

Jan. 9, 1968

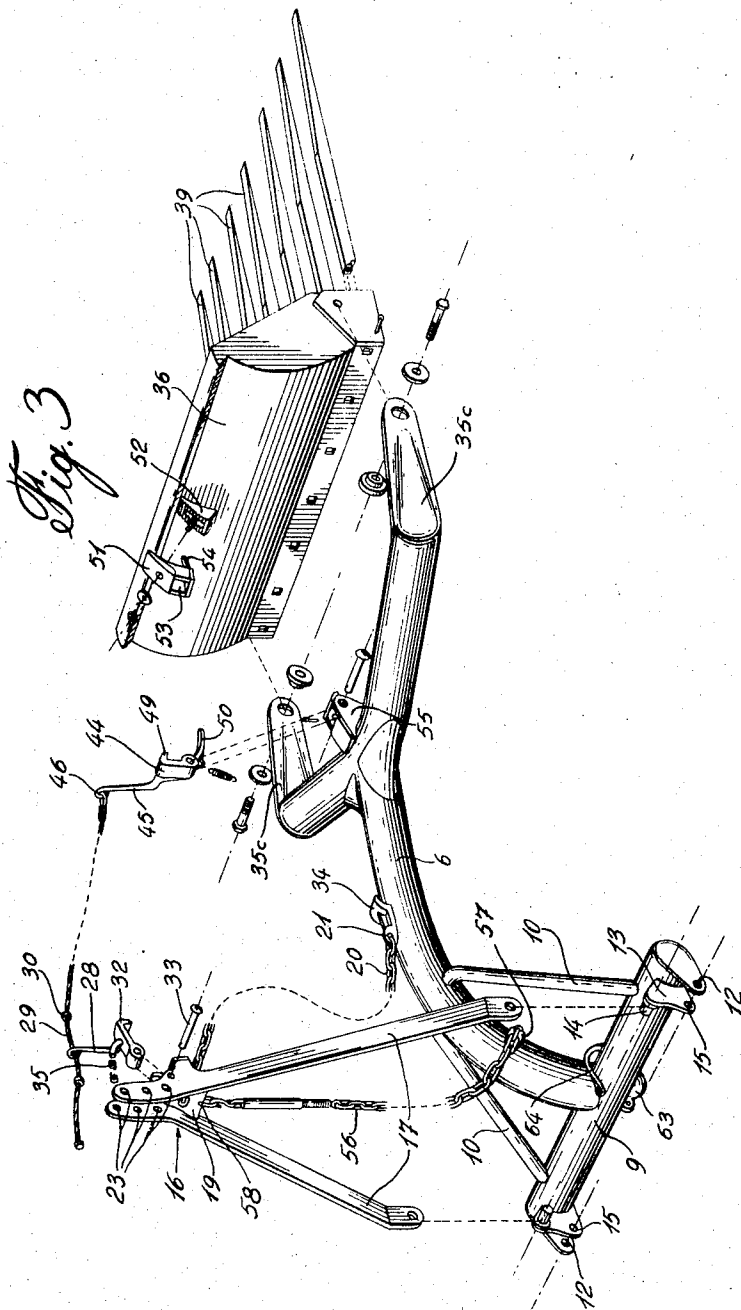
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3,362,554

