Sept. 18, 1962 F. G. MALONEY 3,054,520

FORK LIFT ATTACHMENT FOR TRACTORS

Filed May 11, 1960 2 Sheets-Sheet 1

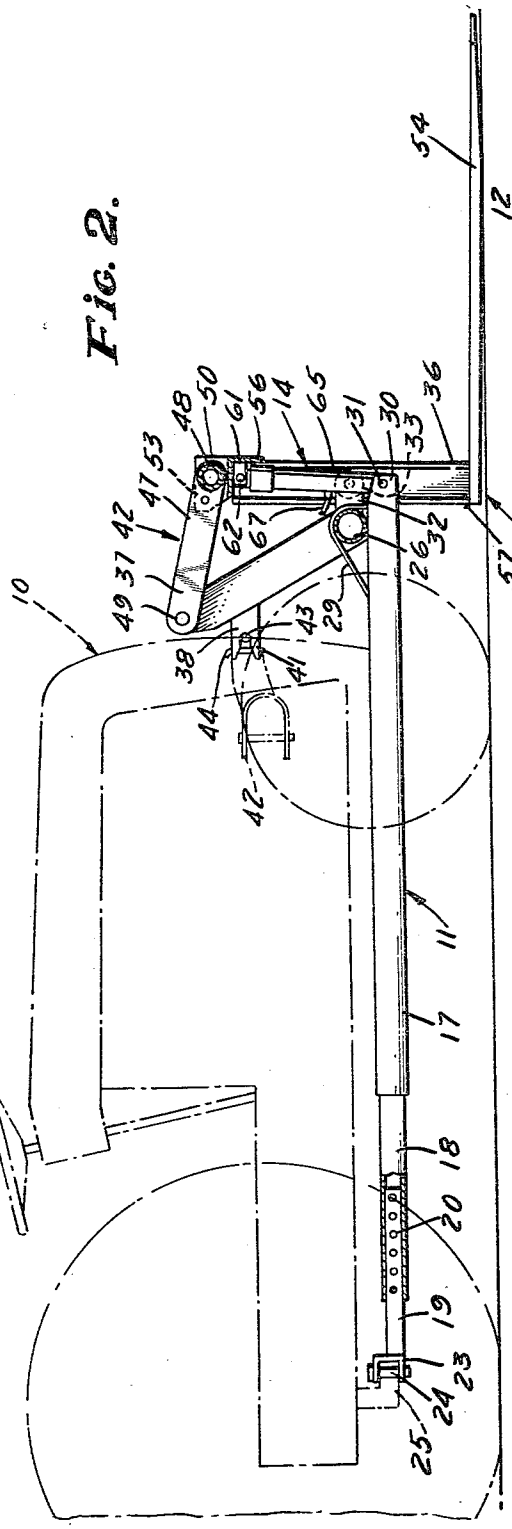


Fig. 2.

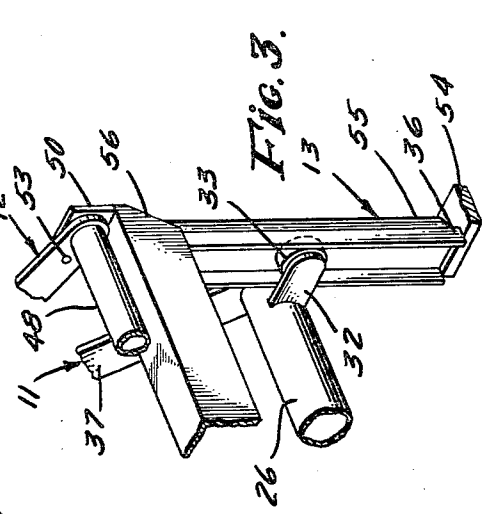


Fig. 3.

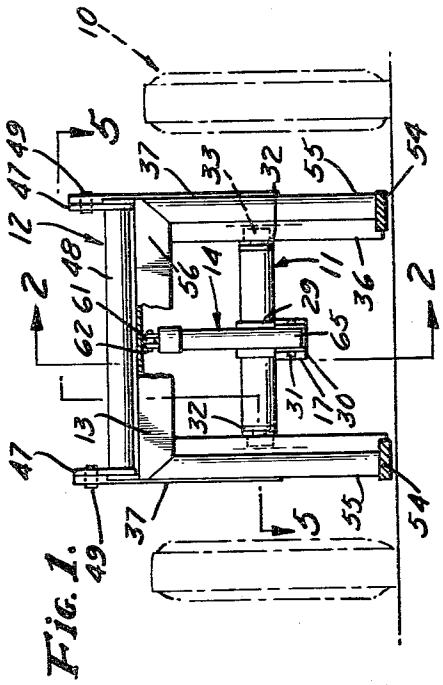


Fig. 1.

