Aug. 3, 1937. R. W. KING 2,088,655

RAILWAY ROLLING STOCK

Filed March 27, 1936 2 Sheets-Sheet 1

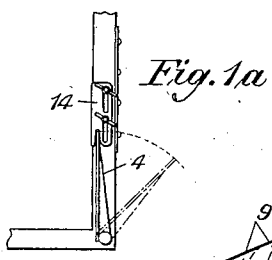


Fig. 1a

Fig. 1

Fig. 1b

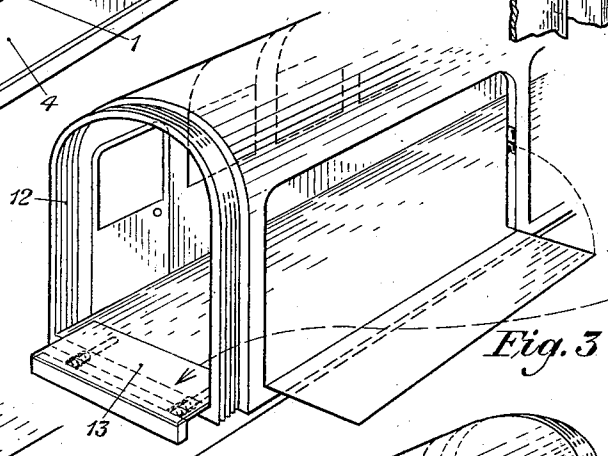


Fig. 3

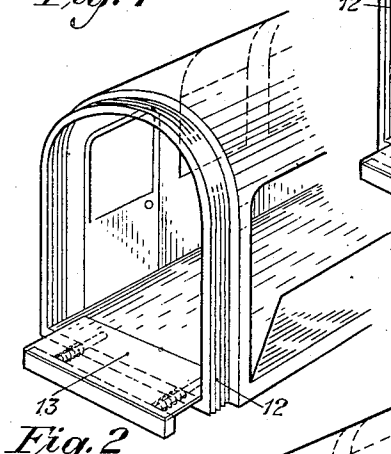


Fig. 2

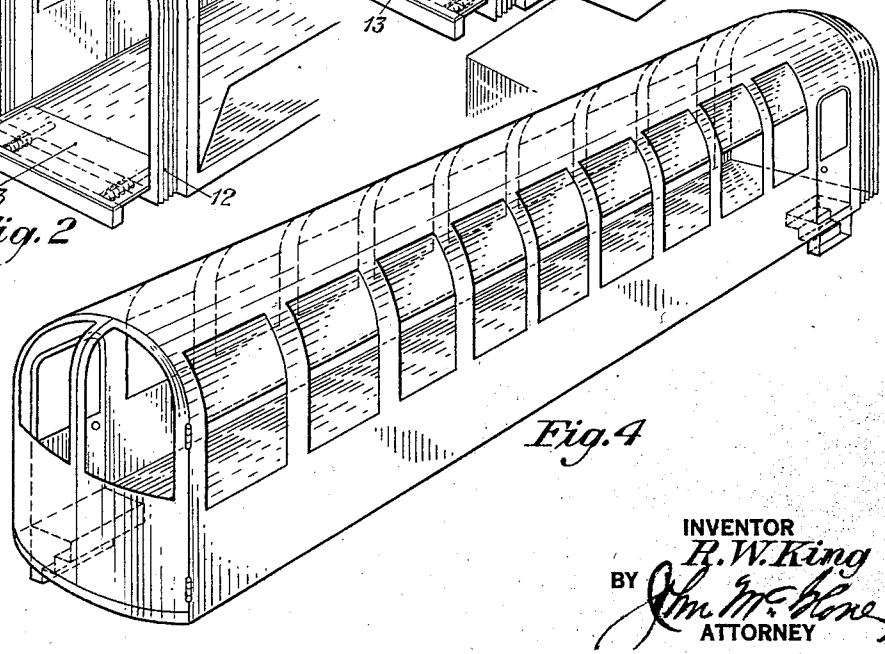


Fig. 4

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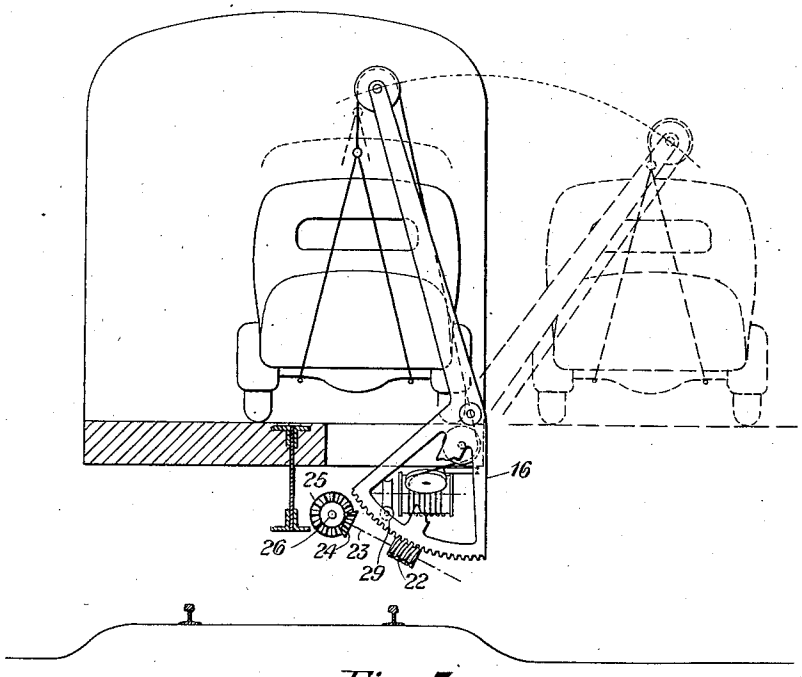


Fig. 5

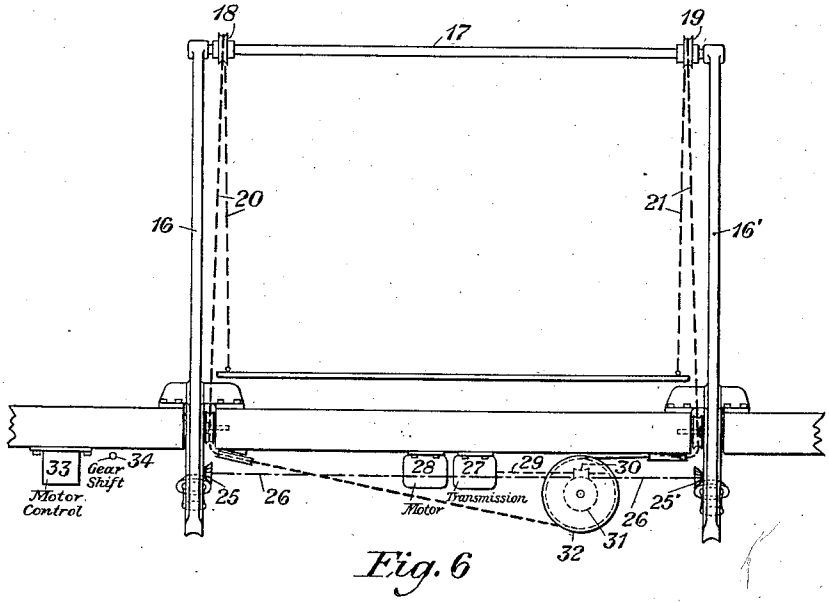


Fig. 6

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RAILWAY ROLLING STOCK

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12 Claims. (Cl. 105—368)

This invention relates broadly to a system for transporting motor vehicles and their passengers by railroad trains, and particularly to novel types of railroad cars, characterized by means to facilitate the loading and the unloading of the said vehicles and their passengers, and to provide suitable protection to the said vehicles and passengers in transit.

For many years the volume of motor vehicle traffic has been steadily increasing, resulting in a marked decline in the revenues of railroads and in great congestion of the highways over which such motor vehicle traffic moves. The latter result has greatly increased the number of serious accidents and has intensified the nervous strain incurred in driving motor vehicles for long distances over the trunk highways of the country.

It is believed that if the railroads of the country were equipped with cars of the type in which this invention is embodied and were to offer the class of service hereinafter described, a considerable fraction of the people now driving their motor vehicles over long distances would avail themselves of this new class of service, with resulting increase in railroad revenues and decrease in congestion of the motor highways.

