No. 776,149. PATENTED NOV. 29, 1904.

G. E. SIMONTON.

COAL, ORE, OR BALLAST CAR.

APPLICATION FILED JUNE 2, 1903.

NO MODEL. 4 SHEETS—SHEET 1.

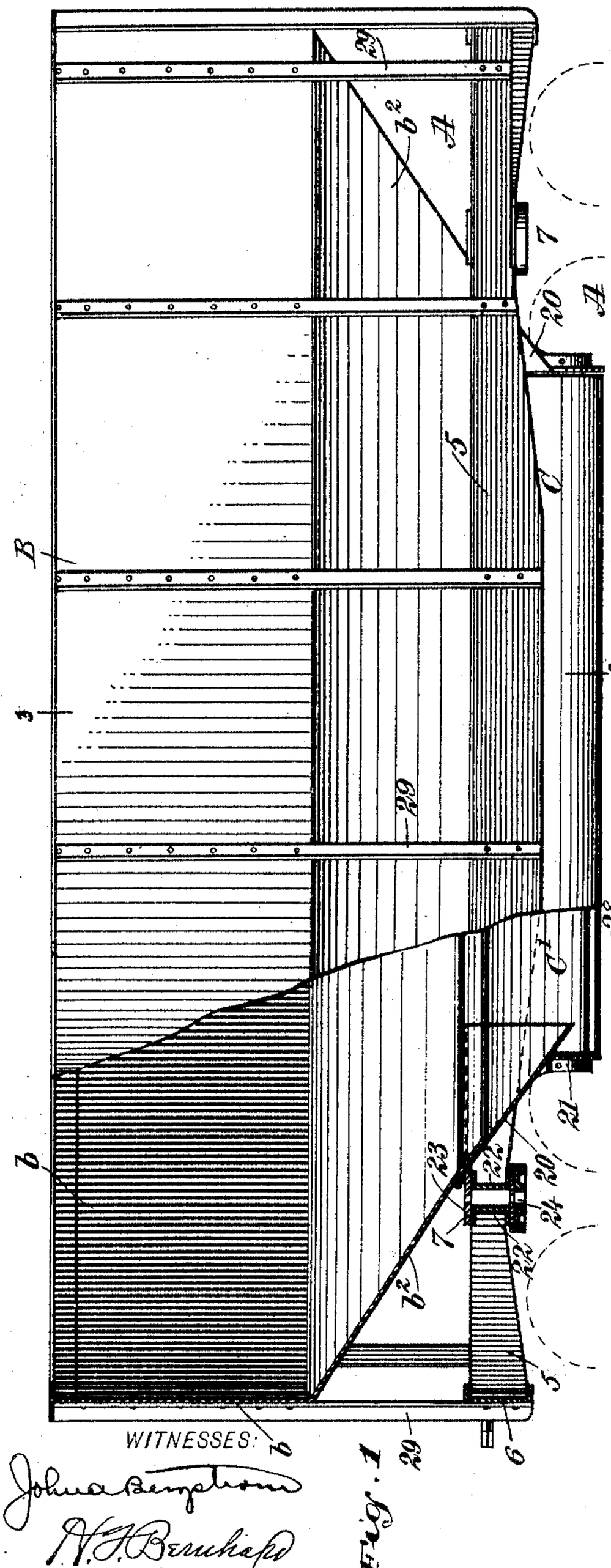

Fig. 1.

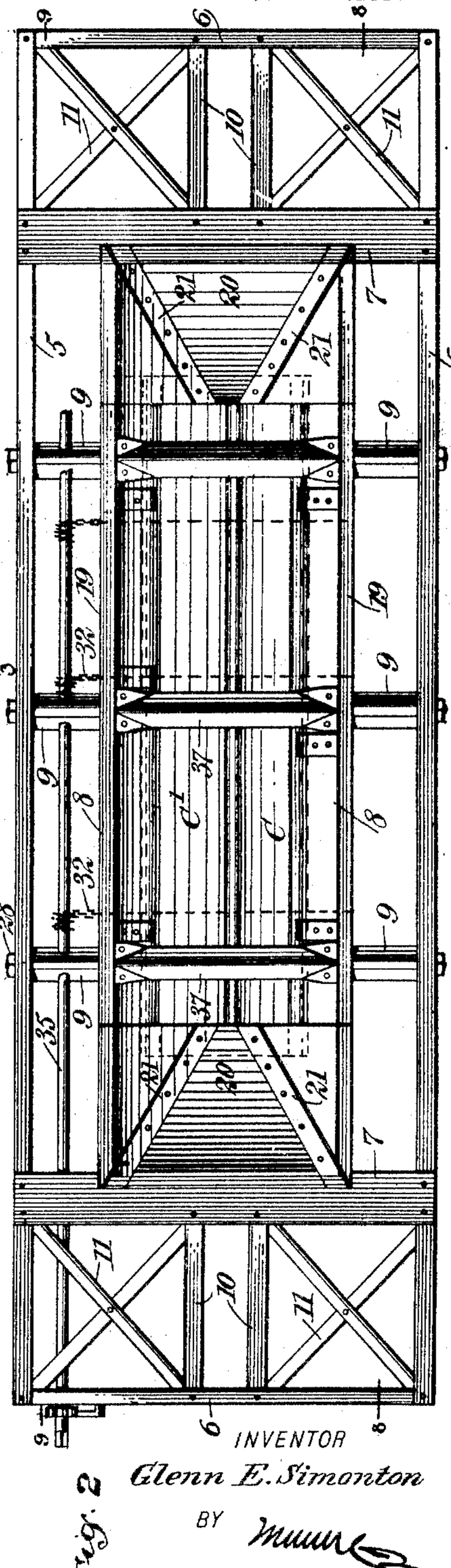

Fig. 2.

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NO MODEL. 4 SHEETS—SHEET 2.

