

March 16, 1954

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2,672,377

PLATFORM ATTACHMENT FOR TRACTORS

Filed March 10, 1950

3 Sheets-Sheet 1

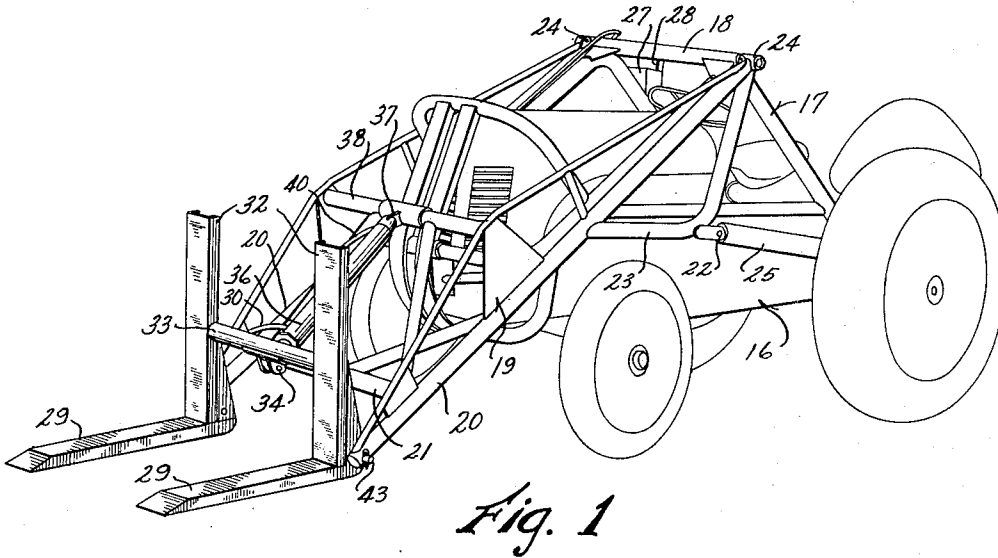


Fig. 1

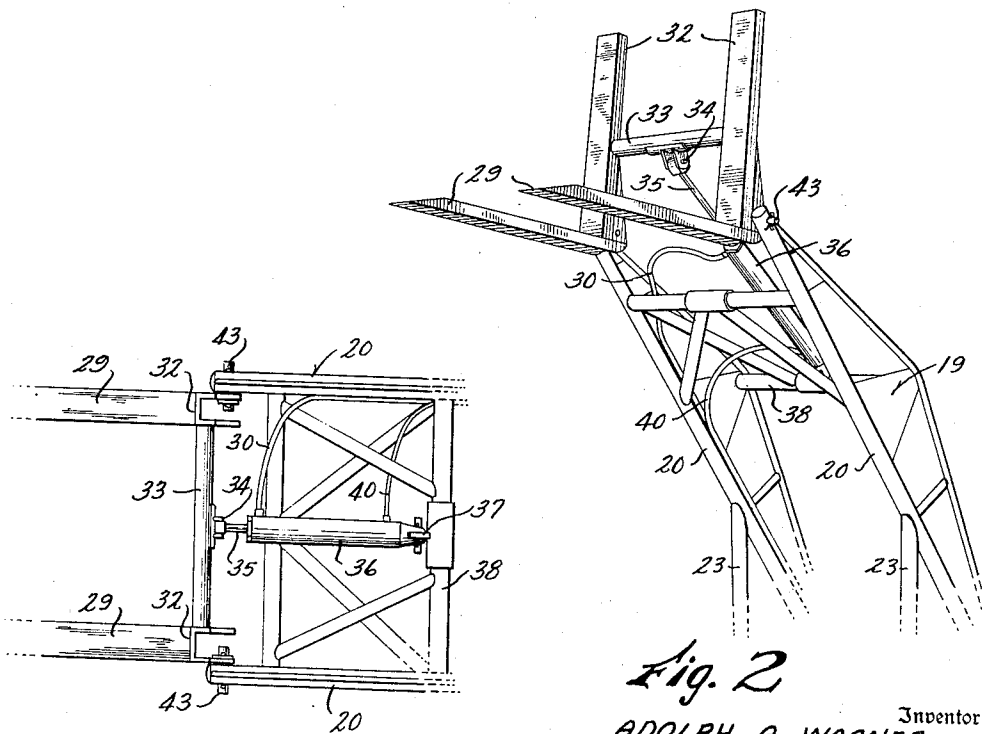


Fig. 2

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Fig. 3

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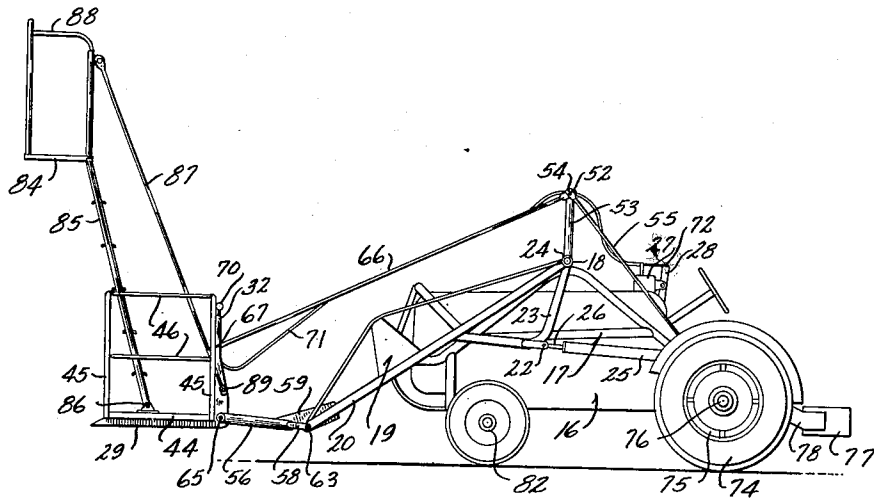