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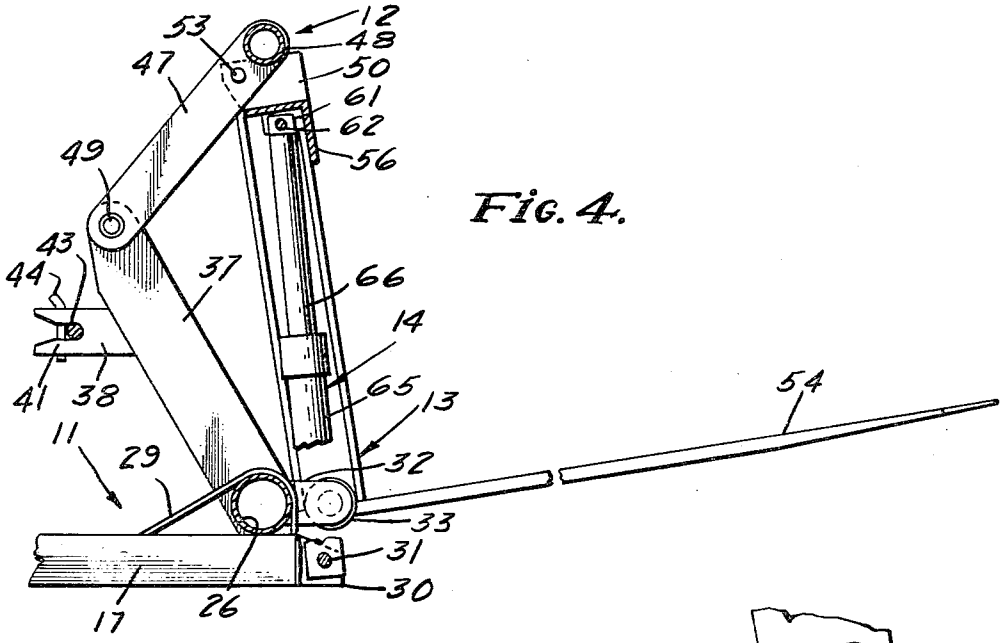


Fig. 4.

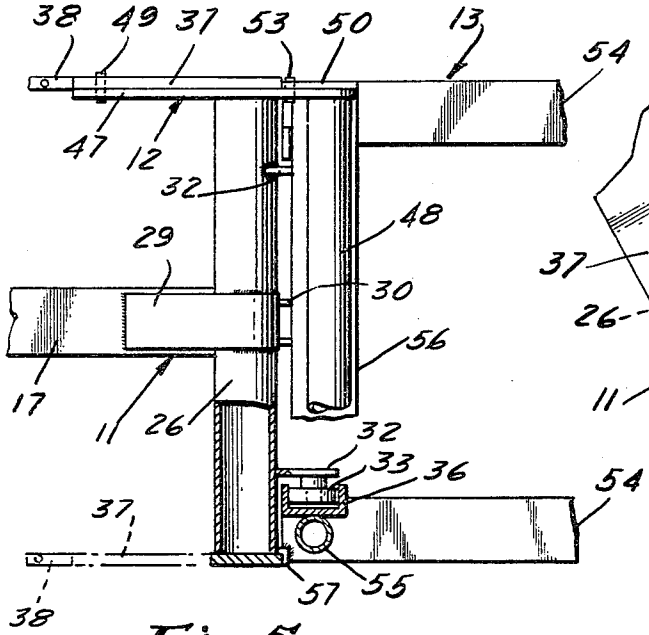


Fig. 5.

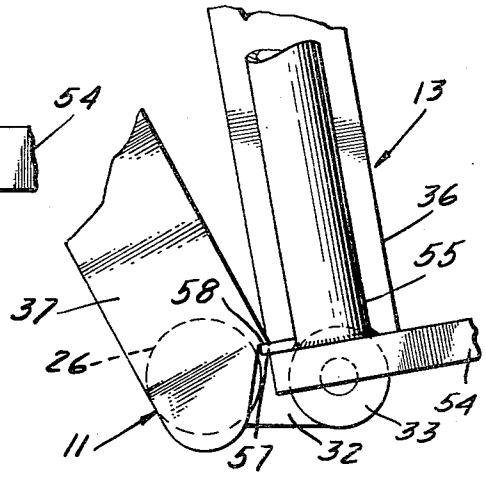


Fig. 6.

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3,054,520

FORK LIFT ATTACHMENT FOR TRACTORS

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Filed May 11, 1960, Ser. No. 28,413
14 Claims. (Cl. 214—620)

This invention relates to fork lifts and more particularly to fork lift attachments adapted to be mounted on the front end of utility type farm tractors.

The tractors have important uses on farms, for example, and in addition to their normal pulling capabilities they can be employed to lift and carry loads by means of a detachable fork lift assembly. In the past some tractors have been constructed with attached fork lifts extending rearwardly of the tractor and for such a tractor a detachable fork lift, to be secured forwardly on the tractor, according to the present invention, is particularly desirable in that it not only provides an additional load carrying means but also provides a support to counterbalance loads carried on the rear fork.

Accordingly, it is one object of the present invention to provide an improved fork lift assembly for attachment to a tractor.

It is a further object of the invention to provide a fork lift assembly which is tilted rearwardly as it is raised on a tractor and which is pivoted as it is lowered to a low loading position so that its pronge are substantially horizontal or tilted downwardly from the horizontal.

It is an object of the invention to provide a simply and ruggedly constructed fork lift assembly which can be easily attached and detached from the front end of a tractor.

It is another object of the invention to provide a fork lift assembly adapted for attachment to various types of tractors by means of brackets on their rear axles and from their front axle supports.

