

No. 763,696.

PATENTED JUNE 28, 1904.

G. E. RUSSELL & J. McE. AMES.

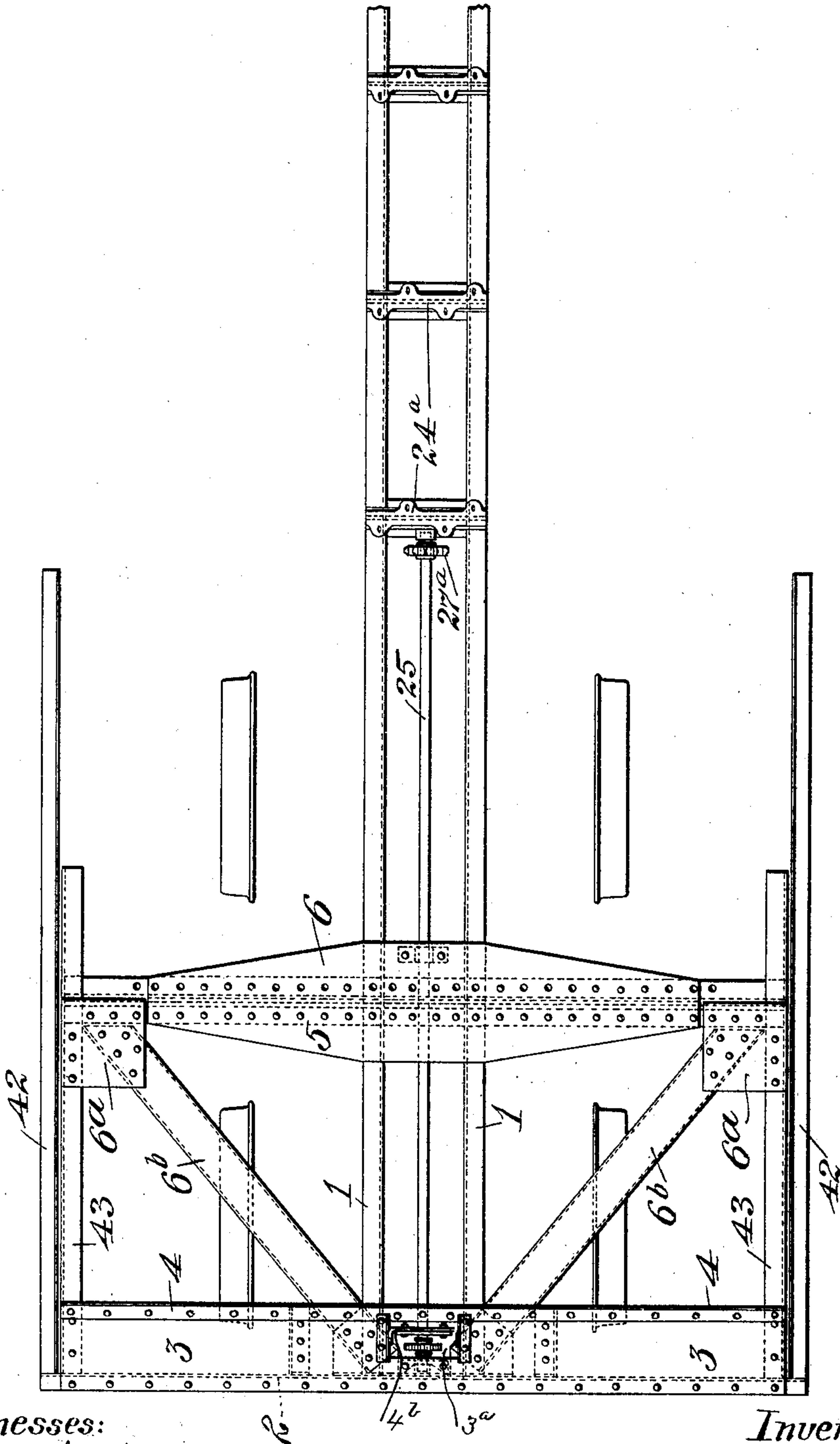
HOPPER CAR.

APPLICATION FILED JAN. 25, 1904.

NO MODEL.

5 SHEETS—SHEET 1.

Fig. 1.



