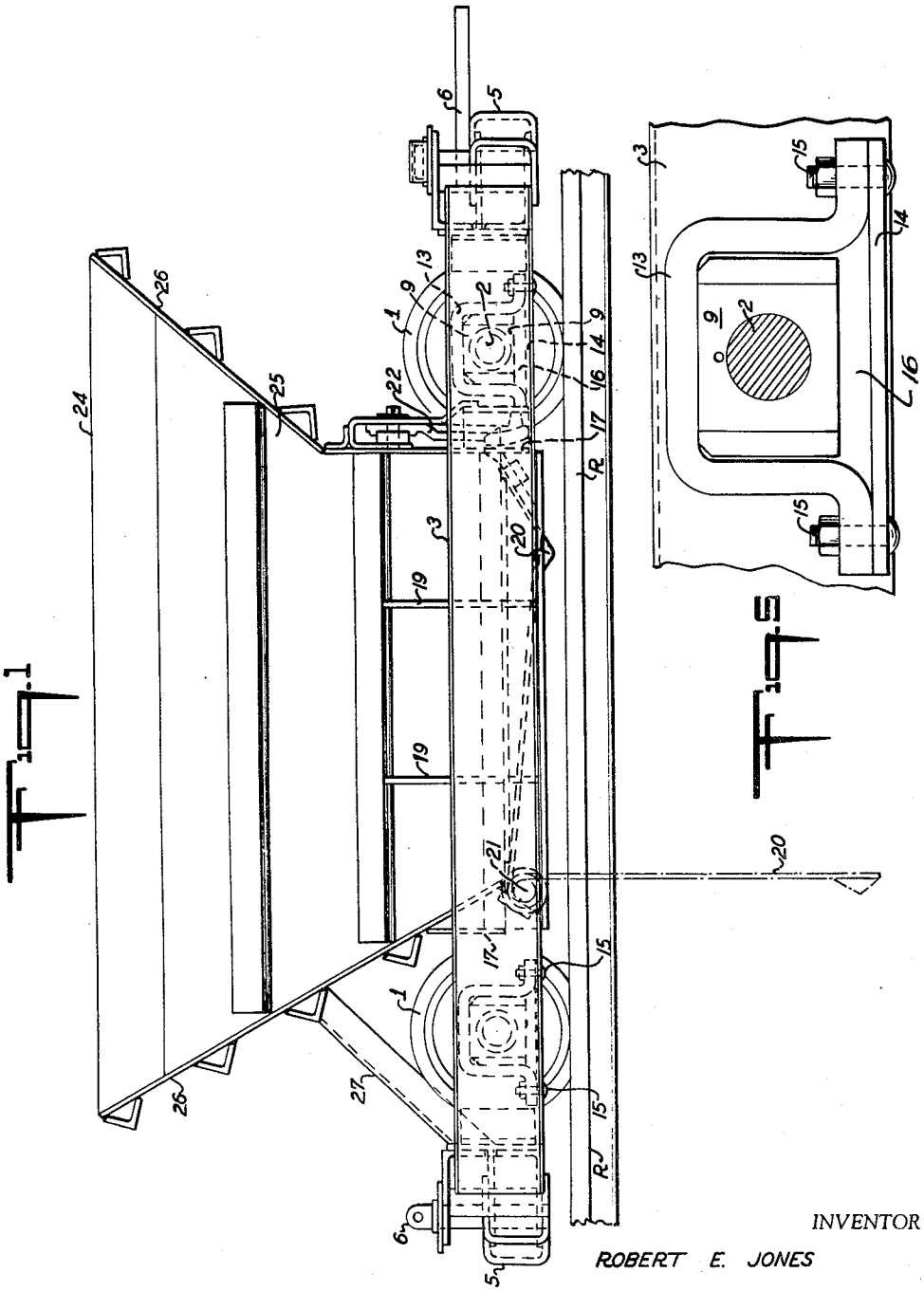
July 26, 1960 R. E. JONES 2,946,296

DROP BOTTOM CARS

Filed Aug. 8, 1956 