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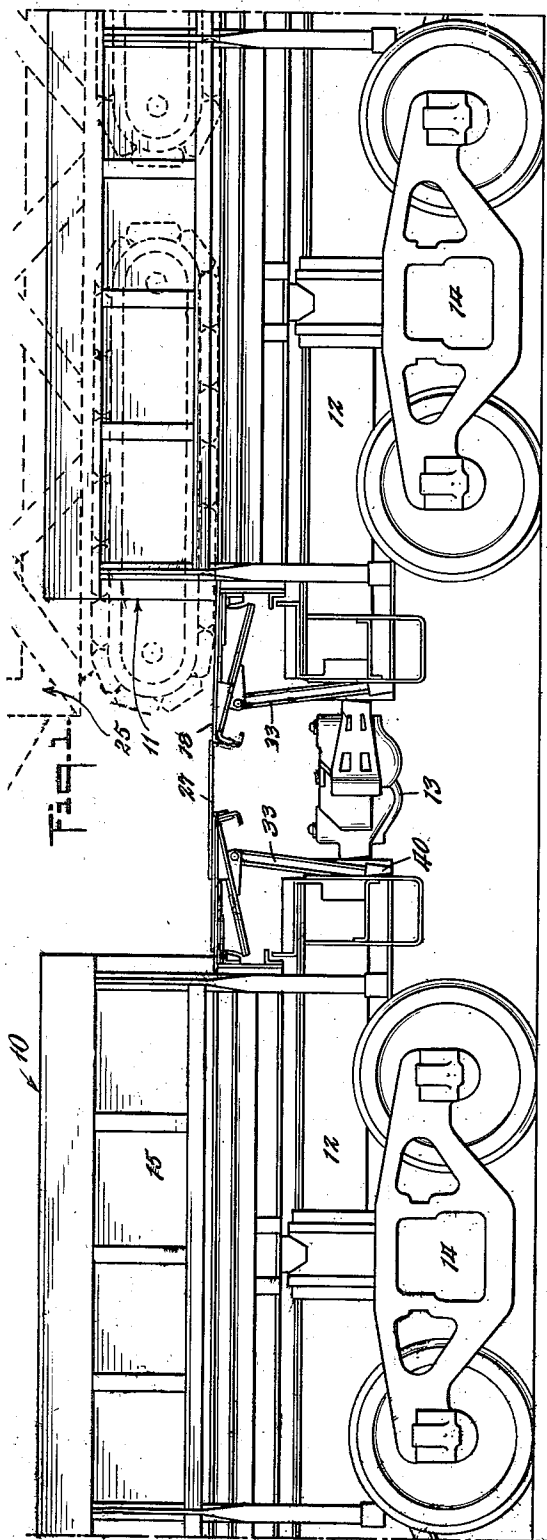
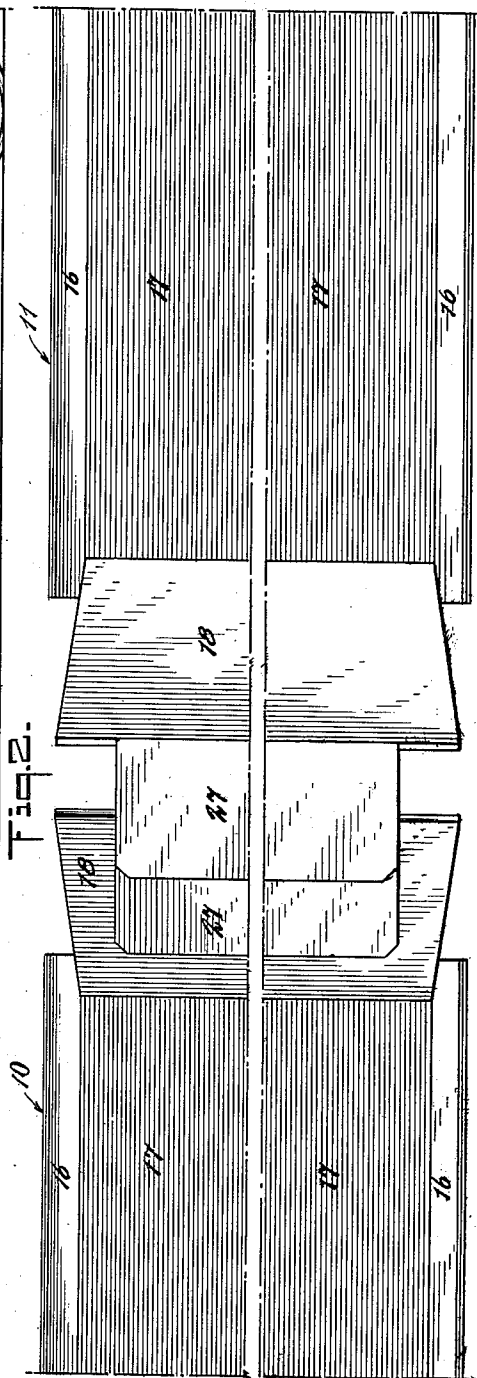
R. E. CARTZDAFNER ET AL

