

March 8, 1932.

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1,848,623

DROP BOTTOM CAR

Filed April 1, 1930

3 Sheets-Sheet 1

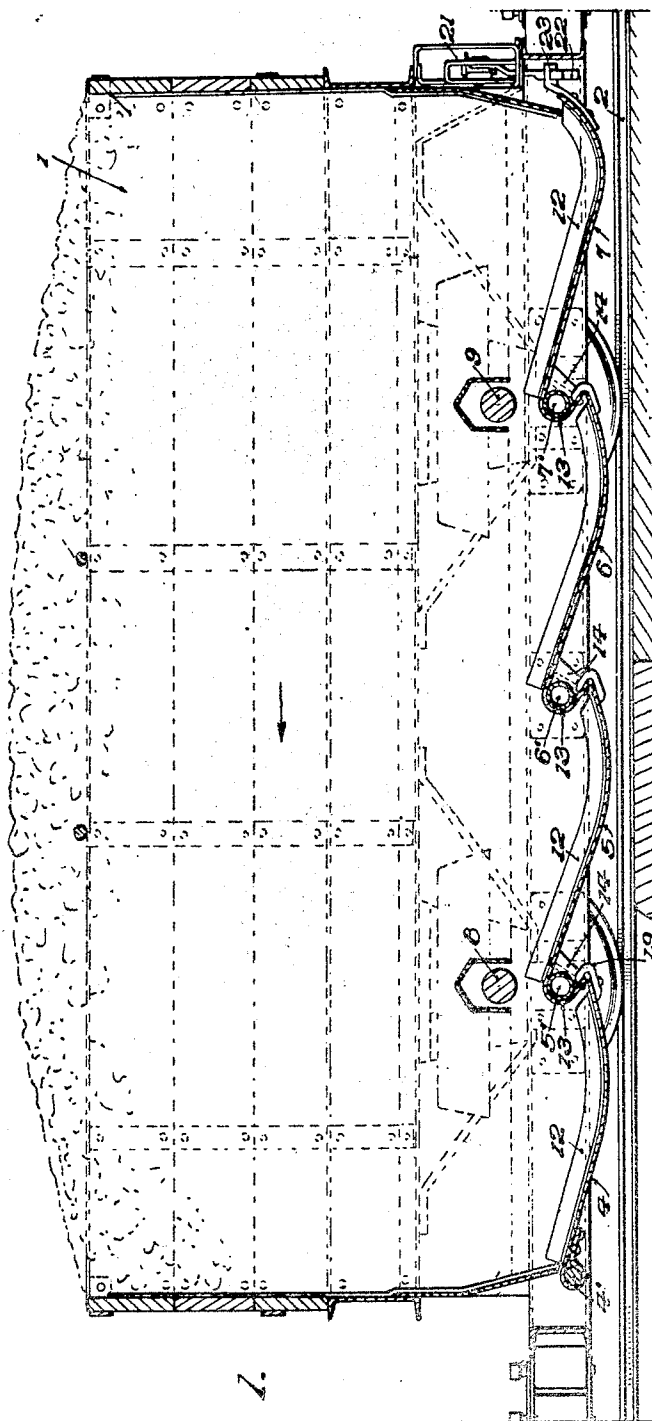


Fig. 1.

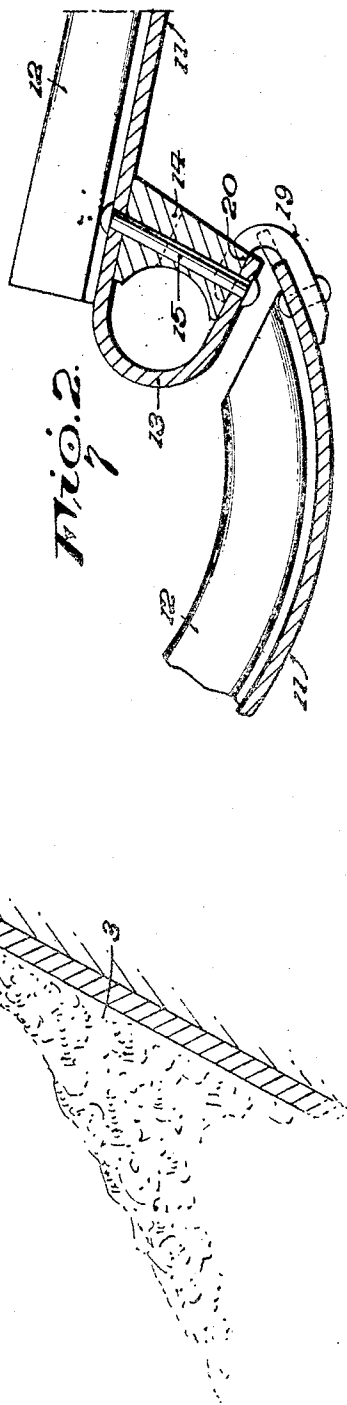


Fig. 2.

