

**July 13, 1937.**

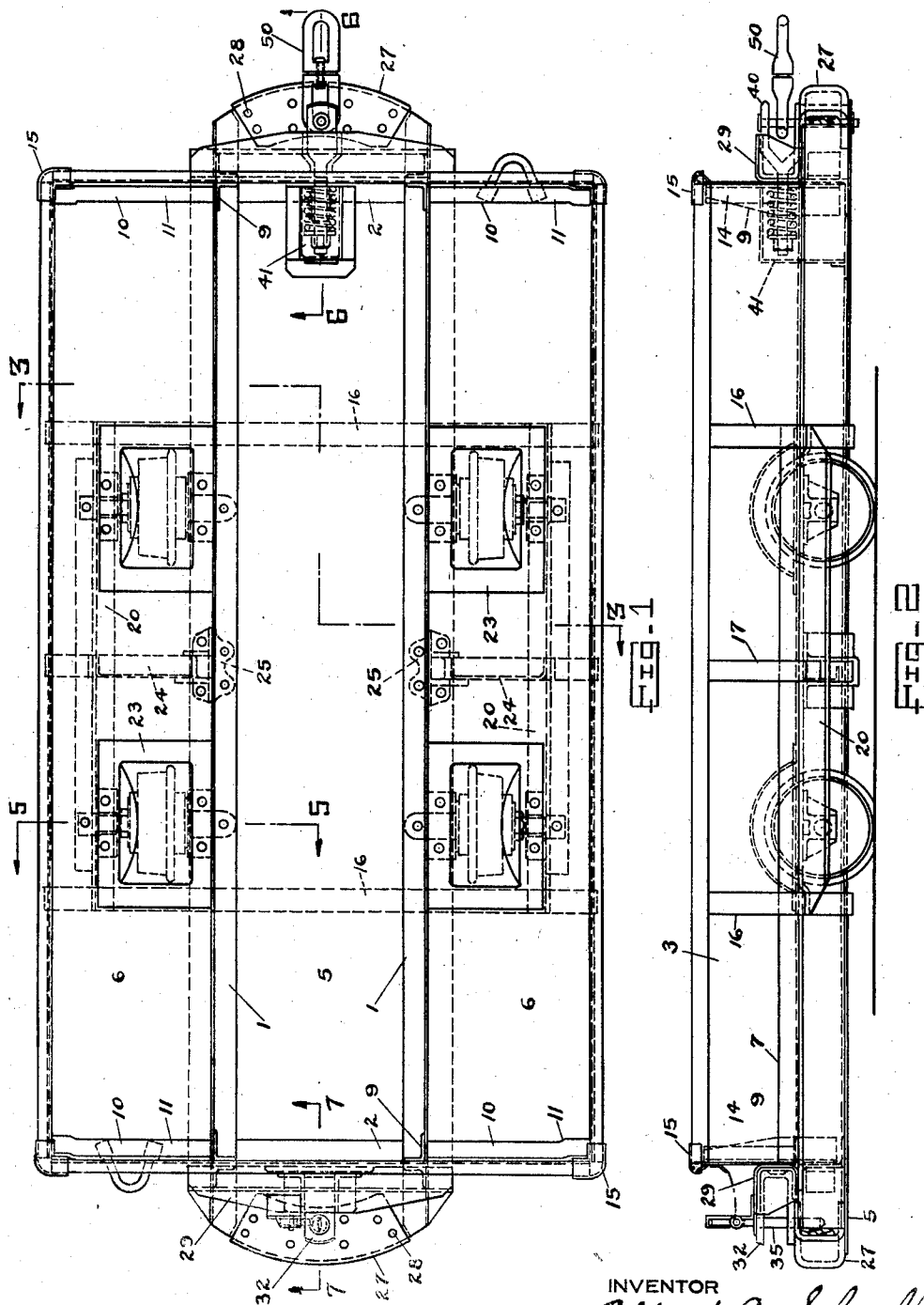
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**2,086,924**

