

J. R. BOWLING.

DUMP CAR.

APPLICATION FILED APR. 9, 1908.

Patented May 28, 1912.

4 SHEETS—SHEET 1.

1,027,809.

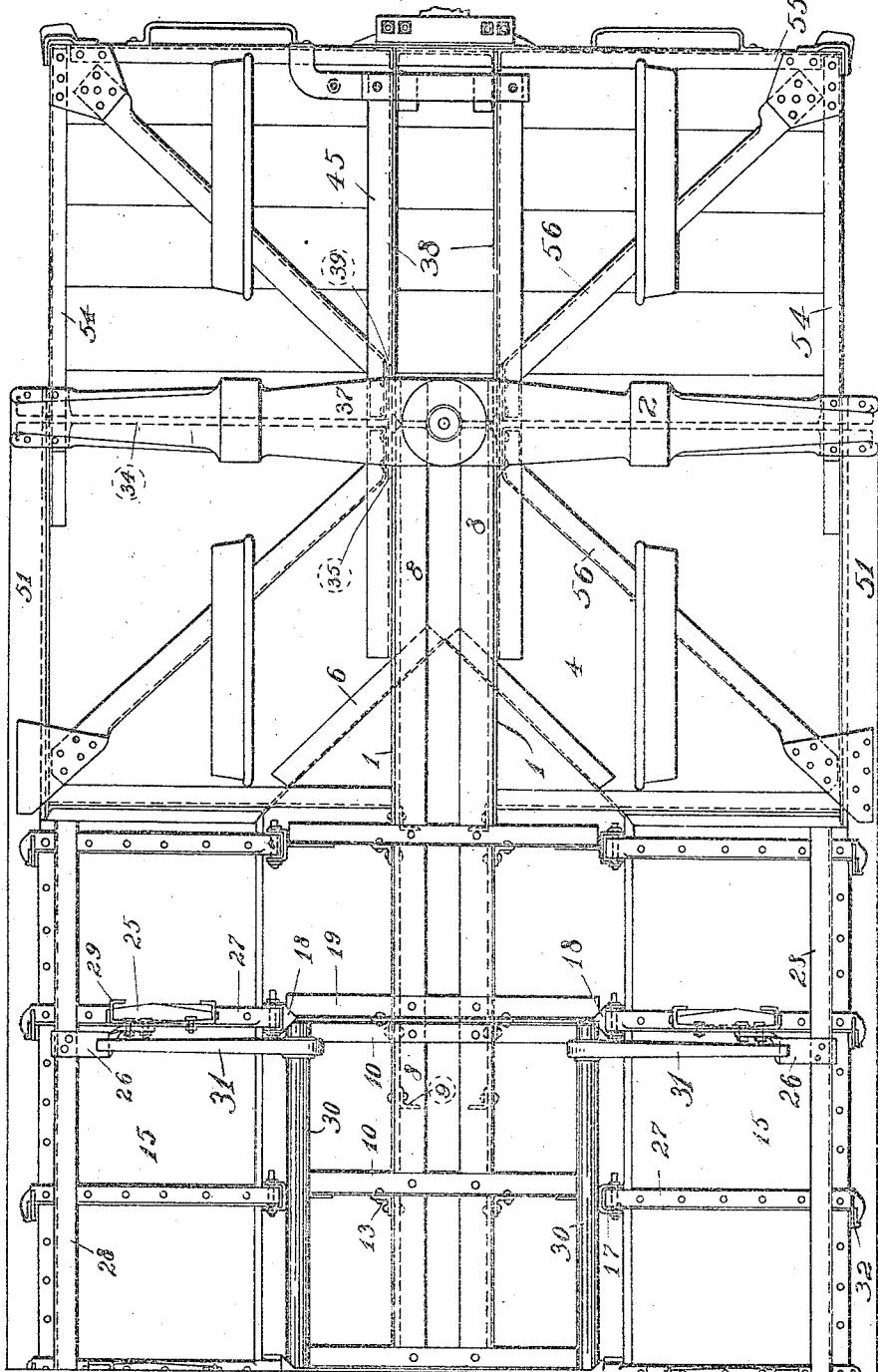


Fig. 1.

