PUBLISHED
MAY 25, 1943.
BY A. P. C.

K. SCHROTER ET AL

CARS, ESPECIALLY TRAILERS, WITH TILTABLE BODY

Filed Jan. 13, 1941

Serial No. 374,217

2 Sheets-Sheet 1

Fig.2

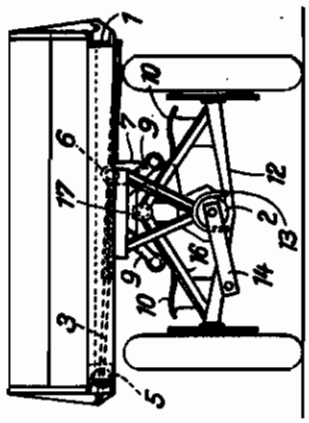


Fig.4

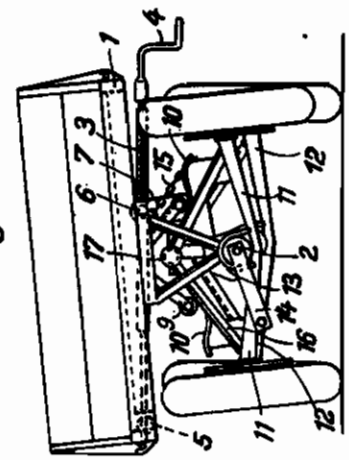


Fig.1

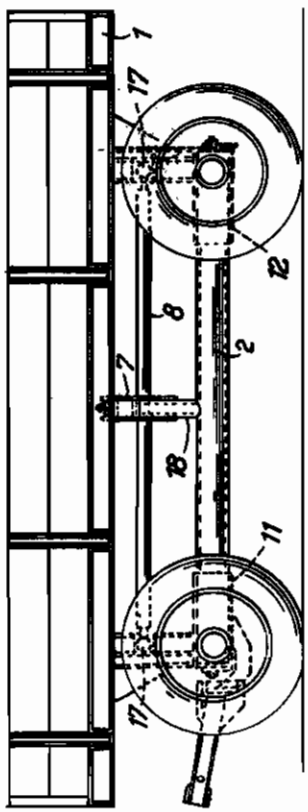
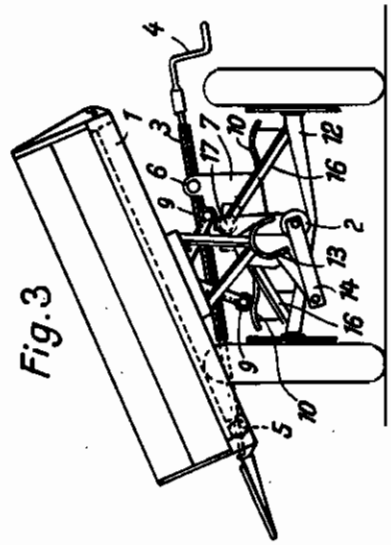


Fig.3



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By
Richards & Geier
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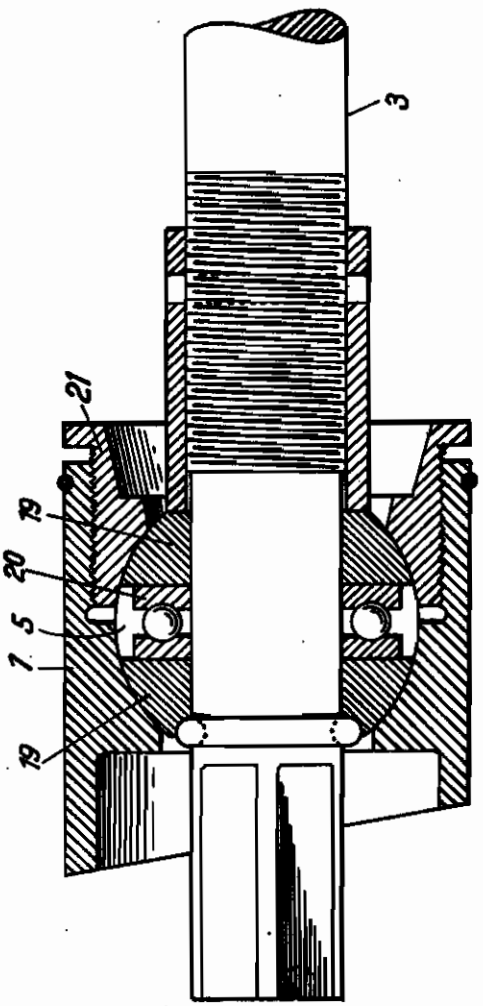

Fig. 5

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ALIEN PROPERTY CUSTODIAN

CARS, ESPECIALLY TRAILERS, WITH TILTABLE BODY

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Application filed January 13, 1941

Our invention relates to cars especially trailers, with tiltable body; more especially, it relates to equipping cars of this type with a compensation device so designed as to be able to swing the second axle counter to the first if this axle is being swung owing to the car running on uneven ground, and to hold the wheeled underframe in a middle position between the thus moved axles.

With freight cars and trailers much used on building yards and for agricultural work there arises on uneven ground the drawback that the strong torsional strains constitute additional strains on the frame members and the lockings between the tilting frame and the supporting frame can be actuated only with the greatest difficulties if the car is torsional. These drawbacks are overcome according to the present invention, by equipping cars of the above-mentioned type with a ground compensation device whereby, moreover, the further advantage is obtained that the body can be tilted relatively to the axle frame so that it is possible to give the body a horizontal position in spite of the freight surface being, perhaps, in an inclined one. The new arrangement presents, furthermore, also the possibility that for lifting a wheel from the ground, for instance for exchanging a damaged tire, a car jacking device is no more necessary.