## CAR CONSTRUCTION

Filed May 16, 1933

3 Sheets-Sheet 1



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CAR CONSTRUCTION

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3 Sheets-Sheet 2

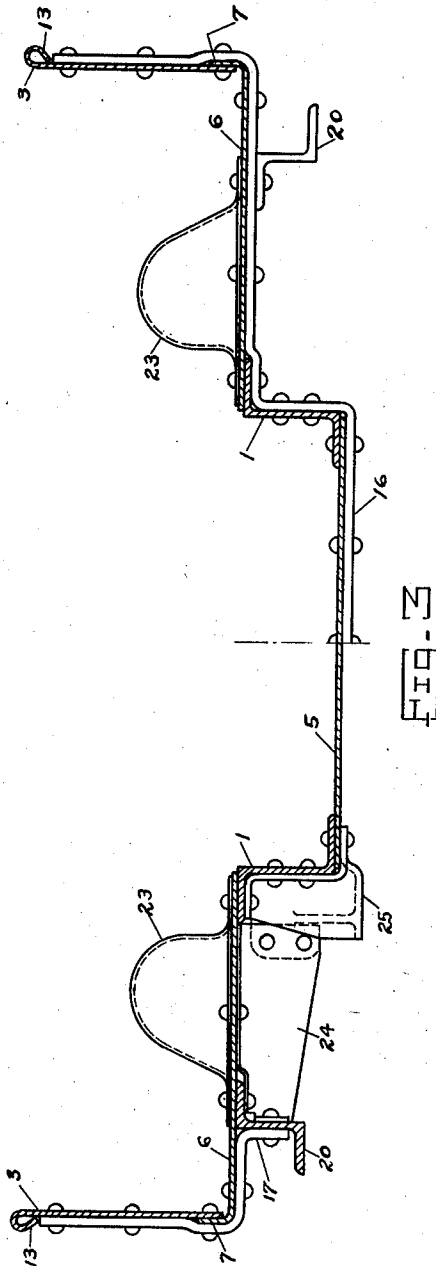


FIG. 2

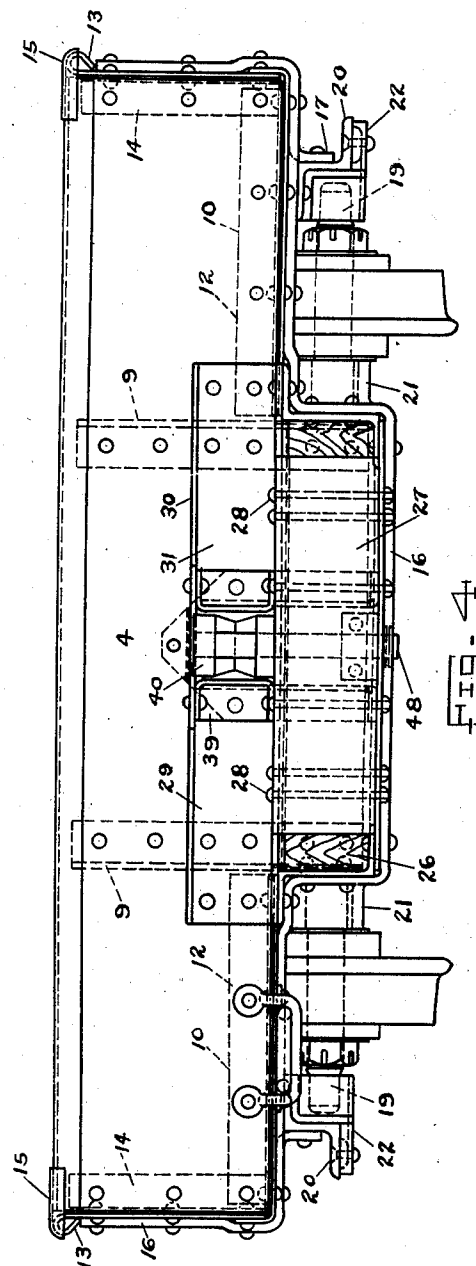


FIG. 4

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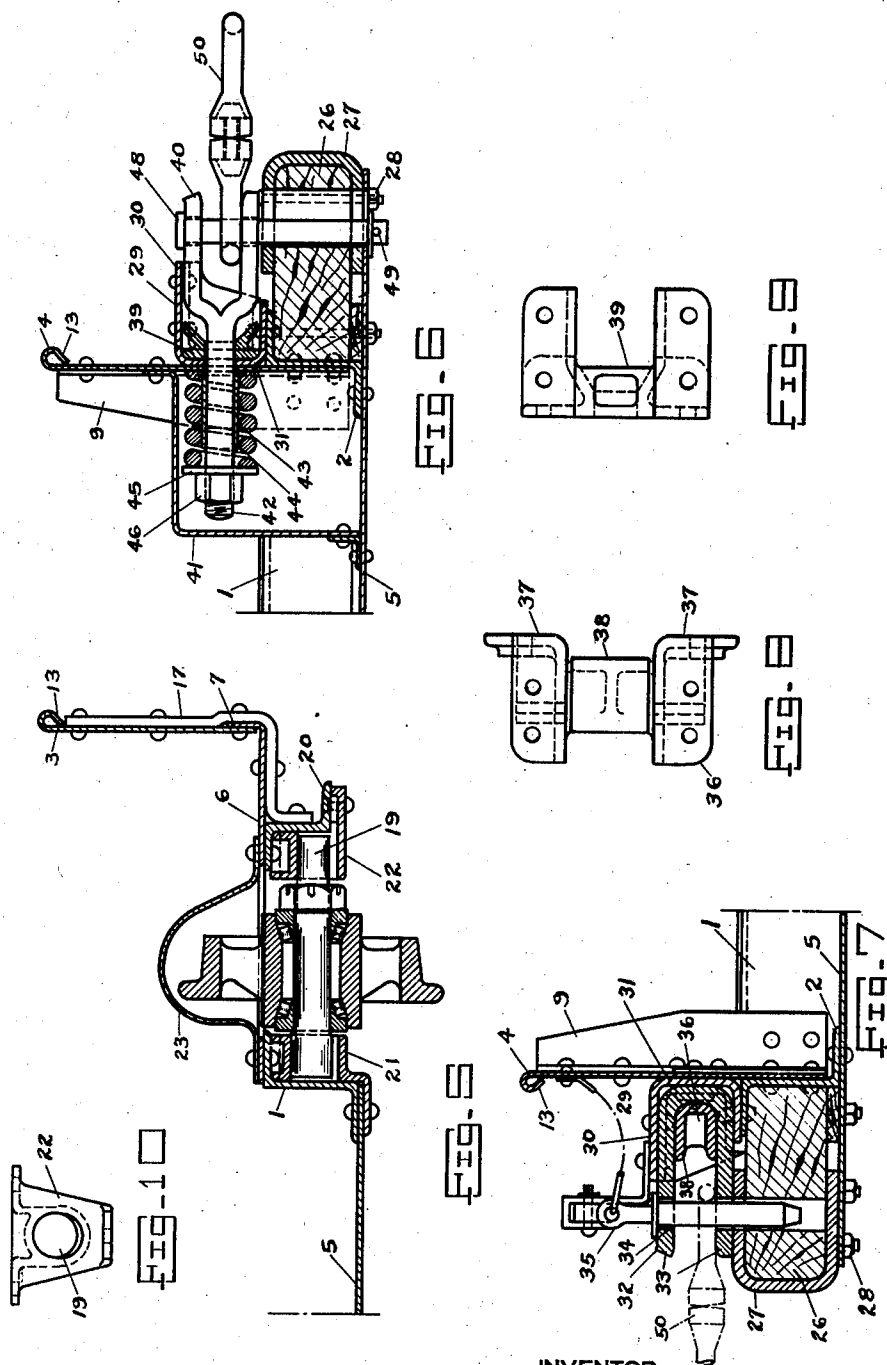
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**2,086,924**

## CAR CONSTRUCTION

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3 Sheets-Sheet 3



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## UNITED STATES PATENT OFFICE

2,086,924

## CAR CONSTRUCTION

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by mesne assignments, to Pressed Steel Car  
Company, Inc., Pittsburgh, Pa., a corporation  
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24 Claims. (Cl. 105-364)

The invention hereinafter described pertains to car construction, particularly that type of car known as a mine car and having the mid portion of the floor of the body below the plane of the floor at the sides of the body and more particularly to that type of construction having the wheels mounted on stub axles presenting an unobstructed car floor.