It is still another object of the present invention to provide a fork lift assembly to enable a tractor to carry an additional load forwardly which counterbalances the load carried on the rear fork on the tractor.

Further objects and advantages of the invention may be brought out in the following part of the specification wherein small details have been described for the completeness of disclosure, without intending to limit the scope of the invention which is set forth in the appended claims.

Referring to the accompanying drawings which are for illustrative purposes only:

FIG. 1 is a front elevational view of the fork lift assembly according to the invention showing its relative position with the front wheels of the tractor;

FIG. 2 is a longitudinal sectional view taken as indicated by the line 2—2 of FIG. 1, showing the fork assembly in its lowered position;

FIG. 3 is a fragmentary perspective view illustrating the relationship of the fork assembly, the main supporting frame and the rocker arm of the present invention;

FIG. 4 is an enlarged partially sectioned side elevational view similar to FIG. 2, but illustrating the fork assembly in its raised and tilted position on the main frame of the fork lift attachment;

FIG. 5 is a fragmentary partially sectioned plan view taken as indicated by the line 5—5 of FIG. 1; and

FIG. 6 is a fragmentary side elevational view illustrating the upper limit stops for the fork assembly.

Referring again to the drawings, there is illustrated in FIGS. 1 and 2 a utility tractor 10, shown in dotted lines, and having a forwardly extending fork lift attachment detachably secured thereto. The fork lift attachment is

comprised of a main frame 11, a rocker arm assembly 12, a fork assembly 13, and a hydraulic ram 14.

The main frame 11 has an undercarriage 17 formed of an elongated member, rectangular in cross-section, and secured therein is a smaller extension member 18. Extension 18 has substantially the same shape cross-section as the undercarriage and slidably engaged in its rear end is an adjustable boom 19. Adjacent the forward end of boom 19 are a plurality of spaced adjusting holes 20 to permit the extension or retraction of the boom the proper amount for securing it to the rear axle of a tractor. Bolts are inserted into mating holes in the boom and extension for securing the boom to the main frame. At the rear end of the boom 19 is a clevis clamp 23 detachably secured by its pin 24 to a lug 25 extending downwardly from the unshown rear axle of the tractor.

Forming a T with the undercarriage 17 adjacent its forward end is a transverse tubular member 26, the latter being secured to the former by a heavy strap 29, which is welded to both members. Extending forwardly from the front end of the undercarriage are horizontally spaced vertical ears 30 to provide the lower pivotal support at 31 for the ram. Two roller support ears 32 extend forwardly from transverse member 26 inwardly of its ends and in fixed spaced horizontal alignment. Extending outwardly, as best seen in FIGS. 3 and 5, from each of the ears 32 is a roller 33 supported for rotation on a stub axle. The rollers function as a guide for the vertically displaceable track forming channel members 36 of the fork assembly 13.

Welded to each of the ends of the transverse member 26 are a pair of upwardly and rearwardly extending support arms 37 and extending rearwardly and substantially horizontally from each of the latter, adjacent their upper ends, are bracket ears 38. Each of the two bracket ears 38 has inwardly extending from its rearward edge a V-shaped opening forming a clevis clamp 41 for securing the front end of the main frame 11 to suitable brackets 42, shown in dotted lines in FIG. 2, extending forwardly from each of the opposite sides of the front axle support members of the tractor. Each bracket 42 and clamp 41 are joined by a heavy pin 43 which is held horizontally in place by pin 44. Brackets 42 may be of various shapes according to those the tractor axle supports on which they are to be fitted and all may be made to be easily secured to clamp 41 by means of the pin 43.

The rocker arm assembly 12 is comprised of a pair of rearwardly extending rocker arms 47 and are secured at their forward ends on opposite ends of a tubular transverse rocker support member 48. The transverse member 48 extends generally forwardly and upwardly of the main frame in position so that rocker arms 47 on each side are in longitudinal alignment with corresponding support arms 37, the corresponding rocker and support arms being pivotally engaged on opposite sides of the frame by pivots 49. The forward end of the rocker arm assembly fits between two vertically directed ears 50 extending upwardly from the fork assembly. A rocker arm 47 on each side is pivotally engaged at 53 to the corresponding oppositely disposed ears 50 longitudinally inwardly of the tubular support member 48.

The fork assembly 13 includes a pair of two forwardly directed transversely spaced prongs 54, each having secured at its inner rear surface one of the inwardly opening track forming channels 36. Transversely outwardly of the channels on the rear ends of the prongs are upwardly extending tubular support members 55. Welded to the upper end of the parallel channels 36 and the tubular supports 55 on both prongs is a transverse L-shaped upper support member 56 having a vertical leg directed downwardly, forwardly of the supports 55, and having the inner surface of its horizontal leg in abutment with the

upper ends of the channels and tubular supports. The fork assembly pivot ears **50** are welded at the opposite ends of the upper surface of the L-shaped member **56**, and as previously stated, the channels are slidably engaged with the fixed corresponding guide rollers **33**.

As best seen in FIGS. 5 and 6, stop lugs **57** are secured to the upper and outer rear end surface of the prongs **54** to limit the upward movement of the fork assembly on the main frame when the lugs make contact with limit stop surfaces **58** adjacent the lower forward end of the support arms **37**.