3 Sheets-Sheet 1



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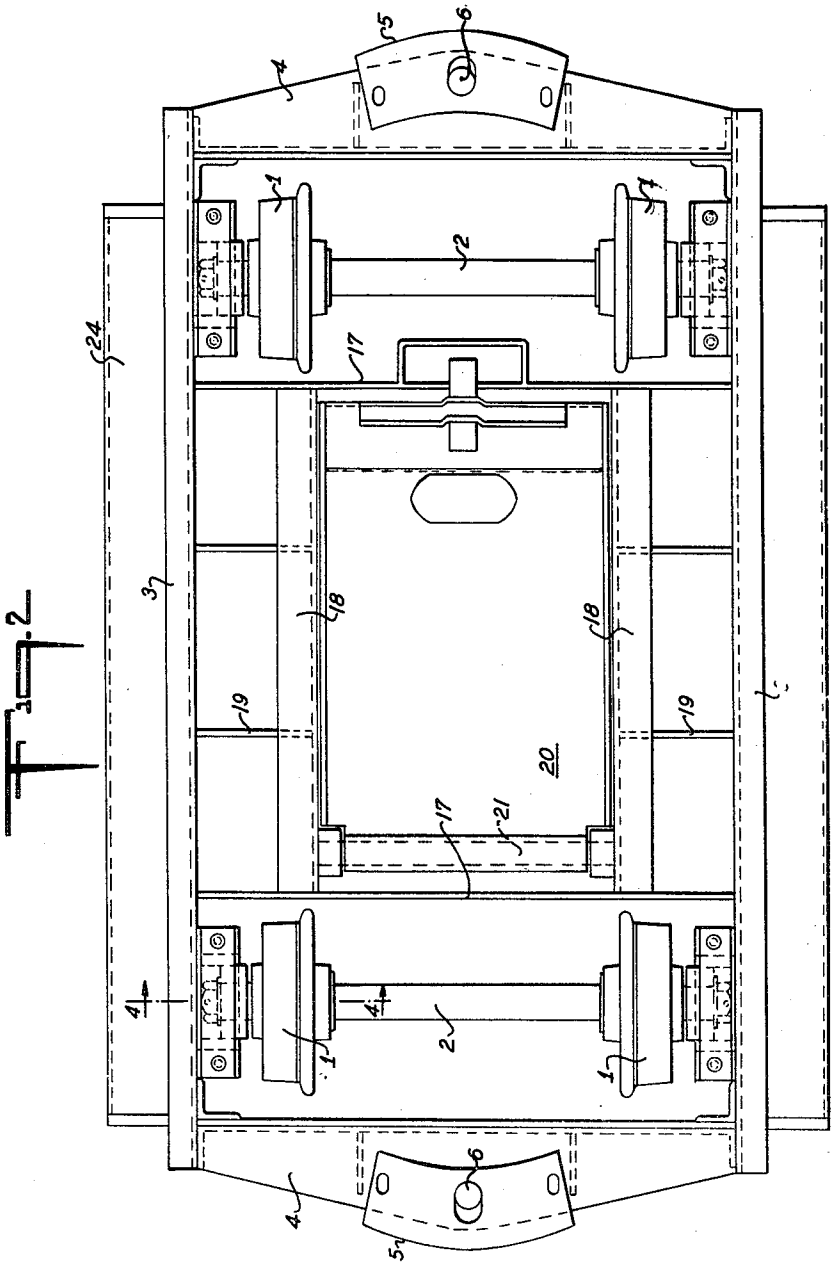


