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METHOD FOR THE TRANSPORTATION OF FREIGHT

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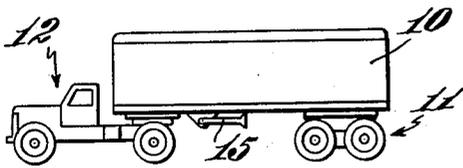


Fig. 1

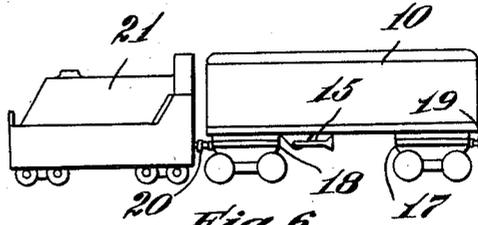


Fig. 6

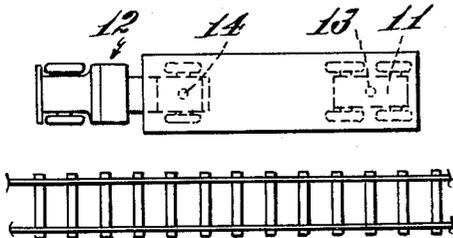


Fig. 2

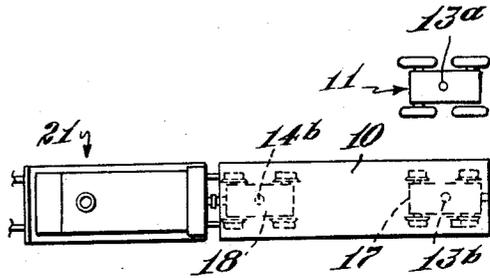


Fig. 7

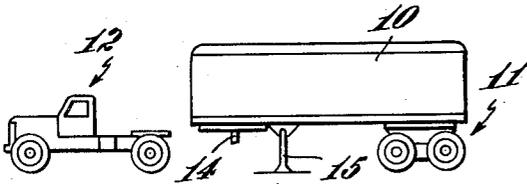


Fig. 3

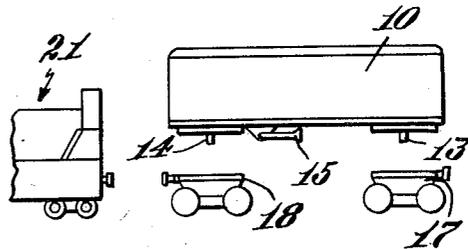


Fig. 8

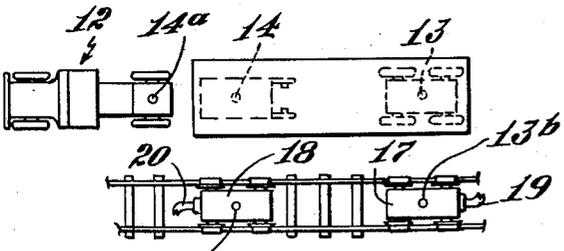


Fig. 4

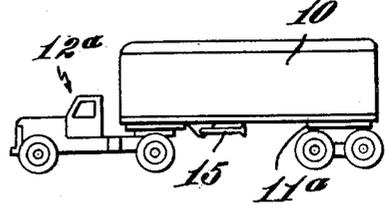


Fig. 9

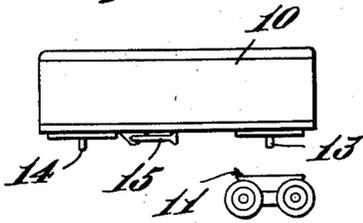


Fig. 5

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METHOD FOR THE TRANSPORTATION OF FREIGHT

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7 Claims. (Cl. 105—215)

This invention pertains to a novel method for the transportation of freight. A very considerable proportion of the traffic in goods and passengers formerly transported over railways or jointly over railways and highways now passes over highways exclusively, especially where the passengers or goods are to be transported relatively short or intermediate distances. The gradual taking over by the bus and truck lines of such a considerable portion of the passenger and freight traffic of the country has been brought about by numerous well-known causes which need not be here enumerated. But one principal advantage which the highway carrier has over the railway carrier consists in his ability to transport goods or passengers from any shipping point in one locality to any definite receiving point in a different locality without trans-shipment of the goods or handling during transit in any manner. This method of transport which is generally designated "door-to-door" transport not only saves greatly in time of shipment over that mode of transportation which involves loading onto and unloading from railway cars at transfer points, but is less expensive to the shipper, and in most cases insures that the goods will be received in better condition than when they pass over the railways. The increasing passenger and freight traffic on the public highways has, however, greatly increased the traffic hazard incident to ordinary highway travel, the busses, trucks and trailers now commonly used being in many instances of such large size and great weight as to constitute objectional traffic hazards as well as being destructive to the highways.