Hydraulic ram **14** extends from the lower forward end of the undercarriage **17**, where it is pivotally engaged at **31**, to the upper central inner surface of the horizontal leg of the L-shaped member **56** to which it is pivotally engaged to ear **61** by pivot pin **62**. The ram is composed of a lower cylinder **65**, as best seen in FIGS. 1, 2 and 4, and the piston **66** which is slidably and sealably engaged in the latter and which extends upwardly and outwardly therefrom to the pivot. As shown in FIG. 2, the ram has a combined inlet and outlet fitting **67** which permits the entry of a hydraulic fluid under pressure and the release thereof when the pressure is released. The fluid pressure source is a hydraulic pump, not shown, secured to the tractor as a part of its auxiliary equipment. In view of the foregoing, it is clear that the various parts are easily assembled and easily adjusted to be secured to a variety of types of tractors.

In operation, the pressure is released from the hydraulic ram **14** to move the fork assembly **14** to its lower position, shown in FIGS. 1 and 2, and the tractor is moved forwardly to place the prongs **54** under the unshown load. When the latter has been accomplished, pressure is applied to the hydraulic ram from the source within the tractor through the inlet **67** to cause the piston **66**, as shown in FIG. 4, to move outwardly of its cylinder **65** and to thereby raise fork assembly **13** on fixed rollers **33** which guide it in its upward movement by their slidable engagement in the tracks formed by the inwardly directed channels **36**. The upper limit of the movement is determined by the positioning of the limit surfaces **58** which stop the lugs **57** on contact.

By the pivotal arrangement between the support arms **37**, the rocker arms **47**, and the pivots **53** on ears **50** on the fork assembly, the latter is tilted rearwardly at about 10° as it moves upwardly. That is, since the channels can pivot on the rollers and the rocker assembly **12** is secured to the supports **37** at **49**, rearwardly of the rollers, when the fork assembly **13** is moved upwardly, it must be tilted rearwardly because the rocker arms **47** are pivoted upwardly to shorten the horizontal distance from the pivot point **49** to the channels, or stated differently, as the upper ends of the rocker arms are raised, they pull the work assembly rearwardly. This provides the advantages of carrying the load in a secure position and increases the clearance under the prongs **54** between them and the road surface.

Similarly, when the hydraulic pressure in the ram is released, the weight of fork assembly and/or the load causes the former to be lowered and be returned to its untilted position in which the prongs are substantially horizontal or tilted slightly below the horizontal, as shown in FIG. 1.

I claim:

1. For attachment to a tractor, a fork lift assembly comprising: a main frame; means on said main frame for detachably securing it on a tractor; a fork assembly having upwardly extending members and two forwardly directed transversely spaced prongs extending from its lower end; guide means extending from said main frame being slidably and pivotally engaged with said upwardly extending members; pivotable means securing said upwardly extending members to said main frame rearwardly of and above said guide means; and means associated with said upwardly extending members and said main frame to raise said fork assembly with respect to said main frame and said guide members to a load carrying position, while moving said upwardly extending members upwardly on said guide means and pivoting said pivotable means rearwardly and upwardly, and to lower said fork assembly to a low loading position while pivoting said pivotable means forwardly and downwardly.

2. For attachment to a tractor, a fork lift assembly comprising: a main frame; means on said main frame for detachably securing it on a tractor; a fork assembly having upwardly extending members and forwardly directed transversely spaced prongs extending from its lower end; guide means extending from said main frame being slidably engaged with said upwardly extending members; means associated with said upwardly extending members and said main frame for raising and lowering said fork assembly with respect to said main frame and said guide members to respectively place said prongs in a raised load carrying position and a lowered loading position; and means associated with said upwardly extending members and said main frame responsive to the raising movement of said fork assembly for moving said prongs to vary their position respectively in the load carrying and loading positions.

3. For attachment to a tractor, a fork lift assembly comprising: a main frame; means on said main frame for detachably securing it on a tractor; a fork assembly having upwardly extending members and forwardly directed transversely spaced prongs extending from its lower end; guide means extending from said main frame being slidably engaged with said upwardly extending members; means associated with said upwardly extending members and said main frame for raising and lowering said fork assembly with respect to said main frame and said guide members to respectively place said prongs in a raised load carrying position and a lowered loading position; and pivotable means securing said upwardly extending members to said main frame rearwardly of and above said guide means responsive to the raising movement of said fork assembly for moving said prongs to a forwardly and upwardly inclined position in said raised load carrying position.

4. For attachment to a tractor, a fork lift assembly comprising: a main frame having a longitudinal undercarriage supportable at its rear end on the rear axle of a tractor; a transverse frame member secured adjacent the front end of said undercarriage member; support means extending upwardly and rearwardly from said transverse frame member; means on said support means for securing the front end of said main frame to brackets adjacent opposite ends of the front axle of said tractor; rocker means extending rearwardly and having its rearward part extending rearwardly of said transverse frame member, said rocker means having its rearward part pivotally engaged with said support means; a fork assembly having upwardly extending members and having two forwardly directed transversely spaced prongs extending from its lower end; guide means extending forwardly from said transverse frame member, said upwardly extending members being slidably engaged with said guide means, said rocker means pivotally engaged at points adjacent its forward part to pivot means on said upwardly extending members of said fork lift assembly; a hydraulic ram extending between the forward end of said undercarriage and an upper portion of said fork assembly, said hydraulic ram being pivotally secured at its lower end to said undercarriage and having its upper end pivotally engaged with said upper portion; and means to supply hydraulic fluid to said ram to raise said fork assembly and to allow said hydraulic fluid within said ram to be bled therefrom to lower said fork assembly to a low loading position, said last mentioned points on said rocker means being in their most forward position when said prongs are in a low loading position, said points moving rearwardly when said prongs are raised.

