upper side, the flanges projecting above the rollers to fit into the grooves *q*, formed by the overlapping flange *r* of a plate secured to the lower part of the car-frame over the trucks. There is also a projection, *s*, on one end of the upper portion of the side bearing, to fit a socket, *t*, which is fastened to the under part of the car-bed, to hold the said side bearings more firmly in their places on the truck-timbers *b*.

The devices for simultaneously removing these side bearings from the truck-timbers *b*, in order to allow the car to be dumped, are as follows, (it being understood that until these bearings be so removed they serve to bear up and support the body of the car on each side of its central supports or bearings, and it being also understood that each truck has two of these side bearings, one on each side of its center, so that the car may be dumped, as well as supported, at either side:)

A short shaft, *u*, placed in a direction crosswise of and underneath the bed of the car, is fastened or journaled to the timbers *v w*, and provided with arms *x*, to which are attached bars or rods *y*, one to each arm, said rods being, at their outer ends, connected to the side bearings. In order to operate these devices and move the side bearings away from and again back to their positions on the truck-timbers, the shaft *u* is connected at its outer end to a lever, *z*, on the outside of the timber or sill 4, the shaft projecting through said sill. It will now be seen that by moving this lever it will turn the shaft and its attached arms *x*, and through them the rods *y y*, which thus pull each its own side bearing away from its truck on that side of the car on which it is desired to dump, preparatory to such dumping. Similar mechanism is placed on each side of the car, each system of lever, shaft, and rods operating its own pair of side bearings. When the car has been dumped a reversing of the movement of lever *z* replaces both the side bearings *m* in their original positions upon the trucks.

The manner of and means for fastening and unfastening the doors 5 of the car, on whichever side the dumping is to be made, are as follows: The same lever *z* which actuates the side bearings *m* also serves for this duty in regard to the doors, but at a different portion or stage of its movement, and through the instrumentality of a system of slide-bar catches and levers now to be described. A long bar, 6, of iron is pivoted or bolted to a series of lever-catches, 7, (say four or more,) which serve to catch or to release the doors, as desired. This bar 6 has a longitudinal shifting motion imparted to it for operating these catches, which are centered on pivot-bolts to the outside sill of the car by means of the arm or lever *z*, heretofore named. A lever, 8, is hung or centered on a bolt or pivot, 9, projecting outward from the car, and is provided with a slot, 10, through which said pin projects, and this arm is connected to the lever *z*.

The operation resulting from this construction and arrangement of parts is as follows, viz: When the lever *z* is moved, the first part of its motion removes both the side bearings on that side of the car. After this is effected completely the end of the slot 10 will have been brought into contact with the pin or bolt 9, and it is then in position to actuate the long bar 6, and consequently the catches 7, which have not as yet been disturbed by the first portion of the movement of lever *z*. The further movement of said lever has no duty now to perform except to dislodge the catches and release both the doors, and consequently all the power expended on the lever at this latter stage or part of its motion is given to unfastening these doors, while all the power expended during the first part of its motion was given to moving the side bearings, so that there is no lost power, and no need of or demand for exerting at the same moment the amount of power which would be requisite to perform both these duties at the same time, nor any need of complicating the mechanism, increasing the cost, or multiplying parts by having separate sets of devices—one set for the doors and one for the side bearings.

When the lever is reversed it first replaces both of the side bearings in their original positions upon their respective trucks, and after this is done the further movement of the same lever *z* actuates the catches 7, and locks or fastens both the doors on that side of the car. Each side of the car is provided with these devices for moving the side bearings and for unfastening and fastening the doors. The whole power of the lever, upon reversing, is given first to replacing the side bearings, and next the whole power is given to fastening the doors, and all by one continuous movement of the hand-lever *z*, and by a single action or effort of the attendant.

The manner of and means for dumping the car are as follows: An iron shaft, 11, extending lengthwise of and underneath the car-body, is secured in bearings on the car, cross-end beams or timbers 12 and sills *w w*, and it is provided with a cog-wheel, 13, at one end, which gears into a worm, 14, on an upright shaft, 15, the upper end of which projects above the car-body, and is furnished with a hand-wheel, 16, and lever, or crank, for operating it. On the long shaft 11 are enlargements or fixed cylinders 17, for winding and unwinding ropes or chains 18, one end of which is fastened to such enlargement and the other to one of the truck-timbers B, such ropes or chains intermediately passing down on the other side of the shaft 11 to the center of the front truck-timber, and under a pulley, which is fastened to said center of the truck-timber, and thence upward and over a pulley, 19, fastened to the under side of the car-bed, and situated opposite to and in the same relative position as the corresponding rope or chain provided for a corresponding shaft on the opposite side of the car. Instead of this arrangement, however, the rope or chain may pass from the long shaft 11 up over the top of the floor-timbers and underneath the floor, to said last-named pulley 19, and then pass down and fasten to that end of the truck timbers or irons which is opposite the one at which the other end of this chain is fastened.

Therefore, when the hand-wheel 16 is turned its shaft turns the long shaft 11, unwinds the chain from the shaft at one of its ends, and

winds up other portions, thereby dumping the car with ease and without any jar or damage. A reversing of the wheel or crank lifts the car-bed again to its original position, so as to be ready for loading anew.

