

No. 693,218.

Patented Feb. 11, 1902.

A. B. BELLOWS.
STEEL CAR.

(Application filed Mar. 28, 1900.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 2.

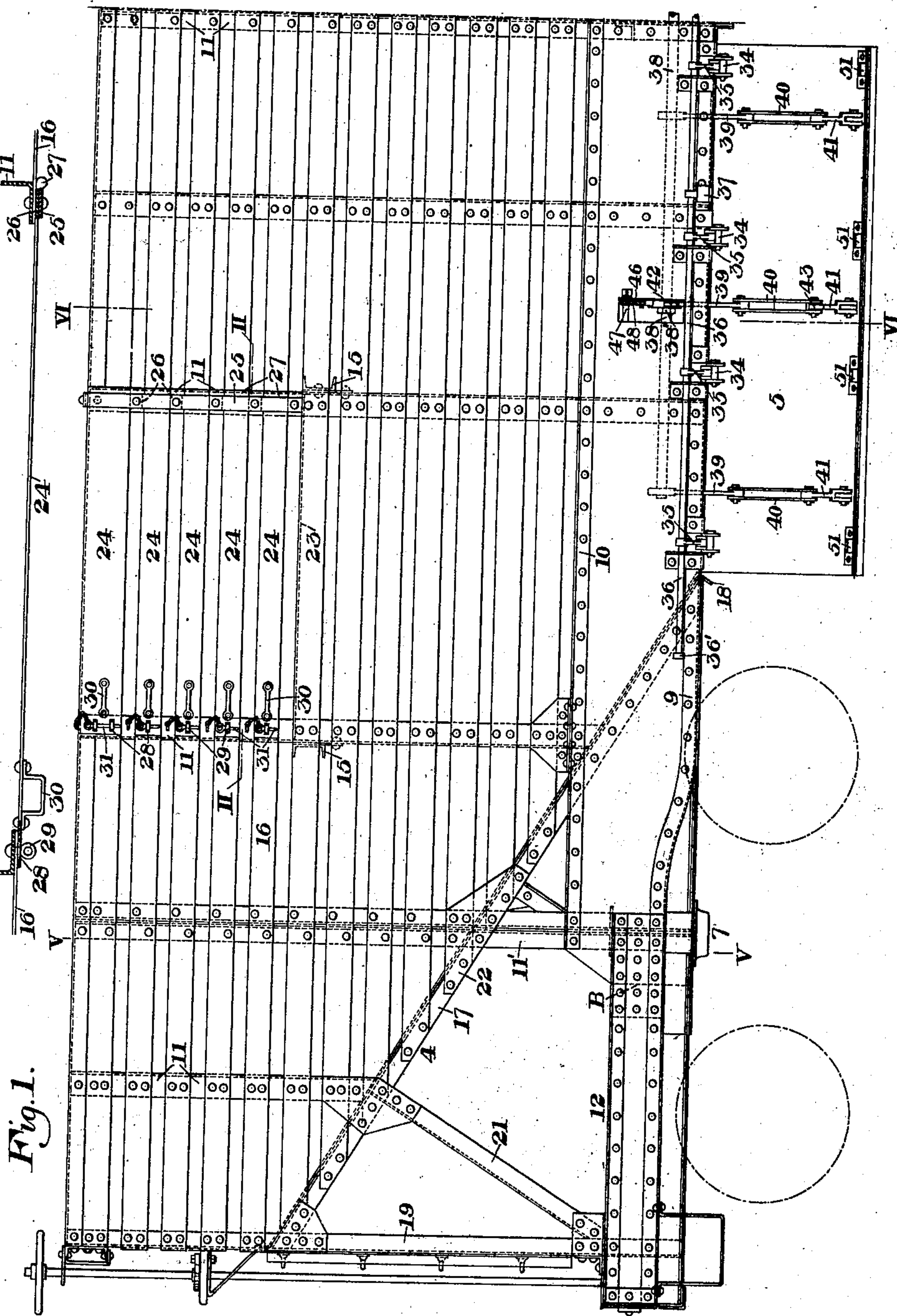


Fig. 1.

