May 29, 1951 C. A. BOYD 2,554,773

MINE CAR

Filed Feb. 4, 1948 4 Sheets-Sheet 1

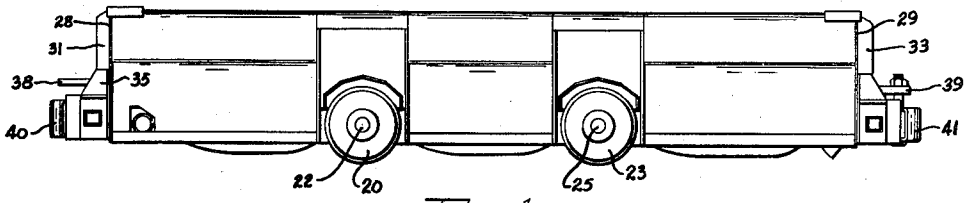


Fig. 1

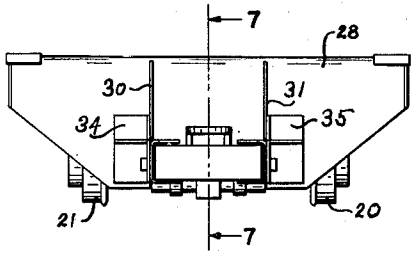


Fig. 2

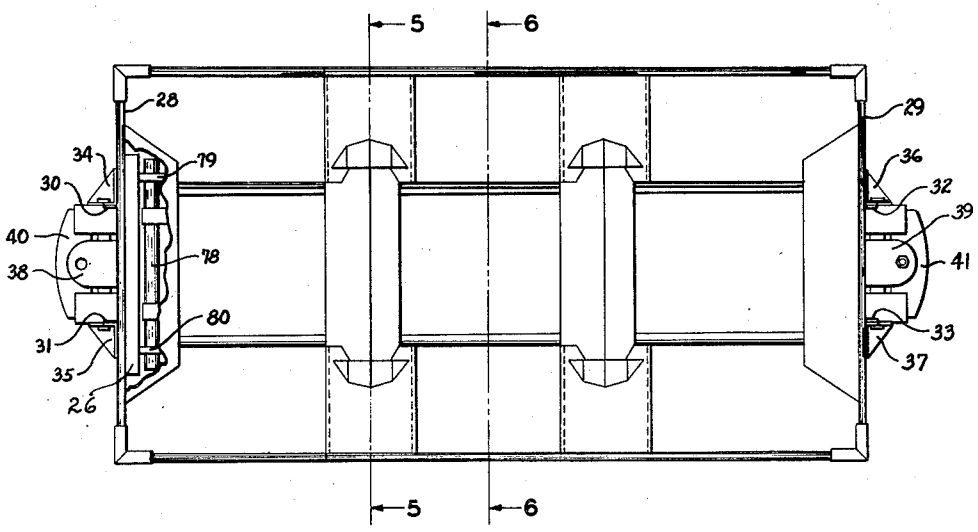


Fig. 3

