

No. 750,670.

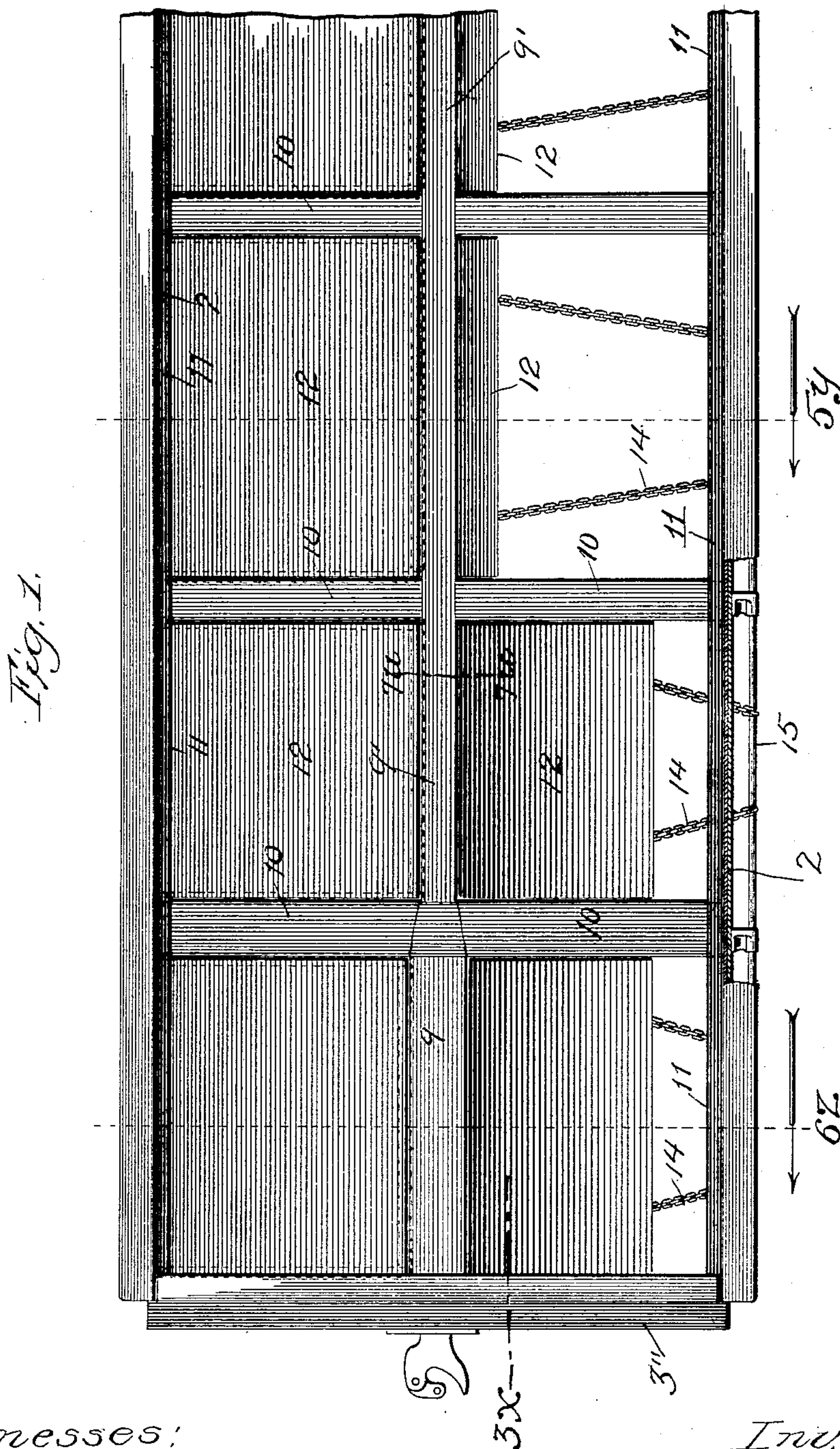
PATENTED JAN. 26, 1904.

A. LIPSCHUTZ.
COMBINED FREIGHT AND DUMP CAR.

APPLICATION FILED FEB. 9, 1903.

NO MODEL.

4 SHEETS—SHEET 1.



Witnesses:
 Geo. C. Dawson?
 E. Ireland

Inventor:
Arthur Lipschutz

By *C. Hawley* Att'y.

No. 750,670.