WITNESSES

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No. 693,218.

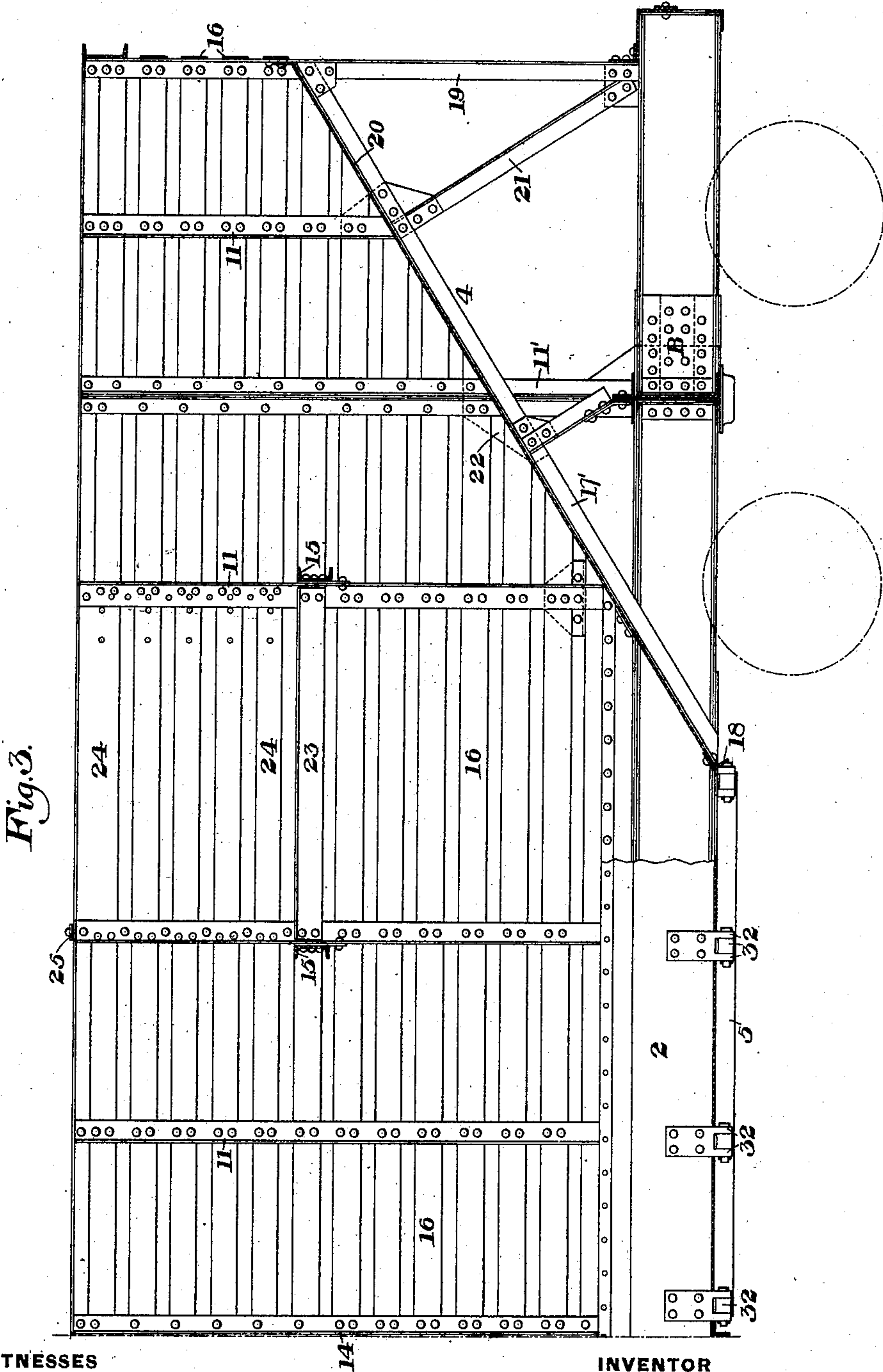
