Sept. 5, 1939. F. GRUNDLER 2,172,244

HIGHWAY AND RAILWAY TRANSPORTATION

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FIG. 1.

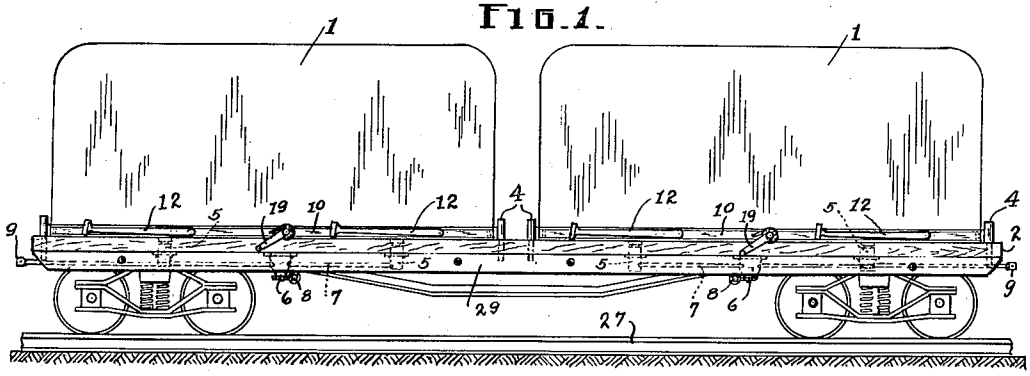


FIG. 3.

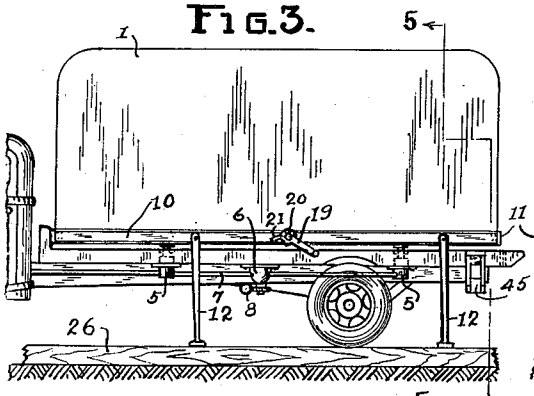


FIG. 2.

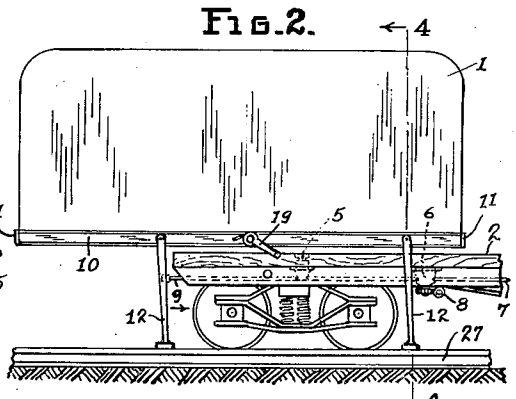


FIG. 3a.

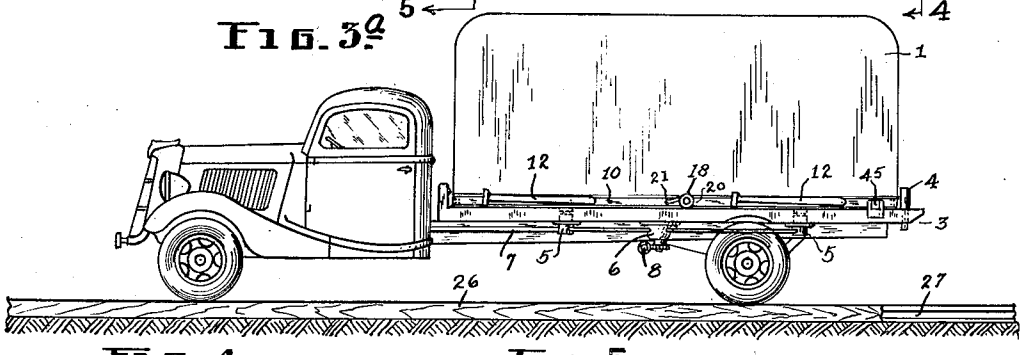


FIG. 4.