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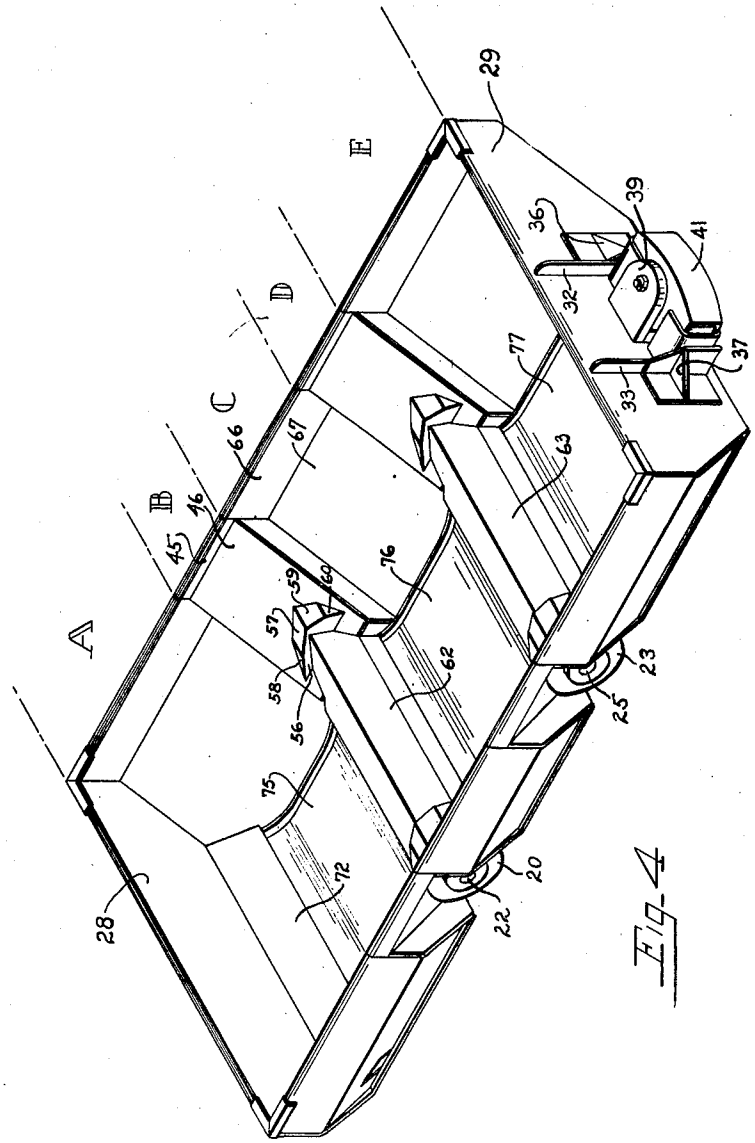


Fig. 4

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Fig. 5

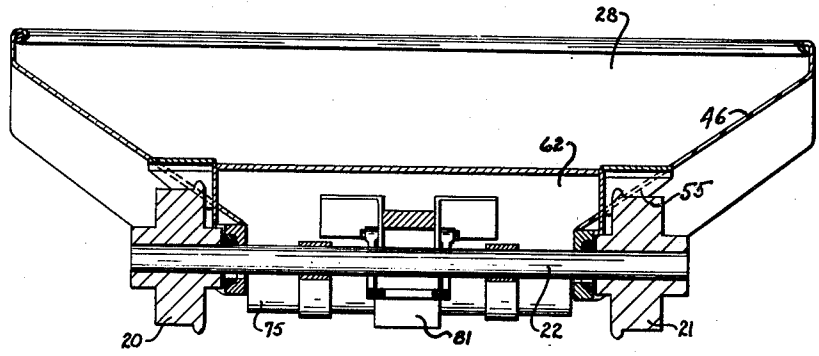


Fig. 6

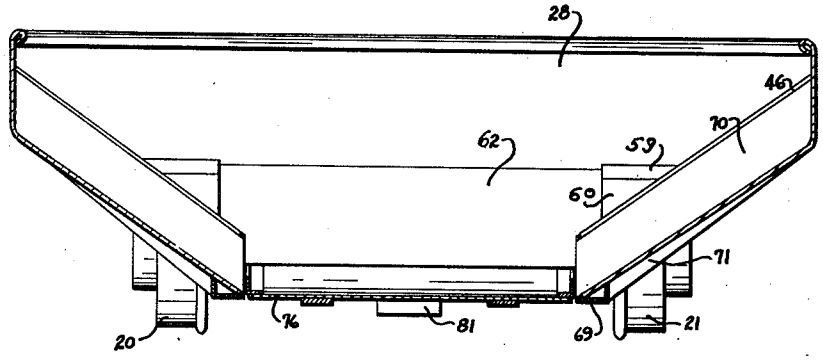
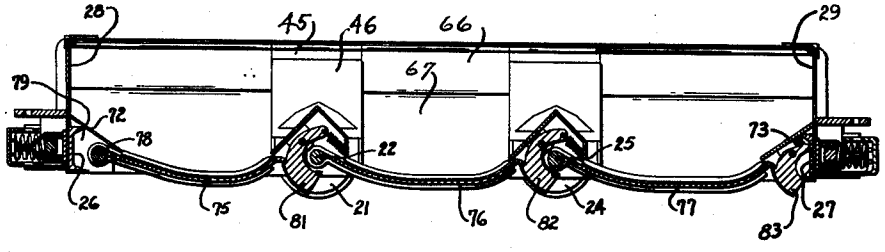