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Fig. 3.

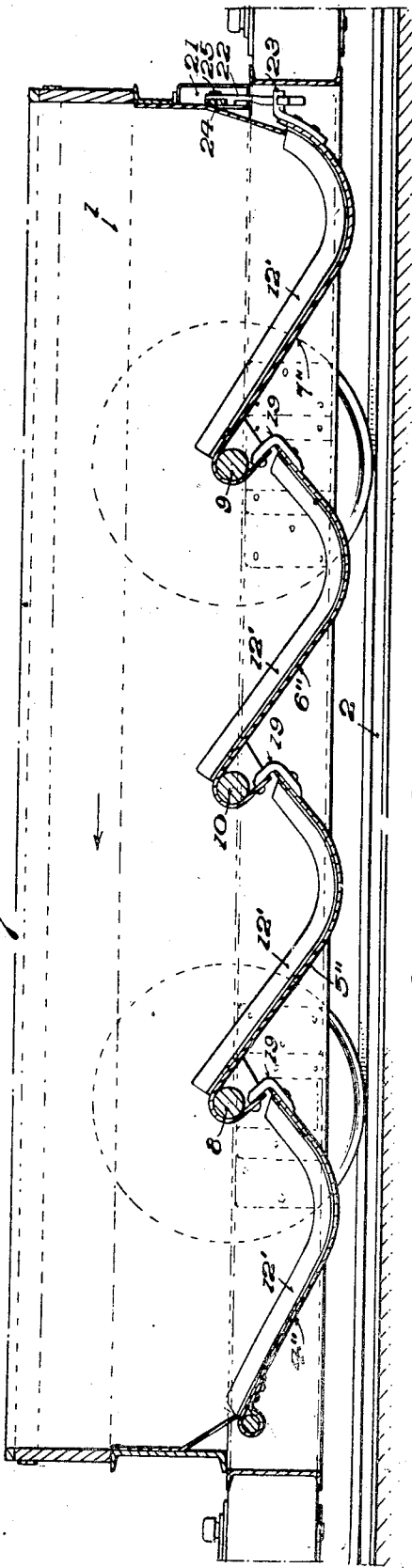


Fig. 4.

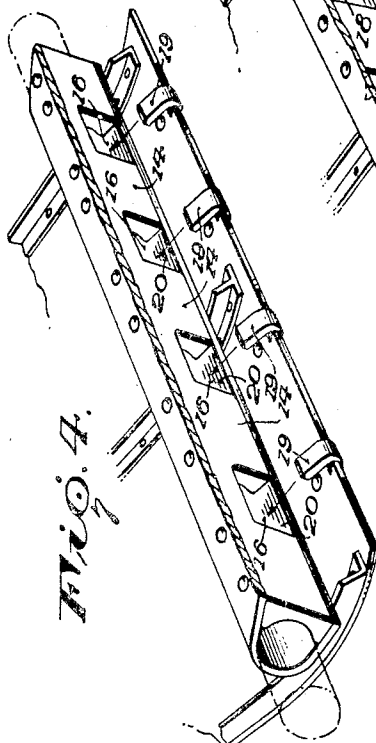


Fig. 5.