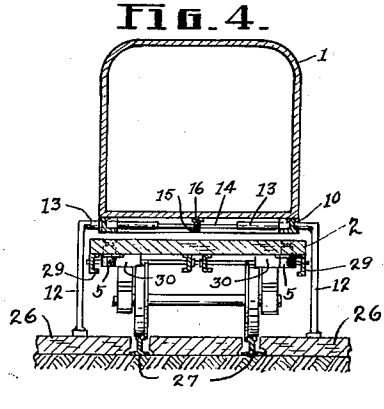
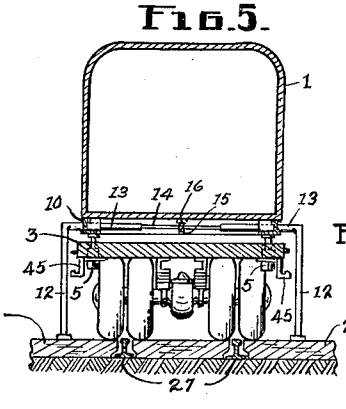


FIG. 5.



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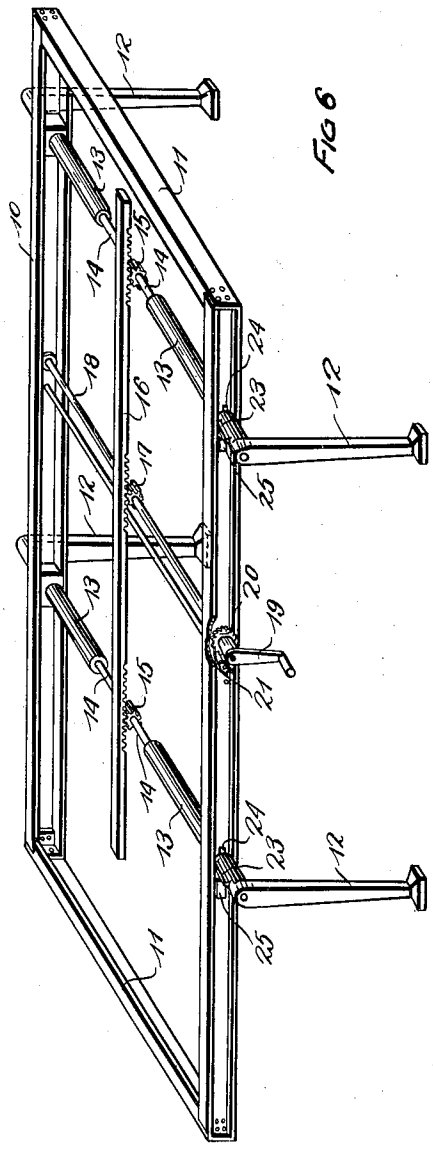