5. For attachment to a tractor, a fork lift assembly comprising: a main frame having a longitudinal undercarriage supportable at its rear end on the rear axle of a tractor; a transverse frame member secured adjacent the front end of said undercarriage; a pair of transversely spaced support arms extending upwardly and rearwardly from said transverse frame member; means extending rearwardly from said support arms for securing the front end of said main frame to brackets adjacent opposite ends of the front axle of said tractor; a pair of spaced and transversely aligned rocker arms extending rearwardly and having their rearward ends extending rearwardly of said transverse frame member, one rocker arm having its rearward end pivotally engaged with the upper end of one of said support arms and the other rocker arm having its rearward end pivotally engaged with the upper end of the other of said support arms; an inverted U-shaped frame having one forwardly directed prong extending from one of its lower ends and a second forwardly directed prong extending from the other of its lower ends; guide means extending forwardly from said transverse frame member, the legs forming said inverted U-shaped frame being slidably engaged with said guide means, said rocker arms pivotally engaged at points adjacent their forward ends to pivot means on said U-shaped frame, and a hydraulic ram extending between the forward end of said undercarriage and an upper portion of said U-frame, said hydraulic ram being pivotally secured at its lower end to said undercarriage and having its upper end pivotally engaged with said upper portion; and means to supply hydraulic fluid to said ram to raise said U-frame and said prongs to a load carrying position and to allow said hydraulic fluid within said ram to be bled therefrom to lower said prongs to a low loading position, said last-mentioned points on said forward ends of said rocker arms being in their most forward positions when said prongs are in a low loading position, said points moving rearwardly when said prongs are raised.

6. For attachment to a tractor, a fork lift assembly comprising: a main frame having a longitudinal undercarriage supportable at its rear end on the rear axle of a tractor; a transverse frame member secured adjacent the front end of said undercarriage; a pair of transversely aligned and spaced guide members extending forwardly from said transverse frame member; a pair of transversely spaced support arms extending upwardly and rearwardly from said transverse frame member; means extending rearwardly from said support arms for securing the front end of said main frame to brackets adjacent opposite ends of the front axle of said tractor; a pair of spaced and transversely aligned rocker arms extending rearwardly and downwardly and having their rearward ends extending rearwardly of said transverse frame member, one rocker arm having its rearward end pivotally engaged with the upper end of one of said support arms and the other rocker arm having its rearward end pivotally engaged with the upper end of the other of said support arms; an inverted U-shaped frame having one forwardly directed prong extending from one of its lower ends and a second forwardly directed prong extending from the other of its lower ends; one of the legs forming said inverted U-shaped frame being slidably engaged with one of said guide members and the other of said legs being slidably engaged with the other of said guide members, said rocker arms pivotally engaged at points adjacent their forward ends to pivot means on said U-shaped frame; a hydraulic ram extending between the forward end of said undercarriage and an upper portion of said U-frame, said hydraulic ram being pivotally secured at its lower end to said undercarriage and having its upper end pivotally engaged with said upper portion; and means to supply hydraulic fluid to said ram to raise said prongs and to allow said hydraulic fluid within said ram to be bled therefrom to permit said prongs to be lowered.

7. For attachment to a tractor, a fork lift assembly comprising: a main frame having a longitudinal undercarriage supportable at its rear end on the rear axle of a tractor; a transverse frame member secured adjacent the front end of said undercarriage; a pair of transversely aligned and spaced guide members extending forwardly from said transverse frame member; a pair of fixed and transversely spaced support arms extending upwardly and rearwardly from said transverse frame member; means extending rearwardly from said support arms for securing the front end of said main frame to brackets adjacent opposite ends of the front axle of said tractor; a pair of spaced and transversely aligned rocker arms extending rearwardly and having their rearward ends extending rearwardly of said transverse frame member, one rocker arm having its rearward end pivotally engaged with the upper end of one of said support arms and the other rocker arm having its rearward end pivotally engaged with the upper end of the other of said support arms; a fork assembly having two forwardly directed transversely spaced prongs, a pair of upwardly extending guidable members, one of said guidable members secured to the rear end of one of said prongs and the other of said guidable members secured to the rear end of the other of said prongs; an upwardly extending support member secured to said one of said prongs adjacent its rear end, a second upwardly extending support member secured to the other of said prongs adjacent its rear end, one of said guidable members being slidably engaged with one of said guide members and the other of said guidable members being slidably engaged with the other of said guide members; a transverse upper support member extending between and secured to the upper ends of said guidable members and said support members; transversely spaced means extending from transverse upper support member, said rocker arms being pivotally engaged at points adjacent their forward ends to said last mentioned means; a hydraulic ram extending between the forward end of said undercarriage and said transverse upper support member, said ram being pivotally secured at its lower end to said undercarriage and having its upper end pivotally engaged with said transverse support member; and means to supply hydraulic fluid to said ram to raise said fork assembly to a load carrying position and to allow said hydraulic fluid within said ram to be bled therefrom to lower said fork assembly to a low loading position, said last mentioned points on said forward ends of said rocker arms being in their most forward positions when said fork assembly is in a low loading position.