2,052,867

DROP END RAILROAD CAR SERVICE

Filed June 11, 1932

3 Sheets-Sheet 1



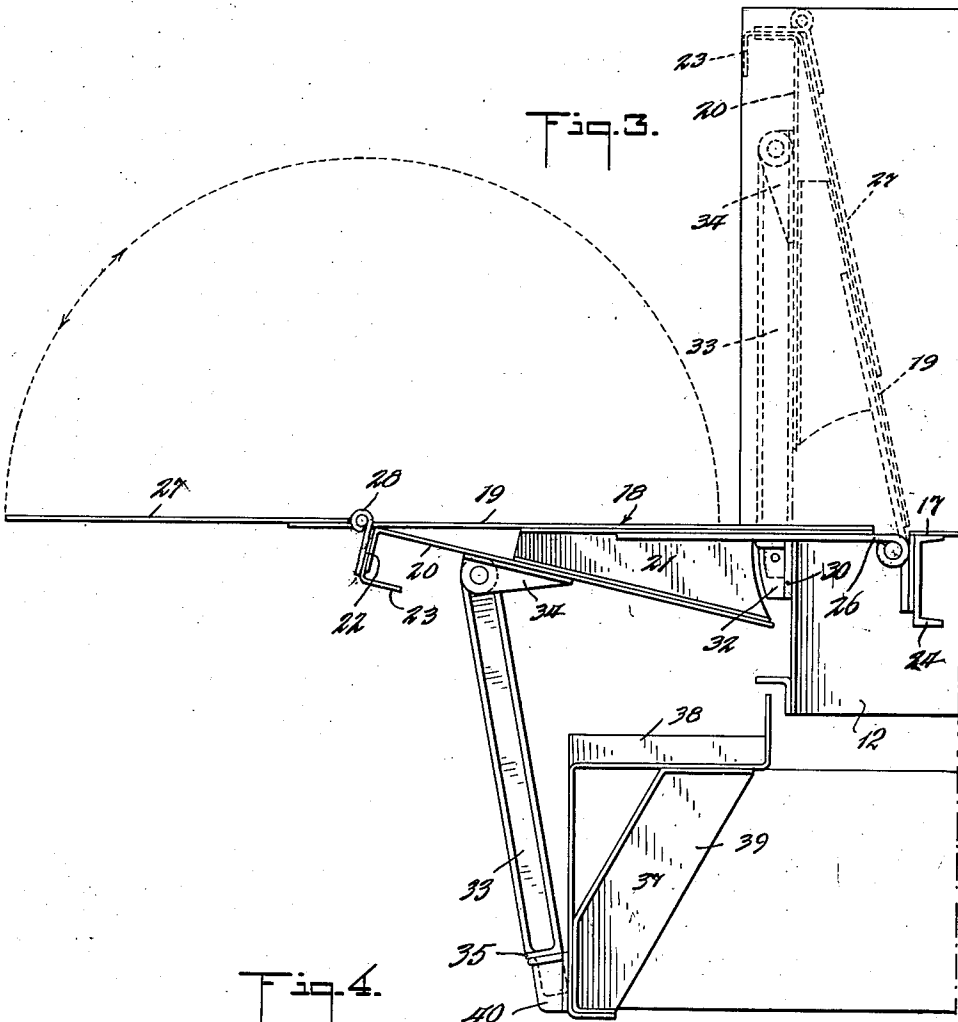
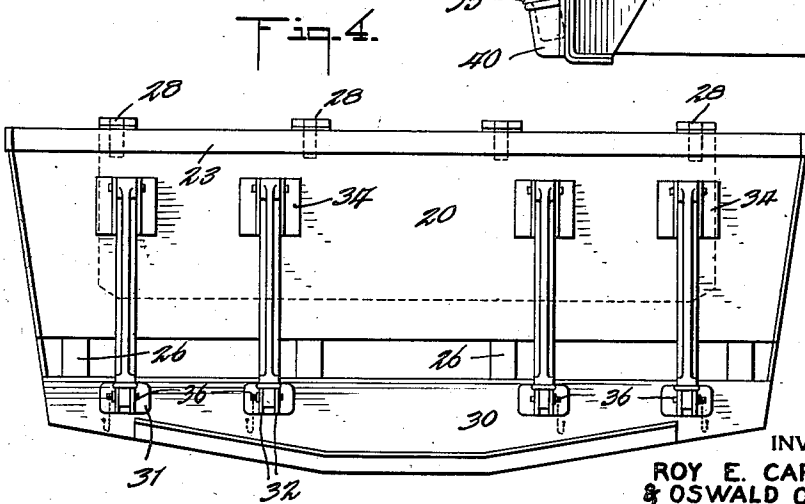
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3 Sheets--Sheet 2