FIG. 2

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Fig. 3

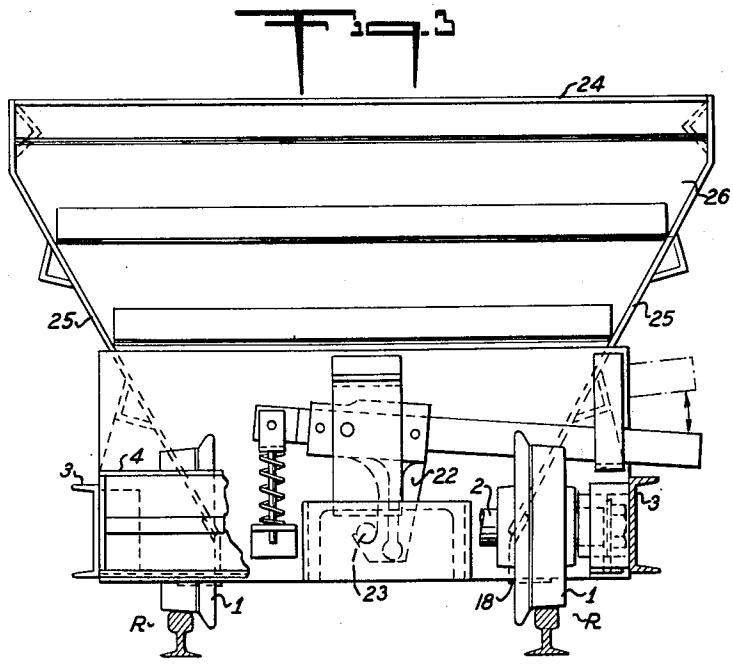
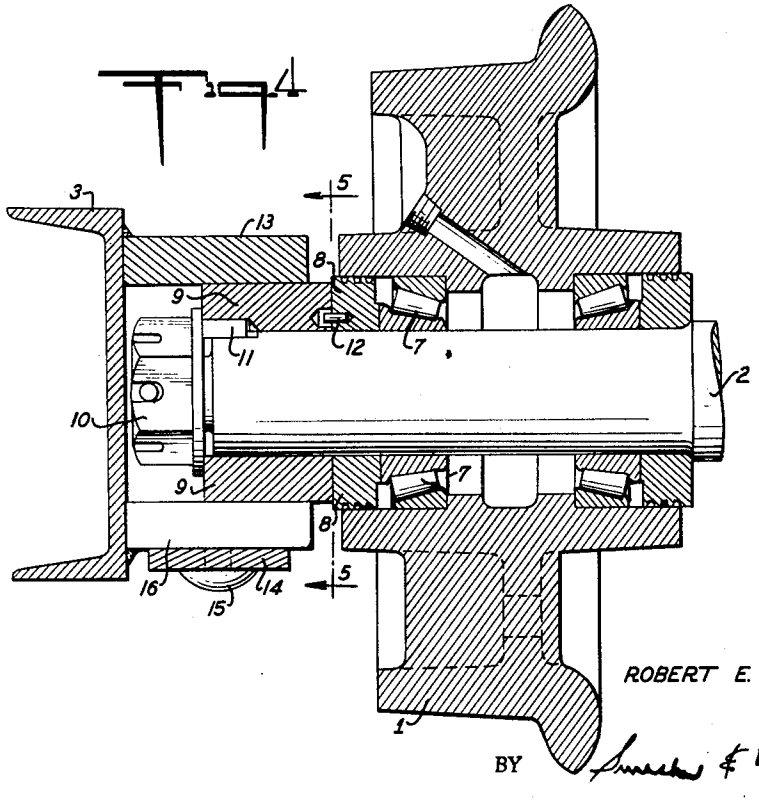


Fig. 4



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DROP BOTTOM CARS

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9 Claims. (Cl. 105—364)

This invention relates to improvements in drop bottom cars, adapted particularly for hauling rock and other minerals and large lading, as encountered at rock quarries, mines and the like.

A very large percentage of the mines of the hard rock or heavy mineral industry use narrow track gauges and loading machines which pick up the broken ore by means of a bucket and discharge it directly into cars to which the machine is connected. The loading machine discharges by means of an overhead bucket in a swinging action. The receiving car must be close to the loading machine and the length of the car must be comparatively short.

Conventional four-wheel cars have been manufactured heretofore using three drop bottom doors spaced along the length of the bottom of the car. Such cars have been unsatisfactory for the heavy rock industry for various reasons. The three-door car is generally manufactured with a width of door opening that is not greater than seven inches less than the track gauge, which gives a door opening of seventeen inches on a track gauge of twenty-four inches, or twenty-three inches on a track gauge of thirty inches. A track gauge of thirty inches is exceptionally wide for the ore mines, twenty-four inches being the more common track gauge customarily used.

The three-door cars usually have some cross members intermediate the doors, or may be divided into compartments. These compartments, however, are shorter than desirable when the overall length is divided into three segments for doors and interfere with the shedding of the lading during the discharge thereof from the car body.