This new type of transportation service contemplates the loading of motor-cars together with their occupants and incidental baggage upon a special type of train. This train, preferably, would be scheduled to average perhaps thirty-five to forty-five miles per hour, and would make stops at only important intermediate points. The occupants of the motor-cars would, in this way, be assured of a more rapid journey than they could safely undertake on any highway and with a negligible nervous strain and danger of accident.

It is further contemplated that for this service, the railroad charges would be approximately commensurate with the present freight rates on automobiles, and that the human occupants would pay but a small surcharge. In this way, the actual cost of transportation would be very little, if any, more than that arising from the use of gasoline, oil and general wear and tear when motoring over a public highway. As a matter of fact, the present freight rate on an average sized car, when transported over a distance of about one thousand miles, works out at about five cents per mile. It is well recognized by every one who drives a motor-car that long distance journeys involve an expenditure per mile of about this figure or larger, depending upon the size of the car.

From the standpoint of the railroads, such a revenue per automobile is in keeping with their present freight rates when broken down on the basis of a single freight-car traveling over a distance of one mile. Average freight revenue per freight-car mile, taking the country as a whole, is very nearly ten cents. The average revenue per loaded freight-car mile is about fifteen cents. The design of freight-car herein disclosed has capacity for three motor-cars. It therefore represents a loaded revenue of fifteen cents per car mile from the motor vehicles, with the maximum being determined by the number of motor-car occupants together with the amount of surcharge per occupant.

It is further contemplated, of course, that in offering this service, stop-over privileges would be granted. Using as an illustration the case of a family going from Chicago to the West Coast: they could enjoy stop-overs en route at any of the national parks or other points of major interest, picking up a similar train one or two days later. Furthermore, upon arrival at their destination, their car would be with them for general use. The cost of the journey would be distinctly less than that now required if the motor-car occupants were to travel by passenger train. In fact, it would be very little, if any, greater than the cost entailed if they were to drive the entire distance, and as previously pointed out, the railroad would obtain a freight revenue adequate to compensate it on the basis of present-day freight statistics.

To give such service requires special equipment, examples of which are shown on the attached drawings and are fully described hereinafter. Fig. 1 shows the body or superstructure of a railroad car characterized by openings at the sides then at the ends for the loading and unloading of motor vehicles, the said body being designed to afford suitable protection to the vehicles and passengers in transit; Figs. 1*a* and 1*b* show details for fastening the members that close the openings at the side of the car; Fig. 2 shows the arrangement of the end of the car-body which is intended to form a flexible enclosure at the junction of two cars similarly equipped; Fig. 3 shows the side enclosure in its lowered position to provide a gang-plank over which vehicles may be moved to and from the car; Fig. 4 shows a type of car in which the vehicles are loaded or unloaded solely from the ends of the car; Figs. 5 and 6 show the applica-

tion of a crane to the type of car shown in Fig. 1 by which the motor vehicles may be swung from the car floor to ground or platform, and vice versa, in the course of unloading and loading such vehicles.

The body or superstructure, shown in Fig. 1, which may be mounted upon trucks in the usual manner of railroad car construction, has in one side thereof a plurality of openings 1, 2 and 3 of such dimensions as to permit a motor vehicle to be moved into or out of the car. These openings may be closed, either wholly or partly, by panels 4, 5 and 6, which when lowered, as shown in Fig. 3, serve as gang-planks over which the vehicles may be moved to and from the car. At the end of the same side wall of the car is a door 7 for the use of passengers and trainmen. The opposite side wall contains a similar door 8 and a plurality of windows 9, 9. Other windows may be placed in the roof of the car as indicated by the dotted lines above the windows 9, 9. Suitable steps 10 may be provided, as indicated also by dotted lines under the door 8, which steps would normally be covered by a steel plate in the manner in which such steps are customarily guarded upon the vestibules of standard railroad cars. One end of the superstructure of Fig. 1 would be fitted with a pair of doors 11 of such proportions that, when opened, would permit motor vehicles to pass readily therethrough. Those doors would have therein large windows to permit the occupants of the first motor-car to obtain an unobstructed view of the country. The other end of the car-body would be open, the side walls and roof terminating in an accordion-like section, represented by 12 in Figs. 1 to 3, which is designed to coact with a similar section upon an adjacent, open-ended, car-body to form a flexible, weatherproof joint or passageway between the adjoining car-bodies, hereinafter referred to as covered articulation. The opening at the end of the car through the said accordion-like section would be substantially the full width and height of the car to permit the passage of motor vehicles from one car to the other during the process of loading or unloading. It is to be understood, of course, that the gap between the floors of the cars would be bridged by a plate, or other suitable device, represented by 13 in Figs. 2 and 3, so that the motor vehicles could be rolled from car to car. That plate would be attached in such a fashion as to permit it to conform to changes in alignment of the adjacent cars. For the purpose of identification, the car just described will hereinafter be referred to as the A_1 type.

