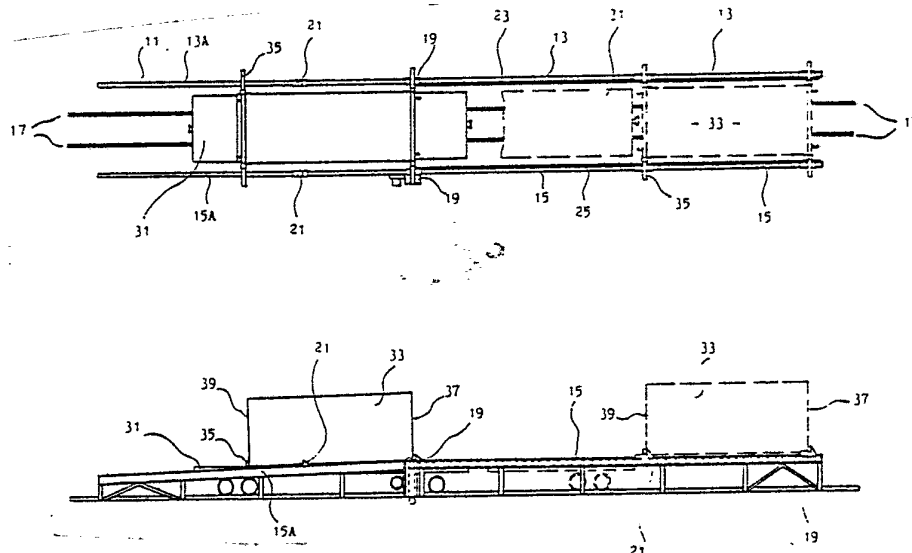




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(54) Title: METHOD OF REMOVING A CONTAINER FROM A RAIL TRUCK



(57) Abstract

A method of removing a container from a rail truck (31) comprising erecting a ramped container supporting means (11) including two elevated spaced apart rail members (13, 15) each with a ramp surface (13A, 15A) at one end, said ramp rail members having a gauge greater than the gauge of track (17) supporting said rail truck, providing a first skate member (19) on each one end of said ramp surfaces, providing an endless chain (23, 25) to each ramped container supporting means, drive means being provided to one of said endless chains, said skate member being linked to said endless chain and adapted to travel along the rail member on operation of the chain drive, positioning said rail truck (31) and container between the one ends of said ramp surfaces, securing a container companion plate (35) to the leading and trailing ends of the container, activating said chain drive means to move said first skate member (19) towards the leading container companion plate, continual forward movement of the skate member engages said leading container companion plate and with the incline of the ramp surface lifts the leading end of the container clear of the rail truck, a second skate member (21) linked to said endless chain and trailing said first skate member (19) engages the trailing container companion plate, continual forward movement of the chain drive means results in the container being lifted clear of the rail truck and being supported by said ramped container supporting means.

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TITLE: "Method of Removing a Container from a Rail Truck"

THIS INVENTION relates to a method of removing a container from a rail truck.

In the past a large number of containers have been able to be transported from one country to another by sea, provided of course that the country despatching the containers and the country to receive the containers are suitably equipped with container lifting equipment. Once in a specific country the containers are loaded onto rail trucks of the flat car form or onto road transport vehicles for transportation to their final destination for unloading. At the unloading station it is necessary to have lifting equipment which is capable of removing the containers from the transport vehicles or rail trucks. If such lifting facilities are not available the road vehicle or rail truck must be left at the unloading station until such time as the container has been emptied. This delay is extremely costly and one of the objects of this invention is to provide a method of off-loading containers so that the transport vehicle or rail truck can be used more efficiently.

In our Australian Patent No. 499974 and various overseas patents, we described a system of loading a front and rear supported elevated container onto the tray or chassis of a vehicle including inclining said chassis downwardly towards the rear, providing a skate member on its upper surface, said skate member being adapted to travel along the chassis or on longitudinal tracks provided on the tray of the vehicle, reversing said vehicle under the elevated container until a container companion plate mounted to the leading underside of the container engages with the skate member, the continual reversal and incline of the



vehicle tray lifts the container clear of the front supports, the skate member and leading companion plate travel along the longitudinal tracks provided and positively engage with locking means at the forward end of the tray, providing hydraulic jacks at the rear portion of the tray, lifting a second container companion plate attached to the trailing underside of the container free of the rear supports and lowering it into a lock position on the rear of the vehicle tray.

