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(54) **Outrigger mounting structure of loading and unloading vehicle**

Auslegerbefestigungsstruktur eines Ladefahrzeugs

Structure de montage des pieds de sustention d'un véhicule de chargement et décharchement

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Description

BACKGROUND OF THE INVENTION

Field of the invention

[0001] The present invention relates to a rubber-tired platform car mounted with a crane, etc., specifically to a loading and unloading vehicle having a plurality of axles attached to the underside of the vehicle body frame for supporting, driving, and steering wheels of the platform car, and being equipped with outriggers at least at the front part and rear part of the body frame for anchoring the vehicle to the ground.

Description of the Related Art

[0002] A tire-wheeled mobile harbor crane for performing stevedoring work at a harbor has a heavy crane for handling a heavy object, the crane being mounted on a platform car equipped with a plurality of axles. The crane is transferred freely by the travelling of the platform car driven through the axles.

[0003] FIG. 3 is a schematic side view of a conventional rubber-tired platformcar of a mobile harbor crane. In the drawing, reference numeral 01 is the body frame of the platform car, 02 is a supporter for mounting the crane (not shown in the drawing), the supporter being provided on the center portion of the body frame 01, and 03 shows the center axis of the body frame, which is the rotation axis of the crane.

[0004] Reference numeral 07 are a plurality of left and right wheels, 010 are axle supporters provided under the body frame 01, which has axles 010A for supporting said wheels and steering means thereof. Reference numeral 021 are outriggers for anchoring or fixing the platform car to the ground, 020 are outrigger housing parts for accommodating the outriggers 021. The outrigger housing parts 020, in which the outriggers 021 are supported so that they can be slid in and out of the outrigger housing parts 020, are provided at front end and rear end of said body frame 01 such that the front and rear outrigger housings 020 protrude from a forefront wheel 07a and a rearmost wheel 07a among the wheels 07 respectively.

[0005] The tire-wheeled mobile harbor crane comprising the platform car equipped with outriggers can be anchored or fixed to the ground by means of oil hydraulic jacks by jutting the outriggers 021 out of the outrigger housing parts 020 in the direction of the width of the body frame (the direction perpendicular to the longitudinal direction of the body frame) when performing stevedoring work.

[0006] When not performing stevedoring work, the oil pressure of said oil hydraulic jacks is released, and said outriggers 021 are tucked into said outrigger housing parts 020.

[0007] When the load capacity of the crane of said tire-wheeled mobile harbor crane is increased, the moment applied by the crane load to the platform car increases. To meet the increase of the moment, it is necessary to increase the span for supporting the moment by increasing the distance between the front and rear axle supporters 010.

[0008] However, in the conventional tire-wheeled mobile harbor crane comprising the platform car equipped with outriggers as shown in FIG. 3, said outrigger housing parts 020, in which the outriggers 021 are supported so that they can be slid in and out of the outrigger housing parts 020, are provided at the front end and rear end of said body frame 01 protruding from the forefront and rearmost wheels 07a among the wheels 07.

[0009] Therefore, when the distance between the front and rear axle supporters 010 are to be increased in order to increase the span for supporting the increased moment, it is necessary to shift the axle supporters 010 and the outrigger housings 020 provided at both ends of the body frame toward outer sides by increasing the length of the body frame of the platform car 01, which results in increased length of the platform car resulting in upsizing of the vehicle.

[0010] US-A-2,653, 829 discloses a vehicle according to the preamble of claim 1.

SUMMARY OF THE INVENTION

[0011] The present invention was made in light of the problem of the prior art, and its object is to provide a loading and unloading vehicle which can meet the increase of the moment applied to a platform car due to the increase of crane load capacity by a compact structure, which can minimize the increase in length of the vehicle comprising a platform car equipped with outriggers.

[0012] According to the invention, the outrigger housing parts are formed in the locations inside toward the center of the body frame from each of the vertical lines tangential to the perimeter of the forefront wheel and rearmost wheel at the front end side and rear end side thereof respectively.

[0013] In a preferred embodiment, each of said outrigger housings parts has an outrigger inserting hole in the direction perpendicular to the longitudinal direction of the body frame, and each of the outrigger beam of said outrigger is inserted for slide in said outrigger inserting hole.