In order to meet the requirements of varying traffic conditions, different types of cars, employing different combinations of the features hereinbefore described, must be provided. For example, in addition to the A_1 type, characterized by one closed end, one open end and an opening side, a second type, designated A_2, might be provided, characterized by two open ends and an open side, as shown in fragmentary form in Figs. 2 and 3. With cars of those two types, loading and unloading can take place in either of two ways. Assuming that the train is drawn up alongside the freight platform, as many as need be of the hinged metal gang-planks characterizing the open side of the cars could be let down to the horizontal position, as shown in Fig. 3. The lengths of the openings thus formed are quite sufficient to permit of the ready entrance or exit of the familiar types of automobiles. This type of structure is well adapted to the quick loading and unloading of individual cars. It seems likely, however, that at main railroad terminals, it might be found preferable to make provision for cars driving from end to end of the train—in other words, on at one end and off at the other, after the manner now common on ferry boats. It is therefore contemplated that trains of the type under consideration would ordinarily include the familiar type of flat-car at both the front and rear ends—in other words, a flat-car would be placed immediately behind the locomotive and in front of the leading motor-car carrier of type A_1. This car would be followed by a suitable number of type A_2, the train being terminated finally by another type A_1 car, its swinging doors of course closing to the rear, and it in turn followed by another flat-car. Such a train, when drawn up alongside the freight platform and with suitable gang-planks placed across from the platform to the flat-cars, would permit of rapid entraining and detraining. In fact, it is anticipated that for certain roads where the traffic would be largely through traffic and where there would be little demand to pick up and drop off automobiles at intermediate points, this method of loading and unloading would be used exclusively, thus permitting the use of two other types of cars, one of which is shown in Fig. 4, and one other differing therefrom only to the extent of having both ends of the car open. Those two types of cars, designated B_1 and B_2 respectively, are characterized by a row of large windows on both sides, there being no lateral openings to accommodate motor vehicles. The design and operation of the B_1 and B_2 types of car are in all other respects similar to the A_1 and A_2 types. A train made up exclusively of these types of cars would permit of heating from the locomotive in winter, should traffic demands make this desirable.

The modus operandi of the cars thus far described presupposes the existence of the familiar type of freight platform which stands at about the same level as the freight-car floor. It may be found, however, that in actually handling the type of traffic contemplated herein, it will not always be convenient or feasible to draw the train alongside such a platform during the loading and unloading operations. This would appear to be particularly the case at intermediate stops where to draw into a siding possessing such a platform might be interposing objectionable delay. It therefore seems desirable that means be provided whereby motor-cars can be loaded and unloaded at track or ground level. In the case of trains composed of any combination of cars already described together with a loading and following flat-car, such loading could obviously be effected in a variety of ways:

1. By the use of a sloping gang-plank which would reach from the ground to the car floor level and would hook on the side of the car;

2. By means of a permanent prismatically-shaped runway, alongside which the car or train could be placed;

3. By means of small derricks together with appropriate swings or cradles placed upon the leading or following flat-cars. These derricks could be operated by steam, electricity or an internal combustion engine and would permit of loading and unloading in the same way as it is now carried out at docks for marine transportation.

In view, however, of the fact that in practice

a very wide variety of operating conditions may conceivably arise, two other types of car designated as C_1 and C_2 are herewith proposed. They differ from the A_1 and A_2 types respectively only by the addition of small electrically operated hoists, as depicted in Figs. 4 and 5. It would be noted that these hoists are small enough so that when set in the vertical position, they lie entirely within the cross-sectional outline of the car itself and therefore offer no troublesome projections.