By utilising the skate member and container companion plate described in our Australian Patent No. 499974 we have found that it is also possible to lift containers from rail trucks without needing heavy, expensive overhead lifting gear.

In one form the invention resides in a method of removing a container from a rail truck comprising erecting a ramped container supporting means including two spaced apart rail members each with a ramp surface at one end, said ramp rail members having a gauge greater than the gauge of track supporting said rail truck, providing a skate member on each one end of said ramp surface, said skate member being adapted to travel along the rail member, moving said rail truck towards said ramp surface until a container companion plate mounted to the leading underside of the container engages with the skate member, the continual forward movement of the rail truck and the incline of the ramp surface lifting the leading end of the container clear of the rail truck with the skate member and leading companion plate travelling along the spaced apart rail members, placing a further set of skate members on said one end of each said ramp surface so that they can receive and support a further container companion plate mounted to the trailing underside of the container, continual forward movement of the rail truck resulting in the container be-



ing lifted clear of the rail truck and being supported by said ramped container supporting means.

A variation can be achieved by repositioning the container companion plate and making alterations to the ramped container supporting means.

In another form the invention resides in a method of removing a container from a rail truck comprising erecting a ramped container supporting means including two elevated spaced apart rail members each with a ramp surface at one end, said ramp rail members having a gauge greater than the gauge of track supporting said rail truck, providing a first skate member on each one end of said ramp surfaces, providing an endless chain drive means to each ramped container supporting means, drive means being provided to one of said endless claims, said skate member being linked to said endless chain drive and adapted to travel along the rail member on operation of the chain drive, positioning said rail truck and container between the one ends of said ramp surfaces, securing a container companion plate to the leading and trailing ends of the container, activating said chain drive means to move said first skate member towards the leading container companion plate, continual forward movement of the skate member engages said leading container companion plate and with the incline of the ramp surface lifts the leading end of the container clear of the rail truck, a second skate member linked to said endless chain and trailing said first skate member engages the trailing container companion plate, continual forward movement of the chain drive means results in the container being lifted clear of the rail truck and being supported by said ramped container supporting means.

The invention will be better understood by reference to the following description of the second embodiment as shown in the accompanying drawings wherein:-



Fig. 1 is a plan view of the invention;
Fig. 2 is a sectional side elevation of the invention; and
Fig. 3 is a part sectional side elevation of the skate member linked to the chain drive.

In this embodiment, a ramped container supporting means 11 is constructed comprising two elevated spaced apart rail member 13, 15 each with a ramp surface 13A, 15A at one end. The gauge or width between the rail members 13 and 15 being greater than the gauge of a conventional railway track 17. A first skate member 19 and a second skate member 21 are provided on each of the rail members 13 and 15. An endless chain drive 23 and 25 is provided adjacent to the respective rail members 13 and 15. The skate members being fitted with a downwardly projecting block 27 which forms a link in the chain drive so that movement of the chain drive causes each skate member to make a corresponding movement. Suitable, chain drive, sprockets and coupling means (not shown) are provided to link the chain drives 23 and 25 to the one power source and to ensure that they move in unison.

In operation a railway truck 31 which is carrying a container 33 is shunted up the railway until it is between the ramped ends 13A and 15A of the ramped container supporting means 11. The railway truck or wagon 31 being provided with twist locks (not shown) to securely hold the container on the wagon during transport. These particular twist locks are released and a container companion plate 35 is placed transversly across the front 37 and rear 39 of the container and locked into the leading and trailing twist lock pockets provided on the container. A sleeve member is slid over each end of the container companion plate 35 and locked into the side twist lock pockets and



clamped to the companion plate. The free ends of the container companion plates 35 extending over the width of the ramped supporting means as shown in Figure 1 of the drawings. The skate members 19 and 21 are positioned as shown in Figure 3 of the drawings so that the recess 41 can accommodate the companion plate 35 and be retained in such a position by post member 43.

