

No. 711,163.

Patented Oct. 14, 1902.

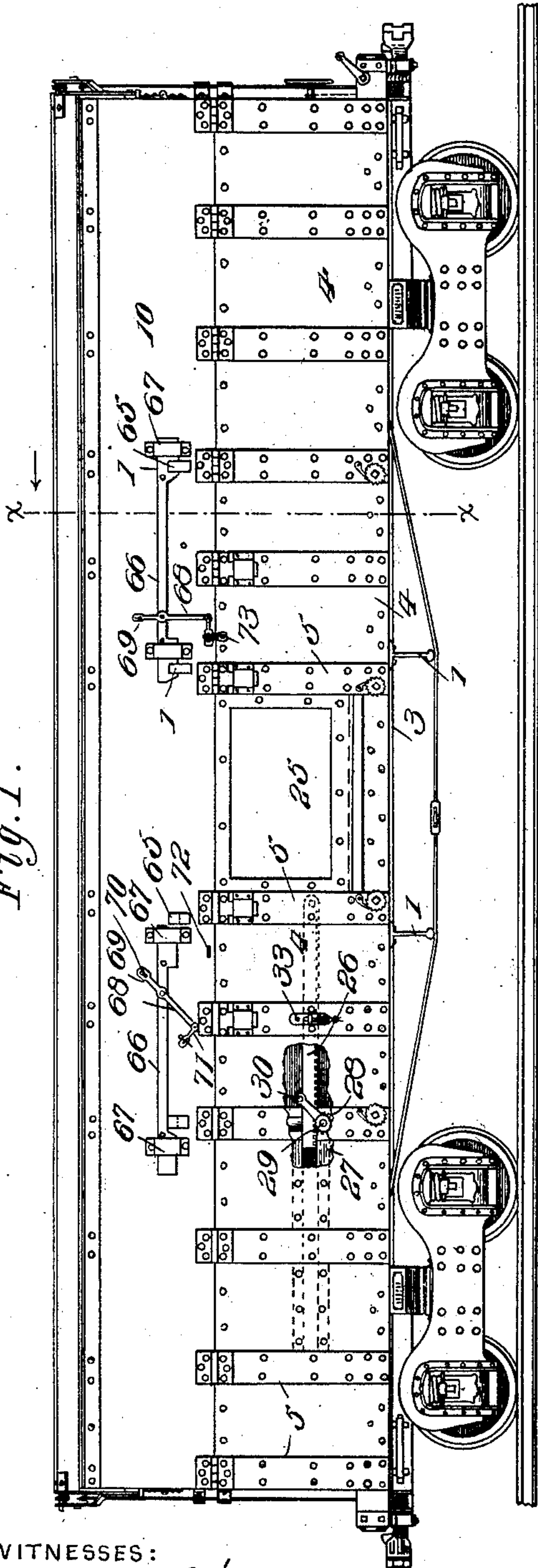
H. M. HOOVER.
RAILWAY CAR.

(Application filed Sept. 4, 1901.)

(No Model.)

3 Sheets—Sheet 1.

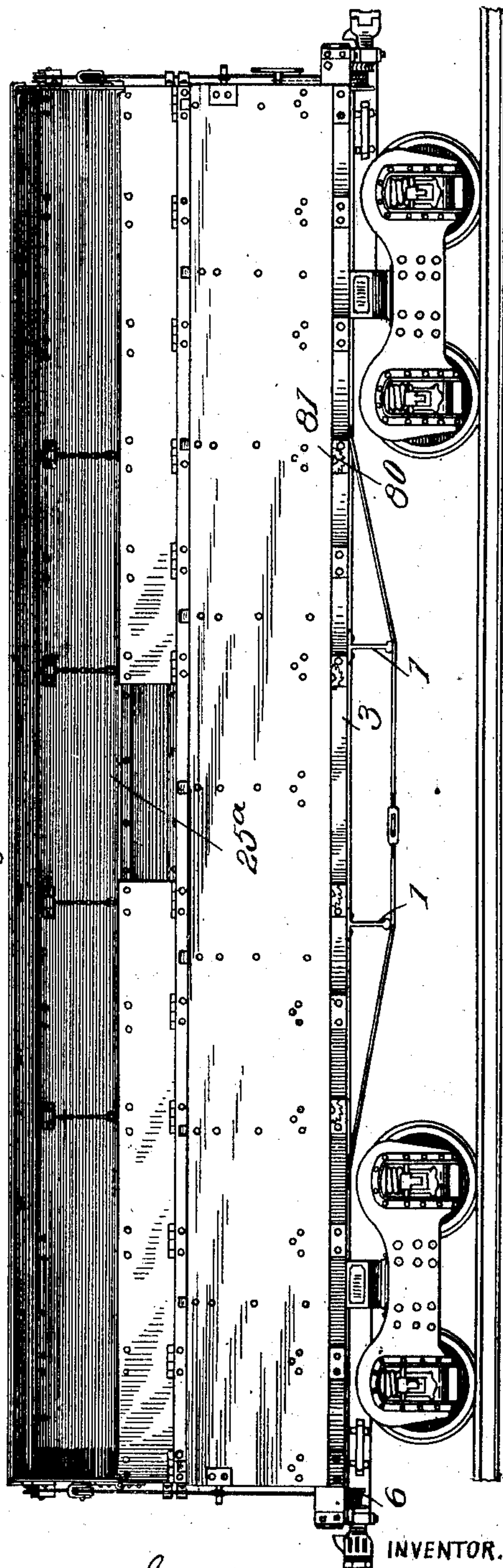
Fig. 1.



