

[54] **DUMP CAR AND COVER COMBINATION**

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298/17.5

[51] Int. Cl. **B61d 39/00**

[58] Field of Search **105/377, 261, 409;**
52/45, 55, 56, 41; 298/17.5, 17.6, 17.7;
296/137 R, 100

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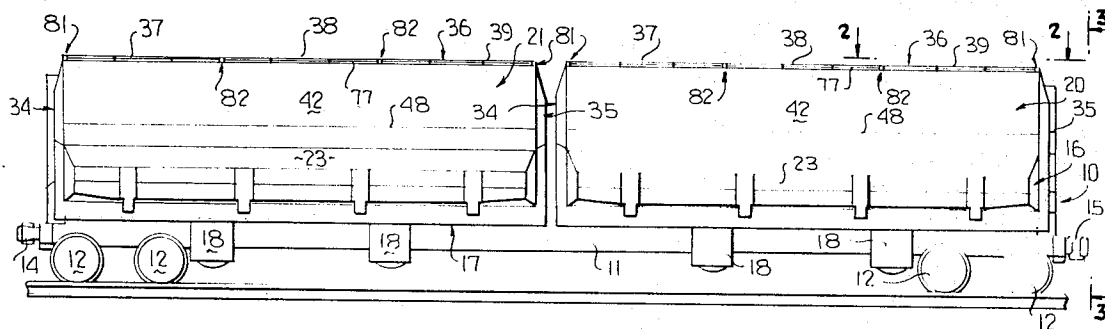
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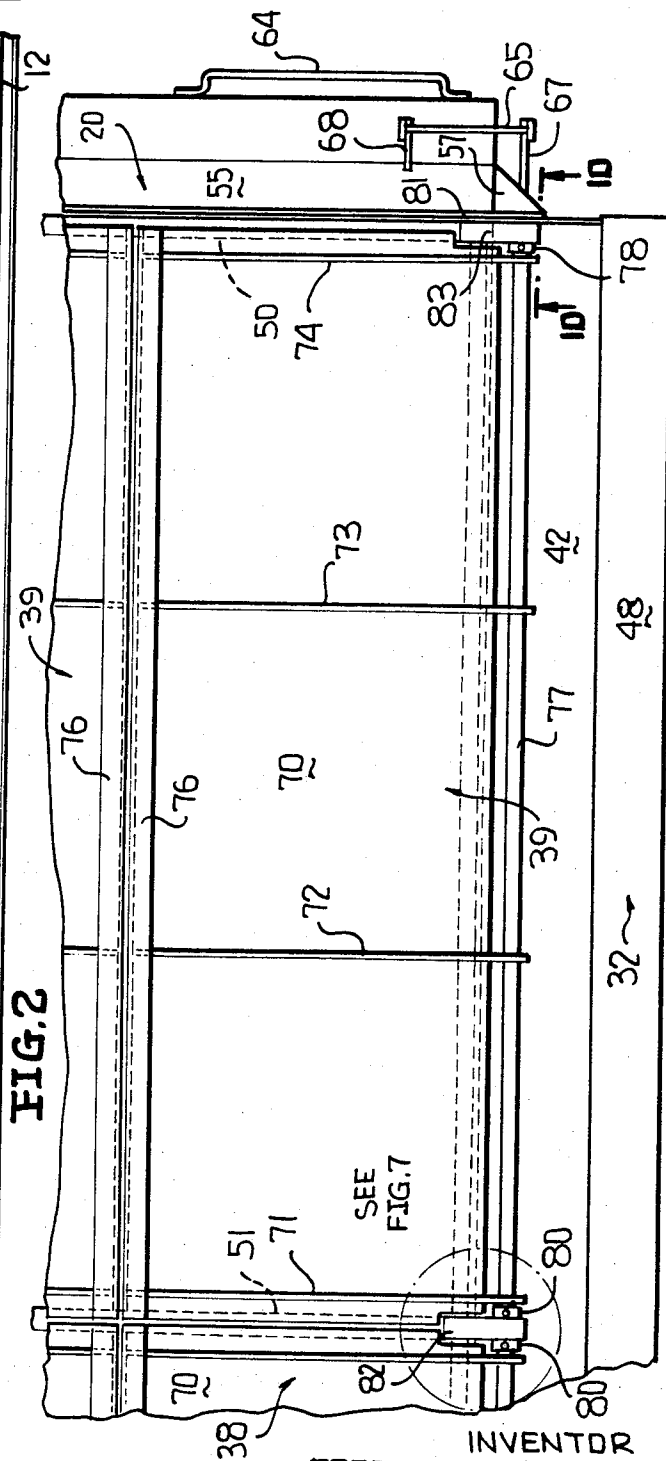
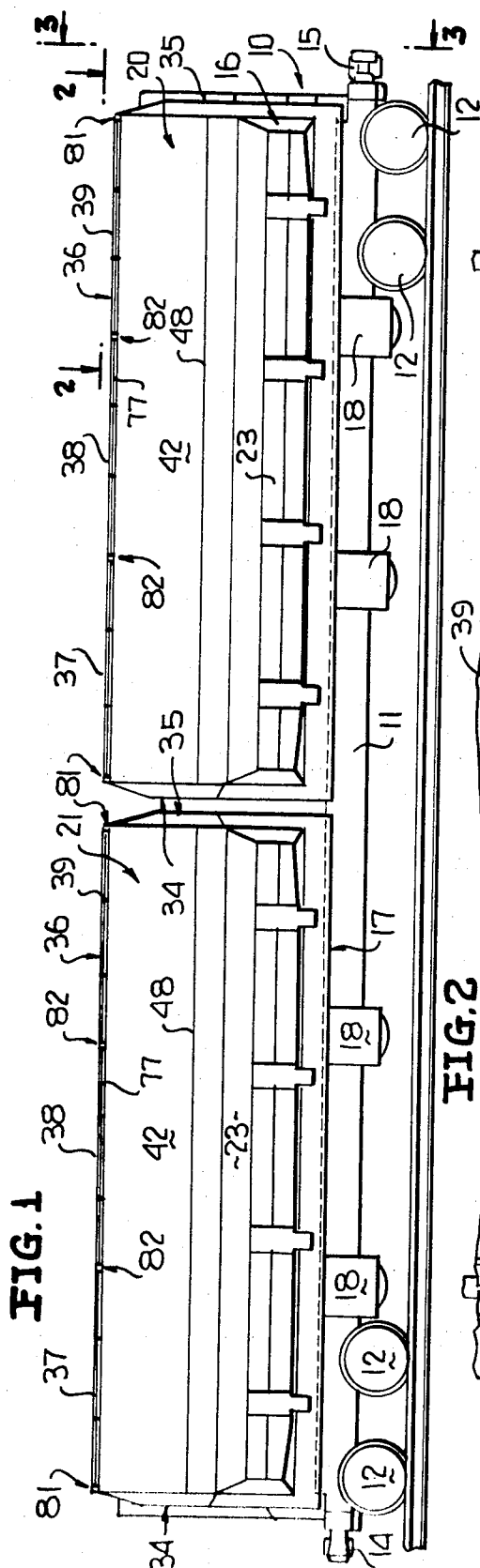
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[57] **ABSTRACT**

