No. 770,306. PATENTED SEPT. 20, 1904.

W. Q. OLDEN.

STEEL SIDE DUMP CAR.

APPLICATION FILED JULY 3, 1903.

NO MODEL. 7 SHEETS—SHEET 1.

Fig. 1.

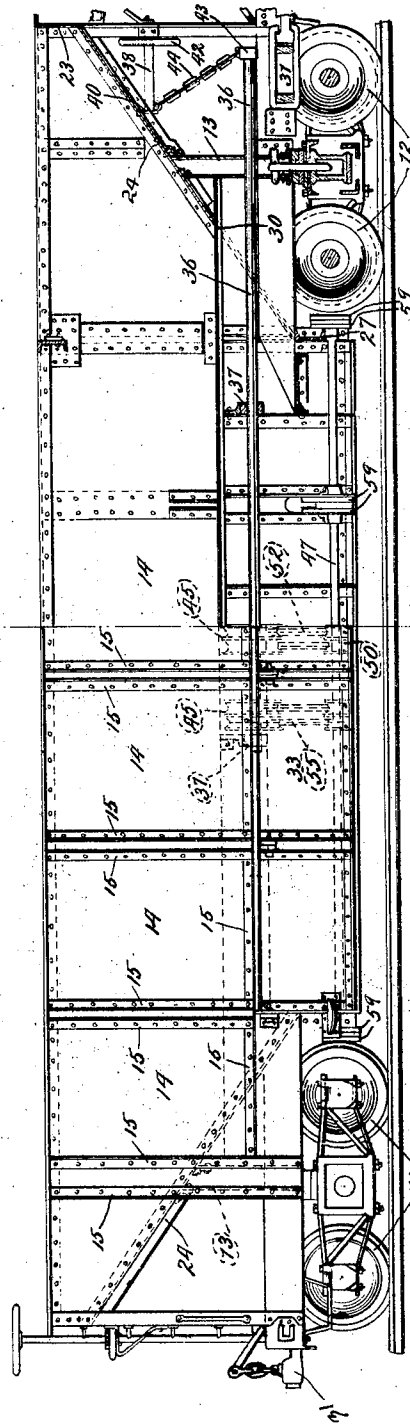
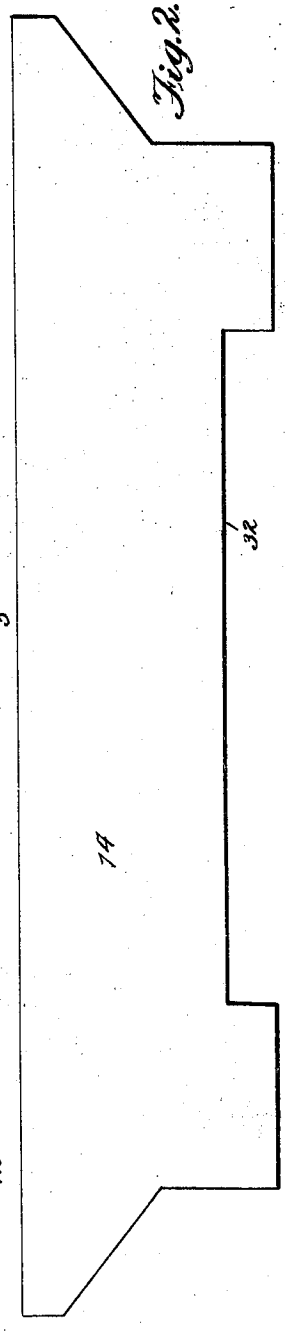


Fig. 2.



Witnesses:
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G. V. Donovan

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No. 770,306. PATENTED SEPT. 20, 1904.

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NO MODEL. 7 SHEETS—SHEET 2.

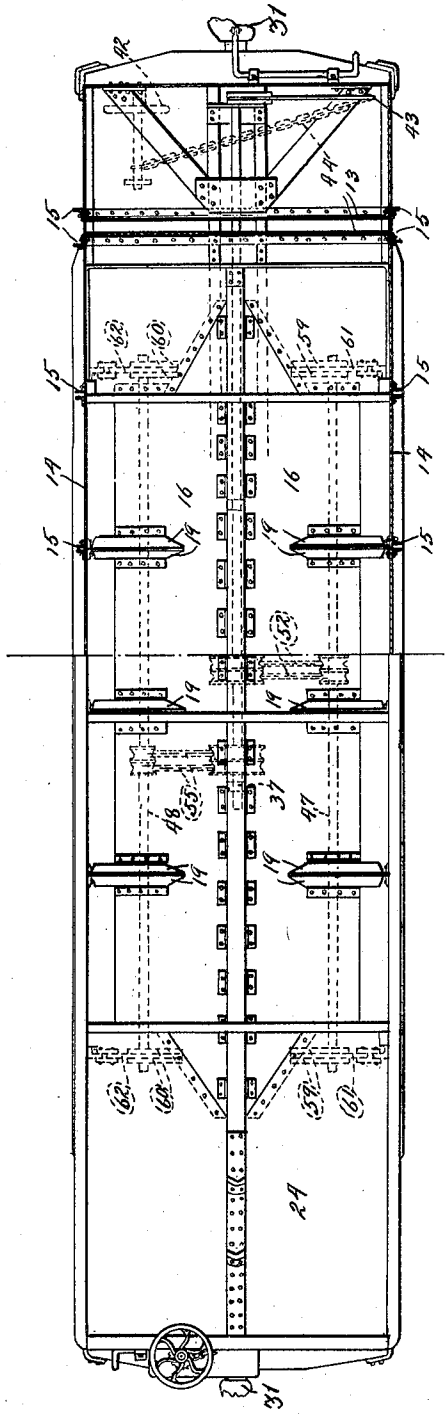


Fig. 3.

Witnesses:
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G. V. Howanus

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No. 770,306. PATENTED SEPT. 20, 1904.

W. Q. OLDEN.

STEEL SIDE DUMP CAR.

APPLICATION FILED JULY 3, 1903.

NO MODEL. 7 SHEETS—SHEET 3.