WITNESSES:

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Fig. 2.



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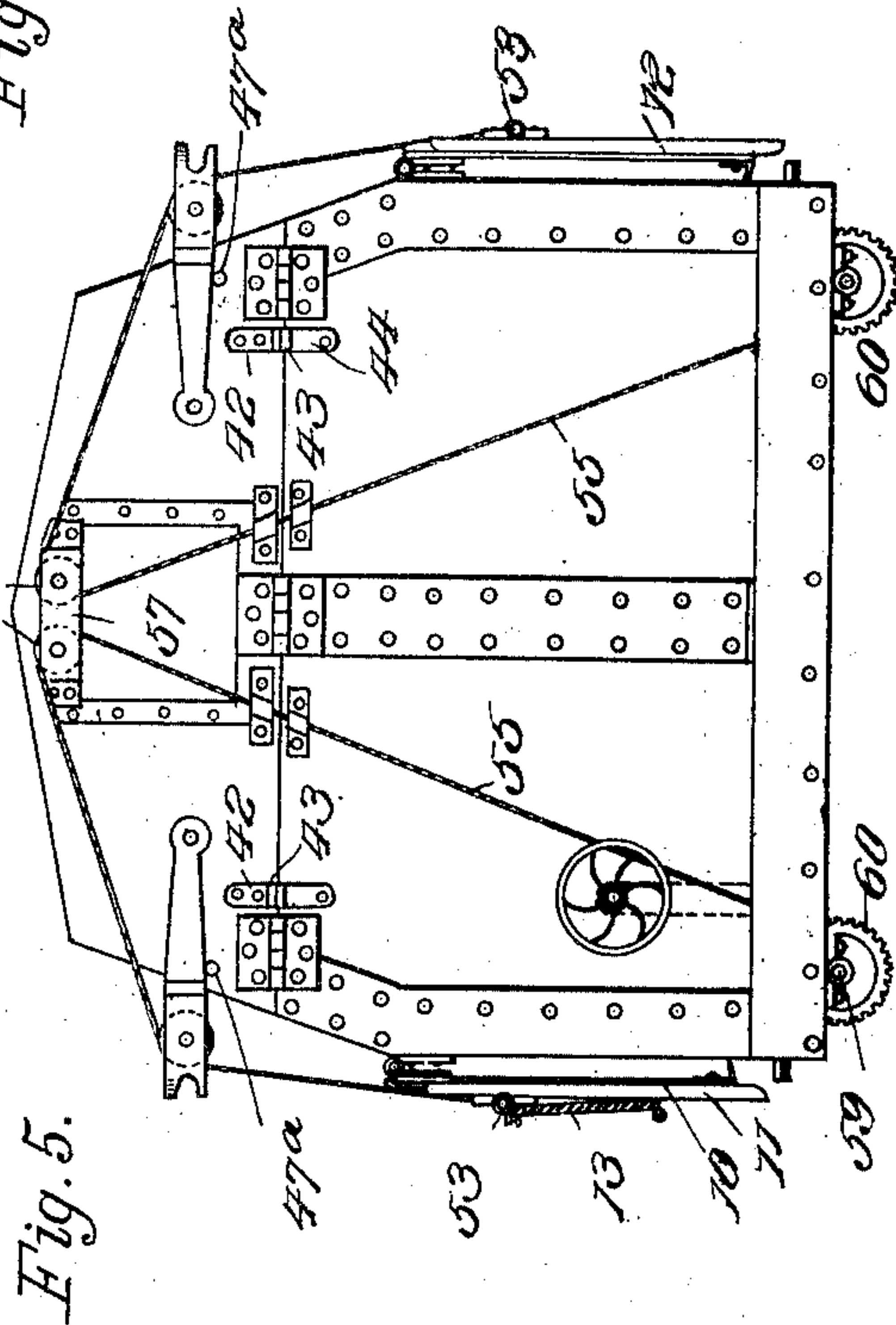