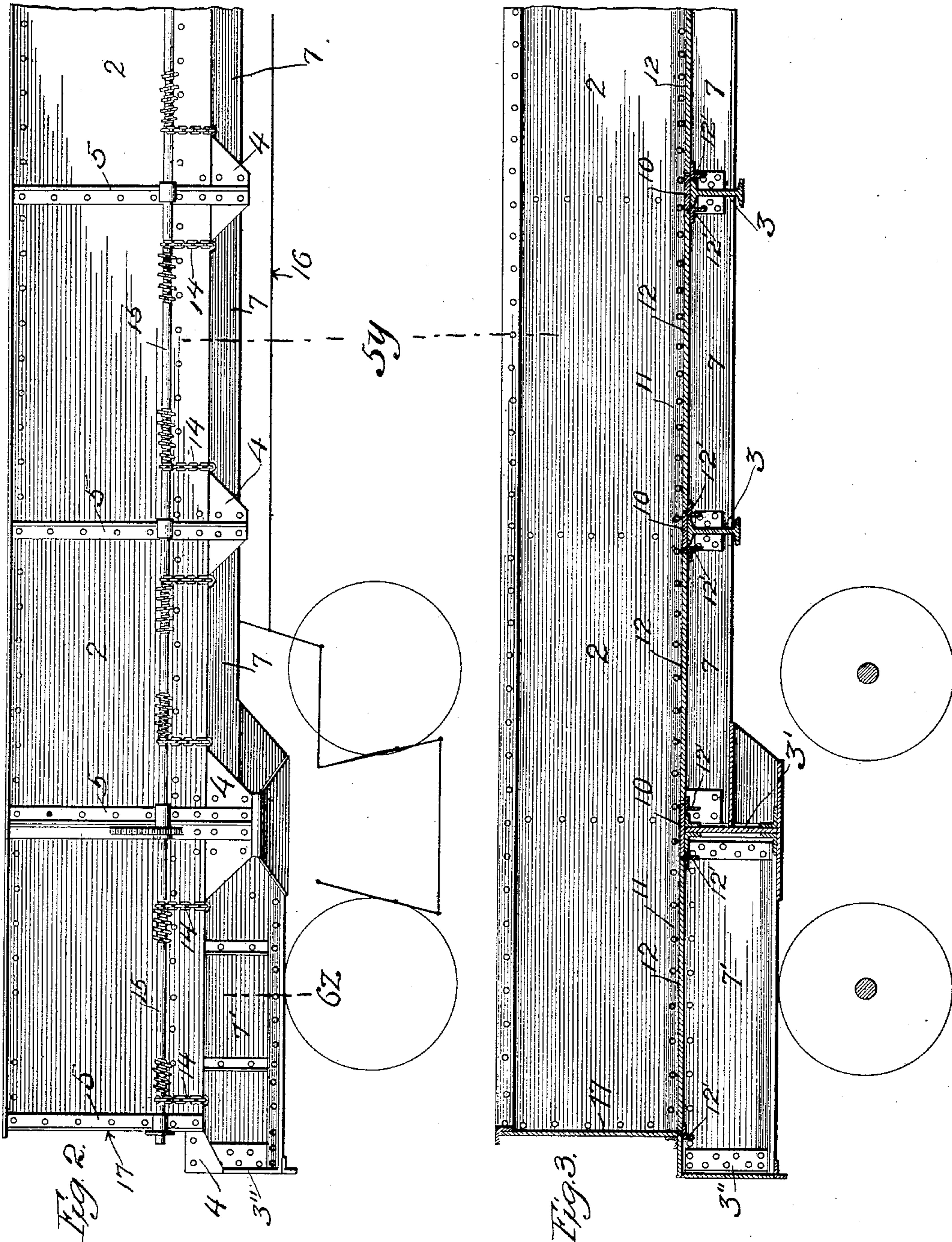
PATENTED JAN. 26, 1904.

A. LIPSCHUTZ.
COMBINED FREIGHT AND DUMP CAR.

APPLICATION FILED FEB. 9, 1903.

NO MODEL.

4 SHEETS—SHEET 2.



Witnesses:
G. C. Davidson.
E. J. Ireland.

Inventor:
Arthur Lipschutz

By *O. Hawley* Att'y.

No. 750,670.