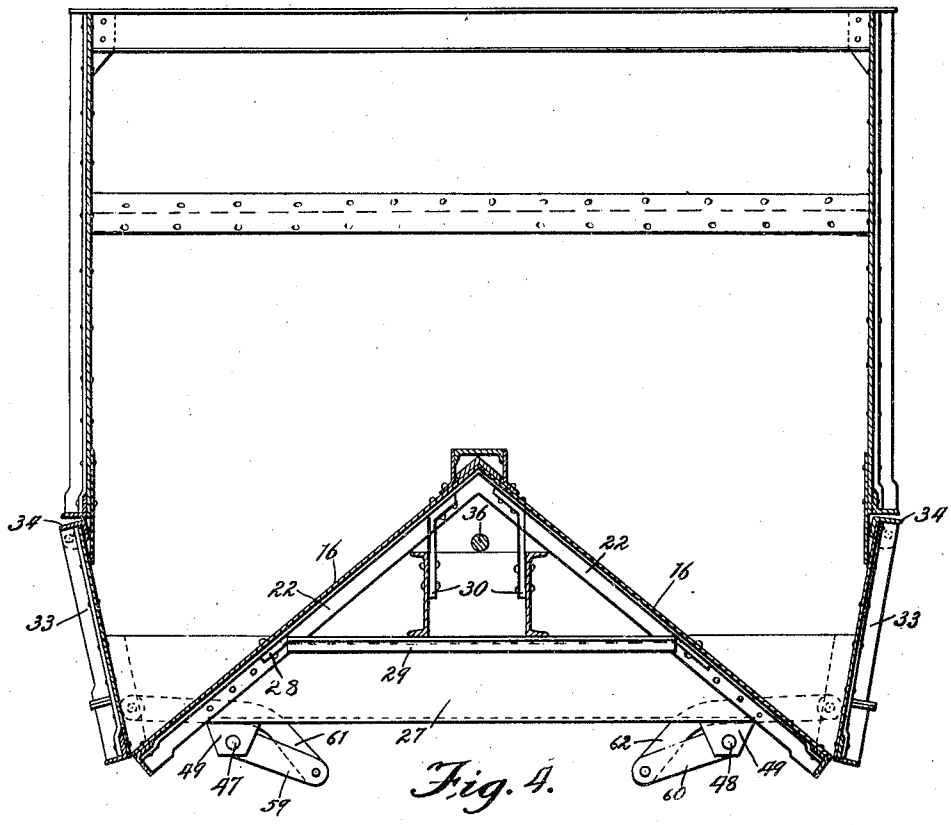


Fig. 4.

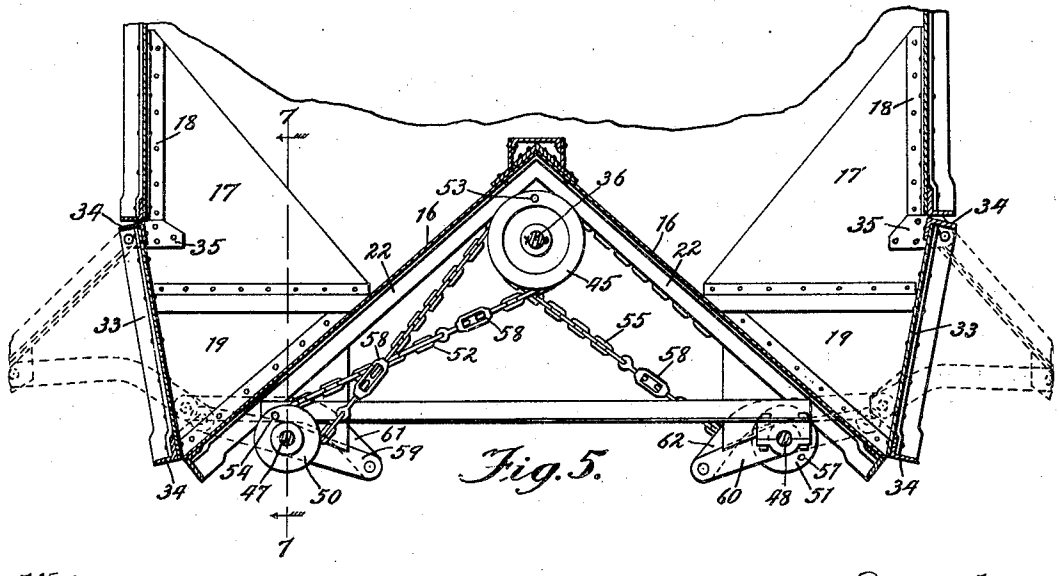


Fig. 5.

Witnesses:
Isa D. Perry
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No. 770,306. PATENTED SEPT. 20, 1904.

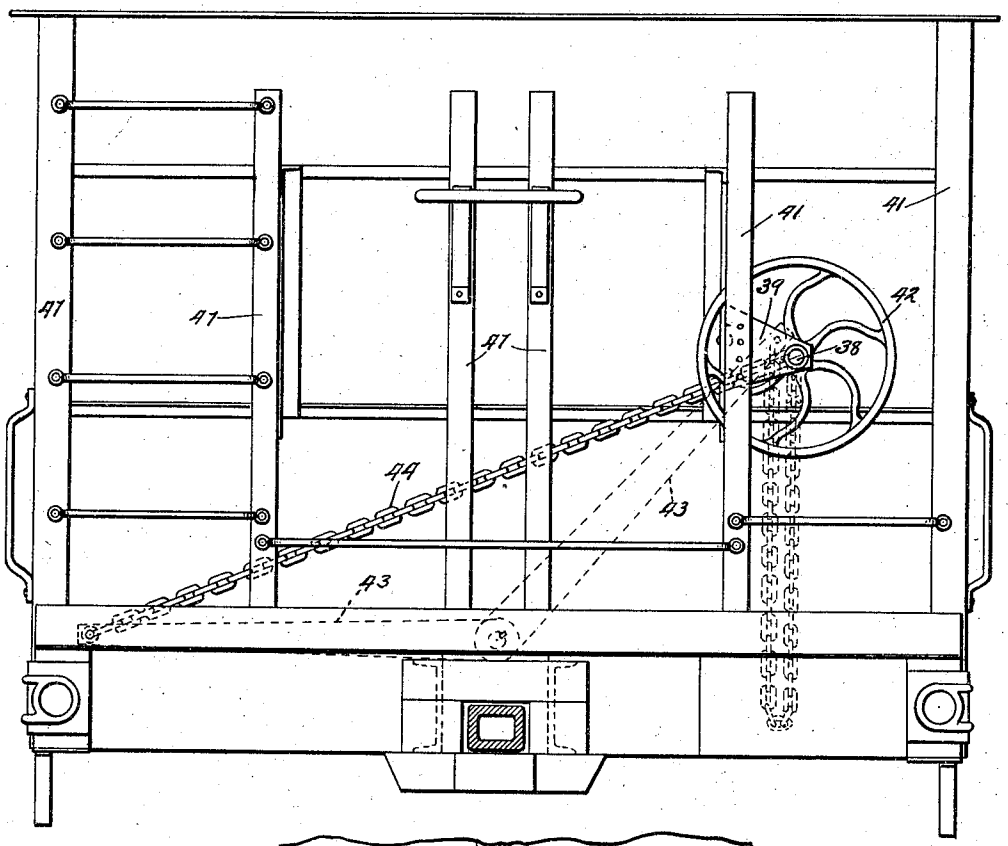
W. Q. OLDEN.