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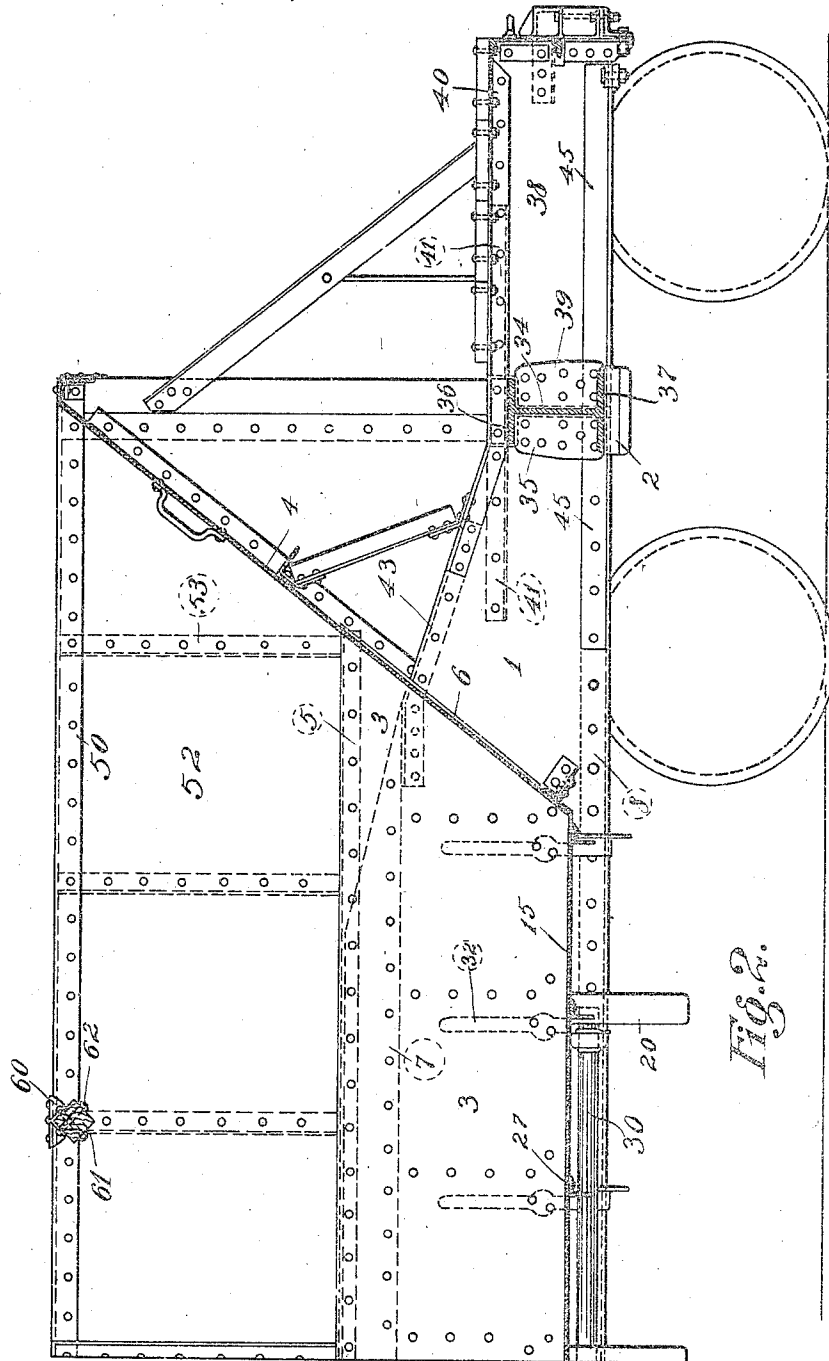
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