Various methods have heretofore been suggested for improving the above methods of transportation, but none of the methods heretofore advanced has adequately solved the problem. For example, it has been proposed to ship loaded highway trailer trucks on railway flat cars, on the theory that a saving in time might thereby be made, because railways generally form the most direct route between principal points, provide the easiest grades for traffic, avoid congested cities, and in general constitute instrumentalities for the safe, fast and economical movement of traffic of all kinds. It has also been proposed to provide a highway truck with an extra set of wheels, similar to railway car wheels, with provision for lifting and lowering one or the other set of wheels, for example, for elevating the highway wheels to allow the other wheels to rest on the railway tracks so that the vehicle can then be treated as a railway car to be hauled along the track by a locomotive. Further, it has been proposed to provide the vehicle with highway wheels which can be elevated so as to allow the truck body to be set upon railway trucks such as are commonly used for supporting railway cars. However, in all of the previously proposed methods the vehicle body with its wheeled support, including the highway wheels and associated parts, is all transported with the load, adding very substantially to the pay tonnage and even more important, keeping the wheeled support with its highway

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wheels out of use during the period while the vehicle body is being transported by rail.

As contrasted with prior proposals, an object of the present invention is to make use of a container which may readily be shifted from supports provided with highway wheels to supports provided with railway wheels, or vice versa, thus avoiding the transportation of excessive weight and making those supports, which are not in use for supporting a particular container, available for moving another container over the highway or railway. To this end in accordance with the present invention, the body has a kingpin adjacent to each of its respective ends, one of said pins being engageable with a suitable socket in a dolly provided with usual highway wheels having rubber tires and the other engaging a socket in a motor propelled tractor, also provided with highway wheels having rubber tires, thus providing a vehicle for use on the highway, the same kingpins being designed for engagement alternatively with sockets in a pair of spaced independent railway dolly trucks having wheels designed to run on a railway track, thus forming a railway vehicle. At an appropriate designated railway interchange, and assuming that the body has been in use as part of a highway vehicle, the body will be lifted from the highway dolly and tractor (having first been placed adjacent and substantially parallel to the railway track) and will then be moved sidewise until its kingpins are directly above and registered with the sockets in railway trucks, herein, to avoid confusion in terms, being referred to as "bogies" properly placed apart on the railway track, the body then being lowered to engage its kingpins with the sockets of the respective railway bogies. The vehicle body is so designed as to be capable of sustaining the maximum tractive force imposed upon it when a plurality of units (each comprising a body resting upon spaced independent railway dollies) are connected to form a train. Assuming that such units have been coupled together and a locomotive having been coupled to the forward unit, the train thus formed will be moved along the railway to a highway interchange where, after uncoupling the locomotive, the vehicle body of each unit is lifted from its railway dollies or bogies, moved laterally until its rear kingpin is directly above and in register with a highway dolly previously positioned to receive it. The landing gear of the vehicle body is then moved to operative position and the body is then lowered so that its rear kingpin enters the socket of the dolly while the landing gear supports its forward end. A tractor may then be positioned to receive the forward kingpin of the vehicle body and the landing gear is raised, the body thus again becoming a part of a highway vehicle capable of travel over highways to its final destination. Other and further objects and advantages of the invention will be pointed out in the following more detailed description and by reference to the accompanying drawings, wherein

Fig. 1 is a diagrammatic elevation illustrating a vehicle body, in accordance with the present invention, mounted for movement over the highway by a customary type of power tractor;

Fig. 2 is a diagrammatic plan view showing the vehicle of Fig. 1, arranged in position parallel to an ordinary railway track and in readiness for transfer of the vehicle body to the railway;

Fig. 3 is a side elevation similar to Fig. 2, showing the vehicle body separated from the tractor and supported at its forward end by a retractable landing device;

Fig. 4 is a plan view showing the parts as illustrated in Fig. 3, but showing a pair of railway trucks or dollies disposed on the railway track in readiness to receive the vehicle body;

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Fig. 5 is a diagrammatic side view showing the vehicle body elevated from the highway dolly which previously supported its rear portion;

Fig. 6 is a side elevation showing the vehicle body as having been moved horizontally and in a direction perpendicular to the length of the railway and as having been lowered down so as to rest upon the railway dollies or bogies, the forward railway dolly or bogie being shown connected to a locomotive;

Fig. 7 is a plan view of the parts shown in Fig. 6 and showing the empty highway dolly standing near the railway track;

Fig. 8 is a diagrammatic side elevation showing the vehicle body at the unloading point and showing it as having been lifted from the railway dollies or bogies; and

Fig. 9 is a side elevation showing the vehicle body as having been lowered onto a second highway dolly and a second highway tractor whereby it may be hauled away to its ultimate destination.