FIG 6

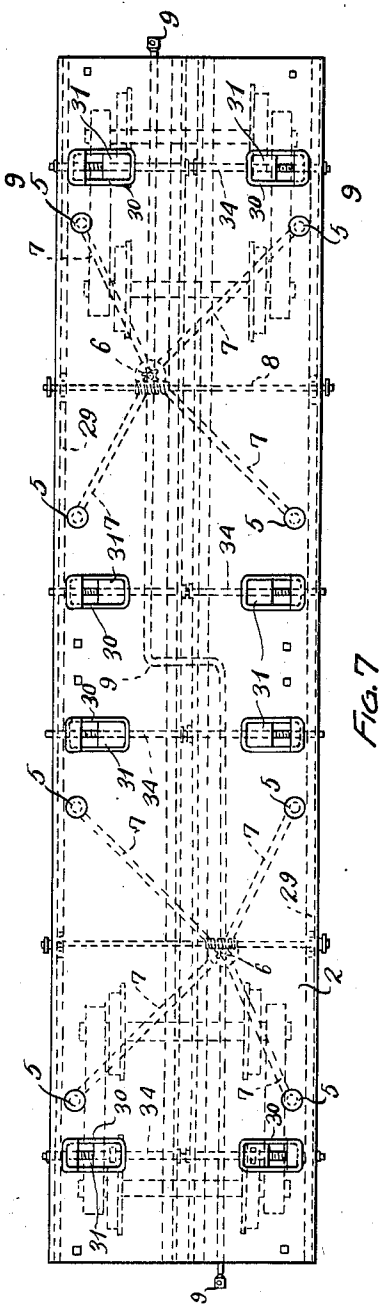

FIG. 7

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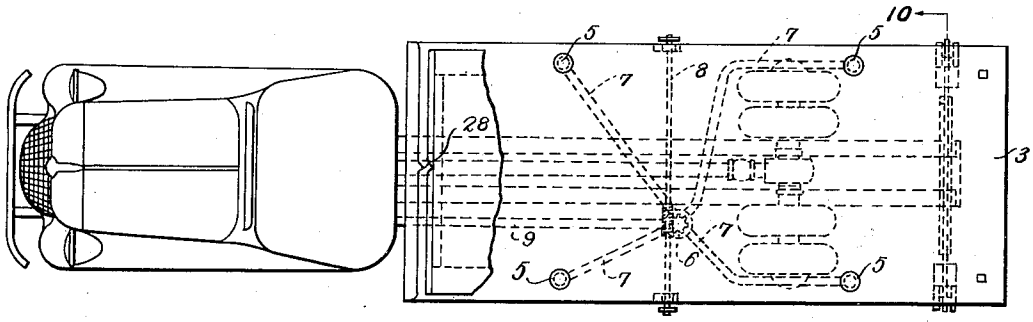