The crane for loading and unloading the vehicles comprises, as shown in Fig. 6, a pair of rotatable members 16 and 16', which are supported by a bearing at or near the floor of the car in such manner that the said members will rotate in a plane perpendicular to the side of the car. The upper ends of those members support a strut 17 that carries two sheaves 18 and 19 over which pass the ropes 20 and 21 by which the motor vehicle is raised and lowered. As clearly shown in Fig. 5, the lower end of each member 16 below the pivot point is arcuate shaped, the outer rim of the arc being provided with teeth that mesh with a worm gear 22 which is upon the same shaft 23 as the bevel gear 24. Another bevel gear 25, which meshes with gear 24, is fastened to the shaft 26 that extends to a transmission unit 27 which is connected to the motor 28. The shaft line 26 (represented by dot and dash line in Fig. 6) has also connected thereto the bevel gear 25' through which power is applied to the member 16' simultaneously with the application of power to member 16. The transmission unit has also connected to it another shaft 29 (represented by a dotted line in Fig. 6) which carries a worm gear that meshes with a gear 31 that is connected to a drum 32 over which pass the ropes 20 and 21. A suitable motor control 33 is provided to start the motor and to control its speed and direction of rotation. Likewise, a gear shift 34 is provided to connect the motor either to shaft 29 (to rotate the drum) or to shaft 26 (to rotate the member 16 and 16'). Since the devices 33 and 34 are of well known types, the details of their connection to the motor 28 and transmission unit 27 have purposely been omitted to avoid confusion of the drawings.

The mode of operation of the device is as follows:—Assuming the crane to be initially in its inward position, as shown by the solid lines of Fig. 5, and that it is desired to swing it outward, the gear shift would be moved to connect the motor 28 to the shaft 26 and the motor would be started in such direction as to effect movement of the crane in the outward direction. The rotation of shaft 26 would cause the rotation of gear 25 which, in turn, would cause the rotation of gear 24 and the worm 22. The movement of the latter will cause the member 16 to move in the desired direction. In like manner, the member 16' is caused to move through the action of the gear 25' and its associated gears. When the arms of the crane have been swung outwardly to the position represented by the dotted line, the motor would be disconnected from shaft 26 and connected to shaft 29, thereby applying power to the drum 32. By suitable adjustment of the motor control 33 the drum will be caused to rotate in the desired direction and at such speed as to permit the lowering of the motor vehicle to the ground with safety and dispatch.

The hinged panels 4, 5 and 6, shown in Fig. 1, may be fastened in a variety of ways to hold them in their normal vertical position, two of which ways are shown in Figs. 1*a* and 1*b*. In Fig. 1*a*, the member 14, having a V-shaped slot in its lower end, is adapted to move vertically along the upright members, such as 15, of the framework of the body of the car, and is fastened thereto by means of bolts and wing nuts by which it may be held fixed at any position. When the panel 4 is raised to its vertical position, the members 14 at each end are dropped so that the V-shaped slots straddle the panel, and are securely held by tightening the wing nuts. This is shown in greater detail in Fig. 1*b*, which differs from the arrangement of Fig. 1*a* merely by the use of a single bolt and wing nut.

In Fig. 1, open spaces 1, 2 and 3 are shown above the hinged panels which serve as gang-planks. It should be noted, however, that these spaces could readily be closed by means of other panels in which suitable windows are incorporated. This second set of panels would be arranged either to slide up along tracks or trolleys under the roof of the car and to be counter-balanced with weights or springs after the manner of certain types of garage doors, or to descend into slots or recesses in the lower panels and to be raised and lowered by racks and gears. A purpose of the upper set of panels is to virtually enclose the A_1 and A_2 types of car thus permitting of their being readily heated in winter.

While the invention has been shown and described in a variety of forms of embodiment, it is obviously capable of embodiment in other and substantially different forms without departing from the spirit and scope of the appended claims.

What is claimed is:

1. A railroad car for the transportation of motor vehicles and their passengers, the said car having a superstructure forming the side walls, an end wall and the roof of the said car, the end wall having doors therein of such proportions as to permit the passage of a motor vehicle through the doorway, and the other end of the said car being open and having an accordion-like section adapted to coact with a similar section upon an adjacent car to form a flexible enclosure at the junction of the said cars, and means to bridge the gap between the floors of the adjoining cars to provide for the passage of vehicles from one car to the adjoining one.

2. A railroad car for transporting motor vehicles and their passengers, the said car having a superstructure forming the side walls, an end wall and a roof thereof, each side wall having one or more windows therein together with a passenger stairway and door, the said end wall having therein a door or doors of such proportions as to permit, when opened, the passage of a motor vehicle through the said end wall, the opposite end of said car being open and having an accordion-like section adapted to coact with a similar section of an adjoining car to form a flexible enclosure at the junction of the said cars, and means to bridge the gap between the floors of the adjoining cars to provide for the passage of vehicles from one car to the adjoining one.