Fig. 7



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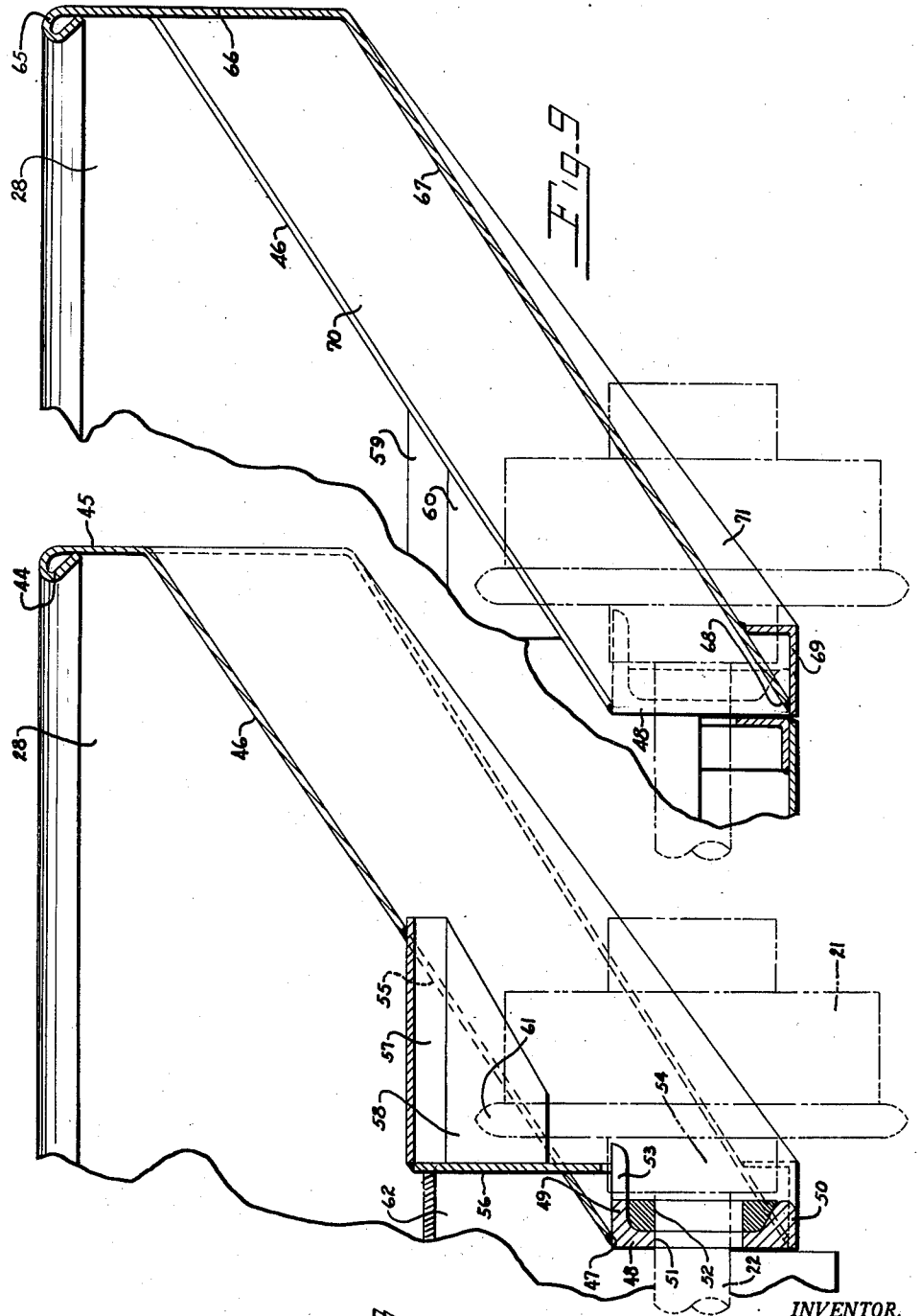


FIG. 9

FIG. 8

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Patented May 29, 1951 2,554,773

UNITED STATES PATENT OFFICE

2,554,773

MINE CAR

Clarence A. Boyd, Barnesville, Ohio, assignor to The Watt Car & Wheel Company, Barnesville, Ohio, a corporation of Ohio

Application February 4, 1948, Serial No. 6,191

16 Claims. (Cl. 105—364)

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This invention relates to a mine car, and more particularly pertains to one of greatly increased capacity over those heretofore known, such increase in capacity being brought about by the deepening of outside flared portions of those transverse sections of the car body which are not over the wheels and axles, the deepening being made possible by novel sidewall and sidewall support structure which eliminates the necessity for straight side sills running the length of the car.

