

Aug. 16, 1938.

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2,127,480

TRANSFER SYSTEM FOR FREIGHT CONTAINERS

Filed Dec. 3, 1934

4 Sheets-Sheet 1

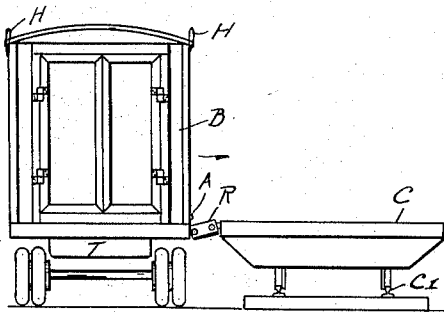


Fig. 1

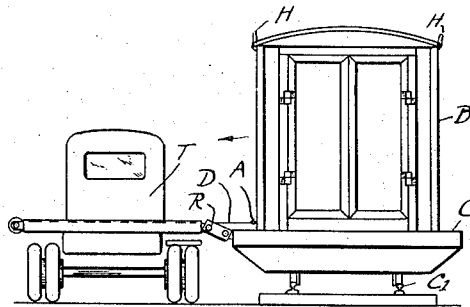


Fig. 2.

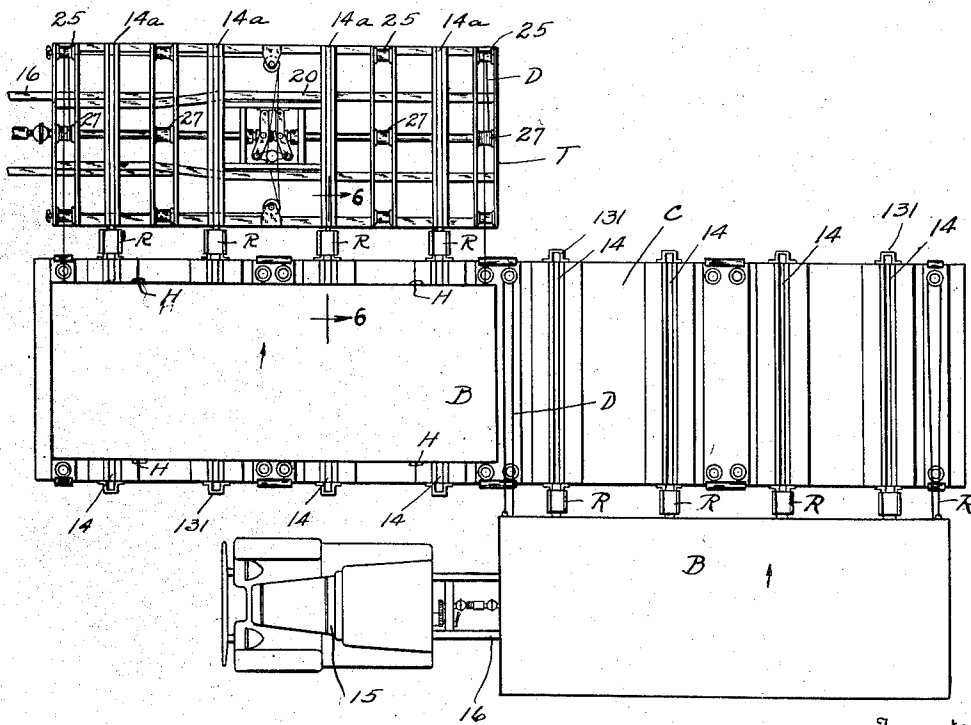


Fig. 3.