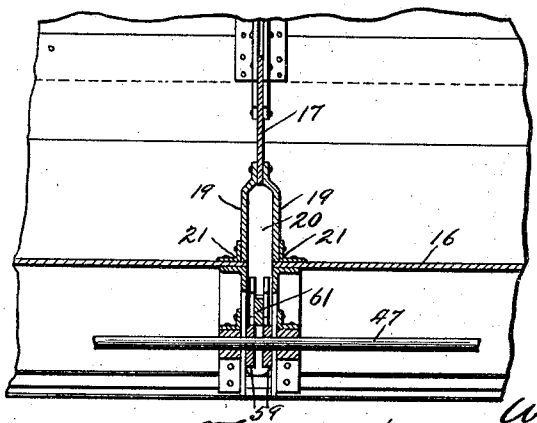
STEEL SIDE DUMP CAR.

APPLICATION FILED JULY 3, 1903.

NO MODEL. 7 SHEETS—SHEET 4.

Fig. 6.





Witnesses:
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Fig. 7.

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W. Q. OLDEN.

STEEL SIDE DUMP CAR.

APPLICATION FILED JULY 3, 1903.

NO MODEL. 7 SHEETS—SHEET 5.

Fig. 8.

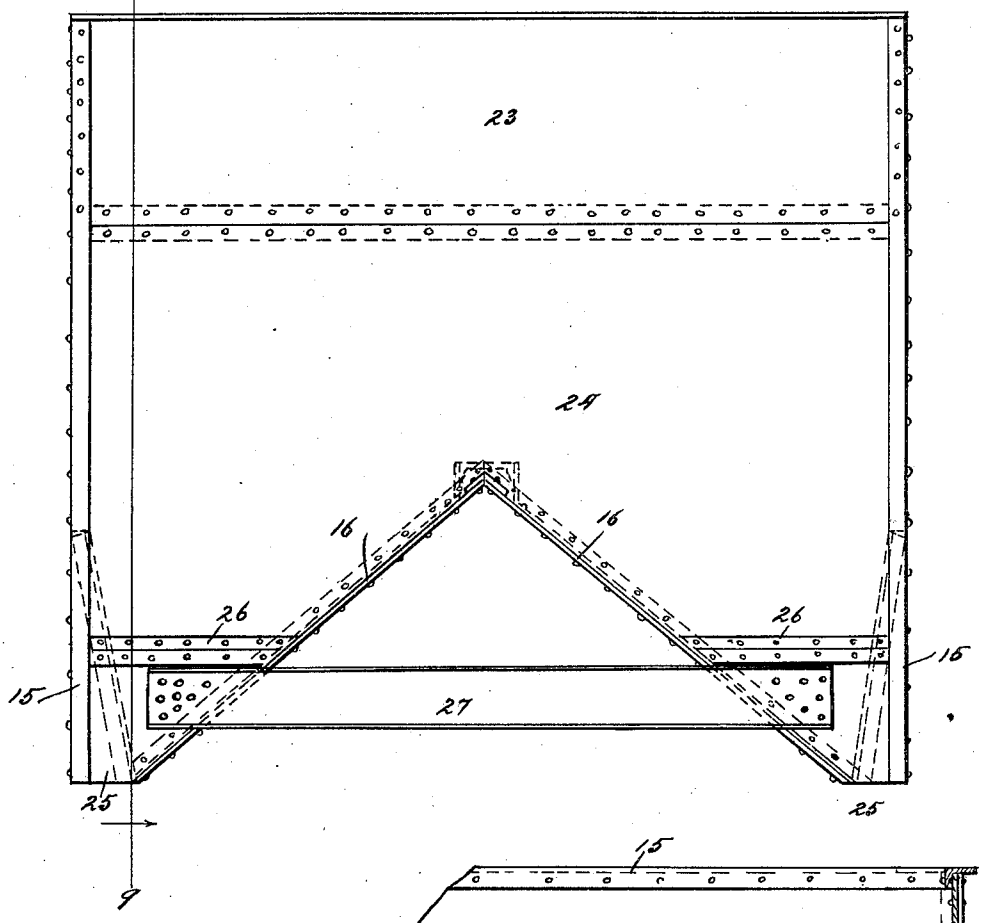
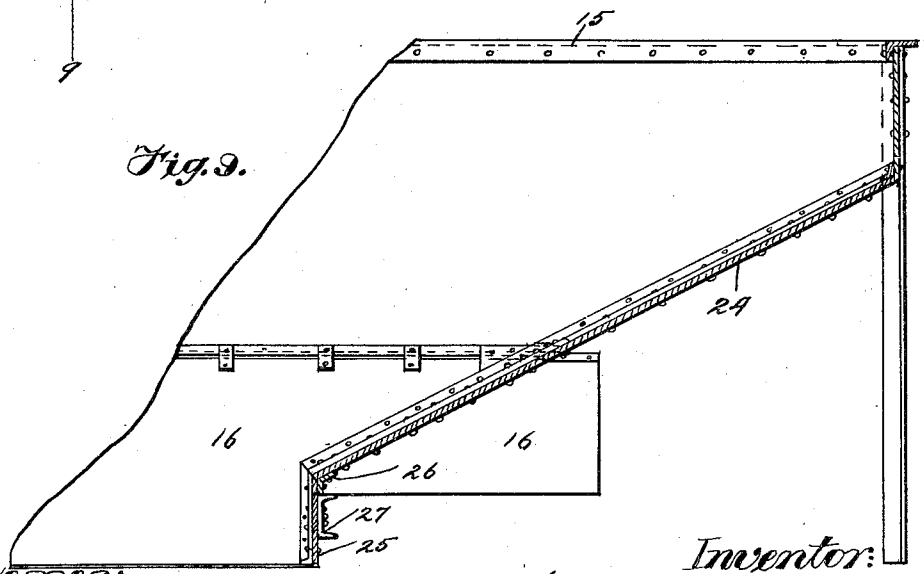


Fig. 9.