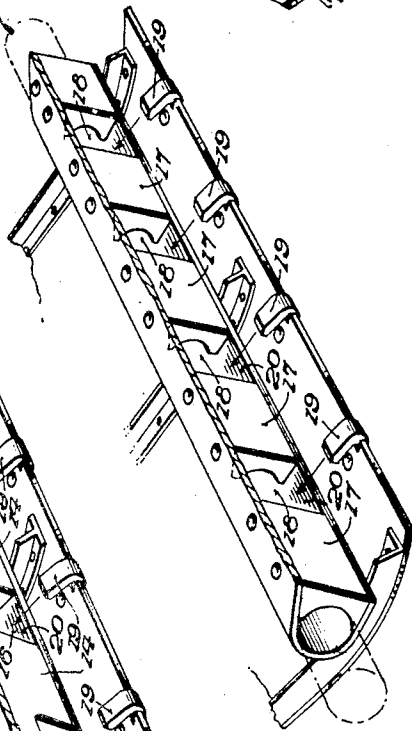
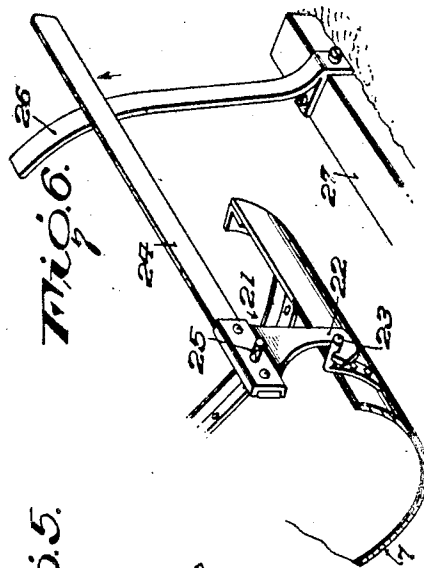


Fig. 6.



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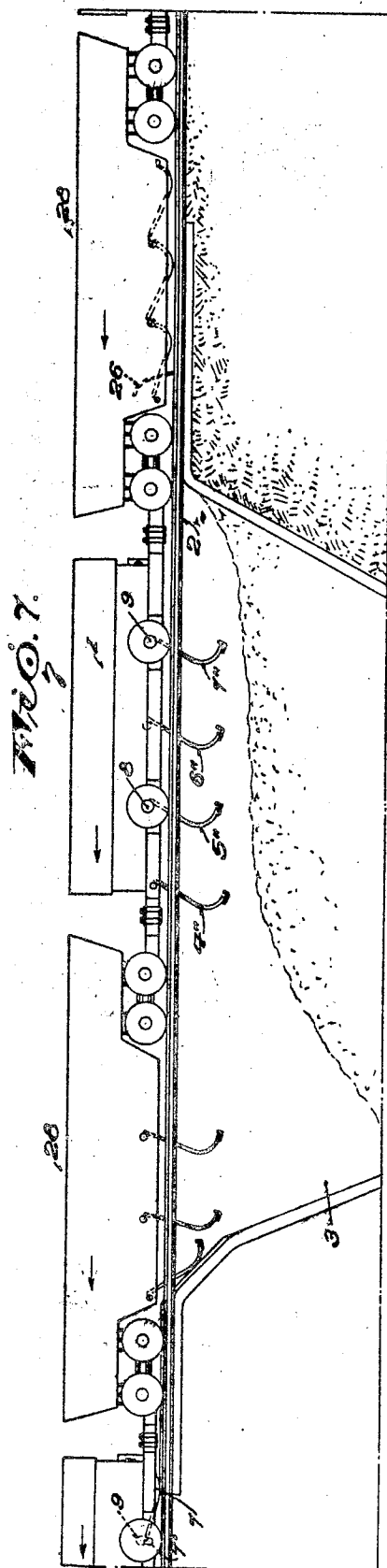
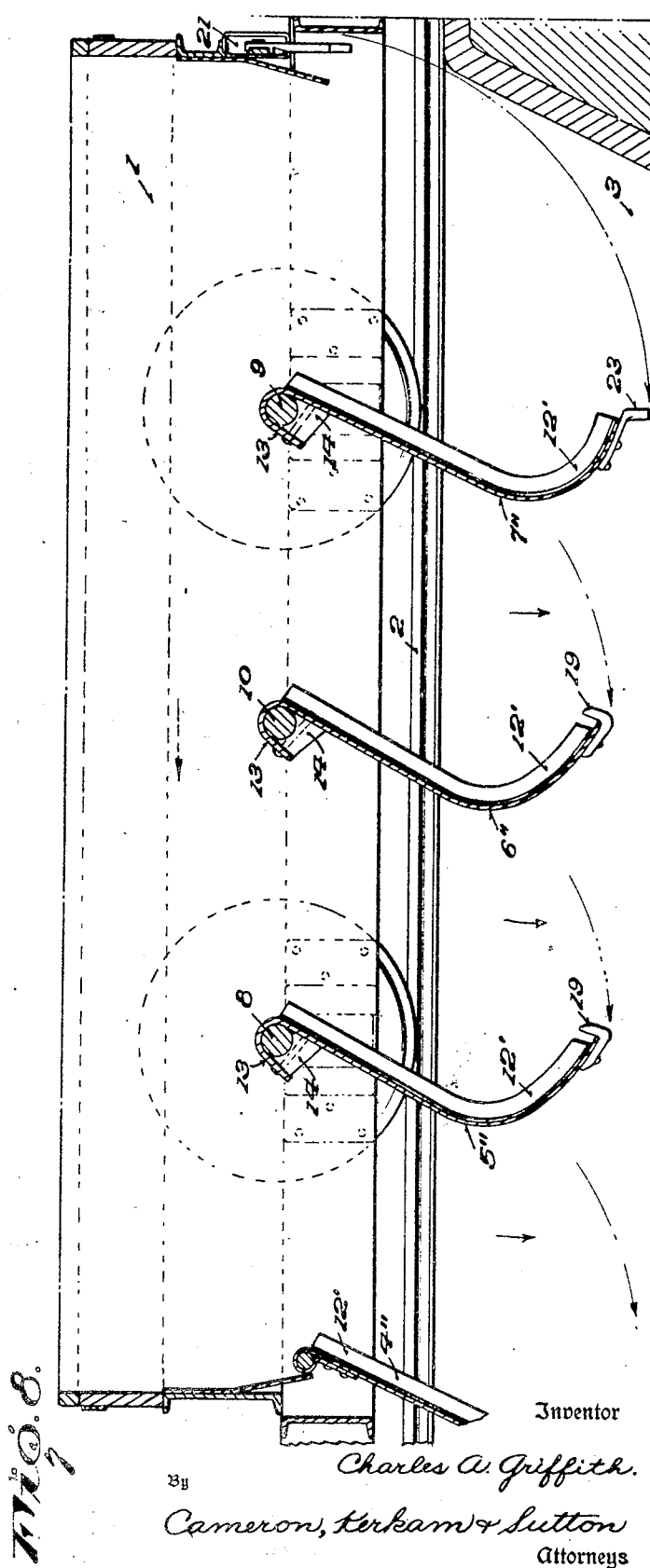
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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DROP BOTTOM CAR