One object of the invention is to overcome the objections heretofore encountered in drop bottom cars used for handling rock and other heavy minerals, and to provide a more practical construction which will be effective in supporting the loads encountered and also will effectively discharge the lading when desired.

Another object of the invention is to provide in a drop bottom car for a maximum width of door opening relative to the track gauge, increasing the capacity within given overall dimensions through wide spacing of the door compartment walls.

Still another object of the invention is to improve the construction of the drop bottom car to provide for the negotiation thereby of the average curves encountered at mines where hard rock or heavy minerals are removed, and which car has a wide door opening relative to the track gauge and the frame provides for a bumper and drawbar close to the rail.

These objects may be accomplished according to one embodiment of the invention by mounting the wheels and axles on an outside frame, with inside carrying members supporting the drop bottom door. The carrying members for the door extend in longitudinal alignment with the wheels on the corresponding sides of the car

and do not require intersection either by the wheels or axles, whereby the lateral margins of the door can be very close to the wheel flanges. Moreover, such an arrangement allows the outside frame and bumper and drawbar construction to be located very close to the top of the rails, which decreases the overturning tendency when negotiating track curves.

This embodiment of the invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a side elevation of a drop bottom car;

Fig. 2 is a bottom plan view thereof;

Fig. 3 is an end elevation thereof, with a part broken away and in section to show the interior construction;

Fig. 4 is a cross section through one of the wheels and axle boxing thereof, taken on the line 4—4 in Fig. 2; and

Fig. 5 is a detail cross section on the line 5—5 in Fig. 4.

Most tracks, as used at mines of hard rock or heavy minerals, are of relatively narrow gauge, usually twenty-four inches, although a track gauge up to thirty inches, in exceptional cases, has been encountered. The top of the rail is indicated at R at each side of the track on which the car travels. The wheels 1 are journaled on axles 2, extending in bridging relation between frame side sills 3. The side sills 3 extend longitudinally on opposite sides of the car and are connected together at their opposite ends by end sills 4. The end sills 4 are provided with bumpers 5 and drawbar means, generally indicated at 6, such as a pin and link.

Referring to Fig. 4, each wheel 1 is journaled on the axle 2 by anti-friction bearing means 7 which is retained on the axle by a follower plate 8 that telescopes into the hub of the wheel. A box 9 is fitted over the axle against the plate 8 and is confined by a nut 10. The box 9 is held against rotation relative to the axle by a pin 11. A pin 12 is also used between the box 9 and the plate 8 and holds the latter against rotation relative to the axle.

The box 9 is of angular shape in cross section, as shown in Fig. 1, and fits within a boxing 13 that encloses three sides of the box and is confined at the bottom by a bar 14. The boxing 13 is formed by a bar bent or shaped as required, and forming a support seated on the box 9. The ends of the bar forming the boxing 13 support the bar 14 by bolts 15 which are detachable to permit separation of the axle construction from the frame side members 3. The boxing 13 is secured rigidly to the frame member 3 as by welding. A space 16 is provided between the bottom of the box 9 and the bar 14 to allow the truck at each wheel to follow the rail through dips, etc.

Extending transversely between the frame side members 3 are tie plates 17, which tie plates 17 are close to the adjacent wheels 1, but both tie plates are intermediate the axles. Extending lengthwise of the car between the tie plates 17 are carrying members 18 that abut at their ends the tie plates 17 and are secured thereto. Gussets are shown at 19 extending between the carrying members 18 and the respective adjacent frame side members 3.

The tie plates 17 and carrying members 18 define a drop bottom door opening through the bottom of the car for the discharge of lading therefrom. This opening is substantially closed normally by a drop bottom door 20 hinged at one end on a rod 21 extending transversely between the carrying members 18 to which the rod 21 is secured at its opposite ends. The free edge of the door 20 is adapted to be latched in its closed position by a latch 22 of conventional construction adapted to engage a pin 23 on the end of the door 20 for holding the door

in its closed position, shown in the upper dotted-line position in Fig. 1. Upon release of the latch **22**, the door can drop open to the lower dotted-line position in Fig. 1.

