PUBLISHED
APRIL 27, 1943.
BY A. P. C.

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PUSHER MECHANISM FOR TRACTORS
Filed May 16, 1941

Serial No.
393,715
2 Sheets-Sheet 1

Fig. 1.

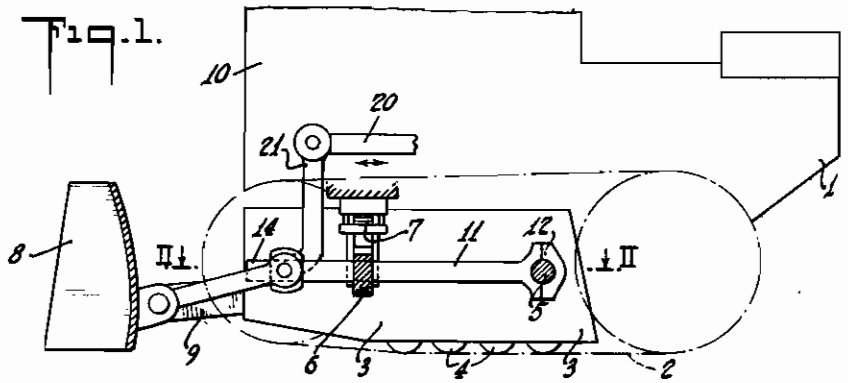

Fig. 2.

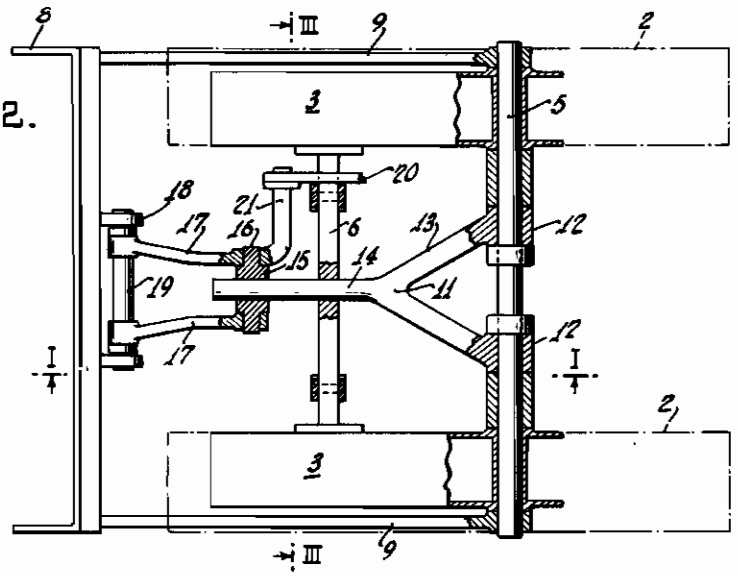

Fig. 3.

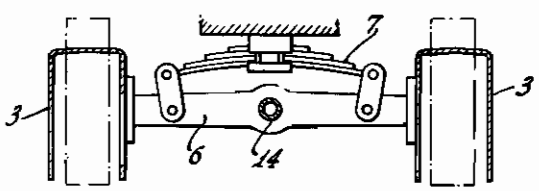

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Fig. 4.

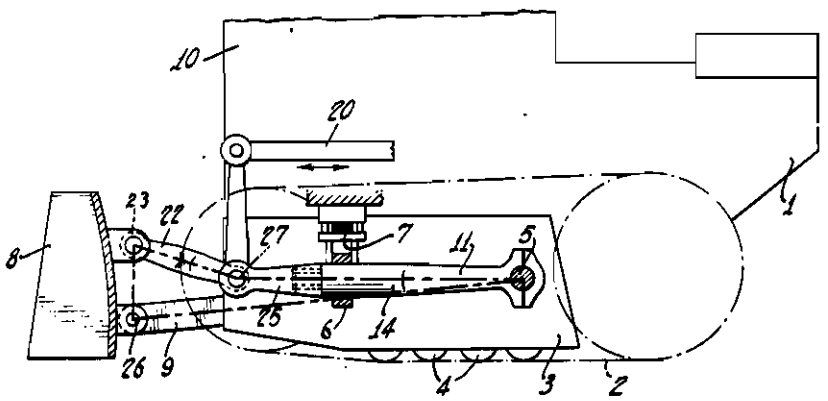
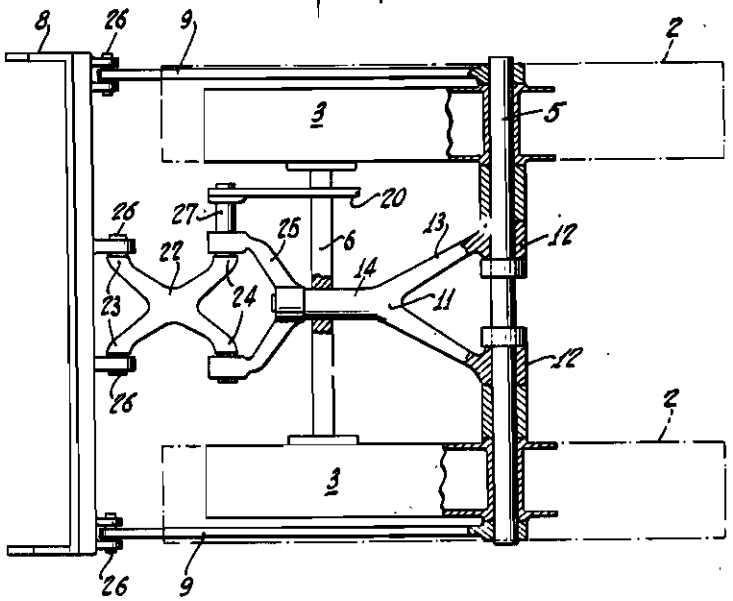