This disclosure relates to a railroad dump car cover having opposite side and end walls and a top wall in the form of at least one pair of cover doors mounted adjacent upper edges of the side walls for pivotal movement about a longitudinal axis, and a pair of longitudinally extending plates secured to each other and to each of the side wall lower edges exteriorly thereof for performing the dual functions of imparting rigidity to the side walls and providing a walkway for workmen. Novel means are provided for aligning the cover with a dump car body and removably securing the same thereto for readily converting the dump car as necessary depending upon the particular material being hauled. The cover is particularly adapted for use with side-dumping railroad cars, and novel seal means are provided between the side dump doors of the railroad car body and the side walls of the cover, along with appropriate seals about the periphery of the top cover doors to prevent debris from being scattered while the car is in transit.

22 Claims, 13 Drawing Figures





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FIG. 3

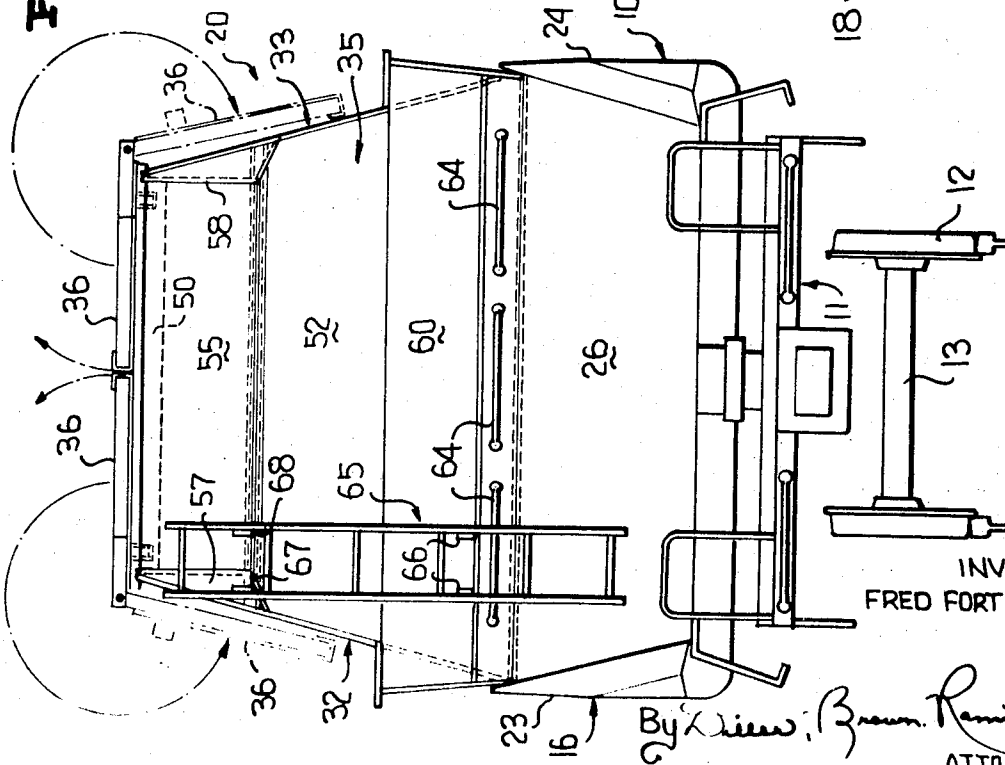
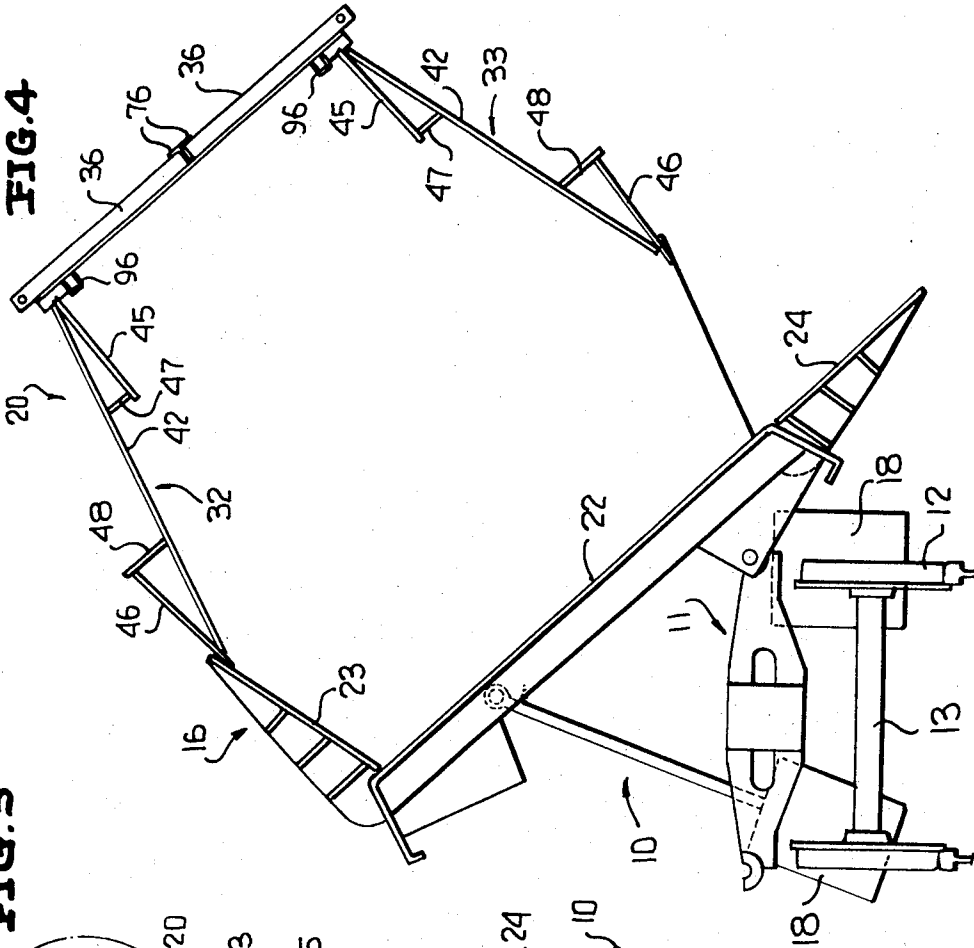