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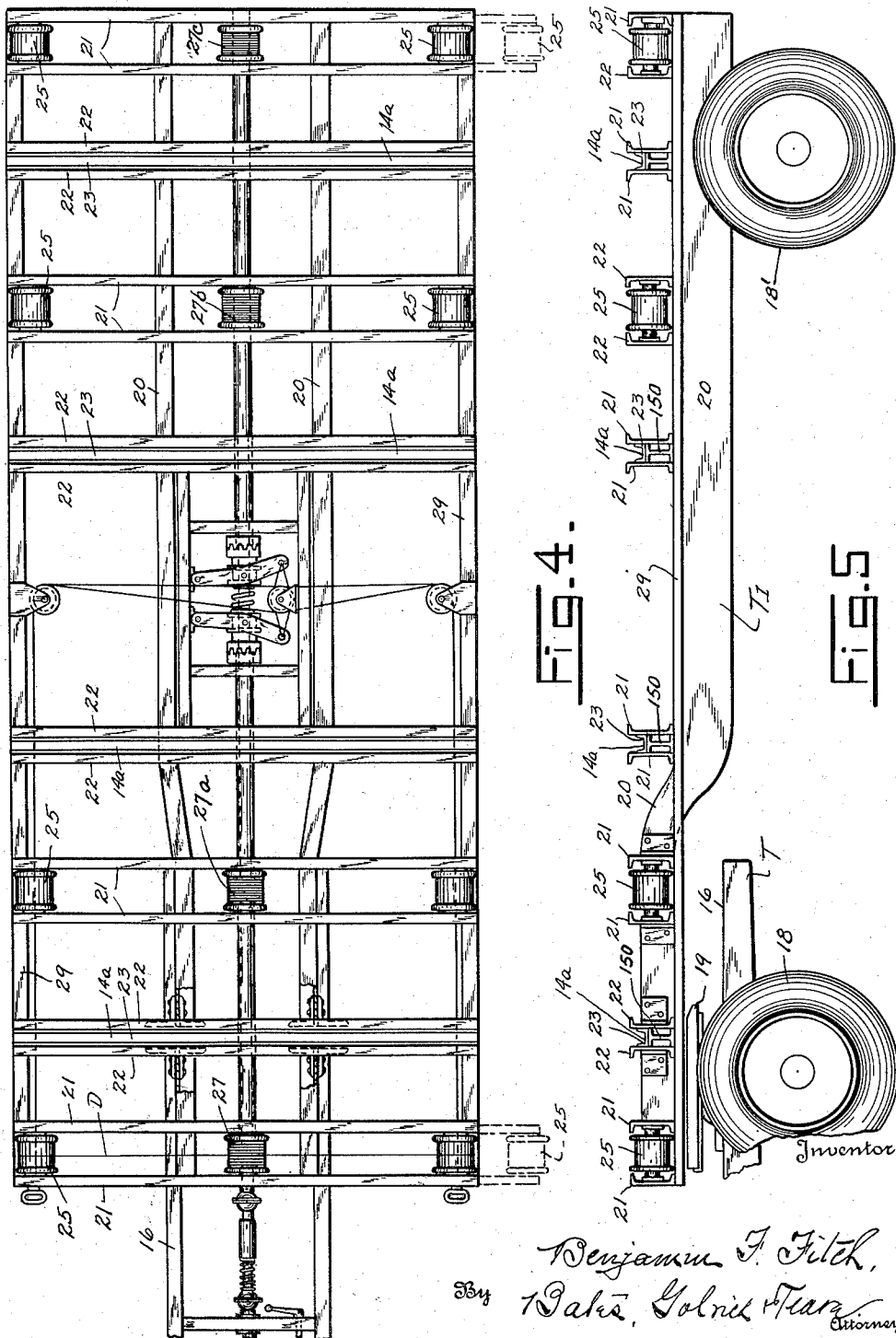
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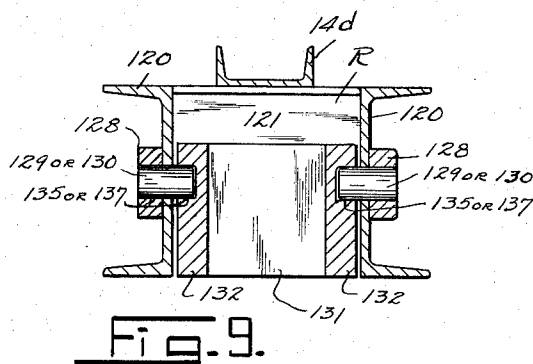


Fig. 9.

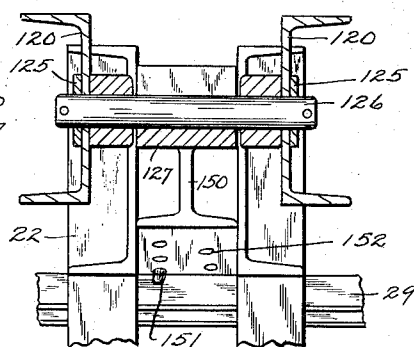


Fig. 10.