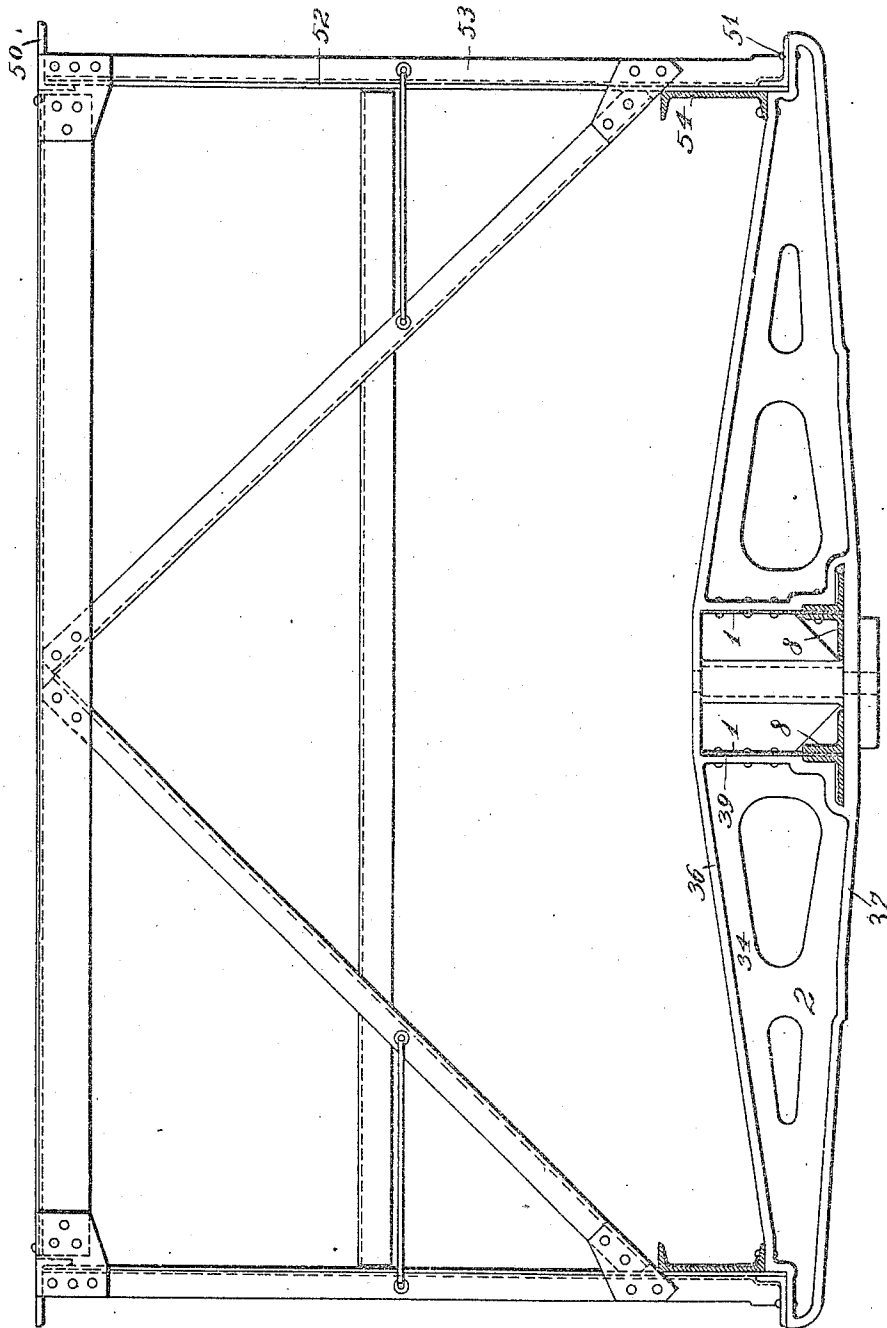
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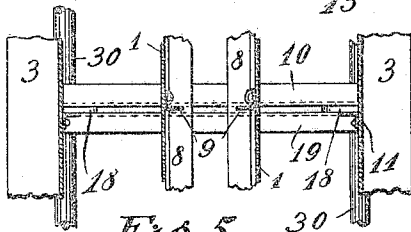
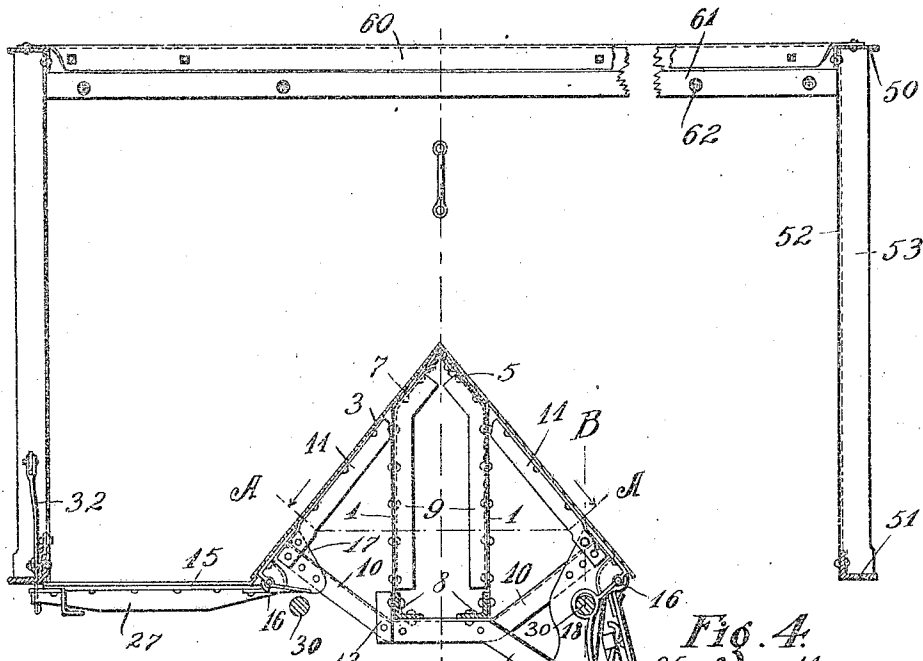