FIG. 4



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FIG. 5

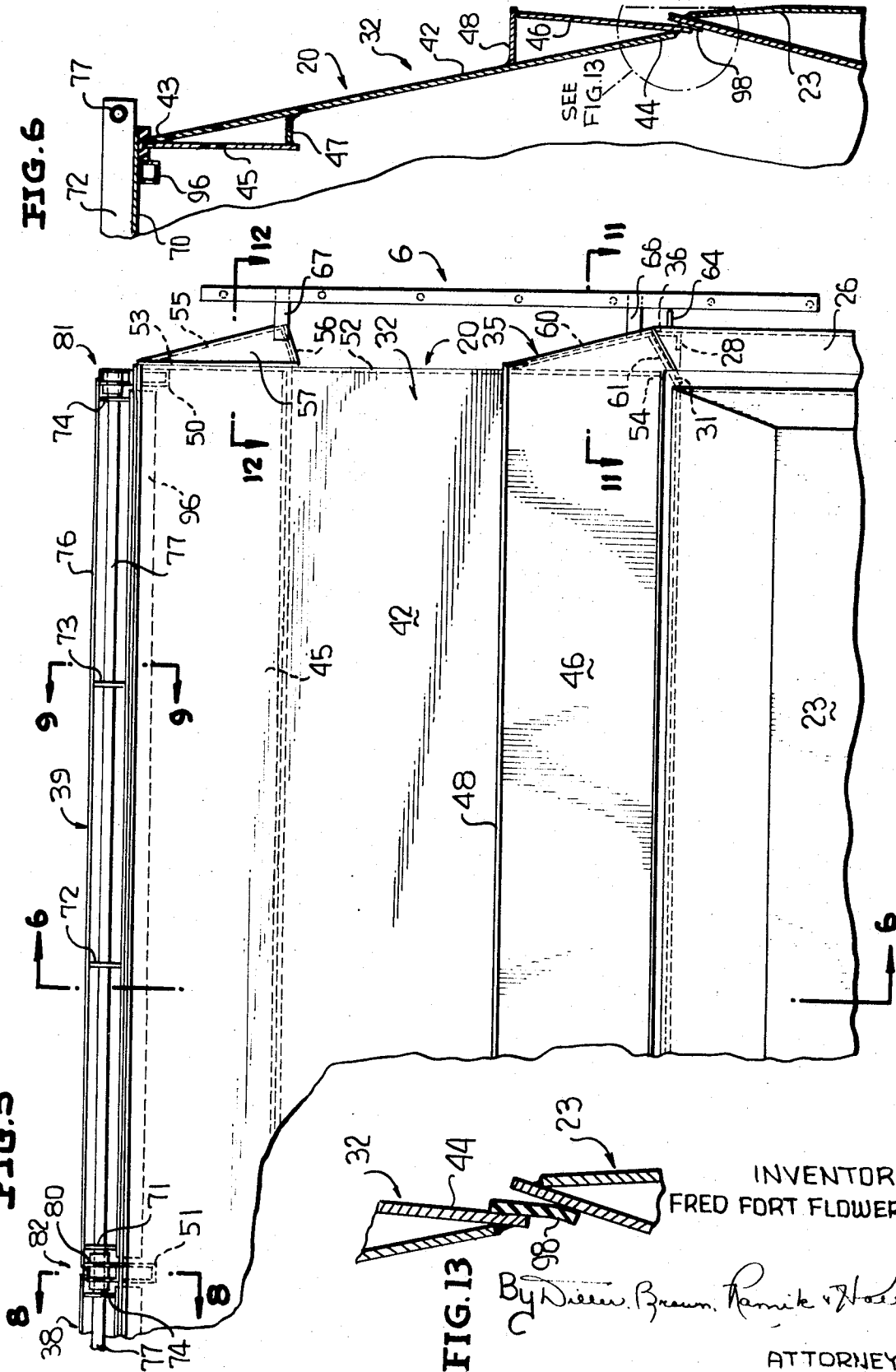


FIG. 6

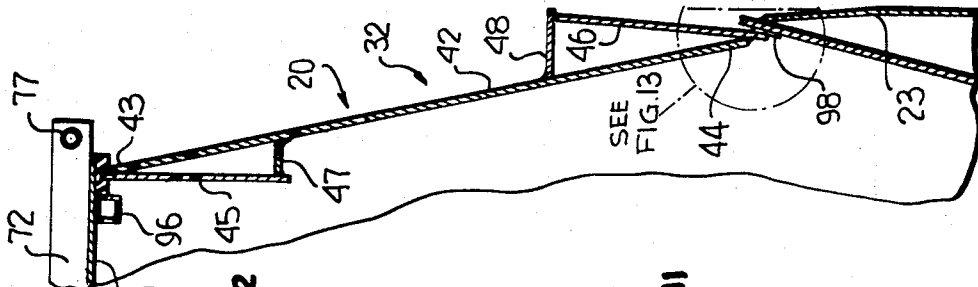
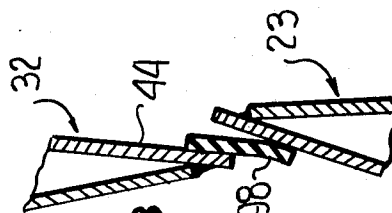


FIG. 13



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