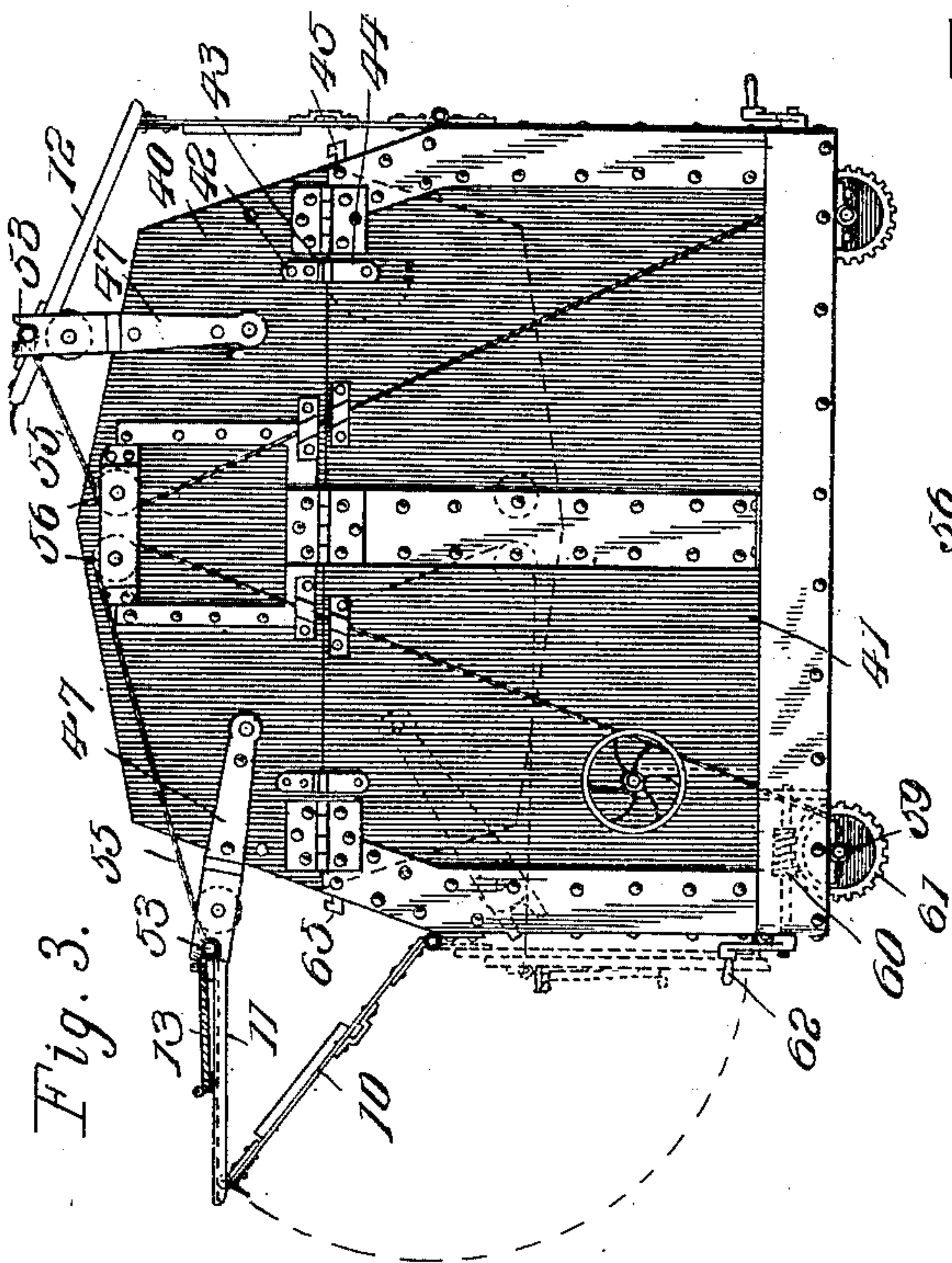
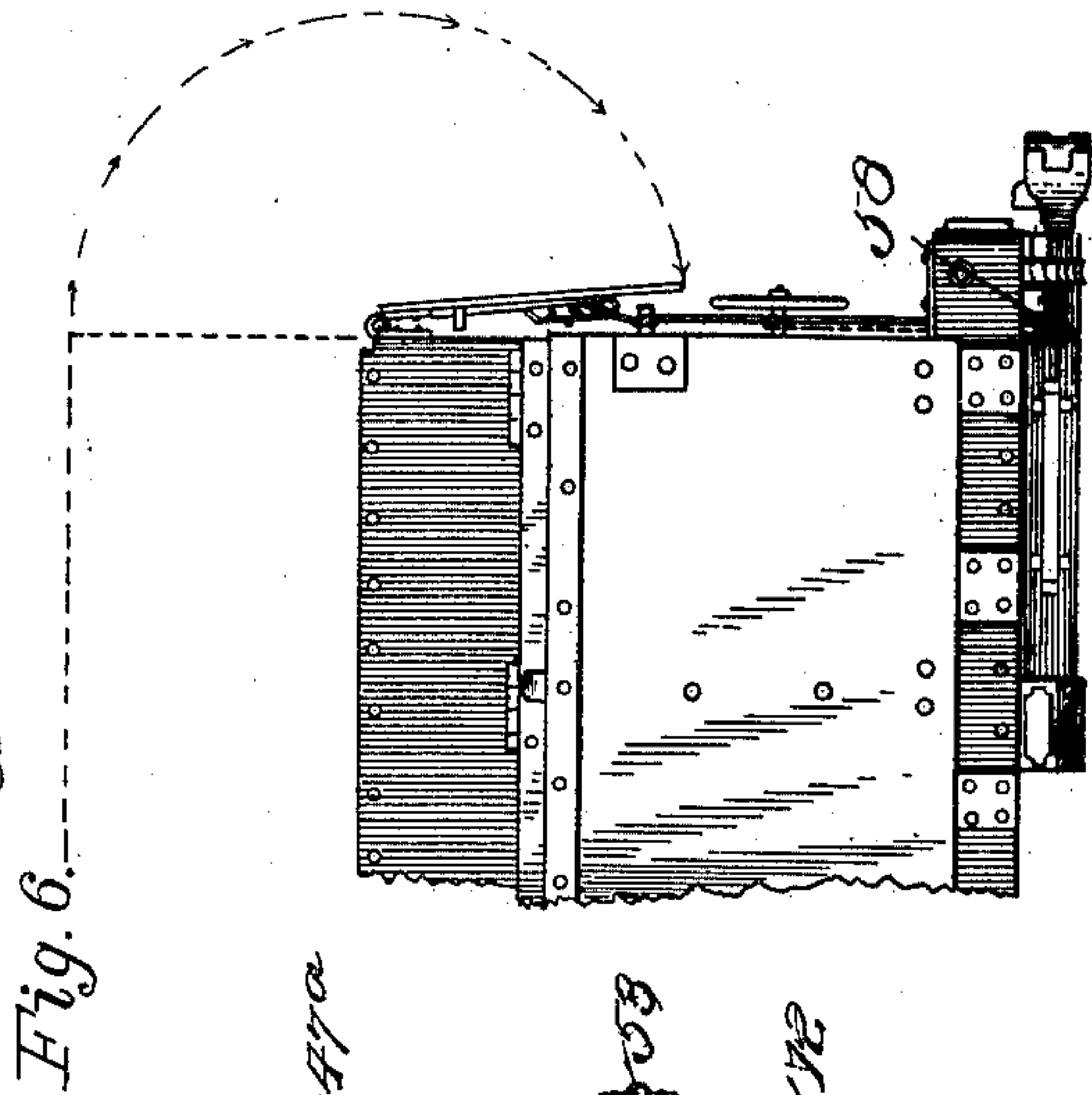
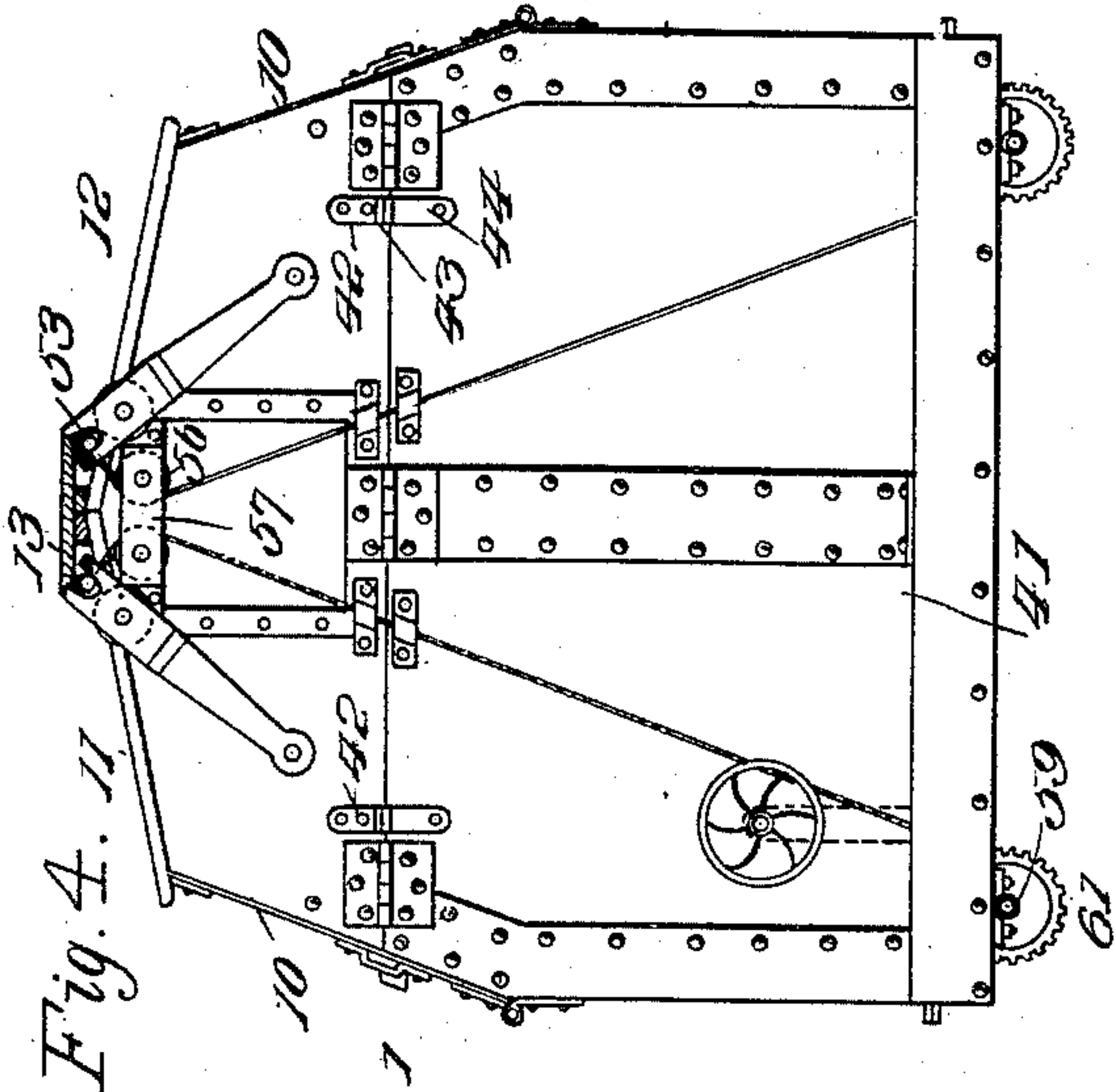
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3 Sheets—Sheet 2.