Fig. 3

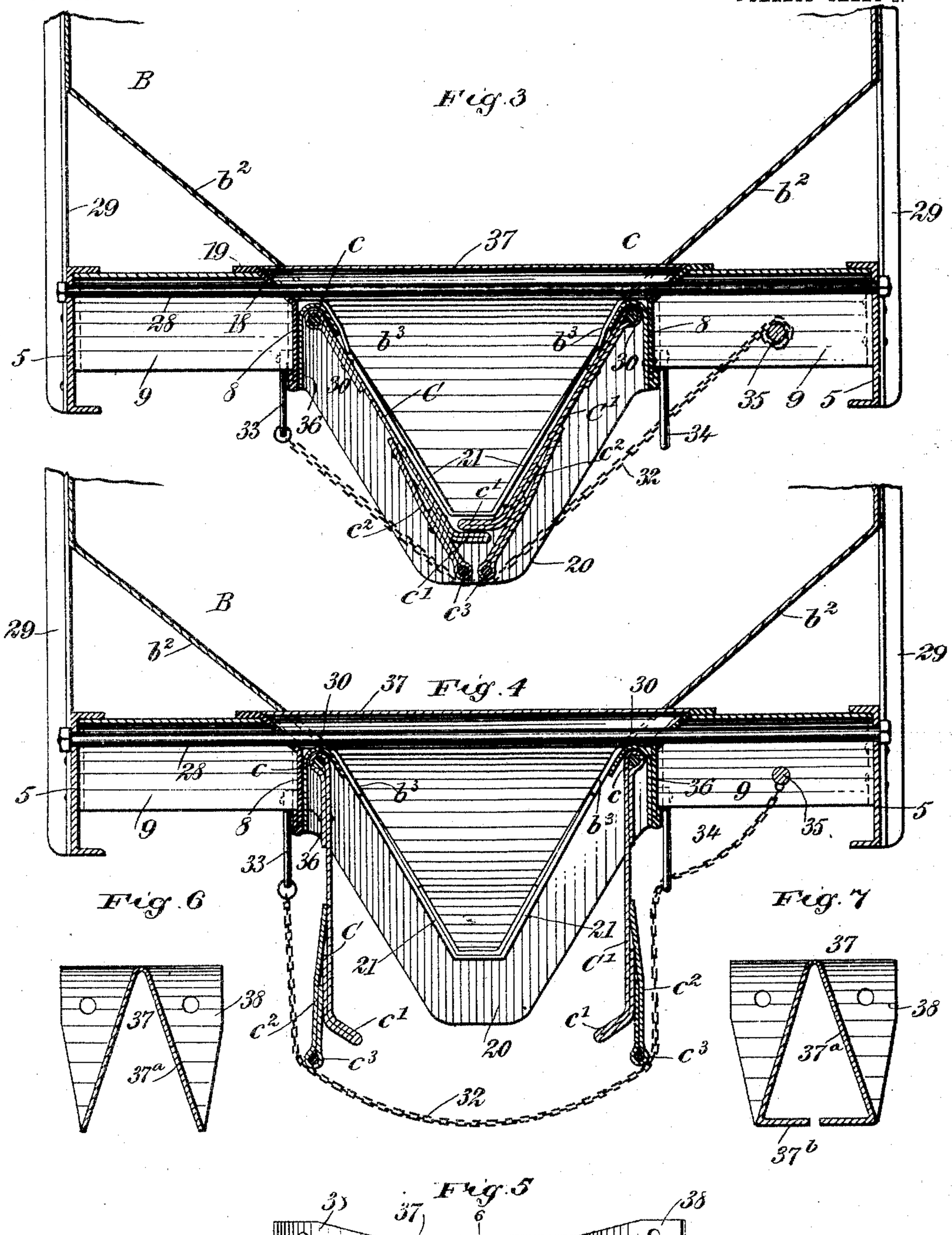
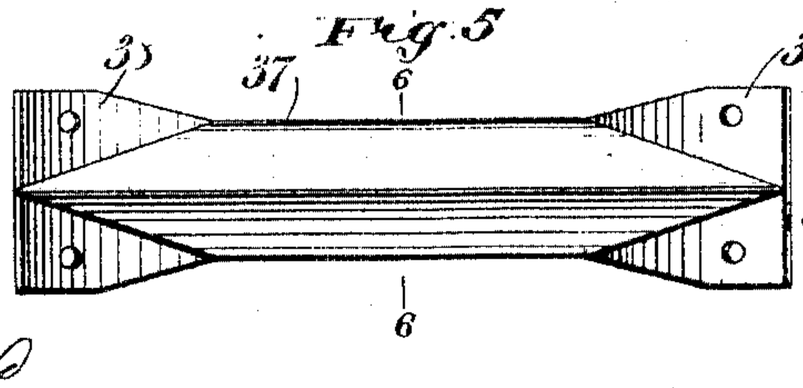


Fig. 4

Fig. 6

Fig. 7

Fig. 5



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NO MODEL. 4 SHEETS—SHEET 3.