An object of the invention is to provide a mine car of minimum height and large capacity which is rugged and the parts thereof are readily accessible for repairs.

Another object of the invention is to provide such a car which by its construction tends to adapt itself to inequalities in the track and prevent or reduce the possibilities of the car leaving the track when moving thereon.

A further object of the invention lies in the construction of the individual members of the car and the combinations thereof as will be hereinafter described.

Referring now to the drawings, Fig. 1 is a plan view of the car; Fig. 2 is a side elevation of the car shown in Fig. 1; Fig. 3 is an enlarged sectional view taken along line 3-3 of Fig. 1; Fig. 4 is an enlarged end elevation of the car shown by Fig. 1; Fig. 5 is an enlarged sectional view taken along the line 5-5 of Fig. 1; Fig. 6 is an enlarged sectional view taken along line 6-6 of Fig. 1; Fig. 7 is an enlarged sectional view taken along line 7-7 of Fig. 1; Fig. 8 is an enlarged plan view of the anchor plate shown in section by Fig. 7, and Fig. 9 is an enlarged plan view of the coupler guide shown in section by Fig. 6; Fig. 10 shows in elevation the journal box of Fig. 2.

Referring now in detail to the drawings where like reference characters refer to like parts, the car body comprises center sills 1, end sills 2 and body side and end walls 3 and 4. The center sills preferably extend beyond the end walls of the body for a purpose to be hereinafter set forth. As shown by the drawings these sills, in the preferred form, are Z-bars which may be either commercially rolled, pressed or built up shapes, having their top flanges directed outwardly and their bottom flanges inwardly disposed. Secured to the bottom flanges and beneath the sills 2 is an intermediate floor plate 5 which preferably extends as one continuous member throughout the length of the center sills. At each side of the intermediate floor plate 5 and secured to the upper flanges of the center sills 1 are the side floor plates 6 which are shown in the drawings as having their outer side edges 7 flanged upwardly for a purpose which will be hereinafter described.

Completing the underframing of the floor are two end sill members 2 disposed between the center sills of the car to form the body end walls of the intermediate floor section. These end sill

members 2 are preferably of Z-bar construction having their bottom flanges turned inwardly and cut out to fit between and in the plane of the bottom flanges of the center sill members. These lower flanges are conveniently secured to the intermediate floor sheet. The upper flanges of the end sill 2 are disposed outwardly and preferably extending beyond the inner limits of the bottom flanges to adjacent the web of the center sills 1 and in the plane of the top flanges thereof. These end sill members 2 are secured to the webs of the center sills by means of suitably formed angular members 9 which extend above the center sill members to a point adjacent the upper edge of the end of the car body and serve as intermediate end posts.

Along the end edges of the side floor plates 6 are angular shaped members 10 having their bottom flanges 11 disposed upon the side floor plates 6 and secured thereto, the other leg 12 of the member 10 being vertically disposed and in the plane of the end wall of the car body. To these members 11 and the flanges 7 of the side floor sections 6 are secured the ends 4 and sides 3 of the car body. These end and side sheets have reinforcements at the upper edges in the form of a flange 13 turned back on itself as shown in Fig. 3 of the drawings. At the juncture of the side and end sheets of the body are mounted vertically disposed angular members 14 which are secured to the side and end sheets inwardly of the car body. These members 14 are also secured to the members 10 and flanges 7 of the side floor sections. At each of the upper corners of the car body are mounted corner caps 15 closing the joint between the side and end sheets and serving to more securely tie them together.

Intermediate the ends of the body and on opposite sides of the transverse center line thereof, members 16 preferably in the form of a flat bar of considerable thickness extends beneath the intermediate and side floor plates, being secured thereto and extending upwardly along the sides of the body to a point adjacent the top edge thereof. Adjacent the transverse center line of the body a member 17 is provided which is on each side of the body but preferably stops short of the center sills. These members 16 and 17 serve to brace the sides of the car preventing transverse distortion of the body and serve to reinforce the sides in a vertical direction. It will be observed from the above description that each side of the car is designed as a beam, the top flange 13 of the side forming the top chord and the side flanges 7 of the side floor sections forming the bottom chord. The top and bottom chords are connected by means of the corner members 14 and the intermediate body band members 16 and 17.