FIG. 8

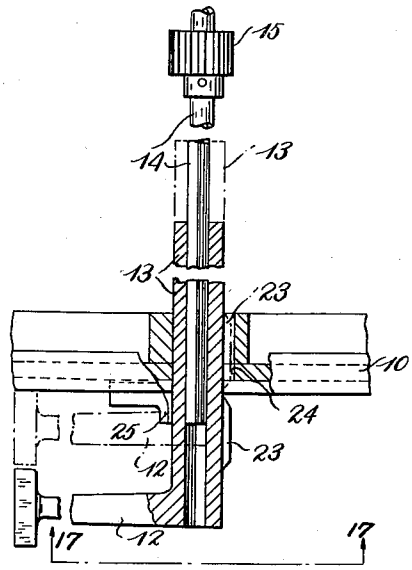


FIG. 16

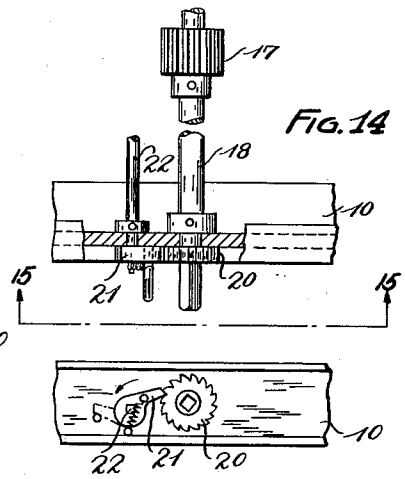


FIG. 14




FIG. 15

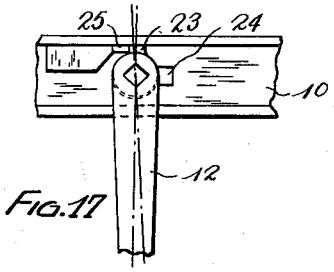


FIG. 17

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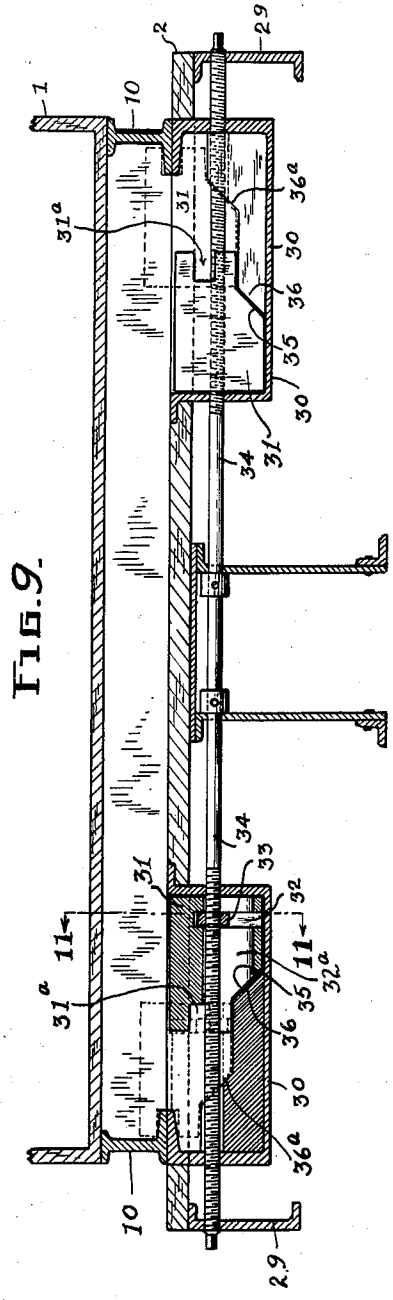

Fig. 9.

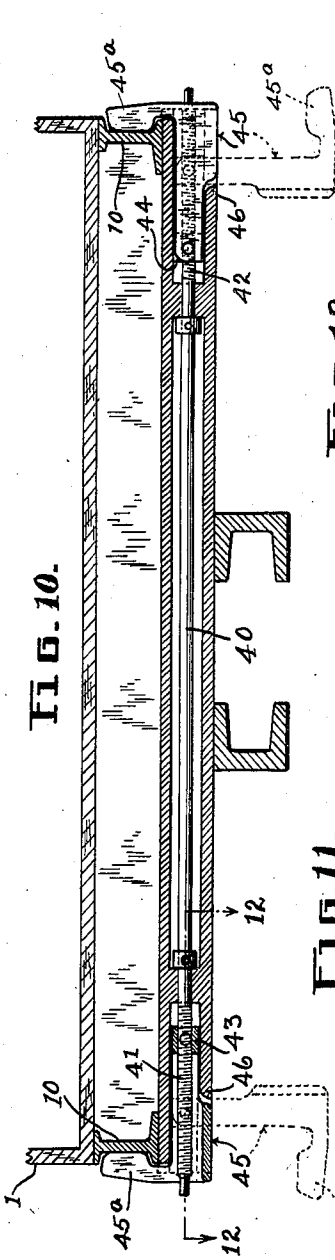

Fig. 10.

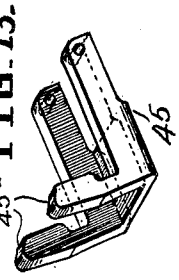

Fig. 13.

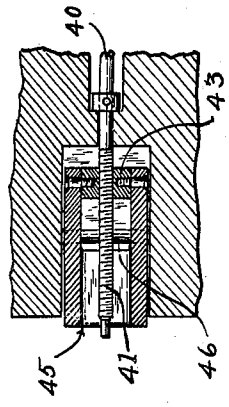

Fig. 12.

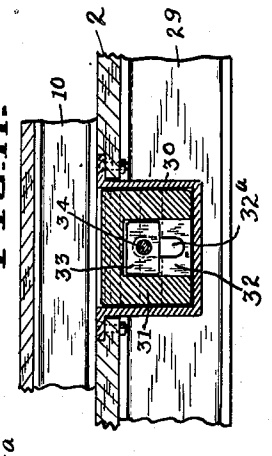

Fig. 11.

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Patented Sept. 5, 1939 2,172,244

# UNITED STATES PATENT OFFICE

2,172,244

## HIGHWAY AND RAILWAY TRANSPORTATION

Frederick Grundler, Elyria, Ohio

Application June 1, 1936, Serial No. 82,985

5 Claims. (Cl. 254—45)

This invention relates to the art of transportation and more particularly the co-ordination of highway truck and railway train transportation of freight.

With the ever-increasing transportation by truck and the steady expansion of the railway companies into the use of trucks for shipping within certain zones, and in view also of certain regulatory considerations which enter into the matter of collection and deliver of freight shipments, it seems highly desirable that there be effected a greater co-ordination between railway and highway transportation not only as a means of solving the problem of competition between these two systems but also as a means of better serving the public.