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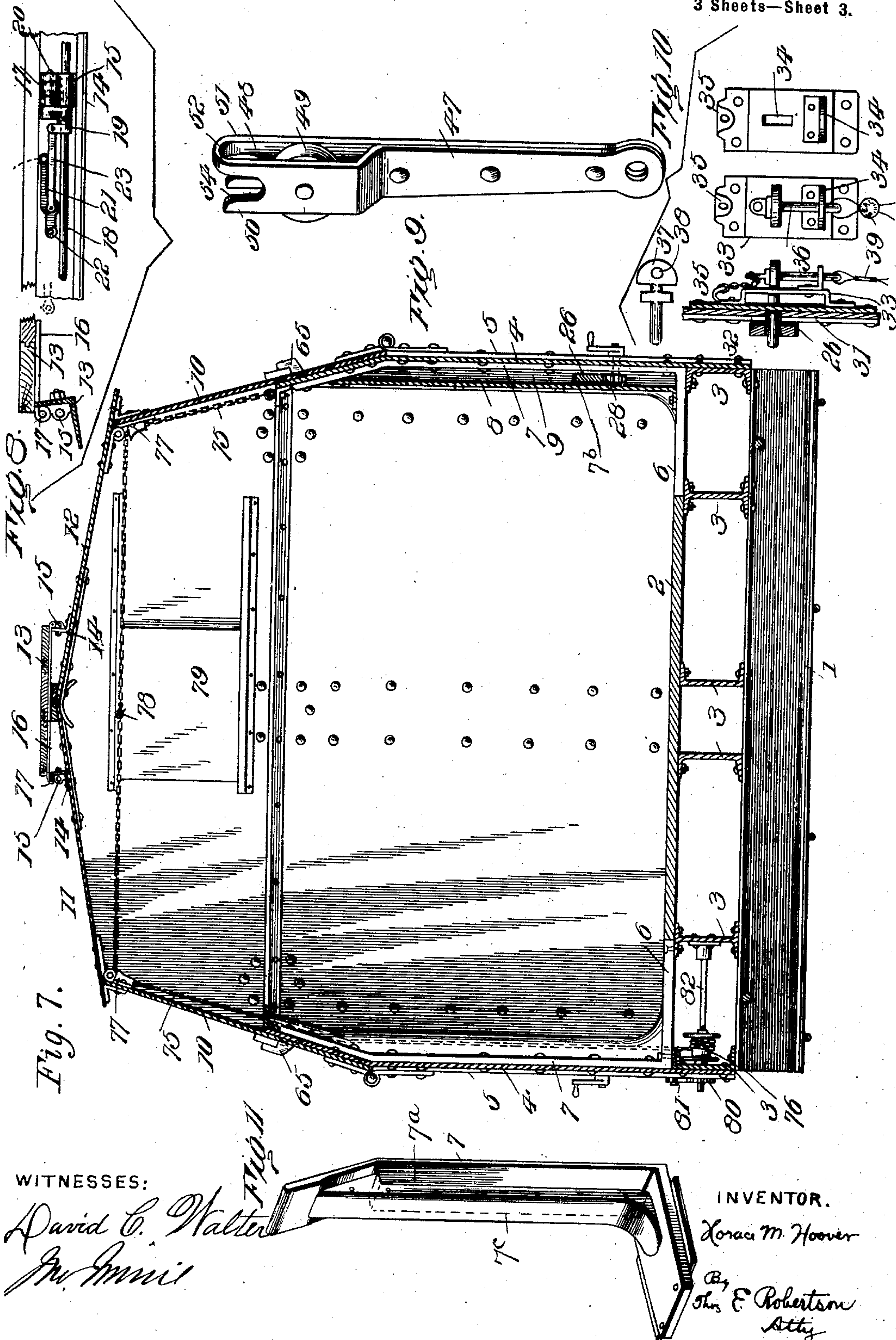
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RAILWAY CAR.