Fig. 5.

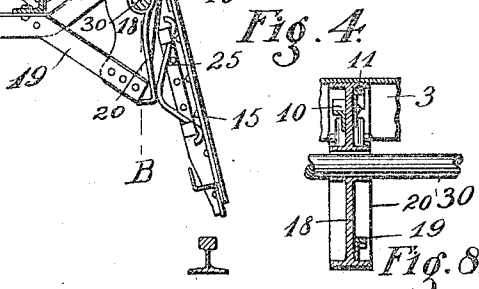


Fig. 8.

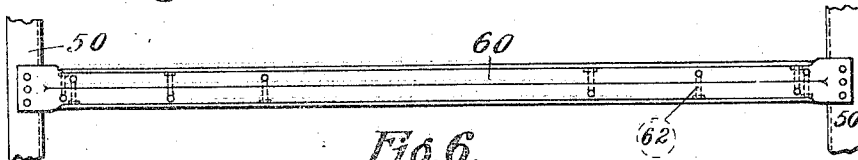


Fig. 6.

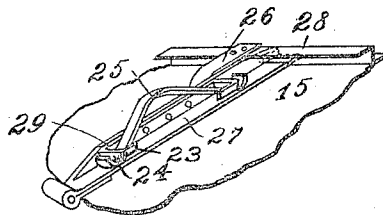


Fig. 7.

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UNITED STATES PATENT OFFICE.

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DUMP-CAR.

1,027,809.

Specification of Letters Patent.

Patented May 28, 1912.

Application filed April 9, 1906. Serial No. 310,803.

To all whom it may concern:

Be it known that I, JOSEPH R. BOWLING, residing at St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Dump-Cars, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The object of this invention is to provide a steel dump car in a form which shall be both efficient in service and cheap in construction. The car is of the Ingoldsby type, wherein there is a central longitudinal beam, to the opposite edges of which are pivoted dumping doors adapted to form a portion of the load-sustaining floor and swing downward to discharge the load. The present invention is concerned with the structure of such longitudinal beam, with the bolster and the connections thereto of the central beam and the draft members, with rub plate and spring holding device on the dumping doors, and with a cross member for bracing the car sides at their upper edges. These features of invention are hereinafter more fully explained and are definitely summarized in the claims.

In the drawings, Figure 1 is a bottom plan of a portion of a car embodying my invention; Fig. 2 is a vertical section thereof; Fig. 3 is an end view sectioned beyond the bolster; Fig. 4 is a cross section of the car; Fig. 5 is a detail in substantially horizontal section on the line A--A of Fig. 4; Fig. 6 is a plan showing the cross strut-tie; Fig. 7 is a bottom perspective showing the rub plate and spring holding device on the door, and Fig. 8 is a detail in vertical section on the line B--B of Fig. 4.

The central longitudinal beam is of the box girder type, including a pair of parallel plates 1 which extend from the bolster 2 at one end of the car to the bolster at the other end of the car. The upper edges of these plates are cut off diagonally as they approach the bolster, as shown in Fig. 2. The central beam has cover plates 3 extending from one inclined end floor 4 to the other and secured to the upper bent portion 7 of the plates 1, which lie along and are

riveted to the cover plates intermediate of the end floors. Beneath the ridge thus formed is an angle bar 5. The cover plates are secured at their ends to the end floors, being flanged onto the underside thereof, as shown at 6 in Figs. 1 and 2.