3. A railroad car for the transportation of motor vehicles and their passengers, the said car having a superstructure forming the side walls and the roof thereof at least one side wall having therein one or more windows together with a passenger stairway and door, the ends of the side walls and of the roof having an accordion-like structure to coact with a similar structure upon an adjoining car to form a flexible enclosure at

the junction of the said cars, and means to bridge the gap between the floors of the adjoining cars to provide for the passage of vehicles from one car to the adjoining one.

4. A railroad car for the carrying of motor vehicles and their passengers, the said car having side doors in the side walls thereof for the accommodation of the passengers and end openings for the transfer of vehicles and of passengers from the said car to an adjoining car, together with covered articulation giving adequate protection between the adjoining cars against the weather.

5. A railroad car for the carrying of motor vehicles and their passengers, the said car having side and end openings in the respective walls thereof for the transfer of vehicles and of passengers from the car to a loading platform and from the said car to an adjoining car, together with covered articulation between the adjoining cars to give adequate protection against the weather and a continuous runway for the vehicles and passengers.

6. A railroad car for the carrying of motor vehicles and their passengers, the said car possessing a superstructure comprising, at least, side walls and a roof to protect against the weather and having side and end openings for the transfer of vehicles and of passengers from the car to a loading platform and from the said car to an adjoining car, the said car having also a crane positioned in a side opening for the ready lifting of motor vehicles to and from the car and ground, together with covered articulation between the adjoining cars to give adequate protection against the weather and a continuous runway for the vehicles and passengers.

7. A railroad car for the carrying of motor vehicles and their passengers, the said car possessing a superstructure comprising, at least, side walls and a roof to protect against the weather and having doors in said side walls for the accommodation of the passengers and end openings for the transfer of vehicles and of passengers from the said car to an adjoining car, together with covered articulation providing a continuous runway as well as giving adequate protection between the adjoining cars against the weather, and possessing windows in both side walls and roof.

8. A railroad car for the carrying of motor vehicles and their passengers, the said car possessing a superstructure comprising, at least, side walls and a roof to protect against the weather and having side and end openings for the transfer of vehicles and of passengers from the car to a loading platform and from the said car to an adjoining car, together with covered articulation between the adjoining cars to give both a continuous runway and adequate protection against the weather, and possessiong windows in both side walls and roof.

9. A railroad car for the carrying of motor vehicles and their passengers, the said car possessing a superstructure comprising, at least, side walls and a roof to protect against the weather and having side and end openings for the transfer of vehicles and of passengers from the car to a loading platform and from the said car to an adjoining car, the said car having also a crane positioned in a side opening for the ready lifting of motor vehicles to and from the car and ground, together with covered articulation between the adjoining cars to give both a continuous runway and adequate protection against the weather, and possessing windows in both side walls and roof.

10. A railroad car for the carrying of motor vehicles and their passengers, the said car possessing a superstructure comprising, at least, side walls and a roof to protect against the weather and having a door in a side wall for the accommodation of the passengers and end openings in said superstructure for the transfer of vehicles and of passengers from the said car to an adjoining car, together with covered articulation giving both a continuous runway between the adjoining cars and adequate protection against the weather at the junction thereof, the said car possessing a pair of virtually full width doors at the other end.

11. A railroad car for the carrying of motor vehicles and their passengers, the said car possessing a superstructure comprising, at least, side walls and a roof to protect against the weather and having side and end openings for the transfer of yehicles and of passengers from the said car to a loading platform and from the said car to an adjoining car, together with covered articulation between the adjoining cars to give both a continuous runway and adequate protection against the weather at one end, the said car possessing a pair of virtually full width doors at the other end.

12. A railroad car for the carrying of motor vehicles and their passengers, the said car possessing a superstructure comprising, at least, side walls and a roof to protect against the weather and having side and end openings for the transfer of vehicles and of passengers from the car to a loading platform and from the said car to an adjoining car, the said car having also a crane positioned in one of said side openings for the ready lifting of motor vehicles to and from the car and ground, together with covered articulation between the adjoining cars to give both a continuous runway and adequate protection against the weather at one end, the said car possessing a pair of virtually full width swinging doors at the other end.

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