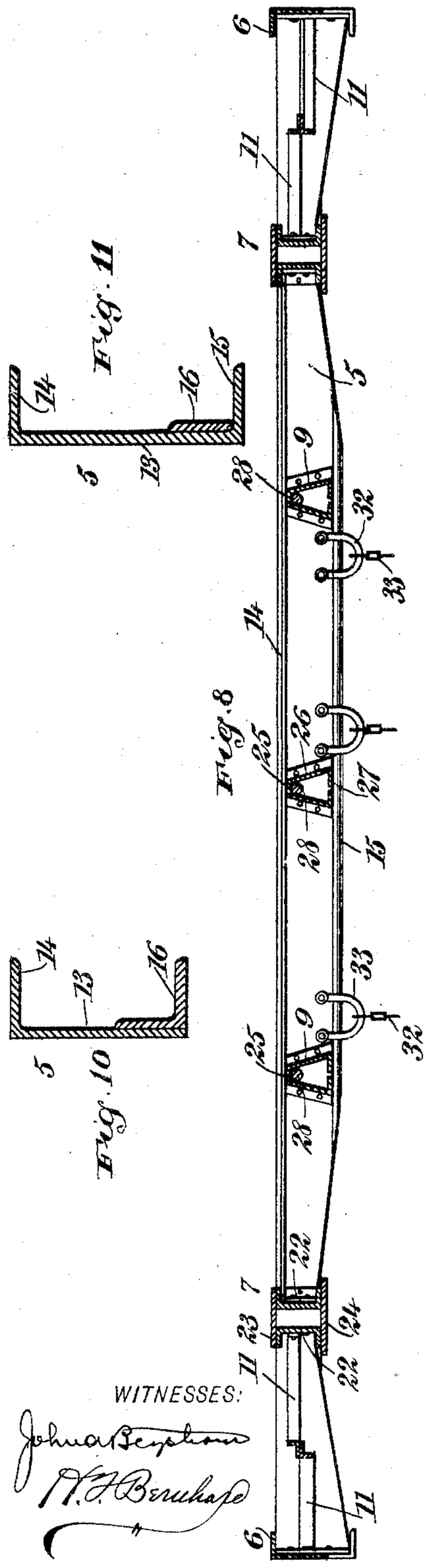

Fig. 11

Fig. 8

Fig. 10

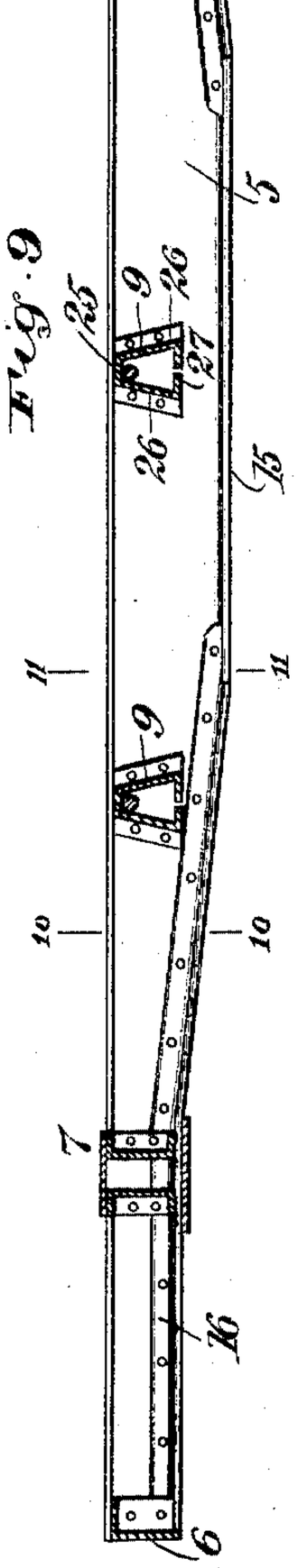

Fig. 9

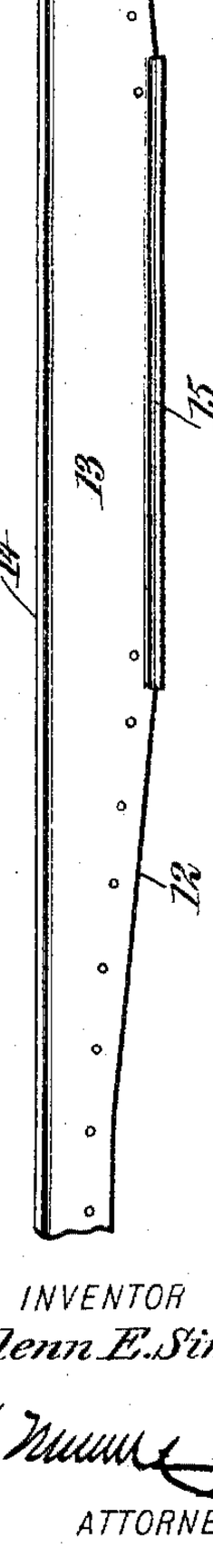

Fig. 12

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G. E. SIMONTON.

COAL, ORE, OR BALLAST CAR.

APPLICATION FILED JUNE 2, 1903.

NO MODEL. 4 SHEETS—SHEET 4.