REAR-END HYDRAULIC LOADER FOR TRACTOR

Filed July 14, 1966

4 Sheets-Sheet 2



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4 Sheets-Sheet 5

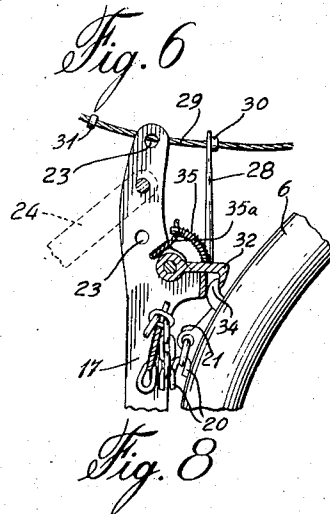
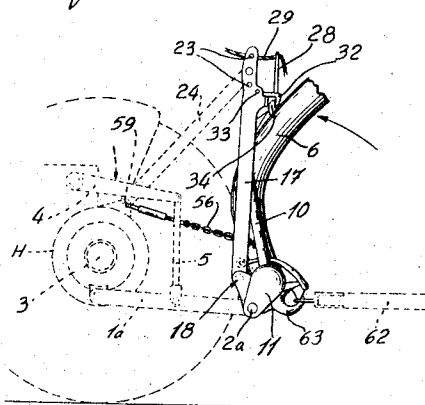
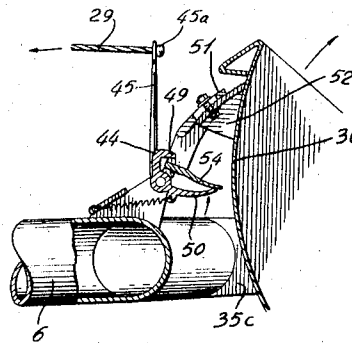
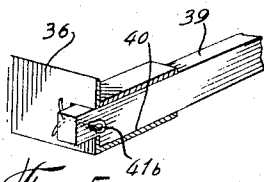
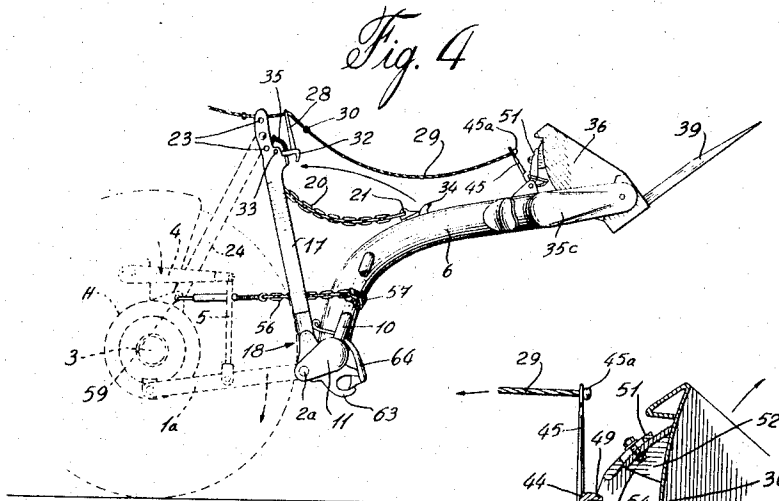