Although there have already been various improvements in the handling of freight with particular reference to the loading and unloading of the same onto and off of trucks and likewise in connection with freight railway cars, and although there has been an attempt to facilitate the transferring of freight from a flat car onto a truck dolly and vice versa, yet in the present invention I have eliminated the necessity of transfer platforms, derricks or the like which have been used in prior systems, and I have devised improved means for effecting the transfer of freight from a flat car to a truck dolly or trailer or vice versa with a greater degree of efficiency from the standpoint of reduced cost of equipment, greater convenience of operation of the transfer means with which the railway cars and trucks are equipped for a co-ordinated system, and uninterrupted service of the flat car and truck dolly during the interim.

With these considerations in mind, the present invention consists in devising separable container bodies that can be placed upon either the standard railway flat car or the standard truck dolly, together with hoisting means incorporated as a permanent part of the frames of the flat car and truck dolly for elevating and lowering the container bodies, and adjustable legs incorporated as a permanent part of the containers as a means of supporting the same independently of either the flat car frame or the truck dolly during the interim between the unloading from the one vehicle and the loading upon another vehicle, or during the period of loading or unloading of the freight into or out of the container body.

Accordingly, one object of the present invention is to devise an improved hoisting means which is incorporated as a permanent part of the frame of the flat car and that of the truck, in combination with an improved system of adjustable legs incorporated as a permanent part of the individual container bodies.

A more specific object is to provide fluid hoisting means upon the frames of the flat cars and truck dollies, whereby the hoisting means may be effectively operated and controlled as a unit for a given container; and also to provide each container body with a unified mechanism for manipulating a system of legs so that they can all be raised or lowered as a unit.

Another object consists in providing an improved means for locking the container bodies upon either the flat car or the truck dolly, while the locking means may occupy position below the top level of the flat car or truck dolly when in idle position and may be conveniently and efficiently projected into effective locking engagement with the companion means provided upon the container bodies.

Other objects will appear from the following description and claims when considered together with the accompanying drawings.

Fig. 1 is an elevation of a railway flat car embodying my present invention;

Fig. 2 illustrates the manner in which a container body can be removed from a railway flat car;

Fig. 3 illustrates the manner in which the same container body can be loaded onto a truck dolly;

Fig. 3ª illustrates the same container body in fully loaded position upon a truck dolly;

Fig. 4 is a view taken upon line 4—4 of Fig. 2;

Fig. 5 is a view taken on line 5—5 of Fig. 3;

Fig. 6 is a perspective view of the leg-operating mechanism provided upon the bottom of each container body;

Fig. 6 is a perspective view of the leg-operating mechanism provided upon the bottom of each container body;

Fig. 7 is a top plan view of a railway flat car;

Fig. 8 is a plan view of a truck with most of the container broken away so as to show the top of the truck dolly;

Fig. 9 is a view taken on line 9—9 of Fig. 7;

Fig. 10 is a view taken on line 10—10 of Fig. 8;

Fig 11 is a view taken on line 11—11 of Fig. 9;

Fig. 12 is a view taken on line 12—12 of Fig. 10;

Fig. 13 is a perspective view of the pivoted locking member forming part of the locking mechanism for the truck;

Fig. 14 is a plan view, partly broken away, illustrating the means for locking the leg-operating mechanism in adjusted position;

Fig. 15 is an end elevation of the same and corresponds to line 15—15 of Fig. 14;

Fig. 16 is a plan view partly, browen away, illustrating the means for permitting lateral adjustment of the legs of the container body; and

Fig. 17 is a view corresponding to line 17—17 of Fig. 16 and illustrates the means for limiting the pivotal movement of each leg towards lowered position.

In the illustration shown in the accompanying drawings, I have indicated a container body 1 of such form and dimensions that two of them can be placed end to end upon the standard size of railway flat car 2 while one of them can be placed upon the dolly 3 of the usual size of truck. These container bodies will, of course, be provided with suitable doors for loading and unloading the contents thereof, although these doors form no part of the present invention and are not here shown. The floor of the flat car and truck dolly are each provided with openings to receive removable stakes 4 to brace the bodies in position. Other locking means is also provided upon both the flat car and the truck, as will be later explained.

