

No. 801,459.

PATENTED OCT. 10, 1905.

R. B. KENDIG.

TRANSPORTATION CAR OF THE DROP BOTTOM GONDOLA TYPE.

APPLICATION FILED MAY 1, 1905.

3 SHEETS—SHEET 1.

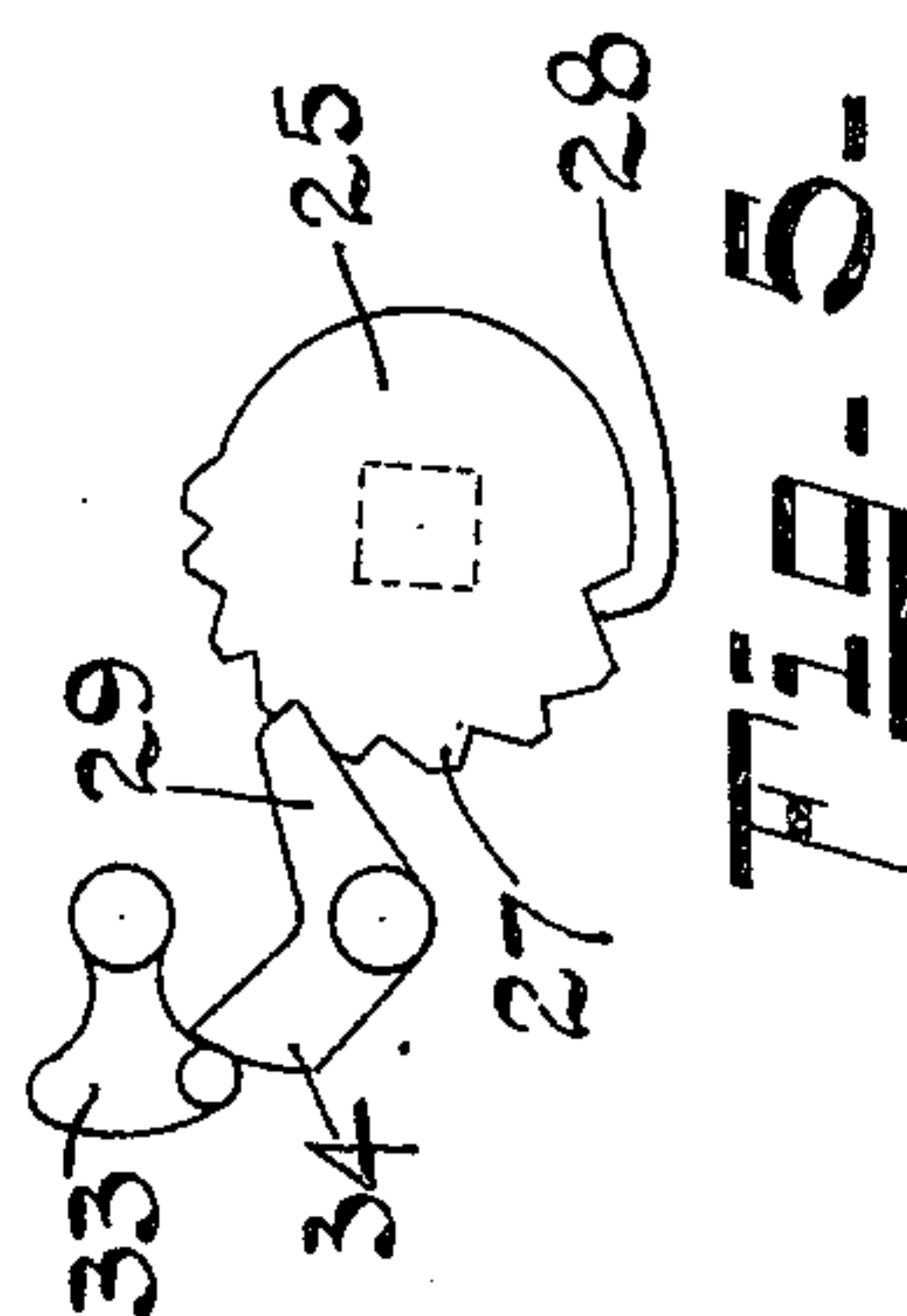
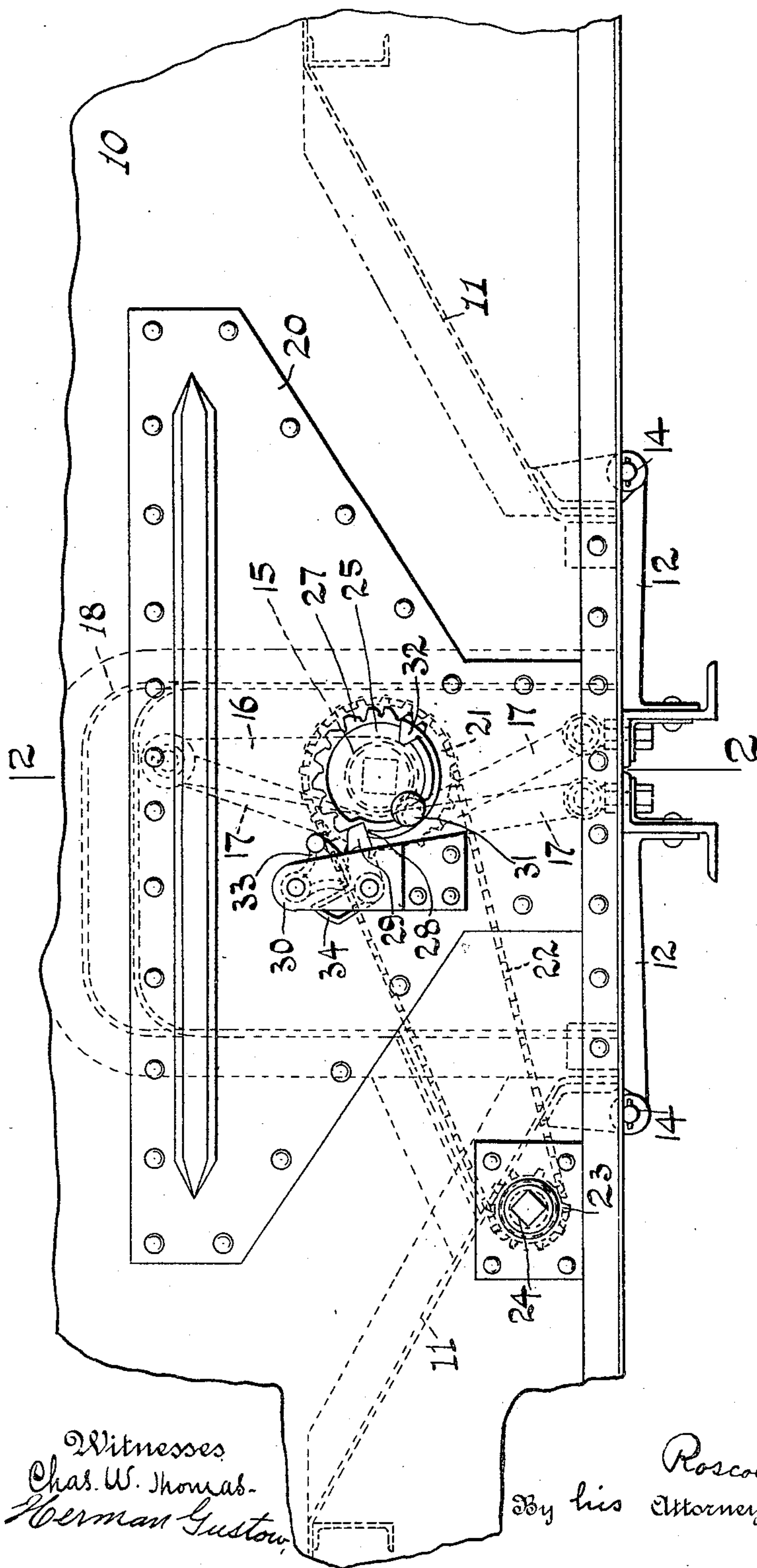