Fig. 7

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4 Sheets-Sheet 4

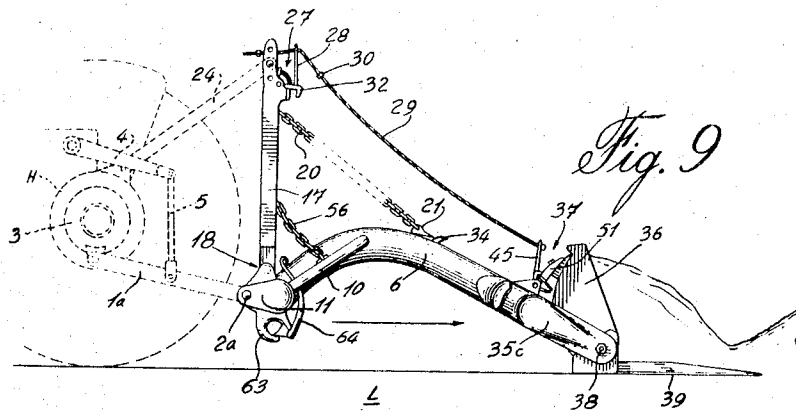


Fig. 9

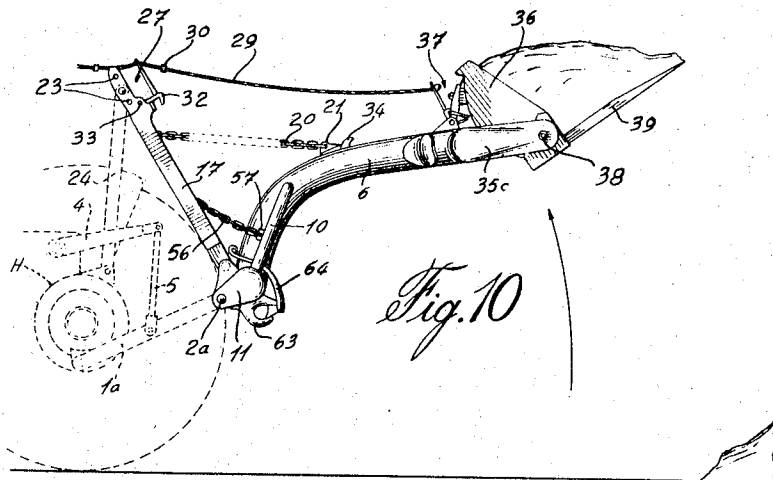


Fig. 10

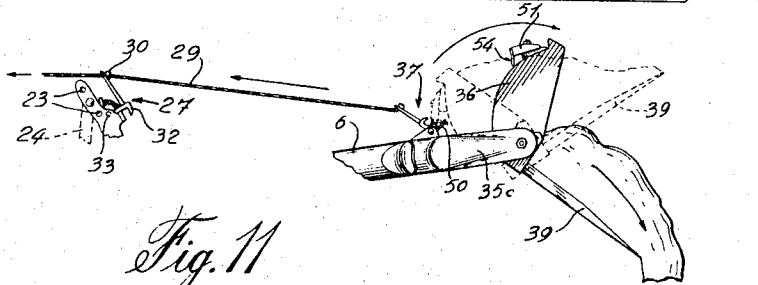


Fig. 11

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REAR-END HYDRAULIC LOADER FOR TRACTOR

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12 Claims. (Cl. 214-766)

This invention relates to a loading device. More particularly, the invention is directed to a rear-end hydraulic loader for tractors especially designed for loading manure into manure spreaders. However, the loading device according to the invention may also be modified for loading other types of material.

The loader according to the present invention is particularly adapted to be used in combination with a farm tractor provided with a conventional lifting mechanism at the back thereof.

In my Canadian Patent No. 598,427, issued on May 24, 1960, I have described a loader which is power actuated by the lifting mechanism of the tractor between a lowered and an elevated position for loading operation of the tractor and which is provided with means for automatically raising the loader into an upright, inoperative position upon actuation of the lifting mechanism whereby the loader clears the back of the tractor so that a vehicle such as a manure spreader may be hitched to and pulled by the tractor without having to dismount the loader. Such means for automatically raising the loader into an upright, inoperative position has been described as a tension member freely extensible between a retracted and an elongated position and to be mounted between the tractor and the arm of the loader and having means for locking the tension member in a retracted position.

It has been found that the tension member described in my above-identified Canadian patent is a device which is too complex and the operation thereof is too awkward to be utilized with advantage in a rear-end hydraulic loader for tractor.

I have found that the above disadvantage may be overcome by providing in a rear-end hydraulic loader for a tractor having a pair of lifting levers at the back thereof and power means for raising and lowering said lifting levers, and wherein the loader comprises a main arm having a transverse leg at the inner end thereof, the outer ends of said transverse leg being pivotally connected to said pair of lifting levers, a loading device being mounted at the outer end of said main arm, an upstanding member being pivotally connected to said main arm at its lower end on said transverse leg, a link being pivotally connected to the upper end of said upstanding member and to said tractor at a point above the points of attachment of said lifting levers to said tractor, a first collapsible tension member between said upstanding member and said main arm and a second collapsible tension member attached at one end thereof to said main arm at a point between the inner end of said main arm and the point of attachment of said first collapsible tension member on said main arm, said second collapsible tension member being adapted to be connected at the other end thereof in an inoperative freely extensible position on said upstanding member when said lifting levers are caused to raise and lower said main arm and upstanding member between a lowered and a raised upwardly inclined position for normal loading operation, the second collapsible tension member being adapted to be connected in an operative stretched position to said tractor at a point above the points of attachment of said lifting levers to said tractor to cause stretching of said second collapsible tension member and pivoting of said main arm into an inoperative upright position.