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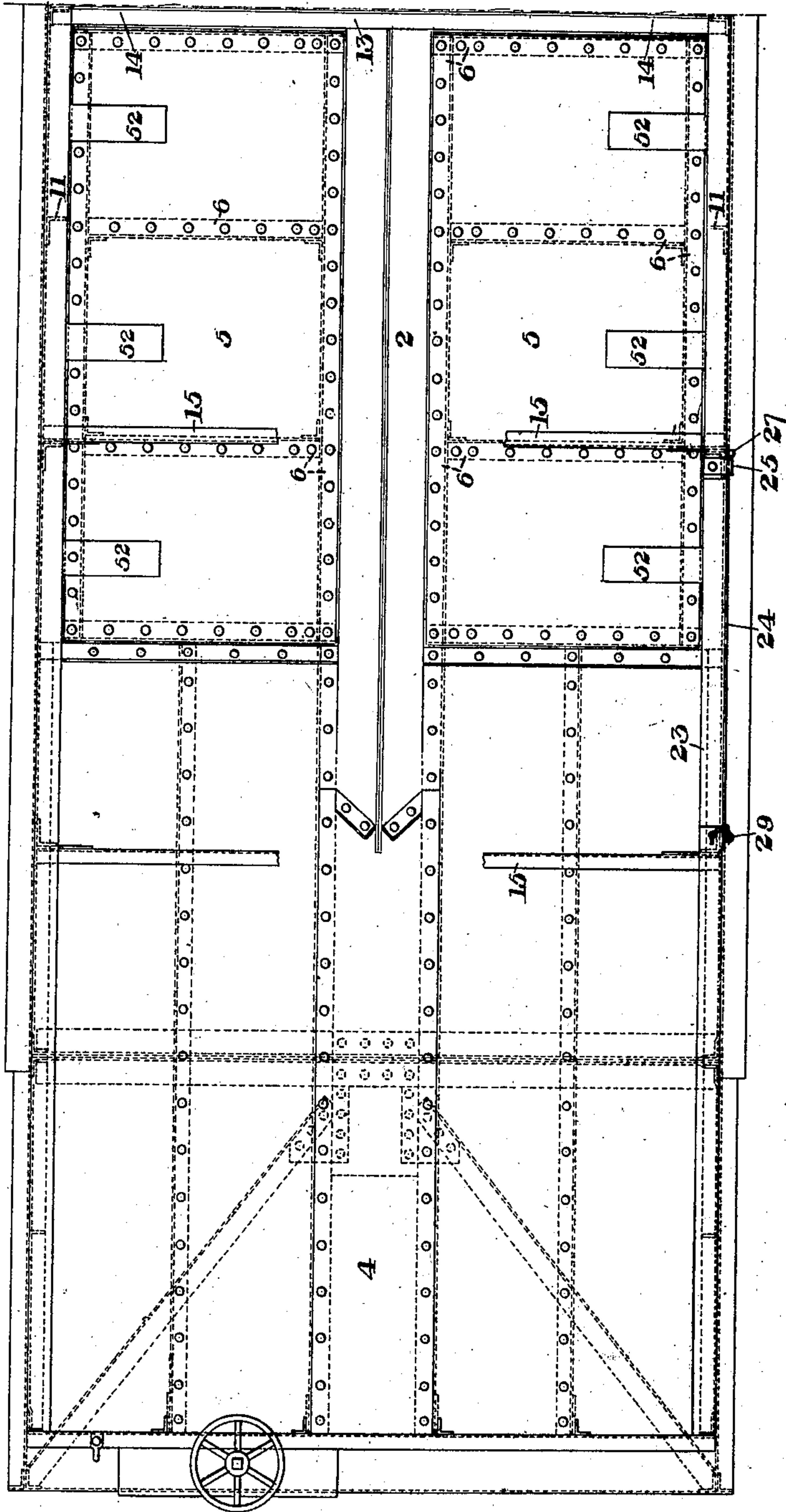
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Fig. 4.