Mine cars must be able to withstand longitudinal draft and buff forces without buckling and be able to support a load of mined material on the axles and wheels. In constructions heretofore known the longitudinal rigidity and load transfer characteristics of such cars have been provided by end sills, one at either end, joined by straight continuous side sills to which the bottom of the side walls necessarily have been secured.

In the construction now provided such rigidity is maintained without side sills, the longitudinal draft and buff forces and load forces being transmitted between alternate deep and shallow transverse sections of the car by an offset structure consisting of certain braces, plates, and support members to which the sidewalls are rigidly secured. All of this is accomplished without interfering with the interior of the car as far as bottom unloading slopes are concerned.

Although the preferred embodiment of the invention, as shown in the drawings and particularly described in the specification, is a drop bottom type of car, it is to be understood that the invention applies as well to cars which are unloaded by overturning or tipping.

Therefore, it is an object of this invention to provide a mine car of increased carrying capacity.

Another object of the invention is to provide such a car in which straight side sills are eliminated.

A further object of the invention is to provide such a car with alternate transverse sections, those sections over the wheels and axles providing wheel clearance and those sections not over the wheels having deep side dimensions relative to the wheel sections.

A still further object of the invention is to provide such a car in which draft, buff and load forces are transmitted longitudinal of the car by a system of offset braces, plates, sidewall structures, and axle-borne members all rigidly secured together.

Further objects and objects pertaining to the details and economies of construction and operation will be found in the specification to follow

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which is to be read in conjunction with the drawings in which

Fig. 1 is a side elevation of the car;

Fig. 2 is a front end elevation of the car;

Fig. 3 is a top plan view of the car with a part of the front end of the car body broken away;

Fig. 4 is a perspective view looking into the interior of the car;

Fig. 5 is a vertical transverse section on the line 5—5 of Fig. 3;

Fig. 6 is a vertical transverse section on the line 6—6 of Fig. 3;

Fig. 7 is a vertical longitudinal section on the line 7—7 of Fig. 2;

Fig. 8 is an enlarged detail view of a portion of the right side of Fig. 5 with the axle and wheel in phantom;

Fig. 9 is an enlarged detail view of a portion of the right side of Fig. 6 with the axle and wheel in phantom.

The sectional views are taken on the section lines looking in the direction of the arrows.

Throughout the specification it is to be understood that the parts joined together are preferably welded although they may be bolted or riveted together by allowing for the necessary overlapping of the joined parts or by providing bridging straps or plates.

A four-wheeled three door drop bottom type of mine car is shown in the drawings but it will be evident that the invention is applicable to cars of different size and having different numbers of wheels and doors.

Referring to the drawings, wheels **20** and **21**, forming a pair, are mounted on axle **22**, and wheels **23** and **24**, forming a pair, are mounted on axle **25**.

The car body includes channel bar end sills **26** and **27** (Fig. 7) running transversely to the longitudinal axis of the car, said sills having secured thereto, respectively, front end wall **28** and rear end wall **29**.

Stiffening pieces **30** and **31**, associated with end wall **28**, and stiffening pieces **32** and **33**, associated with end wall **29**, are welded edgewise to their respective walls and secured against lateral displacement by being welded to the associated one of angle brackets **34**, **35**, **36** and **37** (see Fig. 3).

A drawbar **38** is secured to the front end wall and a drawbar **39** is secured to the rear end wall. The front end is provided with a spring bumper **40** and the rear end is provided with a spring bumper **41**.

The end wall structures just described are not new except insofar as they are adapted to fit the novel sidewall construction to be described.

Referring to Fig. 4, the car body is divided into transverse sections A, B, C, D and E. Section B and D will be designated wheel sections as they are over the wheels and axles, and section A, C and E will be designated the deep sections, which give the car added capacity.