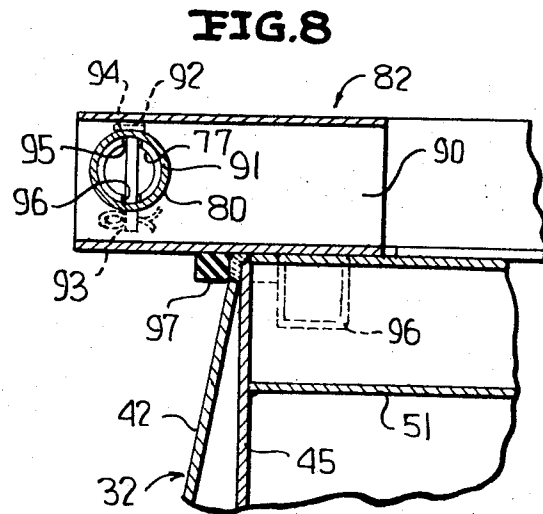
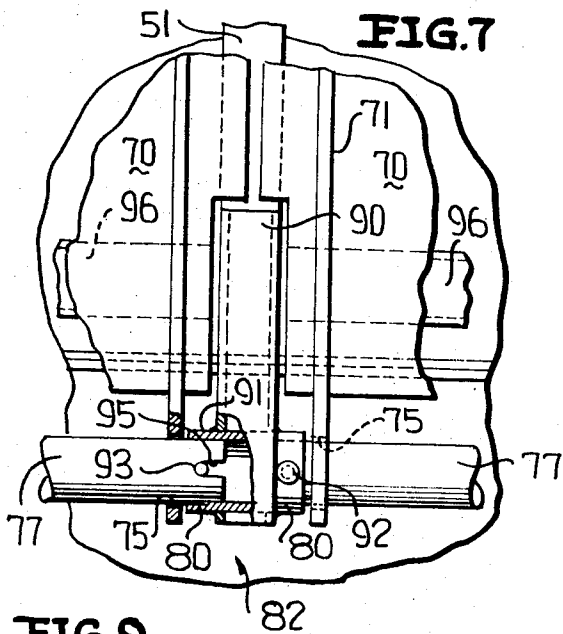
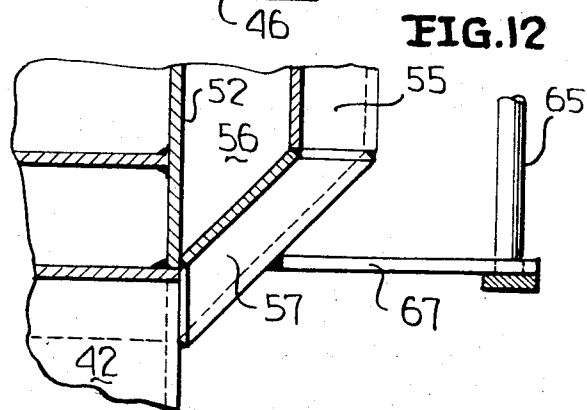
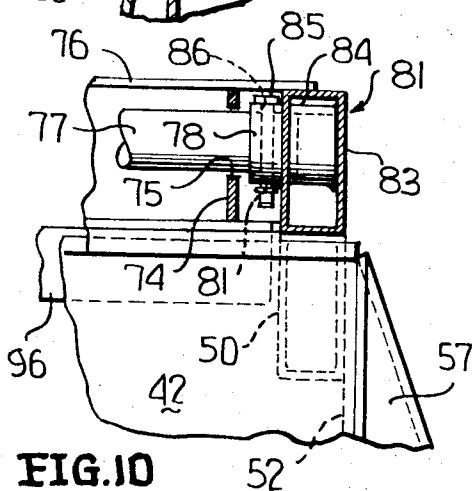
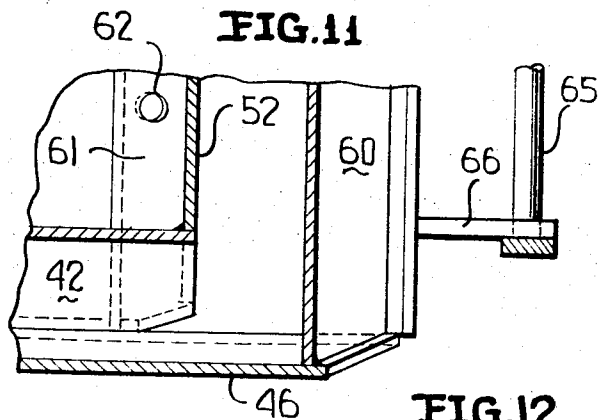
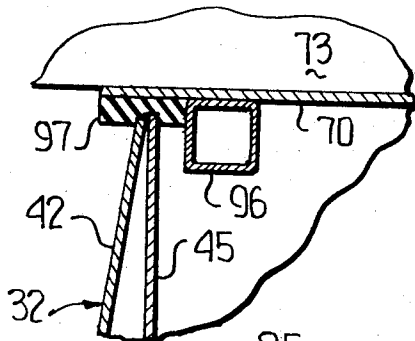