Fig. 5.



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ALIEN PROPERTY CUSTODIAN

MECHANISM FOR PROPPING TRAILERS AGAINST TRACTORS

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Application filed May 16, 1941

The present invention relates to a supplementary coupling mechanism for a trailer implement, for example a planer, which is connected by means of swing arms with a tractor particularly of the crawler type having chain tracks and which is supplementarily propped up against said tractor by means of said coupling mechanism.

An object of the present invention resides in the provision of means for propping a trailer against a tractor in such a manner that forces acting on the trailer cannot act directly on the body of the tractor and that the position of the trailer is not influenced by resilient movements of the tractor body. The coupling members of the mechanism according to the invention are light, simple and can be manufactured inexpensively although the coupling mechanism gives greatest assurance against torsion of the trailer relatively to the tractor.

The conventional systems for propping a trailer against a tractor can be used only in connection with tractors the body of which is not resiliently supported on the under-carriage and cannot be used in connection with spring supported tractor bodies because in such case the trailer implement changes its position with respect to the ground whenever there is a resilient motion of the tractor body.

According to the present invention the trailer implement is supplementarily propped against a support member disposed underneath the tractor body between the chain tracks and the support member is propped against one or a plurality of parts of the tractor. The support member is preferably arranged in the middle between the chain tracks and extends in the longitudinal direction of the tractor. The support axle and the swing axle for the chain tracks preferably serve for propping up said support member. The coupling mechanism according to the invention usefully fills the free space between the trailer and the swing axle. The support member according to the invention absorbs transverse forces and transmits these forces through the support axle to the rear and less sensitive part of the tractor body. With conventional propping arrangements transverse forces are directly transmitted to the forward part of the tractor body and thereby to the engine or to the propelling mechanism. Resilient movements of the tractor body are without influence on the position of the trailer implement with the mechanism according to the invention because there is no supplementary propping of the implement against the body of the tractor. The support member according to the invention consists of a preferably tubular carrier or beam which rests on the support axle and is guided in or on the swing axle and longitudinally and rotatably movable thereto. With this arrangement a portion of the support member serves at the same time as swing axis for the swing axle. The trailer implement may be propped against the support member in various ways. The implement may, for example, depend from the support member and be preferably cross head like connected therewith and longitudinally displaceable with respect thereto. In this case the support member is provided with a forked end at which it is swingably connected with the support axle whereas the other end of the support member is rod like and extends through the swing axle and forms the swing axis thereof. A cross head is arranged at the end of the rodlike end portion of the support member and connected with the implement by means of prop levers. This kind of connection is particularly suitable for implements which must adapt themselves to unevenness of the ground and move relatively to the tractor when in operation. In case the implement is forced rectangularly or transverse to the direction of movement of the tractor the forces are transmitted by the propping mechanism, according to the invention, through the prop levers and the cross head to the support member and therefrom to the support axle and to the swing axle without directly affecting the body of the tractor. Forces acting in the longitudinal direction of the vehicle are transmitted through the swing arms only which in this case are rigidly connected with the trailer implement, to the support axle; the same is the case with torsional forces because the implement can automatically adjust itself with respect to the tractor by turning about the longitudinal axis of the support member. Also in this case undesirable forces do not act on the tractor body itself. Lifting or lowering of the implement is effected by means of a lifting and lowering mechanism which is known per se and the operating gear thereof acts, according to the invention, on the prop levers. The implement is lifted or lowered by swinging the swing arms rigidly connected therewith about the support axle whereby the cross head with the prop levers connected thereto are longitudinally displaced on the support member.