As the weight of the car and its load are supported on the axles and through them to the wheels, a wheel section of the body will be described first with reference to section B shown in Fig. 5, the right side of which is shown in enlarged detail and with the axle and wheel in phantom, in Fig. 8. As both sides of a section are constructed the same, principal reference will be had to Fig. 8.

Starting at the top edge, wheel section B has a rolled rim **44**, which is provided for the upper edges of all the sidewalls and end walls, a relatively short vertical wall **45** and an inwardly and downwardly sloping wall **46** the lower edge of which is welded to the inside upper edge **47** of a sidewall channel bar support member **48**, of modified U-shape cross-section having a wide upper flange **49** projecting outwardly laterally and a narrow lower flange **50** extending in the same direction. The vertical dimension of the flange is such that it extends considerably above and below the axle **22** which passes through a vertically oval bearing hole **51** therein. Bearing **52** surrounds the hole on the outside, and an aperture **53** is cut in the upper flange as clearance for the inner hub **54** of wheel **21**. Support member **48** is as long fore and aft as the width of section B. Cut in sloping wall **46** is a clearance aperture **55** which is covered by a shallow wheel housing comprising plates **56**, **57**, **48**, **59** (see Fig. 4) and **60**, which admits the rim **61** (Fig. 8) of wheel **21**.

Extending toward the opposite wheel housing from plate **56** is an axle shield **62** (see Figs. 4 and 5) which is of inverted V-shaped cross-section and which is shaped at the ends to make a fitted connection with the sidewalls of section B. The axle shield **62** (Fig. 4) of section B and the axle shield **63** of section D act as a side wall reinforcing and support means in addition to furnishing sloping walls aiding the loaded mined material to be dumped through the bottom of the car.

Taking section C shown in Figs. 6 and 9 as an example of the construction of a deep section, and referring principally to Fig. 9, there is provided a rolled rim **65** and a vertical wall section **66** which is deeper than vertical wall **45** (see Fig. 8) of section B by an amount approximately equal to the vertical height of sidewall support member **48**. This increase in depth of a deep section compared to a wheel section may be as much, or more, than six inches in a car having a body whose maximum depth is a little over twenty-five inches. This capacity of a car is of great importance in commercial operations and to provide a car of increased capacity has always been a leading objective in the manufacture of mine cars. Section C has a sloping wall **67** which has attached to its outside lower edge **68** an angle brace **69**, running the entire length fore and aft of said edge.

Closing the vertical offset between sloping wall **46** of section B and sloping wall **67** of section C is a plate **70** whose upper edge is welded to the under side of sloping wall **46** and whose lower face is welded to the edge of sloping wall **67**. Plate **70** widens toward its lower end leaving a sector portion **71** extending below wall **67** the lower end of which engages and is welded to the end of brace **69**. The other face of plate **70** is welded to the end of channel bar support member **48** and, hence, both vertical and longitudinal forces are transferred from sidewall section C to support member **48**. It will be seen from Figs. 8 and 9 that there is a place of direct longitudinal alignment of the lower flange of member **48** and the horizontal flange of the adjacent angle brace **69** through the intermediary of plate **70**.

This offset structure between sections B and C is present between each wheel section and the adjacent deep sections on each side.

The end deep sections A and E have their edges welded to their respective end wall and end sill and the angle braces **69** are welded in abutting relation to the end walls.

Each end section has a transverse slope sheet such as sheets **72** and **73** (Fig. 7) which extend from the interior face of the associated end wall downwardly and inwardly in the car body. This construction leaves a bottom opening in each of the deep sections A, C and E to which the load material tends to move by reason of the slope of the car interior.

To close these openings there is provided three doors **75**, **76** and **77** (Figs. 4 and 7), the doors **76** and **77** being hinged, respectively, on axles **22** and **25**, and door **75** being hinged on a hinge rod **78** (Fig. 7) mounted in holes in blocks **79** and **80** (Fig. 3) extending rearwardly from the front end sill **26**. Doors **75**, **76** and **77** are secured in closed position by respective latch members **81**, **82** and **83** of the type shown and described in United States Letters Patent No. 2,225,462 issued to Rose, Dec. 17, 1940, which may be tripped on movement of the car over a tripping member located between the tracks at the spot at which the car is to be dumped.