The plates 1 carry angles 8 along their lower edges while at intervals are vertical angles 9 riveted to the inner sides of the plates and bent inward at their upper ends and riveted to the ridge. Cross angle bars 10 pass beneath the horizontal angles 8, being riveted thereto, and are then bent upward approximately normally to the ridge plate adjacent to which they terminate. The ends of these bars 10 are riveted to reinforcing angles 11, which are riveted to the underside of the ridge plate.

The dumping doors 15 are hinged at intervals to the longitudinal beam. As shown in the left hand half of Fig. 4, this hinging may be accomplished by mounting the hinge pintle 16 of the door in a flanged bracket 17 which is riveted to the ridge plate, to the bar 11 and to the bar 10. At intervals, bumpers are employed to receive the impact of the dropping door. The right hand half of Fig. 4 is in a different plane from the left hand half, being taken just in front of one of such bumpers. There the bracket 18 which the hinge pintle is mounted is riveted to the ridge plate and to the bars 10 and 11, and also extends downwardly and has riveted to it an angle bar 19 which extends beneath the box girder and is riveted to the bar 10 and to the horizontal angles 8. This bracket 19 is preferably a casting having a flange 20 along its outer edge, which, as shown in Fig. 4, is adapted to be engaged by the spring 25 carried on the underside of the door and form a bumper therefor. These bumpers are employed at intervals and are located opposite each other, the bar 19 extending across from bumper to bumper. At the hinges where the bumpers are not employed, the brackets 17 are used and the bars 10 are braced by short angle bars 13 riveted to the bars 10 and to the plates 1 and angles 8.

The doors are raised by suitable rock

shafts 30 which carry arms 31 adapted to engage rub plates 26 carried by the door, as shown in Fig. 1. These rock shafts 30 are journaled in the brackets 18, the bracket 5 having a hollow boss for that purpose, as shown in Figs. 4 and 8.

The doors 15 have floor beams 27 in the form of angle bars riveted to their undersides, and along the underside of these doors near their edges are the Z-bars 28 through which the floor beams project. Riveted to the Z-bars and then being twisted at right angles and riveted to the flange of the floor beam are the rub plates 26 with which engage the raising arms 31 on the rock shafts 30. This provides a smooth and convenient surface for the ends of the raising arms to rub upon as the door is being raised. Hooked levers 32 may be provided on the car sides adapted to engage the projecting end to the floor beams to hold the doors in elevated position, as is usual with Ingoldsby cars.

The spring 25 which strikes the bumper 20 is carried by the door by means of a strap 29 which is riveted to the flange of the floor beam 27 and is bent across the spring at 24 and has its ends 23 then turned inwardly parallel with the main portion of the strap, as shown in Fig. 7. The portion 24 of this strap which crosses the spring holds it against the floor, while the ends 23 prevent lateral displacement of the spring. The spring, however, is free to flatten, sliding in opposite directions along the floor beam toward the edges of the door; this it does when it strikes the bumper 20.

The bolsters 2 extend through from one side of the car to the other and have cross webs to which the central sill plates 1 are riveted. Such cross webs are shown at 35 in Figs. 1 and 2. The bolster has a vertical web 34 and tension and compression flanges 36 and 37 along the upper and lower edges of the same so that it is approximately an I-beam. The end of the plates 1 is cut out, as shown by the dotted lines in Fig. 2, to fit into the bolster between the flanges 36 and 37 thereof, and such end is riveted to the cross-web 35. The draft plates 38 are located in alinement with the center-sill plates 1 and extend into the bolster on the other side and are riveted to the cross webs 39 thereof, as shown.

The present invention includes the forming of the bolsters, as shown and explained, and extending the center sill plates and draft plates into them and there securing them. The drawings show, along the upper edges of the draft plates, angle members 40 and 41 riveted thereto with their angles facing opposite directions. These members may extend across the top of the bolster and be riveted to opposite sides to the center-sill plates 1. A third angle member 43 may

be provided on the opposite side of the plate 1 from the angle member 41. The angles 8 at the lower edge of the center-sill plates 1 may extend to or through the bolster, and angles 45 may be secured to the lower edge of the draft plates and extend through the bolster, and be riveted along the lower edge of the center-sill plates on the opposite sides from the angles 8.