The lading body is indicated generally at **24** and comprises side and end walls suitably braced and extending downwardly to the upper edges of the respective tie plates **17** and carrying members **18** for shedding the lading through the drop bottom door opening. One of the end walls may extend over the hinge pin **21**, as indicated in Fig. 1, to prevent lodging of the lading on the hinged edge of the door.

The construction described locates the longitudinal walls of the door compartment of the car entirely between the spaced axles, so that there is no vertical section of a side plate of the car body or side angle that is pierced by either axle or a wheel. The entire lading side walls of the door compartment are completely between the wheels and axles, as shown in Fig. 1, which makes it possible to widen the door opening and door to at least twenty-six inches on a track gauge of thirty inches and with a thirty-six inch length of door opening thereby made possible without an excessively long wheel base, so that the car can still negotiate the average curves that may be encountered by rail haulage in hard rock and heavy mineral mines. The door **20** is hinged so as to swing through an arc as a pendulum, almost to a horizontal position behind the wheels, with only sufficient clearance for free rotation of the wheel flanges relative thereto. It is possible to make a door width up to one inch or one and one-half inches of the inside of the ball of the rail.

This construction makes it possible to provide a maximum discharge opening within the door compartment walls, both in width and length in comparison with the length of the car and relative to the track gauge. Moreover, the capacity gained within given overall dimensions is increased because of the wide spacing of the door compartment walls, particularly as to width.

As shown in Fig. 2, the side walls **25** of the car body **24** are in planes that extend directly to the upper edges of the carrying members **18**, and by reference to Fig. 1, it will be apparent that these side walls **25**, within the door compartment, are not pierced by either the wheels or axles. These side walls, as well as the end walls **26**, are substantially flat with no recesses, pockets or other means thereon which would interfere with the discharge of the material. Thus, no shedding problem is encountered even with wet, sticky material which may be found in rock mines, and the capacity of the car is maximum for the conditions required.

The side and end walls **25** and **26** are suitably braced for rigidity, and the rear end wall **26** is also provided with one or more oblique braces **27** extending upwardly to an intermediate portion thereof from the adjacent cross member or end sill **4**.

The construction of the main frame **3—4** with additional carrying means for the drop bottom door allows the bumper and drawbar to be maintained close to the rails. Thus, the outside frame members have more than 50% of their cross sections below the tops of the axles, by reason of the use of axle boxings **13** welded to the inside faces of the frame members **3**. This low outside frame has advantage in applying draft and buff close to the top of the rail and also along the center of the axles which decreases overturning tendency when negotiating track curves. Moreover, the frame construction allows the outside frame to serve as a lateral limitation to the shifting of the trucks, as well as its placement close to the tops of the rails.

The construction makes possible high capacity and location of the lading body with an extremely wide door completely within the wheel base with no recesses, pockets, etc. to hinder the discharge of the material.

While the construction has been illustrated and described in one embodiment, it is recognized that variations and changes may be made therein without departing from the invention as set forth in the claims.

I claim:

1. In a drop bottom car, the combination of a body having side and end walls and having a bottom opening therebetween, a supporting frame for the body including side and end members, axles connected within the side members of the frame and spaced between the end walls of the body and the end members, supporting wheels on the axles, said bottom opening having its opposite side edges adjacent an upright plane extending lengthwise of the body at the inner faces of the wheels at each side of the body.

2. In a drop bottom car, the combination of a body having side and end walls with a bottom opening therebetween, drop bottom doors for closing said opening, a frame supporting the body including side members extending lengthwise of the car on the outer sides of the side walls and having connecting cross members at opposite ends of said frame side members, an axle extending transversely between the frame side members at each end of the frame and located intermediate the adjacent body end walls and frame cross members and connected with the frame, and wheels on the axles, said bottom opening being of substantially the same width as the track gauge between opposite wheels.