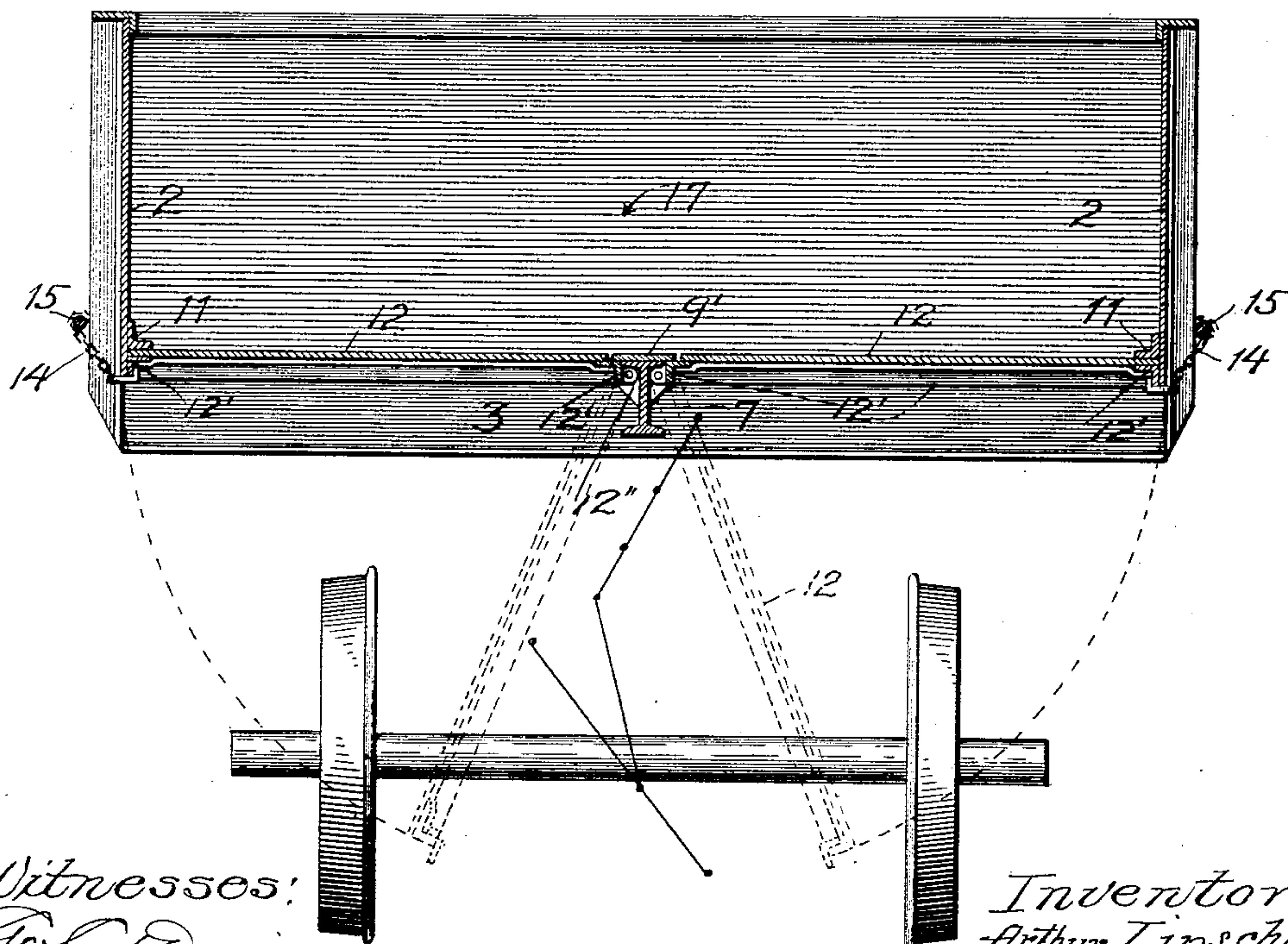
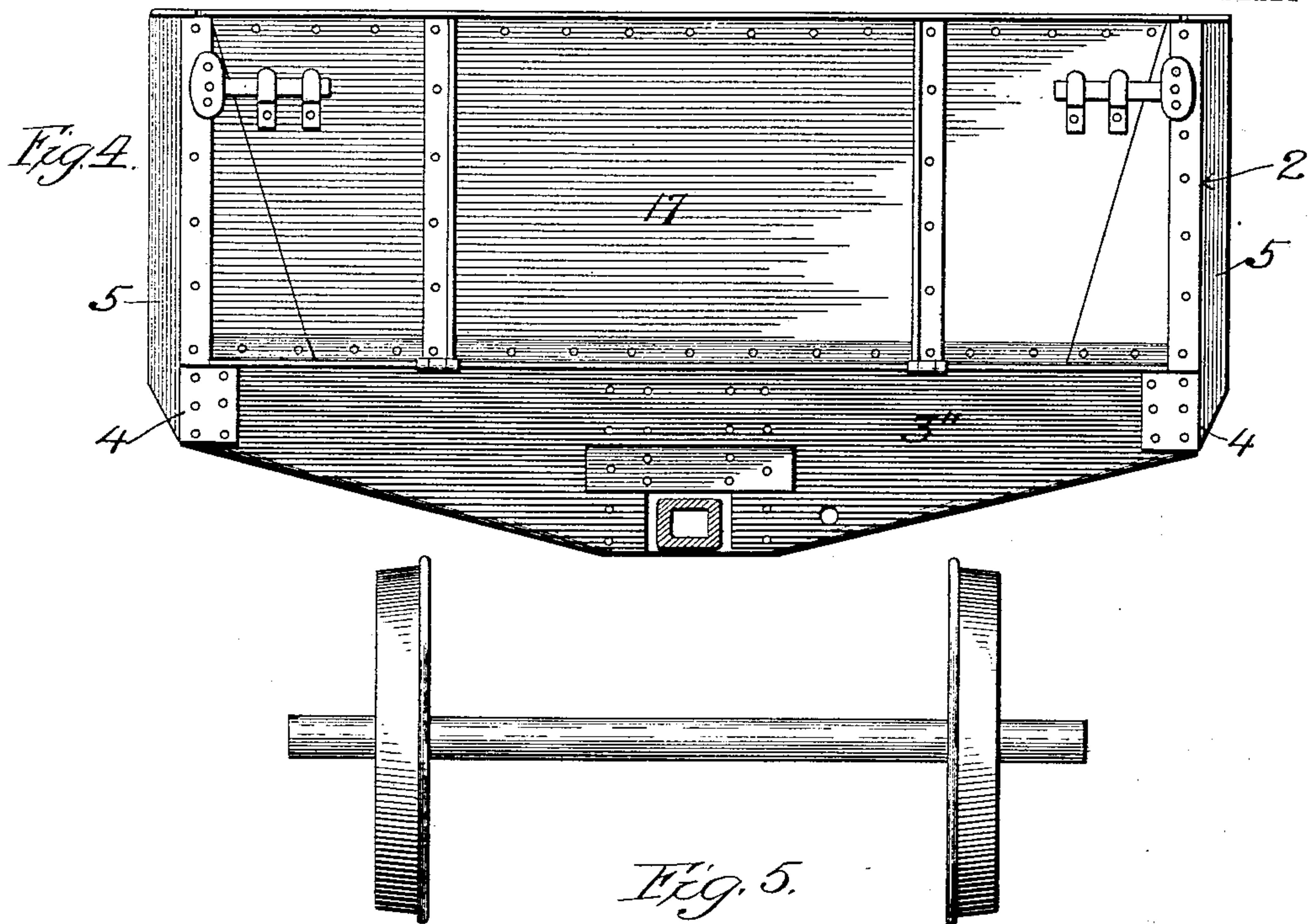
PATENTED JAN. 26, 1904.

A. LIPSCHUTZ.
COMBINED FREIGHT AND DUMP CAR.

APPLICATION FILED FEB. 9, 1903.

NO MODEL.

4 SHEETS—SHEET 3.



No. 750,670.

PATENTED JAN. 26, 1904.

A. LIPSCHUTZ.
COMBINED FREIGHT AND DUMP CAR.

APPLICATION FILED FEB. 9, 1903.

NO MODEL.

4 SHEETS—SHEET 4.

Fig. 6.