In many cases it is not desirable that the implement can turn with respect to the vehicle and it is a further object of the present invention

to provide a torsion resisting intermediary member for propping the trailer implement against the support member. This intermediary member is preferably provided with two forked ends so as to form an X shaped lever one end of which is vertically swingably connected with the trailer and the other end of which is vertically swingably connected with a correspondingly shaped forked end of the support member. The latter may be built up of two parts: an individual forked end part connected with the intermediary member which end part is connected with the rod like end of the forward part of the support member after said rod like end has been pushed through the swing axle. In this embodiment of the invention the swing arms are movably connected with the trailer implement and form therewith and with the torsion resisting lever and with the support member a four cornered mechanism the corners of which are formed by movable joints. Torsion forces are absorbed by the swing arms and transmitted through the torsion resisting lever to the support member and to the support axle and to the swing axle. Since also all other undesirable effects are conducted through the swing arms and the propping mechanism to the support axle and to the swing axle the implement itself as well as all connecting and propping members can be made comparatively light whereby the weight and the lifted forces are considerably reduced.

Further and other objects of the present invention will be hereinafter set forth in the accompanying specification and claims and shown in the drawings which, by way of illustration, show what I now consider to be preferred embodiments of my invention.

In the drawings:

Fig. 1 is a diagrammatic, vertical, longitudinal sectional view of a coupling mechanism according to the present invention, taken along line I—I of Fig. 2.

Fig. 2 is a diagrammatic, horizontal sectional view of the mechanism shown in Fig. 1 and taken along line II—II of said Fig.

Fig. 3 is a cross sectional view of the mechanism shown in Figs. 1 and 2 and taken along line III—III of Figure 2.

Fig. 4 is a diagrammatic, vertical sectional view of a modified coupling mechanism according to the present invention.

Fig. 5 is a horizontal sectional view of the coupling mechanism shown in Fig. 4.

Like parts are designated by like numerals in the drawings.

Referring more particularly to Figures 1 to 3, the motorized vehicle or crawler tractor 1 is provided with chain tracks 2 which are guided by rollers 4 journalled in frame 3 and which can adapt themselves to the configuration of the ground because of the arrangement of an axle 5 journalled in frame 3 and a swing axle 6. The latter is linked to springs 7 and propped against the roller frame 3. A trailer implement, for example a planer 8, is connected with the tractor 1. The planer 8 is connected to swing arms 9 which are journalled, for example, to the axle 5.

In the embodiment of the present invention shown in Figures 1 to 3 the implement 8 is welded to the swing arms 9 and propped against a carrying element 11 which extends substantially in the longitudinal axis of the tractor between the chain tracks 2 and the tractor body 10. Element 11 may be made of tubular material and has a forked end 13 provided with eyelet bearings 12 by means of which it is swingably connected with axle 5. The rodlike portion 14 of element 11 extends longitudinally movably through the swing axle 6 and forms the axis about which said axle swings. A cross head like joint consisting of a bearing member 15 journalled in part 14 and having horizontal pins 16 journalled in stay levers 17 which are swingably connected with implement 8, is arranged between portion 14 of the carrying element 11 and the trailer implement 8. The latter is provided with link elements 18 in which rests the link shaft 19 for supporting the stay levers 17 and preventing lateral movement thereof. Implement 8 may be raised and lowered about axle 5 which may be accomplished by means of a mechanism known per se and having an operating element 20 which is linked to an extension 21 of one of the stay levers 17. Implement 8 may move about the longitudinal axis of part 14 and adapt itself to transverse unevenness of the ground. When raising or lowering the implement the cross joint mechanism 15, 16 together with the stay levers 17 move in the longitudinal direction of the rod like part 14 of the carrying element for adjusting themselves to the swing motions.

In the mechanism illustrated in Figures 4 and 5 the implement 8 rests on the carrying element 11 by means of torsion resisting lever member 22. The latter is forked at both ends and has the configuration of an X. End portion 23 of member 22 is swingably connected with implement 8 and end portion 24 with forked end 25 of element 11; the swing joints permit movement only in a vertical plane in the direction of movement of the vehicle. Forked end 25 of the carrying element 11 is an individual element which is connected to rod like part 14 after the latter has been pushed through the swing axle 6. In the embodiment of the invention shown in Figures 4 and 5 the arms 9 are articulated to implement 8 by means of hinges 26 and form, together with the implement, the lever 22 and the carrying element 11, 25, a four-cornered mechanism, the corners of which are formed by joints. In this case implement 8 is connected with vehicle 1 absolutely stiff against torsion and can only adjust itself to unevenness of the ground by swinging in a vertical direction about axle 5. A gear 20 for lifting and lowering the trailer implement is swingably connected with an extension 27 of a pin of the forked end 24 of lever 22.

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