Application filed April 1, 1930. Serial No. 440,802.

This invention relates to drop bottom cars, constructed and made of interchangeable parts to the end that they may be quickly and cheaply assembled either in the construction of the car or in making repairs.

With the object of accomplishing these desired ends, the car of the present invention is provided with a plurality of drop bottom doors, preferably made of sheet steel or other suitable metal, and each hinged on an axis transverse to the body of the car, each door being hinged to its axis by bending an edge portion of the metal part way around the axis with the bent edge projecting beyond said axis and approximately parallel to the main body of the door, there being a block or blocks interposed between said projecting edge portion and the main body of the door, said block or blocks extending along the hinge axis from one side of the door to the opposite side thereof and being suitably secured in position, as by riveting or otherwise, to thus form a strong durable hinge for the door. The latching or free edge of each door, except the rear door, is provided with means for engaging the rearwardly projecting edge of the hinge of the door immediately to the rear, to thus positively latch the doors together when they are in closed position, and the aforesaid block or blocks are formed or arranged to receive said means and at the same time reinforce or strengthen the rearwardly projecting edge portions of the hinges of the doors by connection of said block or blocks with said edge portions and the main body portions of the doors. The rear door, as in the construction shown in my patents above referred to, has its rear edge engaged by suitable latch mechanism which may be automatically or manually tripped, so that when the rear door falls, upon arrival of the car over the pit or bin, it frees the next forward door which, when falling, frees the door next in front of it, and so on through the series, as before described. The doors having thus been opened for dumping, are closed in reverse order as they successively engage the forward edge of the pit or other inclined way provided for this purpose.