In the drawings which illustrate embodiments of the invention,

FIG. 1 is a perspective view of the rear-end hydraulic loader according to the invention;

FIG. 2 is an embodiment of the loading bucket to be mounted on the loader;

5 FIG. 3 is an exploded view of the rear-end hydraulic loader according to the invention;

FIG. 4 is a side elevation view of the rear-end hydraulic loader according to the invention;

10 FIG. 5 is a perspective view illustrating the assembly of a prong on the bucket;

FIG. 6 is a side elevation view of the latching device operating in conjunction with the bucket;

15 FIG. 7 is a side elevation view showing the loader in an inoperative upright position and the attachment of the manure spreader at the back of the tractor;

FIG. 8 illustrates the latching device to maintain the loader in an inoperative upright position;

20 FIG. 9 is a side elevation view of the loader according to the invention in lowered position shown attached to the conventional lifting mechanism of the tractor;

FIG. 10 is a view similar to that of FIG. 9 illustrating the loader in elevated position prior to unloading a bucket of manure; and

25 FIG. 11 is a side elevation view illustrating the unlatching of the latching device and the pivoting of the bucket for unloading manure.

Referring now more particularly to the drawings in which like reference characters indicate like elements throughout, the manure loader is generally indicated at L and is mounted at the back of a conventional farm tractor which is provided with conventional lifting mechanisms. The lifting mechanism comprises a pair of lifting levers 1 which have their forward end pivotally mounted at 2 (FIG. 3) on the differential housing H of the tractor and underneath the tractor driving shaft 3. The lifting levers 1 extend rearwardly laterally of the housing H and are raised or lowered by means of the power arms 4 and connecting rod 5. The lifting mechanism also comprises a pair of auxiliary arms 1a similar to lifting levers 1 which have their forward end pivotally mounted at 2a outwardly of pivot joints 2.

The loader L, in accordance with the present invention, is fitted to the lifting levers 1 and auxiliary arms 1a of the conventional lifting mechanism and all the movements of the loader L are produced by said lifting mechanism.

30 The loader L comprises a tubular main arm 6 having a straight rearward portion 7 and a curved front portion 8. The end of the curved portion 8 is welded or otherwise rigidly secured to a transverse tubular leg 9. Diagonal braces 10 rigidly connect the outer ends of the transverse leg 9 to the main arm 6. Brackets 11 projecting from tubular leg 9 are provided at the outer ends of the transverse leg 9 and are each provided with a pivot hole 12 for pivotally connecting the loader to the outer ends of the auxiliary arms 1a of the conventional lifting mechanism.

35 The tubular leg 9 also comprises a second pair of brackets 13 mounted adjacent the first pair of brackets 11 and oriented in the same general direction, each provided with an inwardly projecting pin 14 and pivot hole 15 which is disposed opposite pivot hole 12 for pivotally connecting lifting levers 1. A stirrup member 16, in the form of an inverted V-shaped element, is disposed over the transverse leg 9 and has the outer end of its two straight legs 17 pivotally connected at 18 (FIGS. 4, 7, 9 and 10) to the pivot pins 14. The apex portion of the stirrup 16 is provided with a web 19 which has a keyhole (not shown) for removably receiving a chain 20 and adjustably securing said chain to said stirrup member 16 by engaging any one of the links of the chain into the restricted portion of the keyhole. The forward end of the chain 20 is attached to an intermediate portion of the main arm 6 by means of

bracket 21. The main arm 6 normally tends to rotate downwardly, with respect to the stirrup member 16, under its own weight and the chain 20 is a collapsible tension member which serves to limit said downward rotational movement of the arm 6 to thereby adjustably vary the angular limit position of the arm 6 with respect to the stirrup 16.