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Fig. 6.

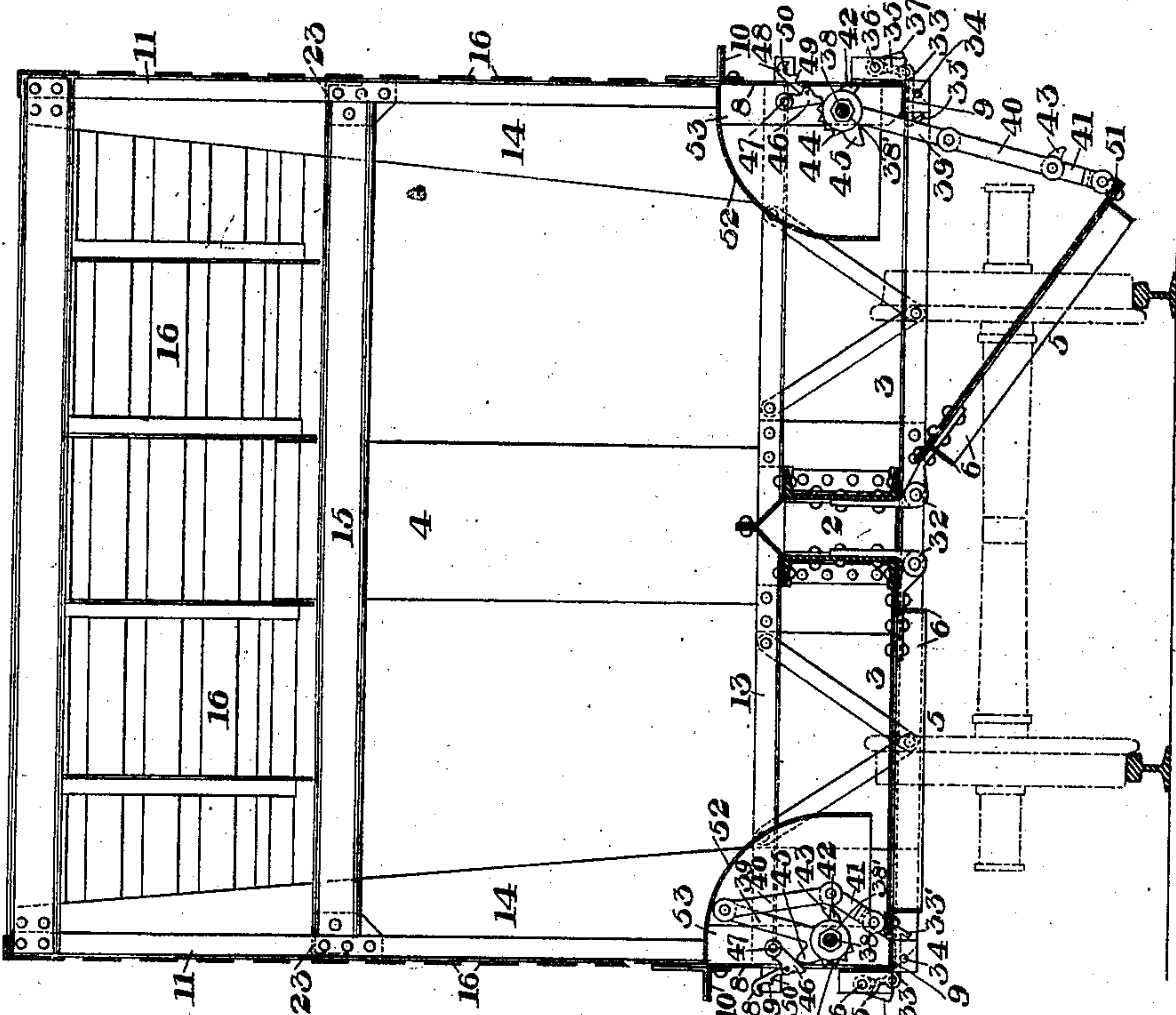