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(Application filed Sept. 4, 1901.)

(No Model.)

3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

HORACE M. HOOVER, OF PERRYSBURG, OHIO.

RAILWAY-CAR.

SPECIFICATION forming part of Letters Patent No. 711,163, dated October 14, 1902.

Application filed September 4, 1901. Serial No. 74,320. (No model.)

To all whom it may concern:

Be it known that I, HORACE M. HOOVER, a citizen of the United States of America, and a resident of Perrysburg, in the county of Wood and State of Ohio, have invented certain new and useful Improvements in Railway-Cars, of which the following is a specification.

The object of my invention is to provide a simple form of convertible railroad-car which may be easily and readily changed from an ordinary box-car into an open or gondola car, or vice versa; and the invention consists of a car of this character, as hereinafter more particularly described and then definitely set forth by the claims at the end hereof.

In the drawings accompanying this application, which show what I now consider the preferable, though not necessary, embodiment of my invention, Figure 1 is a side elevation of my improved car shown closed and with a part broken away to show the rack and pinion for opening the door. Fig. 2 is a similar view, but with one of the sides thrown open. Figs. 3, 4, and 5 are end elevations showing the sides of the car in the act of opening, entirely closed, and entirely open, respectively. Fig. 6 is a detail of the rear end of the car with the end also thrown open. Fig. 7 is a vertical transverse section through the line *xx* of Fig. 1. Fig. 8 is a detail of the running-board and its lock on an enlarged scale. Fig. 9 is a perspective view of the pivoted arm and its sheave used in opening and closing the sides of the car. Fig. 10 is a group of figures shown on a larger scale, representing the lock for the car-door; and Fig. 11 is a perspective view of one of the posts or standards forming part of the sides of the car.

Referring now to the details of the drawings by numerals, 1 indicates the usual or any form of cross-girders, and 2 the bottom of the car, between which are located a series of longitudinal sills 3, the outer and inner pairs of which are preferably of channel-iron and the intermediate ones I-beams.

