United States Patent

[11] **3,554,396**

[72] Inventor **Eugene Demkiw**
Vegreville, Alberta, Canada

[21] Appl. No. **720,511**
[22] Filed **Apr. 11, 1968**
[45] Patented **Jan. 12, 1971**

[54] **FRONT END LOADER**
3 Claims, 7 Drawing Figs.

[52] **U.S. Cl.** **214/140,** 172/273, 172/275
[51] **Int. Cl.** **E02f 3/70**
[50] **Field of Search** ..... 214/140, 131, 145, 130, 152; 172/273, 275, 272, 274; 212/(Inquired)

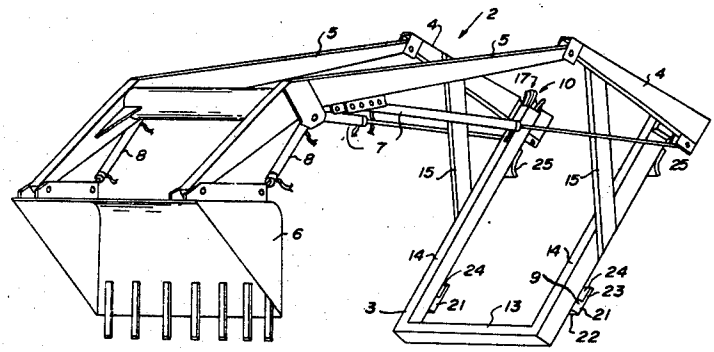
[56] **References Cited**

UNITED STATES PATENTS

3,460,690	8/1969	Seifert	214/140
2,972,424	2/1961	Cadwell	214/131X
3,324,954	6/1967	Westendorf	214/140X
3,403,802	10/1968	Lundell	172/273X

Primary Examiner—Hugo O. Schulz
Attorney—Ernest Peter Johnson

ABSTRACT: A detachable front end loader having a rigid frame comprised of a horizontal U-shaped yoke and vertical rigid posts extending upwardly from the ends of the yoke side members. The usual arms carrying a pivoted bucket at the front end are pivotally mounted at the upper ends of the vertical posts. Hydraulic cylinder piston assemblies actuate the arms and bucket. When not is use, the loader rests with the transverse member of the yoke on the ground and the side members extending upwardly. The tractor's front end, equipped with a pair of outwardly extending, horizontal pins, is driven between the side members so they contact the pins. By a combination of contracting the front cylinder piston assemblies and driving the tractor ahead, the loader can be pivoted around the front pins and slid into operating position supported on front and rear side pins carried by the tractor. Means for locking the loader in place are provided.



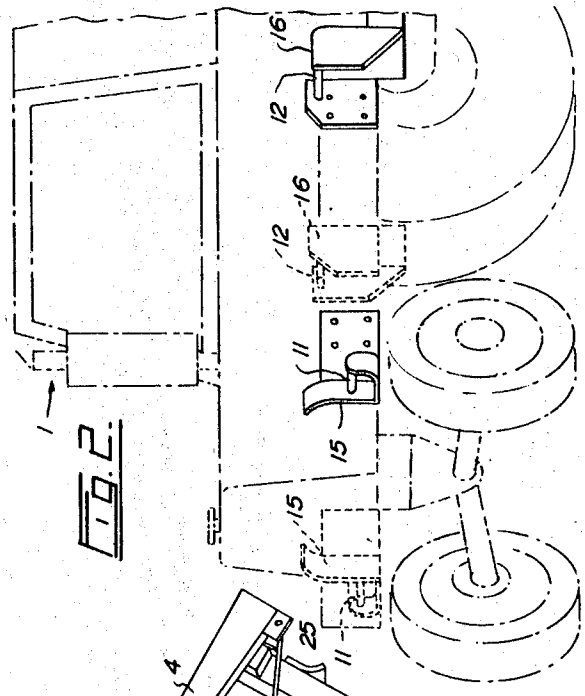


FIG. 2.