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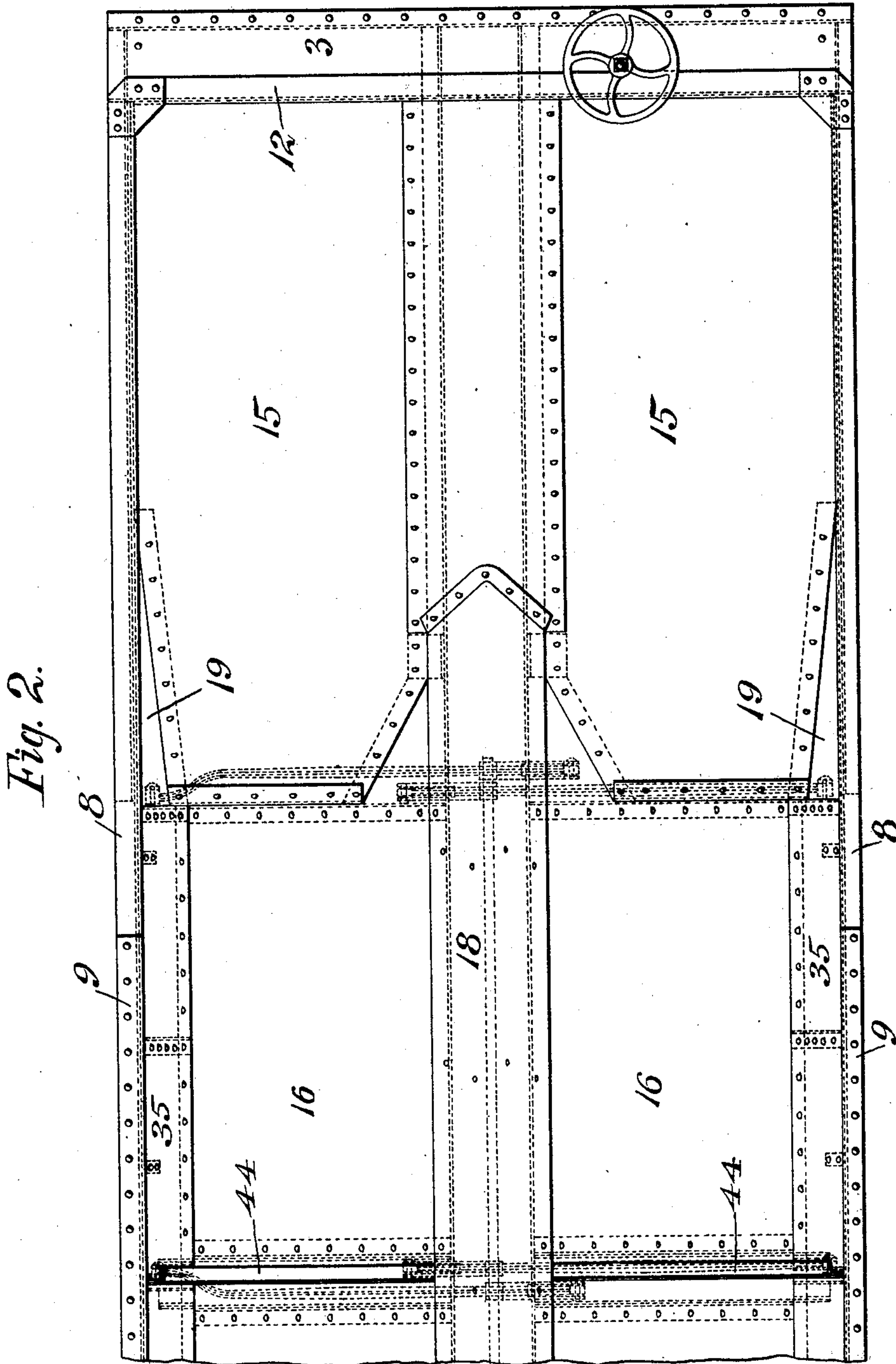
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5 SHEETS—SHEET 2.