Referring to Fig. 4, it will be seen that the sections B and D are made only as wide as is necessary to allow for the wheels and axles, and that the sections A, C and E may be made as much larger as is practical. It will be evident, also, that cars having more than two axles may be built on the same novel plan.

I am aware that the car shown herein may be varied considerably without departing from the spirit of the invention and, therefore, I claim my invention broadly as indicated by the appended claims.

Having thus described my invention, what I claim as new and useful and desire to secure by Letters Patent, is:

1. In a mine car, including a plurality of wheel-supported axles, the combination of end sills; end walls joined to the end sills; and sidewall structure between the end walls including a first plurality of sidewall sections each having a vertical wall portion and a portion sloping upwardly and outwardly from a horizontal plane below the axles to the vertical wall portion, and a second plurality of sidewall sections each including a vertical wall portion and a portion sloping upwardly and outwardly from a horizontal plane above the axles to the vertical wall portion, all sidewall sections being integrally united, with the vertical wall portions in alignment, and with adjacent offset sloping portions of the joined portions being connected by plates, forming a unitary side wall structure, and oppositely disposed axle supporting means secured to the side wall structure beneath the second plurality of sidewall sections.

2. In a mine car, including a plurality of

wheel-supported axles, the combination of end sills; end walls joined to the end sills; and sidewall structure between the end walls including a first plurality of sidewall sections each having a vertical wall portion and a portion sloping upwardly and outwardly from a horizontal plane below the axles to the vertical wall portion, and a second plurality of sidewall sections each including a vertical wall portion and a portion sloping upwardly and outwardly from a horizontal plane above the axles to the vertical wall portion, the end sidewall sections being of the first plurality, and sidewall sections like those of the second plurality being interspersed intermediate of said end sidewall sections with those sections of the first plurality, and oppositely disposed axle supporting means secured to the sidewall structure beneath the second plurality of sidewall sections.

3. The structure of claim 1 in which the lower edge of the sloping portion of each of the first plurality of sidewall sections is provided with a stiffening member running the length of the section.

4. The structure of claim 1 in which the lower edge of the sloping portion of each of the second plurality of sidewall sections is secured to the oppositely disposed axle supporting means, and in which the lower edge of the sloping portion of each of the first plurality of sidewall sections is provided with a stiffening member running the length of the section, and in which said stiffening members and said axle supporting means transmit draft, buff and load forces through said plates against which they bear in offset relation.

5. A structure of claim 2 in which the lower edge of the sloping portion of each of the second plurality of sidewall sections is secured to the axle supporting means running the length of the section.

6. The structure of claim 2 in which the lower edge of the sloping portion of each of the first plurality of sidewall sections is provided with a stiffening member running the length of the section.

7. The structure of claim 2 in which the lower edge of the sloping portion of each of the first plurality of sidewall sections is provided with a horizontal stiffening member running the length of the section and in which the lower edge of the sloping portion of each of the second plurality of sidewall sections is secured to the top of the axle supporting means running the length of the section, said stiffening members and said axle supporting means transmitting draft, buff and load forces to and from one another through said plates against which they bear and to which they are secured in an offset manner, and the outer ends of the stiffening members of the end sidewall sections bearing against the associated end wall and sill.

8. In a mine car, including a plurality of wheel-supported axles, the combination of two spaced end sills between which the axles are disposed in parallel relation; an end wall secured to each of the end sills; sidewall structure between the end walls, said sidewall structure including a first plurality of sidewall sections each having on either side a vertical wall portion and a portion sloping upwardly and outwardly from a horizontal plane below the axles to the vertical wall portion, and a second plurality of sidewall sections each including on each side a vertical wall portion and a portion sloping upwardly and outwardly from a horizontal plane above

the axles to the vertical wall portion, said first plurality of sidewall sections having interspersed therebetween the sections of the second plurality, all sidewall sections being integrally united with the vertical wall portions in alignment and adjacent offset sloping portions on adjacent sections being connected by closure plates, and the end sidewall sections being secured to the end walls and the end sills, forming a body structure, and oppositely disposed axle supporting means secured to the sidewall structure beneath the second plurality of sidewall sections and having portions in longitudinal alignment with lower edges of the first plurality of sidewall sections.