The connection between the rear edge of one door and the hinge portion of the next door should be such that wear or buckling of the doors, under the heavy loads which they have to sustain, will be prevented, while at the same time, the construction of the hinge portions of the doors should be such as to afford strength and durability and at all times enable ready and efficient connection of any given door with the hinge portion of the next door to the rear thereof. A still further requirement is that the doors should be cheaply

The inventive idea is capable of embodiment in various forms of drop bottom cars,

several of which, for purposes of illustrating the invention, are shown in the accompanying drawings, but it is to be expressly understood that said drawings are for purposes of illustration only, and are not intended to define the limits of the invention, reference being had to the appended claims for this purpose.

In said drawings:

Fig. 1 is a longitudinal sectional elevation through a portion of a car body, showing a series of drop bottom doors in closed position and hinged on axes extending transversely of the car in spaced relation with the axles thereof;

Fig. 2 is an enlarged cross-sectional view of one of the door hinges and catches shown in Fig. 1;

Fig. 3 is a view similar to Fig. 1, illustrating doors of somewhat different shape in closed and latched position, and showing the axles of the car wheels utilized as the axes to which some of the doors are hinged;

Figs. 4 and 5 are expanded perspective views illustrating in detail two constructional forms of reinforced hinges for the doors, and the catches whereby each of the doors (except the rear door) may be engaged with and supported by a hinged portion of the door next in the rear thereof;

Fig. 6 is a detail perspective view of latch mechanism for the rear door and means for tripping the same;

Fig. 7 is a side elevation of a train of drop bottom cars of various types, said cars being equipped with doors embodying the present invention, and shown crossing a pit or bin into which material is dumped from said cars; and

Fig. 8 is a view similar to Fig. 3, showing the car over the pit or bin and the doors unlatched and in fully open position.

Referring to the drawings, wherein like reference characters designate like parts throughout the several views, 1 indicates the body of a car which may be of the usual or any suitable construction and is shown in the drawings moving from right to left, in the direction indicated by the arrows, on a suitable track 2 that extends across a pit or bin 3. The forward door 4, as shown in Fig. 1, is hinged on any suitable axis 4' extending transversely of the car, by any suitable or desired hinged device. The remaining doors 5, 6, and 7, are each hinged to axes 5', 6', and 7', which, as shown in Fig. 1, are preferably on a plane below the horizontal plane of the axles 8 and 9 of the car. If desired, however, these axes may be on a higher plane, for example in the same plane as the axles of the car, as shown in Figs. 3 and 8, and in the latter case, if desired, the axles 8 and 9 may themselves form the axes around which certain of the doors turn, additional axes, for example, the axis 10, being provided in the same horizontal plane as the axles 8 and 9.

Referring again to Figs. 1 and 2, and particularly to Fig. 2, each door is composed of a sheet of steel or other suitable metal 11, preferably reinforced by flanges 12. The front edge portions 13 of all of the doors (except the front door 4) are bent partially around the axes 5', 6', 7', leaving the extreme edge portions projecting rearwardly beyond said axes, and blocks 14, preferably of metal, are interposed between said rearwardly projecting edge portions and the main body portions of the doors, said blocks having the parts thereof adjacent the axes 5', 6', 7', arc-shaped in cross section to fit said axes. These blocks are secured to the rearwardly projecting edge and main body portions of the doors in any suitable manner, as by rivets 15, and extend along the hinge axes of the doors from one side of each door to the opposite side thereof. The blocks 14, as shown in Fig. 4, may each comprise a single member having catch receiving portions 16 cut or formed therein, or sectional means in the form of individual blocks 17 may be employed which, as shown in Fig. 5, are arranged in spaced relation along the hinge axis of each door and form catch receiving openings 18. In either case, said blocks and the axes of the doors substantially fill the spaces between the doors proper and the edge portions thereof which are bent around said axes so that the hinges thus formed have increased strength, and the bent projecting edges of the doors are reinforced along the length thereof to withstand the weight supported thereby when the doors are closed, and the wear incident to latching and unlatching of the doors as they are closed and opened, respectively.

The rear or free edge portion of each door (except the rear door) is formed with suitable means for catching over the edge portion of the extension 13 on the hinge part of the door next to the rear. Said means may be of any suitable construction and, as herein shown, comprises hook-shaped catches 19 formed on or secured to the rear or free edge portion of each door, except the rear door, and so spaced that when the door is raised in closed position, said catches will engage over the edge portion or extension 20 on the hinge part of the door next to the rear thereof and enter the catch receiving portions 16 of the blocks 14, or the spaces 18 between the blocks 17, as the case may be. By this means, the rear edges of the doors 4, 5, and 6 are positively latched to hold said doors in their upper closed positions. The rear door 7, however, has its rear edge portion engaged by any suitable latch mechanism 21 which may be automatically or manually tripped as desired.