Witnesses:
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No. 770,306. PATENTED SEPT. 20, 1904.

W. Q. OLDEN.

STEEL SIDE DUMP CAR.

APPLICATION FILED JULY 3, 1903.

NO MODEL. 7 SHEETS—SHEET 6.

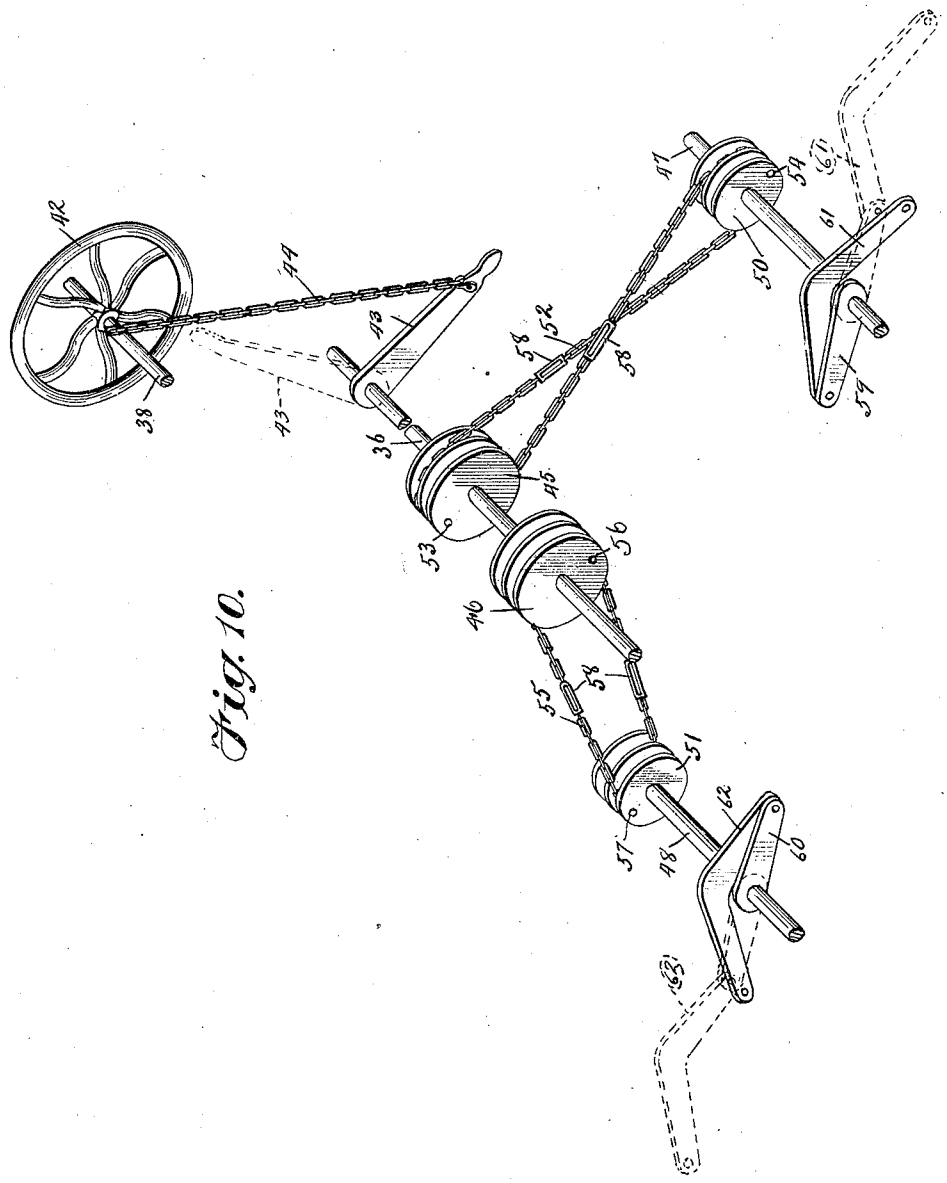


Fig. 10.

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No. 770,306. PATENTED SEPT. 20, 1904.

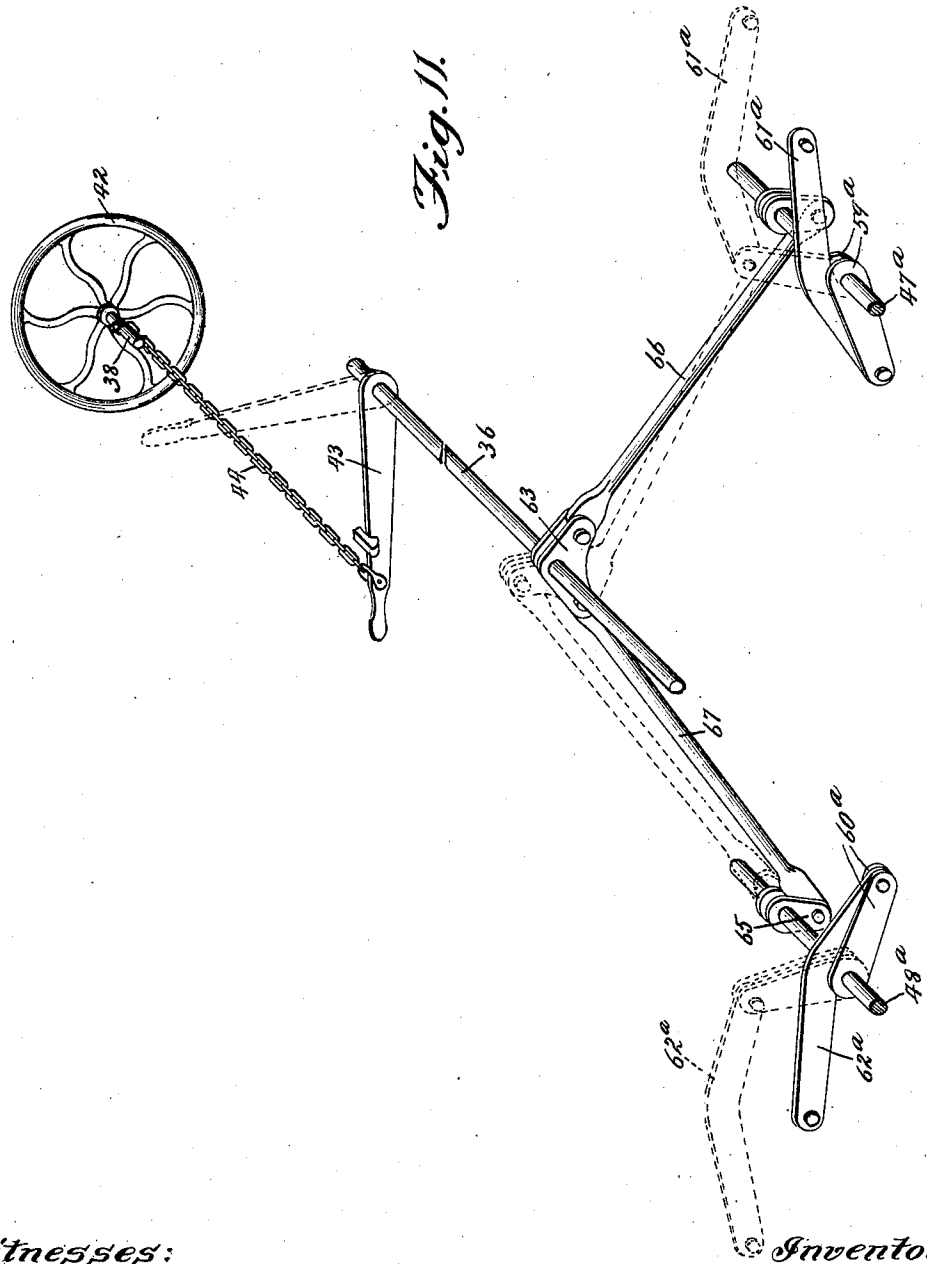
W. Q. OLDEN.