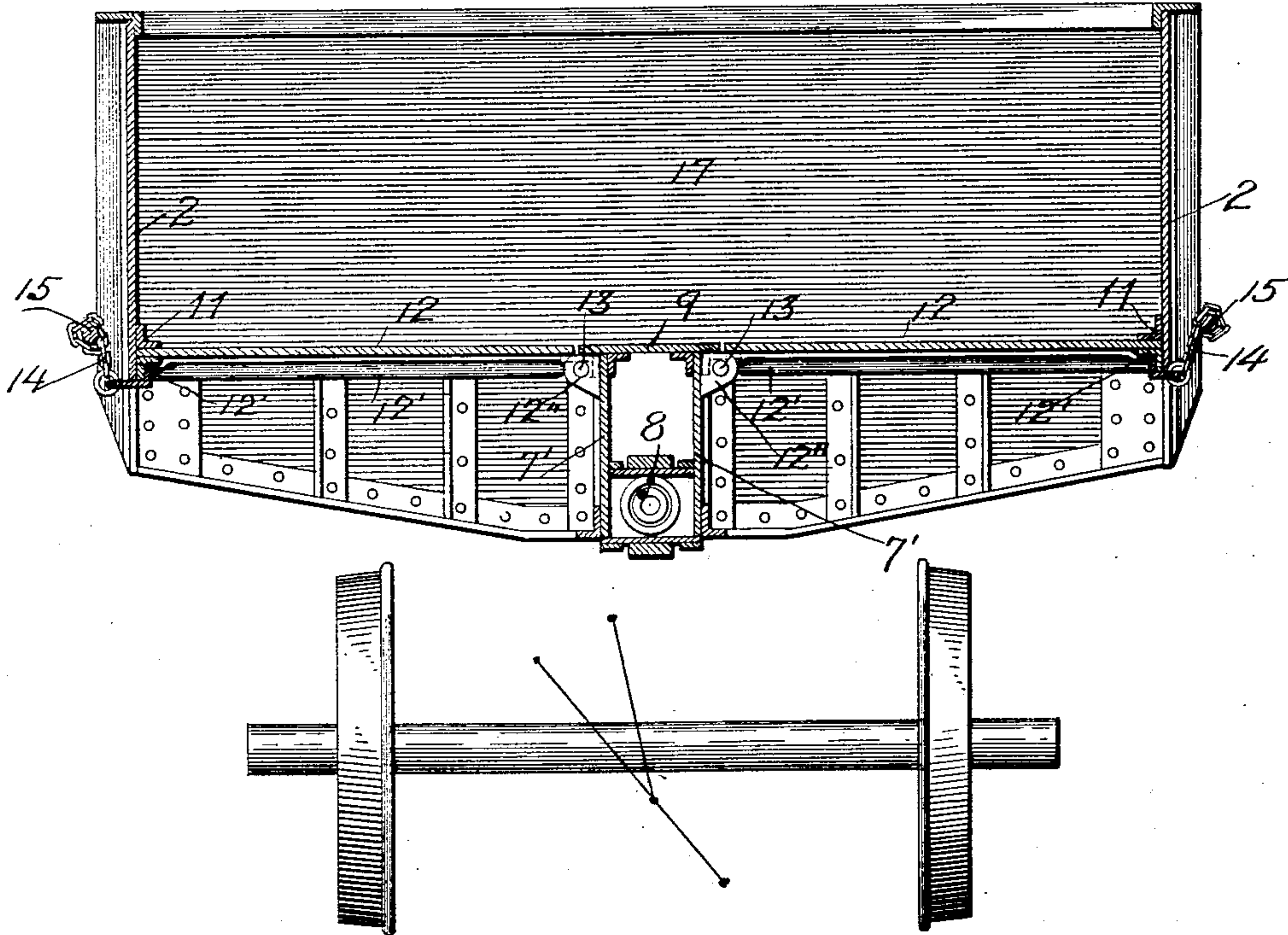


Fig. 7.