Fig. 13

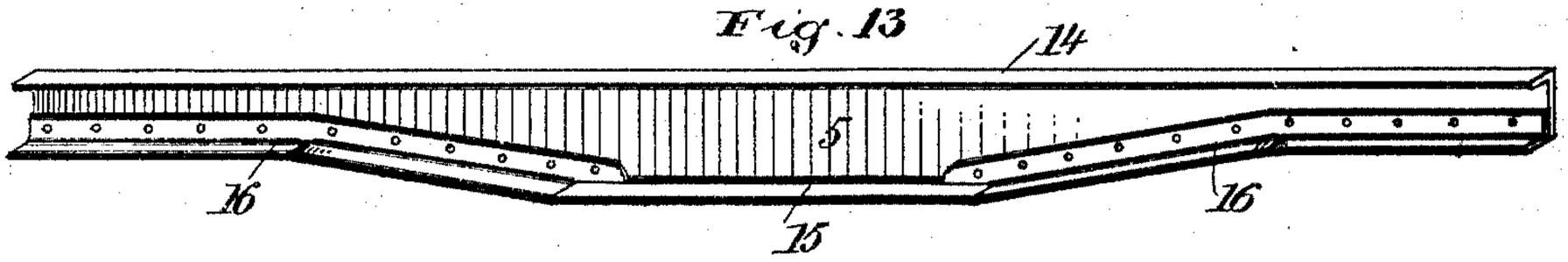


Fig. 14

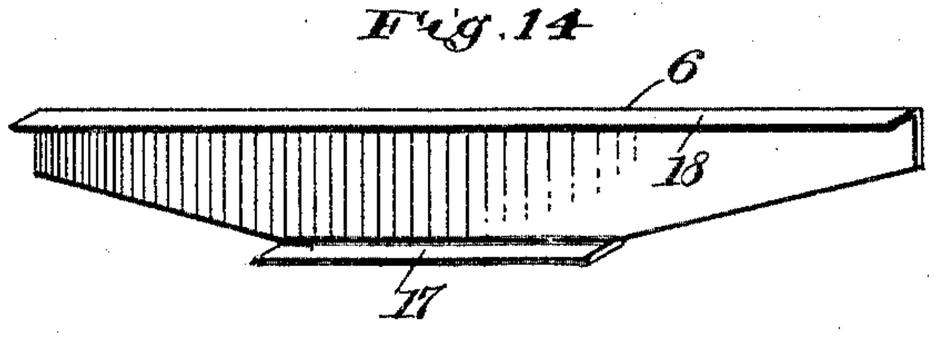


Fig. 15

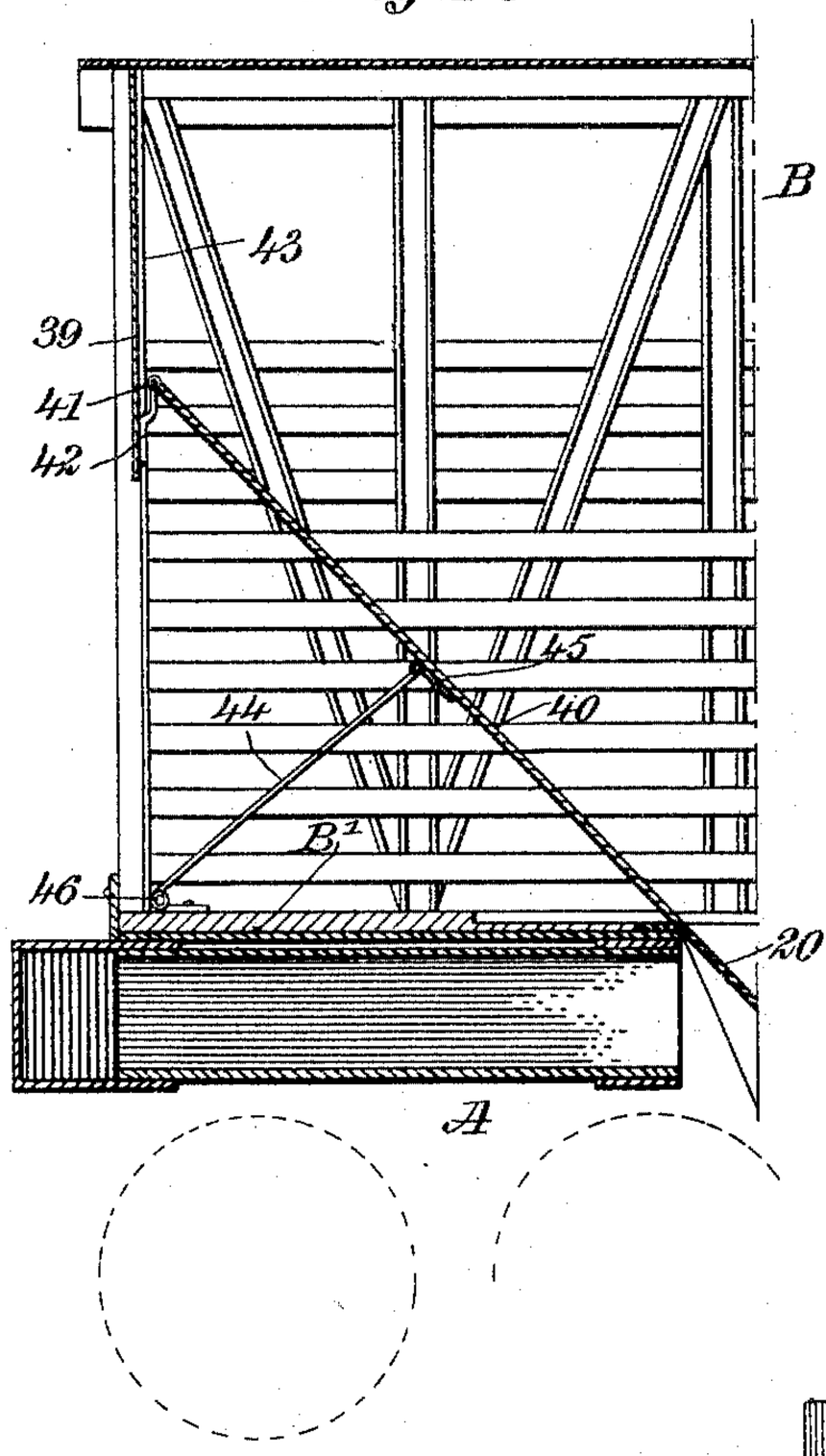


Fig. 16

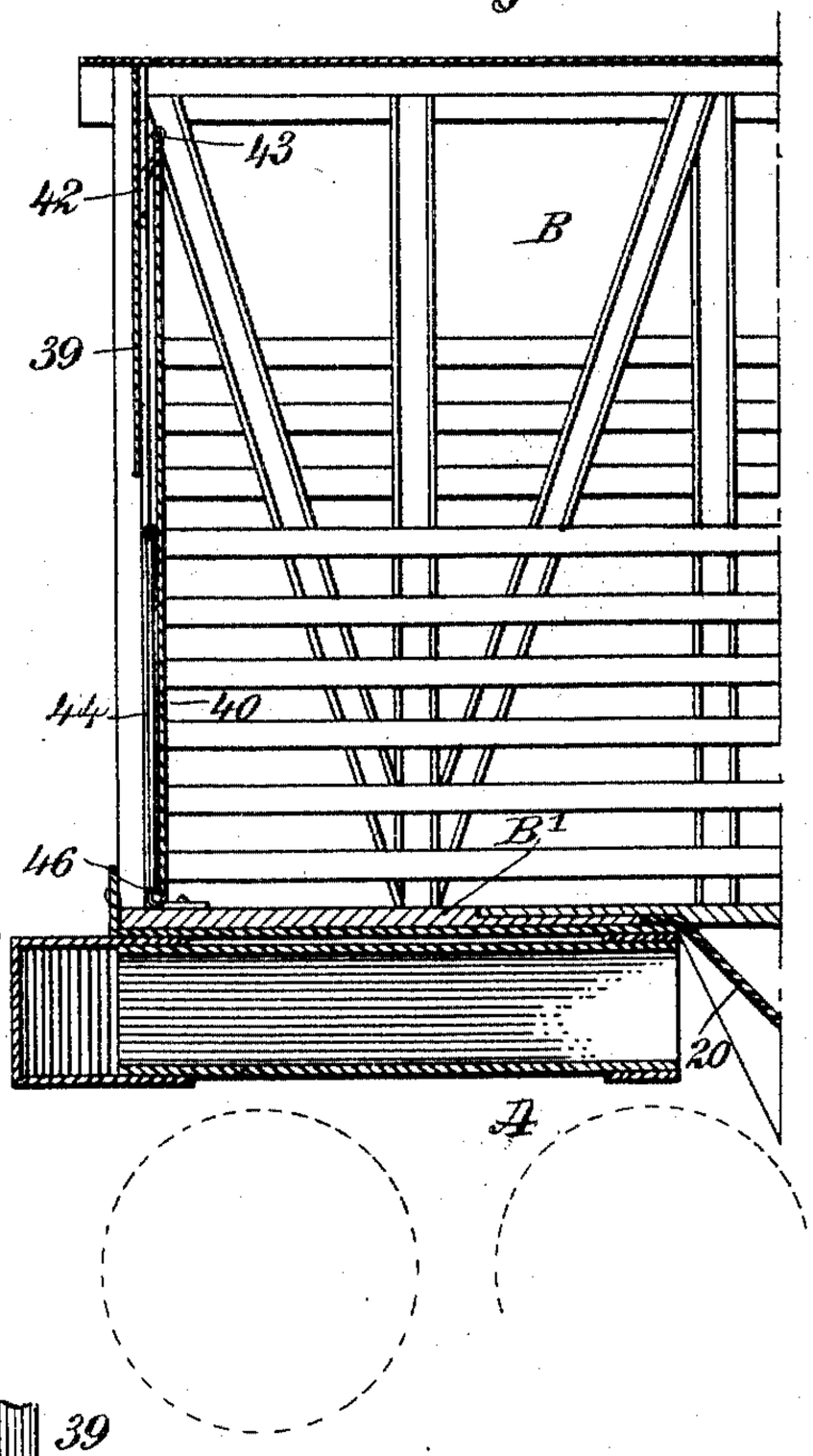
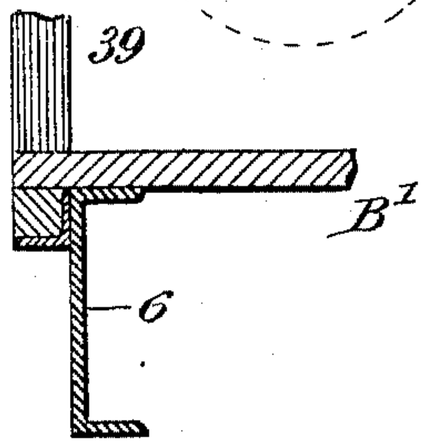


Fig. 17



WITNESSES:

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No. 776,149. Patented November 29, 1904.

UNITED STATES PATENT OFFICE.

GLENN E. SIMONTON, OF VANWERT, OHIO.

COAL, ORE, OR BALLAST CAR.

SPECIFICATION forming part of Letters Patent No. 776,149, dated November 29, 1904.

Application filed June 2, 1903. Serial No. 159,825. (No model.)

To all whom it may concern:

Be it known that I, GLENN E. SIMONTON, a citizen of the United States, and a resident of Vanwert, in the county of Vanwert and State of Ohio, have invented new and useful Improvements in Coal, Ore, or Ballast Cars, of which the following is a full, clear, and exact description.

My invention relates to improvements in metallic freight-cars, the same being especially adapted for the transportation of dumpable material—such as coal, ore, and ballast—although it may be employed for other classes of dumpable substances.

In some of its features the car of the present invention is similar to the metallic cars disclosed by prior applications for Letters Patent filed August 15, 1902, and March 12, 1903, for dumping box-car and combination stock, coal, and coke car, respectively, said applications bearing serial numbers 119,793 and 147,415, respectively, the former now bearing the patent number 734,939.

One of the improvements of the present invention is a metallic underframing which may be used in connection with any style of car.

Another improvement resides in an improved construction of the hopper-doors by which the material may be discharged in the middle of the track, this being especially desirable when unloading ballast, said hopper-doors being constructed for mutual engagement, so as to effectually close the doors.

A further object is to provide an improved cross-tie for the hopper-opening, said tie being secured permanently in position out of the path of the hopper-doors and presenting sloping surfaces which afford no lodgment for the material.

Another improvement resides in an improved form of false end or partition adapted to be adjusted to two positions, in one of which the partition serves as a permanent end for closing an open end portion of the car.