Fig. 6

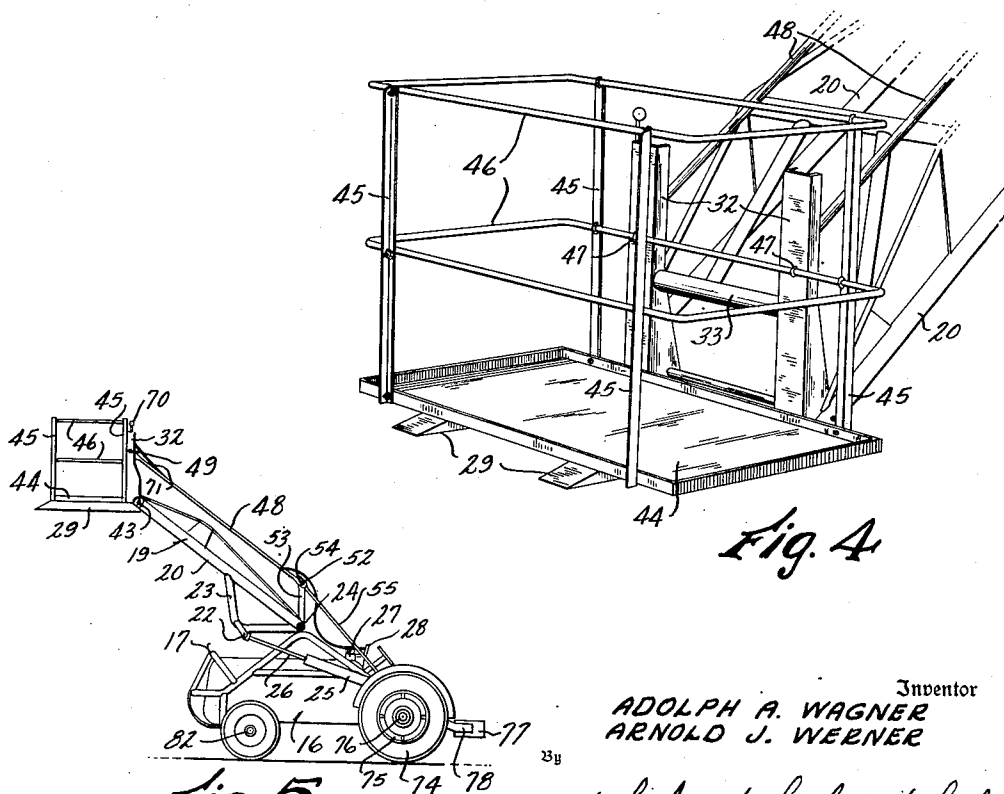


Fig. 4

Fig. 5

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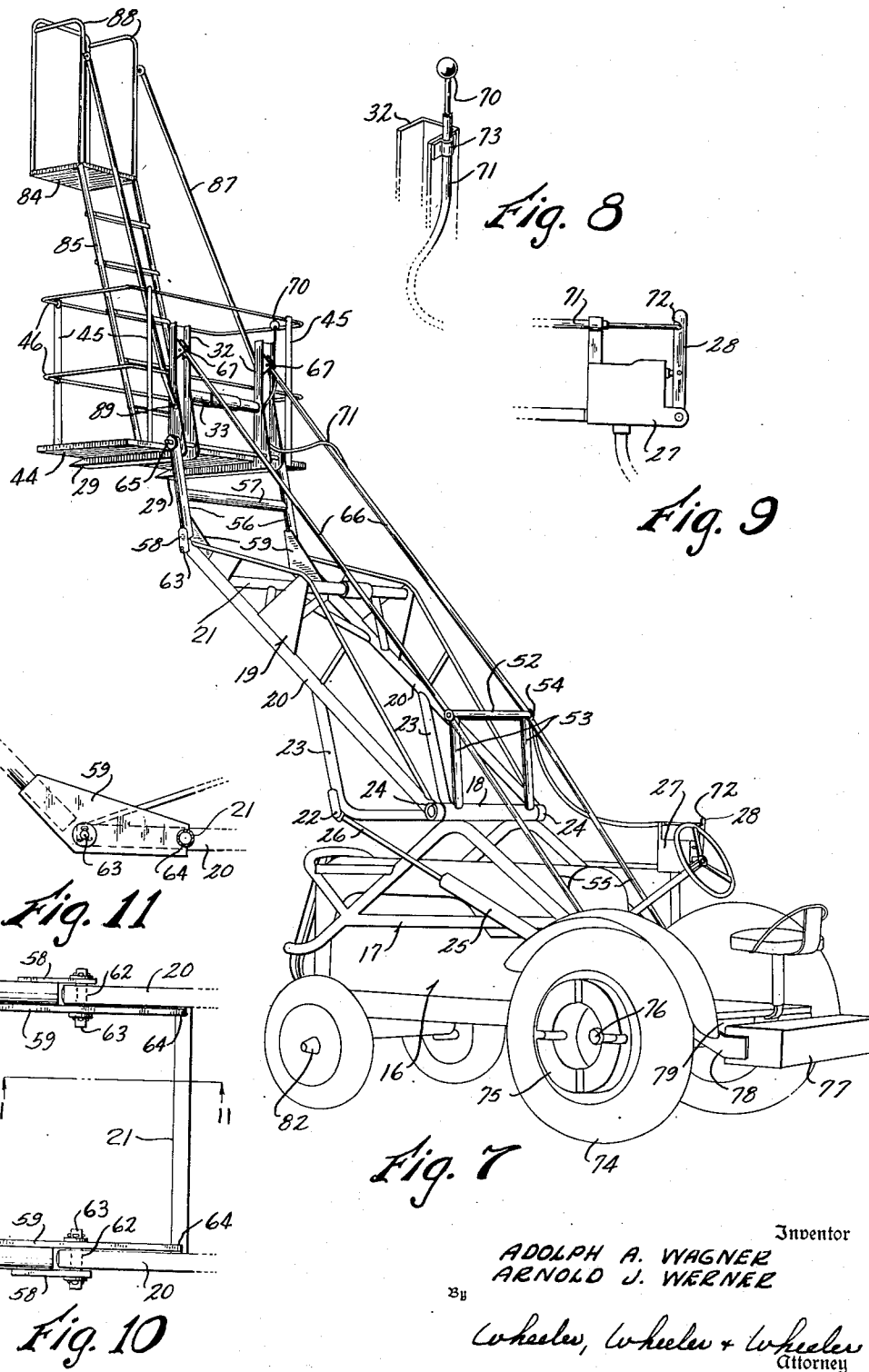
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3 Sheets-Sheet 3



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PLATFORM ATTACHMENT FOR TRACTORS

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Application March 10, 1950, Serial No. 148,962

8 Claims. (Cl. 304-29)

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This invention relates to a platform attachment for a tractor.

It is the principal object of the invention to provide a utility platform and mounting readily applicable to, and removable from the front end of a tractor dipper stick. In this connection it is an object of the invention to apply the platform in such a manner as to insure its remaining level in all positions of dipper stick elevation.