The apex portion 18 of the stirrup 16 is further provided with upward flanges 22 extending from said two legs 17 and are each provided with a series of vertically spaced pivot holes 23 for adjustably pivotally connecting the apex 18 of the stirrup member 16 to a link 24 which is pivotally connected at its forward end 25 to a bracket 26 rigidly secured on top and in the middle of the tractor housing H. The link 24 may be adjustably connected by means of either of the pivot holes 23, to adjust the level of the upwardly inclined position of the loader.

The apex portion 18 of the stirrup member is also provided with a latching member 27 which is pivotally mounted therein and will be more specifically described in detail with reference to FIG. 8 of the drawings. The latching member 27 comprises an actuating arm 28 provided with an eye (not shown) through which a rope 29 provided with a pair of knots 30 and 31 may pass. The arm 28 is fixedly mounted at a 90° angle on a hook 32 which is pivotally connected at 33 on upwardly depending flanges 22. Hook 32 is adapted to engage a hooking block 34 mounted on arm 6 integrally with bracket 21. The latching device 27 finally comprises a spring 35 adapted to engage the hook 32 in latched position over hooking block 34. Spring 35 is in the shape of an arc, is fixed at one end on hook 32 and at the other end on an arm support 35a. The forward end of the rope 29 is attached near the driver's seat of the tractor so as to be accessible to the driver and, as mentioned earlier, is provided with a pair of knots 30 and 31 rearwardly and forwardly of the eye in the arm 28 so that on pulling the rope 29, the knot 30 will abut against the eye 28 to thereby pivot the latching member 27 at 33 to unlatch the main arm 6 from the stirrup member 16. Knot 31 is provided to prevent the escape of rope 29 so that it remains accessible to the driver's arm. The rope 29 also has a further function which will be described more fully in detailed hereinafter.

The outer end of the main arm 6 is provided with a pair of legs 35c (FIGS. 1 and 3) which extend in parallel relationship with respect to each other and are adapted to pivotally engage a bucket 36. A latching member 37 is provided at the junction of the two legs 35c and main arm 6 for unlatching the bucket 36. The bucket 36 is pivotally mounted between legs 35c at pivot joints 38 by any known means such as by a combination of bolts and nuts, as illustrated in FIG. 3. The bucket 36 is of standard shape and size and is further provided with a multiplicity of prongs 39 inserted in holes 40. Instead of prongs 39 to be inserted in holes 40, a bucket extension 41 provided with teeth 41a may also be mounted on bucket 36 in holes 40.

As illustrated in FIG. 5, it will be seen that each prong 39 is inserted in hole 40 and is locked therein by means of a cotter-pin 42.

For a better illustration of the latching device 37, reference is herein made to FIG. 6. The latching device 37 will be seen to comprise a latching lever 44 having an arm 45 provided with an eye 46 (see FIG. 3) to attach rope 29 by means of knot 45a. Besides arm 45, the latching lever 44 also comprises a locking hook 49 and a second arm 50 at a 90° angle with respect to arm 45. The latching device also comprises a locking element 51 (FIG. 3) mounted on bucket 36 by means of support 52. The locking element comprises therein a hole 53 to engage hook 49 to thereby lock said bucket 36 in upright position and an arm 54 to abut against arm 50 which will enable unlatching of the latching device and pivoting thereof in bracket 55 by pulling on cord 29. The latching member 44 is mounted at the junction of said two legs 35c by means of a bracket 55. By pulling on cord 29, the latching element 44 is pivoted in the direction indicated by the arrow in

FIG. 6 wherein hook 49 is disengaged from the hole 53 in locking element 51 and the bucket of manure is unloaded (FIG. 11).

The loader, in accordance with the present invention, is further provided with a second tension member 56 which is connected on said main arm 6 at a point 57 midway between the transverse tubular leg 9 and bracket 21 connecting chain 20. The other end of said chain or tension member 56 may be connected at 58 on web 19 of the stirrup 16 (FIGURE 3) or at a point 59 (FIGURES 4 and 7) on said tractor above the points of attachment of said lifting levers to the tractor. The tension member comprises two sections. One section 60 which is a chain length and another section 61 which is a turn buckle.