Briefly, my invention contemplates elevating the container body sufficiently above the frame of the flat car or truck, then lowering the legs of the body, releasing the hoisting means so as to permit the body to rest entirely upon its legs, and then withdrawing the flat car or truck dolly from beneath the container body or bodies. The container body can then be unloaded or it can be loaded onto another vehicle, either truck dolly or flat car, by reversing the order of operations just outlined. The following detailed description will explain more fully the several features of structure involved and the manner of operation and the advantages resulting therefrom.

In the present instance, I have indicated air jacks 5 which are incorporated as a permanent part of the frame of the railway car or truck dolly. In each case, the jacks are of usual plunger type so constructed and arranged that the plungers will be below the top surface of the floor of the car or truck frame when in idle position. These jacks may be arranged at suitable positions about the frame, in each instance; for example, there may be four jacks for each container body, as indicated in Figs. 7 and 8 of the drawings. The jacks for each container body are controlled from the same valve 6 through the communicating pipes 7 and by means of the valve-operating rod 8 which is accessible for manipulation from either side of the frame of the car or truck, as also indicated in Figs. 7 and 8. The valves 6 are connected to the air pipe 9 which may be connected to the source of compressed air with which railway cars and trucks are usually equipped for operation of the brakes.

Each container body has depending from the bottom thereof, at least along the two sides thereof, the I-beams 10 which serve a dual purpose, as will be explained. The bottom of the bodies at their two ends may have channel members 11 or other form of members depending therefrom; these members which depend from the bottom of the container body, in each case, constitute virtually a rectangular frame, as indicated in Fig. 6, wherein is illustrated in detail the means for manipulating the legs 12. Each leg 12 has a hollow axle member 13 which has suitable bearing support in the I-beam 10 and which has its interior of angular form for slidable adjustment with respect to the correspondingly formed shaft 14. Upon the shaft 14 there is carried a pinion 15 for operative engagement by the rack 16 which has suitable mounting for slidable movement back and forth. The middle part of the rack member 16 has operative engagement with the pinion on the transverse operating rod 18 which in turn is mounted in the I-beams 10 and has a crank connection at each end so that it can be manipulated from either side of the flat car or truck by application of a crank 19. One end of rod 18 is provided with a ratchet 20 upon the outside of the I-beam for engagement by the pawl 21 for releasable locking engagement therewith. The pawl is mounted upon the outside of the I-beam and upon the end of the transverse rod 22, so that the pawl can be manipulated from either side of the car or truck. This locking means will prevent accidental reverse movement of the legs after they have once been moved to the position desired.

As indicated in Fig. 16, the legs 12 are adjustable laterally in order to accommodate the different widths of frames upon the railway flat car and the truck. At the present time, the frame or floor of the standard flat car is about two feet wider than the floor of the usual truck dolly. However, if this difference should be eliminated by making the floor width the same in the two cases, as the railway and truck transportation becomes more highly developed as a co-ordinated system, this adjustment will not be necessary. In fact, there is not indicated any difference in the floor width in the present illustration. However, in the present showing I have provided a fin 23 on the hollow axle or hub 13, this fin being adapted for engagement in the correspondingly shaped slot 24 in the bearing of the hub 13, as indicated in Figs. 16 and 17. With this arrangement, it becomes necessary to withdraw the fin 23 from its slot prior to lowering the legs, this being intended as a further cautionary measure to prevent accidental lowering of the legs. Also, the fin 23, by its engagement with the stop 25 on the I-beam, will serve as a means of limiting the extent of movement of the legs. It will be observed that when the legs have been moved fully to their lowered position and the body settled down thereupon, they occupy position past dead center so as to ensure against the danger of the body being toppled over.

As indicated in Figs. 4 and 5 of the drawings, at the points of transfer of container bodies from a flat car onto a truck or vice versa, there is provided a floor 26 that is substantially flush with the top of the rails of the railway 27, in order that the bodies can be unloaded in the manner explained and either a flat car or truck dolly can be properly positioned for transferring the same thereto, in accordance with the system above explained.