The car side is a plate-girder having an upper chord 50 and a lower chord 51, a plate 52, and the angle-bar bracing 53. The lower chord 51 rests on the end of the bolsters, as shown in Fig. 3, and forms a side sill of the car. An extension side sill in the form of a channel beam 54 is secured on the inner side of the car and extends across the bolster to the end sill 55. This extension-channel rests on and is riveted to the bolster, as shown. Diagonal bracing bars 56 are secured to the bolster flanges 35 and 39 and extend outwardly in four directions, as shown in Fig. 1, two of them being secured at their ends by connection plates to the corners of the car and the other two by connection plates to the side sills 51 adjacent to the ends of the dumping doors.

To effectively brace the car sides at their upper edges against lateral displacement inward or outward, I provide a very efficient and simple strut-tie. This is shown in Figs. 2 and 6 and consists of an angle bar 60 placed in the form of a ridge across the car and having its ends flattened and riveted to the upper chord 50 of the car side, and a wooden filling beam 61 beneath such ridge 60 and abutting the car sides and held by bolts 62 passing through the angle bar. This strut-tie is very cheap to construct, and is very strong and efficient in service.

The features of the angle bars crossing the bolster to connect the draft plates to the center-sill plates; the diagonal brace bars bent at their inner ends and riveted to the bolster flanges, as shown; the car sides seating on the bolster and the additional channel beam crossing the bolster and extending to the end of the car, are the invention of Frank S. Ingoldsby, being claimed in his application No. 312,535, filed April 19, 1906. Having thus described my invention, I claim:—

1. In a dump car, the combination of a pair of through bolsters, each having a vertical web with tension and compression flanges and lateral webs, and a longitudinal central member including a pair of plates extending from one bolster to the other and projecting into the bolster but secured to such lateral webs, and a surmounting ridge secured to inwardly bent upper edges of said plates.

2. In a dump car, in combination, a beam including a pair of vertical plates bent inward at their upper ends to form an inverted

V and a surmounting ridge and an angle tie bar extending beneath the vertical plates and connected at its ends with the ridge.

3. In a dump car, the combination of a beam including a pair of vertical plates with reinforcing angles along their lower edges and a surmounting ridge at the top, and tie bars consisting of angle irons arranged in pairs and extending beneath the plates and the reinforcing angles and connected at their ends with the ridge.

4. In a dump car, in combination, a beam including a pair of vertical plates and a surmounting ridge connected directly thereto, and a tie bar having webs at an angle to each other and extending beneath the vertical plates and connected at its ends with the ridge.

5. In a dump car, in combination, a beam including a pair of vertical plates and a surmounting ridge, a tie bar extending beneath the vertical plates and then inclining upwardly and connected at its ends with the ridge.

6. In a dump car, a central longitudinal beam including a pair of vertical plates and a surmounting cover, a tie bar extending beneath the vertical plates, and a member secured to the cover and to such tie bar and carrying a hinge-eye, combined with a door hinged at such eye.

7. In a dump car, the combination of a beam having a cover and longitudinal supporting members thereunder, a cross bar extending beneath such supporting members and connected at its ends with the cover, a second cross bar extending beneath such supporting members and secured thereto and bending downwardly on opposite sides thereof, a member riveted to the two bars, and door raising mechanism mounted in such member.

8. In a dump car, the combination of a beam having a cover and cross bars bracing the same, members secured to the cross bars, additional cross bars secured to such members and to the beam, dumping doors and door-raising mechanism mounted in such members.

9. In a dump car, a beam having a cover and cross bars bracing the same, combined with members secured to the cross bars, additional cross bars secured to such members and to the beam, and dumping doors hinged to said members.

10. In a dump car, the combination, with a hinged dumping door, of a beam having a cover and cross bars bracing the same and members secured to the cross bars, and additional cross bars secured to such members and to the beam, said members being formed to present bumpers to the doors.

11. In a dump car, a beam having a ridge or cover plates and cross bars bracing the same combined with members secured to the

cross bars, and additional cross bars secured to such members and to the beam, dumping doors hinged to said members, said members being formed to present bumpers to the doors hinged thereto, and door raising mechanism for such doors mounted in said members.

12. In a dump car, the combination of a central longitudinal beam including cover plates arranged to form a ridge, an under-bracing therefor, such under-bracing including longitudinal members, cross bars extending beneath the longitudinal members and secured to them and extending beyond the longitudinal members to the ridge plate, castings riveted to the cover plates and to such cross bars and additional cross bars riveted at their ends to the lower ends of such castings and extending diagonally upward beneath the longitudinal members and riveted thereto, said castings being formed near their lower ends to act as bumpers for the dumping doors.