Referring to the drawings, there is shown in Fig. 1 a vehicle designed for use on the highway, and which in external appearance generally resembles a conventional trailer truck. In accordance with the present invention, in preparation for highway travel, the elongate container or body portion 10, which has no wheels of its own, is detachably mounted at its rear end upon a road dolly 11, and at its front end upon a motor propelled tractor 12, the dolly and tractor being provided with conventional rubber-tired wheels for use on the highway. As illustrated, the body or container 10 is provided with a retractable landing gear 15 for use in supporting the forward end of the body, at times, when the tractor 12 is disengaged from the body. To facilitate the detachable connection of the body to the dolly 11 and the tractor 12, the body is provided, as illustrated more clearly in Figs. 5 and 8, with kingpins 13 and 14 near its rear and forward ends respectively, these kingpins being designed to enter appropriate sockets provided in the dolly 11 and the tractor 12. Desirably some appropriate locking means should be assembled with each kingpin 13 and 14 for detachably securing the vehicle body to the dolly and tractor.

In Fig. 2 the vehicle of Fig. 1 is shown as standing at a transfer station with its longitudinal axis substantially parallel to a standard gauge railway track 16. It will be understood that in pulling into this transfer station the driver will endeavor to place the truck body as nearly parallel with the railroad track as is practicable, and will endeavor to stop the vehicle at a definite position such as might be indicated for example, by means of a mark or other device on the parking ramp at which the vehicle comes to rest. The vehicle will be provided with suitable brake means, and after the vehicle has stopped, the landing gear 15 will be moved downwardly to the position shown in Fig. 3, and the tractor 12 will then be withdrawn from beneath the forward end of the vehicle body 10, leaving the latter supported on the dolly 11 and the landing gear 15.

With the body 10 in this position, two independent railway bogies or dollies 17 and 18 will be moved to positions such as indicated in Fig. 4, on the railroad track 16 unless said bogies are already standing there with their brakes locked, as the result of a previous operation in which a vehicle body was removed from them and placed on road wheels. These bogies or dollies 17 and 18 which are wholly independent and normally unconnected are provided with sockets 13^b and 14^b designed for the reception of the kingpins 13 and 14 carried by the vehicle body. In preparation for the reception of the container 10, the bogies are so spaced apart that the axes of the sockets 13^b and 14^b are spaced apart the same distance as the axes of the kingpins 13 and 14 of the body or container 10. The bogies 17 and 18 are provided with flanged iron wheels of railway type resting on the track 16, and are furnished with couplings 19 and 20 at their remote ends respectively.

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Assuming that these bogies are in proper position, the body 10 is now lifted, together with the dolly 11 by any suitable lifting means, for example, a suitable wheeled support or transfer dolly which may be placed beneath the container and then elevated so as to lift the container with the dolly 11.

It may be necessary, after having lifted the container body and highway dolly 11, to shift the body or container longitudinally one way or the other a short distance, to bring its kingpins into proper relation to the sockets of the railroad bogies, to compensate for any inaccuracy in parking the vehicle. It may also be necessary, while it is so lifted to orient it about a vertical axis to bring its longitudinal axis into true parallelism with the railway track thereby to assure the proper location of the dolly 11 relatively to the railway track to receive another body brought by rail to the terminal. The vehicle body and the dolly 11 are now again lowered until the dolly rests on the ground; the rear kingpin is disconnected from the dolly 11 and the body is again lifted high enough to clear the dolly 11, and the landing gear 15 is folded to an inoperative position. This position of the truck body 10 with reference to the dolly 11 is illustrated in Fig. 5 (but without any attempt to show the lifting means by which the truck body is thus elevated). The body 10 is now moved horizontally in a direction at right angles to the railway track until its kingpins 13 and 14 are directly above and in registry with the socket 13^b and 14^b in the bogies 17 and 18. The body or container is lowered and the kingpins enter the respective sockets, the body or container now occupying the position relative to the bogies or dollies 17 and 18 as show in Figs. 6 and 7. The transverse movement of the container above described results in leaving the dolly 11 standing empty at one side of the track. If desired, a tractor may now be connected to this dolly and may carry the latter away to some point of use, but preferably the dolly 11 will be left beside the track in readiness to receive another truck body brought to it on the railway.