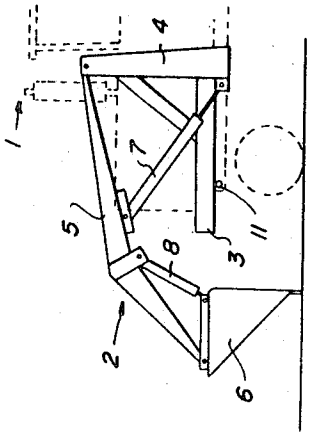


FIG. 7.

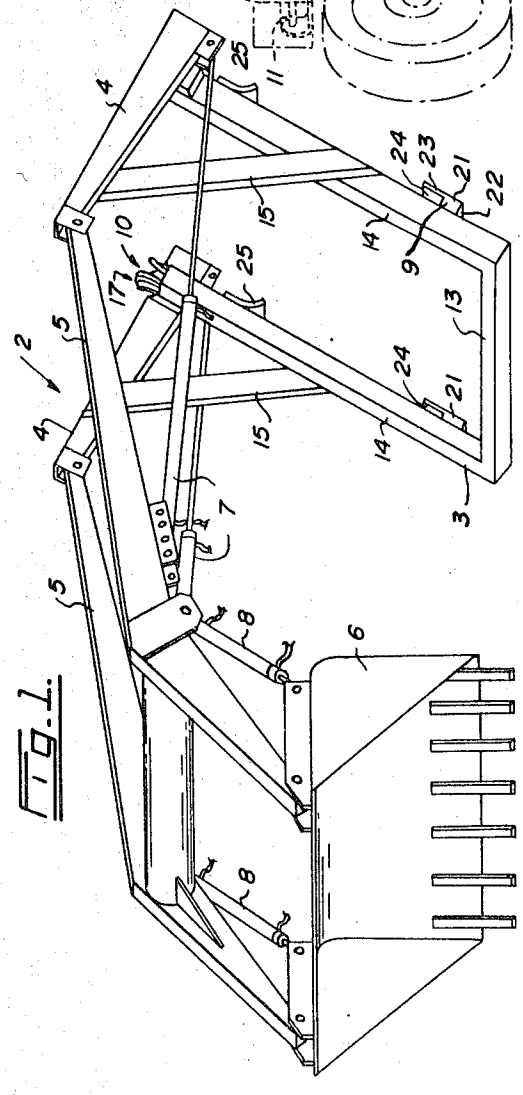


FIG. 1.

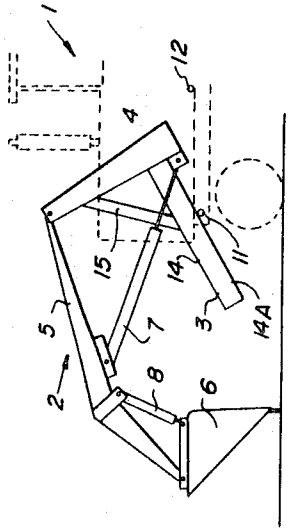


FIG. 6.

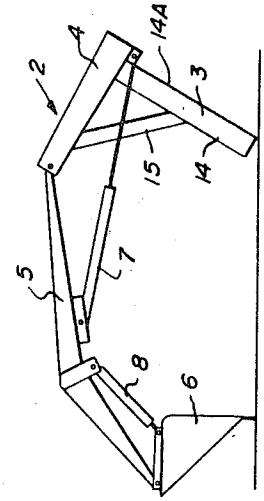


FIG. 5.