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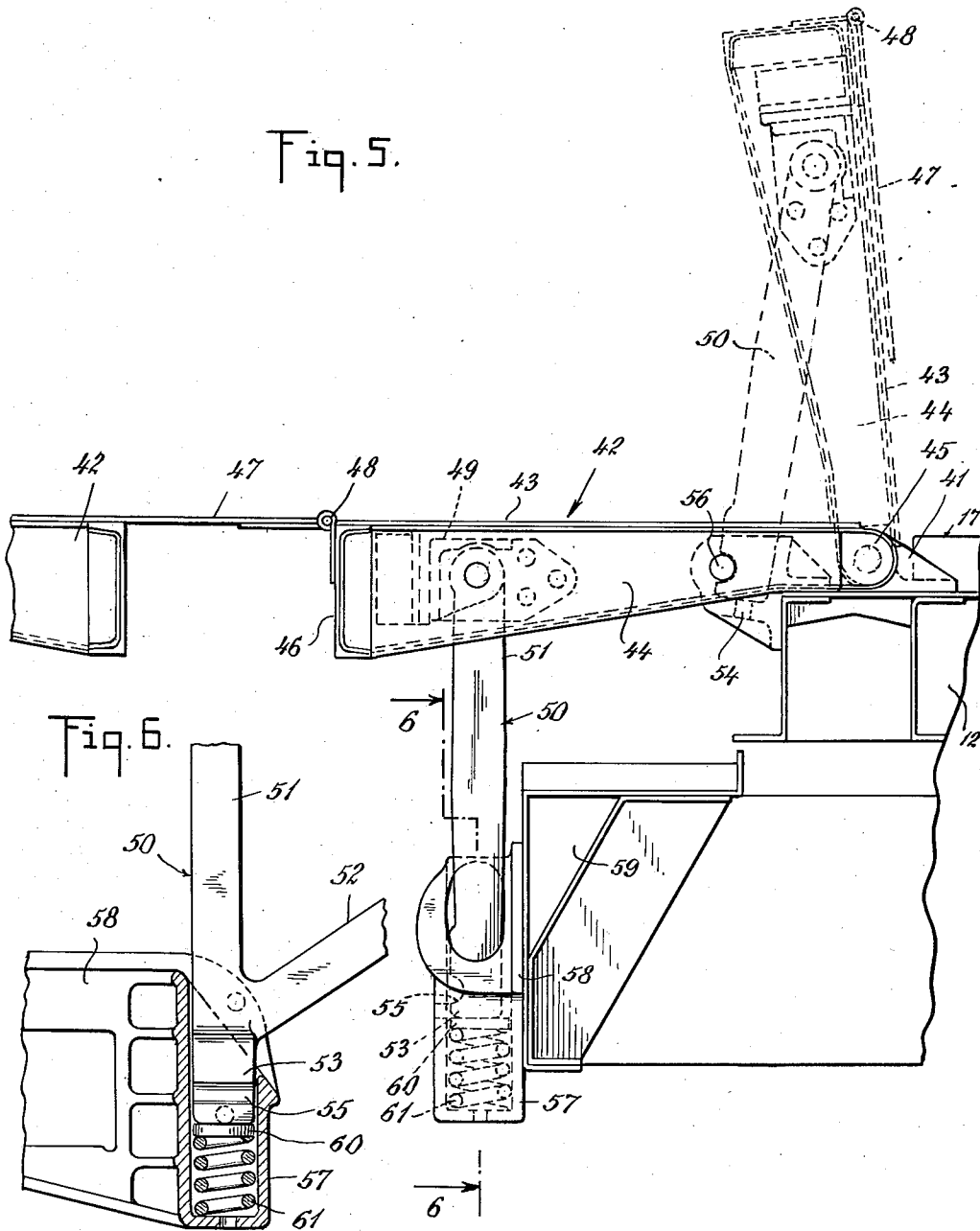
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Fig. 5.