Referring particularly to Fig. 6 of the drawings, the latch mechanism 21 comprises a hook 22 that engages a lug 23 on the rear

door 7 to hold said door in its elevated or closed position. The hook 22 is rigidly secured on a lever 24 which is pivoted at 25 on the rear end of the car and projects outwardly beyond one side thereof. As the car approaches the pit or bin 3, said lever engages a cam or other suitable incline 26 anchored in any suitable manner to a support 27 arranged adjacent the rails 2. Engagement of the lever 24 with the cam or incline 26 swings the latter upwardly about its pivot 25 so that the hook 22 is released from the lug 23, and the rear door 7, together with the doors 4, 5, 6, will, when the car arrives over the pit or bin 3, all swing downwardly and open. The load in the car is thus dumped into said pit or bin, whereupon the doors are serially raised and latched from the front to the rear of the car, by engagement with the forward edge of said pit or other suitable incline, as the car travels past the same.

In Figs. 3 and 8, the several car doors 4", 5", 6", 7" and the flanges 12' thereof, extend downwardly and rearwardly from the hinges in substantially straight lines and are then curved sharply upward, whereas, in Fig. 1, the doors are shown bent upwardly at the rear portions thereof only to a very slight degree. The capacity of the car is materially increased by placing the axes 5', 6' and 7' on a plane lower than the plane of the car axes, and when, as in Figs. 3 and 8, the axes of the doors are placed in substantially the same horizontal plane as the axes of the cars, this results in material reduction of the car capacity which, to a certain extent, is compensated for by the downward dip of the doors 4", 5", 6" and 7", as shown.

The forward door 4, or 4", as the case may be, may be hinged to its axis by bending the sheet metal of the door around the hinge bar or axis, or in any other suitable manner. This may be a simple hinge construction, since it is not required to provide any catch engaging portion therefor to cooperate with another door.

While the cars shown in Figs. 1, 3 and 8 are carried on wheels and axles situated between the front edge of the front door and the rear edge of the rear door, it will be readily understood that the invention is not limited in its application to a car of this specific construction, since the wheels and axles thereof may, if desired, be located to the front and to the rear of the drop bottom portion of the car, as illustrated in Fig. 7 of the drawings wherein the cars 28, 28 are of the type last referred to.

It will be readily apparent to one skilled in the art that various modifications of the construction described herein may be made without departing from the spirit of the invention as defined in the appended claims, and it is to be expressly understood that such modifications as fall within the definition of

thereby. What is claimed is:

1. In a drop bottom car, a hinged sheet metal bottom door, an axis therefor extending transversely of the car body, the hinge edge of the door being bent partly around said axis and extending therebeyond approximately parallel to the main body of the door, reinforcing means interposed between the bent hinge edge of the door and the main body thereof and arranged along said axis from one side of the door to the opposite side thereof, and means securing said reinforcing means to the bent hinge edge and main body portions of said door.

2. In a drop bottom car, a hinged sheet metal bottom door, an axis therefor extending transversely of the car body, the hinge edge of the door being bent partially around said axis and extending therebeyond approximately parallel with the main body of the door, reinforcing means interposed between the bent hinge edge and main body portions of the door and extending along the hinge axis from one side of the door to the opposite side thereof, said reinforcing means being shaped at one side to fit said axis, and means securing the reinforcing means to said bent hinge edge and main body portions of the door, respectively.

3. In a drop bottom car, a hinged sheet metal bottom door, an axis therefor extending transversely of the car body, the hinge edge of the door being bent partially around said axis and extending therebeyond approximately parallel with the main body of the door, reinforcing means interposed between and secured to the bent hinge edge and main body portions of the door and arranged along the hinge axis from one side of the door to the opposite side thereof, a second axis extending transversely of the car body in spaced relation with the first named axis, and a second sheet metal bottom door similarly hinged to said second transverse axis, the edge of said second door opposite the hinge thereof having supporting engagement with the extended hinge edge of said first door when in normal or closed position.