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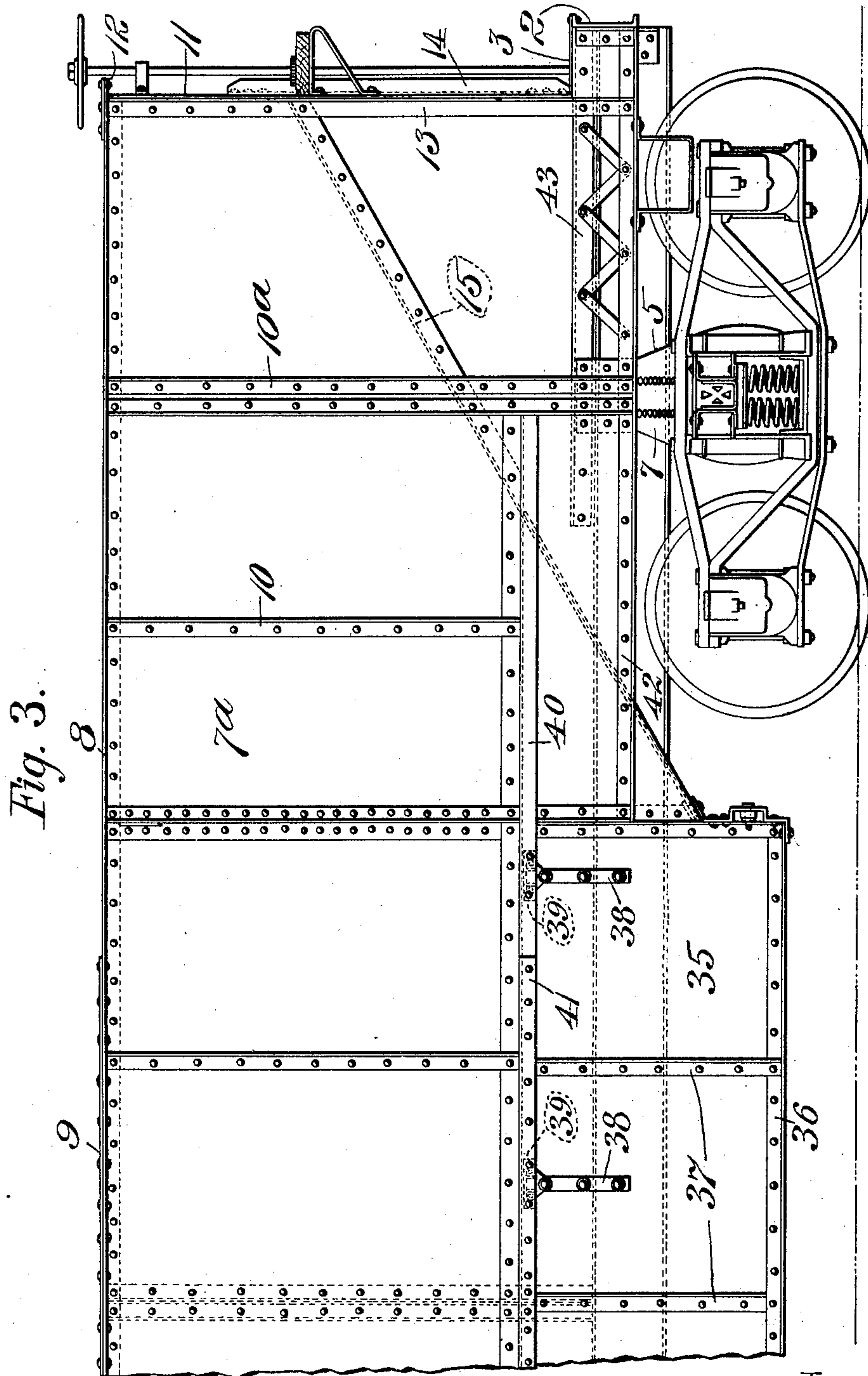
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5 SHEETS—SHEET 3.