Fig. 1.

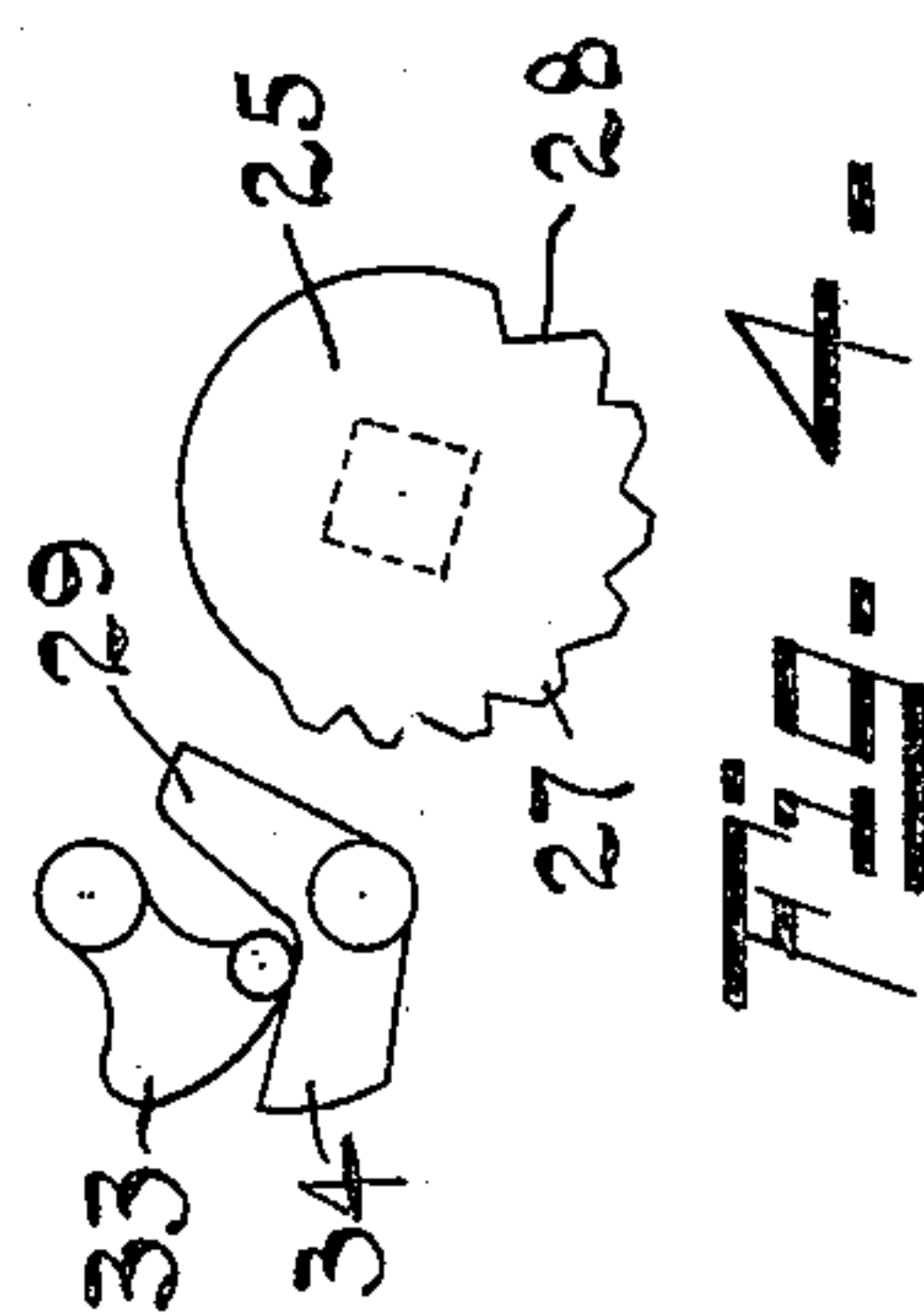


Fig. 4.

Witnesses  
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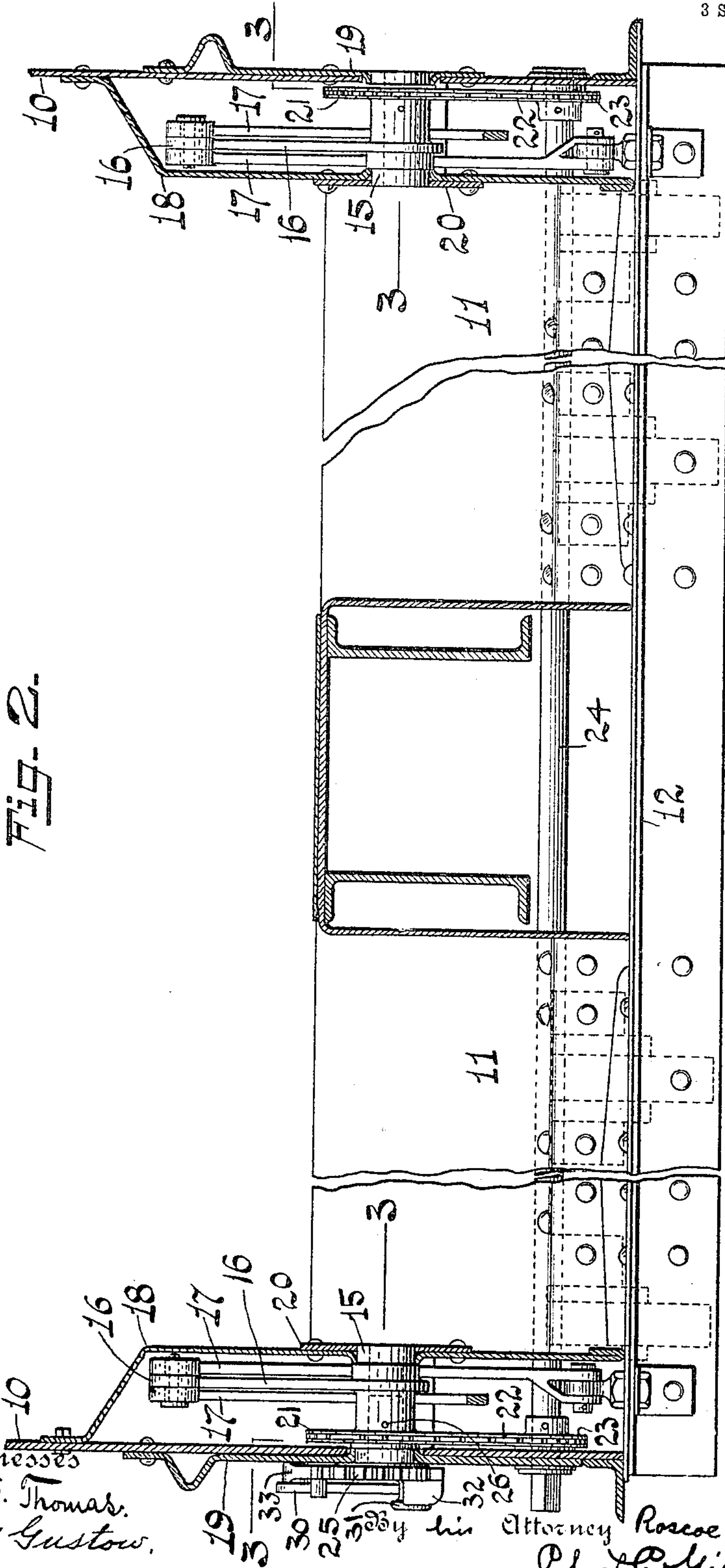


Fig. 2.

Witnesses  
Chas. W. Thomas.  
Herman Gustow.