13. In a dump car, the combination of a dumping door, a bracing member secured to the same near its edge, a rub plate secured to the bracing member, and a raising arm adapted to bear against the rub plate.

14. In a dump car, the combination of a dumping door, a floor beam therefor, a strengthening member secured to the door near its edge, a rub plate secured to the strengthening member and to the floor beam, and a raising arm adapted to engage the rub plate.

15. In a dump car, the combination of a dumping door, a floor beam therefor in the form of an angle bar, a strengthening member secured to the door near its edge, a rub plate secured to the strengthening member and to the projecting flange of the floor beam.

16. In a dump car, the combination of a door, a Z-bar secured to the under side thereof near its free edge, a flanged floor beam secured to the under side of the door and extending through the web of the Z-bar and having a projecting flange, a rub plate secured to the lowermost flange of the Z-bar and extending inward parallel with the floor beam and being twisted and secured to the flange of the floor beam.

17. In a dump car, the combination of a door, a floor beam in the form of an angle bar secured thereto, a spring, and means secured to the projecting flange of the floor beam for holding said spring in place.

18. In a dump car, the combination of a door, floor beams secured thereto, a strap secured to a web of the floor beam and a spring held in place by the arms of such strap, said spring bending down between such arms.

19. The combination with a door, of a flat spring, a U-shaped strap extending along

one side of the spring and having two arms extending across beneath the spring and then bending toward each other on the opposite side of the spring, and means for securing said strap to the door.

20. In a dump car, the combination of a dumping door, an angle shaped floor beam secured thereto, a flat spring adapted to rest on the portion of the floor beam which is adjacent to the door, and a retaining strap for said spring secured to the flange of the floor beam which is at an angle of the door.

21. In a dump car, the combination of a dumping door, an angle shaped floor beam secured thereto, a flat spring adapted to rest on the portion of the floor beam which is adjacent to the door, and a retaining strap for said spring secured to the flange of the floor beam which is at an angle of the door, said strap being secured to the projecting flange of the floor beam alongside of the spring and having a pair of arms turned crosswise beneath the spring and having its extreme ends turned toward each other beyond the spring and parallel with the main portion of the strap.

22. The combination with car sides of a strut-tie therefor consisting of a metal member extending from side to side and riveted thereto, and a wooden beam abutting the sides and secured to said member.

23. The combination with car sides of a strut-tie comprising an angle beam with its flanges facing downwardly and its ends secured to the tops of the car side, and a wooden filling beam within the angle beam and having its ends abutting the car side, and means for securing the wooden beam to the angle beam.

24. The combination with car sides having a metal upper chord, of a cross brace comprising the angle beam with its flanges facing downward and with its ends flattened and secured to the upper chord of the sides, a wooden beam beneath the channel and abutting the car sides at its ends, and bolts extending through the wooden beam into the channel.

25. A strut-tie for bracing car sides at their upper edges comprising an angle bar with ends extended for securement to the car sides, and a wooden strut beam within the angle and secured thereto.

26. A strut-tie for bracing car sides at their upper edges comprising an angle bar with ends extended for securement to the car sides, a wooden strut beam within the angle, and bolts passing through the wooden beam into the two flanges of the angle bar for securing the wooden beam thereto.

27. In a dump car, the combination of a beam including a pair of vertical plates and a surmounting ridge, a tie bar extending beneath the plates and connected with the ridge, dumping doors hinged adjacent to the

lower edge of the ridge, and door raising mechanism carried by such structure.

28. In a dump car, the combination of a beam including a pair of vertical plates and a surmounting ridge, a tie bar extending beneath the plates and connected with the ridge, and dumping doors and door raising rock shafts carried by such structure.

29. In a dump car, the combination of a beam including a pair of vertical plates and a surmounting ridge, a tie bar extending beneath the plates and connected with the ridge, and brackets connecting the tie bar with the ridge.

30. In a dump car, the combination of a beam including a pair of vertical plates and a surmounting ridge, a tie bar extending beneath the plates and connected with the ridge, brackets connecting the tie bar with the ridge, and dumping doors hinged to said brackets.