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UNITED STATES PATENT OFFICE

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DROP END RAILROAD CAR SERVICE

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17 Claims. (Cl. 105—406)

This invention relates to railroad cars and has particular reference to service cars employed in special railroad work.

In conducting certain railroad work in which material is loaded upon service cars, as when a trench or ditch is dug alongside the track, it is common practice to mount a power shovel or other material-handling device upon one of the service cars for transferring the material from the track side to the service cars. Inasmuch as the material-handling device has a limited range of operation or reach, it can only handle the material along a comparatively short length of track and, under the most favorable conditions, can only reach and fill the two cars adjacent the car upon which it is mounted. When the device has transferred all the material within its reach and/or has filled all of the cars within its reach, the car carrying the device is uncoupled from the cars which it has filled, is coupled to unfilled cars and the train advanced along the track to the next batch of material; or the train of one or more of these loading and material-carrying units is moved to a remote point to discharge the material-carrying cars and is returned to the loading point. This practice decreases the working time of the device and crew and requires practically continuous use of a locomotive and much more switching of the cars than is warranted for the amount of material which is handled and transported in a given time.

According to the present invention, a service car is provided which is of such construction that a train of these cars cooperate to form a continuous platform having the length of the train of the cars, along which the power shovel or other loading or material-handling device may be moved, preferably under its own power, while loading the material from alongside a considerable length of track upon the successive cars of the train.

The new car of this invention is provided with drop ends which cooperate with the dropped ends of the adjacent cars to form bridges which span the space between the adjacent cars and which lie flush with the floors thereof. The drop ends of the cars are reinforced, are hinged at their lower edges and, when in dropped or horizontal position, are supported adjacent the hinges by extensions of the car frame and adjacent their free edges by braces seated in sockets on the frame of the car. A flap, hinged on the upper edge of the drop end, overlies the dropped end of the adjacent car and is slidable thereover in response to relative movements of the adjacent ends to compensate for these movements when the cars negotiate curves, hills and the like, or when the adjacent car floors have different levels resulting from uneven compression of the car springs due to uneven loads on the cars and the

like. These flaps and the braces are foldable against the surfaces of the drop ends when the latter are moved to the normal elevated position.

In a preferred arrangement of the invention, the free edges of the dropped ends of the car are resiliently supported in such a way that they adjust themselves as the shovel, or other loading or material-handling device, or the like, passes from one car to another, this self-adjustment compensating for the difference in level of the two cars resulting from uneven compression of the springs of the two cars due to their differing loads, which is usually the case, since the shovel passes from a loaded to an empty car as it progresses along the train of the service cars. The cars are otherwise conventional in form, preferably of the dumping type, the drop end arrangement of this invention being applicable to conventional or standard types of service cars without material alteration thereof, and requires no change in the dumping mechanism, under-frame, or equipment thereof.

It will be seen that with the new arrangement of the invention, a train of practically any number of the cars may be traversed by a self-propelled power shovel or other material-handling device of commercial form, which is accordingly enabled to handle material along the entire train and fill all of the cars before it becomes necessary to transfer the cars to the dumping point. Accordingly the actual working time of the shovel and screw is considerably increased, the services of a locomotive are not required until after the entire train is loaded and little or no switching of the cars is necessary.