STEEL SIDE DUMP CAR.

APPLICATION FILED JULY 3, 1903.

NO MODEL. 7 SHEETS—SHEET 7.

Fig. 11.



Witnesses:
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Attys

No. 770,306. Patented September 20, 1904.

UNITED STATES PATENT OFFICE.

WILLIAM Q. OLDEN, OF CHICAGO, ILLINOIS, ASSIGNOR TO HIMSELF AND ALEXANDER F. BANKS, OF CHICAGO, ILLINOIS, AND ROBERT B. CAMPBELL, OF JOLIET, ILLINOIS.

STEEL SIDE-DUMP CAR.

SPECIFICATION forming part of Letters Patent No. 770,306, dated September 20, 1904.

Application filed July 3, 1903. Serial No. 164,199. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM Q. OLDEN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Steel Side-Dump Cars, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to steel side-dump cars; and one of its principal objects is to provide a new and improved form of car from which the load may be dumped upon each side of the track.

Another object of my invention is to provide new and improved mechanism for operating the swinging doors on side-dump cars, and particularly to provide a new and improved form of mechanism by which the doors may be opened to dump the load and closed again and by means of which they will be automatically locked in both their closed and open positions.

Another object of my invention is to provide new and improved features of construction in steel side-dump cars hereinafter pointed out specifically in detail.

In the accompanying drawings, Figure 1 is a side elevation partially in vertical longitudinal section. Fig. 2 is a side view of one of the side girders of the car. Fig. 3 is a top or plan view partially in horizontal section. Fig. 4 is an enlarged cross-section upon line 4 4 of Fig. 1. Fig. 5 is an enlarged cross-section on line 5 5 of Fig. 1. Fig. 6 is an enlarged detail, being an end view of the car-body viewed from the right in Fig. 1. Fig. 7 is an enlarged detail, being a section on line 7 7 of Fig. 5. Fig. 8 is an enlarged detail, being an end view of the car-body with the parts outside of the car-body removed. Fig. 9 is an enlarged detail, being a vertical longitudinal section of one end of the car-body. Fig. 10 is an enlarged detail, being an isometric view of the apparatus for opening and shutting the car-doors; and Fig. 11 is an enlarged detail, being a modification of the parts shown in Fig. 10.

Referring to the drawings, 12 indicates trucks, of any well-known form and description, upon which the other parts of the car are supported.

13 indicates body-bolsters, which are preferably formed of two plates of steel or other suitable material, strengthened by suitable angle-irons, and secured to and supported upon the trucks 12.

14 indicates side girders, which are preferably formed of several plates of steel suitably riveted or otherwise secured together and suitably stiffened by angle-irons 15, so as to form a girder and forming the sides of the car of the shape shown in Fig. 2. The side girders 14 are riveted, by means of suitable angle-irons, to the body-bolsters 13.

16 indicates the floor, which is preferably formed of steel plates riveted together by means of suitable angle-irons. The floor 16 is roof-shaped—that is to say, it slopes downward upon each side of its median longitudinal line toward the side of the car. The side girders 14, as is best shown in Fig. 1, are cut away in their central lower portion to form an opening 32 above the roof-shaped floor, through which the load of the car may be dumped. The openings 32 upon each side of the car are closed by the doors suspended from and hinged to the side girders in the manner hereinafter described.

The floor 16 is suspended from the side girders by means of gusset-plates 17, which are connected to the side girders by means of angle-irons 18, riveted to the gusset-plates and to the side girders. (See Fig. 5.) The lower portion of the gusset-plates 17 is composed of two plates 19, riveted to the plates 17. The plates 19 are of triangular shape, as is best shown in Fig. 5, and are separated from one another, so as to inclose and house over slots 20, cut through the floor 16 upon each side and near the lower edges for the purpose of permitting the passage through them of levers connected with the doors and hereinafter described. The plates 19 are secured to the floor of the car 16 by means of angle-irons 21, riveted to the plates 19 and to the floor 16. The plates 17, together with the plates 19, form

practically continuous supports or gusset-plates, which, as was said above, suspend the floor 16 from the side girders 14. The ends of the floor 16, cut away partially from below, as is best shown in Fig. 1, project outward through the sloping end plates hereinafter described and are secured to the body-bolsters 13 by means of suitable angle-irons. The floor 16 is strengthened by suitable angle-irons 22 riveted thereto.

23 (see Figs. 8 and 9) indicates an end girder, preferably formed of a plate of steel and riveted to the side girders by means of suitable angle-irons. 24 indicates end plates, which are secured by suitable angle-irons to the side girders 14. The end plates 24 slope downward and inward to positions between the trucks 12 and are secured, by means of suitable angle-irons and rivets, to the body-bolsters 13. The plates 24 are also cut away in triangular shape from below, as is best shown in Fig. 8, so as to rest over the roof-shaped floor 16, to which the end plates 24 are secured by suitable angle-irons and rivets. 25 indicates steel plates, which are secured to the lower ends of the sloping plates 24 upon each side of the triangular opening by means of suitable angle-irons 26 and rivets. They are also secured by suitable angle-irons 26^a and rivets to the floor 16. The plates 25 are vertical and form practically a continuation of the plates 24 to form the ends of the car-body and inclose the same. I prefer to form the end girder 23, the sloping plate 24, and the plates 25 of separate plates, secured together by angle-irons and rivets, as this is the preferable form of construction; but it is obvious, of course, that these portions might be formed of one plate bent to suitable shape.