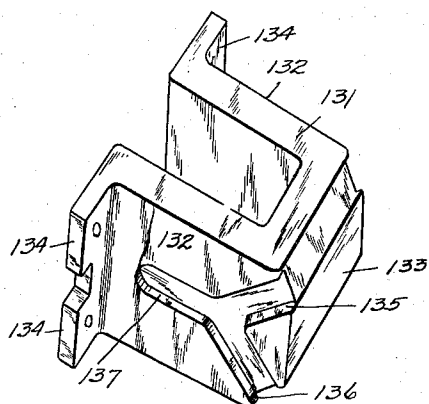


Fig. 11.

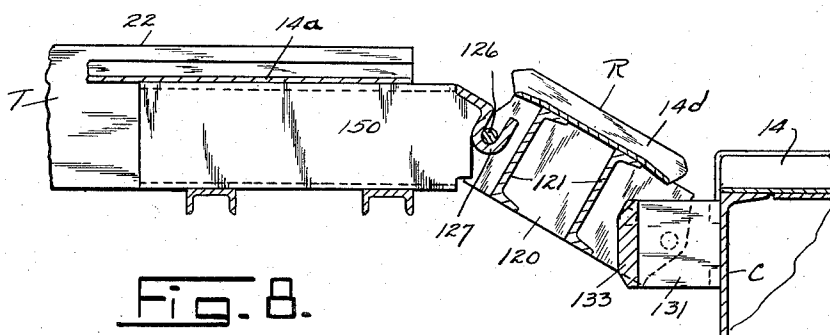


Fig. 8.

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UNITED STATES PATENT OFFICE

2,127,480

TRANSFER SYSTEM FOR FREIGHT
CONTAINERS

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Application December 3, 1934, Serial No. 755,752

7 Claims. (Cl. 214—38)

This invention relates to a transfer system for freight containers, and especially to a transfer system where freight is stored in removable containers which are then handled as a unit and transferred from an automotive truck to a rail-
way car or shipper's platform or vice versa. To permit the handling of freight in an expeditious manner and on a large scale, in such systems, I have heretofore employed, with great advantage, overhead traveling cranes for raising and transferring the containers from the truck to a platform, or from a truck to a railway car, or vice versa. However, it is sometimes desirable to supplement the crane handling of demountable containers by a transfer system which does not necessitate the expense of crane installation at each point of interchange. The present invention is designed for such handling, either as a supplement to the cranes or as a substitute therefor, whenever the conditions are such as to make the latter method preferable. I will give a few illustrations of such instances.

As the system expands, the necessity for excessive length of crane runways may become an objection, not only from the viewpoint of equipment required, but also due to the fact that in certain localities building conditions are such that overhead cranes cannot be readily installed and operated in a satisfactory manner. Likewise, as the system expands major and minor points for the interchange of containers are required. That is, at some points of interchange, namely, the major points, containers are transferred between trucks and railway cars frequently, whereas at the minor points there are only occasional transfers. For instance, at an individual shipper's platform, only an occasional container is transferred from the platform to a truck or from a platform to a railroad car. For these occasional transfers, at minor points of interchange, the cost of overhead crane equipment becomes excessive and a demand for a more economical system of interchange or transfer is created.

In such instances, namely, at minor points of interchange, the cost of the time factor for the transfer of a body to a truck is not as important as at the major points of transfer. The cost of overhead crane equipment for such occasional interchanges, is so great that it cannot be offset by the value of the time gained by the use of crane equipment. Therefore, while transfers may be economically made with the use of crane equipment at major points of interchange, it nevertheless is desirable that a different system of interchange be provided for minor points of

interchange which system may be carried out by the use of apparatus having either a nominal cost or, an apparatus readily transferred with the truck from one shipper's platform to another, as distinguished from crane mechanism which forms relatively costly stationary equipment at each point of interchange and cannot be transferred from one point to another.

The principal object of the present invention is to facilitate the handling of freight in large units by transporting mechanism as to eliminate overhead cranes where the traffic does not warrant them. In such case, I prefer to accomplish the transfer of bodies by use of a system for mechanical surface interchange of the body between flat cars and highway equipment, either truck, trailer or semi-trailer, by the use of rails secured to the underside of the demountable truck bodies, whereby a body may be slid between a truck, a flat car or a platform. In the past, many obstacles have been in the way of such a system. For instance, a deviation of the elevations of the car and automotive chassis results from reverse spring deflection consequent upon the transfer of the loaded container to or from either one or the other. It is therefore an object of the present invention to provide a mechanism whereby the transfer may be readily made despite such deviating elevation.