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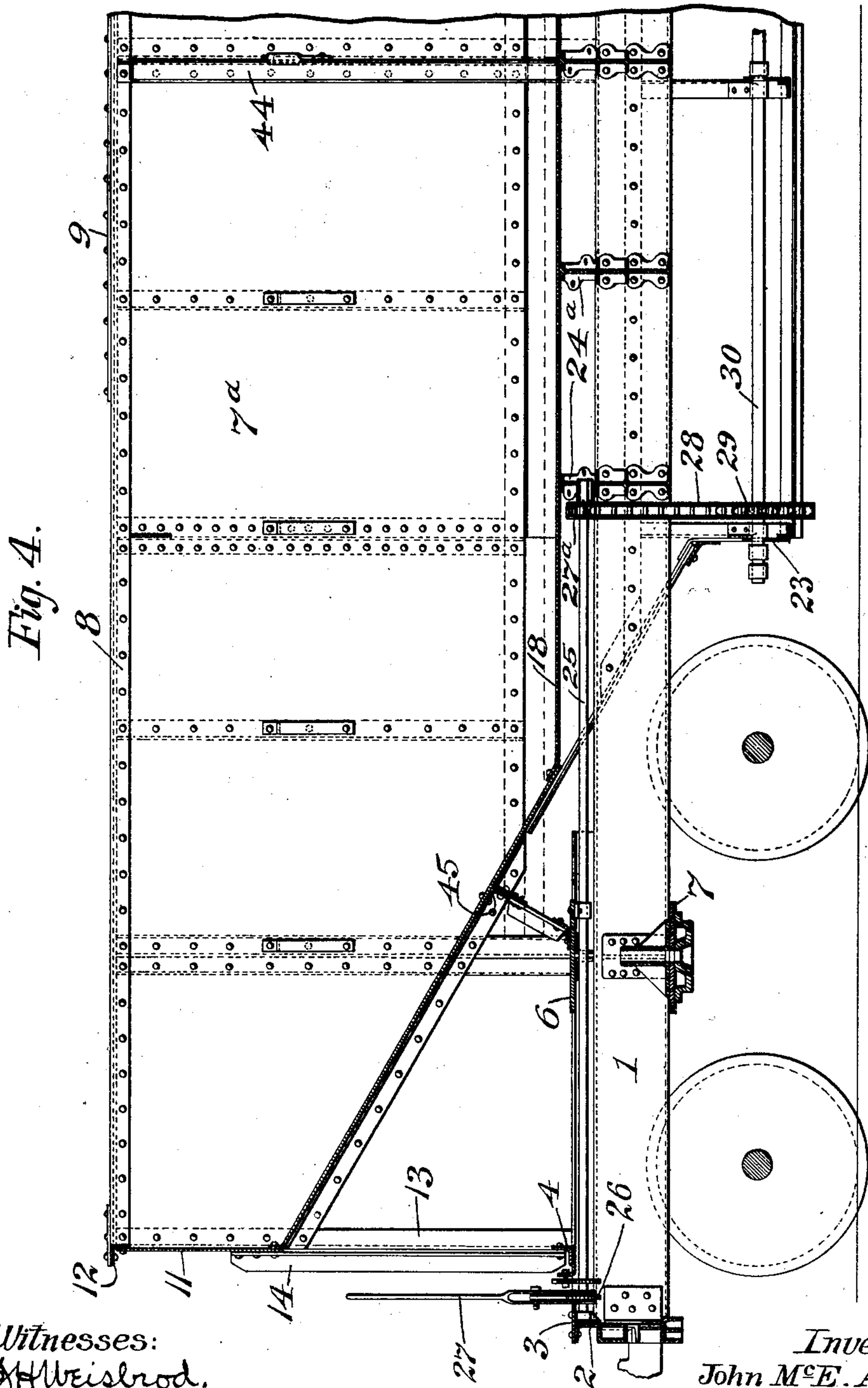
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HOPPER CAR.

APPLICATION FILED JAN. 25, 1904.

NO MODEL.