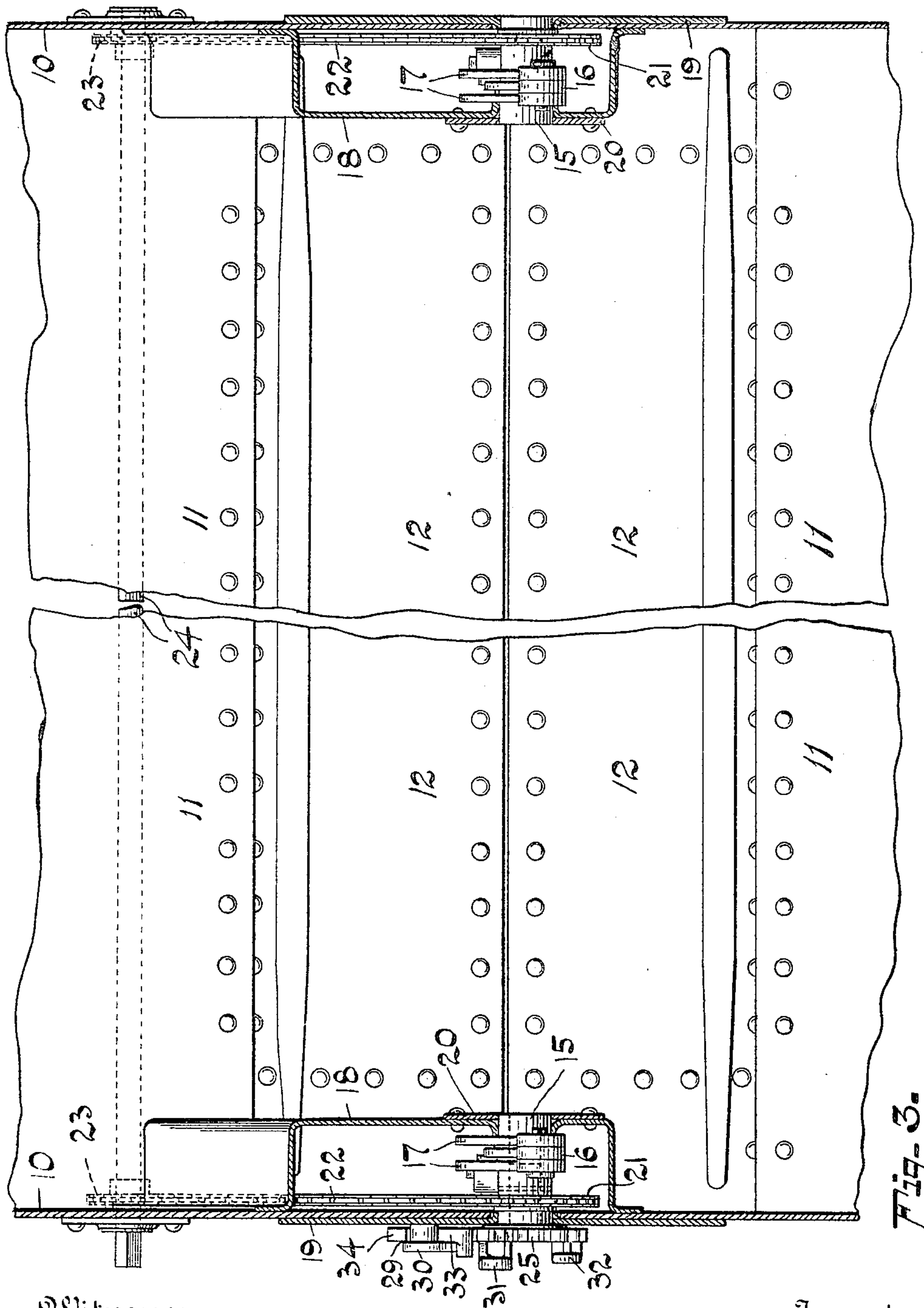
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TRANSPORTATION CAR OF THE DROP BOTTOM GONDOLA TYPE.

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3 SHEETS—SHEET 3.



Witnesses  
Chas. W. Thomas.  
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# UNITED STATES PATENT OFFICE.

ROSCOE B. KENDIG, OF CLEVELAND, OHIO, ASSIGNOR TO BENJAMIN A. HEGEMAN, JR., OF NORTH PLAINFIELD, NEW JERSEY.

## TRANSPORTATION-CAR OF THE DROP-BOTTOM-GONDOLA TYPE.

No. 801,459.

Specification of Letters Patent.

Patented Oct. 10, 1905.

Application filed May 1, 1905. Serial No. 258,204.

*To all whom it may concern:*

Be it known that I, ROSCOE B. KENDIG, a citizen of the United States, and a resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Transportation-Cars of the Drop-Bottom-Gondola Type, of which the following is a specification.

The invention relates to improvements in transportation-cars of the drop-bottom-gondola type having downwardly-inclined floors leading to gates which when opened permit the discharge or dumping of the load; and my invention consists in the novel gate-operating mechanism hereinafter described and claimed for such cars and analogous vehicles and also in the novel structural features hereinafter described pertaining to the plate-girder sides of the car above the hopper-opening in the bottom of the car.