From the above description it will be obvious that the side girders 14, floor 16, and end portions, composed of the end girders 23, sloping plates 24, and plates 25, form an open-top car, completely inclosed at sides, ends, and bottoms, with the exception of the opening left in the middle portion at each side by reason of the cut-away portion of the side girders, (shown in Fig. 2,) as above described, for the purpose of dumping the load.

Referring particularly to Figs. 1, 4, and 8, 27 indicates channel-irons, which extend across the car from side to side outside of the plates 25, to which they are secured by suitable rivets, as is best shown in Fig. 8. 28 indicates plates which extend across from side to side below the floor 16. The plates 28 extend outward above the channel-irons 27 and are secured thereto by rivets. The ends of the plates, as is best shown in Fig. 4, are bent downward to conform with the slope of the floor 16 and are secured thereto by rivets. The plates 28 are strengthened by suitable angle-irons 29. 30 indicates center sills, which are preferably formed of two channel-irons, as is best shown in Fig. 4, set parallel with each other. The sills 30 extend outward to the end of the car and are adapted to contain draft-rigging 31, which may be of any suitable form and description and supported by the center sills in any suitable manner. As this draft-rigging forms no part of my present invention and may be of any approved form, it is believed it needs no further description here. The channel-irons forming the center sill 30 pass through suitable openings in the body-bolsters 13 and are secured to the body-bolsters by suitable angle-irons riveted to the body-bolsters and to the channel-irons forming the sills 30. The sills 30 are also secured by rivets to the channel-irons 27 and to the plates 28.

As best shown in Fig. 1, the sills 30 extend only partially under the car and may be called for purposes of description "interrupted" sills. By means of their connection with the body-bolsters, with the floor, and with the side girders of the car by means of the channels 27 and plates 28 the floor of the car practically forms a continuation of the central sills, and the buffing strains caused by the shocks on the car either in the nature of thrust or pull are received first upon the draft-rigging and transmitted to the center sills 30 and thence distributed throughout the floor and sides of the car. By thus interrupting the sills a considerable saving in weight and cost of manufacture is brought about, and at the same time space is left in the center of the car to contain and permit the free working of the mechanism hereinafter described for operating the swinging doors hereinafter described.

33 indicates swinging doors, which are preferably formed of steel plates braced by suitable angle-irons 34. The doors 33 are hinged at their tops to suitable supports 35, carried by the side girders 14, so as to fill in the opening caused by the cut-away portion 32 in the side girders 14 between the lower edges of the side girders and the outer edges of the floor 16. The doors 33, as is best shown in Fig. 5, are arranged to swing outward, so that when they are swung outward the load will be dumped, guided to the center or discharge portion of the car by the sloping end plates 24 and toward each side of the car by the sloping floor 16.

36 indicates a shaft which is journaled in one of the body-bolsters 13 and in suitable bearings 37 in the center of the car below the floor 16, and its outer end, as is best shown in Fig. 1, projects outward beyond the body of the car over the truck 12.

38 indicates a short shaft which is journaled in suitable bearings 39 40, secured, respectively, to uprights 41 and to the plate 24. 42 indicates a hand-wheel which is keyed to the outer end of the shaft 38.

43 indicates a lever which is keyed or otherwise secured to the end of the shaft 36 and when the doors 33 are closed lies normally horizontally, as is shown in Figs. 3 and 6.

44 indicates a chain one end of which is secured to the shaft 38 and the other to the outer end of the lever 43. By rotating the hand-wheel 42 the chain 44 will be wound upon the shaft 38, the lever 43 lifted, and the main shaft 36 rotated.

45 46 indicate grooved pulleys which are keyed or otherwise secured to the shaft 36 near the center of the car.

47 48 indicate rock-shafts which are journaled in suitable bearings 49 below the floor 16 and near each side thereof.

50 51 indicate pulleys which are keyed or otherwise secured, respectively, to the rock-shafts 47 48.

52 indicates a chain which passes around the pulley 45 and, crossing itself, passes around pulley 50.

53 indicates a pin in the pulley 45, which passes through a link in the chain 52, and 54 indicates a pin in the pulley 50, which passes through a link in the chain 52.

55 indicates a chain which passes around the pulleys 46 and 51.

56 indicates a pin in the pulley 46, which passes through a link in the chain 55, and 57 indicates a pin in the pulley 51, which passes through a link in the chain 55. The chains 52 and 55 are provided with turnbuckles 58. When the lever 43 is raised, as above described, and the shaft 36 rotates, the rock-shafts 47 and 48 will be rocked in opposite directions by means of the chain-and-pulley connections above described.

59 60 indicate arms which are secured, respectively, to the rock-shafts 47 48. As I prefer to build the car and construct these devices, two of these arms are located outside of each end of the car-bottom, with two or more of these arms between them on each of said shafts. The arms 59 60, as is best shown in Figs. 10 and 11, are arranged in pairs, with a space between them for the connection with the bent lever hereinafter described. The intermediate arms 59 60 are located opposite the slots 20 in the floor above described.

61 62 indicate bent levers which are pivoted between the pairs of arms 59 90, respectively, and extend over the rock-shafts 47 48, their forward ends being pivotally connected with the bottoms of the doors 33. The levers 61 62, which are on the portions of the rock-shafts 47 48 between the ends thereof pass through the slots 20 in the floor 16 and, as was said above, are housed in and protected from the load carried by the car by the plates 19. The levers 61 62 are bent in order that when the doors 33 are in their closed position they may pass centers with the pivotal point of their connection with the arms 59 60 and with the centers of the rock-shafts 47 48.