Further objects and advantages of the invention will appear in the course of the subjoined description, and the novelty will be defined by the annexed claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation, partly in section, of a metallic freight-car constructed in accordance with the present invention. Fig. 2 is a detail plan view of the metallic underframing of the present invention. Fig. 3 is an enlarged vertical transverse sectional elevation through the lower portion of the improved car, illustrating the hopper-doors in their closed positions, the plane of the section being indicated by the dotted line 3 3 of Fig. 1. Fig. 4 is a transverse section similar to Fig. 3, showing the hopper-doors in their open positions. Fig. 5 is a detail plan view of one form of the cross-tie adapted for use in connection with the hopper-opening. Fig. 6 is a transverse section on the line 6 6 of Fig. 5. Fig. 7 is a cross-section of another form of the cross-tie adapted for use in the hopper-opening. Figs. 8 and 9 are longitudinal sectional elevations on the lines 8 8 and 9 9, respectively, of Fig. 2. Figs. 10 and 11 are enlarged cross-sections through a side sill of the metallic underframing, taken in the planes of the dotted lines 10 10 and 11 11, respectively, of Fig. 9. Fig. 12 is a perspective view of one of the side sills looking at the outside thereof. Fig. 13 is a similar perspective view of the side sills shown by Fig. 12 looking at the inner side thereof. Fig. 14 is a detail perspective view of one of the end sills of the underframing. Fig. 15 is a vertical longitudinal sectional elevation taken through an end portion of a stock or box car, illustrating the false end or partition adjusted to an inclined position for use in connection with an end section of the hopper-opening. Fig. 16 is a view similar to Fig. 15, showing the shiftable end or partition adjusted to a vertical position which serves as a permanent end for a skeletonized or open end wall of the stock or box car; and Fig. 17 is a detail section through an end portion of the car shown by Figs. 15 and 16.

The underframing A of the present invention is shown more particularly by Fig. 2 of the drawings, said underframing being of metallic construction throughout, as I will now proceed to describe. Said underframing consists of the side sills 5, the end sills 6, the

transverse bolsters 7, a pair of inside longitudinal sills 8, a series of cross-braces 9, pairs of short longitudinal braces 10, and diagonal braces 11. Each side sill 5 is of the construction shown more particularly by Figs. 10, 11, 12, and 13 of the drawings, wherein I have shown these sills as being made from a continuous length of channel-iron. This sill has its lower flange and a portion of the web sheared or cut in inclined directions, as at 12, from points near the middle thereof toward the ends, thus leaving a web 13, a top flange 14, and a bottom flange 15 along the lower portion of the web at the middle of the sill. (See Figs. 11 and 12.) For the purpose of reinforcing this side sill I employ the metallic angle-plates 16, which may be applied against either face of the web—that is to say, two metallic plates of angular form in cross-section are secured by rivets to the lower sheared edge of the web 13 and extend from the non-sheared solid portion 15 of the sill to the end portions of said sill. This construction provides a built-up metallic sill possessing great strength and durability, which can be economically manufactured from stock materials; but I do not strictly confine myself to this particular type of sill, because I am aware that a sill having the shape or contour shown by Figs. 12 and 13 may be made from pressed steel.

Each cross-sill 6 is made from channel-iron sheared to produce the inclined lower edges on opposite sides of a central bottom flange 17, as shown more clearly by Fig. 4, thus producing an end sill having the shape shown by Fig. 14 and leaving a continuous top flange 18 on the web of said sill. The end sills of the angular form are fitted between the end portions of the parallel side sills 5, and the parts are united solidly by rivets or any other suitable fastening means.

I do not limit myself to the particular form of end sill shown; but it is evident that the sill may be of channeled iron and that it may be reinforced in a similar way to the side sill.

The intermediate longitudinal sills 8 are constructed of metal having a cross-sectional form (shown more particularly by Figs. 3 and 4)—that is to say, each sill 8 is a flat vertical plate having an inclined or sloping upper portion 18 and a top flange 19. The intermediate sills are assembled into parallel relation one to the other and to the side sills 5, and the end portions of these intermediate sills are united solidly to the transverse bolsters 7. These intermediate sills 8, in connection with the inclined sections 20, produce the hopper-opening, which ranges lengthwise of the car centrally thereof. The hopper-sections 20 are inclined, as shown more particularly by Fig. 1, and these hopper-sections are secured solidly by the bolsters 7 and to the intermediate longitudinal sills 8. Said hopper-sections are of the tapering form indicated by the plan view in Fig. 2, and said end sections are provided on their under sides with the inclined flanges 21, the latter forming abutments for the hopper-doors when the latter are closed, as will hereinafter appear.

Each bolster 7 is built up of the channel-irons 22, a top plate 23, and a bottom plate 24. (Shown more particularly by Fig. 1.) The several parts of the bolsters are united solidly in any approved way, and the end portions of this bolster are secured to the side sills 5 at suitable distances from the end sills 6. (See Fig. 2.)

The intermediate longitudinal sills 8 of the underframing are braced at numerous points throughout their length by the cross-braces 9, the latter being made of sheet metal and bent to the cross-sectional form shown more particularly by Figs. 8 and 9. These cross-braces are provided with a top portion 25, the inclined webs 26, and the inwardly-extending flanges 27. The end portion of each cross-brace 9 is flanged for application to the opposing sides of the sills 5 and 8, to which sills said cross-braces are secured by riveting the parts; but the underframing is braced or stayed transversely by the employment of a plurality of cross stay-bolts or truss-rods 28, which extend through the hollow cross-braces, the side sills, and the intermediate sills, so that these cross bolts or stays extend across the hopper-opening, substantially as shown by Figs. 2, 3, 4, 8, and 9.

The short longitudinal sills 10 are disposed in pairs between the end sills 6 and the bolsters 7, and these sills 10 are braced by the angular iron stays 11, which are disposed in diagonal and crossing relation in the spaces combined by the side sills, the end sills, the short sills 10, and the bolsters 7, substantially as shown by the drawings.