Another advantage presented by our invention is that the car body is guided during the tilting, and the movement of the axle frames in upward direction is restricted. The car designed according to this invention is, for said purpose, provided with supporting rolls and curved lugs engaging one another when the body of the car is tilted so that said rolls roll along upon said lugs and the supporting bearings of the tiltable body are lifted off the frame carriers. This arrangement renders it possible to obtain a sufficiently large tilting angle even if the loading surface is perhaps, located approximately near the ground, the point of gravity of the load being, nevertheless, not elevated during the tilting procedure.

The invention is illustrated diagrammatically and by way of example on the accompanying drawings on which Figure 1 is a side-view of a trailer having a tiltable body and being equipped with a compensation device according to this invention. Figure 2 is a rear view of said trailer, Figure 3 is a view similar to Fig. 2 and shows the body tilted. Figure 4 is likewise a view similar to Fig. 2, but showing one wheel lifted; and Figure 5 shows partly in side-view and partly in axial section a mechanism used when the body of the car is tilted, the mechanism proper being shown in section and a spindle supporting it being shown in side-view.

The wheeled frame of the car, or the body 1 respectively, is tiltable with respect to the longitudinal middle carrier 2. The frame or body 1 is, for this purpose, supported together with the supporting bearings 13 upon the axle frames 11 and 12 which are turnable, together with said bearings, on said carrier 2. This latter is connected with the tiltable body 1 by a member 3 which is transversely shiftable and preferably adjustable in its longitudinal direction. Said member 3 is formed, in the example shown, by a spindle engaging the body 1 by the intermediary of a ball-joint 5; said spindle carriers a two-pivot nut 6 which is turnably supported on an arm 7 of the longitudinal carrier 2 in a transverse plane of the same. The spindle is preferably at both ends designed in such a manner that a hand-crank 4 can be applied to it. By turning the crank in the one or the other direction the nut 6 is correspondingly moved along the spindle whereby the distance between the arm 7 which is rigidly connected with the longitudinal carrier 2 and the joint-point 5 of the spindle 3 at the frame or body 1 is varied. The body 1 will, therefore, be tilted to the one or other side according to the direction of rotation of the spindle, the body turning first on the carrier 2 with its supporting bearings 13.

The ground compensation device itself may be of any desired known design. In the constructional form illustrated by way of example it consists of a lever 8 turnably supported on a vertical pivot 18 (Fig. 1) projecting forth from the arm 7 that is connected with the longitudinal carrier 2, the ends of said lever 8 are ball-shaped and engage correspondingly shaped joints 17 whereby it is connected with the axle frames 11 and 12. These latter carry two upwardly directed stiffening struts 16, the points of junction of which constitute connecting joints for the compensation lever 8 which is slightly movable in vertical direction also upon its pivot 18. The lever 8 maintains, therefore, the longitudinal carrier 2 positively in a middle position relatively to the axle frames 11 and 12.

For guiding the body 1 while the tilting procedure is going on supporting rolls 9 and curved lugs 10 are provided which are connected with said body, or with the axles frames 11 and 12 respectively. If by turning the hand crank 4 and the spindle 3 the body has been laterally so

much inclined that the supporting rolls 9 attached to the body push upon the said lugs, which are, at least in the example shown, attached to the two upwardly directed stiffening struts 16, the body will when the rotation of said spindle is continued be lifted together with its supporting bearing 13 from the longitudinal carrier 2, the supporting rolls 9 located on the tilting side rolling them along upon the curved lugs 10 located on the same side. The supporting rolls serve at the same time for limiting the extent of deviation of the axle frames 11 and 12. It is by this arrangement prevented that the bottom of the body pushed upon the tyres, and at the same time the advantage is attained that in spite of the tilting angle of the body 1 being the largest possible the loading surface does not lie too low in its middle position, viz, when it is not tilted.

The body is, furthermore, guided also positively by the scissor levers 14 inserted between the supporting bearings 13 and the longitudinal carrier 2, so that said bearings always contact again with this carrier when the body is tilted in rearward direction.

The supporting bearings 13 are lifted from the longitudinal carrier 2 also when the car is running over a comparatively large obstacle met with in the road, viz, when the axle frames 11 and 12 are so much turned with respect to one another as well to the wheeled underframe, or the body 1 respectively, that the supporting rolls 9 contact with the curved lugs 10 of the said frames.

In all these cases the bottom of the body gives way automatically in upward direction if the wheel tyres approach it. It is, therefore, no more necessary to provide the bottom with so-called wheel boxes into which the head portion of every wheel reaches.

If a wheel axle is connected with the body 1 at one side by means of an unyielding member, for instance a chain 15 (Fig. 4), and if the body is then laterally tilted, this latter takes the wheel located in the proximity of the chain along with it in upward direction, so that, for instance for exchanging a wheel tyre, the otherwise requisite jacking or hoisting device can be dispensed with.

If low speeds are sufficient to attain the purposes in view, the axles need not be connected by springs with the body whereby the advantage is attained that the net weight of the car is considerably reduced.

In Fig. 5 the ball joint 5 by the intermediary of which the spindle 3 engages the tiltable body is separately illustrated and drawn on a considerably larger scale relatively to the other figures. Said joint is provided with a transverse ball bearing 20 active at both sides and inserted between two half-spheres 19 turnably supported in correspondingly shaped hollow bearings and able to take up the lateral pressure. The hollow ball bearing is bipartite and one of its parts (21) is adjustably connected with the other, stationary part for instance by means of screw-threads. This other part may be made integral with the body 1, if desired. By designing the ball-joint 5 in the just described manner the friction arising within it is greatly reduced.

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