To the outer channel-iron sills 3 are firmly riveted on each side of the car the outer side plates 4, as clearly shown in Fig. 7, and vertical reinforcing-plates 5 are securely riveted to the side plates 4 and also to the channel-iron sills 3. Where these reinforcing ver-

tical plates 5 occur, the floor is slotted, and fitting within these slots are the horizontal members 6 of the vertical posts or standards 7, which are riveted to the inner side of the side plates immediately opposite the vertical reinforcing strips or plates 5. The aforesaid horizontal member 6 of said posts or standards 7 are bolted or riveted to the inner I-beams 3, as well as to outer plates 4 and the outer channel-iron sills 3. It will thus be seen that these posts or standards firmly support and reinforce the outer plating. These posts or standards 7 are set about four feet apart on each side of the car, except at the doorway, where the space would be wider. These posts are all made similar to each other, except that two are slotted, as seen at 7^a in Fig. 11, through which slots the door slides, and there are two more that have short slots 7^b, as shown in Fig. 7, for the rack-bar 26, hereinafter described, to pass through. To prevent grain, coal, or any kind of merchandise from coming in contact with the door when shoved back in the slots in said posts or standards, I bolt or rivet a reinforcement or guard 8 of sheet iron or steel to the vertical web 7^c of said posts, which runs up far enough to intersect the outside plating 4 at the slant at the top end of post and above the door-slot.

To the upper ends of the vertical reinforcing-bars 5 are hinged the slanting upper parts 10 of the sides of the car, these slanting parts 10 being hinged or pivoted to the said bars 5, so that they may occupy the positions shown in Figs. 1, 4, and 7 and form a closed box-car or occupy the positions shown in Figs. 5 and 6 and provide an open gondola-car.

The top of the car is formed mainly of two parts 11 and 12, which are hinged or pivoted to the said slanting side parts 10, so as to fold thereon, as clearly shown in Figs. 3 and 5. The running-board 13 is connected to these parts 11 and 12 in any desirable manner; but I prefer the detachable fastening shown in Figs. 7 and 8 and which may be briefly described as follows: To each of the top parts 11 and 12 is secured a longitudinal angle-iron 14, on which are formed eyes 15. The running-board has a bottom 16 of metal, on the ends of which are also formed eyes 17. On each side there is a round rod 18,

running through the eyes 15, and for each set of eyes there is a bracket 19, which supports a short stud or pin 20, the bracket 19 being movable with the rod 18. An eccentric lever 21 is pivoted at 22 and is pivotally connected with the bracket 19 by means of a link 23. The construction is such that when the eccentric lever is thrown over to the point marked *o* in dotted lines in Fig. 8 the bracket 19, its rod 18, and the short stud 20 are all moved longitudinally, so as to disengage the stud 20 from the eyes 17 and allow the running-board 13 to be free on this side. It will of course be understood that there are three or four of these hinged attachments (though only one eccentric lever) on each side of the car and that while the running-board can be unfastened on each side I prefer to unfasten only one side and allow the running-board to swing on its hinge, (formed of the eyes 17 and stud 19,) as shown in Fig. 3.

On each side of the car there is left a larger space between the central two vertical reinforcing-plates 5, and the side of the car is cut away or left open between these center plates so as to leave a door-opening. The door is shown at 25 in Fig. 1 and is capable of sliding into the passage or opening 9, formed between the siding 4 and the inner plating 8. To strengthen the plating, the door-opening is bridged across, as seen at 25^a in Fig. 2. To properly move the door 25, I connect therewith a rack-bar 26, the outer end of which slides in a pocket formed by a recessed plate 27, riveted to the interior of the car, as clearly shown (mostly in dotted lines) in Fig. 1. This rack-bar 26 meshes with a pinion 28, fast on a spindle 29, on the outer end of which is a crank 30, so that by turning this crank the door 25 may be opened or closed. To lock the door in its closed position, I form an opening 31 (see Fig. 10) in the side of the car and a similar opening 32 in the rack-bar 26, these two openings 31 and 32 being in line with each other when the door is closed. On the outside over the opening 31 is riveted a sheet-metal hanger 33, which is provided with a vertical slot 34, the center of which is in line with the opening 31. A perforated angle-plate 34 is riveted to the hanger 33 under the slot 34 and the upper end of the hanger is bent over, as shown at 35, and forms a means of suspending a locking-pin 36. A locking-key or turning button 34 of the peculiar shape shown in Fig. 10 is inserted through the slot and the two openings 31 and 32, (when it is desired to lock the door,) and after it is in position it is turned at right angles and the locking-pin 36 inserted through the perforations 38 and through the perforated angle-iron 34, when it may be secured from fraudulent tampering by the usual seal 39. It will be evident that to open the door it will be necessary to first break the seal 39, lift the locking-pin out of its place, turn the turn-button or key 37 and remove

it, and then turn the crank 30 to rotate the pinion 28, and thereby move its rack-bar 26 and open the door 25.