FIG. 9



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DUMP CAR AND COVER COMBINATION

The present invention relates to improvements in railroad dump cars of the type exemplified in U.S. Pat. Nos. 2,826,999 and 3,166,022 issued in the name of Henry Fort Flowers on March 18, 1958, and January 19, 1965, respectively. Railroad dump cars or vehicles of the type disclosed in the latter-noted patents include an undercarriage to which the car body is pivotally attached for dumping to either longitudinal side with side walls of the car body being in the form of down turning pivoted side doors. Such dump cars are designed primarily for hauling high-density heavy material, such as coal, or limestone, etc., and range in sizes up to 70 cubic yards. Experience has indicated that such dump cars in groups of from 5 to 10 with an associated mine locomotive will transport ore, stripping material or like high-density bulk products at lower cost than the most efficient mine trucks, averaging at about 8 percent below comparable mine truck operating costs.

It should be appreciated that though designed for transporting high-density material such dump cars are equally suited for transporting low-density solid bulk products, but as density decreases overall efficiency likewise decreases since less tonnage per cubic yard of load will be carried by any particular car. Thus, it is highly desirable to increase load capacity for transporting garbage, paper and other loose low-density solid products (or waste) and to do so in a manner to prevent scattering, release of odors, and doing so in preferably as tight and weatherproof a manner as possible. In keeping with the foregoing, it is a primary object of the present invention to convert conventional dump car bodies in such a manner as to increase the capacity thereof to permit more weight of low-density material to be carried in each railroad car, thus saving costs by reducing the number of cars required for any particular job. The foregoing object is accomplished primarily by providing a novel dump car cover which is of a light-weight though reinforced construction to additionally minimize the overturning moment produced by gravity when the dump car body is pivoted or tilted, thus preventing the overturning of the dump car and enabling the emptied dump car body to return to its central or normal travel position.

Another object of this invention is to provide a novel dump car cover of a light-weight construction formed of opposite side and end walls, a pair of longitudinally extending plates secured to each other and to each of lower longitudinal edges of the side walls thereby imparting reinforcement thereto, and the pair of plates being of a triangular cross section and disposed exteriorly of the side walls whereby one plate of each pair serves as a walkway for personnel movement when the cover is secured to an associated dump car body.

Another object of this invention is to provide a novel cover of the type heretofore described wherein lower edges of the end walls include inwardly and downwardly converging surfaces for aligning the cover with an associated dump car incident to the securement of the cover thereto.

A further object of this invention is to provide a novel dump car cover of the type heretofore described wherein a top wall of the cover is formed of at least one pair of cover doors, means adjacent each side wall upper longitudinal edge mounting each door for pivoting movement about a longitudinal axis, the mounting

means including a plurality of apertured reinforcing bars transversely spanning and secured to each cover door, a rod received through each apertured reinforcing bar, and means securing each rod adjacent an associated side wall upper longitudinal edge whereby each rod serves as the pivot means for its associated cover and also as a handle which may be grasped by workmen moving along the walkway heretofore noted.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claimed subject matter, and the several views illustrated in the accompanying drawings.

IN THE DRAWINGS

FIG. 1 is a side elevational view of a railroad dump car, and illustrates two identical side dumping car bodies each carrying an identical cover of this invention.

FIG. 2 is an enlarged fragmentary top plan view taken generally along line 2—2 of FIG. 1, and illustrates the manner in which each of a plurality of top cover doors are pivotally mounted to the cover.

FIG. 3 is an enlarged end view taken generally along line 3—3 of FIG. 1, with parts removed for clarity, and more clearly illustrates the reinforced construction of a pair of side walls of the cover.

FIG. 4 is a transverse cross-sectional view of the dump car in one of its two dumping positions, and more clearly illustrates the reinforced construction of the cover side walls.

FIG. 5 is a fragmentary side elevational view of the uppermost right-hand corner of the right-handmost cover of FIG. 1, and illustrates triangular reinforcement of the cover end wall and the manner in which the same seats upon an end wall of the dump car body.

FIG. 6 is a fragmentary sectional view taken generally along line 6—6 of FIG. 5, and more clearly illustrates the triangular box reinforcement of one of the side walls.

FIG. 7 is an enlarged fragmentary top plan view of the encircles portion of FIG. 2, and illustrates the manner in which each cover door is hinged to a tube by apertured reinforcing bars with the tube serving as a handle for personnel walking along the cover side walls.

FIG. 8 is an enlarged fragmentary sectional view taken generally along line 8—8 of FIG. 5, and illustrates the manner in which each tube is keyed to a boss which is in turn welded to a transverse tube welded between the opposite side walls.

FIG. 9 is an enlarged fragmentary sectional view taken generally along line 9—9 of FIG. 5, and illustrates a longitudinally extending reinforcing tube welded to the cover door with sealing means being provided between the door and an uppermost terminal edge of one of the side walls.

FIG. 10 is an enlarged fragmentary sectional view taken generally along line 10—10 of FIG. 2, and illustrates the manner in which an end of the pivot tube is secured to a transverse reinforcing tube of the cover.

FIG. 11 is an enlarged fragmentary sectional view taken generally along line 11—11 of FIG. 5, and illustrates the manner in which a lower reinforced transverse edge of the cover is seated upon an upper transverse reinforced edge of the dump car body.

FIG. 12 is an enlarged fragmentary sectional view taken generally along line 12—12 of FIG. 5, and illus-

trates details of a triangular box reinforcement of an upper edge of the cover end wall.

FIG. 13 is an enlarged fragmentary sectional view of the encircled area of FIG. 6, and more clearly illustrates sealing means between side walls of the car body and cover.