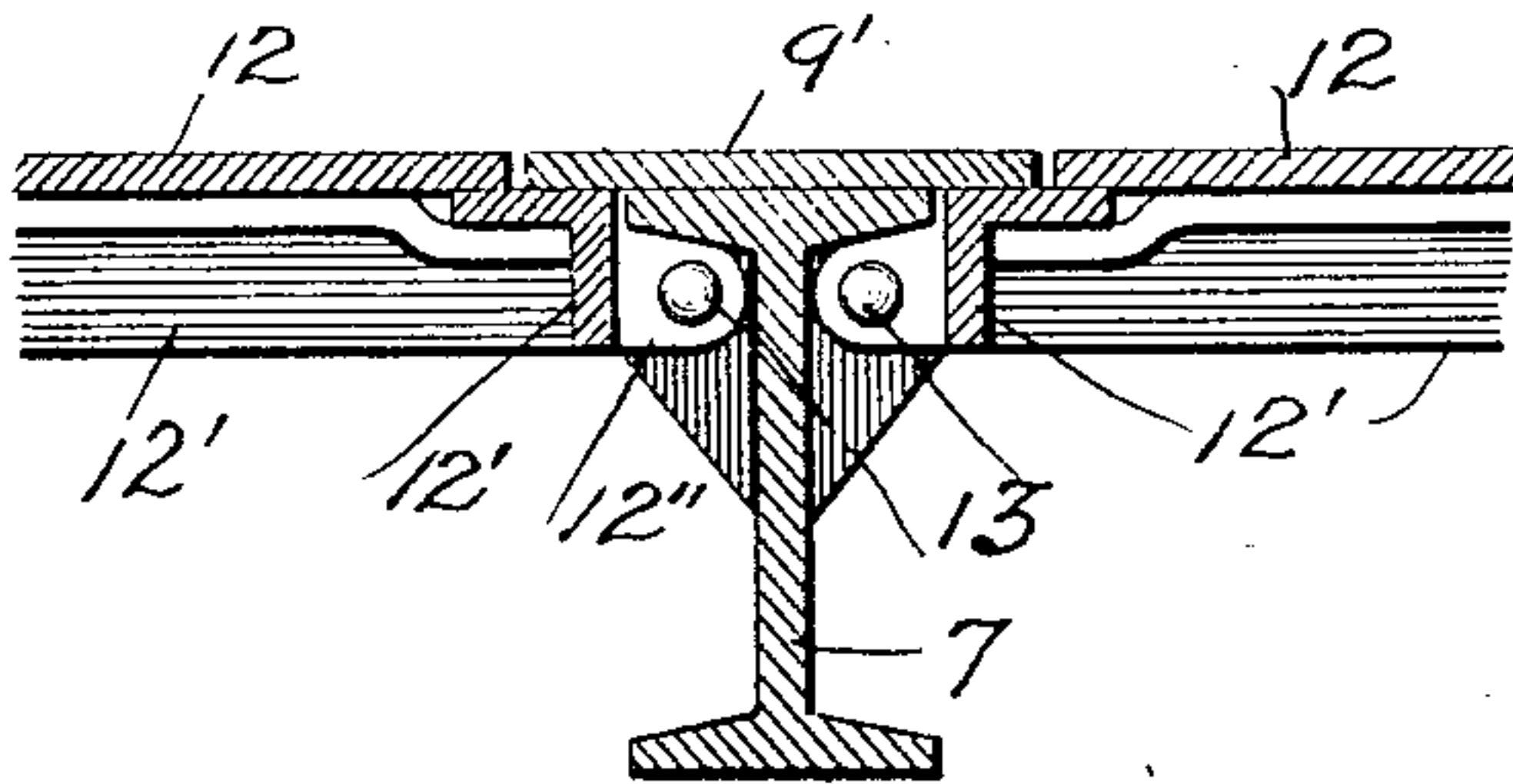
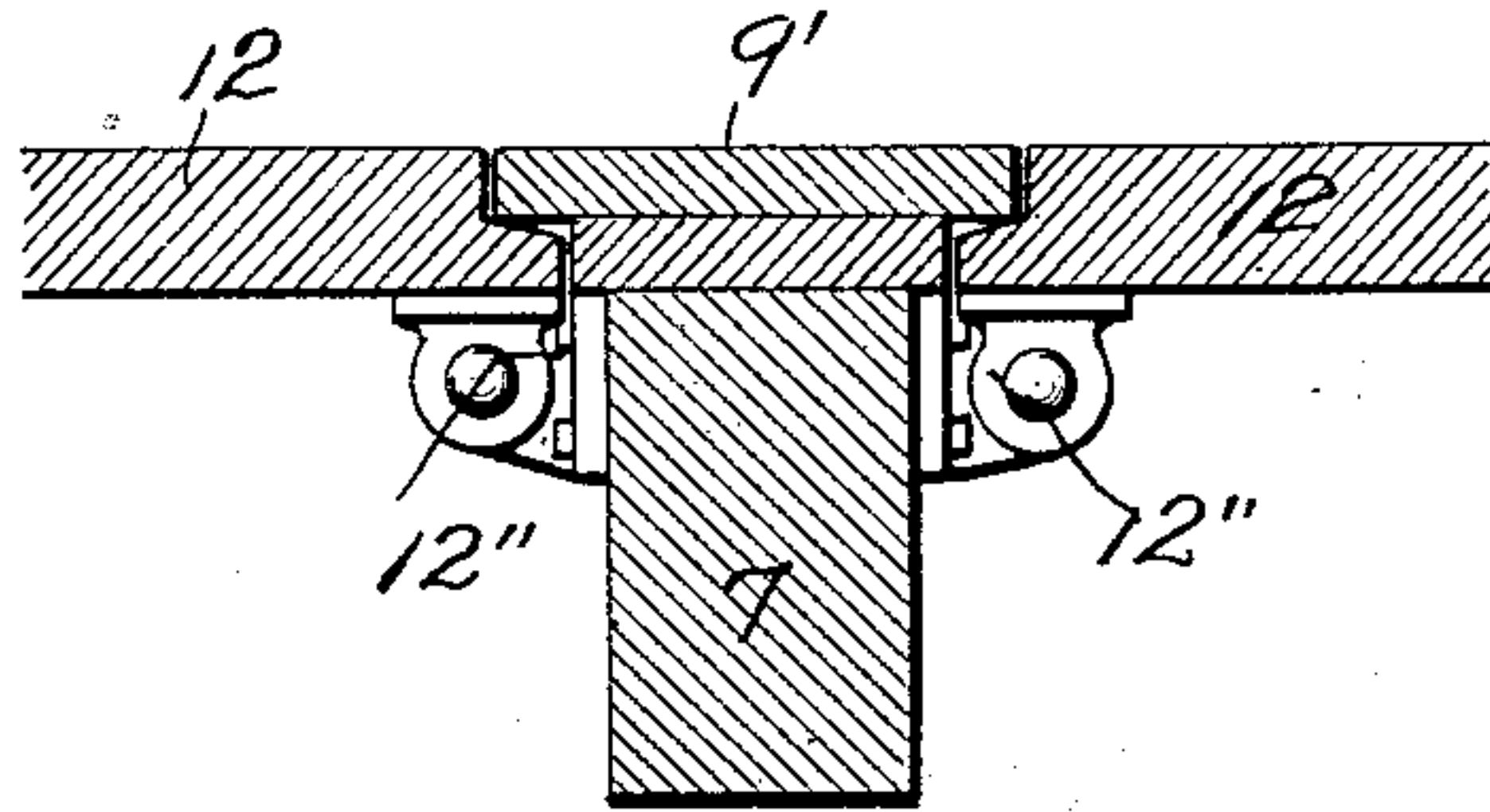


Fig. 8.



Witnesses:
Geo. P. Dawson.
E. J. Ireland.

Inventor.
Arthur Lipschutz

By *Chas. H. Hawley* Att'y

UNITED STATES PATENT OFFICE.

ARTHUR LIPSCHUTZ, OF ST. LOUIS, MISSOURI, ASSIGNOR OF TWO-THIRDS
TO MAX TOLTZ, OF ST. PAUL, MINNESOTA, AND H. W. WOLFF, OF ST.
LOUIS, MISSOURI.

COMBINED FREIGHT AND DUMP CAR.

SPECIFICATION forming part of Letters Patent No. 750,670, dated January 26, 1904.

Application filed February 9, 1903. Serial No. 142,453. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR LIPSCHUTZ, of the city of St. Louis, State of Missouri, have invented a certain new, useful, and Improved
5 Combined Freight and Dump Car, of which the following is a specification.