For a more complete understanding of the invention, reference may be had to the accompanying drawings, in which:

Figure 1 is a side elevation of two coupled cars of this invention, illustrating the dropped ends thereof in cooperative relation;

Fig. 2 is a plan view thereof;

Fig. 3 is an enlarged elevation of the drop end of the new car showing the drop end in both horizontal and elevated positions;

Fig. 4 is an end view of the new car, showing the drop end thereof in elevated position;

Fig. 5 is an enlarged view of a modified form of the drop end car of this invention, the drop end of which automatically compensates for differences in level of the floors of adjacent cars; and

Fig. 6 is a section through a portion of the compensating mechanism of the modified arrangement as seen along the line 6—6 of Fig. 5.

Referring to Figs. 1 and 2 of the drawings, numerals 10 and 11 designate two coupled service cars of a train of cars used for conducting special railroad work. Each car includes wheel trucks 14 mounted on which is a wheel supported main frame including an underframe 12, with

coupling mechanism 13 and a car body 15 including a car body frame 12'. In the particular type of service car illustrated, the sides or side gates 16 of the body swing outwardly to discharge the contents of the car in accordance with well known practice. Although one particular form of dump car is illustrated, the car may be of any conventional design insofar as the truck's under-frame, sides and dumping mechanism are concerned.

Instead of being of the usual design, the car ends are pivoted along their lower edges adjacent the floor 17 of the car so as to lie substantially flush therewith when moved into the horizontal position indicated in Figs. 1, 2 and 3. The drop ends 18 are of special construction and include the inner plate 19 which forms the sloping end panel of the car body 15 when the drop end 18 is in the elevated position illustrated in dotted lines in Fig. 3. The outer plate 20 extends substantially vertically when the drop end is in the elevated position illustrated in dotted lines in Fig. 3 and is spaced from inner plate 19 by triangular filler plates 21, which also reinforce the plates 19 and 20. The free ends of the plates 19 and 20 are provided with overlapping flanges and jointly form the hinge support 22. The free edge of the plate 19 is turned back upon itself parallel to the plate 20 to form a hollow channel type of reinforcement for free edge of the drop end 18.

The lower or inner edge of drop plate 19 of the drop end 18 is connected to the cross member 24 of the carbody frame 12' by means of a plurality of strap hinges 26, preferably four in number as shown in Fig. 4. These hinges are so constructed and arranged that the end 18 can be swung from substantially horizontal to substantially vertical position and vice versa, about an axis transverse to the car. The hinges 26 are spaced inwardly from the end of the under-frame 12 and from the adjacent end of the carbody frame 12', so that the drop end 18 rests on and is braced by the carbody frame adjacent its pivot point.

Pivoted by hinges 28 to the hinge support 22 of the drop end 18 is a flap 27 which is arranged to be folded down upon the inner plate 19 of the drop end 18 when the latter is in the elevated position indicated in dotted lines in Fig. 3, and when in use the flap 27 is adapted to be swung outwardly about its hinges 28 as indicated in the dotted line in Fig. 3, so as to form an extension of the drop end 18 for a purpose to be described later.

A vertical plate 30 secured across the end of the carbody frame 12' supports a plurality of sockets 31, each having spaced ears 32 adapted to receive the lower end of a corresponding brace 33, a plurality of which are pivoted at their other ends on the hinge plates 34 secured to the outer surface of plate 20 of the drop end 18. The free ends of the braces 33 are provided with shoulders 35, which engage the upper surfaces of the ears 32 of the corresponding sockets 31 so as to secure the drop end 18 against outward movement when it is in elevated position. The drop end 18 is locked in elevated position by cotter pins 36 passing through aligned holes in the ears 32 of the brackets 31 and the free ends of the corresponding braces 33.

The end of the under-frame 12 of the car is provided with brackets 37 comprising the pressed members 38 and 39 suitably secured together. Spaced along the outer wall of member 38 are sockets 40, which are equal in number to and

are aligned with the braces 33. The upper edge of each socket 40 is inclined so that the shoulder 35 of the corresponding brace 33 bears flatly against it when the end of the brace is inserted therein to support the drop end 18 in horizontal position, as shown in Figs. 1 and 3. In this way the weight of the drop ends and the lading thereon is transmitted through the braces 33 acting under compression directly to the rugged underframe.