In many instances, it is preferable that the truck or trailer be positioned parallel to the railway car, and it is desirable that a source of power be carried by the trailer. In such instances, because of the torque requirement and the minimum weight of the empty trailer, the power application might skid the empty trailer sidewise instead of moving a loaded body from the railway car to the trailer. It is therefore an object of the present invention to provide a mechanism whereby a removable container may be skidded or slid from a railway car to a trailer, parallel therewith without danger of skidding the empty trailer.

For this purpose, I provide a system of articulated bridge members between the car and the automotive truck or trailer, which members function to maintain the two chassis in parallel alignment regardless of cable pulls and at the same time permit deviating elevation of the two chassis without lengthening or shortening the distance between the same.

It is also an object of the present invention to provide the railway car floor and the trailer with guides to coact with the container rails and guide the body between the truck and car. I prefer to

accomplish this by installing guiding channels on both the railway car and the truck or trailer to engage with the container rails, and I provide a mechanism for locking the body rail to the channels as insurance against movement of the body in the channels during its transportation on the carrier.

Other objects of the present invention will become more apparent from the following description, reference being had to the accompanying drawings, in which a preferred form of apparatus is illustrated for carrying out my improved system. The essential features and characteristics of the invention will be set forth in the claims.

In the drawings, Fig. 1 illustrates in end elevation, a truck having a removable container thereon, and a railway car likewise in end elevation to which the container is to be transferred; Fig. 2 is a view similar to Fig. 1, illustrating, however, the container in position on the railway car and the truck alongside ready to receive it; Fig. 3 is a plan view illustrating a railway car with a trailer and tractor unit at either side thereof, one of the trailers having a container positioned thereon for transfer to the car, while the car carries a container for transfer to the other truck; Fig. 4 is a plan view on an enlarged scale of a trailer; Fig. 5 is a side elevation of the trailer shown in Fig. 4; Fig. 6 is a sectional detail on an enlarged scale illustrating the bridge member for interconnecting the truck with the railway car, the plane of the section being indicated by the line 6-6 on Fig. 3; Fig. 7 is a fragmentary plan of the bridge member and associated parts illustrated in Fig. 6; Fig. 8 is a sectional detail, as indicated by the lines 8-8 on Fig. 7; Figs. 9 and 10 are sectional details, the planes of the sections being indicated by the correspondingly numbered lines on Fig. 6; Fig. 11 is a perspective view of a car stake pocket arranged to receive the interconnecting bridge members.

As heretofore mentioned, my system for transferring freight containers contemplates sliding or skidding of a removable container between a truck or trailer and a railway car. As shown in Fig. 1, I have illustrated a railway car C supported by rails C' in the usual roadbed. Adjacent to, and parallel with, the car C is a truck or trailer T, having a removable container or body B mounted thereon. The truck has previously been positioned adjacent to the railway car and bridge members or ramps R, hereinafter to be described in detail, have been interconnected between the trailer and the car. The difference in elevation between the top of the truck T and the top surface of the railway car are to be noted.

In Fig. 2, I have illustrated the body B as positioned on a flat car C and ramps R positioned between the car and a truck T. The top of the truck or trailer T is somewhat higher than the top of the surface of the flat car C due to the absence of the body or container, whereas the top surface of the car C is somewhat lower.

The body B is skidded from the flat car C across the ramp R into position on the trailer T by a suitable power mechanism carried by the truck and operatively connected with winding drums on the trailer. Cables carried by such drums are attached, as at A, to the container B, whereby the power of the truck may be utilized, as will hereinafter be described in detail, to draw the body from the car C into position on the trailer.

The body B comprises a rectangular container

having suitable side and end walls supported by the suitable base frame. Rigidly secured to the base frame extending transversely across the body are a series of inverted rails the heads of which are arranged to slide in guideways 14 of the car and similar guideways 14a on the trailer, such guiding elements serving to maintain the body in proper angular position on the carrier and providing surfaces which may be greased in the usual manner to coact with the body supporting rails to eliminate to a certain degree the friction between the bottom of the container and the carrier.

I will first describe in detail the truck and trailer as are illustrated in the drawings, and especially with reference to Figs. 1 to 5, inclusive. As there shown, the truck proper comprises the usual motor and cab unit 16, mounted on a chassis frame 18 supported by suitable dirigible forward wheels (not shown) and suitable rear driving wheels 18, Fig. 5. The truck chassis carries one member of a trailer connecting device 19, the other member of which is detachable therefrom in any well known manner, and is carried by the trailer frame.