The described construction of underframing supports the body B of the improved metallic car, and in Figs. 1, 3, and 4 of the drawings this body is represented in the form of a hopper-car adapted for the transportation of dumpable material, although the underframing may be used in connection with a body of the box or stock car type shown by Figs. 15 and 16. I would have it understood, however, that the underframing may be used in the construction of cars generally and of any suitable type of car.

The hopper-car shown by Figs. 1, 3, and 4 consists of side and end walls $b\,b'$ and the sloping bottom b^2 at the sides and ends, said sloping sections of the bottom at said side and ends conforming to the angles of the portions 18 of the intermediate longitudinal sills 8 and the inclined end sections 20, which collectively form the longitudinal hopper-opening and the bottom of the hopper-body B. This hopper-body rests on the underframing A and is secured in any approved way thereto, and said hopper-body is braced or stayed by the em-

ployment of a plurality of vertical angle-iron stays 29.

The lower edge portions of the hopper-bottom sections b^2 at the sides of the body B are extended downwardly into overlapping relation to the intermediate longitudinal sills 8, as indicated at b^3 in Figs. 3 and 4, and between these lower edge portions b^3 and the sills are arranged the hinge-rods 30, the latter being secured in any suitable way to the underframing A. On these hinge-rods are mounted a pair of hopper-doors C C′, said doors being of metallic construction and having their upper edges bent or doubled so as to form the eyes or loops c, which are fitted loosely on the stationary hinge-rods 30. It will be observed that each hopper-door is free to swing or turn on its hinge-rod independently of the other hopper-door and that both of the hopper-doors are movable, whereby they may be drawn by mechanical devices into inclined closed relation, as shown by Fig. 3, although said hopper-doors are free to drop by their own weight or by the pressure of the load to the vertical suspended positions indicated by Fig. 4. Each hopper-door is provided at its lower edge with an inwardly-extending lip c', the same being preferably formed by doubling or folding the metal of the door upon itself and bending the doubled edge at an angle to the plane of the door. The lips c' of the two doors lie in different positions and in opposing or facing relation, so that they will lap one another when the doors are moved to their closed positions, (see Fig. 3,) thus making the doors form a close fit or joint, which effectively prevents the escape of the material through the hopper-opening when the car is loaded.

The hopper-doors C C′ are strengthened by the employment of reinforcement-plates c^2, which are doubled upon themselves and are united in lapping relation to the outer faces of the doors. These reinforcement-plates support or carry the interposed stay-rods c^3, thus forming a rounded strengthening edge at the lower portion of each door. These edges of the reinforcement-plates are engaged by chains or cables 32, which provide the means for closing the doors tightly in lapping relation. I employ a series of these chains, which are spaced at intervals throughout the length of the hopper-doors, and each chain is anchored individually by the employment of a link 33, attached to one of the intermediate longitudinal sills 8. The chains 32 extend from the links 33 below the reinforced edges c^3 of the plates on the hopper-doors, and these chains or cables are threaded through suspended guide-loops 34 and are fastened to a winding-shaft 35. The guide-loops 34 are attached to the other intermediate sill 8, and the winding-shaft 35 extends through one series of cross-braces 9 and through one of the end sills 6. (See Fig. 2.) The winding-shaft may be constructed to receive a wrench or other implement for the purpose of turning said shaft, and the shaft may be locked in place by any suitable form of detent. It will be understood that the shaft may be turned in either direction for the purpose of winding a series of chains or cables thereon and making these chains operate on the lower edges of the doors in a way to securely close them; but by releasing this winding-shaft the weight of the material forces open the two doors in a way to spread them to the position shown by Fig. 4, thus allowing the ready discharge of the material from the car. In handling ballast the series of chains may be set or adjusted for gaging the discharge of material as desired.

The upper hinged edges of the doors are protected by the inclined extended edges b^3 of the hopper-body from the accumulation of dirt; but as a further precaution hoods 36 are provided, which extend the entire length of the intermediate sills and serve as reinforcements for said sills, one of said hoods being disposed between the extended edge b^3 and one of the sills 8. The vertical plate of the hood 26 is fastened securely in a suitable way to one of the sills 8, and the upper edge of this hood is bent or extended over the hinged edge of one door and the rod on which said door is hung, thus making provision for housing the hinged edge of the door. Each hood 26 occupies a stationary position with relation to the movable door, and said hood extends the full length of the door and practically the full length of the hopper-opening.

In my construction both of the doors are movable and they are adapted to swing uniformly to their open position in order that the hopper may be fully exposed and the load will be discharged centrally on the track or with relation to the car.

For the purpose of interiorly bracing the intermediate sills 8 of the hopper-opening I employ one or a series of cross-ties 37, the positions of which are indicated by Figs. 2, 3, and 4, and one cross-tie being shown in detail by Figs. 5 and 6. This cross-tie 37 is bent or doubled from a piece of sheet metal of proper form to produce the downwardly-diverging members 37ª, and the end portions of this cross-tie are provided with flanges 38, which are fashioned to fit the inclined upper members 18 of the sills 8, thus making provision for securely riveting the cross-tie to the sills at points above the hinged connections of the doors C C′ to said sills of the underframing. The cross-ties present their apices to the superposed load in the car, and they do not afford any lodgment for the material, thus allowing said material to be readily discharged. It will be understood that I may employ only one or two of the cross-ties, in which event the cross-tie is located at the middle of the hopper-opening; but I prefer to employ a series of these cross-ties and to make them serve as a housing for the stay-bolts 28 by extending said

stay-bolts through the hollow cross-ties. The cross-ties are secured solidly to the sills 8 above the hopper-doors, and they thus form a permanent fixture of the underframing by being located out of the way of the hopper-doors in opening and closing the latter.