My invention relates to railroad-cars, and has special reference to freight-cars that may be employed as dump-cars for carrying and
10 distributing material, such as sand, gravel, coal, coke, and the like.

The object of my invention is provide a car that may be used as a freight-car or as a dump-car and which shall be free from the objec-
15 tionable features that are present in all other combination-cars.

The principal object of the invention is to provide a self-cleaning dump-car upon the opening of the doors of which the whole con-
20 tents of the car will be discharged, shoveling being avoided.

Another particular object of the invention is to provide a dump-car that shall have a level flat bottom to accommodate any sort of
25 freight, being unobstructed by ridges, depressions, or hoppers.

Another special object of the invention is to provide a dumping-car having a level floor and which shall be of uniform cross-section
30 throughout the extent of the underframe to the end that the capacity of the car shall be as great in the portions over the trucks as at the center of the car.

Another object of the invention is to provide a dump-car the floor of which shall be substantially wholly composed of large drop-
35 doors, and, furthermore, to provide a combination-car that may take the form of a flat-car, a coal-car, a coke-car, or a box-car without change in its underframe or floor.

The general object of the invention is to provide a combined freight and dump car of simple construction, capable of being easily re-
40 paired if damaged, and which may be built at less cost than other cars adapted for the general purposes mentioned.

A further object of the invention is to pro-

vide a combination-car of such construction as to permit of the employment of any style or type of trucks and which shall not require
50 special constructions or applications of brake mechanisms.

My invention consists generally in a combined freight and dump car the floor of which from end sill to end sill is substantially wholly
55 composed of drop-doors, which being opened permit the discharge of the whole load of the car.

My invention further consists in a car of the class described, the underframe of which
60 comprises suitable body-bolsters or cross-girders, in combination with side girders, a plurality of cross-beams extending between said side girders, and a plurality of doors or traps filling the openings between the beams and
65 girders and constituting the floor of the car.

My invention specifically consists in a car having an underframe composed of side sills or girders in combination with cross-beams extending between said girders, an articulated
70 center sill extending from end to end of the car, and a plurality of doors hinged upon said center sill and constituting the floor of the car.

My invention consists, further and specifically, in a car having its underframe composed
75 of rectangularly-arranged longitudinal and cross-girders, provided with floor plates or flanges and doors closing upward beneath said flanges, making tight joints therewith and having their surfaces in the plane of the tops
80 of said flanges, and my invention consists, further, in various details of construction and in combination of parts, all as hereinafter described, and particularly pointed out in the
85 claims.

The invention will be more readily understood by reference to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a plan view of substantially one-
90 half of a combined freight and dump car embodying my invention. Fig. 2 is a side elevation thereof. Fig. 3 is a vertical longitudinal section substantially on the line 3^x of

Fig. 1. Fig. 4 is an enlarged end view of the car. Fig. 5 is a similarly-enlarged cross-section substantially on the line 5^x of Figs. 1, 2, and 3. Fig. 6 is a similar section on the line 6^z of Figs. 1 and 2. Fig. 7 is an enlarged detail section on the line 7^u of Fig. 1, and Fig. 8 is a similar detail showing the construction in wood.

The advantages that are sought in cars of the class mentioned are substantially these: a perfectly level floor—that is, a floor without obstructions or depressions; vertical sides and ends that may be reduced or increased in height, according to the use to which the car is to be put; a car-body of the same length as the underframe, whereby loss of load capacity is avoided, as compared with those cars in which the car-body is located between the ends of the underframe, starting at a considerable distance from said ends; drop-doors, by which the entire load of the car can be dumped without shoveling; doors of great size that will permit the passage of large rocks or chunks of ore or coal; few convertible parts, none, if possible, aside from the doors which constitute the floor; adaptability for use as flat, coal, coke, or box car without reference to the character of the car-floor; simple and strong floor construction, having drop parts which at all times normally enter into the floor structure—that is, parts which are at no time extra or superfluous members, their functions being constant without reference to the character of the load, and, finally, great simplicity and economy of construction.

While other combination-cars may and have possessed one or more of the features and functions above enumerated, each contains objectionable features, such as elevated or inclined ends, floor-ridges, or a reduced body or permanent level floor parts, or convertible tilting floor parts, all of which either reduce the load capacity of the car or restrict the load to certain materials, reducing the earning capacity of the car as a unit or largely increasing the cost of constructing and maintaining the car. The ordinary combination freight and dump cars are also objectionable by reason of their great weight, increasing the dead-weight to be hauled.

I conceive that the greatest number of desirable features and advantages attainable in a single car may be secured through simplification of car construction rather than by the addition of unique unusual structures or convertible movable members. My invention proceeds upon this conception, and the gist of the invention resides in the combination of side girders suitably supported upon the trucks and with a plurality of short cross-beams constituting the underframe of the car. The floor of this car is composed of a large number of drop or trap doors or members, preferably normally in a horizontal plane, though, if de-

sired, they may be inclined in either direction from the center or axial line of the underframe.

While my invention is not limited thereto, I prefer the embodiment and construction illustrated in the drawings because of its simplicity, lightness, and cheapness. Again, while herein illustrated as an all-steel car my invention is equally well adapted for construction in wood.