[0014] According to the invention, since the outrigger housing parts are formed in the body frame of the platform car, preferably above said axle supporters, and further the outrigger housings are formed in the locations of inside toward the center of the body frame from each of the vertical lines tangential to the perimeter of the forefront wheel and rearmost wheel at the front end side and rear end side thereof respectively, the outrigger housing can be positioned without protruding from the forefront axle and the rearmost axle.

[0015] With this construction, the outrigger housings are located at the positions inside toward the center of the body from each of the vertical lines tangential to the perimeter of the forefront wheel and rear most wheel at the front end side and rear end side thereof respectively, so in the case of increasing the distance between the front and rear axle supporters to increase the span to support the increased moment due to increased capacity of the crane, the distance between the front and rear axle supporters, i.e. the wheel base can be increased with minimal increase in the length of the vehicle.

[0016] Therefore, according to the invention, the stability of the platform car is secured with minimal increase in the length of vehicle compared with the conventional structure when to increase the capacity of the crane mounted on the platform car.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017]

FIG.1 is a side view of the platform car and outriggers of the mobile harbor crane according to the present invention

FIG.2 is a sectional view along line A-A in FIG.1.

FIG.3 is a side view of a conventional platform car and outriggers of mobile harbor crane.

DETAILE DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0018] A preferred embodiment of the present invention will now be detailed with reference to the accompanying drawings. It is intended, however, that unless particularly specified, dimensions, materials, relative locations and so forth of the constituent parts in the embodiments shall be interpreted as illustrative only not as limitative of the scope of the present invention.

[0019] FIG. 1 is a side view showing the platform car and outriggers of the mobile harbor crane according to the present invention and FIG.2 is a sectional view along line A-A in FIG.1.

[0020] In FIG.1 and 2 showing an embodiment of the platform car and outriggers according to the invention, reference numeral 1 is the body frame of a platform car, 2 is a supporter provided on the center part of the body frame 1 for mounting a crane (not shown in the drawing), and 3 shows the center axis of the platform car, which is the rotation axis of the crane.

[0021] Reference numeral 7 are front and rear wheels, 10 are hydraulically steering type axle supporters having a plurality of axles 10A supporting left and right wheels and driving means thereof. The hydraulically steering type axle 10 is public known and detailed explanation of its structure is omitted.

[0022] Reference numeral 04 are brackets fixed to the underside of said body frame 1 at the front and rear parts. Reference numeral 5 are supporting arms, the center part of each of which is supported for rotation by said bracket 04 so that the arms 5 can swing parallel to a longitudinal vertical plane, which is a so-called balance-beam structure.

[0023] Reference numeral 06 are second brackets, each of which is supported for rotation at an end side of each supporting arm 5. Reference numeral 6 are second supporting arms, the center part of each of which is supported for rotation at each second bracket 06 so that each second supporting arm 6 can swing parallel to a longitudinal vertical plane, which similarly constitutes a balance-beam structure just like said supporting arms 5.

[0024] Forefront wheel 7a and rearmost wheel 7a are mounted for rotation to the front end and rear end part of said supporting arms 5 respectively, and other wheels 7 are mounted for rotation to the front and rear end part of said second supporting arms 6 respectively.

[0025] This construction of axles 10A and wheels 7 is the same as that of the prior art.

[0026] Reference numeral 21 are outriggers for anchoring or fixing the platform car to the ground, 20 are outrigger housing parts for accommodating said outriggers 21.

[0027] The outrigger housing parts 20 are formed at the front and rear end of said body frame 1 integral to the body frame. In FIG.2, reference numeral 24 is an outrigger inserting hole formed in said outrigger housing part 20 in the direction perpendicular to the longitudinal direction of said body frame 1, and beam parts 22 of said outriggers 21 are inserted into said outrigger inserting hole 24 for slide.

[0028] The front and rear outrigger housing parts 20 are provided above front and rear axle supporters 10 in the locations nearer to the center axis 3 than the forefront wheel 7a and rearmost wheel 7a among plurality of the wheels 7respectively.