The trailer T comprises the usual longitudinal chassis sills 20, which are connected together by suitable cross-frame members, hereinafter to be described in detail, and have, adjacent their forward end, a member for engagement with the connecting device 19, which connects the trailer with the tractor.

The transverse frame members of the trailer comprise a series of channel members 21 and 22, arranged in pairs as shown in Fig. 5. The pairs of channels 21 support a suitable winding drum, hereinafter to be described, whereas the channels 22 are spaced apart and have secured therebetween a guiding channel 23.

It will be noted that in Figs. 4 and 5 I have shown four such channel members 23. These correspond in number and position to the rails carried by the maximum sized body. However, I contemplate using bodies of different sizes.

Each body has a suitable attaching device, such as eave hooks H, for use in connection with lifting cables when the body is used at major transfer points which are equipped with overhead cranes for the transfer of the body. However, when the system of the present invention is employed, suitable cables are connected, as at A, (Fig. 2) to the body, as by means of a hook and eye or a clevis and pin. When transferring the body from a railway car to a truck, one end of each cable is attached to the side of the body adjacent the end thereof, and extends across the truck and is guided thereon by suitable guiding pulleys or drums 25 carried between the cross frame members 21 adjacent the outer edges thereof. The cables are then wound around the outside of the guiding drums 25 which lie farthest from the car C and wound inwardly to suitable winding drums 27, mounted between the transverse frame members 21 adjacent the center of the trailer.

When it is desired to draw a body from the trailer and slide it onto the car, the cables pass the winding drums 27 over the guiding drums 25 adjacent the car and then around suitable pulleys carried by the car, hereinafter to be described in detail, and have their ends connected to the retaining devices A on the side of the body nearest the car. Consequently, upon power being applied to rotate the winding drums, the body will be moved from the trailer to the car.

Due to the weight of the container, the maximum of which may be as much as twenty tons, and the difference in elevation between the trailer chassis and the railway car, it is desirable to provide a power-operated mechanism for reeving the cables on the cable winding drums 27. For this purpose I find it very convenient to utilize the truck power plant, as trucks of this type are usually provided with a power take-off mechanism adjacent the transmission.

As heretofore mentioned, due to spring deflection consequent upon the removing of a loaded container from one vehicle and depositing it upon another, it is highly desirable to maintain the two vehicles in parallelism during the transfer of the container. It is also desirable to provide an interconnecting ramp or bridge member R, which may guide the body or container from one vehicle to the other, or to a shipper's platform.

Figs. 1, 2, and 3 show the ramp members R in position for the transfer of the body. It will be noted from Fig. 3, that I provide a ramp member for each one of the guideways 14, which connects them with the guideway 14a of the trailer. These ramps are best illustrated in detail in Figs. 6 to 10 inclusive. As there shown, each ramp member comprises a pair of channels 120, which are spaced apart and secured to each other by suitable reinforcing cross members 121, which support a guiding channel 14d. The ramps are arranged for attachment at one end to the trailer and at the other end to the car in such a manner that the ramp 14d provides an extension of the guides 14, 14a, and 14d.

The arrangement is likewise such that when the body is being drawn from the car to the trailer the ramp will, consequent upon the pull of the drawing cables, act to decrease the difference in elevation between the trailer and the car, thereby reducing the power required to draw the container.

Adjacent one end of the ramp member I weld or secure to the channel members 120 a pair of bosses 125 in which is secured a pin 126 arranged to coact with a hook 127 carried by the trailer. At the other end the ramp or bridge member "R" carries bosses 128 through which extend a pair of pins 129 and 130, the ends of which project inwardly from either side of the channel members 120 which form the side walls of the ramp and are arranged to engage a suitable retaining device secured to the railway car. To prevent sidewise movement of a ramp, each hook member 127 and each car retaining device 131 is arranged to be inserted between the side channels 120 of the ramp member.

As heretofore mentioned, the ramps are so arranged that, consequent upon the contact between the load and the ramp during the skidding of a container from the railroad car to a trailer, the trailer springs are deflected, thereby lowering the level of the trailer platform and reducing the inclination of the ramp member R, thereby facilitating the movement of the loaded container.