5 SHEETS—SHEET 4.



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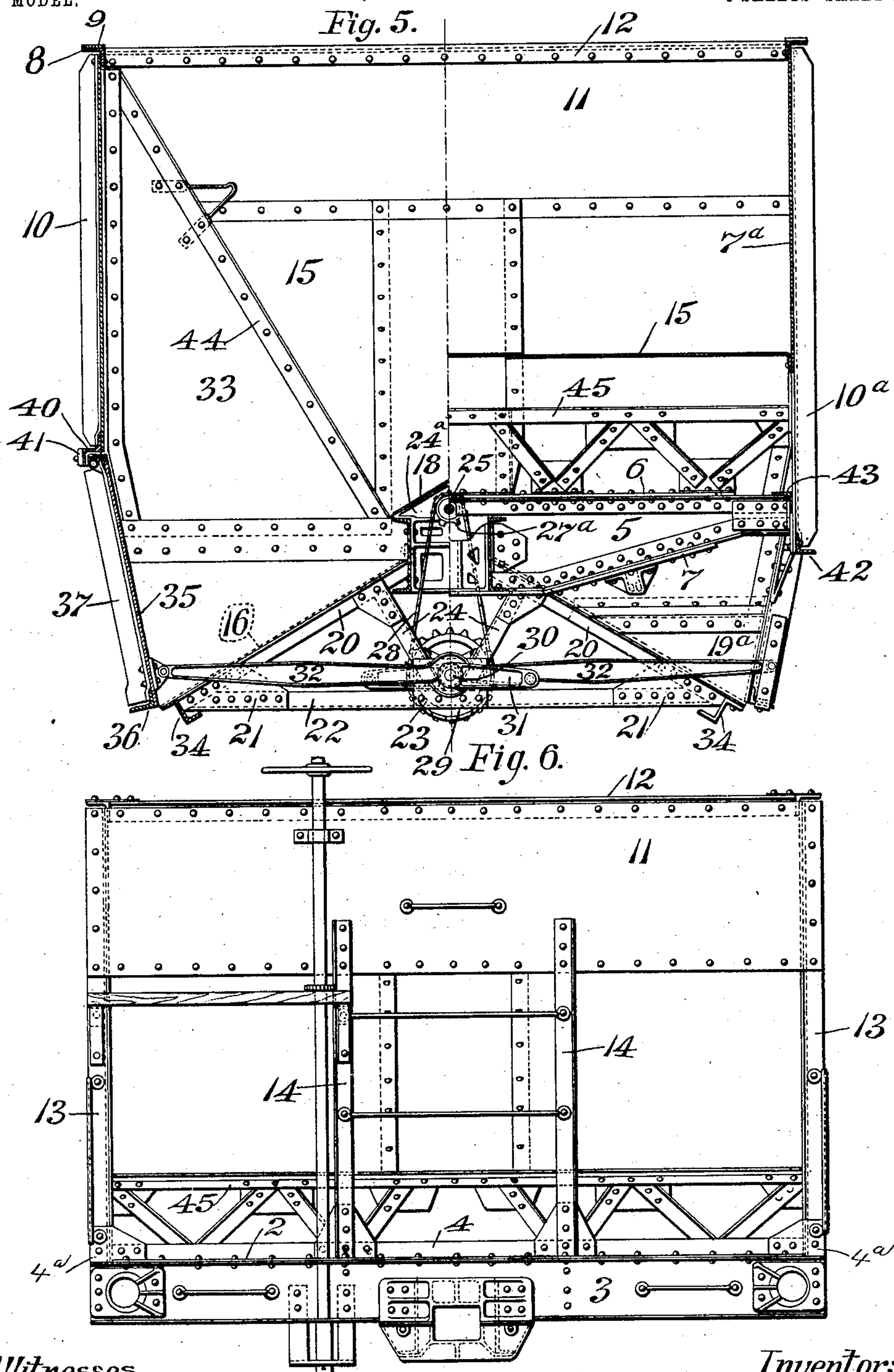
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HOPPER CAR.

APPLICATION FILED JAN. 25, 1904.

NO MODEL.

5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

GEORGE E. RUSSELL AND JOHN McE. AMES, OF NEW YORK, N. Y.,
ASSIGNORS TO AMERICAN CAR & FOUNDRY COMPANY, OF ST.
LOUIS, MISSOURI, A CORPORATION OF NEW JERSEY.

HOPPER-CAR.

SPECIFICATION forming part of Letters Patent No. 763,696, dated June 28, 1904.

Application filed January 25, 1904. Serial No. 190,512. (No model.)

To all whom it may concern:

Be it known that we, GEORGE E. RUSSELL and JOHN McE. AMES, citizens of the United States, residing at New York, State of New York, have invented a certain new and useful Improvement in Hopper-Cars, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a diagrammatic view of the underframing. Fig. 2 is a top plan view of one end of the car. Fig. 3 is a side elevational view of one end of the car. Fig. 4 is a vertical longitudinal sectional view through one end of the car. Fig. 5 is a vertical sectional view, the left half being through the center of the car and the right half being in the plane of the bolster; and Fig. 6 is an end elevational view of the car.

This invention relates to improvements in car construction, being adapted particularly to hopper-bottom cars.

The objects of our present invention are to reduce the dead weight of the car in proportion to its carrying capacity and to simplify the construction and cheapen the cost of manufacture.

With these objects in view the invention consists in the construction, arrangement, and combination of the several parts, all as will be hereinafter described and afterward pointed out in the claims.

In the drawings, 1 indicates the center sills, which are preferably continuous from end to end of the car.