A locomotive 21 may now be coupled to the forward coupling 20 of the bogie 18, and the railway vehicle comprising the body 10 and the bogies 17 and 18 may now be hauled by the locomotive to any desired destination, it being understood that a series of these railway vehicles or units, each comprising a body 10 and bogies 17 and 18, may be coupled together one after another to form a train. As above noted, the railway bogies 17 and 18 are independent, and the only connection between them is through the container 10 when the kingpins of the container are seated in the sockets in the railway bogies. If desired, the sockets of the bogies 17 and 18 may be provided with means cooperative with locking devices associated with the kingpins 13 and 14 for locking the body to the railway bogies.

Assuming that the locomotive has hauled the above railway vehicle constituted by the container 10 and the bogies 17 and 18 to a destined transfer station, where the vehicle and locomotive will be in the same relation as shown in Fig. 6, and the brakes on the bogies 17 and 18 having been set, the locomotive may now be uncoupled from the bogie or dolly 18, and by suitable lifting means, such for example as above referred to, the body 10 is now elevated from the bogies 17 and 18, and is then moved horizontally in a direction at right angles to the railway track (Fig. 7) until its rear kingpin 13 is directly above and in registry with the socket in a rubber-tired road dolly 11^a which may for example, have been standing in that position since a vehicle body was lifted therefrom, as above described. The container 10 is now lowered until its kingpin 13 enters the socket in the dolly 11^a, the landing gear 15 having first been lowered to support the forward end of the vehicle body until a tractor is available to haul it away. When a tractor is available it is engaged with the forward kingpin of the vehicle body, the landing gear is folded up,

and the resultant assembly of said parts is now in readiness to be drawn by the tractor 12^a (Fig. 9) to the destination of the goods.

While the method of procedure according to the present invention has herein been illustrated and described as applied to the shift of a single container from a road dolly and tractor to railway bogies standing on a railway track so as to form a railroad vehicle and the subsequent re-transfer of the body from the railroad bogies to a second dolly and tractor, it is to be understood that the operation may be carried out in either direction, and that in the same station containers may be transferred from wheeled supports designed to travel on the highway to wheeled supports designed to travel on the railroad track while containers are taken from wheeled supports on the railway track and transferred to wheeled supports for use on the highway, or in fact, to the same wheeled highway supports as those from which a body has just been shifted to wheeled railway supports.

No attempt has been made to describe or illustrate in detail many of the adjunctive features which are common to highway and railway vehicles and which are well understood by those skilled in the art, nor has any attempt been made to illustrate in detail the features of an efficient transfer station, the single track 16 and the parking ramp for a single truck being here suggested merely by way of example of a single unit which might be incorporated in such a transfer station. It is to be understood that any and all modifications such as fall within the terms of the appended claims are to be regarded as within the scope of the invention.

I claim:

1. That method of transporting goods which comprises as steps placing the goods in road vehicles, each consisting of an elongate container, unprovided with wheels of its own, which is detachably mounted at its forward and rear ends respectively, upon a tractor and road dolly, each provided with rubber-tired wheels designed for highway use, hauling the vehicles, thus constituted and in each of which the container forms the vehicle body, to a railway terminal where pairs of independent bogies, each bogie having railway wheels, are standing in spaced relation on a railway track, parking each of said road vehicles alongside of the track so that one is adjacent to each respective pair of independent, relatively movable railway bogies, removing each container from its respective tractor and road dolly and detachably securing its opposite ends to the two railway bogies of a corresponding pair, respectively, thereby forming a railway car of which the container alone constitutes the body, assembling several of the railway cars, each thus consisting of a container and a pair of railway bogies, so as to constitute a train by coupling the rear bogie of one railway car to the front bogie of the next car to the rear and hauling the train thus made up, by means of a locomotive, along the railway to another railway siding, assembling road dollies each having rubber-tired highway wheels, in properly spaced relation adjacent to said last-named siding and with one dolly adjacent to the rear portion of each railway vehicle respectively, removing each container from its respective railway bogies and detachably securing its rear end to the corresponding road dolly while providing a temporary support for the forward end of said container, bringing a tractor, provided with rubber-tired highway wheels, into operative relation to the front of each container and connecting the container thereto while removing its temporary support, thus again forming a plurality of highway vehicles in each of which one such container constitutes the body, and moving the vehicles, so constituted, to the respective destinations for the goods which each vehicle contains.

2. That method of transporting goods according to claim 1, wherein each container is transferred from a parking space adjacent to the railway track by first sliding a transfer device beneath the container, lifting the

container by means of the transfer device, moving the transfer device with the elevated container supported thereon until the container is directly above the railway track, allowing the container to descend thereby to place the container on the railway bogies, and thereafter sliding the transfer device from beneath the container.