A railroad dump car or dump vehicle is designated by the reference numeral 10 (FIGS. 1, 3 and 4), and includes an undercarriage or underframe 11 borne on conventional railroad bogies (not shown) carrying wheels 12 and axles 13 (FIG. 3). The dump car 10 is coupled to other cars in a train by conventional couplers 14, 15.

The dump car 10 includes two identical dump car bodies 16, 17 (FIG. 1) which are pivotally mounted to the underframe 11 and are pivoted relative thereto by telescoping power units 18. The details of the mounting of the car bodies 16, 17 to the underframe 11 and the power units 18 form no part of this invention, but the same may be constructed in keeping with the two latter-identified patents.

Since the dump car bodies 16, 17 are identical, as are respective covers 20, 21 carried thereby, the remainder of this description will be directed solely to the dump car body 16 and the cover 20.

The dump car body 16 includes a bottom wall 22 (FIG. 4) to which is pivotally attached side walls or doors 23, 24 movable between generally upright and horizontal positions relative to the bottom wall 22 by means disclosed in the latter-identified patents. Identical opposite end walls 26 (only one shown in FIG. 3) are rigidly secured at their lower edges (unnumbered) to the bottom wall 22 while at their upper edges (unnumbered) each of the end walls, 26 has secured thereto a vertical flange (unnumbered) of a reinforcing angle bar 28. The angle bars 28 span the entire transverse width of the end walls, 26, and welded to each is an inwardly and downwardly inclined plate 30 having a plurality of circular openings or apertures 31 spaced predetermined distances along the length of the plate 30 which function to secure the cover 20 to the dump car body 16 in a manner which will be described more fully hereinafter.

The cover 20 (and the identical cover 21) includes a pair of side walls 32, 33, opposite identical end walls 34 (FIG. 1), 35 and means, generally designated by the reference numeral 36 (FIGS. 1 and 2) for closing the top of the cover 20. The means 36 consists of three cover doors 37 through 39 pivoted adjacent upper longitudinal edges of the side walls 32, 33 for pivoting movement in the manner illustrated in solid and phantom outline in FIG. 3.

Each of the side walls 32, 33 is constructed from a rectangular plate 42 having respective upper and lower longitudinal edges 43, 44. Vertical plates 45, 46 are welded interiorly and exteriorly, respectively, to the respective upper and lower edges 43, 44 of the plate 42. A horizontal plate 47 is welded between the plates 42, 45 interiorly of the plate 42 while a horizontal plate 48 is welded to the plates 42, 46 exteriorly of the plate 42, in the manner best illustrated in FIG. 6. The plates 45 through 48 run the entire length of the plate 42 and due to the triangular box-like transverse configuration serve to reinforce the longitudinal edges 43, 44. Moreover, the plate 48 additionally functions as a walkway for workers moving along the side walls 32, 33.

The upper longitudinal edges 43 of the side walls 32, 33 are joined to each other by a plurality of transverse tubular reinforcing members 50, 51, etc., which are welded to the plates 45 of the side walls 32, 33 in the manner best illustrated in FIG. 8. In addition to reinforcingly joining the upper longitudinal edges 43 of the side walls 32, 33, the tubular reinforcing members 50, 51 function as points of securement for the cover doors 37 through 39 in a manner to be described more fully hereinafter.

Each of the identical cover end walls 34, 35 includes a generally trapezoidal shaped plate 52 (FIGS. 3 and 5) having an upper edge portion 53 and a lower edge or edge portion 54. The upper edge 53 is reinforced by a transversely extending plate 55 which is inclined downwardly and outwardly, as viewed in FIG. 5 and is welded at its upper end to the plate 52. A generally trapezoidal shaped plate 56 (FIGS. 5 and 12) is welded along one edge to the plate 55 and along its opposite edge to the plate 52. Generally triangular end plates 57, 58 (FIGS. 3, 5 and 12) are welded to the plates 52, 55 along the upwardly converging side edges thereof while the lower edge of the plates 57, 58 are welded to the plate 56, thus forming a generally triangular box-like reinforcement across the entire length of the upper edge portion 53 of each of the end walls 34, 35.

The lower edge portion 54 of each of the end walls 34, 35 is reinforced in a like manner by a plate 60 welded at its upper end to the plate 52 and converging therewith in an upward direction. A plate 61 is welded along one edge to the bottom edge of the plate 60 and along opposite transverse edges (unnumbered) to the plate 46. The plate 61 underlies the lower edge portion 54 of the plate 52, as is best illustrated in FIG. 11, and is welded thereto. The plate 61 has a plurality of openings 62 (FIGS. 5 and 11) which are in register with the openings 31 of the plate 30 of each end wall 25, 26 of the dump car body 16. Removable fastening means (not shown) such as pins, nuts and bolts, etc., are passed through the openings 31, 62 to secure the cover 20 to the dump car body 16. In this regard it is to be noted that due to the inward and downward inclination of the plates 30, 61 at both ends of the cover 20 and the dump car body 16, the contacting surfaces of the plates 30, 61 function as means to align the openings 31, 62 incident to the insertion of fastening means therein.

Three identical generally U-shaped grab bars 64 (FIGS. 3 and 5) are secured to the angle bars 28 by bolts or the like (not shown), and function as points of connection for appropriate hoist mechanisms for applying the cover 20 to the dump car body 16 and removing the same therefrom. Moreover, the grab bar 64 can be grasped by workmen to facilitate the alignment of the apertures 31, 62 during the assembly of the cover 20 upon the dump car body 16 in the manner heretofore described.

A ladder 65 is secured to the end wall 35 by a pair of brackets 66 welded to the ladder 65 and to the plate 60, and a pair of brackets 67, 68 welded to the respective plates 57, 55.

Reference is now made to FIGS. 2, 5 and 7 through 10 of the drawings which illustrate the manner in which the six covers 37 through 39 are hinged to the cover 20. The covers 37 through 39 are each formed by a rectangular plate 70 to an upper surface of which is welded four reinforcing bars 71 through 74 (FIGS. 2 and 5) each having a circular opening or aperture 75 (FIGS.