As above stated, my invention contemplates also a further means for locking the container body upon the flat car, (Fig. 9), and upon the truck dolly, (Fig. 10), as will now be more fully explained.

In the case of the flat car, I have provided this locking means both forwardly and rearwardly upon each side of each container body, as indicated in Fig. 7, whereas in the case of the truck, I have provided a locking means therefor only at the rear, as indicated in Fig. 8. However, in the case of the truck, I have provided a spear-head inter-engagement 28 between the front end

of the lower depending part of the body and the front upright end board or plate of the frame. In the case of both the flat car and the truck, the locking means, (Figs. 9 and 10), serve to prevent both lateral and vertical displacement of the body with respect to the frame, and also rearward displacement.

Extending along the under-side of the flat car frame or floor, are the channel beams 29 at the two sides thereof, which may be recognized as part of the regular understructure of a standard flat car. Suspended from beneath the floor of the car and at each side thereof, I have provided a lock box 30 within which is housed the locking member 31 having a vertical recess 32 for cooperation with nut 33 on screw 34. The screw 34 extends transversely beneath the bottom of the flat car and has its opposite end portions reversely threaded for operation of the duplicate locking members which are operated outwardly or inwardly together for either locking or unlocking the container body with respect to the car frame. Turning of the screw 34 will cause the non-rotatable nuts 33 to move either outwardly or inwardly and by virtue of the engagement of the nut with the slot of each locking member, the locking members may be permitted to move vertically as well as outwardly as its cam lower surface portion 35 engages the correspondingly formed cam portion 36 fixed in the lock box 30. Such outward and upward movement of the locking members brings them into engagement with the base of the I-beam 10 and the upper inwardly extending flange at the top of the lock box, the lock member being formed with a mouth 31a for this purpose. When the lock, in each case, has been moved to fully locked position, its cam surface will engage against the correspondingly formed surface 36a provided upon the fixed member in the lock box. Vertical longitudinal slot 32a permits such movement of member 31.

As will be seen, the screw 34 is mounted in the under frame of the flat car and can be manipulated by attachment of a suitable crank at either end thereof, that is, from either side of the car. It will be observed also that the lock, when in fully retracted position, is entirely below the level of the floor of the car frame and is thus out of the way.

Extending across the under-side of the truck frame and suitably mounted thereupon, is the rod 40 which has its two end portions reversely threaded at 41 and 42 for operation of the nuts 43 and 44 thereupon. Upon the sides of each nut there is pivotally mounted a locking member 45 which is of generally angular or L-shape and has an open form in order to accommodate the operation of the rod 40. The divided locking fingers 45a are adapted to be turned upwardly into locking engagement with the outwardly extending portion of the bottom flange of the I-beam 10 so as to prevent accidental dislodgement of the body. The rod 40 may have a crank attached to either end thereof for operation from either side of the truck. Upon turning rod 40 in one direction, the nuts will be moved inwardly and the lock member 45 will engage the lower edge 46 in such manner as to cause upward swinging or turning movement of the lock member which then assumes position indicated in full lines, Fig. 10. Continued lateral movement of the rod will cause the fingers 45a to a effectively engage the I-beam 10. Upon operation of the rod 40 in the reverse direction, the nuts 43 and 44 will be moved outwardly and the lock member 45 will be released to the point where the nuts move out beyond the edges 46, whereupon the locking members will swing down by gravity so as to occupy the position indicated in dotted lines, Fig. 10. It will be observed that when the locking member 45 is in dotted line position, it is entirely below the level of the floor of the truck dolly and hence out of the way, so as not to interfere with the loading of a container body onto the truck dolly in the manner above explained. It will be noted also that when the locking members 45 are in locking position, they are substantially flush with the sides of the container body.

By employing I-beams 10 along the underside of the container bodies, they can serve as part of the locking means for securing the bodies upon either the flat car or truck dolly, the locking engagement in the one case being upon the inside and in the other case being upon the outside of the I-beam 10.