For the purpose of providing an unobstructed

bottom portion in the car body while maintaining a low center of gravity the wheels of the car, which are four in number, are mounted on stub axles 19. The inner ends of the axles are secured to the center sills and the outer ends are secured to longitudinally extending members 20 mounted beneath the side floor plates and secured to the body bands. As shown in the drawings these members 20 are preferably of Z-shape having their top flanges disposed inwardly of the car and secured to the side floor sections 6 and body bands 16-17. The stub axles 19 are mounted in bearings, the inner bearing 21 being secured to the sill member and the outer bearing 22 being secured to the member 20. It will be noted upon reference to Figs. 2, 5, and 10 of the drawings that the bearings 21 and 22 have vertically slotted openings to permit vertical movement of the wheels and axles. As shown in the drawings the stub axles have anti-friction bearings mounted thereon upon which the wheels turn whilst the axles remain stationary. It is to be understood, however, that any other type of bearing may be used and the wheel may be mounted rigidly with the shaft and the axle turn in the bearings. With the axles 19 mounted in this manner it will be obvious that the periphery of the wheels extends above the floor of the body and for this purpose openings are cut in the side floor plates 6. These openings are closed by wheel hoods 23 mounted upon said side floor plates.

For the purpose of providing a more adequate support on the car for the outer axle bearings and to brace the side floor portion against deflection under load, I propose to mount diaphragms 24 at the transverse center line of the car and extending between the members 1 and 20. These diaphragms are preferably in the form of a pressing having their outer ends secured directly to the members 20 and their inner ends mounted in a bracket 25 secured to the center sill 1.

It will be obvious from a consideration of the hereinbefore described construction that the center sills are so connected as to form a rigid backbone for the car, and that the sides of the car are formed as a beam, each beam being supported upon its respective pair of wheels. In this manner a strong rigid central member is provided for all buffing and pulling purposes, while the wheels and sides of the car have sufficient flexibility to enable the car to adjust itself to the ordinary inequalities in the track rails and thereby resist displacement of the car from the rails during operation thereon.

At each end of the car and secured to the center sills thereof are mounted buffing and coupling mechanisms. In the embodiment as shown by the drawings a buffing device is provided at each end of the car to receive impact forces, while one coupling is made solid and the other a spring coupling to reduce the pulling shock transmitted to the car. It is to be understood, however, that either or both ends may be equipped with a solid or spring coupling device.

The bumper or buffing devices provided at each end of the car comprises a wood filler 26, fitting between the car center sills 1, beneath the top flange of the end sill member 2 and preferably abutting against the web of the member 2. The outer end of the wood filler is covered by a steel wear plate 27 which is U-shaped and embraces the filler between the arms of the U. The filler and wear plate are mounted between the center sills 1 and upon the bottom plate 5 which ties

the sills 1 together. Bolts 28 are passed through the wear plate 27, filler 26 and through the bottom plate 5 securely fastening the bumper in place.

The rigid coupling device, as shown in Figs. 1, 2, and 7, comprises a draft sill 29 secured to the top flanges of the center sills 1, the end sill 2, end posts 9 and to the body end sheets 4. This draft sill is of J-shape having the arms of the J substantially horizontal, the longer leg 30 preferably uppermost, and the connecting web 31 disposed against the body end plate 4. The draw bar 32 is placed between the arms of the draft sill with its end portion preferably abutting the web 31 of the sill. The draw bar comprises a U-shaped member having horizontally disposed arms 33 and open sides. Near the free end of each arm is an opening 34 to receive a coupling pin 35. Disposed between the arms of the draw bar and against the web of the draft sill is a draw bar anchor plate 36. This plate has coplanar side portions 37 and a connecting web 38, offset inwardly from the rear face of the side portions. The side portions 37 of the anchor plate are secured to the web and flanges of the draft sill 29 and the web of the draw bar is engaged in the offset 38 aforesaid. In this manner the web 38 of the anchor plate secures the draw bar in position on the car.