31. In a dump car, the combination of a beam including a pair of vertical plates and a surmounting ridge, a tie bar extending beneath the plates and connected with the ridge, brackets connecting the tie bar with the ridge, and door raising rock shafts carried by said brackets.

32. In a dump car, the combination of a pair of longitudinal plates, a surmounting overhanging ridge, a tie bar extending beneath the plates, connecting members secured to such tie bar and to the overhanging portion of the ridge, door raising rock shafts supported by such connecting members, dumping doors and arms on the rock shafts adapted to engage the under sides of the doors.

33. In a dump car, the combination of a box girder, a surmounting ridge, and rock shafts outside of the girder and beneath the ridge.

34. In a dump car, the combination of a beam including a pair of vertical plates and a surmounting ridge, brackets between the ridge and the outer side of the plates, and door raising rock shafts carried by said brackets.

35. In a dump car, the combination with the bolsters and inclined end floors of the car, of a box girder beam having vertical plates and a ridge, the vertical plates extending from bolster to bolster, and the ridge terminating at the end floors and being secured to them, and rock shafts beneath the ridge outside of the vertical plates.

36. In a dump car, the combination with a bolster and inclined end floors of the car, of a beam having a ridge and longitudinal supporting members, the latter extending from bolster to bolster, and the ridge terminating at the end floors and being secured to them, rock shafts beneath the ridge, and dumping doors pivoted near the outer edges of the ridge.

37. In a dump car, the combination of a beam having an upper chord in the form of a ridge, lower chord members, plates between the upper and lower chord members, and door raising rock shafts outside of said plates.

38. A dump car having a beam in the form of a box girder comprising vertical members and a ridge secured to inwardly bent portions of said vertical members, a pair of parallel rock shafts outside of said members and beneath said ridge.

39. A dump car having a member in the form of a box girder with a ridge along the top thereof, said ridge being in engagement with members which provide depth for the girder, and rock shafts between the girder and ridge.

40. In a dump car, the combination of a member in the form of a box girder having a ridge along the top thereof secured to the girder plates, dumping doors supported by the member, and a pair of door raising rock shafts supported by the member.

41. In a dump car, the combination with a pair of bolsters, a ridge, a pair of vertical longitudinal plates beneath the ridge and secured to it, a pair of rock shafts parallel with and outside of said plates, and doors pivoted to the central structure.

42. In a dump car, the combination of bolsters, a beam comprising two lower chord members, two longitudinal plates, and an upper chord member in the form of a ridge, dumping doors, and a pair of longitudinal shafts for operating the same carried parallel with said plates.

43. The combination with a pair of bolsters inclined end floors between the bolsters, a longitudinal structure comprising a pair of longitudinal plates extending from bolster to bolster, a surmounting ridge on which said plates are connected, and a pair of door operating shafts beneath the ridge and doors hinged to the surmounting ridge near the outer edges thereof.

44. The combination with a pair of bolsters, inclined end floors between the bolsters, a longitudinal structure compris-

ing a pair of longitudinal plates extending from bolster to bolster, a surmounting ridge to which said plates are connected, stiffening members for the lower portions of said plates, shafts carried by such structure parallel with the plates, and doors adapted to be operated by the movement of said shafts.

45. The combination in a dump car, of a pair of vertical plates, a surmounting ridge, dumping doors, rock shafts outside of the plates and beneath the ridge, and arms on said rock shafts adapted to engage the under sides of the doors.

46. In a dump car, the combination of a longitudinal central structure comprising a pair of vertical plates and a surmounting ridge, dumping doors carried by such structure, and shafts for raising the doors supported by said structure outside of the plates and beneath the ridge.

47. The combination of a central longitudinal structure comprising a pair of vertical plates and a surmounting ridge, dumping doors carried by such structure, rock shafts carried by such structure outside of the plates and beneath the ridge, and arms on such rock shafts adapted to cooperate with the doors.

48. In a dumping car, a central structure comprising a pair of vertical plates extending from bolster to bolster, draft plates secured to the vertical plates and extending from the bolsters to the end sills, a surmounting ridge upon the vertical plates, and transverse bracing members extending beneath the vertical plates and secured at their ends to the surmounting ridge.

49. In a dumping car, a combination of a pair of vertical plates, a surmounting ridge, dumping doors secured to said ridge, and door raising shafts outside of the plates and beneath the ridge.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

JOSEPH R. BOWLING.

Witnesses:

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THELMA KNUDSON.