[0029] Therefore, the outrigger inserting holes 24 of the outrigger housing parts 20 for accommodating the outriggers 21 (for accommodating the beamparts 22 of the outriggers 21) are formed in the body frame 1 above the axle supporters 10 in the locations such that the outriggers 21 are located at the positions inside toward the center axis 3 from each of the vertical lines(L) tangential to the perimeter of the forefront wheel 7a and rearmost wheel 7a at the front end side and rear end side thereof respectively.

[0030] In the mobile harbor crane comprising a platform car and outriggers, said outriggers 21 are jutted out by sliding the outrigger beam parts 22 in the outrigger inserting holes 24 of the outrigger housing parts 20 in the direction of width of the body frame (in the direction perpendicular to the longitudinal direction of the body frame), and the platform car is anchored or fixed to the ground 23 by means of oil hydraulic jacks when loading or unloading is performed.

[0031] When loading or unloading is not performed,

the oil pressure on the oil hydraulic jacks is released for the outriggers 21 to be lifted up, and then the outrigger beam parts 22 are accommodated in the outrigger inserting holes 24 of the outrigger housing parts 20.

[0032] According to the above described embodiment, the outrigger inserting holes 24 of the outrigger housing parts 20, into which holes 24 are inserted the outrigger beam parts 22 so that the beam parts 22 of the outrigger 21 can be slid in and out, and the outrigger housing parts 20 are formed above the axles 10 in the locations such that the outriggers 21 are located at the positions inside toward the center axis 3 from each of the vertical line(L) tangential to the perimeter of the forefront wheel 7a and rearmost wheel 7a at the front end side and rear end side thereof respectively, so the front and rear outrigger housing 20 are able to be positioned nearer to the center axis 3 of the body frame than the forefront wheel 7a and rearmost wheel 7a without protruding from the forefront and rearmost wheel respectively.

[0033] By this structure, the distance between the front and rear axle supporters 10, i.e. the wheel base can be increased without increasing the length of the body frame when intending to increase the wheel base in order to increase the span for supporting the moment applied to the platform car to meet larger crane capacity. Therefore, the crane capacity of the platform car can be increased with minimal increase in the length of the platform car.

[0034] As described in the foregoing, according to the present invention, the outrigger housings are provided in the body frame without protruding from the body frame, so the wheel base can be increased with a minimal increase in the length of the vehicle when it is intended to meet the increase of the moment that acts on the platform car when loading and unloading accompanying the increase of the capacity of the crane.

[0035] Therefore, according to the invention, the stability of the platform car is secured with minimal increase in the length of vehicle compared with the conventional structure when to increase the capacity of the crane mounted on the platform car, as the wheel base can be increased without moving the position of the outrigger housing parts by lengthening the body frame, and a light weight and compact construction of the platform car with increased wheel base is attained.

Claims

1. A loading and unloading vehicle provided with a plurality of axle supporters (10) having a plurality of axles (10A) supporting car wheels (7, 7a) and steering means thereof under a body frame (1) of the vehicle, mounting a crane proper on the body frame (1) of the vehicle and equipped with outriggers (21) at least at the front and rear parts of the body frame (1) for anchoring the vehicle to the ground, wherein outrigger housing parts (20) for accommodating said outriggers (21) are provided in the body frame (1) and the outriggers (21) are inserted in the outrigger housing parts (20) so that they can be slid into and out of the outrigger housing parts (20),
characterised in that
said outrigger housing parts (20) are provided so that the vertical center line of each of front and rear outrigger housing parts (20) is located inside toward the center of the body frame (1) from each of the vertical lines tangential to the perimeter of the forefront car wheel (7a) and rearmost car wheel (7a) at the front end side and rear end side thereof, respectively.

2. A loading and unloading vehicle as claimed in claim 1, wherein each of said outrigger housings parts (20) has an outrigger inserting hole (24) in the direction perpendicular to the longitudinal direction of the body frame (1), and each of the outrigger beams (22) of said outriggers is inserted for a sliding movement in said outrigger inserting hole.

3. The loading and unloading vehicle according to claim 1 or 2, wherein said outrigger housing parts (20) are formed above said axle supporters (10).