The object of my invention is to provide an efficient, easily-operated, and durable mechanism for closing and opening the discharge-gates of the cars and for locking said gates in their closed position; and a further object of the invention is to secure the benefits of a transverse shaft for simultaneously operating the gate-levers at opposite sides of the car without the inconveniences arising from said shaft being extended through the compartment of the car above the gates in the path of the discharging load, which has heretofore been the usual position of said shaft.

In the gate-operating mechanism of my invention a transverse shaft is made use of; but it is located to one side of the gates and below one inclined floor of the car, where it cannot, of course, interfere with the discharge of the load and does enable the attainment of increased advantages in the operation of the gates.

A further object of the invention is to provide the plate-girder sides of the car above the hopper-opening with efficient reinforcing-plates and other features hereinafter described and claimed.

The invention will be fully understood from the detailed description hereinafter presented, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation, partly broken away, of a gondola car equipped with gates and gate-operating mechanism and other features embodying the invention. Fig. 2 is a

transverse section of same on the dotted line 2 2 of Fig. 1, and Fig. 3 is a horizontal section of same on the dotted line 3 3 of Fig. 2. Fig. 4 is a detached view of the pawl and ratchet shown in disengaged relation, and Fig. 5 is a like view showing the position of the parts during the closing of the gates.

In the drawings, 10 designates the plate-girder sides of the car, 11 the inclined floor-sections for enabling the discharge of the load, and 12 the corresponding gates at the lower ends of said inclined sections 11, said gates being hinged at their outer edges at 14 and adapted to turn downwardly and outwardly from each other in a usual manner, said gates in themselves being of well-known form and construction, with the exception that at their inner ends their hinge-straps have depending ends secured to commercial Z-bars connected to the gates, as shown in Fig. 1.

At the sides of the car and above the center line between the doors 12 are suitably mounted short transverse crank-shafts 15 15, having crank-arms 16, to which are pivotally secured the upper ends of the rods 17, whose lower ends are pivotally-connected with the doors 12. There are two rods 17 at each side of the car, and both these rods are pivotally secured to the crank 16, while the lower end of one of said rods is connected with one door 12 and the lower end of the other rod 17 is connected with the other door 12.

The crank-shafts 15 are mounted in the sides 10 of the car and the vertical sides of the housings 18, which inclose the cranks 16 and rods 17, the said sides being apertured to receive the ends of said crank-shafts and being reinforced by plates 19 20, respectively, which are also apertured and the former of which around its aperture is flanged into the aperture of the side 10, as shown in Fig. 2, to afford a better bearing for the outer end of the crank-shaft. The edges of the aperture in the inner side of the housings 18 are also flanged inwardly to afford a more substantial bearing for the inner end of the crank-shaft. The housings 18 are of plate metal and formed with an edge or peripheral flange, which is secured to the plate-girder sides 10. The reinforcing-plates 19 are secured to the outer faces of the sides 10 above the hopper discharge-opening and are arranged longitudinally of the car and across



the hopper, and said plates 19 along their upper portions each have a longitudinal embossment, as shown in Figs. 1 and 2. Within the housings 18 the crank-shafts 15 are provided with sprocket-wheels 21, as shown in Figs. 2 and 3, and these sprocket-wheels 21 are connected by sprocket-chains 22 with sprocket-wheels 23, secured upon the ends of a shaft 24, which is located to one side of the gates 12 and extends transversely across the car below one of the inclined floor-sections 11 thereof. The chains 22 are within the housings 18, the latter being extended at one edge to inclose said chains and keep the same from contact with such material as may be carried by the car. The transverse shaft 24 is not within the carrying-compartment of the car, but is below one floor-section 11 thereof, and one end of said shaft extends beyond the side of the car and is formed with angular sides, so that a wrench may be applied to said shaft for rotating the same and through the sprocket-wheels 23 21 and chains 22 imparting rotary movement to the crank-shafts 15 for at the proper time actuating the cranks 16 and rods 17 to close the doors 12. I preferably make the sprocket-wheels 23 one-half the size of the sprocket-wheels 21, so as to facilitate the closing of the doors 12 and enable the gate mechanism to be operated by one man standing at one side of the car. The shaft 24 by extending entirely across the car assures simultaneous movement in the gates 12 and their operating-rods 17 during both the opening and closing of said gates, and this is of considerable importance in view of the weight of the gates and the conditions to be met in the use of the gondola cars.

The rods 17, as indicated in Fig. 1, extend laterally at their middle portions, so that when the gates 12 are in their closed position the said rods may, in effect, extend around one side of the crank-shafts 15 and have their upper pivoted ends slightly beyond the vertical center line of said shafts, this arrangement of said rods affording a lock for holding the gates 12 in their closed position. It is necessary, however, that the gates 12 be very securely locked, so that they may not jar open during the loading or travel of the cars, and hence upon the outer end of one of the crank-shafts 15 I provide a special toothed locking-wheel 25, this wheel being secured to the crank-shaft by means of a polygonal stem thereon, which enters a socket in said shaft, as shown by dotted lines in Figs. 1 and 2, and is secured therein by a pin 26. The wheel 25 is formed with a series of teeth 27 and has at the end of the series a deep notch 28 to receive when the gates 12 are in their closed position the point of the pawl 29, which is pivoted in a bracket 30 and with the wheel 25 serves to effectually lock, through the crank-shafts 15 and intermediate and cooperating mechanism, the gates 12 in their closed posi-

tion. The wheel 25 is also formed with two projecting lugs 31 32 to be used as bearing-points for a crowbar or like device to be inserted between them and utilized for giving the wheel a very slight rotary movement toward the right, so that the pawl 29 may be released from said wheel, and then for giving said wheel a slight rotary movement toward the left looking at Fig. 1 sufficient to carry the upper ends of the rods 17 to the left of the vertical center line of the crank-shafts 15, when, the gates being then unlocked, the weight upon the gates 12 will compel them to open.