8. For attachment to a tractor, a fork lift assembly comprising: a main frame having a longitudinal undercarriage supportable at its rear end on the rear axle of a tractor; a transverse frame member secured adjacent the front end of said undercarriage; a pair of transversely aligned and spaced roller support ears extending forwardly from said transverse frame member, each of said roller ears having a roller supported outwardly thereon; a pair of fixed and transversely spaced support arms extending upwardly and rearwardly from said transverse frame member; means extending rearwardly from said support arms for securing the front end of said main frame to brackets adjacent opposite ends of the front axle of said tractor; a rocker arm assembly having a transverse rocker support member, a pair of spaced and transversely aligned rocker arms extending rearwardly from said rocker support member and rearwardly of said transverse frame member, one rocker arm having its rearward end pivotally engaged with the upper end of one of said support arms and the other rocker arm having its rearward end pivotally engaged with the upper end of the other of said support arms; a fork assembly having two forwardly directed transversely spaced prongs, a pair of upwardly extending inwardly opening channels, one of said channels secured to and extending upwardly from the rear end of one of said prongs and the other

of said channels secured to and extending upwardly from the rear end of the other of said prongs, an upwardly extending support member secured to said one of said prongs adjacent its rear end, a second upwardly extending support member secured to the other of said prongs adjacent its rear end, one of said channels being slidably engaged with one of said rollers and the other of said channels being slidably engaged with the other of said rollers; a transverse upper support member extending between and secured to the upper ends of said channels and said upwardly extending support members; transversely spaced means extending from said transverse upper support member, said rocker arms being pivotally engaged at points adjacent their forward ends to said last-mentioned means, said last mentioned points on forward ends of said rocker arms being in their most forward positions when said fork assembly is in a low loading position; a hydraulic ram extending between the forward end of said undercarriage and said transverse upper support member, said ram being pivotally secured at its lower end to said undercarriage and having its upper end pivotally engaged with said transverse support member; and means to supply hydraulic fluid to said ram to raise said fork assembly and allow said hydraulic fluid within said ram to be bled therefrom to permit said fork assembly to be lowered.

9. For attachment to a tractor, a fork lift assembly comprising: a main frame having a longitudinally adjustable undercarriage member supportable at its rear end on the rear axle of a tractor; a transverse frame member secured to the front end of said undercarriage member; a pair of transversely aligned and spaced roller support ears extending forwardly from said transverse frame member, each of said roller ears having a roller supported outwardly thereon; a pair of fixed and transversely spaced support arms extending upwardly and rearwardly from said transverse frame member; a bracket ear extending rearwardly and intermediate the ends of each of said support arms for securing the front end of said main frame to brackets adjacent opposite ends of the front axle of said tractor; a rocker arm assembly having a transverse rocker support member; a pair of spaced and transversely aligned rocker arms extending rearwardly from said rocker support member and rearwardly of said transverse frame member, one rocker arm having its rearward end pivotally engaged with the upper end of one of said support arms and the other rocker arm having its rearward end pivotally engaged with the upper end of the other of said support arms; a fork assembly having two forwardly directed transversely spaced prongs, a pair of upwardly extending inwardly opening channels, one of said channels secured to and extending upwardly from the rear end of one of said prongs and the other of said channels secured to and extending upwardly from the rear end of the other of said prongs; an upwardly extending support member secured to said one of said prongs adjacent its rear end; a second upwardly extending support member secured to the other of said prongs adjacent its rear end, one of said channels being slidably engaged with one of said rollers and the other of said channels being slidably engaged with the other of said rollers; a transverse upper support member extending between and secured to the upper ends of said channels and said upwardly extending support members; a pivot ear extending from one of the ends of said transverse upper support member and a second pivot ear extending from the other end of said last mentioned member, one of said rocker arms pivotally engaged adjacent its forward end to one of said pivot ears and the other of said rocker arms being pivotally engaged adjacent its forward end to the other of said pivot ears; limit stop surfaces on each of said support arms, stop lugs being positioned on said prongs to be moved vertically upward thereon to contact said limit surfaces; and a hydraulic ram extending between the forward end of said undercarriage member and said transverse upper support member, said ram being pivotally secured at its lower end to said undercarriage member and having its upper end pivotally engaged with said transverse support member, a combined hydraulic fluid inlet and bleed off to supply hydraulic fluid to said ram to raise said fork assembly and to allow said hydraulic fluid within said ram to be bled therefrom to permit said fork assembly to be lowered.