The means for obtaining an increased space between the transoms and the truck-timbers and truck-irons, so as to allow space enough for the car to dump or turn over sufficiently to discharge its load before coming into contact with such timbers or irons, as heretofore stated, are as follows: Two iron bars, 20 and 21, compose each transom, one of which, 20, passes above the car-timbers *w w* and 22 22, and just beneath the car-floor, at a point directly above the truck-timbers *b* and parallel therewith, thence passes to the top of the outside sills *v v*, as seen in Fig. 2, and each end of this bar is then bent and extends down the inside of one of said sills to its lower edge, over and upon which it is bolted or secured, as seen at 23, thereby making a strong support for said sills, as also for the floor of the car. The other bar, 21, passes below the timbers *w w* and 22 22, and directly beneath the bar 20, and it is curved or bowed upward toward each of its ends, as shown, as it passes from underneath timbers *w w* up to the upper edge or portion of the inside of the sills *v v*, where each of its ends is bolted or secured to the bar 21, thus making a strong, safe transom, and one which, at the same time, by reason of its peculiar construction and shape, and because the upwardly-bent parts of the under bar 21 have no bolts, beams, or other projections beneath them to occupy the clear space which they have provided; and this affords ample room for the car-bed to be dumped or tilted to discharge its load before coming in contact with the truck-timber or truck-irons; the free space beneath the upward inclines of the bars 21 permitting the car to be turned over to the fullest distance required before they could touch the truck-beam *b*, and their position preventing their touching the wheels, the latter being on opposite sides of this transom.

The bed of the car is made as follows: A broad space, 25, is left between each of the outside sills *v* and the sill *w* next adjacent thereto, these inner sills running lengthwise of the car, and the second sills, 22, are placed nearer the center of the car-bed, and also run lengthwise of the car. All the cross sills or timbers beneath these floor-sills, and which serve to support them, are so arranged that the machinery for removing the side bearings and for dumping the car will not come in contact, and will not be obstructed in its work.

It will be noticed that, instead of placing a wood transom over the truck-timbers, as usual in freight-cars, I not only make a transom in the manner heretofore described, but I place the other timbers, 26, lower, and put supports 27 under them, in such position as will clear the arms *x* and bars *y*, and also the machinery for dumping. This construction allows the car to dump or turn over sufficiently to discharge its load without coming in contact with the wheels, truck-timbers, irons, or trucks.

The center stakes 28, on which the doors swing, are braced and held to place as follows: A short timber, 29, beneath each of said stakes is bolted to the outside sill, and also to the second or next adjacent sill, *w*, and an iron bar, 30, serving as a brace, passes from the center of the outside of said stake obliquely through it, and down through the floor and through said short timber, and is fastened underneath said timber, and firmly holds the stake to place against all the strain it may receive, as shown in Figs. 2 and 3.

The lever *z*, heretofore described, which serves to remove the side bearings and open the doors, is made in two parts, as follows: One part is made with two slots in its upper end—namely, one, 31, being an open-ended slot, and the other, 32, closed at both ends. The other part, 32*, of this compound or jointed lever has two bolts or pins projecting laterally from its lower end, one, 33, of these pins being adapted to enter the open-ended slot, and the other one, 34, passing through the other slot, and serving to fasten the two parts of the lever together. When these two parts are in line, and the pin 33 is in the open-ended slot, the whole serves as one long lever of considerable leverage and power, and is ready for use to operate the door-fastenings and the side bearings.

When not needed for use the pin 33 may be disengaged from its slot or notch, and the part 32* of the lever turned down out of the way and locked to the outside of the car-frame, so that it may offer no impediment while loading the car.

In Figs. 10 and 11 I have shown another form of construction for the center support of the car upon the truck, the plate upon the truck having a ball and rocking pin projecting upward from such ball, and the under center beams of the car-floor having secured to them a plate having a hemispherical socket thereon adapted to receive the ball, and a transverse slot in the bottom of such socket adapted to receive the rocking pin, and to permit the same to rock therein as the car is swayed or tilted to either side.

I claim—

1. The combination, with the bed-plate C, of the jointed rocker-hinge bolt F, adapted to project through said plate and through the truck-timbers, and provided with the groove *j* and rib *k*, to conform to the upper face of said plate, and with the arched rib *g* and slot 2, adapting it for the socket *h h'*, substantially as shown, and for the purposes described.

2. The movable side bearings *m*, made with flanges *o* and groove *p*, adapted to the grooved and flanged plate *q r*, and provided with a projection, *s*, substantially as and for the purpose set forth.

3. In combination with the side bearings *m*, the shaft *u*, its arms *x*, rods *y*, and lever *z*,

substantially as shown and described, and operating to move the side bearings off the truck-timbers and to replace them again.

4. In combination with the shaft *u*, the lever *x*, slotted lever *z*, link 8, bar 6, and catches, substantially as shown and described, and operating to fasten and unfasten the doors, as set forth.

5. The combination, with the described devices for operating the side bearings *m*, and with the described devices for fastening and unfastening the doors of one hand-lever, *z*, operating in conjunction with the slotted link 8, for actuating both sets of devices consecutively by one continuous movement of said lever, as set forth.

6. In combination with the longitudinal shaft 11 and its gear, the vertical shaft 15 and its gear, chain, or rope 18 and pulley 19, and the truck-timbers to which the chain or rope is fastened, substantially as and for the purpose set forth.

7. The described construction of the car-bed with its longitudinal sills *w*, which are next adjacent to the outer sills *v*, placed lengthwise and near the center of the car, leaving a clear broad space between them for dumping, combined with the cross-timbers 26 and their supports or braces 27, and whereby the dumping and the working of the machinery may be effected without the cars coming in contact with the wheels, or the interference of the structure with the mechanism.

8. In combination with the door stakes or posts 28, the short sills 29 and iron braces 30, passing obliquely through the posts and through the car-floor, and secured to these sills, as shown and described.

9. In combination with the lever *z*, its slot 32 and notch 31, the extension bar or handle 32* and its pivotal pin 33 and locking-pin 34, the construction permitting this compound lever to be elongated for use, and to be shut up against the side of the car, as and for the purpose shown and described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

MATTHEW VAN WORMER.

Witnesses:

D. K. BOYER,

O. M. GOTTSCHALL.