The pawl 29 is employed in connection with a pivoted weight or dog 33, which when in the position shown in Fig. 1 rests upon the pawl 29 and locks the latter in its engaging position, whereby the wheel 25 is assuredly prevented under all conditions from rotating and the gates 12 from opening. When it is desired to free the pawl 29, so that the wheel 25 may rotate toward the left looking at Fig. 1 and the gates 12 open, the dog 32 is turned upwardly and toward the left and the pawl 29 is turned upwardly and toward the left from the wheel 25, so as to clear the latter, and then the dog 32 by being turned completely over toward the left may be dropped against the angular arm 34 (then about horizontal) of said pawl (the handle end of the dog at such time engaging said arm) and operate to retain the pawl 29 in its upwardly-turned position clear of the wheel 25. After the pawl 29 and dog 33 have thus been disposed of the wheel 25 is left free to be turned, and then the attendant will by means of a crowbar or otherwise give the said wheel its slight movement toward the left, as above explained, for carrying the upper ends of the rods 17 to the left of the vertical center line of the shaft 15 and allowing the gates 12 to open. The dog 33 is thus utilized at one time for locking the pawl 29 in its operative engaging position and at another time for holding said pawl in its upturned or inoperative position, so that it may not interfere with the movement toward the left of the toothed wheel 25.

The normal condition of the operating parts of the gate mechanism is that shown in Fig. 1, with the gates 12 locked in their closed position. When it is desired to discharge the contents of the car, the pawl 29 will be turned upwardly and held in such position by means of the dog 33, as above explained, and thereupon the attendant will turn the wheel 25 toward the left, so as to permit the weight on the gates 12 to drive them to their open position. After the load has been discharged the gates 12 should again be closed and locked, and this is accomplished by means of a wrench or other suitable tool applied to the polygonal end of the transverse shaft 24, the rotation of the shaft resulting in the crank-shafts being rotated through the medium of the chains and sprocket-wheels and turning the cranks 16



upwardly and through the rods 17 drawing the gates 12 to their former closed position, whereupon the pawl 29 will be restored to its initial locking position for effectually retaining the gates in their closed position.

Ordinarily the gates and their connections are of considerable weight, and in the absence of special conditions a great deal of strength is required in closing them. With my invention, however, the gates may be readily closed by one man, since the transverse shaft 24 is connected at its ends with the crank-shafts 15 and may simultaneously operate both said crank-shafts and the parts connected with them. The sprocket-wheels 23 on the crank-shaft 24 are, moreover, one-half the size of the sprocket-wheels 21, and thus the force employed to rotate the shaft 24 is used with maximum efficiency on the crank-shaft 15. I provide the continuous series of teeth 27 on the wheel 25, so that the man at the transverse shaft 24 may not be compelled at one continuous stretch to move the gates 12 from their open to their fully-closed position, the pawl 29 being adapted to engage any one of the teeth 27 during the closing movement of the gates 12. I have hereinbefore described the use of the dog 33 for locking the pawl 29 in its initial engaging position (shown in Fig. 1) and for retaining said pawl in its upturned inoperative position. When the gates 12 are to be closed, I first free the dog 33 from the pawl 29 and allow the engaging end of said pawl to rest upon the teeth 27 and then in order to dispose of the dog 33 allow the handle end of the latter to rest against the outer left-hand end of the arm 34, connected with said pawl, said dog when in this position allowing the pawl to oscillate upon its pivot as the teeth 27 ride under its operating end and permitting said end to closely follow said teeth, so that at any stage of the rotation of the wheel 25 the operator may cease the rotation of the shaft 24, and the pawl 29 will lock the gate-operating parts, thus affording an opportunity for the man at the shaft 24 to rest, if he should so desire.

It is evident that power may be applied directly to the wheel 25 instead of to the transverse shaft 24 for closing the gates 12 and that under such arrangement the rods 17 at both sides of the car would have simultaneous movement, the motion of one crank-shaft 15 being imparted through the sprocket-wheels, chains, and shaft 24 to the other crank-shaft; but I deem it better to apply the power for closing the gates directly to the shaft 24, which is to one side of the gates and at which a man may stand with perfect safety. In any event the shaft 24 will be provided below one of the inclined floor-sections 11, where it will not interfere with the discharge of the load when the gates 12 are opened. It is evident also that a ratchet-wheel and locking-pawl, as wheel 25 and pawl 29, may be applied at the end of the

shaft 24; but I deem it better when practicable to locate said wheel and dog at the end of one of the crank-shafts 15 in the manner shown.