10. For attachment to a tractor, a fork lift assembly comprising: a main frame having a longitudinally adjustable undercarriage member supportable at its rear end on the rear axle of a tractor; a transverse frame member secured to the front end of said undercarriage member; a pair of transversely aligned and spaced roller support ears extending forwardly from said transverse frame member, one of said roller ears being adjacent one end of said transverse frame member and the other of said roller ears being adjacent its other end, each of said roller ears having a roller supported outwardly thereon; a pair of transversely spaced support arms extending upwardly and rearwardly from said transverse frame member; a bracket ear extending rearwardly and intermediate the ends of each of said support arms for securing the front end of said main frame to brackets adjacent opposite ends of the front axle of said tractor; a rocker arm assembly having a transverse rocker support member; a pair of spaced and transversely aligned rocker arms extending rearwardly from said rocker support member and extending rearwardly of said transverse frame member, one rocker arm having its rearward end pivotally engaged with the upper end of one of said support arms and the other rocker arm having its rearward end pivotally engaged with the upper end of the other of said support arms; a fork assembly having two forwardly directed transversely spaced prongs; a pair of inwardly opening channels, one of said channels secured to and extending upwardly from the rear end of one of said prongs and the other of said channels secured to and extending upwardly from the rear end of the other of said prongs so as to be in an upwardly aligned parallel relationship with each other; an upwardly extending support tube secured to said one of said prongs adjacent its rear end and outwardly of said one channel, a second upwardly extending support tube secured to the other of said prongs adjacent its rear end and outwardly of the other of said channels, one of said channels being slidably engaged on one of said rollers and the other of said channels being slidably engaged on the other of said rollers; a transverse upper support member extending between and secured to the upper ends of said channels and said support tubes; a pivot ear extending upwardly from one of the ends of said transverse upper support member and a second pivot ear extending upwardly from the other end of said last mentioned member, one of said rocker arms pivotally engaged adjacent its forward end to one of said pivot ears and the other of said rocker arms being pivotally engaged adjacent its forward end to the other of said pivot ears; a hydraulic ram extending between the forward end of said undercarriage member and said transverse upper support member, said ram being pivotally secured at its lower end to said undercarriage member and having its upper end pivotally engaged with said transverse support member; and a combined hydraulic fluid inlet and bleed off to supply hydraulic fluid to said ram to raise said fork assembly and to allow said hydraulic fluid within said ram to be bled therefrom to permit said fork assembly to be lowered.

11. For attachment to a tractor, a fork lift assembly comprising: a main frame having an adjustable longitudinal undercarriage member supportable at its rear end on the rear axle of the tractor; a transverse tubular frame member secured to the front end of said undercarriage member; a pair of transversely aligned and spaced roller support ears extending forwardly from said transverse frame member, one of said roller ears being adjacent one end of said transverse frame member and the other of

said roller ears being adjacent its other end, each of said roller ears having a roller supported outwardly thereon; a pair of support arms extending upwardly and rearwardly from said transverse frame member, one of said support arms extending from one end of said transverse member and the other of said support arms extending from its other end; a bracket ear extending rearwardly and intermediate the ends of each of said support arms for securing the front end of said main frame to brackets adjacent opposite ends of the front axle of said tractor; a rocker arm assembly having a transverse rocker support member; a pair of transversely aligned rocker arms extending rearwardly from said rocker support member and rearwardly of said transverse frame member, one of said rocker arms being secured to one end of said rocker member and the other of said rocker arms being secured to its other end, one rocker arm having its rearward end pivotally engaged with the upper end of one of said support arms and the other rocker arm having its rearward end pivotally engaged with the upper end of the other of said support arms; a fork assembly having two forwardly directed transversely spaced prongs; a pair of inwardly opening channel members, one of said channel members secured to and extending upwardly from the rear end of one of said prongs and the other of said channel members secured to and extending upwardly from the rear end of the other of said prongs so as to be in an upwardly aligned parallel relationship with each other; an upwardly extending support tube secured to said one of said prongs adjacent its rear end and outwardly of said one channel member; a second upwardly extending support tube secured to the other of said prongs adjacent its rear end and outwardly of the other of said channel members, one of said channel members being slidably engaged on one of said rollers and the other of said channel members being slidably engaged on the other of said rollers; a transverse upper support member extending between and secured to the upper ends of said channel members and said support tubes; a pivot ear extending upwardly from one of the ends of said transverse upper support member and a second pivot ear extending upwardly from the other end of said last mentioned member, one of said rocker arms pivotally engaged adjacent its forward end to one of said pivot ears and the other of said rocker arms being pivotally engaged adjacent its forward end to the other of said pivot ears; limit stop surfaces facing downwardly adjacent the lower front ends of each of said support arms; a lug extending rearwardly from one of said prongs in vertical alignment with one of said limit stop surfaces on one of said support arms and a second lug extending rearwardly from the other of said prongs in vertical alignment with the other of said limit stop surfaces on the other of said support arms, said lugs being positioned to be moved vertically upward on said prongs to contact said limit surfaces; a hydraulic ram extending between the forward end of said undercarriage member and said transverse upper support member, said hydraulic ram including a cylinder pivotally secured at its lower end to said undercarriage member; a piston slidably engaged in said cylinder therein and having its upper end pivotally engaged with said transverse support member; and a combined hydraulic fluid inlet and bleed off through said cylinder to supply hydraulic fluid to said cylinder to raise said piston and said fork assembly and to allow said hydraulic fluid within said cylinder to be bled therefrom to permit said fork assembly to be lowered.