I have hereinbefore stated that the top and slanting sides fold down on the side of the car in the manner illustrated in Fig. 3, and I will now proceed to describe the devices for drawing these parts in their closed positions. It may be best to first mention, however, that the ends of the cars are formed in two parts, the upper part 40 of each of which is hinged to the lower part 41, so as to be folded down into the position shown in Fig. 6. To hold this upper part 40 in its upward position while the sides are being placed in position, I rivet to the upper part 40 a fixed stop-plate 42, which has a stop 43 projecting therefrom at right angles thereto, and a swinging stop-plate 44 is connected to the lower part of the end of the car and also has a stop 45, which when the block is in the position shown in full lines in Fig. 3 coacts with the stop 43 and prevents the upper part of the end from falling rearward. When the pivoted blocks 44 (there are two on each end) are turned to the position shown in dotted lines on the right-hand side of Fig. 3, the stops 43 and 45 are separated, and hence the upper part of the end of the car can be lowered. Swinging on this upper part 40 are two sheave-carrying swinging lifting-bars 47, (shown in perspective detail in Fig. 9,) which are made of suitable stamped-out sheet metal doubled over onto itself, leaving a recess 48 at one end in which is journaled a sheave or pulley 49. These lifting-bars 47 are also formed with a forked end 50 and 51, one part, 50, of which is open and the opposite part, 51, looped over at 52 to form a closed end for a purpose to be described. A lug or stud 53 projects from each end of each of the parts of the roof 11 and 12, and when the parts are in the position shown in Fig. 4 these lugs fit in the opening or notch 54 between the forked ends 50 and 51. A chain or its equivalent 55 is also connected to each of these lugs or studs 53, and these chains lead from their respective lugs or studs through the loops 52 and over the pulleys or sheaves 49 of the swinging lifting-bar 47, thence over pulleys 56, (carried in a plate or hanger 57,) and thence to drums 58, (see Figs. 1, 2, and 6,) fixed on shafts 59, the movements of which are controlled by a worm and worm-wheel 60 and 61, which may be operated by a crank 62. (See Fig. 3.) One of these drums 58 is keyed to each end of the shafts 58, so that both drums of one shaft move together, the shafts running the full length of the car. If it is preferred, the worm 60 and its shaft may be vertically disposed, so that the crank 62 will be under the car, where it will be out of the way. In order to lock the sides in the position shown in Figs. 1, 4, and 7, I rigidly connect hooked brackets 65 (seen best in Figs. 3 and 7) to the stationary sides of the car, and when the movable

sides 10 are closed the hooked brackets 65 pass through openings in the movable sides. To engage these hooked brackets 65, I slid-
 5 ingly secure latches 66 in brackets or hangers 67, which latches are capable of being moved longitudinally and engaging the hooked brackets 65, and thus lock the movable sides 10 in their closed positions. To readily op-
 10 erate these sliding latches 66, I pivot a lever 68 to each latch and have one of its ends slot-
 15 ted at 69 to engage a stud 70, (fixed to the side 10,) which acts as a fulcrum for the lever 68. The free end of this operating-lever has a pivoted link 71, which has a slotted end
 20 adapted to engage a staple 72, to which it may be secured by a pin or cotter or sealed in the usual manner, as seen at 73. One of these latches and its operating-levers is shown in the unlocked position at the left-hand side
 25 of Fig. 1 and in the locked position at the right hand of said figure.

While it is not absolutely necessary to sup-
 30 plement the lock just described to prevent the roof from sagging, I prefer to use the
 35 chains 75, (shown in Fig. 7,) and these chains run from drums 76 (see Fig. 7) up through pockets, past the brackets or guides 77, and are hooked together at the center, as seen at
 40 78, a sliding door 79 being provided in the end, through which these chains may be hooked if it is necessary to do this after the car is loaded. In order to hold these chains
 45 75 tight, I provide ratchet-wheels 80 and pawls 81 on the spindles 82, which carry the drums 76 on which the chains are wound. The
 50 outer ends of the spindle 82 are made square, so that they may be engaged and turned by a crank.

The operation of changing the car from an
 40 open gondola-car to a closed box-car is as fol-
 45 lows: Supposing the car to be open, so as to act as a gondola-car, (see Fig. 6,) the ends 40 are first turned up, as shown in Fig. 5, and locked in this position by swinging the stop-
 50 plates 44 to the position shown in said Fig. 5. The swinging lifting-bars 47 will occupy the position shown in Fig. 5, being kept from fall-
 55 ing by the stops 47^a. The operator now turns the crank 62, which winds the chains on the drums 58 through the medium of the worm 60 and worm-wheel 61, and the winding of the chains 55 pulls or swings the tops 10 and 11
 60 upward until the lugs or studs 53 slip into the notches 54 in the swinging lifting-bars 47. As the chains pass over the sheaves or pul-
 65 leys 49 in these lifting-bars and are held in contact with said pulleys by the loops 51 the continued winding of the chains coacting with the looped ends of the swinging lifting-bars
 guides the tops into the closed position. (Shown in Fig. 4.) As the parts assume the closed positions the sides 10 shut over the hooked brackets 65, and the operator there-
 fore now swings or slides the latches 66 by means of the operating-levers, and the sides
 will be locked in position. The running-

board 13 is now swung over the joint where the tops or roofs 11 and 12 meet, and the op-
 erator moves the eccentric lever 21, (see Fig. 8,) so as to cause the stud 20 to pass into the
 70 ears 17 and lock the running-board in posi-
 tion. The chains 75 may now be hooked and tightened, when the car will be completely closed. It will of course be evident that to
 75 convert the car into an open one it is merely
 necessary to go through the reverse of the movements just described.

In the drawings accompanying this appli-
 cation I have illustrated what I now consider the preferable embodiment of my invention, 80
 and it will be manifest that changes and al-
 terations may be made without departing from my invention, and I therefore intend the appended claims to cover any and all
 85 modifications and changes that naturally fall
 within the scope of my invention.

What I claim as new is—

1. In a car, a stationary side, an upper mov-
 ing side hinged thereto, and a roof-section
 90 connected to said moving side, in combina-
 tion with a swinging lifting-bar pivoted to the end of the car and coacting with said hinged parts, a pulley supported on the car, and a chain connected with one of the moving sec-
 95 tions, and passing over said pulley, and co-
 acting with said swinging lifting-bar, where-
 by the hinged sections may be moved in po-
 sition, substantially as described.

2. In a car, a stationary side, an upper mov-
 ing side hinged thereto, and a roof-section 100
 hinged to said moving side, in combination
 with a swinging lifting-bar pivoted to the end of the car and coacting with said hinged parts, a pulley supported by said lifting-bar, a pul-
 105 ley supported on the car, and a chain con-
 nected with one of the moving sections and passing over each of said pulleys, whereby the hinged sections may be drawn into place, substantially as described.