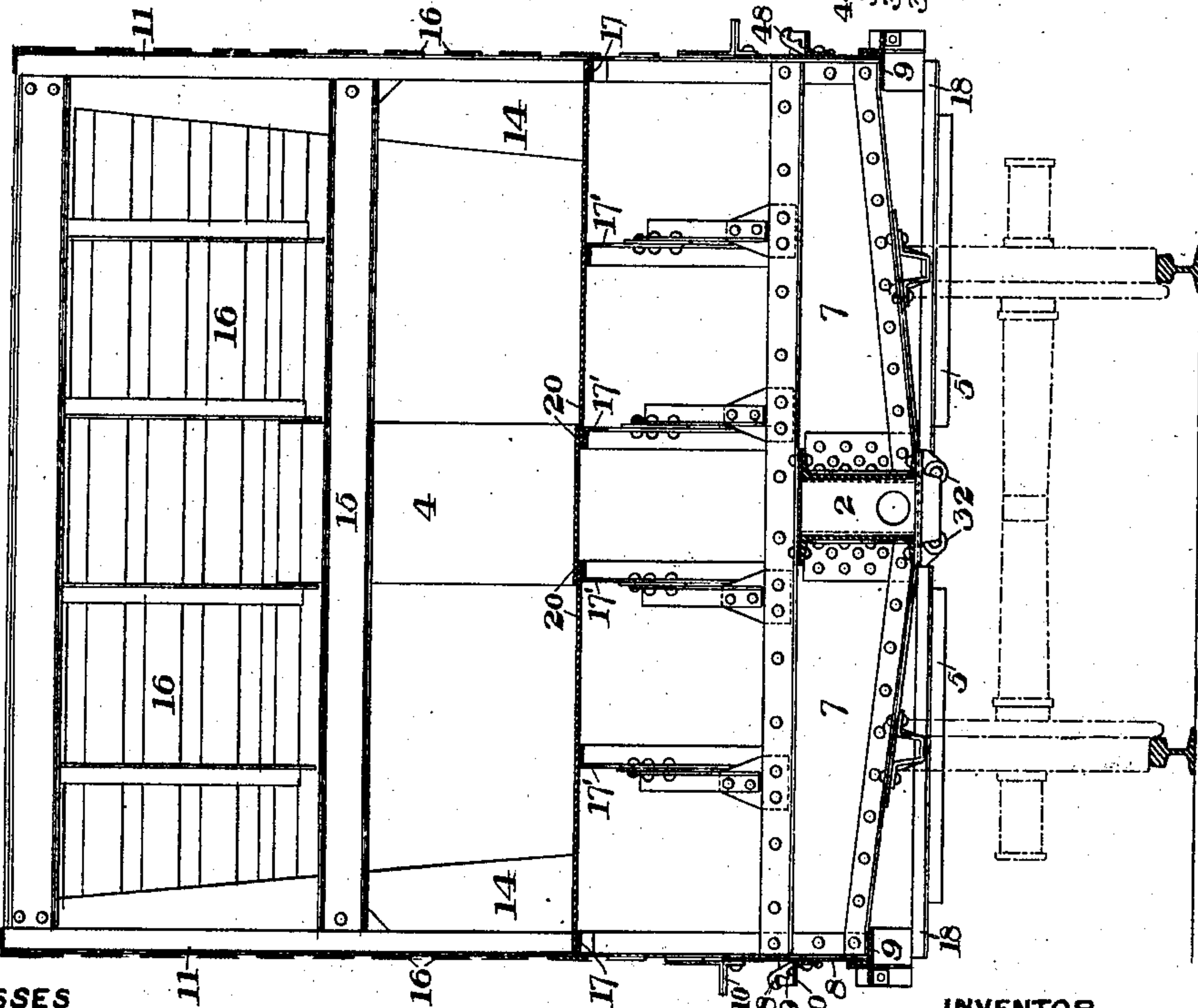


Fig. 5.



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STEEL CAR.