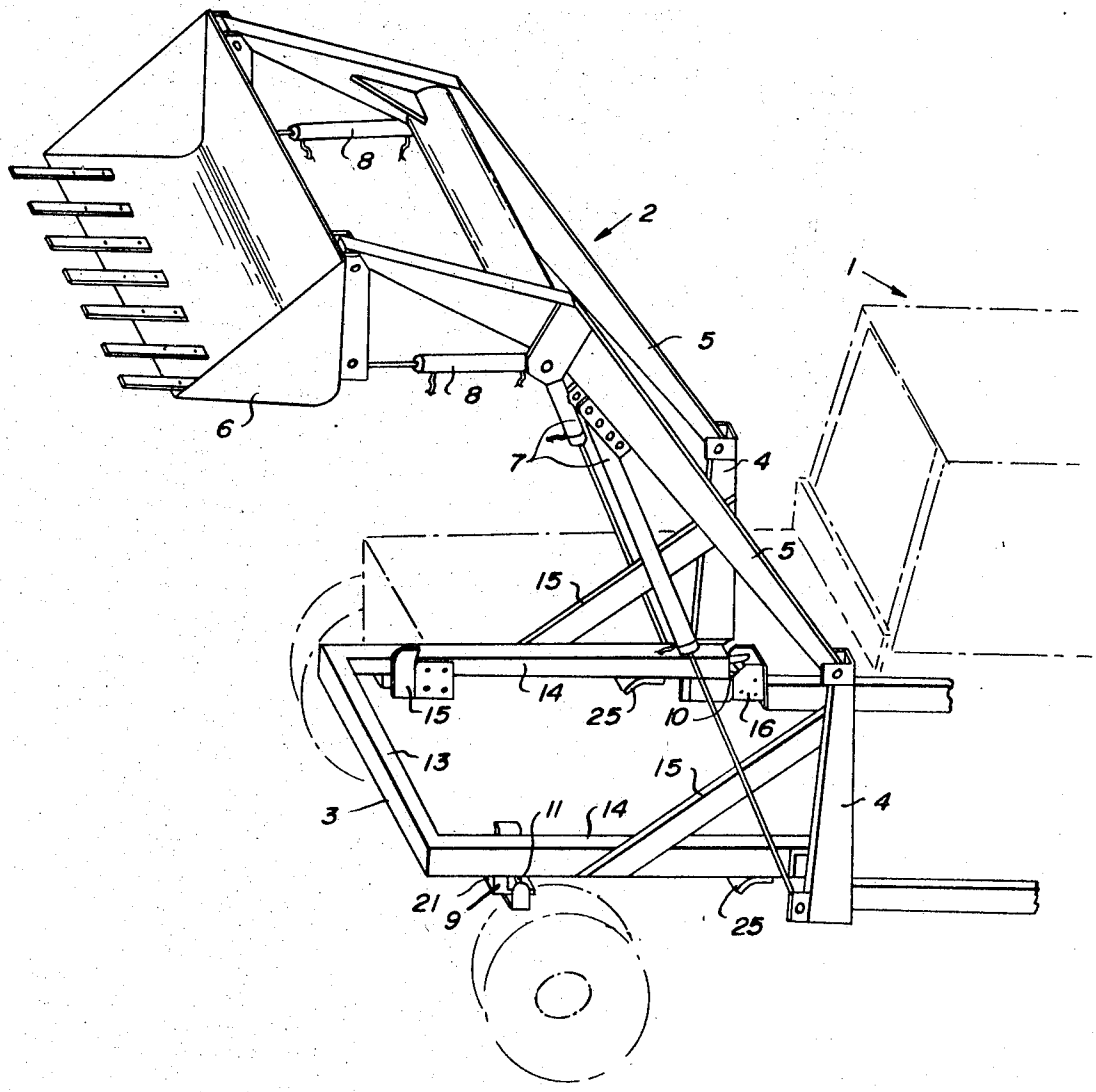


FIG. 3.