At the opposite end of the car, wherein is mounted the resilient coupling device, there is the aforementioned buffer and draft sill as previously described. Instead of a rigid draw bar anchor plate 36 being secured to the draft sill a draw bar guide member 39 is secured between the horizontal portions of the said sill and contiguous openings formed in the guide and sill. The draw bar 40 extends through these openings into the body of the car and is protected by the hood 41 fastened to the intermediate floor and body end sheets. As the draw bar does not receive buffing shocks of the car it is resilient in one direction only. The end portion of the draw bar extending within the said hood comprises a stem 42 having a threaded end portion. Mounted on the stem is a sleeve or ferrule 43 terminating short of the end of the stem, a compression spring 44 having a free length greater than the length of the sleeve is placed over the sleeve, a washer or spring abutment plate 45 is placed upon the stem, against the spring, in spaced relation to the ferrule 43, and secured in place by the nut 46. The outer end of the draw bar is similar to the rigid draw bar and made integral with the said stem 42.

Adjacent the outer ends of the draw bars are registering perforations in the draw bar and buffer. A coupling pin is mounted in the perforations of each draw bar and extends into the openings in the buffer. In the case of the rigid draw bar, the coupling pin 47 extends but part way through the buffer, and is movable for coupling purposes. In the case of the resilient draw bar, the coupling pin 48 extends through the buffer and floor plate and a pin 49 is inserted therein to fix the coupling pin in place. The buffer and floor plate adjacent the coupling pin 48 have suitable slotted openings to accommodate movement of the draw bar and coupling pin. It is preferable to have the coupling link 50 permanently mounted upon the coupling pin 48, so that when the cars are so disposed in a string as to have a rigid and a movable draw bar opposed to each other the cars can be coupled together.

Having thus described the invention what I

claim as new and desire to secure by Letters Patent is:

1. In a mine car, center sills, oppositely disposed top and bottom flanges on said sills, a bottom floor plate secured to the inwardly directed bottom flanges, side floor sections secured to the top flanges of said sills, Z-shaped end sills between said sills connected thereto inwardly of the ends thereof and to said bottom floor plate, side walls secured to said side floor sections, end walls secured to said side walls and to the side floor sections and end sills, said bottom floor plate extending beyond said end sills to the ends of the center sills and a wood buffing member secured between said center sills and resting upon said floor plate, abutting said end sill and extending beyond said center sills.
2. In a mine car, Z-shaped center sills having inwardly and outwardly directed flanges, a bottom floor plate extending the length of said sills and secured to the inwardly directed flanges, end sills between said center sills, intermediate the ends thereof and resting upon said bottom plate, side floor sections upon the outwardly directed flanges of said center sills, end walls secured to the side floor sections and end sill side walls secured to said side floor sections and end wall, and posts secured to said center sills, end sills, and inner face of said end wall, a buffing member between said center sills and resting upon said bottom floor plate, extending beyond the ends of the center sill and abutting said end sill, a draft sill connecting the top flanges of the center sills and secured to said end posts, end wall and end sill, and a coupling draw bar secured to said draft sill.
3. In a mine car, in combination, center sills, a center floor section secured thereto beneath said sills, side floor sections overlapping said sills, side and end walls secured to said floor sections, a continuous extension of said sills beyond the end walls, an end sill between and intermediate the ends of said center sills resting upon said center floor section and situated outwardly of said end wall, a draft sill situated outwardly of said wall, superimposed above and secured to said sills, and connected to the end wall, end posts secured to said end wall, center sill and end sill, and body bands joining said side walls and extending beneath said center sills and floor sections.
4. In a mine car, spaced sills, a floor plate, a timber filler between said sills adjacent the extremities thereof, a U-shaped wear plate encasing the forward portion of the filler and secured to said floor plate and timber filler, a draft sill rearwardly of said wear plate overlying and secured to the spaced sills, timber filler and floor plates, an anchor plate secured within the draft sill and a draw bar disposed above said filler and engaging said anchor plate.
5. In a mine car, spaced longitudinal sills, a timber filler between said sills adjacent the extremities thereof, a U-shaped wear plate encasing the forward portion of the filler, a transverse draft sill rearwardly of said wear plate and overlying and secured to the longitudinal sills and timber filler, a draw bar mounted within said draft sill, a coupling pin in said draw bar and engaging said filler.
6. In a mine car, spaced longitudinal sills, a wooden filler between said sills adjacent the extremities thereof, a wear plate encasing the forward portion of the filler, a transverse draft sill rearwardly of said wear plate overlying and secured to the longitudinal sills and wooden filler, an anchor plate secured within the draft sill and a draw bar engaging said anchor plate.
7. In a mine car, spaced Z-shaped longitudinal sills, a composite bumper device between the sills adjacent the extremities thereof, a transverse draft sill secured to the longitudinal sills and bumper device, said draft sill being of general J form having a vertical web portion and horizontal leg portions, an anchor plate within the draft sill having coplanar side portions secured to the web and leg portions of the draft sill and an offset connecting web joining the side portions of the anchor plate, and a drawbar engaging the offset connecting web.
8. In a mine car, spaced Z-shaped longitudinal sills, a composite bumper device secured between the sills adjacent the extremities thereof, a transverse draft sill secured to the longitudinal sills and bumper device, said draft sill being of general J form having a vertical web portion and horizontal leg portions, an anchor plate within the draft sill having coplanar side portions secured to the web and leg portions of the draft sill and an offset connecting web joining the side portions of the anchor plate, and a U-shaped drawbar engaging the offset connecting web.
9. In a mine car, spaced longitudinal sills, end sills secured to the longitudinal sills in the same plane and intermediate the extremities thereof, an end wall secured to the end sills, a composite bumper device between the longitudinal sills adjacent the extremities thereof, a transverse draft sill rearwardly of the front face of the bumper device overlying and secured to the longitudinal sills, end sills and bumper device, a draw bar guide within the draft sill, a drawbar extending through the guide, draft sill and end wall, and resilient means within the body of the car secured to the drawbar.
10. In a mine car, center sills having inwardly directed bottom flanges, a bottom plate secured beneath said flanges and extending the length of said sills, Z-shaped end sills intermediate the end of said center sills and connected to the webs of the center sills, having a bottom flange inwardly directed and secured to said bottom plate, an end wall secured to the end sills and extending above the end and center sills and between the webs of said center sills, and end posts secured to the inner face of said end walls and the webs of the center and end sill.
11. In a mine car, a pair of longitudinal sill members of Z-shape, transverse sill members of Z-shape joining the longitudinal sill members intermediate the ends thereof to form a frame, a center floor secured to the inwardly directed flanges of the sill members and extending beyond the transverse members, a buffing member disposed beneath the top flange of the transverse sill, supported by said floor and substantially filling the space between the longitudinal sills, the rear face of the buffing member engaging the web of the transverse sill.
12. In a mine car, spaced longitudinal Z-shaped sills, transverse Z-shaped sills joining the longitudinal sills inwardly of the ends thereof, a floor plate supported by said sill flanges and extending beyond the transverse sills, a wood buffer member mounted on the floor plate between the webs of the longitudinal sills and against the web of the transverse sill and fastening members securing the buffing member to the floor plate and transverse sill.
13. In a mine car, spaced longitudinal angular

shaped sills, transverse angular shaped sills between the longitudinal sills inwardly of the ends thereof, a draft sill having an upright rear face and a bottom flange, a member engaging the inner face of each longitudinal sill and the adjacent end of the inner face of the transverse sill, and fastening means joining the bottom flange of the draft sill to the longitudinal sills and joining each member to each of the said sills.

14. In a mine car, longitudinal sills, transverse sills joining the longitudinal sills, each of said sills having an upright leg and a top flange; a draft sill comprising an upright leg and a bottom flange, the latter being supported on the flange of the transverse sill, a member joining the upright leg of the transverse sill to the adjacent longitudinal sill and extending above the said sills to engage the upright leg of the draft sill.

15. In a mine car, longitudinal sills, transverse sills joining the longitudinal sills, a central floor supported by the sills, flanges on the upper edges of the longitudinal sills, side floors secured to the flanges and extending outwardly of the longitudinal sills above the central floor, side walls extending upwardly from the side floor, end walls extending upwardly from the transverse sills and extending laterally to the side walls, a draft sill disposed above the end sill and against the outer face of the end wall, a member laying against the inner face of each longitudinal sill and the end wall and fastening means securing the member to said longitudinal, transverse and draft sills and end wall.