Another object of the invention is to provide the dipper stick with a novel extension or link structure upon which the platform may be carried to increase its range of use, said extension being detachably connectible to the dipper stick whereby the platform may be interchangeably applied either directly to the dipper stick or to the extension which is in turn carried by the dipper stick.

A further object of the invention is to provide the platform with control means within the reach of a workman riding the platform whereby dipper stick and platform movement may be controlled from the platform.

A still further object of the invention is to provide the tractor with counterweights whereby the capacity of the platform and the extent to which it may be manipulated is materially increased.

This application is a companion to our copending application entitled "Hydraulic Front End Power Lift Attachments For Tractors," Serial No. 148,961, filed March 10, 1950.

Other objects and advantages will be more apparent upon examination of the following disclosure.

In the drawings:

Fig. 1 is a perspective view of a tractor equipped with a dipper stick mounting, a fork lift attachment, and front end hydraulic power means for the manipulation of the fork lift.

Fig. 2 is a fragmentary perspective view of the fork lift and dipper stick with the dipper stick raised.

Fig. 3 is a fragmentary plan view of the front end of the dipper stick showing the pivotal and hydraulic connections between the fork lift and dipper stick.

Fig. 4 is a fragmentary front end perspective view of a utility platform mounted on the fork lift of Fig. 1.

Fig. 5 is a side elevational view of the utility platform mounted upon the fork lift attachment of Fig. 1, showing the raised position of the dipper stick.

Fig. 6 is a view in side elevation of a modification of the invention whereby the articulate dipper stick is provided with a detachably rigidly

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connected extension upon which the platform is mounted to give the platform an increased range of use.

Fig. 7 is a perspective view of the device of Fig. 6 with the dipper stick in raised position.

Fig. 8 is a detached perspective view of the remote control mounted on the utility platform.

Fig. 9 is a detached side elevational view of the tractor hydraulic side cylinder control valve and its connection with the platform remote control.

Fig. 10 is a fragmentary plan view of the detachably rigid connection between the extension link and the tractor dipper stick.

Fig. 11 is a cross section taken through the lines 11-11 of Fig. 10.

As also disclosed in our co-pending application entitled "Hydraulic Front End Power Lift Attachments For Tractors" a tractor, indicated generally as 16, may be provided with a base or mounting frame, indicated generally as 17, which is rigidly connected to the front and rear axles of the tractor. The base frame 17 has a tubular top cross member 18 upon which a dipper stick frame, indicated generally as 19 and comprising longitudinally extending laterally spaced levers 20, is pivoted on a rock shaft bearing in the tubular cross member 18 and journaled in the sockets 24 at the rear ends of the levers 20. The dipper stick frame 19 is further provided with a front cross member 21.

The dipper stick frame 19 is pivotally movable about the base frame cross member 18 by means of the paired hydraulic side cylinders 25. Cylinders 25 are disposed at either side of the tractor upon pivotal connections with the bottom rear ends of the base frame and are provided with extensible piston rods 26 pivoted at 22 to the depending side arms 23 of the cantilever dipper stick. Fluid pressure to the hydraulic cylinders is supplied by a pump (not shown) through the control valve indicated generally at 27. The control valve 27 is manually actuated by a handle 28 mounted on the valve, the valve and handle being within the reach of the tractor operator.

As best shown in Fig. 1 the dipper stick 19 may be provided with a fork lift attachment having forwardly extending fingers 29 and upstanding back members 32. The back members 32 are interconnected by means of the cross member 33. As best shown in Fig. 3 the fork lift is pivoted to the front ends of the levers 20 on pin mounts 43. The fork lift is manipulated about the pins 43 by means of the hydraulic front end cylinder 36 which is pivoted at 37 to the dipper stick cross member 38. The cylinder 36 is pro-

vided with an extensible piston rod 35 which is pivoted at 34 to the fork lift cross member 33. The hydraulic cylinder is supplied at either side of the piston plunger with hydraulic fluid through the feed lines 30, 40, which lead to a control valve within the operator's reach. Fluid pressure is supplied to the cylinder in either direction and serves to manipulate the fork lift upon its pivotal connections at 43 with the spaced arms 20 of the dipper stick frame 19.