The loader is further provided with a latching device to attach the draw bar 62 (FIGURE 7) of the manure spreader (FIGURES 1, 4, 7, 9 and 10) and consists of a hook 63 welded or otherwise secured to the transverse leg 9 underneath the main arm 6 and provided with a pivoted locking member 64 which is manually actuated or could be actuated from the drivers' seat of the tractor by means of any combination of lever and rope (not illustrated).

The loader in accordance with the present invention is operated as follows:

For normal loading operation, the tension member 56 attached at 58 has no action. Thus, raising and lowering of the conventional lifting mechanism of the tractor moves the bucket 36 between a ground level position as shown in FIGURE 9, and upwardly inclined raised position as shown in FIGURE 10. During this movement, the tension member 56 is allowed to move freely, both of its ends being attached respectively at 57 and 58. The stirrup member 16 moves as a unit together with the main arm 6, the latter being maintained in a predetermined angular position with respect to the stirrup 16 by means of the chain 20. This unit moves about the pivot points 2 and 2a (FIGURE 1) through the intermediary of the lifting levers 1 and link 24. To unload the manure from the bucket 36, the latter is unlatched by means of latching device 37 so as to freely pivot downwardly about the pivots 38 by pulling on the rope 29 which unlatches the latching lever 44 from locking element 51.

Whenever it is desired to place the loading device in inoperative upright position, as shown in FIGURE 7, the device is raised to its operative upwardly inclined position, as shown in FIGURE 4, in which position the tension member 56 is attached at 59 on the tractor housing. Upon subsequent lowering of the conventional lifting mechanism, the main arm 6 will pivot upwardly due to the tension exerted by the tension member 56 and will finally take an upright position in which it is locked by the latching member 27 engaging the block 34 on the main arm 6. When the loader is in an upright operative position, the draw-bar 62 of the manure spreader can be easily latched onto the hook 63, just underneath the root of the main arm 6.

To again use the loader, the rope 29 is pulled by the driver to unlatch the latching member 27 from the block 34 whereby the bucket 36 drops into its lowered position ready for the loading operation of the manure spreader after tension member 56 has been removed from its attachment at 59 and connected at 58.

I claim:

1. In a rear-end hydraulic loader for a tractor having a pair of lifting levers at the back thereof and power means for raising and lowering said lifting levers and wherein the loader comprises a main arm having a transverse leg at the inner end thereof, the outer ends of said transverse leg being pivotally connected to said pair of lifting levers, a loading device being mounted at the outer end of said main arm, an upstanding member being pivotally connected to said main arm at its lower end on said transverse leg, a link being pivotally connected to the upper end of said upstanding member and to said tractor at a point above the points of attachments of said lifting

5

levers to said tractor, a first collapsible tension member between said upstanding member and said main arm and a second collapsible tension member attached at one end thereof to said main arm at a point between the inner end of said main arm and the point of attachment of said first collapsible tension member on said main arm, said second collapsible tension member being adapted to be connected at the other end thereof in an inoperative freely extensible position on said upstanding member when said lifting levers are caused to raise and lower said main arm and upstanding member between a lowered and a raised upwardly inclined position for normal loading operation, said second collapsible tension member being adapted to be connected at the other end thereof in an operative stretched position, to said tractor at a point above the points of attachment of said lifting levers to said tractor, to cause stretching of said second collapsible tension member and pivoting of said main arm into an inoperative upright position.

2. In a rear-end hydraulic loader for a tractor as defined in claim 1, wherein said transverse leg is integral with said main arm.

3. In a rear-end hydraulic loader for a tractor as defined in claim 1, which comprises a pair of auxiliary arms pivotally connected at one end thereof to the outer ends of said transverse leg and at the other end thereof to said tractor.