3. That method according to claim 2 wherein, while the transfer device is holding the container in elevated position, the transfer device is actuated to orient the container until its front-to-rear axis is exactly parallel to the rails of the siding.

4. That method of transporting goods according to claim 1, wherein, preparatory to transferring the container to the railway bogies, the tractor is disconnected from and pulled away from the container and the latter is temporarily supported at its forward end by other supporting means, and, while the container is so supported, a transfer device, capable of moving at right angles to the track, is slid beneath the container, lifting the container with its road dolly by means of the transfer device, orienting the elevated container to bring its longitudinal axis exactly parallel to the railway track, lowering the container with its dolly until the wheels of the latter rest on the ground, disconnecting the dolly from the container, removing the temporary support from the front end of the container, elevating the container to clear the dolly and moving the transfer device transversely of the track to position the ends of the container above the respective railway bogies standing on the track.

5. That method of transporting goods according to claim 4, wherein, while the container body with said rear dolly is in elevated position, the container is moved in the longitudinal direction thereby to position its opposite ends properly with reference to the corresponding pair of spaced railway bogies.

6. That method of transporting goods from a shipping point to a distant destination partly by highway and partly by railway, and wherein the goods to be shipped are placed in an elongate container designed to constitute the only connection between two independent and otherwise unconnected wheeled supports, and wherein the container is of such construction that it is capable of sustaining the maximum traction force to which it may be subjected when so employed, the container having a single, downwardly directed kingpin adjacent to each end, respectively, said pins being designed to enter sockets in the respective wheeled supports, characterized in that for highway travel the wheeled supports are a road dolly, having two sets of highway wheels, and a power-driven tractor also having two sets of highway wheels, respectively, and wherein, for railway travel, the wheeled supports are two railway bogies each having two pairs of flanged wheels designed to roll on railway rails, entering the kingpins of the container into the sockets of the road dolly and tractor respectively, thereby forming a highway vehicle of which the container constitutes the body, hauling the container, by means of the tractor to a point of railway interchange where a pair of railway bogies are standing on a railway track, relatively moving the bogies until their sockets are spaced apart a distance equal to the distance between the kingpins of the container, drawing up the highway vehicle alongside the railway track so that the kingpins of the container are adjacent to but spaced laterally from the respective bogies, disconnecting the tractor from the container while temporarily supporting the forward end of the latter by other supporting means, sliding a transfer device, capable of moving transversely of the railway track, beneath the container, elevating the container, together with its road dolly, by means of the transfer device, orienting the container while so elevated thereby to bring its longitudinal axis into parallel relation to the railway track, moving the container longitudinally until its kingpins are exactly opposite the sockets of the respective railway bogies, lowering the container until the wheels of its road dolly rest

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on the ground, disconnecting the dolly from the container and causing the temporary supporting means at the front of the container to become inoperative, elevating the container sufficiently to clear the road dolly, leaving the dolly in position to receive another container from the railway, moving the transfer device transversely of the railway track to position the kingpins of the container directly above the sockets of the respective railway bogies, lowering the container until its kingpins are within the sockets of the bogies, sliding the transfer device out from beneath the container, leaving the container as the sole connection between the railway bogies, thus forming a railway car of which the container constitutes the body, and moving said railway car along the railroad to a point of highway interchange convenient to its ultimate desination.

7. Method according to claim 6, wherein at the point of highway interchange a road dolly provided with highway wheels and having a socket for the reception of a kingpin, is arranged alongside the railway track, stopping the railway car comprising the container carried by the railway bogies so that the rear kingpin of the container is approximately opposite to the socket of the dolly, slacking the coupling between the railway car and the locomotive, or the next adjacent cars if several of said cars have been coupled in series, sliding a transfer device, capable of moving at right angles to the railway and also longitudinally of the railway track, beneath the container and in the space between the railway bogies, connecting the transfer device to the center of the container, moving the transfer device longitudinally of the

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railway track thereby moving the railway bogies along the track until the rear kingpin of the container is directly opposite to the socket of the dolly, elevating the container by means of the transfer device to clear the kingpins of the container from the sockets of the railway bogies, moving the transfer device with the elevated container transversely of the railway track until the kingpin of the container is above the dolly, orienting the elevated container until its kingpin is exactly aligned with the socket of the dolly, lowering the container by means of the transfer device to enter the kingpin of the container in the socket of the dolly, disposing temporary supporting means beneath the forward end of the container, sliding the transfer device from beneath the container, thereafter seating the forward kingpin in the socket of a power-driven highway tractor, making the temporary supporting means ineffective, and by means of the tractor moving the container along the highway to its ultimate destination.

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