In utilizing the cars of this invention to form a continuous platform extending practically the length of the train, the cars are coupled together, cotter pins 36 are removed to release the brace 33 and the drop ends 18 of the car are lowered to the horizontal position in which they are supported and braced by the braces 33 inserted in corresponding sockets 40. When in this position the drop ends of adjacent cars are aligned with and extend toward each other across the space between adjacent cars in the manner illustrated in Fig. 1. The free edges of the drop ends 18 of adjacent cars do not engage each other but are spaced apart as is indicated, in order that there will be clearance between them as the ends of the adjacent cars swing relatively to each other when the train rounds a curve.

In order to span the space remaining between the free edges of the drop ends 18 of adjacent cars, the flap 27 of one of the drop ends 18 is swung in the manner indicated in Fig. 3 so as to overlie and rest upon the drop end 18 of the adjacent car. Only one of the flaps 27 need be used at a time under ordinary circumstances and the flap 27 of the drop end 18 of the adjacent car remains folded down upon the surface of the corresponding upper plate 19. Because the flap 27 is movable through a wide angle, it overlies and rests upon the adjacent drop end regardless of the relative elevations of the floors of the corresponding adjacent cars. Thus, even if the levels of the cars vary because one is loaded more than the other or for some other reason, the flap 27 slopes the appropriate angle so that the floors of adjacent cars are substantially co-extensive.

When the drop ends of all of the cars of the train are placed in horizontal position and the small gaps remaining between adjacent drop ends are bridged by one of the corresponding flaps 27 the train of cars forms what may be considered a single long platform having a length equal to the number of cars which are joined together in the manner described. In carrying on special railroad work such as loading or unloading material to or from the cars a commercial or standard form of power shovel or other material-handling device indicated at 25 in Fig. 1 may be placed in one of the cars and may be used for transferring material from the side of the rails to the cars or vice versa and after it has handled all of the material within its reach or has transferred the material to or from as many cars as lie within its reach it may advance to a new position under its own power along the platform formed by the cars and the drop ends 18. This process may be continued until either all of the cars have been loaded or unloaded or all of the material along the track within the length of the train of cars has been transferred by the power shovel. If the entire train of cars has been loaded in this fashion during the process of ditching or trenching the roadway alongside of the track the entire train may be moved to the dumping point and the car emptied after which

the train is returned to the loading point and the process is repeated.

Inasmuch as the cars are usually unevenly loaded since they are loaded or unloaded successively the floor levels of the adjacent cars are uneven because of the uneven compression of the car springs. Inasmuch as the material-handling device 25 moves from a loaded to an unloaded car it is desirable to compensate for their difference in level. While this compensation is provided to a certain extent by the flaps 27 which have a material angular lowering movement beyond the horizontal and a thus possible total angular movement materially more than 180°, in the case of the showing in Fig. 3 an angle of about 250° and in the case of the showing in Fig. 5 an angle of the order of 270°, a modified construction illustrated in Figs. 5 and 6, provides for the compensation in a preferred manner. In this arrangement the free edges of the drop ends 18 are resiliently supported, so that the weight of the material-handling device or other object moving from one car to another, depresses the higher of the two drop ends 18 as it passes over it, so as to lower it to the level of the cooperating drop end of the other car.

In this modified arrangement, hinge brackets 41 are secured to the car body frame below the level of the floor 17, and the drop end 42 is pivoted thereto for movement from the horizontal position shown in Fig. 5 to the vertical position shown in dotted lines, and vice versa.

The drop end 42 comprises the inner plate 43 secured to the fabricated frame 44 having hinge elements 45 along one edge cooperating with the hinge plates 41. The free edge of the drop end 42 is reinforced by a channel 46 to which the flap 47 is pivoted by the hinge 48. Brackets 49 are secured to the frame 44 of the drop end 42 upon which are pivoted braces 50, two of which are preferred. Each of these braces 50 preferably comprises a vertical member 51 and a diagonal member 52 which converge to form the plunger 53, the diagonal member 52 being pivoted to the drop end 42 in the same way that the vertical member 51 is pivoted thereto. The plungers 53 are received in sockets 54 secured to the edge of car body frame 12', whereby the drop end is secured in the elevated position illustrated by dotted lines in Fig. 5. The plungers 53 are each provided with a groove 55 which aligns with holes in the corresponding socket 54, whereby the plunger may be locked in the socket by a pin 56 inserted through the aligned holes and groove 55.