I do not limit my invention in every instance to the employment of the two sets of crank-shafts, cranks, and pivoted rods located one at each side of the car, because I am aware that in some instances it may be desirable to locate the cranks and rods for operating the discharge-gates at the center of the car and between the draft-sills thereof, in which event but one crank-shaft would be made use of, the said crank-shaft carrying a crank connected by a rod or rods with the gate or gates. In cars employing such centrally-disposed gate-operating mechanism the crank-shaft will possess the sprocket-wheel 21 and be connected by a sprocket-chain 22 with a sprocket-wheel 23 upon the transverse shaft 24, extending transversely below the inclined floor-section of the car and operated from the outer side of the car, as hereinbefore explained. My invention is therefore applicable to cars in which it is desirable to have the two sets of gate-operating mechanism one located at each side of the car as well as to cars requiring a single gate-operating mechanism located at the center of the car and between the draft-sills thereof.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a car or the like having an inclined floor-section and a hinged discharge-gate at the lower end thereof, the gate-operating mechanism comprising the short crank-shafts carrying cranks, the rods pivoted to said cranks and said gate, the sprocket-wheels on said shafts, the transverse shaft extending across the car below said inclined floor-section and having sprocket-wheels, chains connecting the sprocket-wheels on said transverse shaft with the sprocket-wheels on said crank-shafts, and means for locking said gate in its closed position; substantially as set forth.

2. In a car or the like having an inclined floor-section and a hinged discharge-gate at the lower end thereof, the gate-operating mechanism comprising the short crank-shafts carrying cranks, the rods pivoted to said cranks and said gate, the sprocket-wheels on said shafts, the transverse shaft extending across the car below said inclined floor-section and having sprocket-wheels, chains connecting the sprocket-wheels on said transverse shaft with the sprocket-wheels on said crank-shafts, and pawl-and-ratchet mechanism for locking the gate closed, said rods being offset to pass around the side of said crank-shafts so that their upper ends may lie beyond the vertical center line of said shafts; substantially as set forth.

3. In a car or the like having downwardly-inclined converging floor-sections and hinged



discharge-gates at the lower ends thereof, the gate-operating mechanism comprising the short crank-shafts carrying cranks, the pairs of rods pivotally connected at their upper ends with said cranks and at their lower ends to said gates respectively, the sprocket-wheels on said shafts, the transverse shaft extending across the car below one of said inclined floor-sections and having sprocket-wheels at its ends, chains connecting the sprocket-wheels on said transverse shaft with the sprocket-wheels on said crank-shafts, and means for locking said gates in their closed position; substantially as set forth.

4. In a car or the like having downwardly-inclined converging floor-sections and hinged discharge-gates at the lower ends thereof, the gate-operating mechanism comprising the short crank-shafts carrying cranks, the pairs of rods pivotally connected at their upper ends with said cranks and at their lower ends to said gates respectively, the sprocket-wheels on said shafts, the transverse shaft extending across the car below one of said inclined floor-sections and having sprocket-wheels at its ends, chains connecting the sprocket-wheels on said transverse shaft with the sprocket-wheels on said crank-shafts, and pawl-and-ratchet mechanism for locking said gates in their closed position, said pairs of rods being offset to pass around the side of said crank-shafts so that their upper ends may lie beyond the vertical center line of said shafts; substantially as set forth.

5. In a car or the like having downwardly-inclined converging floor-sections and hinged discharge-gates at the lower ends thereof, the gate-operating mechanism comprising the short crank-shafts carrying cranks, the pairs of rods pivotally connected at their upper ends with said cranks and at their lower ends to said gates respectively, the sprocket-wheels on said shafts, the transverse shaft extending across the car below one of said inclined floor-sections and having sprocket-wheels at its ends, chains connecting the sprocket-wheels on said transverse shaft with the sprocket-wheels on said crank-shafts, and pawl-and-ratchet mechanism for locking said gates in their closed position; substantially as set forth.

6. In a car or the like having downwardly-inclined converging floor-sections and hinged discharge-gates at the lower ends thereof, the gate-operating mechanism comprising the short crank-shafts carrying cranks, the pairs of rods pivotally connected at their upper ends with said cranks and at their lower ends to said gates respectively, the sprocket-wheels on said shafts, the transverse shaft extending across the car below one of said inclined floor-sections and having sprocket-wheels at its ends, chains connecting the sprocket-wheels on said transverse shaft with the sprocket-wheels on said crank-shafts, the ratchet-wheel on one of said crank-shafts, and the pivoted

pawl and locking-dog for coöperation therewith, one end of said transverse shaft being exposed to receive means for rotating the shaft to effect the closing of the gates; substantially as set forth.

7. In a car or the like having downwardly-inclined converging floor-sections and hinged discharge-gates at the lower ends thereof, the gate-operating mechanism comprising the short crank-shafts carrying cranks, the pairs of rods pivotally connected at their upper ends with said cranks and at their lower ends to said gates respectively, the sprocket-wheels on said shafts, the transverse shaft extending across the car below one of said inclined floor-sections and having sprocket-wheels at its ends, chains connecting the sprocket-wheels on said transverse shaft with the sprocket-wheels on said crank-shafts, the ratchet-wheel on one of said crank-shafts, and the pivoted pawl and locking-dog for coöperation therewith, one end of said transverse shaft being exposed to receive means for rotating the shaft to effect the closing of the gates, and said rods being offset to pass around the side of said crank-shafts so that their upper ends may lie beyond the vertical center line of said shafts; substantially as set forth.