16. In a mine car, longitudinal sills, end sills joining the longitudinal sills intermediate the ends thereof, a central floor supported by the sills and extending beyond the end sill, a wood buffer disposed between the longitudinal sills outwardly of the end sill, a draft sill supported on the end sill and above the buffer, a member connecting the draft sill to the inner face of the longitudinal sill and a coupling pin connected with said draft sill.

17. In a mine car, angular longitudinal sills having bottom flanges, end sills of Z-shape having inwardly directed bottom flanges and disposed inwardly of the ends of the longitudinal sills, a central floor supported by said flanges and extending beyond the end sill, a buffer mounted between the longitudinal sills upon the floor and beneath the top flange of the end sill.

18. In a mine car, longitudinal sills of Z-shape, end sills of Z-shape and secured to the web of the longitudinal sills inwardly of the ends of the longitudinal sill, a central floor disposed beneath the sills and secured to the bottom flanges thereof, said floor extending beyond the end sill, a wood buffer disposed beyond the end sill upon the floor between the longitudinal sills and engaging the web of the end sill.

19. In a mine car, longitudinal sills, end sills between the longitudinal sills inwardly of the ends thereof, a central floor supported by the sills and extending beyond the end sill, a buffer between the longitudinal sills upon the floor, a draft sill mounted above the sills, an end wall, end members mounted on the inner face of the end wall and connecting the draft and end sills to the longitudinal sills, a drawbar mounted in the draft sill and a coupling pin engaging the drawbar and buffer.

20. In a dump car, longitudinal sills, a central

floor supported by said sills, side floors extending outwardly from said sills above said central floor, an end wall between said sills and extending upwardly from the side floors, a composite buffing device between said sills, beyond the end wall and upon the central floor, a draft sill above the buffing device and connected to the end wall, a longitudinal movable draw bar extending through the draft sill and interiorly of the car, a draft spring between the inner end of the draw bar and the draft sill and a draft spring housing secured to the central floor and end wall.

21. In a mine car, longitudinal sills, end sills between the longitudinal sills, a central floor supported by the longitudinal sills, an end wall extending above the sills, a draft sill above the longitudinal sills, end members mounted on the inner face of the end wall and connecting the end wall and draft sill to the longitudinal sills, a U-shaped draw bar extending from the draft sill above the end sill and a coupling pin spanning the arms of the draw bar.

22. In a mine car, in combination, longitudinal sills, transverse sills disposed between the longitudinal sills and spaced inwardly from each end thereof, a floor connecting the lower portions of the longitudinal sills and connected to said transverse sills, said floor extending outwardly of said transverse sills, an end wall secured to each transverse sill, a buffing member mounted on the floor between said longitudinal sills outwardly of one end wall and extending beyond the ends of the longitudinal sills, a draft sill disposed above said buffing member and connected to the adjacent longitudinal sills, and vertically disposed members at said end wall and adjacent each end of the associated transverse sill for connecting each longitudinal sill to the associated end wall, draft sill and transverse sill.

23. In a mine car, longitudinal sills, a transverse sill secured between the longitudinal sills and inwardly of one end thereof, an end wall, a floor connecting said longitudinal sills and extending outwardly of the transverse sill, a buffing member mounted on the floor between the longitudinal sills and extending beyond the ends of the longitudinal sills, a draft sill disposed above the buffing member and connecting the longitudinal sills, a draft member mounted in said draft sill and extending through the draft sill and end wall into the interior of the car, resilient means on said draft member engaging the end wall to resist movement of the draft member, and a housing mounted on the end wall and floor between said longitudinal sills for enclosing said draft member and resilient means.

24. In a mine car, in combination, longitudinal sills, transverse sills connecting the longitudinal sills inwardly of each end thereof, side floors extending outwardly from each longitudinal sill, a central floor connecting the longitudinal sills and disposed below the side floors, end walls connected to each transverse sill, said central floor extending beyond said transverse sills, a buffer disposed on said extension and reinforced by said transverse sill, and vertically disposed members adjacent the ends of said transverse sills and extending for substantially the height of said end walls, each said vertical member connecting the associated transverse sill and end wall to the adjacent longitudinal sill.

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