SPECIFICATION forming part of Letters Patent No. 693,218, dated February 11, 1902.

Application filed March 28, 1900. Serial No. 10,467. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR B. BELLOWS, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Steel Cars, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

10 Figure 1 is a side elevation of the left-hand half of a steel car constructed in accordance with my invention, the car being designed specially for use in carrying coke, though the novel features of my invention may be applied to cars of all kinds. Fig. 2 is an enlarged horizontal section on the line II II of Fig. 1, showing the door-opening closed by the slats. Fig. 3 is a longitudinal section of the right-hand half of the car. Fig. 4 is a plan view of the left-hand half of the same. Fig. 5 is a vertical section on the line V V of Fig. 1. Fig. 6 is a vertical section on the line VI VI of Fig. 1, showing the doors in their open and closed positions.

25 In the drawings, 2 represents the center sill of the car, which may be composed of metal beams of suitable cross-section, and extends lengthwise of the car from end to end, not, however, as in prior constructions, below the level of the car-floor, but above the level thereof, the car-floor 3 being arranged at the level of the lower part of the sill structure, so as to utilize for load-carrying purposes the vertical space between the top and bottom of the sill, which heretofore has not been employed, except in the form of pockets. The floor 3 between the inclines 4 4 at the end portions of the car is substantially flat throughout and is constituted by drop-doors 5, made of metal plates suitably strengthened by angle-pieces or other flanged sections 6. The doors are hinged on longitudinal axes either at the inner ends next to the center sill, as shown in the drawings, or at their outer ends at the sides of the car. They constitute the entire floor of the car below the inclined end and extend laterally from the sides of the sill to the outer vertical portion of the car. When they are hinged next to the sill, the load will be discharged outside of the rails of the track, and where they are hinged at the outer edges the doors when dropped will discharge the

load between the rails; but in either case the construction is preferably such that when the doors are dropped the entire bottom of the car between the inclines, except the space occupied by the center sill, is opened for the discharge of the load. I describe below the means which I prefer to employ for closing the doors and for locking them.

60 Instead of employing side sills I make the sides of my car of plate-girders, by which I mean metal plates having one or more flanged metal pieces at the top and bottom edges. These plate-girders extend from one body-bolster 7 to the other, and each is constituted by a plate or web portion 8 and marginal flanged pieces 9 10, the vertical portions of the latter being set against the outer side of the plate 8 and riveted thereto, as shown in Fig. 6, thus leaving the inner side of the plate plain and unbroken by projections and affording a smooth surface against which upright stiffening-pieces may be placed and riveted without crimping or otherwise bending them. These stiffening-pieces 11 are made of flanged metal, preferably angles, T's, or channels, which may be continued vertically above the line of the plate-girders, as shown in the drawings, so as to constitute the uprights of the superstructure of the car. They are thus made to serve a double purpose. The plate-girders may be reversed and the stakes placed on the outer sides; but in such case the vertical portions of the marginal flanged sections are applied to the inner side of the plate-girder.

The center sill and plate-girders are preferably made sectional—that is to say, divided at each end at a point between the body-bolster and the end of the car—and spliced, as at B, the splicing, which is sufficiently illustrated in Fig. 3, being effected by suitable flanged sections and rivets. The object is that in case the car should be injured at the end by collision the damaged end sections of the sill and plate-girders may be detached and replaced with relatively small cost as compared with cutting out and replacing the entire sill, as in prior car constructions, or replacing the entire plate-girders. Within the scope of my broader claims I may, however, make the sill or the plate-girders, or both, continuous throughout their length. For economy of construction I preferably form

plate-girders of less depth from the body-bolster outwardly than between the body-bolster, as shown at 12 in Fig. 1.

To brace the car transversely, I employ a needle-beam 13, extending from the plate-girder on one side of the car to the plate-girder at the other side, and gusset-plates 14, which extend in the plane of the needle-beam vertically along the stakes 11 at that plane. The other stakes of the superstructure are also connected by a suitable number of cross-braces 15, and the superstructure itself when the car is to be used for carrying coke, &c., is made up of metal slats 16, which extend lengthwise of the car and are riveted to the stakes.