Instead of air means for operating the jacks, it is to be understood that hydraulic means may be employed for this purpose. In fact, still further modifications might be made in the particular form of mechanism employed, and also the number and size of container bodies might be varied; and it is to be understood that the present form of disclosure is merely for purposes of illustration and that all modifications or variations that come within the spirit of this invention as herein set forth are intended to be comprehended by the combination as herein disclosed and as hereinafter claimed.

To recapitulate briefly, the empty container bodies can first be deposited by either the railway flat car or by the truck, in the manner explained, then loaded while standing upon their own legs, and then these loaded container bodies can be picked up by either a flat car or a truck dolly, in the manner explained, and transported to their destination to be there deposited upon their legs and later unloaded, or transported to a transfer point where they may be supported upon their own legs and left there to be later picked up by either a flat car or a truck dolly, and so on. Thus the same bodies can be loaded onto and unloaded from either flat car or truck indiscriminately and with the same convenience in both cases and without in the mean time tying up either the frame and running gear of either the flat car or truck. In this way, the frame and running gear of the flat car or truck is always released for other work without waiting for the emptying of the container body or for the transfer of the same onto another flat car or truck dolly, as the case may be.

Furthermore, with my special equipment, the jacks are a permanent part of the frame of the flat car or truck, and the adjustable legs are a permanent part of the container bodies. I have simplified and unified the means for operating both the jacks and the legs and I have provided also a highly efficient means for locking the bodies onto the car frame or the truck dolly, without any of the locking mechanism protruding above the flat surface of either the flat car or truck.

The elimination of special loading and unloading platforms and derricks, the release of the crew and the operating equipment for uninterrupted service during the interim, and the simplification and standardization of the frame and body constructions, mean a substantial saving in

cost as well as an increased efficiency and convenience in operation.

With these and other advantages which will readily suggest themselves to those familiar with the art, it is believed that this invention means a considerable advance in the co-ordination of railway and highway transportation, with resulting increase in service and efficiency and decrease in cost to the ultimate consumer.

What I claim is:

1. In combination, a vehicle frame and running gear, a separable body adapted to be supported upon said frame, hoist means incorporated as a permanent part of said frame for raising and lowering said body, legs permanently and adjustably attached to said body for supporting the same independently of the frame, means incorporated as a permanent part of said frame for controlling said hoist means, and means incorporated as a permanent part of the body for manipulating all of the legs as a unit.

2. In combination, a vehicle frame and running gear, a separable body adapted to be supported upon said frame, hoist means incorporated as a permanent part of said frame for raising and lowering said body, legs permanently and adjustably attached to said body for supporting the same independently of the frame, means incorporated as a permanent part of said frame for controlling the hoist means, and means incorporated as a permanent part of the body for manipulating all of the legs as a unit, said hoist means being substantially flush with the top of the frame when in lowered position, and said legs being substantially flush with the bottom of said when in collapsed position.

3. In combination, a vehicle frame and running gear, a separable body adapted to be supported upon said frame, hoist means incorporated as a permanent part of said frame for raising and lowering the body, legs permanently and adjustably attached to said body for supporting the same independently of the frame, means incorporated as a permanent part of said frame for controlling the hoist means, said legs being adjustable inwardly and outwardly, and means incorporated as a permanent part of the body for manipulating all of the legs as a unit into and out of body-supporting position.

4. In combination, a vehicle frame and running gear, a separable body adapted to be supported upon said frame, hoist means incorporated as a permanent part of said frame for raising and lowering the body, said body having an under-frame of I-beams, legs permanently and adjustably attached to said I-beams for supporting the same independently of the vehicle frame, means incorporated as a permanent part of the vehicle frame for operating said hoist means, means incorporated as a permanent part of the body for manipulating the legs, and means for effecting locking engagement between the I-beams of said under-frame and the vehicle frame.

5. In combination, a vehicle frame and running gear, a separable body adapted to be supported upon said frame, hoist means incorporated as a permanent part of said frame for raising and lowering the body, said body having an under-frame of I-beams, legs permanently and adjustably attached to said I-beams for supporting the same independently of the vehicle frame, means incorporated as a permanent part of the vehicle frame for operating the hoist means, means incorporated as a permanent part of the body for manipulating the legs, and means carried by said vehicle frame for locking engagement with the I-beams of said under-frame so as to lock the body in place.

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