2 indicates the end sills in the form of channels, to the upper flanges of which are attached platform-plates 3, the inner edges of said platform-plates being provided with angles 4, providing upwardly-extending flanges to which are secured the connection-plates 4^a for the end and corner posts 13, which are riveted to the connection-plates and are on the outside of the side and end plates of the car. The platform-plates 3 are provided with slots

3^a, which are formed by bending the upstanding flange 4^b from the plate to form a bearing for the dog or pawl A, which engages the ratchet B on the shaft 25 of the door-operating mechanism to be referred to hereinafter.

5 indicates the bolster, provided with the usual cover-plate 6. This bolster is shown in Fig. 5 as being composed of web-plates having angles riveted to its upper and lower edges, said angles forming tension and compression members, the structure being reinforced by a bottom cover-plate 7. These bolsters may be continuous from side sill to side sill, in which event the center sills would be interrupted in the plane of the bolster, or the bolsters could be interrupted as shown, whereby the center sills are continuous from end to end of the car.

6^a indicates connection-plates at the ends of the bolster, which plates are also riveted to the bottom member of the short side sill, said connection-plates affording means for attachment of diagonals 6^b, whose other ends converge and are riveted to the platform-plate at the points of connection of the center sills and end sills.

7^a indicates the sheets constituting the side walls of the car, which sheets are provided at their upper edges with angles 8, extending the full length of the car-body, which angles are reinforced by plates 9 at the center of the car. (See Fig. 3.) These side sheets are reinforced by angles or T-irons 10 to add strength to the structure and prevent the sheets from buckling. These angles 10 practically form vertical posts, and in the transverse plane of the bolsters two of these angles 10^a are preferably arranged side by side for the purpose of stiffness.

11 indicates the end wall of the car, which end wall has an angle 12 along its upper edge.

13 indicates the corner-posts in the form of angles, and 14 indicates the end posts.

15 indicates the sloping end floor-sheet riveted to the lower edge of the end plate. These floor-sheets are flanged down at their side edges and riveted to the side sheets 7^a in a well-known manner. The lower or inner edges of these plates 15 are riveted to hop-

per-sheets 16, which hopper-sheets are secured to the center sills and are inclined downwardly and outwardly, said hopper-sheets being supported by trusses carried by the center sills.

5 A hood 18 is arranged above the center sills between the inclined end floor-sheets for the purpose of shedding the load. A short triangular plate 19, forming a side hopper-sheet, depends from the side wall of the car and is

10 riveted to the lower outer edges of the inclined end floor-sheets for the purpose of supporting the same. To avoid continuing the sheet 15 downwardly beyond the end of the sheet 16, we arrange a small triangular plate

15 19^a at each end of plate 16, which plates 19^a are connected at their outer edges to the triangularly-shaped hopper-sheets 19. (See Fig. 5.)

Referring to Fig. 5, it will be seen that the

20 inclined hopper-sheets 16 are supported by angles 20, which angles at their upper ends are connected to the center sills and at their lower ends are riveted to connection-plates 21, said connection-plates carrying trans-

25 versely-disposed angles 22. The centers of these angles 22 have riveted to them connection-plates 23, forming bearings for the door-operating shaft, to which connection-plates 23 are riveted struts 24, whose upper ends

30 are connected to the angles 20. By this structure a longitudinally-trussed ridge is formed, of which the center sills form the apex.

The center sills are spaced apart by malleable castings 24^a, which not only serve to sup-

35 port the hood-sheet 18, but provide a bearing for the operating-shaft 25 of the door mechanism. This shaft 25 extends outwardly to the end of the car, where it is provided with the usual ratchet-and-pawl mechanism 26 and

40 an operating-handle 27 of a lever *c*, whereby the shaft may be rotated in either direction. The inner end of shaft 25 carries a sprocket-wheel 27^a, around which passes a chain 28, said chain engaging a sprocket 29, arranged

45 on a shaft 30, which shaft is journaled to the bearings in the connection-plate 23. Shaft 30 carries rock-arms 31, to which arms are connected links 32. 27 is a lever-and-ratchet mechanism for operating the shaft 25, which

50 mechanism is mounted in the slot in the platform-plate 3, the lever mechanism being controlled in an obvious manner to operate the shaft 25. These links are in turn connected to the doors of the car and may be provided

55 with recesses near their inner ends to engage the shaft, so as to lock the doors in their closed position. Shaft 25 extends from the end of the car to a point slightly beyond the ends of the hopper-sheets 16, while the shaft

60 30 extends throughout the longitudinal ridge formed in part by the sheets 16 and is provided at each end with rock-arms, which carry the links connected to the doors. In this way

65 parallelism is maintained in opening and closing the doors, and the links are exteriorly

arranged with respect to the discharging-hoppers so as not to interfere with the unloading of the car.