9. The structure of claim 8 in which there are a number of sidewall sections of the second plurality equal to the number of axles, there being one axle associated with each of said sidewall sections and being disposed thereunder on the central transverse line of the section, and in which the entire body structure is supported on the axles by the lower edges of the sloping portions of said sections of the second plurality, the axle supporting means and the plates.

10. In a mine car, including a plurality of wheel-supported axles, the combination of end sills spaced apart and between which the axles are disposed in parallel alignment; end walls joined to the end sills; sidewall structure, between the end walls, including a first plurality of sidewall sections each having a vertical wall portion and a portion sloping upwardly and outwardly from a horizontal plane below the axles to the vertical wall portion, and a second plurality of sidewall sections each including a vertical wall portion and a portion sloping upwardly and outwardly from a horizontal plane above the axles to the vertical wall portions, all sidewall sections being united with vertical wall portions in alignment and adjacent offset sloping portions of adjoining sections being connected by closure plates, forming a unitary sidewall structure, there being one of the second plurality of sidewall sections between each two adjacent ones of the first plurality of sidewall sections, and there being one of said second plurality of sidewall sections for each of said wheel-supported axles, the axle associated with each section running thereunder transversely thereof; a plurality of bearing and stiffening members each secured by its top surface along the length of the bottom edge of an associated one of the sloping sidewall portions of said second plurality of sidewall sections, an axle passing through bearing holes in the associated bearing and stiffening members; transverse members connecting the opposite sloping walls of each of the second plurality of sections, each such transverse member being of an inverted V-shaped formation and acting as an axle cover and as a slope sheet; a slope sheet extending from the inner side of each end wall, from a line between the top and bottom thereof, inwardly and downwardly; and bottom closure members for each of the first plurality of sections, forming a material-tight car body.

11. The structure of claim 10 in which the bottom closures of the first plurality of sections are doors, each hinged at one end on a transverse axis and releasably secured in closed position on the other end by a latch.

12. The structure of claim 10 in which the wheels on an axle are accommodated in the embrasure formed in the outer conformation of the sidewall structure where the sloping portion of the associated sidewall section is offset inward-

ly from the sloping portions of the sidewall sections on either side, and in which clearance is given in a vertical direction by a clearance formation in the associated bearing member and by a clearance hole in the sloping portion of the sidewall section directly thereabove.

13. The structure of claim 11 where the axles act as hinge pins, each for an associated one of the doors, except for the door serving the front section of the car, which last mentioned door is hinged on a shaft supported in bearings projecting rearwardly from the front end wall of the car beneath the slope sheet extending inwardly and downwardly therefrom.

14. The structure of claim 12 where the portion of the wheel projecting through the sloping portion of the sidewall section is covered by a shallow wheel housing.

15. In a mine car, in combination, a plurality of axles each having a wheel on each end and said wheels and axles being disposed for use as the running gear of the car; a horizontal car body support and axle bearing member associated with each wheel, each of said members being located on the associated axle just inside the associated wheel and extending horizontally fore and aft from the wheel axis just beyond the limits of the wheel associated therewith, each of said members having a substantial vertical depth above and below the axle, and each having the associated axle passing therethrough in a bearing aperture therein; a car body having end sills, end walls, and sidewalls, each of said sidewalls having portions sloping inwardly and downwardly from a point in a vertical upper portion, those side portions opposite a wheel commencing such slope near the upper edge of the car body and ending at the top of the associated body support and axle bearing member, and the other side portions commencing to slop farther down from

the upper edge of the car body and ending on a line which is the fore and aft projection of the bottom edges of the car body support members on the associated side of the car, the vertical offset spaces between sloping portions of adjacent sections being closed by vertical plates, each of said plates at its lower end abutting the associated end of the associated car body support member and axle bearing; and a longitudinal brace member secured to the bottom outside edge of each of the lower sloping portions and abutting each associated vertical plate at a point opposite the bottom of the car support member and axle bearing, on the other side thereof, and the outer ends of braces adjacent the end walls being secured to the associated end wall and end sill, said end walls, sidewalls, vertical plates, braces, and car support members being secured to one another to hold them in abutting relation so that longitudinal forces of draft and buff will be transmitted from end sill to end sill without buckling the sidewalls, and so that load forces will be transmitted to the axles.

16. The structure of claim 15 in which each car body support member is a U-shaped channel member, the legs of which extend laterally outward.

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