The main carrying members of the car are the side girders or sills. These are preferably the side plates or girders 2 2, which form parts of the underframe, and the sides of the car-body, obviously I-beams or channels or pressed shapes, may be substituted and, in fact, are used when a simple flat-car is required. These side girders 2 2 are joined by a number of cross beams or sills 3 3, which have different forms at the center of the car, over the trucks, and at the ends. The cross-beams directly over the trucks serve as bolsters and are heavier than the cross-beams at the ends and middle of the car. The center or middle cross-beams are simple I-beams, having plates at their ends, by which they are secured to the gusset-plates 4, depending from the sides 2, and strengthened by the upright bars or stakes 5. The cross-beams 3' over the trucks constitute the body-bolsters of the car and are constructed accordingly. Their detailed construction being unimportant to this invention need not be specifically defined. The end cross-beams 3'' are preferably built of angled plates heavily trussed and serving as the buffer or end sills of the underframe. It will be noted that any load placed upon the center cross-beams or the end cross-beams will be transmitted to the bolster cross-beams by the side sills, girders, or plates. A strong center girder or sill is therefore unnecessary, and in place of the usual continuous or spliced center sill I use an articulated sill 6, composed of light sections of sills 7 of small cross-section, arranged between the several cross-beams 3 and having their ends abutted against and secured upon respective cross-beams. Such is the construction of the center sill between the bolsters. Beyond the bolsters—that is, between the bolsters and the end sills—the center sill is divided to form casings for the draft-riggings. The construction of these ends of the center sill or girder is indicated in Figs. 2, 3, and 6, wherein it will be seen that I prefer to make each end in the form of a short box-girder 7', containing the draft-rigging 8 and securely fastened between the end sill and the body-bolster beam 3'.

9 represents the top or cover plate of the end box-girder portion of the center sill and this is preferably continued throughout the length of the car, forming, with the portion or narrow plate 9', a continuous plate chord upon the top of the center sill. The cross-plates 10 10 upon the tops of the cross-beams have their surfaces in the same plane with the

plates 9 9', and all of these plates extend over or overhang the underlying beams, sills, or girders, whereon they are secured. Their edges therefore constitute stops for the floor-
 5 doors of the car. The horizontal flanges of the angle-bars 11 constitute equivalent stops for the doors upon the sides of the car.

Because the cross sills or beams are very short they may be of light weight and small
 10 cross-section and yet sustain a heavy load between the sides of the car. For the same reason the cross-beams may be few in number, and hence it is possible to provide very large openings between the longitudinal and trans-
 15 verse girders or sills which make up the under-frame.

The arrangement of the parts is symmetrical throughout the length of the car and the openings are of substantially the same size through-
 20 out, the only exceptions being the end door-openings, which are somewhat narrower because of the greater width of the box-girder ends of the articulated center sill. A single door 12 is provided for each opening. This
 25 door is a flat plate that is strengthened by angled or flanged bars 12' at its edges. At the outer edge of the door the angle-bar may be flush with the edge of the door-plate, but upon the other edges of the plate the angle-bars
 30 project far enough to close the cracks between the edges of the plate and the adjacent floor-plates 9' 10. As illustrated, the door closes tightly upward against the under surfaces of the overhanging floor-plates 9' 10, and the side
 35 flanges 11, making a tight level floor for the car. The doors may be hinged either to the side sills or to the center sills, (I prefer the latter,) and, as shown, the center-sill sections 7 and the doors or, if desired, the cross-
 40 beams and the doors are provided with hinged lugs 12'', secured by suitable hinged bolts or pins 13. The free ends of the doors are supported by chains 14, secured upon the wind-
 45 ing-shafts 15, or by any other suitable means, as by latches. Stop-chains may be applied to all the doors, if desired, to limit their fall; but as the doors are usually of less width than the distance between the center sill and the railroad-track I prefer to dispense with stop-
 50 chains upon the center or middle doors of the car and use the same only upon the doors which are above the trucks. In these places the stop-chains prevent the doors from striking upon the wheels and are therefore useful.

It will be observed that as the end doors—four over each truck—have a limited fall plenty of space is left beneath them for the draft-rigging and for the air-brake and hand-
 55 brake mechanisms, which may occupy their usual positions. The connecting-rod 16 of the brake mechanism is preferably arranged directly beneath the center sill, so that it does not interfere with the fall of the middle doors of the car.

65 The coal-car or gondola shown in the draw-

ings has its sides composed of the side girders 2. Its ends 17 are preferably pivoted and provided with locks, as shown in Fig. 4, in order that the same may be thrown down to permit the carrying of long beams or poles
 70 that extend from one car to another. These end doors preferably have nothing to do with the dumping of the load. The upper edges of the car-body sides and ends are preferably strengthened by the usual angles, and it is
 75 obvious that the sides and ends of the car may be extended by any desired superstructure to convert the car into a coke-car or a box-car.

In constructing my car of wood the foregoing lines are preserved, and the doors, whether
 80 of wood or metal, make tight joints with the fixed portions of the car-floor, as indicated in Fig. 8. I prefer in making the wooden car to notch the center sill and cross girders or beams, thereby gaining the advantage of a
 85 substantially continuous center sill. The essential feature to be retained in all cases is the light underframe composed of girders or sills that have narrow tops and which are separated by large distances, whereby upon the
 90 dropping of the doors the whole contents of the car will be discharged. The small quantities of material that will finally lodge upon the narrow tops of the center and cross sills are negligible in estimating the efficiency of
 95 the car. It will be obvious that a continuous metal center sill may be treated in a similar manner or may be placed beneath the cross-beams.

I desire also that my invention shall include
 100 the construction in which the center sill is placed on top of the beams, which extend from side to side of the car. In this case I should employ a V-shaped sill, though regarding its use as generally objectionable.
 105

As it is obvious that numerous modifications of my invention will readily suggest themselves to one skilled in the art, I do not confine the invention to the specific constructions herein shown and described.
 110

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

1. A freight-car, having its floor substantially wholly composed of a single set of drop-doors and narrow floor-plates in the plane of
 115 said doors, means being provided for holding the doors in their normal positions, substantially as described.

2. A freight-car, having its floor substantially wholly composed of a single set of drop-
 120 doors and narrow floor-plates, in a single horizontal plane, substantially as described.

3. A combined freight and dump car, having a suitable center sill and having a straight level floor substantially wholly composed of
 125 a plurality of narrow floor-plates and a single set of drop-doors arranged in two series, one series on each side of said center sill, substantially as described.

4. A combined freight and dump car pro-
 130

vided with parallel side girders and having a straight, level floor substantially wholly composed of normally horizontal doors, hinged parallel with and adjacent to the longitudinal axis of the car and having their free ends supported from said girders, substantially as described.