The particular form of the cross-tie is not material and in Fig. 7 I have shown said cross-tie as having diverging members and the inwardly-extending flanges 37[b], which may terminate short of one another or they may be disposed in lapping relation or in any other desired order, whereby I am able to produce a cross-tie possessing great strength and durability and to manufacture said cross-tie economically.

In case I use a series of cross-ties between the sills 8 I prefer to arrange them in alinement with the cross-braces 9, said cross-ties and the cross-braces being fastened individually to the sills 8 on opposite sides thereof, and the ties and braces thus occupying the described relation for the purpose of housing the transverse stay-bolts.

In the form of construction shown by Figs. 15 and 16 I have represented the body B adapted for use as a stock or box car. The side walls of this car-body may be of any suitable construction, but the end wall 39 of said body is of open construction and skeletonized to adapt the body for carrying certain kinds of freight—as, for example, heavy railway-rails, which may be thrust endwise through the open end of said body. In connection with the body of this style I employ a partition or false end 40, having the general features of construction embraced in the combination stock, coal, and coke car disclosed by my application of March 12, 1903, Serial No. 147,415; but this end partition is adjustable to form a closure for the end 39 of the car, as shown by Fig. 16, and it may also be raised for the introduction of rails into the car. The partition 40 is hinged at its upper end, as at 41, to a vertically-movable slide 42, the latter being fitted in vertical guideways 43, which are provided on the end 39 of the body. The slide 42 is adapted to be raised when the partition 40 is moved to the vertical position shown by Fig. 16, and in this position of the partition its lower edge is adapted to rest in a suitable recess, opening, or slot, which is provided in the car-floor B′ at each end of the car. The partition is stayed in place when adjusted to the inclined position of Fig. 15 by means of a brace 44, which is united by a link-hinge 45 to said partition at a point intermediate of the length thereof. The other end of this brace or stay is connected in a suitable way to the floor B′ of the car-body—as, for example, by means of a hinge 46, whereby the stay is adapted to be folded or unfolded with said partition. When the partition is unfolded, as shown by Fig. 15, it occupies an inclined relation to the car-body coincident with the inclination of the end section 20 of the hopper-opening, thus providing for the proper discharge of the load of dumpable material by gravity through the hopper-opening when the doors assume the separated position shown by Figs. 3 and 4.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a metallic car, a metallic underframing having intermediate sills forming a hopper-opening and provided with flared upper portions, and a cross-tie disposed across the hopper-opening and lying in the horizontal plane of the sills, said tie being provided with end flanges which are secured to the flared portions of the intermediate sills.

2. A metallic underframing having intermediate sills forming a hopper-opening, and a cross-tie of tapering cross-sectional form secured to the intermediate sills and spanning the hopper-opening.

3. A metallic underframing having intermediate sills forming a hopper-opening, hopper-doors hinged to said sills and ranging lengthwise of the hopper-opening, and cross-ties secured to the sills above the hinged connection of the hopper-doors thereto.

4. A metallic underframing having side and intermediate sills, cross-braces secured to said sills and disposed between the same, cross-ties secured to the intermediate sills and disposed in alinement with the cross-braces, and stay-bolts extending through the parts and housed by the cross-braces and the cross-ties.

5. A metallic underframing having side and intermediate sills, cross-braces secured between the sills, and stay-bolts extending through the sills and housed by the cross-braces.

6. The combination of a metallic underframing having intermediate sills, a pair of hopper-doors hinged individually to the respective sills, and hoods fixed to said sills for reinforcing the latter and housing the hinged connections of the doors to the sills.

7. The combination of a metallic underframing having intermediate sills, of a pair of hopper-doors hinged individually to the sills, a winding-shaft, a series of chains adapted to be coiled on said shaft and fitted to the lower edges of the hopper-doors, and means for individually anchoring the chains on the opposite side of the hopper-opening from said winding-shaft.

8. In a metallic car, synclinal hopper-doors ranging lengthwise of the car and provided on their opposing faces with inwardly-extending lips adapted to overlap one another on the closure of the doors, the edges of the doors being extended below the lips.

9. In a metallic car, a pair of hopper-doors provided with lips adapted to overlap one another on the closure of the doors, and metallic members united to said doors and extending

below the lips thereof, combined with door-closing chains or cables disposed for engagement with said members of the doors.

10. In a metallic car-underframing, a hopper-opening cross-tie made of a single piece of metal pressed to a V shape in cross-section, the sides of said tie having their end portions bent on diagonal converging lines and producing angular flanges at the ends of the tie.

11. In a metallic car, a side sill for an underframing, consisting of a sheared channeled bar provided with reinforcement angle-strips riveted along the sheared portions thereof.

12. In a metallic underframing for a car, a side sill consisting of a channeled bar sheared to the proper shape, and longitudinal angular reinforcements united to said channeled bar along the sheared portions thereof.

13. The combination with a car-body, having a hopper-opening, of a movable slide, a partition hinged to said slide adjusted into position to form an end wall of said body, said partition being shiftable to an inclined relation to the hopper-opening in the bottom of said body.

14. The combination with a car-body having a hopper-opening and an open end, of a partition adjusted to a vertical position for closing said open end, and shiftable to an inclined relation to the hopper-opening, and means for retaining said partition removably in place.

15. The combination with a car-body having a hopper-opening, and an open end, of a partition adjustable to a vertical position for closing said open end, and shiftable to an inclined relation to the hopper-opening, means for slidably connecting said partition with an end portion of said car-body, and means for holding the partition in said inclined position.

16. The combination with a car-body having a hopper-opening, and an open end portion, of a guideway on said car-body, a partition adjustable to a vertical position for closing said open end, and shiftable to an inclined relation to the hopper-opening, and a slidable member fitted to said guideway and having hinged connection with the partition.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GLENN E. SIMONTON.

Witnesses:
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G. E. WILSON.