The inclined ends 4 of the bottom of the car and superstructure are preferably constituted as follows: Flanged beams 17, preferably angles, extend at the desired inclination upwardly and outwardly from the plate-girders to the webs 8, to which they are riveted, and a suitable number of intermediate flanged beams 17' are arranged in the same inclined plane, the outer beams 17 being secured at their lower ends to a cross-floor angle 18 and at their upper ends to the upright stakes 19 at the ends of the car. Floor-plates 20 are riveted to the angles 17 17' and constitute the inclined floor, and to brace this structure I may employ supporting-braces 21, composed, preferably, of angled sections. The stakes 11', which rise from the body-bolster at the sides of the car, are preferably of double strength, as shown, and the several plates are preferably secured to the floor-angles by attachment-plates 22.

In order to constitute a door or doors in the latticed superstructure of the car, I employ belt-rails 23, made, preferably, of flanged section and extending between the cross-braces 15, being, therefore, equal in length to the door-spaces, or the pieces 23 may extend the entire length of the car or any portion of its length. These pieces 15 and 23 constitute strong frames for supporting gang-planks, on which barrows carrying the load of the car may be wheeled through the door-opening. They also serve as strengthening members. The doors are constituted by metal slats 24, which may be of simple slat form or of flanged section. They are arranged to slide independently in a horizontal direction between one of the stakes 11 and a cleat 25, which is riveted to the stake through spacing-blocks 26, interposed between the slats, or the stake and cleat may be otherwise spaced in such manner as to provide openings through which the slats may be slid horizontally and so as to retain the slats in position. The rear ends of the movable slats 24 are provided with stop-shoulders 27, which may be formed by bending the ends of the slats, and at their other ends they are formed with slots 28, adapted to fit over staples or eyes 29 on the adjacent vertical stake 11. Each slat may also have a handle-piece 30, by which it may

be moved lengthwise and which also serves as a stop to prevent it from being slid back beyond the cleat 25, and thus detached from the car. In Fig. 2 I show the door-opening closed by the slats 24, the staples 29 passing through the slots 28 and being held by bolts 31. To open the door, the bolts are withdrawn, the slats pulled out slightly to free them from the staples, and then slid back lengthwise. When so opened, they leave an unobstructed door-opening and do not project or interfere with the loading or unloading of the car.

I shall now describe the construction and the mode of raising and fastening the doors.

In Fig. 6 I show the doors 5 connected by hinged plates 32 at the ends next to the center sill 2. Each door when closed, as shown in Fig. 6, is upheld in horizontal position by a sliding latch 33, supported on a bar 34 and adapted to be moved inwardly under the door by a link 35 on a shaft 36, the shaft being provided with counterweights 37, which tend to force the latch inwardly. To raise the door, I employ shafts 38, preferably one for each door, having a lever-arm 39, connected by links 40 and 41 to the door, and I provide the lever 39 with a lug or projection 42, adapted to engage a lug 43 on the link 41 and to give the final raising movement to the door. The lever 39 is also provided with ratchet-teeth 44 and with a cam 45.

46 is a pawl which is pivoted at 47, and 48 is a catch connected with the pawl and having a hook portion 49, adapted to uphold it on a pin 50 when the door is closed, as in Fig. 6.

The door has, preferably, three sets of lifting-links applied to the shaft 38; but only one of them, preferably the middle set, is provided with the ratchet-teeth, lugs, and pawl.