7 and 10) at one end thereof, while opposite ends of the bars 71 through 74 are welded to a narrow longitudinally extending reinforcing bar 76 (FIG. 2). A tube 77 is received in the apertures 75 and opposite ends (unnumbered) of the tube 77 are received in tubular bosses 78, 80 of respective securing means 81, 82. The securing means 81 are each formed by a tube 83 (FIG. 10) of a generally rectangular cross section having a lower face (unnumbered) welded to the reinforcing member 50. The boss 78 is telescopically inserted through an opening 84 of the member 83 and is welded to the vertical sides (unnumbered) thereof, as viewed in FIG. 10. A removable pin 85 is passed through diametrically opposite openings 86, 87 of the boss 78 and diametrically opposite axially opening slots (not shown) in the end of the tubular member 77 shown in FIG. 10. The pin 85 therefore prevents the tubular member 77 from rotating in the boss 78.

Referring now to FIGS. 7 and 8 in particular, each of the securing means 82 includes a like tubular member 90 having a lower side (unnumbered) welded to the reinforcing member 51. The bosses 80, 80 are in the form of a tube (unnumbered) passed through openings 91 in the vertical sides (unnumbered) of the member 90 and welded thereto. As in the case of the securing means 81, each boss 80, 80 includes diametrically opposite openings 92, 93 through which passes a removable pin 94. The pin 94 also passes through diametrically disposed axially opening slots 95, 96 of the tubular members 77, thus anchoring those ends illustrated in FIGS. 7 and 8 against relative rotation. In this manner each of the tubular members 77 is fixed against rotation and functions as fixed pivots for the doors 37 through 39.

Each of the cover doors 37 through 39 is additionally reinforced adjacent the tubular member 77 by means of a generally rectangular reinforcing tube 96 (FIG. 9) welded to the underside of each plate 70 adjacent the tubular member 77. Moreover, outboard of the tubular reinforcing member 96 is a suitable conventional weather seal 97 of resilient or elastomeric material which prevents moisture from entering into the interior of the cover 20. Like sealing means 97 may be provided atop each of the reinforcing members 50, 51 and between the plates 76, 76 of adjacent pairs of doors 37, 37, 38, 38 and 39, 39 to assure weather-tight conditions. A like weather-tight seal 98 may be conventionally secured to the lower longitudinal edges 44 of the plates 42 of the side walls 32, 33 which in the closed position of the dump car side doors 23, 24 form a weather-proof seal in the manner clearly apparent from FIG. 13. A seal of this type may be secured to either of the plates 76, 76 (FIG. 2) of opposite pairs of doors 37, 37; 38, 38; and 39, 39 to thereby substantially completely close the interior of the cover 20 to atmosphere.

With the exception of the weather-proof seals the cover 20 is preferably constructed from aluminum or similar light weight metal in order to be of the lightest possible weight so that there will be a minimum of overturning moment produced by gravity when the dump car body 16 is tilted in the manner illustrated in FIG. 4. However, due to the reinforcements heretofore described, the cover 20 is extremely rigid even though of light weight and overturning during dumping is completely precluded. Moreover, due to the inclination of the side walls 32, 33 free flow of compacted material is assured when the car body 16 is tilted to either side. In this regard reference is made to FIG. 1 from which

it is readily apparent that the overturning moment can be additionally reduced by tilting one of the dump car bodies 16, 17 while the remaining body is maintained in its normal position to act as ballast or, alternatively, the car bodies 16, 17 can be simultaneously tilted in opposite directions. While the covers 20, 21 permit more weight of low-density material to be carried in each car body 16, 17, it is to be noted that the cover can be removed quickly and easily enabling the dump car 10 to perform its conventional function of carrying dense materials, such as stone, coal, ore, dirt, rubble, etc. Moreover, due to the downwardly and inwardly inclination of the plates 30, 61 of the dump body end walls 26 and the cover end walls 34, 35, respectively, the covers 20, 21 can be accurately fitted upon and subsequently secured to the car bodies 16, 17, respectively.

Though the function of the plates 48 has been noted heretofore, FIGS. 2 and 6 illustrate the manner in which the fixed tubular members 77 project outwardly beyond the plates 42 and extend in parallelism to the plates 48 along the entire length of the cover side walls 32, 33. Due to this construction the tubular members 77 additionally function as grab bars for workmen walking along the plates or walkways 48.

While preferred forms and arrangements of parts have been shown in illustrating the invention, it is to be clearly understood that various changes in details and arrangement of parts may be made without departing from the spirit and scope of this disclosure.

I claim:

1. A railroad car cover comprising opposite side and end walls imparting a generally polygonal cross-sectional shape to said cover, top wall means closing said cover, each side wall including upper and lower longitudinal edge portions, a pair of longitudinally extending plates secured to each other and to each of said side wall lower longitudinal edge portions, and each said pair of plates and the associated side wall lower longitudinal edge portion being of a triangular cross-sectional configuration as viewed in transverse section thereby imparting rigidity to said side wall lower longitudinal edge portions.

2. The railroad car cover as defined in claim 1 wherein said pairs of plates are disposed exteriorly of said side wall lower longitudinal edge portions, and one plate of each pair of plates is disposed in a generally horizontal plane thereby serving as a walkway for personnel movement.

3. The railroad car cover as defined in claim 2 wherein each end wall includes upper and lower longitudinal edge portions, and said end wall lower longitudinal edge portions include inwardly and downwardly converging surface means for aligning said cover with an associated railroad car incident to the securing of the cover thereto.

4. The railroad car cover as defined in claim 1 wherein each end wall includes upper and lower longitudinal edge portions, and said end wall lower longitudinal edge portions include inwardly and downwardly converging surface means for aligning said cover with an associated railroad car incident to the securing of the cover thereto.