Where it is desired to lower the drop end 42, the pin 56 is withdrawn and the plunger 53 is inserted in a socket 57 formed in a bracket 58 secured to the under-frame extension 59. This socket 57 contains a plate 60 upon which the end of the plunger 55 rests, and the plate 60 is in turn supported by the coil spring 61. One side of the socket 57 is cut low, as shown in Fig. 6, to provide clearance for the diagonal member 52 of the brace 50 as the spring 61 is compressed under the weight of a heavy object moving over the drop end 42 to or from the other adjacent drop end.

It will be seen that the new car of this invention provides an extremely simple and effective arrangement whereby a standard material-handling device may traverse the entire length of a train of cars without requiring movement of the train or loss in working time until after the entire length of the train has been traversed by the device, or all of the cars have been filled, or all of the

material has been transferred. Although the invention has been described as particularly adaptable for use in special railroad work, it may be used for many other purposes where it is desirable or necessary to traverse a plurality of cars for loading or unloading the cars and the like. Also the new car is so arranged that any movable object, other than a material-handling device, may be transferred from car to car for any purpose whatever, especially where the object is 10 heavy or bulky.

We claim:—

1. The combination of two railroad cars coupled together, members pivoted transversely of and on the adjacent ends of the cars and which 15 members may be at the same or at different levels, means supporting said members in substantially horizontal position to extend toward each other across the space between the cars, and a device included in the means of at least one of said 20 members responsive to the weight of a body passing over the members for adjusting the level of the corresponding member to that of the other member.

2. The combination of two railroad cars coupled together and members hinged transversely of and on the adjacent ends of the cars and which 25 members may be at the same or at different levels, means supporting said members in substantially horizontal position to extend towards each other across the space between the cars and adjustable means connected to at least one of the members 30 for compensating for any difference in level of the adjacent members.

3. In a railroad car, the combination of an underframe, a car body frame, a floor thereon, a member hinged transversely at one edge to the carbody frame at a point spaced from one end thereof so as to partially overlap and extend substantially horizontally beyond the end of the carbody frame and co-extensively with the floor, said member being supported adjacent its hinge by the end of the carbody frame which it overlaps, and means supporting the member on the underframe at a point adjacent the free edge of the member. 45

4. In a railroad car, the combination of a frame, a floor thereon, a member pivoted transversely of the car to the end of the frame, a brace connected to the member, a support on the frame for the brace for securing the member in substantially vertical position, and a second support on the frame for the brace for securing the member in substantially horizontal position, whereby said member extends beyond the end of the frame substantially coextensively with the floor. 55

5. In a railroad car, the combination of a frame, a floor thereon, a member hinged transversely of the car on one end of the frame, and a brace on the member connectible to two points on the frame for securing the member in independent vertical and horizontal positions, said member when in horizontal position extending beyond the end of the frame and lying substantially co-extensively with the floor. 60

6. In a railway train, the combination of two cars each including a load supporting part, horizontally disposed bridging means providing an uninterrupted continuation of the load supporting part from the load supporting part of one car to the corresponding part of the other car and means providing a support for said bridging means and engaging the same in spaced relation to both of said load supporting parts. 70

7. In combination, two cars in end to end juxtaposition, 75

position, each provided with a load supporting part terminating in spaced apart relation to the other, each part provided with an extension hinged thereto and adapted to be lowered into horizontal position to extend towards but terminating in spaced relation to the other so as to permit one car to shift relative to the other as when going around a curve while minimizing the possibility of the extensions colliding, and one of said extensions provided with a flap hinged thereto and adapted to be moved into position overlapping the other extension and thus to bridge the gap between the two first named extensions when in horizontal position thereby to provide with the two extensions a continuous bridge between the load supporting parts of the two cars.