4. The loading and unloading vehicle according to claim 1, 2 or 3, wherein the vehicle is a mobile harbor crane, and the outriggers are so arranged and constructed as to serve for anchoring the vehicle to the ground.

Patentansprüche

1. Be- und Entladefahrzeug mit mehreren Achsenstützen (10) mit mehreren Achsen (10A), die Fahrzeugräder (7,7a) stützen und Lenkmittel des Fahrzeugs unter einem Körperrahmen (1) des Fahrzeugs, wobei ein zugehöriger Kran an dem Körperrahmen (1) des Fahrzeugs angebracht ist und wobei Ausleger (21) zumindest am vorderen und am hinteren Bereich des Körperrahmens (1) vorgesehen sind, um das Fahrzeug am Boden zu verankern, wobei Ausleger-Gehäuseteile (20) zum Aufnehmen der Ausleger (21) in dem Körperrahmen (1) vorgesehen sind und die Ausleger (21) in die Ausleger-Gehäuseteile (20) so eingebracht sind, dass sie in die Auslegergehäuseteile (20) hineingeschoben und daraus herausgeschoben werden können,
dadurch gekennzeichnet, dass
die Auslegergehäuseteile (20) so vorgesehen sind, dass die vertikale Mittellinie eines vorderen und eines hinteren Auslegergehäuseteils (20) sich innen in Richtung des Körperrahmens (1) befindet, ausgehend von jeder der vertikalen Linien tangential an den Umfang des vorderen Fahrzeugrades (7a) und

des hintersten Fahrzeugrades (7a) auf der vorderen bzw. der hinteren Endseite des Rades.

2. Fahrzeug nach Anspruch 1, wobei jedes der Auslegergehäuse (20) eine Auslegereinführöffnung (24) rechtwinklig zur Längsrichtung des Körperrahmens (1) hat, und jeder der Auslegerbalken (22) dieser Ausleger für eine Gleitbewegung in diese Auslegereinführöffnung eingebracht ist.

3. Fahrzeug nach Anspruch 1 oder 2, wobei die Auslegergehäuseteile (20) oberhalb der Achsenstützen (10) ausgeformt sind.

4. Fahrzeug nach Anspruch 1, 2 oder 3, wobei das Fahrzeug ein mobiler Hafenkran ist und die Ausleger so angeordnet und aufgebaut sind, dass sie zum Verankern des Fahrzeugs am Boden dienen.

Revendications

1. Véhicule de chargement et de déchargement muni d'une pluralité de supports d'essieux (10) comportant une pluralité d'essieux (10 A) supportant les roues du véhicule (7, 7a) et ses moyens de direction sous un châssis de carrosserie (1) du véhicule, montant une grue appropriée sur le châssis de carrosserie (1) du véhicule et muni de stabilisateurs (21) au moins au niveau des parties avant et arrière du châssis de la carrosserie (1) pour ancrer le véhicule au sol, dans lequel des parties de logement de stabilisateur (2 0) pour recevoir lesdits stabilisateurs (21) sont disposées dans le châssis de la carrosserie (1) et les stabilisateurs (21) sont introduits dans les parties de logement de stabilisateur (20) de sorte qu'ils peuvent être mis à coulisser dans et hors des parties de logement de stabilisateur (20), **caractérisé en ce que**

   lesdites parties de logement de stabilisateur (20) sont disposées de sorte que la ligne centrale verticale de chacune des parties de logement de stabilisateur (20) avant et arrière est placée à l'intérieur vers le centre du châssis de la carrosserie (1) à partir de chacune des lignes verticales tangentielles au périmètre de la roue du véhicule (7a) la plus en avant et de la roue du véhicule (7a) la plus en arrière au niveau du côté d'extrémité avant et du côté d'extrémité arrière de celui-ci, respectivement.

2. Véhicule de chargement et de déchargement selon la revendication 1, dans lequel chacune des parties de logement de stabilisateur (20) comporte un trou d'introduction de stabilisateur (24) dans la direction perpendiculaire à la direction longitudinale du châssis de la carrosserie (1), et chacune des poutres de stabilisateur (22) desdits stabilisateurs est introduite pour déplacement coulissant dans le trou d'introduction de stabilisateur.