3. In a drop bottom car, the combination of a body having side and end walls with a bottom opening therebetween, a frame supporting tthe body including side members extending lengthwise on the outer sides of the side walls and connecting cross members at opposite ends of said frame side members, an axle extending transversely between the frame side members at each end of the frame and located intermediate the adjacent body end walls and frame cross members and connected with the frame, wheels on the axles, said bottom opening being of substantially the same width as the track gauge between opposite wheels, carrying members extending lengthwise of the frame on opposite sides of the bottom opening and spaced inwardly from the respective adjacent frame side members, a drop bottom door mounted on the carrying members in position to substantially close the bottom opening, and means mounting the carrying members on the frame.

4. In a drop bottom car, the combination of a body having side and end walls with a bottom opening therebetween, a frame supporting the body including side members extending lengthwise on the outer sides of the side walls and connecting cross members at opposite ends of said frame side members, an axle extending transversely between the frame side members at each end of the frame and located intermediate the adjacent body end walls and frame cross members and connected with the frame, wheels on the axles, carrying members extending lengthwise of the frame on opposite sides of the bottom opening and spaced inwardly from the respective adjacent frame side members, and a drop bottom door mounted on the carrying members in position to substantially close the bottom opening, said carrying members extending lengthwise of the car substantially in alignment with the wheels on the corresponding sides thereof, and means mounting the carrying members on the frame.

5. In a drop bottom car, the combination of a body having side and end walls with a bottom opening therebetween, a frame supporting the body including side members extending lengthwise on the outer sides of the side walls and connecting cross members at opposite ends of said frame side members, an axle extending transversely between the frame side members at each end of the frame and located intermediate the adjacent body end walls and frame cross members and connected with the frame, wheels on the axles, said bottom opening being of substantially the same width as the track

gauge between opposite wheels, carrying members extending lengthwise of the frame on opposite sides of the bottom opening and spaced inwardly from the respective adjacent frame side members, and a drop bottom door mounted on the carrying members in position to substantially close the bottom opening, tie members extending transversely between the frame side members at each opposite end of the car and connected thereto, each tie member being located between the adjacent axle and the bottom opening and having the adjacent ends of the carrying members mounted thereon.

6. In a drop bottom car, the combination of a body having side and end walls with a bottom opening therebetween, a frame supporting the body including side members extending lengthwise on the outer sides of the side walls and connecting cross members at opposite ends of said frame side members, an axle extending transversely between the frame side members at each end of the frame and located intermediate the adjacent body end walls and frame cross members and connected with the frame, wheels on the axles, said bottom opening being of substantially the same width as the track gauge between opposite wheels, carrying members extending lengthwise of the frame on opposite sides of the bottom opening and spaced inwardly from the respective adjacent frame side members, means connecting the carrying members to the frame side members, a drop bottom door mounted on the carrying members in position to substantially close the bottom opening, the axles extending in the same horizontal plane as the frame side members and terminating in spaced relation therefrom, and means mounting the ends of the axles on the inner faces of the frame side members.

7. A drop bottom car comprising a body having side and end walls and a drop bottom opening therein, a frame including side members extending on the outer sides of the body and connecting cross members jointing said side members together, axles extending transversely between the side members in the same horizontal plane therewith, wheels mounted on the axles, each of the axles having a box on an outer end thereof, a boxing surrounding and enclosing the box, said boxing being in said horizontal plane in edgewise abutting relation against the inner face one of the adjacent frame side members, and means securing the boxing to said side member in supporting relation thereon.

8. In a drop bottom car having a body including side and end walls and a supporting frame including side and end members, the combination therewith, of wheels and axles for supporting the car body, each of the axles being in the same horizontal plane as the frame side members intermediate the height of the latter and between the end walls and the end members of the frame, a box telescoped over an end of the axle, a boxing surrounding the box and supporting the latter, said boxing being in said horizontal plane and in endwise abutting relation against the inner face of an adjacent frame side member, and means forming a supporting connection between the boxing and said frame side member.

9. In a drop bottom car, the combination of a body having side and end walls with a bottom opening therebetween, carrying members extending lengthwise of the car on opposite sides of said opening, sills extending lengthwise of the car laterally outside said carrying members and beyond the ends of said carrying members, tie plates extending transversely between the side sills and secured at opposite ends to the side sills and to the ends of the carrying members supporting said members on the side sills, closure means for the bottom opening mounted on the carrying members, and wheels and axles connected to the end portions of the side sills longitudinally outside the tie plates.

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