The lower edges of the sheet 16 are reinforced by angles or Z-bars 34, which form 70 closing edges for the doors.

35 indicates the doors, which are provided with castings to form connection-points for the links. These doors are reinforced by marginal flanges 36 and angles 37, the latter preferably extending in a vertical direction. 75

38 indicates the hinge-straps, which are provided with eyes for taking in the pintles of the hinge-lugs 39, secured to the lower edges of the side sheets. Along the lower edges of 80 the side sheets are arranged Z-bars 40, which Z-bars form a protecting hood or covering for the upper edges of the doors. These Z-bars extend along the upper edge of the door-opening and thence project beyond said door- 85 opening along the side sheet to the stiffeners in the planes of the bolsters. If necessary, these Z-bars may be reinforced by plates 41, arranged in the center of the car and throughout the greater portion of the door-opening. 90 The side sheets extend downwardly on each side of the door-opening for some little distance and are reinforced by angles, the angle along the lower edge of said projecting panel being continued to the end of the car, where 95 it is secured to the end sill. Parallel with this angle, which is marked 42, is arranged another angle 43, said two angles being connected by lattice-bars, the whole forming a short side sill, whose lower angle is secured 100 to the outer face of the side wall, extending inwardly to the door-opening, said angle terminating short of the center of the car, and whose upper angle is oppositely disposed and secured to the inner face of the side wall, terminating slightly beyond the transverse plane 105 of the bolster.

33 indicates triangularly-shaped gusset-plates, secured by connecting-angles to the inner faces of the side walls of the car, which 110 gusset-plates have their inner edges reinforced by an angle 44. These gusset-plates are connected to the center sills and serve to support said center sills from the plate-girder side sills, in addition to which the gusset- 115 plates have downward extensions spliced to them, which extensions are riveted through the plates 16 to the A-shaped trussing-frame in the vertical plane of said gusset-plates. In this manner the plate-girder side walls assist 120 in supporting the center sill of the car and also the longitudinally-disposed ridge depending from said center sill, which ridge terminates short of the bolsters.

It will be observed that the plate-girder 125 side wall is made shallow at its middle portion to provide a door-opening, this shallow portion being reinforced by plates 9 and 41, secured to the angle 8 and Z-bar 40, respectively. The angle 8 forms a compression- 130

flange of the plate-girder, while the Z-bar or angle 40 forms a tension-flange of said plate-girder, the latter being extended to the bolsters of the car and riveted along the outer side faces of the deeper portions of the plate-girder sides.

In order to support the inclined floor-sheets 15 above the bolster, we provide a transversely-disposed angle 45 on the under side of said floor-sheet, so as to provide means of attachment for connection-plates, to which are riveted the angled lattice-bars, having their other ends riveted to connection-plates secured to the top cover-plate of the bolster.

We are aware that minor changes in the construction, arrangement, and combination of the several parts of our device can be made and substituted for those herein shown and described without in the least departing from the nature and principle of our invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. A car-body having plate-girder side walls, and short side sills composed of angles and lattice-bars, one of said angles being attached to the plate-girder and terminating short of the center of the car, and the other of said angles extending from the end of the car-body to a point short of the inner end of the first-named angle; substantially as described.

2. The combination with the side wall of a car, of a side sill including in its construction two oppositely-disposed angles, one of said angles being secured to the inner face of the side wall, and the other to the outer face thereof; substantially as described.

3. The combination with the plate-girder side wall of a car, of a short side sill including in its construction two parallel oppositely-disposed angles, one of said angles, the lower, being secured to the lower outer edge of the side wall and terminating short of the center of the car, and the other of said angles, the upper, being secured to the inner face of the side wall and terminating short of the inner end of the lower angle; substantially as described.

4. In a car, the combination with plate-girder side walls made shallow in the middle, of a tension-angle attached to the lower edge of the shallow portion and extending at its ends above the lower edges of the deeper portion, and a second angle connected to the tension-angle and secured to the outer face of the side wall and terminating short of one end of the first-named angle; substantially as described.