3. Véhicule de chargement et de déchargement selon la revendication 1 ou 2, dans lequel lesdites parties de logement de stabilisateur (20) sont formés audessus desdits supports d'essieu (10).

4. Véhicule de chargement et de déchargement selon la revendication 1,2 ou 3, dans lequel le véhicule est une grue portuaire mobile, et les stabilisateurs sont conçus et construits de façon à servir pour ancrer le véhicule au sol.

FIG. 1

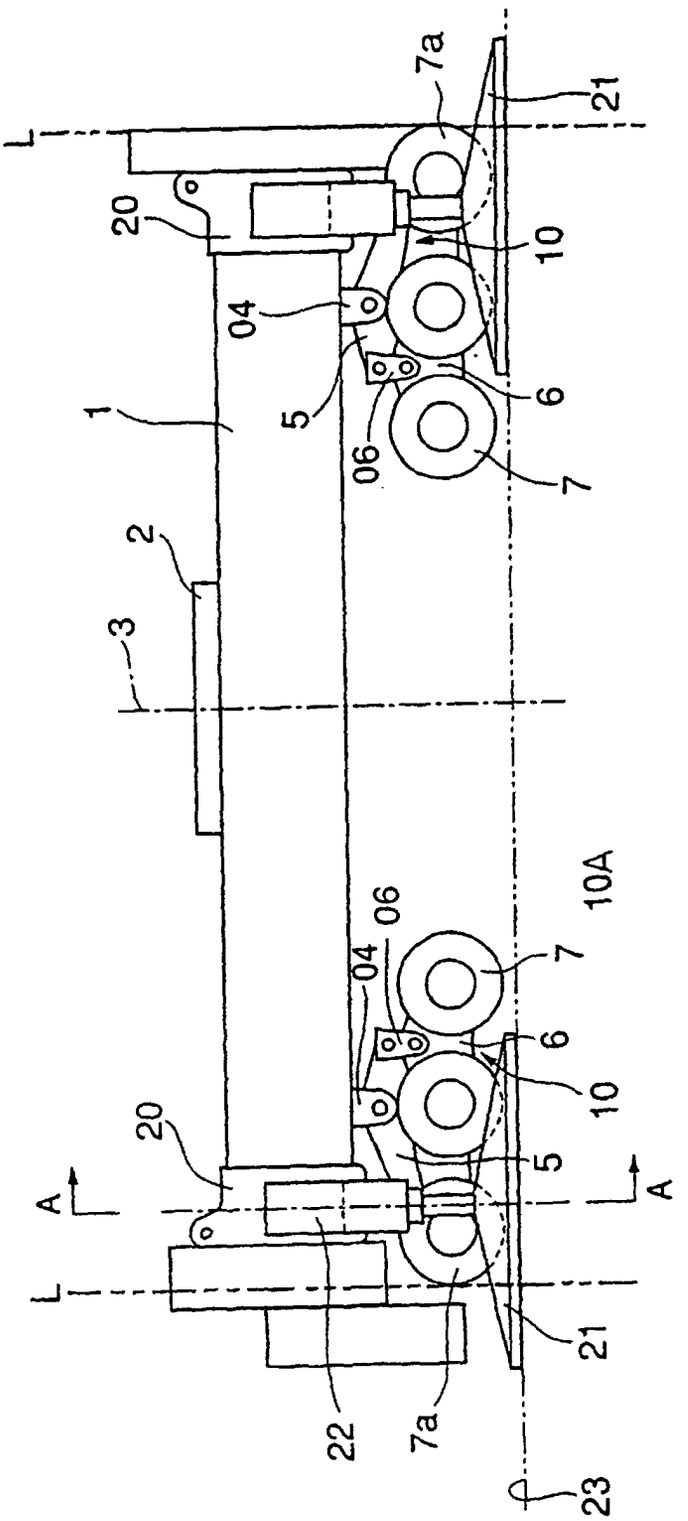

FIG. 2

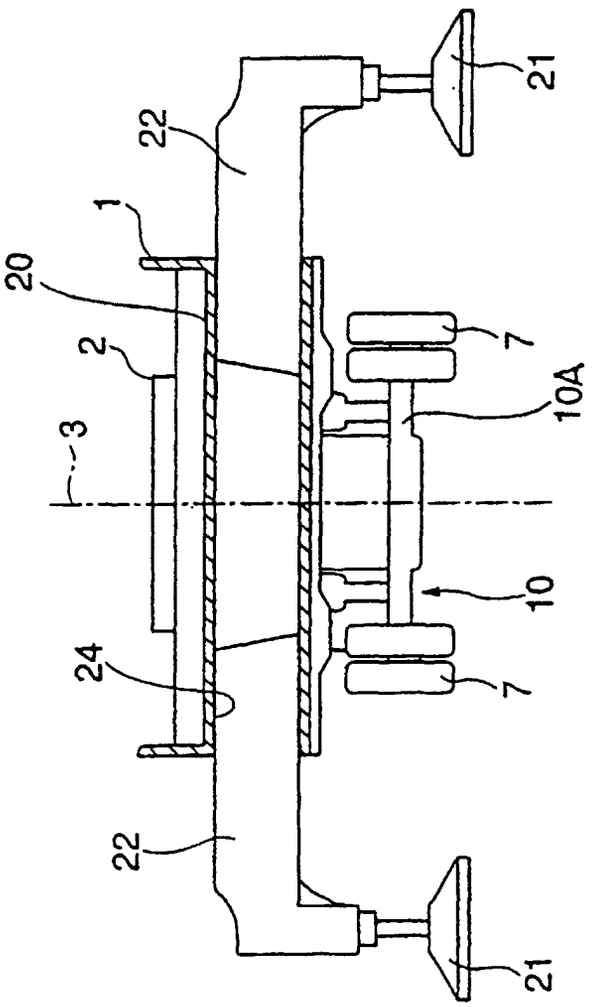
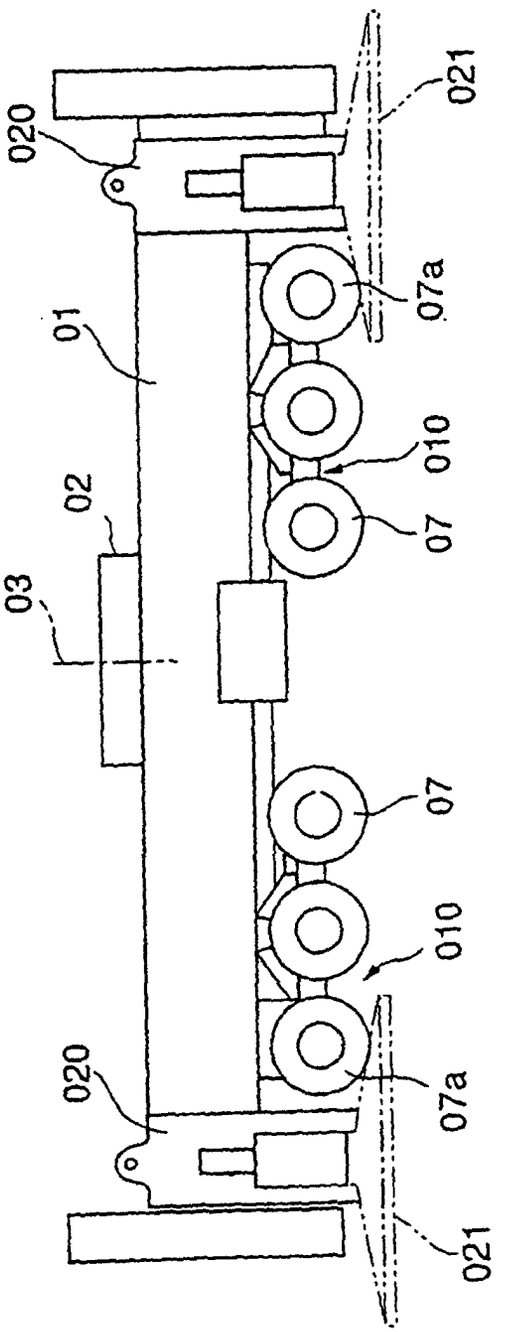
FIG. 3