Suppose the doors to be closed. To drop the doors, the operator applies a wrench to the squared end 36' of the shaft 36 and turns the same far enough to retract the latches 33. A single shaft 36 will operate the bolts of all the doors on one side of the car. Thereupon the doors, being unsupported, drop into the inclined position shown in Fig. 6 and discharge the contents of the car. The doors are preferably raised separately. When it is desired to raise one of them, the operator applies a wrench to the squared end 38' of the shaft 38. Before turning the shaft 38, however, he raises the catch 48, which for this purpose projects through a slot in the web 8 and disengages it from the pin 50, permitting it to drop into engagement with the ratchet-teeth 44. He then turns the shaft by a succession of short motions, and in the intervals the pawl 46 prevents the door from dropping back. As the door reaches a horizontal position the cam 45 raises the pawl and causes the catch 48 to engage the pin 50, and the lugs 42 and 43 coming into engagement impart to the door its final lift, bringing it into horizontal position, whereupon the latch 33, which has been pushed back momentarily by en-

gagement of its beveled end 33' with a projection 51 on the edge of the door, springs forward automatically under the door and upholds it. By thus supporting the door from beneath I hold it securely, so that even if the raising mechanism be broken or put out of order the door will not drop. To shield the raising mechanism from the contents of the car, I prefer to provide for each of the sets of links and levers a protecting-hood 52. To strengthen the plate-girders and to afford a support for the shafts 38, I prefer also to rivet angle-pieces 53 to the plate-girders at the sides of the slots through which the catches project.

It will be understood that within the scope of my claims many changes may be made in the form and construction of the parts. For example, the superstructure above described may be varied or in some cases omitted, since

What I claim is—

1. A steel car having a central longitudinal sill, plate-girder sides extending above the bottom, vertical strengthening members for said sides extending above the same and serving as stakes, and a superstructure connected thereto; substantially as described.

2. A car having a longitudinal sill with a sectional end spliced to the body of the sill at a point between the body-bolster and its end; substantially as described.

3. A car having at the side a plate-girder with an end portion detachably fixed to the body of the plate-girder at a point between the body-bolster and the end; substantially as described.

4. A car having at its side a plate-girder, the marginal flanged sections being applied thereto with the attached portions on one face of the girder, and a strengthening-piece fixed to the other face of the girder and extending beyond the upper flanged section; substantially as described.

5. A car having in its superstructure cross-braces, and belt-rails extending between the same, constituting a supporting-frame; substantially as described.

6. A car having a door composed of sliding slats, slideways at one of the vertical stakes of the car between which the slats may slide, and fastening devices on a stake at the position of the end of the slats when closed; substantially as described.

7. A car having a door composed of sliding slats, slideways at one of the vertical stakes

of the car between which the slats may slide, and fastening devices on a stake at the position of the other end of the slats when closed, said slats having handles at one end, and stop-shoulders at the other end; substantially as described.

8. In a drop-door for cars, the combination with a lifting-lever, a ratchet and pawl, means for disengaging the ratchet when the door is closed, and an upholding-latch; substantially as described.

9. A drop-door for cars, in combination with a lifting shaft or crank, a ratchet and pawl, means arranged to disengage the pawl when the door is closed, and a fastening device or latch for the door; substantially as described.

10. A drop-door for cars, in combination with a lifting shaft or crank, a ratchet and pawl, means arranged to disengage the pawl when the door is closed, a fastening device or latch for the door, and means for upholding the pawl; substantially as described.

11. A car having a flat bottom for at least a portion of its length, a series of horizontal doors in said flat bottom, a series of lifting-levers and links for said doors, and a series of hoods on the interior of the car arranged to protect the said mechanism; substantially as described.

12. A steel car having a center sill and substantially vertical sides, and a plurality of doors arranged on each side of the sill extending from the edge of the sill to the outer vertical side of the car and constituting throughout their length the entire horizontal floor of the car, said doors being hinged on axes extending lengthwise of the car, and lifting mechanism engaging the outer end portions of the doors; substantially as described.

13. A car having a longitudinal center sill, a plurality of doors arranged on each side of the sill and constituting throughout their length the entire longitudinal floor of the car, and a lifting-shaft above the level of the door when closed, said shaft being located in the lower outer portion of the car-body, and connected to the outer end portions of the doors, substantially as described.

In testimony whereof I have hereunto set my hand.

ARTHUR B. BELLOWS.

Witnesses:

G. I. HOLDSHIP,

H. M. CORWIN.