5. In a car, the combination with a side wall in the form of a plate-girder having deep portions near its ends, of a tension-flange arranged along the shallow middle portion, and a tension-flange arranged along said deeper portions, said last-mentioned tension-flange

extending to the end of the car and constituting an element of the side sill; substantially as described.

6. In a car, the combination with a plate-girder side wall having deep portions near its end so as to provide a connection with the bolster, a tension-angle attached to the lower edge of the shallow portion of the plate-girder and extending at its end above the lower edges of the deep portion, and a second angle connected to the tension-angle and secured to the outer face of the side wall of the plate-girder and terminating short of one end of the first-named angle; substantially as described.

7. In a car, the combination with side walls, of a center sill, a longitudinal ridge, said center sill forming an apex for said ridge, hopper-sheets riveted to said center sill, and trussing-frames for supporting said hopper-sheets in position; substantially as described.

8. In a car, the combination with side walls, of a longitudinal ridge, a center sill comprising the apex of said ridge, hopper-sheets riveted to said center sill, and trussing-frames supporting said hopper-sheets in position; substantially as described.

9. In a car, the combination with side walls, of a center sill, hopper-sheets forming a longitudinal ridge of which said center sill is the apex, and transversely-arranged trusses for supporting said hopper-sheets; substantially as described.

10. In a car, the combination with plate-girder side walls, a longitudinal ridge, a center sill forming the apex of said ridge, and a connection between the plate-girder side walls and said center sill; substantially as described.

11. In a car, the combination with plate-girder side walls, of a longitudinal ridge, a center sill, said center sill forming the apex for said ridge, and a connection approximately at the center of the car between said plate-girder side walls and said ridge; substantially as described.

12. In a car, the combination with side walls having doors hinged to their lower edges, a longitudinally-disposed ridge formed in part by downwardly and outwardly inclined hopper-sheets against which said doors close, a center sill forming an apex for said ridge and a connection between the side walls and said ridge, said connection being located about the center of the car; substantially as described.

13. In a car, the combination with side walls in the form of plate-girders of least depth at the middle of the car, reinforcing-plates at the center of the car, bolsters, a center sill carried by said bolsters, inclined hopper-sheets riveted to the center sill, transversely-arranged trusses depending from the center sill for supporting said hopper-sheets in position, gusset-plates extending from the side walls of the car and being connected to said hopper-sheets, center sill and one of said trusses at the center of the car, and doors hinged to the

lower edges of the side walls and closing against the outer edges of said hopper-sheets; substantially as described.

14. In a car, the combination with side walls, 5 of doors hinged to the lower edges thereof, a longitudinal ridge against the lower edges of which said doors close, a door-operating shaft mounted at the base of the ridge, and a manually-operable shaft connected to the first- 10 mentioned shaft, said manually-operable shaft being located at the apex of the ridge; substantially as described.

15. In a car, the combination with side walls having doors hinged to their lower edges, a 15 center sill, hopper-sheets secured to the center sill and against whose outer edges said doors close, a single manually-operable shaft mounted between the center sills and extending longitudinally the car, a single door-op- 20 erating shaft located on a lower plane and geared to and alining with said first-mentioned shaft, and means connecting the door-operating shaft and doors; substantially as described.

25 16. In a car, the combination with side walls having doors hinged to their lower edges, parallel center sills, hopper-sheets depending from said center sills and against the outer edges of which said doors close, truss-frames depend-

ing from the center sills for supporting said 30 hopper-sheets, a single manually-operable shaft mounted in bearings above the center sills, a sprocket on said shaft, a single alining door-operating shaft mounted in bearings 35 carried by the truss-frames, a sprocket on said shaft, a sprocket-chain connecting said two sprockets, rock-arms on the door-operating shaft, and links connecting said rock-arms and said doors; substantially as described.

17. In a car, the combination with an end sill, 40 of a platform-plate riveted thereto, a door-operating shaft journaled in said platform-plate, and end posts secured to said platform-plate; substantially as described.

18. In a car, the combination with an end sill, 45 of a platform-plate riveted thereto, an angle riveted to the inner end of said platform-plate, connection-plates secured to said angle, and end and corner posts riveted to said connection-plates; substantially as described. 50

In testimony whereof we hereunto affix our signatures, in the presence of two witnesses, this 20th day of January, 1904.

GEO. E. RUSSELL.
JOHN McE. AMES.

Witnesses:

PHILIP B. SHERIDAN,
R. G. DEACON.