4. In a drop bottom car, a plurality of axes extending transversely of the car in spaced relation, a plurality of interlocking drop bottom doors hinged to said axes respectively and having edge portions bent around the axes and extending beyond the same to a point opposite the body portion of the doors, reinforcing means interposed between and secured to the bent edge and main body portions of the doors and arranged along said axes from one side of each door to the opposite side thereof, latch mechanism for holding the rear door upwardly in closed position and adapted when unlatched to provide for opening of the rear door and the remaining

doors, and means on said remaining doors engaging the bent edge portions thereof adjacent said reinforcing means when the doors are in normal or closed position.

5 In a drop bottom car, a hinged sheet metal bottom door, an axis therefor extending transversely of the car body, the hinge edge of the door being bent partly around said axis and extending therebeyond approximately
10 parallel with the main body of the door, reinforcing means interposed between and secured to the bent hinge edge and main body portions of the door and arranged along said axis from one side of the door to the opposite side thereof, said reinforcing means providing catch receiving openings, a second
15 hinged sheet metal door, and catches on said second door adapted to enter said openings and engage the bent hinge edge of the first door when said doors are closed.

20 6. In a drop bottom car, a hinged bottom door, an axis therefor extending transversely of the car body, means on the door bent around the transverse axis and terminating in an edge portion opposite to and spaced from the main body of the door, and reinforcing means interposed between and secured to said edge and main body portions of the door and extending across said door from one side of
25 the same to the opposite side thereof.

30 7. In a drop bottom car, a hinged bottom door, an axis therefor extending transversely of the car body, means on the door bent around the transverse axis and terminating in an edge portion spaced from said axis and the main body portion of the door, block shaped reinforcing means interposed between and secured to said edge and main body portions of the door and extending across the
35 door from one side of the same to the opposite side thereof, said block shaped reinforcing means providing spaced catch receiving openings, a second hinged door, and catches secured to the second hinged door adjacent the free edge thereof and adapted to enter said openings and engage said edge portion of said first door when the first door and said second door are closed successively.

40 8. In a drop bottom car, an end drop bottom door hinged thereon, one or more drop bottom doors also hinged on the car, means on said doors bent around the hinge axes thereof to provide edge portions spaced from said axes and the main body portions of the doors, reinforcing means providing catch receiving
45 openings and extending across each door from one side of the same to the opposite side thereof, means securing the reinforcing means in position between the bent edge and main body portions of the doors, a second end door hinged on the car, latch mechanism for the first named end door, and catches on the remaining doors adapted to enter said openings and engage said edge portions of the

doors when all of the doors are closed.

9. In a drop bottom car, a drop bottom door hinged thereon, means on said door bent around the hinge axis thereof to provide an edge portion opposite to and spaced from
70 the main body portion of the door, and a plurality of reinforcing blocks arranged between and secured to the bent edge and main body portions of the door and extending across the door in spaced relation from one side of said door to the opposite side thereof.

10. In a drop bottom car, a drop bottom door hinged thereon, means on said door bent around the hinge axis thereof to provide an edge portion spaced from said axis and the main body portion of the door, a plurality of reinforcing blocks arranged between and secured to the bent edge and main body portions of the door and extending across the door in spaced relation from one side of said door to the opposite side thereof, a second drop bottom door hinged on the car, and catches on the second door adapted to engage the bent edge of the first door and enter the spaces between
80 said blocks when the first and second doors are closed.

11. In a drop bottom car, the combination of a car body, a plurality of transverse rods, a plurality of sheet metal doors hinged to said rods by bending the sheet metal partially around the respective rods as an axis, the bent edge of said sheet metal projecting beyond the axis and approximately parallel with the main body of the door, spaced metal blocks interposed between said projecting edge and the main body of the door, means securing said blocks in position, and a series of hooked catches on the rear edge of each door and engaging said projecting edge when the doors are in closed position and from which catches said edge is withdrawn when the door is dumped.

12. In a drop bottom car, the combination of a plurality of sheet metal doors hinged thereto by bending the sheet metal around the hinge axes, the bent metal projecting beyond said axes and providing edge portions spaced from the main body portions of the doors, spaced reinforcing elements interposed between and secured to the projecting edge and main body portions of each door, and a plurality of catches on each door engaging the projecting edge portion of the next adjacent door between the blocks thereon when the doors are in closed position.

In testimony whereof I have signed this specification.

CHARLES A. GRIFFITH.