12. For attachment to a tractor, a fork lift assembly comprising: a main frame having a longitudinal undercarriage member supportable at its rear end by an adjustable boom slidably adjustable therein, said boom being adapted to have its outer end secured to the rear axle of the tractor; a transverse tubular frame member being secured to said undercarriage by a strap welded to it and to the said front end of said undercarriage; a pair of transversely aligned and spaced roller support ears extending forwardly from said transverse frame member, one of said roller ears being adjacent one end of said transverse frame member and the other of said roller ears being adjacent its other end, each of said roller ears having a roller supported outwardly thereon; a pair of support arms extending upwardly and rearwardly from said transverse frame member, one of said support arms secured to one end of said transverse frame member and the other of said support arms secured to its other end; a bracket ear extending rearwardly and intermediate the ends of each of said support arms for securing the front end of said main frame to brackets adjacent opposite ends of the front axles of said tractor; a rocker arm assembly having a tubular transverse rocker support member; a pair of transversely aligned rocker arms extending rearwardly from said rocker support member and rearwardly of said transverse frame member, one of said rocker arms being secured to one end of said rocker member and the other of said rocker arms being secured to its other end, one rocker arm having its rearward end pivotally engaged with the upper end of one of said support arms and the other rocker arm having its rearward end pivotally engaged with the upper end of the other of said support arms; a fork assembly having two forwardly directed transversely spaced prongs; a pair of inwardly opening channel members, one of said channel members secured to and extending upwardly from the rear end of one of said prongs and the other of said channel members secured to and extending upwardly from the rear end of the other of said prongs so as to be in an upwardly aligned parallel relationship with each other and at approximately 90° to said prongs; an upwardly extending support tube secured to said one of said prongs adjacent its rear end and outwardly of said one channel member, a second upwardly extending support tube secured to the other of said prongs adjacent its rear end and outwardly of the other of said channel members, one of said channel members being slidably engaged on one of said rollers and the other of said channel members being slidably engaged on the other of said rollers; an L-shaped transverse upper support member having one of its L-forming legs directed so as to be in secured abutment with the upper ends of said channels and said support tubes; a pivot ear extending upwardly from one of the ends of said L-shaped member and a second pivot ear extending upwardly from the other end of said L-shaped member, one of said rocker arms pivotally engaged adjacent its forward end to one of said pivot ears and the other of said rocker arms being pivotally engaged adjacent its forward end to the other of said pivot ears; limit stop surfaces facing downwardly adjacent the lower front ends of each of said support arms; a lug extending rearwardly from one of said prongs in vertical alignment with one of said limit stop surfaces on one of said support arms and a second lug extending rearwardly from the other of said prongs in vertical alignment with the other of said limit stop surfaces on the other of said support arms, said lugs being positioned to be moved vertically upward on said prongs to contact said limit surfaces; a hydraulic ram extending between the forward end of said undercarriage member and said L-shaped member, said hydraulic ram including a cylinder pivotally secured at its lower end to said undercarriage member; a piston slidably engaged in said cylinder and having its upper end pivotally engaged with said L-shaped member; and a combined hydraulic fluid inlet and bleed off through said cylinder to supply hydraulic fluid to said cylinder to raise said piston and said fork assembly and to allow said hydraulic fluid within said cylinder to be bled therefrom to permit said fork assembly to be lowered.

13. For attachment to a tractor, a fork lift assembly comprising: a main frame; means on said main frame for detachably securing it on a tractor; a fork assembly

having upwardly extending members and forwardly directed transversely spaced prongs extending from its lower end; guide means extending from said main frame being slidably engaged with said upwardly extending members; means associated with said upwardly extending members and said main frame for raising and lowering said fork assembly with respect to said main frame and said guide members to respectively place said prongs in a raised load carrying position and a lowered loading position; and means associated with said upwardly extending members and said main frame responsive to the raising movement of said fork assembly for moving said prongs to a forwardly and upwardly inclined position in said raised load carrying position.

14. For attachment to a tractor, a fork lift assembly comprising: a main frame having a longitudinal undercarriage supportable at its rear end on the rear axle of a tractor; a transverse frame member secured adjacent the front end of said undercarriage member; support means extending upwardly and rearwardly from said transverse frame member; means on said support means for securing the front end of said main frame to brackets adjacent opposite ends of the front axle of said tractor; rocker means extending rearwardly and having its rearward part extending rearwardly of said transverse frame member, said rocker means having its rearward part pivotally engaged with said support means; a fork assembly having upwardly extending members and having two forwardly directed transversely spaced prongs extending from its lower end; guide means extending forwardly from said transerse frame member, said upwardly extending members being slidably engaged with said guide means, said rocker means being pivotally engaged adjacent its forward part to pivot means on said upwardly extending members of said fork lift assembly; lift means extending between the forward end of said undercarriage and an upper portion of said fork assembly, said lift means being secured at its lower end to said undercarriage and having its upper end engaged with said upper portion; and means to supply power to said lift means to raise said fork assembly to a load carrying position and to lower said fork assembly to a low loading position.

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