The position of the levers and arms with the doors closed is shown in solid lines in Figs. 4 and 5. The open position of the doors and the position of the arms and bent levers are shown in dotted lines in the same figures. From these figures it will be seen that when the doors are closed the centers of the pivotal connections of the levers 61 62 with the doors and with the arms 59 60 are below the rock-shafts 47 48, by which the doors are locked in their closed position against the pressure of the load until the lever 43 is raised. As soon as the lever 43 is raised, so as to lift the pivotal connections of the arms and levers above the rock-shafts 47 48, the weight of the load will ordinarily force the doors open to their farthest limit, carrying the lever 43 up with them. In case the doors should not, however, thus open by the pressure of the load they may be opened to their full extent by farther rotating the hand-wheel 42, winding the chain 44 still farther upon the shaft 38 and lifting the lever 43 with it, thus forcing the doors open to their fullest extent. When the doors are opened to their full limit, as is best shown in Fig. 5, the arms and levers again pass centers, whereby they are held in their open position. When it is desired to close the doors, the lever 43 is thrown downward by hand and the above operations are reversed.

Fig. 11 shows a modification of the mechanism for opening the doors, in which links are used to connect the shaft 36 to the rock-shafts instead of pulleys and chains.

Referring to Fig. 11, 36 indicates the central shaft, as above described, 43 the lever secured to the shaft, 38 the short shaft, 42 the hand-wheel secured thereto, and 44 the chain connecting the shaft 38 with the lever 43, and all operating in the manner above described. 47^a 48^a indicate rock-shafts journaled in bearings in the same manner as the rock-shafts 47 48 above described. 59^a 60^a indicate the pairs of arms secured, respectively, to the rock-shafts 47^a 48^a. 61^a 62^a indicate the bent levers, pivotally connected at their inner ends with the arms 59^a 60^a, respectively, and at their outer ends adapted to be pivotally connected with the lower ends of the doors 33. (Not shown in Fig. 11.) The construction and operation of the arms 59^a 60^a and bent levers 61^a 62^a are precisely as above described in describing the corresponding parts 59 60 61 62. 63 indicates a bell-crank lever rigidly secured to the shaft 36 near the center of the car and beneath the floor. 64 65 indicate arms which are rigidly secured to the rock-shafts 47^a 48^a, respectively, and extend downward therefrom. 66 indicates a link pivotally connected at one end with the arm 64 and at the other end with the end of the bell-crank lever 63 nearest to the rock-shaft 47^a. 67 indicates a link pivotally connected at one end with the arm 65 and at the other end with the end of the bell-crank lever 63 which is nearest the rock-shaft 48^a. By rotating the hand-wheel 42 the lever 43 will be lifted and the shaft 36 given a partial rotation, and by means of the bell-crank lever

63 and connecting-links 66 67 the rock-shafts 47^a 48^a will be rocked, throwing the arms 59^a 60^a and levers 61^a 62^a into the positions shown in dotted lines in Fig. 11 and opening the doors. As the construction and operation of the said levers and arms are exactly the same as above described, the doors will be locked in both their open and closed positions, as above described. The construction shown in Fig. 11 is therefore an equivalent of the construction shown in the other figures.

It will be of course obvious that in the operation of my improved mechanism, whether in the form shown in Fig. 10 or in the form shown in Fig. 11, the construction is such that too great rotation of the shafts in either direction is controlled and prevented. By referring particularly to Fig. 7 it will be seen that the slot 20 is closed at the bottom. When the doors are in their open positions therefore, as best shown in dotted lines in Fig. 5, the ends of the levers 59 60 or 59^a 60^a shown in the two constructions, respectively, will contact with the bottom of the slot and will thereby be prevented from rotating any farther. When the doors are in their closed positions, the bottom of the arms 61 62 or 61^a 62^a in the construction shown in Fig. 11 will bear, respectively, upon the shafts 47 48 or 47^a 48^a, and this will be prevented from moving any farther and will check the further rotation of the several shafts.

That which I claim as my invention, and desire to secure by Letters Patent, is—

1. In a side-dump car, the combination with a roof-shaped floor sloping downward from its median longitudinal line toward each side of the car, a discharge-opening in each side of said car, outward-swinging doors hinged to the sides of the car and suspended over said discharge-openings, of a system of compound levers upon each side of said car below said floor, connected with said doors and adapted to pass centers with each other when said doors are both in their open and closed positions, and mechanism for operating said levers, substantially as described.

2. In a side-dump car, the combination with a roof-shaped floor sloping downward from its median longitudinal line toward each side of the car, a discharge-opening in each side of said car, outward-swinging doors hinged to the sides of the car and suspended over said discharge-openings, of rock-shafts upon each side of said car below said car-floor, arms on said rock-shafts, levers pivoted to said arms and to said doors, said arms and levers being adapted to pass centers with the respective rock-shafts when said doors are in closed position, and means for operating said rock-shafts, substantially as described.

3. In a side-dump car, the combination with a roof-shaped floor sloping downward from its median longitudinal line toward each side of the car, a discharge-opening in each side of said car, outward-swinging doors hinged to the sides of the car and suspended over said discharge-openings, of rock-shafts upon each side of said car below said car-floor, arms on said rock-shafts, levers pivoted to said arms and to said doors, said arms and levers being adapted to pass centers with the respective rock-shafts when said doors are in both open and closed positions, a central shaft extending longitudinally of said car below said floor, means for rotating said central shaft, and connections between said central shaft and said rock-shafts, substantially as described.

4. In a side-dump car, the combination with a roof-shaped floor sloping downward from its median longitudinal line toward each side, a discharge-opening in each side of said car and outward-swinging doors hinged to the sides of said car and suspended over said discharge-openings, of a main shaft extending longitudinally of said car below said floor, means for rotating said shaft, rock-shafts upon each side of said car below said floor, arms on said rock-shafts, bent levers pivotally connected with said arms and with said doors, said arms and levers being adapted to pass centers with said rock-shafts when said doors are in both their open and closed positions, and connections between said shaft and said rock-shafts adapted to rock said rock-shafts when said main shaft is rotated, substantially as described.

5. In a side-dump car, the combination with a roof-shaped floor sloping downward from its median longitudinal line toward each side of said car, a discharge-opening in each side of said car and outward-swinging doors hinged to the sides of said car and suspended over said discharge-openings, of a main shaft extending longitudinally of said car below said floor, a lever secured to the outer end of said main shaft, means for swinging said lever, rock-shafts upon each side of said car below said floor, arms on said rock-shafts, bent levers pivotally connected with said arms and with said doors, said arms and said levers being adapted to pass centers with said rock-shafts when said doors are open and closed, and connections between said shaft and said rock-shafts adapted to rock said rock-shafts when said main shaft is rotated, substantially as described.