8. In a car or the like having downwardly-inclined converging floor-sections and hinged discharge-gates at the lower ends thereof, the gate-operating mechanism comprising the short shafts rotatively mounted at opposite sides of the car above said gates, means connecting said shafts and gates for closing the latter on the rotation of said shafts, sprocket-wheels rigid on said shafts, the transverse shaft extending across the car below one of said inclined floor-sections and having sprocket-wheels at its ends, chains connecting the sprocket-wheels on said transverse shaft with the sprocket-wheels on said short shafts, and means for locking said gates in their closed position; substantially as set forth.

9. In a car or the like having a downwardly-inclined floor-section and a hinged discharge-gate at the lower end thereof, the gate-operating mechanism comprising the short shafts rotatively mounted at opposite sides of the car and carrying cranks, rods pivoted to said cranks and gate, the sprocket-wheels on said shafts, the transverse shaft extending below the car-floor and having sprocket-wheels, chains connecting the sprocket-wheels on said transverse shaft with the sprocket-wheels on said crank-shafts, and means for locking the gate in its closed position; substantially as set forth.

10. In a car having a downwardly-inclined floor-section and a hinged discharge-gate at the lower end thereof, the gate-operating mechanism comprising the short transverse crank-shaft having a rigid crank-arm normally extending upwardly, a rod pivoted to the upper end of said crank-arm and to the



gate, the sprocket-wheel on said crank-shaft, the operating-shaft extending transversely of the car and below the car-floor and having a sprocket-wheel, a chain connecting said sprocket-wheels, and means comprising a dog-and-ratchet plate exterior to the side of the car for locking the gate in closed position and said operating-shaft stationary, the end of said operating-shaft being mounted in the side of the car and having its end exposed and formed to receive the means for rotating the shaft; substantially as set forth.

11. In a car having a downwardly-inclined floor-section and a hinged discharge-gate at the lower end thereof, the gate-operating mechanism comprising the short transverse crank-shaft having a rigid crank-arm 16 normally extending upwardly, a rod 17 pivoted to the upper end of said crank-arm and to the gate, the sprocket-wheel on said crank-shaft, the operating-shaft extending transversely of the car and below the car-floor and having a sprocket-wheel, a chain connecting said sprocket-wheels, and means comprising a dog-and-ratchet plate exterior to the side of the car for locking the gate in closed position and said operating-shaft stationary, the end of said operating-shaft being mounted in the side of the car and having its end exposed and formed to receive the means for rotating the shaft, and said rod, crank-arm and crank-shaft being arranged to permit the pivot-point of said crank-arm and rod to pass beyond the center line of said crank-shaft and the lower pivot-point of said rod, for locking the gate in closed position; substantially as set forth.

12. In a car having downwardly-inclined floor-sections and a pair of hinged gates at the lower end thereof, the gate-operating mechanism comprising the short transverse crank-shaft having a rigid crank-arm 16 normally extending upwardly, a pair of rods 17 pivoted at their upper ends to said crank-arm and at their lower ends to the said gates respectively, the sprocket-wheel on said crank-shaft, the operating-shaft extending transversely of the car and below the car-floor and having a sprocket-wheel, a chain connecting said sprocket-wheels, and means comprising a dog-and-ratchet plate exterior to the side of the car for locking the gate in closed position and said operating-shaft stationary, the end of said operating-shaft being mounted in the side of the car and having its end exposed and formed to receive the means for rotating the shaft; substantially as set forth.

13. In a metallic car, the combination with

plate-girder sides and a bottom having a hopper-opening, of a reinforcing-plate above the hopper-opening and extending across the hopper, and a door-operating shaft extending through the plate-girder side and the plate, substantially as described.

14. In a metallic car, the combination with plate-girder sides and a bottom having a hopper-opening, of a reinforcing-plate secured to each plate-girder side and of greater length than the width of the hopper, a plate on the inner face of one of the plate-girder sides and having a peripheral flange secured to the plate-girder side, and a shaft extending through both plates, said shaft being the operating-shaft for the door mechanism, substantially as described.

15. In a metallic car, the combination with plate-girder sides and a bottom having a hopper-opening, of a plate secured to the inner face of one of the plate-girder sides and comprising a housing, a shaft projecting through said plate and plate-girder sides, and a door-operating mechanism connected to the shaft and protected by said housing, substantially as described.

16. In a metallic car, the combination with plate-girder sides and a bottom having a hopper-opening, reinforcing-plates on the outer faces of said plate-girder sides, and a reinforcing-plate on the inner face of one of the plate-girder sides and cooperating with the plate on the outside of the plate-girder side, substantially as described.

17. In a metallic car, the combination with plate-girder sides and a bottom having a hopper-opening, of doors connected to the bottom of the car and having hinge-straps with depending ends, commercial shapes connected to the doors and to the hinge-straps, and means for operating said doors, substantially as described.

18. In a metallic car, the combination with plate-girder sides and a bottom having a hopper-opening, a shaft projecting through the sides and having a ratchet thereon, a reinforcing-plate connected to one of the sides and above the hopper-opening, and a pawl carried by said plate for engagement with the ratchet on the shaft, substantially as described.

Signed at New York city, in the county of New York and State of New York, this 25th day of April, A. D. 1905.

ROSCOE B. KENDIG.

Witnesses:

CHAS. C. GILL,  
ARTHUR MARION.