As best shown in Figs. 4 and 5 a utility platform comprising a floor 44, upstanding stanchions 45 and guard rails 46 may be positioned on the fork lift and secured thereto by the eye bolts 47 which tie one of the guard rails 46 to the upstanding backs 32 of the fork lift. In this construction the front end hydraulic cylinder 36 is removed from the dipper stick frame or otherwise disengaged from connection with the fork lift and is replaced by a pair of link members 48 which are pivotally connected at 49 with the rear faces of the back members 32 of the fork lift. The rear ends of the links 48 are pivotally connected to pins 54 journaled in the ends of a cross member 52 supported above base frame cross member 18 upon upright standards or masts 53 which are welded or otherwise fixed to the base frame cross member 18 (see Figs. 5 and 7). The cross member 52 is braced by the tie bars 55 which extend from the cross member 52 to a spaced connection at the rear portion of the base frame 17. As best shown in Fig. 5 this construction comprises a parallelogram, the opposite sides of which are the links 48 and dipper stick levers 20, and the fork backs 32 and link masts 53. The pivots 43, 49, 54 and 24 comprise the corners of the parallelogram. Articulation of the dipper stick upon the base frame will be effective to raise and lower the platform, which will remain level throughout as a consequence of parallelogram action.

The utility platform is primarily useful in conveying personnel from one level to another for purposes of inspection of equipment, painting, carpentry work, etc. and for materials handling work.

The utility platform is readily removable from the fork lift and the hydraulic cylinder 36 is similarly readily replaceable. Consequently the tractor and boom may be rapidly converted from one field of use to another.

As best shown in Figs. 6 and 7, the dipper stick 19 may be provided with extension or link arms 56 upon which the platform and fork lift may be mounted to increase the height to which the utility platform is movable and otherwise increase its range of use. The extension arms 56 are provided with a cross member 57 and may be detachably but rigidly secured to the forwardly projecting ends of the spaced arms 20 of the dipper stick frame 19.

As best shown in Figs. 10 and 11 the link arms 56 are respectively provided with plates or brackets 58, 59 which are fixed at opposite sides of the arms 56. The plates are provided with aligned apertures which align with the pivot sockets 62 of the dipper stick arms 20 to receive the pivot pins 63. The link arms, however, are not permitted to pivot on the pins 63 as the inner plates 59 are extended rearwardly from the pivot pins and are provided with forks 64 which embrace the dipper stick cross member 21. In this manner the link arms 56 rigidly but detachably comprise extensions of the dipper stick lever 20 and the fork lift pivot may be transferred from

the end of the dipper stick 20 to the pivotal connection at 65 with the extended ends of the link arms 56.

In order to accommodate the extended dipper stick the links 48 are replaced with longer links 66 which are pivotally connected to the rear faces of the fork lift backs 32 on the transverse pivots 67 in the same manner as pivots 49 in the modification of Fig. 5. In the extended embodiment of the invention the pivots 65, 67 and 54 and 24 define the corners of the parallelogram which including the parallel fork lift backs 32 and link standards 53, and the parallel links 66 and a line connecting pivot 65 with pivot 24. The said line is defined by the rigidly connected dipper stick arms 20 and extension links 56.

As best shown in Figs. 7, 8 and 9 dipper stick articulation may be controlled from the utility platform by means of any remotely operable motion transmitting connections, such as a Bowden wire 71 having an actuating handle 70. The Bowden wire leads from the platform to a connection at 72 with the control lever 23 of the side cylinder control valve 27. Bowden wire 71 is mounted upon one of the fork backs 32 on a bracket 73 and enables a worker on the platform to remotely control the height of the platform by merely manipulating handle 70. Both embodiments of the invention shown in Figs. 5 and 6 are provided with the remote control apparatus.

As best shown in Figs. 6 and 7 the utility platform may be further provided with an extension platform 84 supported above the floor 44 of the utility platform on ladder 85 connected at the bottom rear corner of the platform 84 and bolted as shown at 86 on brackets to the floor 44. The extension platform is braced in position by the braces 87 substantially paralleling the ladder and which also serve as hand rails. The braces 87 connect with the railing 68 of the platform and are bolted at 89 to the fork backs 32. The extension platform increases the utility of the platform as a workman may ascend to greater height than with the utility platform alone.