Operation of the chain drive causes the leading skate member to move forward until it makes contact with the leading companion plate 35. The post member 43 pushes against the container companion plate 35 and slowly pushes the container and railway truck 31 forward to the correct position. Further forward movement causes the companion plate 35 to nestle into recess 41 on the respective skate member. Continual movement of the skate member up the ramp lifts the leading end of the container clear of the railway truck. The second skate member 21 is also linked to the chain drive and by the same operation lifts the trailing or rear end of the container. As the skate members move up the ramp the container is elevated clear of the rail wagon and in this form may be conveyed to any desired position. A road transport truck may be positioned between the ramped framework and by reversing the direction of the chain drive the container may be transferred to the tray of the truck. Twist locks can be provided on the road truck to secure the container for transport.

With this particular invention all rail sidings can be equipped with container handling equipment to enable containers to be transferred from rail to road vehicle or vice versa. It is envisaged that a container handling system of this form will cost approximately (Australian) \$40,000 whilst currently available systems are Fork Lifts (Australian) \$200,000 - \$250,000 (and need hard standing



for working) and Overhead Gantry systems of approximately one million dollars.

Whilst the invention has been described with reference to one specific embodiment it is not limited thereto and may be varied somewhat without departing from the scope of the invention.



THE CLAIMS defining the invention are as follows:-

1. A method of removing a container from a rail truck comprising erecting a ramped container supporting means including two spaced apart rail members each with a ramp surface at one end, said ramp rail members having a gauge greater than the gauge of track supporting said rail truck, providing a skate member on each one end of said ramp surface, said skate member being adapted to travel along the rail member, moving said rail truck towards said ramp surface until a container companion plate mounted to the leading underside of the container engages with the skate member, the continual forward movement of the rail truck and the incline of the ramp surface lifting the leading end of the container clear of the rail truck with the skate member and leading companion plate travelling along the spaced apart rail members, placing a further set of skate members on said one end of each said ramp surface so that they can receive and support a further container companion plate mounted to the trailing underside of the container, continual forward movement of the rail truck resulting in the container being lifted clear of the rail truck and being supported by said ramped container support means.

2. A method of removing a container from a rail truck comprising erecting a ramped container supporting means including two elevated spaced apart rail members each with a ramp surface at one end, said ramp rail members having a gauge greater than the gauge of track supporting said rail truck, providing a first skate member on each one end of said ramp surfaces, providing an endless chain to each ramped container supporting means, drive means being provided to one of said endless chains, said skate member being linked to said endless chain and adapted to travel along the rail member on operation



of the chain drive means, positioning said rail truck and container between the one ends of said ramp surfaces, securing a container companion plate to the leading and trailing ends of the container, activating said chain drive means to move said first skate member towards the leading container companion plate, continual forward movement of the skate member engages said leading container companion plate and with the incline of the ramp surface lifts the leading end of the container clear of the rail truck, a second skate member linked to said endless chain and trailing said first skate member engages the trailing container companion plate, continual forward movement of the chain drive means results in the container being lifted clear of the rail truck and being supported by said ramped container supporting means.

3. A method of removing a container from a rail truck as claimed in claim 2 wherein said skate members are fitted with a downwardly projecting block which forms a link in the endless chain.

4. A method of removing a container from a rail truck as claimed in claim 3 wherein an electric motor is provided to drive said endless chain.

5. A method of removing a container from a rail truck as claimed in claim 4 wherein said drive means is linked to both of said endless chains such that the skate members fitted in each chain move in unison.

6. A method of removing a container from a rail truck as claimed in claim 5 wherein the endless chains have a common drive means located beneath the track supporting the rail truck.



7. A method of removing a container from a rail truck substantially as hereindescribed and as shown in the accompanying drawings.