8. The combination of two railroad cars, operatively coupled together, with the adjacent ends of each car provided with drop ends hinged transversely of the cars, means for supporting each of said drop ends in substantially vertical position each on its respective car, and said drop ends movable into a substantially horizontal position to extend toward each other and in spaced apart relations and a flap mounted on one of the drop ends and movable from a position overlapping said one drop end to a position bridging the gap between said drop ends when in said horizontal position and means for supporting said drop end at a point adjacent the flap.

9. A drop end for a railroad car body comprising an inner plate adapted to form a sloping end panel for the car body when the drop end is in its elevated position and an outer plate extending substantially vertically, and a triangular filler plate located between and reinforcing the inner and outer plates and a plurality of hinges having a strap of each secured to the inner plate.

10. A drop end for a railroad car body comprising an inner plate adapted to form a sloping end panel for the car body when the drop end is in its elevated position and an outer plate extending substantially vertically, a triangular filler plate located between and reinforcing the inner and outer plates, a plurality of hinges having a strap of each secured to the inner plate at its lower edge, hinge plates secured to the outer plate in spaced relation to the hinges and a drop end supporting brace pivoted to each of said hinge plates and forming uprights bracing the drop ends when in vertical position.

11. In a railroad car, the combination of a support, a drop end having one edge hingedly mounted inwardly from an edge of the support and adapted to have a vertically extending and a horizontally extending position, the portion of the support outwardly of the hinged mounting providing a support for the portion of the drop end adjacent its hinged edge when in horizontal position, a plurality of braces spaced apart across the outer and underside of the drop end, each of said braces having their upper ends pivotally connected to the drop end adjacent the edge opposite its hinged edge, means carried by the support for engaging and holding the lower ends of the braces when the car end is in its vertical position to prevent movement of the car end from its vertically extending position, and other means carried by the support for engaging and holding the lower ends of the braces and thus supporting the drop end at spaced apart points adjacent its free edge when the car end is in its horizontal position.

12. A drop end for a railroad car comprising an inner plate, a mounting hinge at its inner edge, channel shaped reinforcing means at its outer edge, reinforcing means backing the inner plate, a flap and a hinge connection between the flap and the reinforced outer edge of the drop end, said hinge connection providing a freedom of movement of the flap over an angle materially greater than 180° and of the order of 250° .

13. In a railroad car, the combination of a frame, a car body including a drop end carried by the frame, said drop end having an upright position and a lowered position, a brace having one end pivoted to the drop end, two supports on the frame for the other end of the brace, one of said supports disposed to receive the other end of the brace when the drop end is in its upright position and the other support disposed to receive the other end of the brace when the drop end is in its lowered position, and said last named support including a cushioning spring.

14. In a railroad car, the combination of a frame, a car body including a drop end carried by the frame, said drop end having an upright position and a lowered position, a brace having one end pivoted to the drop end, two supports on the frame for the other end of the brace, one of said supports disposed to receive the other end of the brace when the drop end is in its upright position and the other support disposed to receive the other end of the brace when the drop end is in its lowered position.

15. In a railroad car, a car body including means providing a fixed floor, said car body including a hinged drop end adapted to be lowered into position to form a continuation of the floor, a flap hinged to the upper edge of the drop end and adapted to form a continuation of the then top side of the drop door and thus form a further continuation of the floor, said flap adapted to bridge the gap between the lowered drop end and an adjacent car, and means for resiliently supporting the drop end adjacent its hinged connection with the flap whereby loads either on the drop end or flap are cushioned.

16. The combination of two railroad cars with adjacent ends thereof provided with drop ends, each hinged to its respective car, said two drop ends adapted to be lowered into position approaching but not touching each other, a flap bridging the gap between the lowered drop ends and having its opposite edge portions supported from the two lowered drop ends, and two braces one for each drop end supporting the drop ends each from its respective car and coacting to support opposite ends of the bridging flap.

17. The combination of two railroad cars with adjacent ends thereof provided with drop ends, each hinged to its respective car, said two drop ends adapted to be lowered into position approaching but not touching each other, a flap bridging the gap between the lowered drop ends and having its opposite edge portions supported from the two lowered drop ends, and resilient means for supporting the drop ends and there-through for resiliently supporting opposite edges of the bridging flap.

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