4. In a rear-end hydraulic loader for a tractor as defined in claim 1, wherein said upstanding member consists of an inverted V-shaped member having the lower ends of its legs pivotally connected to a pair of brackets mounted on said transverse leg and having its apex portion so constructed and arranged to be adjustably connected to said link to adjust the level of the upwardly inclined position of the loader.

5. In a rear-end hydraulic loader for a tractor as defined in claim 4, further including a latching member mounted on the apex portion of said upstanding member and engageable with said main arm to maintain said arm in inoperative position.

6. In a rear-end hydraulic loader for a tractor as defined in claim 5, wherein said second tension member comprises a chain portion and a turn-buckle portion to adjust the length thereof.

7. In a rear-end hydraulic loader for a tractor as defined in claim 1, wherein said loading device is a loading bucket provided with means for inserting thereon a multiplicity of prongs or a bucket extension.

8. In a rear-end hydraulic loader for a tractor as defined in claim 7, further including rope means accessible to the driver of the tractor for unlatching said loading bucket.

9. In a rear-end hydraulic loader for a tractor as defined in claim 8, wherein said rope means are operative to unlatch said main arm from said upstanding member in the inoperative, upright position of said main arm.

10. In a rear-end hydraulic loader for a tractor as defined in claim 7, further including a hitching device mounted on said transverse leg underneath said main arm for attachment of draw-bar of a vehicle to be pulled by the tractor.

11. In a rear-end hydraulic loader for a tractor as defined in claim 2, wherein said main arm has a curved portion adjacent said transverse leg and a straight outer portion to clear a vehicle being loaded.

6

12. In a rear-end hydraulic loader for tractor having a pair of lifting levers at the back thereof and power means for raising and lowering said lifting levers, and wherein the loader comprises a main arm having a transverse leg at the inner end thereof, said transverse leg being integral with said main arm, the outer ends of said transverse leg being pivotally connected to said pair of lifting levers and to a pair of auxiliary arms at one end thereof, said auxiliary arms being pivotally connected at the other end thereof to said tractor, a loading device being mounted at the outer end of said main arm, an upstanding member being pivotally connected to said main arm at its lower end on said transverse leg, a latching member being mounted on the apex portion of said upstanding member and engageable with said main arm to maintain said main arm in inoperative position, a link being pivotally connected to the upper end of said upstanding member and to said tractor at a point above the points of attachment of said lifting levers to said tractor, also including rope means accessible to the driver of the tractor for unlatching said loading device, rope means operative to unlatch said main arm from said upstanding member in the inoperative, upright position of said main arm and a hitching device mounted on said transverse leg underneath said main arm for attachment of a draw-bar of a vehicle to be pulled by the tractor, and wherein said main arm has a curved portion adjacent said transverse leg and a straight outer portion to clear a vehicle being loaded, a first collapsible tension member between said upstanding member and said main arm and a second collapsible tension member attached at one end thereof to said main arm at a point between the inner end of said main arm and the point of attachment of said first collapsible tension member on said main arm, said second collapsible tension member being adapted to be connected at the other end thereof in an inoperative freely extensible position on said upstanding member when said lifting levers are caused to raise and lower said main arm and upstanding member between a lowered and a raised upwardly inclined position for normal loading operation, said second collapsible tension member being adapted to be connected at the other end thereof in an operative stretched position to said tractor at a point above the points of attachment of said lifting levers to said tractor to cause stretching of said second collapsible tension member and pivoting of said main arm into an inoperative upright position, said second collapsible tension member comprising a chain portion and a turn-buckle portion to adjust the length thereof, a pair of auxiliary arms pivotally connected at one end thereof to the outer ends of said transverse leg and at the other end thereof to said tractor, said upstanding member consisting of an inverted V-shaped member having the lower ends of its legs pivotally connected to a pair of brackets mounted on said transverse leg and having its apex portion so constructed and arranged to be adjustably connected to said link to adjust the level of the upwardly inclined position of the loader and said loading device being a loading bucket provided with means for inserting thereon a multiplicity of prongs or a bucket extension.

No references cited.

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