In order to enable the utility platform to carry relatively heavy loads, and to offset the weight shift resultant from extending the platform as shown in Figs. 6 and 7, the rear wheels 74 of the tractor may be provided with counterbalancing weights 75 which are bolted to the hubs 76 of the wheels 74. Furthermore, a utility box 77 which is attached by means of the bracket 78 to the rear frame member 79 of the tractor, when fully loaded, further acts as a counterbalance to stabilize the extended or loaded utility platform.

In operation the loaded device will tend to pivot about the front wheel axle 82 of the tractor. The disposition of the counterbalancing weight 75 and loaded utility box 77 at or behind the rear wheels is particularly effective to counterbalance the utility platform.

From the foregoing description it is readily seen that the utility platform may be conveniently applied to a tractor dipper stick having a fork lift merely by adding the link members 48 or 66 and disengaging the front end cylinder 36 from connection with the fork lift. Where a greater range of utility platform articulation is desired, the extension links 56 may be further added to the same dipper stick 19 by means of the detachable rigid connections as described and without requiring the substitution of an additional extra length dipper stick for that normally used. In either the conventional or extended dipper stick construction a remote dipper

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stick control is provided operable from the utility platform, thereby eliminating the necessity for an operator to remain in the driving seat of the tractor.

We claim:

1. In a device of the character described, an extension link adapted for detachable rigid connection with a tractor dipper stick having spaced lever arms and a cross member proximate the forward ends of the arms, said extension link comprising spaced arms, a detachable connection between said link arms and said dipper stick arms and a stabilizing member fixed to the link arms and extending rearwardly to fixedly engage the dipper stick cross member to restrain link arm articulation respecting the dipper stick arms, said stabilizing member comprising means for mounting said extension link at an oblique angle with said dipper stick arms.

2. The device of claim 1 wherein said stabilizing member comprises a rearwardly open fork extending to embrace the dipper stick cross member.

3. An attachment for a tractor provided with dipper stick and a frame to which the dipper stick is pivoted and on which frame the dipper stick is swingable between an elevated position and a lowermost position in which its swingable end is proximate the ground, said attachment comprising a platform, a mounting for the platform, and an extension link pivoted at one end to the mounting and detachably rigidly connected at an oblique angle at its other end to the dipper stick whereby the extension link substantially parallels the ground in the lowermost position of the dipper stick, a superstructure link pivotally connected to the frame and to the platform mounting at a point spaced from said extension link, the link and dipper stick being non-parallel but the effective length of the combined dipper stick and extension link being substantially equal to the length of the superstructure link whereby the respective pivots on the mounting and frame comprise the corners of a parallelogram whereby the platform will remain level throughout dipper stick articulation.

4. The device of claim 3 further provided with an extension platform on said first mentioned platform, said extension platform being elevated above said first mentioned platform and accessible therefrom by means of a ladder by which personnel riding the same platform may move from one platform to another, said ladder comprising a support for said extension platform, said extension platform being braced by braces substantially paralleling said ladder and acting as hand rails.

5. For use with a dipper stick pivoted for swinging movement, and having a cross member proximate its free end, an extension link comprising spaced arms substantially aligned with

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the arms of the dipper stick but at an oblique angle thereto, means for detachably connecting said link to said dipper stick and comprising a plate having a central mounting portion adapted for connection with the dipper stick arms, said plate having obliquely related legs, one of said legs being fixed to the arms of the extension link and the other leg comprising a rearwardly open fork adapted for engagement with the dipper stick cross member.

6. An attachment for a tractor provided with a mounting frame including a dipper stick pivot, a mast and a truss link pivot on the mast, said attachment comprising a dipper stick mounted on the dipper stick pivot and swingable thereon between an elevated position and a lowered position in which the end of the dipper stick is proximate the ground, an extension link and means for mounting the extension link at the end of the dipper stick whereby the extension link parallels the ground in the lowered position of the dipper stick, a platform pivotally mounted at the end of the extension link and substantially aligned with the extension link in the lowered position of the dipper stick whereby the platform parallels the ground, and a truss link pivoted to the platform and to the truss link pivot on the mast, said truss link being non-parallel to said dipper stick and to said extension link.

7. The device of claim 6 in which the means for mounting the extension link on the dipper stick comprises a detachable rigid connection with the dipper stick, said extension link being mounted by said means at an oblique angle to the dipper stick.

8. The device of claim 7 in which said means further comprises a fixed stabilizing member having a rearwardly open fork extending away from said extension link to embrace a dipper stick member.

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