5. A combined freight and dump car, comprising the trucks, in combination with the body-bolsters, the side girders supported upon said bolsters, cross-beams each extending from side girder to side girder and a plurality of doors arranged between said cross-beams, said cross-beams transmitting the loads of said doors from the center of the car to said side girders, substantially as described.

6. A combined freight and dump car, comprising the trucks, in combination with the side sills or girders, the cross-beams extending between said girders, two thereof being the body-bolsters, horizontal floor-plates secured from the tops of said beams and the car-floor composed of a plurality of drop-doors hinged between said beams, substantially as described.

7. A combined freight and dump car, comprising the trucks, in combination with the body-bolsters, having horizontal tops, the side girders supported on said bolsters, the end and cross beams parallel with said bolsters and the normally horizontal level car-floor made in sections and detachably supported between said beams, substantially as described.

8. A combined freight and dump car body, comprising the parallel center and side sills or girders, in combination with the body-bolsters, the end and cross sills extending between the side girders and supporting said center girder, and the car-floor carried by said parallel beams and bolsters, substantially as described.

9. A combined freight and dump car body, comprising the side girders, in combination with suitable body-bolsters and end beams or sills, the rectangularly-arranged narrow floor-plates, widely spaced and supported between said side girders and a car-floor composed of doors that close upwardly beneath said floor-plates with their tops in the plane of said plates, substantially as described.

10. A combined freight and dump car body, comprising vertical sides and ends, in combination with the widely-spaced cross beams or girders extending from side to side of the car and the series of drop-doors constituting the floor of the car-body and extending from end to end thereof, substantially as described.

11. A combined freight and dump car body, comprising the vertical sides and ends, in combination with a plurality of cross-girders parallel with said ends and supported by said sides, the articulated or sectional center girder, supported by said cross-beams and extending between said ends, and a plurality of drop-

doors arranged between said girders and the sides and ends, substantially as described.

12. A combined freight and dump car, comprising suitable sides and ends, in combination with a plurality of cross-girders extending between said sides, a center girder, the tops of said girders being in substantially the same plane, the overhanging floor-plates provided thereon and the drop-doors normally flush with said plates and provided with joint-closing flanges, substantially as described.

13. A combined freight and dump car, comprising suitable sides and ends, in combination with a plurality of cross-beams extending between said sides, the longitudinal girder-sections attached to the ends and cross-girders, the series of doors upon each side of the center girder constituted by said longitudinal sections and means for normally supporting the same to constitute the car-floor and for dropping them to discharge the contents of the car, substantially as described.

14. A combined freight and dump car, comprising parallel girder sides, in combination with a plurality of cross-girders extending between said sides, two thereof being the body-bolsters, the normally vertical hinged ends and car-floor composed of a series of drop-doors arranged between said cross-girders and extending from end to end of the car, substantially as described.

15. A combined freight and dump car, comprising suitable sides and ends, a plurality of cross-beams parallel with said ends, a suitable center girder or sill having draft-rigging connections at its ends, the trucks, the brake mechanism arranged beneath said center sill and the series or rows of drop-doors suitably supported between said cross-beams, those at the ends of the car above the trucks being limited as to downward movement, substantially as described.

16. A combined freight and dump car, having a longitudinal beam extending throughout the length of the car, in combination with side girders supporting said longitudinal beam and the drop-bottom doors hinged parallel with said longitudinal beam, substantially as described.

17. A combined freight and dump car, comprising suitable sides and ends, in combination with a plurality of cross beams or girders, the drop-doors hinged midway of said cross-beams and having free ends normally supported from said sides and adapted to drop parallel therewith, substantially as described.

18. A combined freight and dump car, having drop-bottom doors hinged from a beam or beams extending throughout the length of the car-underframe, cross-beams supported on the sides of the car and supporting the center beam or center beams.

19. A combined freight and dump car, comprising the sides, in combination with the cross-beams, the drop-doors fitted between and

hinged midway of said cross-beams and a floor-plate extending the full length of the car, substantially as described.

20. A combined freight and dump car, comprising the underframe composed of rectangularly-arranged sides and beams, having stop-flanges, in combination with drop-doors having their tops in the plane of said flanges and therewith constituting the floor of the car, substantially as described.

21. The car-underframe, comprising the side girders, in combination with the cross-beams joining them, the articulated center girder joining said beams and the doors closing the spaces between said girders, substantially as described.

22. The underframing for a freight and dump car, comprising the side and center girders, in combination with the body-bolsters, the end girders, the intermediate beams all extending from side girder to side girder and the series of doors extending from end to end of the underframe thus composed, substantially as described.

23. The parallel side girders, in combination with a plurality of cross-beams, two of which are body-bolsters, and the drop-doors supported by said cross-beams and ultimately supported by said side girders and the bolsters, substantially as described.

24. A combined freight and dump car having a straight and level floor extending from end to end of the car and substantially wholly

composed of a plurality of doors, arranged to be dropped away from the sides of the car to discharge the contents of the car throughout the whole car-bottom, substantially as described.

25. A combined freight and dump car, comprising suitable sides and ends, in combination with a plurality of cross beams or girders, extending between said sides, a plurality of drop-doors suitably hinged upon said cross-beams, said cross-beams and said sides being provided with narrow overhanging floor-flanges and said doors closing tightly beneath and against said flanges, substantially as described.

26. A combined freight and dump car, comprising the parallel side girders, in combination with the transverse girders connecting them and supported thereby, the horizontal stop-flanges provided upon said sides, the longitudinal floor-plate, the transverse floor-plates upon said girders and the doors, hinged upon said girders and provided with projecting strengthening-flanges, closing the joints between the side flange and said plates and the doors, substantially as described.

In testimony whereof I have hereunto set my hand this 28th day of January, 1903.

ARTHUR LIPSCHUTZ.

Witnesses:

CHAS. A. HIDDLE,
E. J. LANGTRIN.