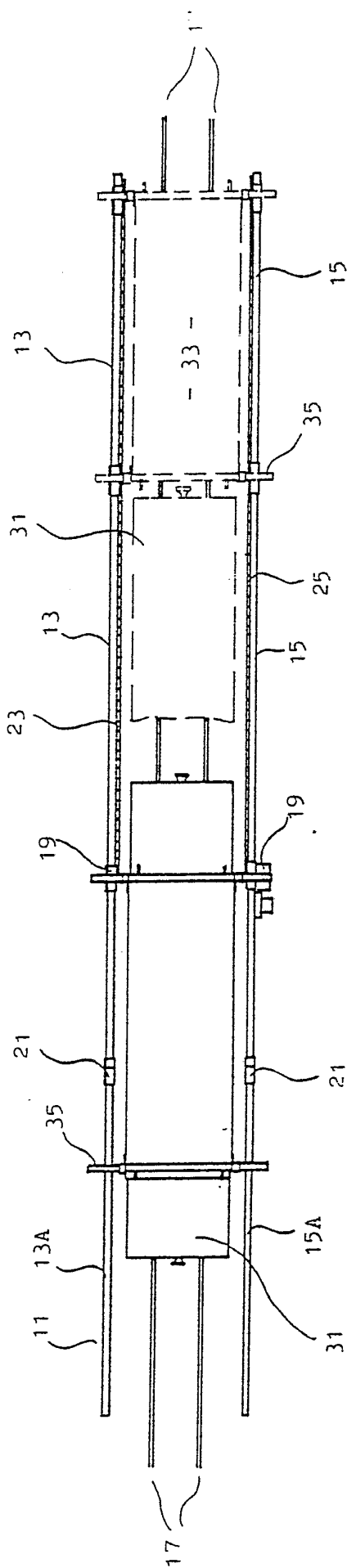


Fig. 1

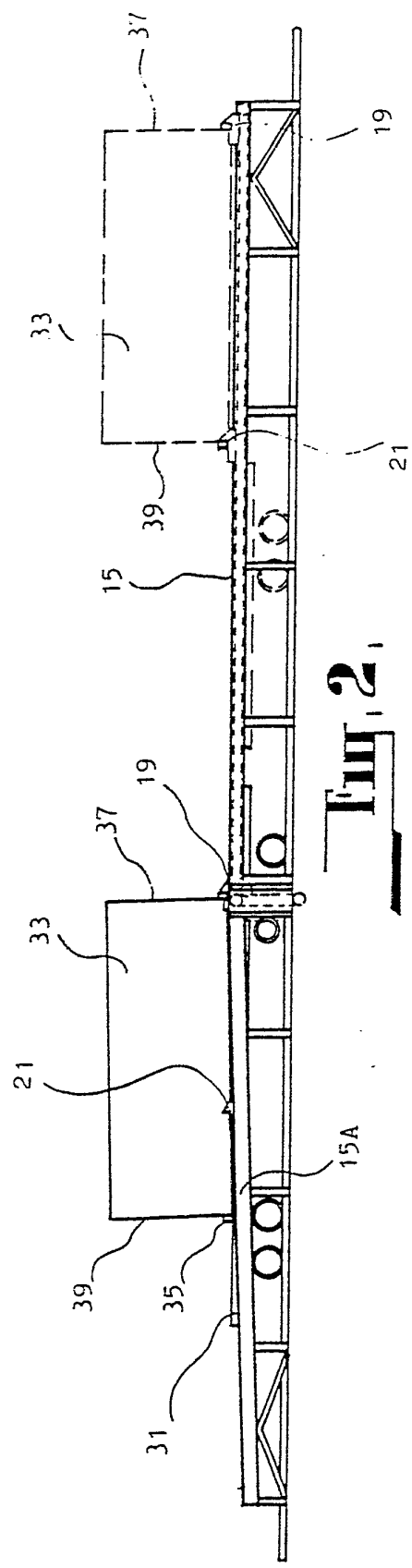


Fig. 2



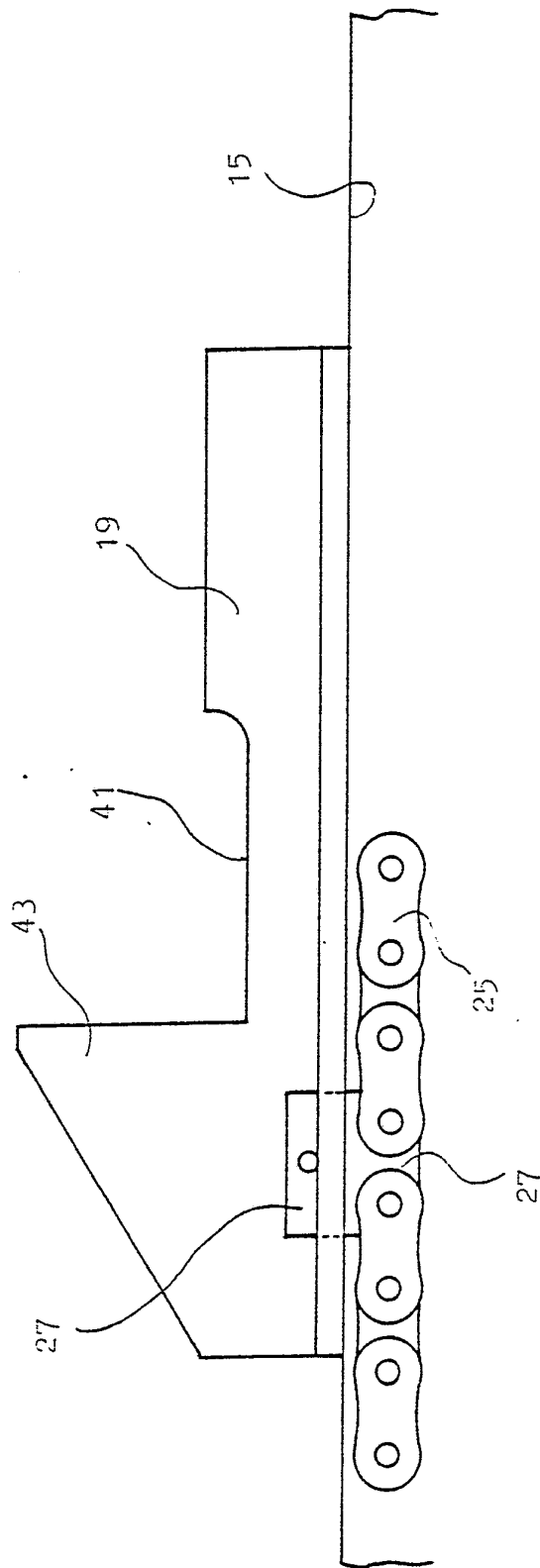


Fig. 3



INTERNATIONAL SEARCH REPORT

International Application No

PCT/AU82/00112

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ³		
According to International Patent Classification (IPC) or to both National Classification and IPC		
Int. C1 ³ B65G 69/28, 69/22		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁴		
Classification System	Classification Symbols	
I P C	B65G 69/28, 69/22	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁵		
AU:IPC as above ; B65G 67/02		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ¹⁴		
Category ⁶	Citation of Document, ¹⁶ with indication, where appropriate, of the relevant passages ¹⁷	Relevant to Claim No. ¹⁸
X	US,A, 1495339 (MAHER) 27 May 1924 (27.05.24)	(1-7)
Y	DE,A, 470292 (ALWIN EWLENFELD) 11 January 1929 (11.01.29)	(1-7)
Y	USA,A, 1390032 (E A HEATH) 6 September, 1921 (06.09.21)	(1-2)
A	AU,B, 16018/70 (ETABLISSEMENT J. BERTHELAT & FILS) 9 December, 1971 (9.12.71)	(1-2)
A	AU,B, 18243/76 (ROBERTSON D K) 6 April 1978 (06.04.78)	(1-2)
<p>¹³ Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&" document member of the same patent family</p>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search ¹⁹	Date of Mailing of this International Search Report ²⁰	
20 October 1982 (20.10.82)	30 September 1982 (30.09.82)	
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