3. In a car, a stationary side, an upper mov- 110
 ing side hinged thereto, and a roof-section
 hinged to said moving side, in combination
 with a swinging lifting-bar pivoted to the end of the car and coacting with said hinged parts, a chain suitably supported and arranged to 115
 draw the hinged sections in place, and means
 for winding said chain, substantially as de-
 scribed.

4. In a car, a stationary side, an upper mov-
 ing side hinged thereto, and a roof-section 120
 hinged to said moving side, in combination
 with a swinging lifting-bar pivoted to the end of the car and coacting with said hinged parts, a chain suitably supported and arranged to
 125 draw the hinged sections in place, and means
 for winding said chain comprising a drum
 and a worm-wheel for operating the drum,
 substantially as described.

5. In a car, a stationary side, an upper side
 and a roof-section hinged to the said station- 130
 ary side and arranged to fold down against
 the same, and a movable end, in combination

with a swinging lifting-bar pivoted to the said movable end and coacting with said hinged parts, a chain suitably supported and arranged to draw the hinged sections in place, and means for winding said chain, substantially as described.

6. In a car, a stationary side, an upper side and a roof-section hinged to the said stationary side and arranged to fold down against the same, and a movable end, in combination with a swinging lifting-bar pivoted to the said movable end and coacting with said hinged parts, a chain suitably supported by said lifting-bar and arranged to draw the hinged sections in place, and means for winding said chain, substantially as described.

7. In a car, a stationary side, an upper moving side and a roof-section hinged to said stationary side, means for operating said upper moving side and the roof-section, and a running-board connected with said roof-section and arranged to fold against the same, substantially as described.

8. In a car, stationary sides, an upper moving side and a roof-section hinged to each of said stationary sides, means for drawing the same in place, and a running-board connected with one of said roof-sections and arranged to fold against the same, and means for detachably connecting said running-board with the opposing roof-section, substantially as described.

9. In a car, a stationary part having a locking-bracket projecting therefrom, and an upper movable side hinged to said stationary part and arranged to fold against it; the movable side having an opening therein through which said locking-bracket projects, whereby the locking-bracket is projected through said opening as the movable side is swung or moved in position, substantially as described.

10. In a car, a stationary part having a locking-bracket projecting therefrom, and an upper movable side hinged to said stationary part and arranged to fold against it; the movable side having an opening therein through which said locking-bracket is projected as said movable side is swung or placed in position, and means coacting with said locking-bracket for locking said movable section thereto, substantially as described.

11. In a car, a stationary side having a locking-bracket projecting therefrom, an upper movable side hinged to said stationary side and arranged to coact with said locking-bracket, and a sliding latch coacting with said locking-bracket, substantially as described.

12. In a car, a stationary side having a locking-bracket projecting therefrom, an upper movable side hinged to said stationary side and arranged to coact with said locking-bracket, a sliding latch arranged to coact with said bracket and a pivoted lever for swinging said sliding latch, substantially as described.

13. In a car, a side formed of an outer siding and vertical posts having openings there-

in, an inner siding secured thereto forming a pocket, and a door sliding in the pocket formed between said inner and outer sidings and also through the openings in said posts, substantially as described.

14. In a car, a stationary side formed of an outer siding, an inner wall forming a pocket between it and said outer siding, a door sliding in said pocket, and an upper movable side hinged to said siding, substantially as described.

15. In a car, a side formed of an outer siding, vertical posts having openings therein, a sliding door having a rack projecting therefrom and passing through the openings in said posts, and a pinion for operating said rack, thereby moving the door, substantially as described.

16. In a car, a side formed of an outer siding and vertical posts having openings therein, inner siding forming a pocket between it and the outer siding, a door sliding in said pocket and having a rack projecting therefrom and passing through the openings in said posts, and a pinion for operating said rack, thereby moving the door, substantially as described.

17. In a car, stationary sides, a movable side and roof-section hinged to each of said stationary sides and uniting at the top, a chain running under the car for holding said sections in place and means under the car for winding said chain, substantially as described.

18. In a car, stationary sides, a movable side and roof-section hinged to each of said stationary sides and uniting at the top, a chain running under the car for holding said sections in place, and means under the car for winding said chain comprising a drum and a ratchet and pawl for holding said drum, substantially as described.

19. In a car, and in combination with moving sides thereof, a swinging lifting-bar carrying a pulley and having means for preventing the operating means from disengaging said lifting-bar, substantially as described.

20. In a car, and in combination with the moving sides thereof, a swinging lifting-bar and a chain coacting therewith, a pulley carried by said lifting-bar, and means as the loop for preventing the chain from slipping away from said lifting-bar, substantially as described.

21. In a car, a side formed of an outer section or siding and a metallic post or standard formed of one piece and having an opening therein through which a door may slide, substantially as described.

22. In a car, a side formed of an outer section or siding, a metallic post or standard formed of one piece and having an opening therein through which the door may slide, and plating forming an opening for the door to slide in, substantially as described.

23. In a car, a side formed of outer plating,
and vertical posts, a sliding door having a
rack projecting therefrom, a recessed plate
27 connected with said siding, and forming a
5 pocket for said rack, and a pinion for oper-
ating the rack and thereby moving the door,
substantially as described.

Signed by me at Toledo, Lucas county,
Ohio, this 21st day of August, 1901,

HORACE M. HOOVER.

Witnesses:

P. J. BETTINGER,
CHAS. SACO.