5. The railroad car cover as defined in claim 4 wherein said downwardly and inwardly converging surface means include means for securing said cover to an associated aligned railroad car.

6. The railroad car cover as defined in claim 1 including another pair of longitudinally extending plates secured to each other and to each of said side wall upper longitudinal edge portions interiorly thereof.

7. The railroad car cover as defined in claim 1 wherein each side wall defines a common hypotenuse as viewed in cross-section to the plates associated therewith at its upper and lower longitudinal edge portions.

8. The railroad car cover as defined in claim 1 wherein said pair of plates are disposed exteriorly of said side wall lower longitudinal edge portions, one plate of each pair of plates is disposed in a generally horizontal place thereby serving as a walkway for personnel movement, and said side walls diverge downwardly and outwardly relative to each other whereby said side wall lower longitudinal edge portions define hypotenuses of said triangular cross-sectional configuration.

9. The railroad car cover as defined in claim 8 wherein each end wall includes upper and lower longitudinal edge portions, and said end wall lower longitudinal edge portions include inwardly and downwardly converging surface means for aligning said cover with an associated railroad car incident to the securement of the cover thereto.

10. The railroad car cover as defined in claim 8 wherein said downwardly and inwardly converging surface means include means for securing said cover to an associated aligned railroad car.

11. The railroad car cover as defined in claim 8 wherein said top wall means include at least one pair of cover doors, means adjacent each side wall upper longitudinal edge portion mounting each door for pivotal movement about a longitudinal axis, said mounting means including a plurality of apertured reinforcing bars transversely spanning and secured to each cover door, a rod received through said apertured reinforcing bars, means securing each rod adjacent an associated side wall upper longitudinal edge portion whereby each rod serves as the pivot means for its associated cover door, said securing means including a tubular boss in telescopic relationship with opposite ends of each rod, and means releasably securing each tubular boss to an associated rod end.

12. The railroad car cover as defined in claim 8 wherein said top wall means include at least one pair of cover doors, means adjacent each side wall upper longitudinal edge portion mounting each door for pivotal movement about a longitudinal axis, said mounting means including a plurality of apertured reinforcing bars transversely spanning and secured to each cover door, a rod received through said apertured reinforcing bars, means securing each rod adjacent an associated side wall upper longitudinal edge portion whereby each rod serves as the pivot means for its associated cover door, said securing means including a tubular boss in telescopic relationship with opposite ends of each rod, means releasably securing each tubular boss to an associated rod end, and said releasable securing means being defined by pin means passed through apertures in said bosses and through axially opening slots in said rod ends.

13. The railroad car cover as defined in claim 1 wherein said top wall means include at least one pair of cover doors, means adjacent each side wall upper longitudinal edge portion mounting each door for pivotal

movement about a longitudinal axis, said mounting means including a plurality of apertured reinforcing bars transversely spanning and secured to each cover door, a rod received through said apertured reinforcing bars, and means securing each rod adjacent an associated side wall upper longitudinal edge portion whereby each rod serves as the pivot means for its associated cover door.

14. The railroad car cover as defined in claim 1 wherein said top wall means include at least one pair of cover doors, means adjacent each side wall upper longitudinal edge portion mounting each door for pivotal movement about a longitudinal axis, said mounting means including a plurality of apertured reinforcing bars transversely spanning and secured to each cover door, a rod received through said apertured reinforcing bars, means securing each rod adjacent an associated side wall upper longitudinal edge portion whereby each rod serves as the pivot means for its associated cover door, said securing means including a tubular boss in telescopic relationship with opposite ends of each rod, and means releasably securing each tubular boss to an associated rod end.

15. The railroad car cover as defined in claim 1 wherein said top wall means include at least one pair of cover doors, means adjacent each side wall upper longitudinal edge portion mounting each door for pivotal movement about a longitudinal axis, said mounting means including a plurality of apertured reinforcing bars transversely spanning and secured to each cover door, a rod received through said apertured reinforcing bars, means securing each rod adjacent an associated side wall upper longitudinal edge portion whereby each rod serves as the pivot means for its associated cover door, said securing means including a tubular boss in telescopic relationship with opposite ends of each rod, means releasably securing each tubular boss to an associated rod end, and said releasable securing means being defined by pin means passed through apertures in said bosses and through axially opening slots in said rod ends.

16. The railroad car cover as defined in claim 1 including a flexible sealing strip secured to and projecting beyond each of said side wall lower edge portions.

17. A railroad car cover comprising opposite side and end walls imparting a generally polygonal cross-sectional shape to said cover, top wall means closing said cover, each side wall and end wall including upper and lower longitudinal and transverse edge portions, respectively, a pair of longitudinally extending plates secured to each other and to each of said side wall upper and lower longitudinal edge portions, both said pair of longitudinally extending plates of each side wall upper and lower longitudinal edge portion being of a triangular cross-sectional configuration as viewed in transverse section, a pair of transversely extending plates secured to each other and to each of said end wall upper and lower transverse edge portions, and both said pair of transversely extending plates of each end wall upper and lower transverse edge portion being of a triangular cross-sectional configuration as viewed in transverse section whereby the over-all cross-sectional shape of said cover is reinforced along its upper and lower edge portions by triangular box sections formed by said side walls, said end walls, and said plates.

18. The railroad car cover as defined in claim 17 wherein the pairs of plates at the upper edge portions of said side walls are disposed internally of said cover.

19. The railroad car cover as defined in claim 17 wherein the pairs of plates at the lower edge portions of said side walls are disposed externally thereof.

20. The railroad car cover as defined in claim 18 wherein the pairs of plates at the lower edge portions of said side walls are disposed externally thereof.

21. The railroad car cover as defined in claim 19 wherein one plate of each last-mentioned pairs of plates is disposed in a generally horizontal plane thereby serving as a walkway for personnel movement.

22. The railroad car cover as defined in claim 20 wherein one plate of each last-mentioned pairs of plates is disposed in a generally horizontal plane thereby serving as a walkway for personnel movement.

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