The members 131, which are secured to the railroad car (or platform) and arranged to receive the ramp member R, are best illustrated in Figs. 9 and 11. As there noted, these members are formed to provide a combined stake pocket and ramp retaining device. As shown in Fig. 11, the retaining device 131 comprises a U-shaped member having side walls 132 joined by the end wall 133 and provided with suitable bracket portions 134 through which bolts may pass to secure the device to the railway car, thus forming be-

tween the walls thereof a stake pocket. The outer faces of the walls 132 are provided with grooves which extend from diagonal outer corners as at 135 toward the horizontal center of the block, where the two diagonal grooves join, forming a horizontal groove or channel 137. The arrangement is such that, as shown in Fig. 6, a pin 129 may rest in either the channel 135 or 136, while a pin 130 coacts with the channel 137. Therefore, consequent upon the weight of the container coacting with the guide rail 14d of the ramp, such weight is transferred to the trailer, thereby deflecting the springs of the trailer. As the trailer is thus lowered, the distance between the inner edge of the trailer and the adjacent edge of the railway car remains the same, and the ramp will be forced toward the railway car, the pin 129 moving toward the car in the diagonal slot 135. Correspondingly, if the trailer were lower than the car, the pin would coact with the slot 136 and raise the trailer.

It may be difficult in some instances to so position the trailer and the car that they are a predetermined distance apart. Therefore, I so arrange the hook 127 of the trailer which supports the ramp that it may be adjustably positioned, so that the hook itself may be set in a predetermined position relative to the side wall of the car, as shown in Figs. 6 and 8. To this end, I mount between the transverse trailer frame members 22 and the trailer guides 14a a beam 150, which is arranged to extend outwardly from the sides of the trailer. The hook 127 is secured to the outer end of the beam 150 and a suitable pin 151 is provided to pass through openings 152 in the bottom flanges of the beam and coact with the longitudinal frame member 29 to prevent inward movement of the beam, thereby permitting the pivot point 126 of the hook member and pin to be adjusted relative to the side wall of the railway car.

To prevent damage of the trailer consequent upon the lowering of the trailer body due to the cam action between the ramp and the car attaching member 131, I prefer to supply the trailer with buffers 155 which may be placed on the tires before the container is drawn from the railway car. I find that this also limits the downward movement of the trailer frame, due to the weight of the container passing thereon, when the weight concentrates over one side of the trailer.

While I have described my invention as utilizing a truck unit comprising a tractor having a detachable trailer, it is obvious that a truck in which the load carrying and motor or power units are mounted on the same chassis may readily be used. The tractor and trailer units are well adapted for large sized containers which would be difficult to transport by ordinary trucks, due to highway rules and regulations regarding vehicle sizes and load to wheel ratios.

For the vehicle mounted winding mechanism: Serial No. 32,132, now Patent No. 2,105,476, entitled "Transportable cable winding mechanism."

For the vehicle train: Serial No. 32,133, entitled "Power connecting device for vehicle train."

I claim:

1. The combination with two carriers, an intermediate ramp having a pivotal connection with one of the carriers, and a movable engagement with the other carrier including a vertically extending Y-shaped cam and means to engage it.

2. The combination with a railway car and a highway truck of an intermediate ramp pivotally connected to one of them, said ramp having pins

occupying Y-shaped slots in one of the carriers and brackets secured to the other carrier.

3. The combination of a railway car having a stake pocket, said pocket comprising a U-shaped bracket, the internal walls of which are arranged to embrace a car stake, the external walls of which are provided with means to engage a ramp.

4. The combination of a railway car having a depression in its floor surface and extending transversely of the car, rollers mounted in said depression adjacent the ends of the car and extending longitudinally of the car, a sheave mounted in the depression adjacent said rollers, whereby a cable may pass over one of said rollers and around the sheave at the opposite side of the car to draw an object onto the car, such depression permitting the object to be drawn onto the car across said cables and at the same time permitting the removal of the cables.

5. The combination with a railway car and a highway truck having load supporting springs, of an intermediate ramp pivotally connected with the railway car and truck, one of said pivotal

connections being slidably secured to the vehicle carrying it in a manner permitting the car and truck to be positioned apart, for load transference, a distance corresponding substantially to the length of the ramp and also a materially greater distance, and aligned guides on the car, truck and ramp.

6. The combination of two carriers each adapted to support a load, one of the carriers having springs to support the load, an intermediate ramp pivotally connected to both of the carriers, and a structural load-carrying beam slidable in a recess on one of the carriers and supporting one of the pivots, whereby the position of such pivot may be adjusted with reference to its carrier.

7. The combination of a railway car having a bracket which is adapted to serve as a stake pocket, the internal walls of which pocket are arranged to embrace a car stake, the external walls being provided with means adapted and arranged to engage a ramp.

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