6. In a side-dump car, the combination with a roof-shaped floor sloping downward from its median longitudinal line toward each side of said car, a discharge-opening in each side of said car and outward-swinging doors hinged to the sides of said car and suspended over said discharge-openings, of a main shaft extending longitudinally of said car below said floor, a lever secured to the outer end of said main shaft, a short shaft journaled upon the end of said car, a chain secured to said short shaft and to said lever, a hand-wheel secured to said short shaft, rock-shafts upon each side of said car below said floor, arms on said rock-

shafts, bent levers pivotally connected with said arms and with said doors, said arms and said levers being adapted to pass centers with said rock-shafts when said doors are opened and closed, and connections between said main shaft and said rock-shafts adapted to rock said rock-shafts when said main shaft is rotated, substantially as described.

7. In a side-dump car, the combination with a roof-shaped floor sloping downward from its median longitudinal line toward each side of said car, a discharge-opening in each side of said car and outward-swinging doors hinged to the sides of said car and suspended over said discharge-openings, of a main shaft extending longitudinally of said car below said floor, means for rotating said main shaft, rock-shafts upon each side of said car below said floor, arms on said rock-shafts, bent levers pivotally connected with said arms and with said doors, said arms and said levers being adapted to pass centers with said rock-shafts when said doors are opened and closed, pulleys secured to said main shaft, pulleys secured to said rock-shafts, chains connecting said pulleys on said main shaft with the pulleys on said rock-shafts, and means for operating said main shaft, substantially as described.

8. In a side-dump car, the combination with a roof-shaped floor sloping downward from its median longitudinal line toward each side of said car and having slots upon each side near the lower edges, housings over said slots above said floor, a discharge-opening in each side of said car and outward-swinging doors hinged to the sides of said car and suspended over said discharge-openings, of rock-shafts below said floor on each side of said car, a plurality of arms on said rock-shafts, bent levers pivoted to said arms and to said doors, said arms and bent levers being opposite said slots in said floor and adapted to pass through the same and being adapted to pass centers with the respective rock-shafts when said doors are opened and closed, and means for operating said rock-shafts, substantially as described.

9. In a steel side-dump car, the combination with trucks, body-bolsters carried by said trucks, a car-body supported upon and secured to said body-bolsters and having a roof-shaped floor extending downward on each side of its central longitudinal line toward the sides of the car, a discharge-opening in each side of said car and swinging doors suspended over said discharge-openings, of interrupted center sills, adapted to support draft-rigging, passing through said body-bolsters and secured thereto, plates secured to said floor below the same and below said sills and secured to said sills, and mechanism located below the floor of said car and adapted to open and close said doors, substantially as described.

10. In a steel side-dump car, the combination with trucks, body-bolsters carried by said trucks, plates forming side girders adapted to form the sides of said car and riveted to said body-bolsters, a roof-shaped floor suspended from and carried by said side girders and sloping downward toward each side of the car from its longitudinal center, end plates sloping downward and inward to positions between said trucks and secured to said side girders and to said body-bolsters, a discharge-opening in each side of said car, outward-swinging doors suspended from said side girders over said discharge-openings, of interrupted center sills, adapted to support draft-rigging, passing through said body-bolsters and riveted thereto and extending only part way under said car, plates secured to said floor below the same and below said center sills and riveted to said center sills, and mechanism located below the floor of said car connected with said swinging doors and adapted to open and close the same and secure them in both their open and closed positions, substantially as described.

11. In a steel side-dump car, the combination with trucks, body-bolsters carried by said trucks, plates forming side girders adapted to form the sides of said car and riveted to said body-bolsters, a roof-shaped floor suspended from and carried by said side girders and sloping downward toward each side of the car from its longitudinal center, end plates sloping downward and inward to positions between said trucks and secured to said side girders and to said body-bolsters, a discharge-opening in each side of said car, outward-swinging doors suspended from said side girders over said discharge-openings, of interrupted center sills, adapted to support draft-rigging, passing through said body-bolsters and riveted thereto and extending only part way under said car, plates secured to said floor below the same and below said center sills and riveted to said center sills, a system of compound levers located below said floor and connected with said doors, adapted to pass centers when said doors are in their open and closed positions, and mechanism for operating said levers, substantially as described.

12. In a steel side-dump car, the combination with trucks, body-bolsters carried by said trucks, plates forming side girders adapted to form the sides of said car and riveted to said body-bolsters, a roof-shaped floor suspended from and carried by said side girders and sloping downward toward each side of the car from its longitudinal center, end plates sloping downward and inward to positions between said trucks and secured to said side girders and to said body-bolsters, a discharge-opening in each side of said car, outward-swinging doors suspended from said side girders over said discharge-openings, of interrupted center sills adapted to support draft-rigging passing through said body-bolsters and riveted thereto and extending only part way under said car, plates secured to said

floor below the same and below said center sills and riveted to said center sills, a main shaft extending longitudinally under said floor, means for rotating said main shaft, rock-shafts journaled below said floor upon each side of said car, arms secured to said rock-shafts, bent levers pivotally connected with said arms and with said doors, said arms and said levers adapted to pass centers with said rock-shafts when said doors are opened and closed, and connections between said main shaft and said rock-shafts adapted to rock said rock-shafts when said main shaft is rotated, substantially as described.

13. In a car of the type described, the combination with the chutes and hinged doors, of a shaft passing along beneath the chutes at each side of the car, toggle-arms on said shafts at each side of the doors, links coupling said arms to the sides of the doors, and means for rotating the shafts simultaneously in either direction to open and close said doors, substantially as described.

14. In a car of the type described, the combination with the chutes and hinged doors, of a system comprising a toggle-shaft with arms and links coupled to the sides of the doors from beneath the chutes whereby all of the doors of a side may be simultaneously opened and closed, an operating-shaft running in from the end of the car, connections between said operating-shaft and said toggle-shaft whereby motion may be imparted thereto in either direction, and a hand-wheel on the operating-shaft at the end of the car by which to turn said shaft, substantially as described.

15. In a side-dump car, the combination with the discharge-chutes and hinged doors suspended over said discharge-chutes, of a shaft beneath said discharge-chutes upon each side of the car, toggle-arms upon said side shafts, links coupling said toggle-arms to said doors, a central shaft running in from the end of the car, connections between said central shaft and said side shafts whereby said side shafts may be simultaneously rotated to open and close said doors, and means for rotating said central shaft, substantially as described.

WILLIAM Q. OLDEN.

Witnesses:
HELEN M. COLLIN,
MINNIE A. HUNTER.