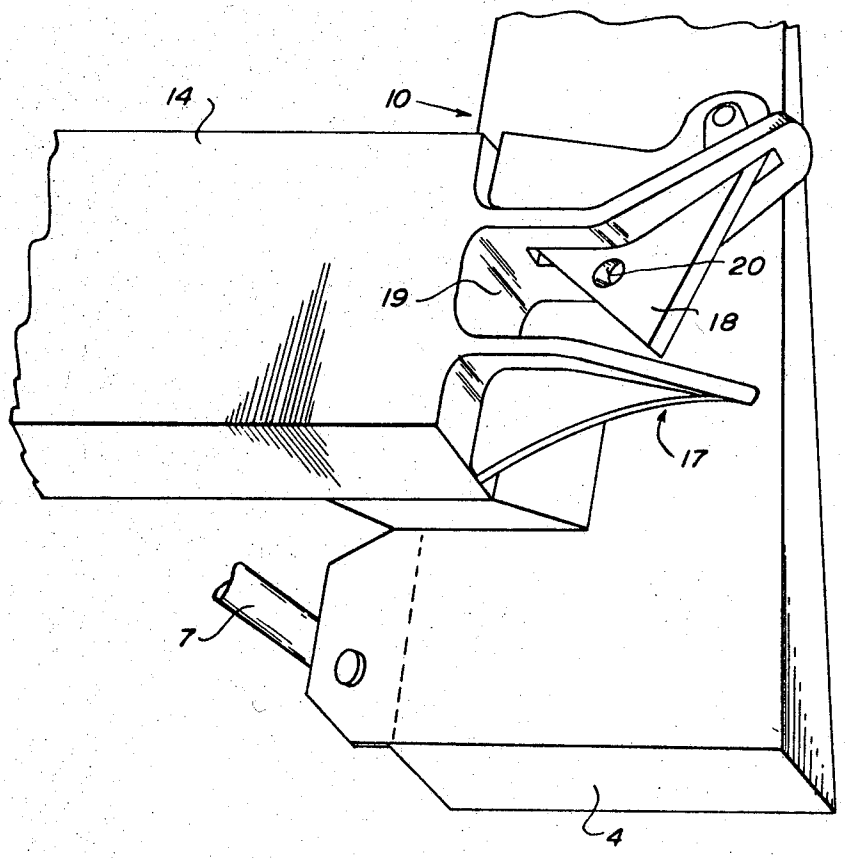


FIG. 4.

FRONT END LOADER

BACKGROUND OF THE INVENTION

This invention relates to front end loaders for use with tractors. More particularly, it relates to a loader structure which can be easily and quickly mounted on or detached from a tractor.

Front end loaders are now commonly used as an attachment to be mounted on tractors. It is desirable that such loaders be detachable and that the effort and time required for mounting and detaching be minimized. Additionally, it is desirable that the loader be adapted to fit tractors equipped with cabs. The present invention provides such a loader.

SUMMARY OF THE INVENTION

In accordance with the present invention a loader is provided which can be slid into operating position from the front end of the tractor and which, when in the operating position, is entirely disposed in front of the tractor cab, if the tractor is so equipped. The loader is adapted to be mounted on the tractor from a resting position on the ground by a combination of virtually labor-free operations. More specifically, the loader frame is constructed according to a design whereby the usual loader cylinder piston assemblies may be used to draw it onto support members carried by the tractor at its sides. The tractor may then be driven ahead to cause the supported loader to slide rearwardly to the operating position. The frame is further provided with locking means which cooperate with means carried by the tractor to secure the loader in place thereon.

DESCRIPTION OF THE DRAWINGS

In drawings which illustrate an embodiment of the invention:

FIG. 1 is a perspective view of the loader shown detached from the tractor;

FIG. 2 is a perspective view showing a tractor, in shadow lines, equipped with support members;

FIG. 3 is a perspective view of the loader mounted on a tractor in the operative position;

FIG. 4 is a perspective view of the clevis locking means; and

FIGS. 5, 6 and 7 show, in sequence, a loader being mounted on a tractor.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Turning now to the embodiment illustrated in the drawings, a tractor 1 is shown equipped with a loader 2. Loader 2 includes a horizontal, U-shaped yoke 3 having vertical posts 4 rigidly attached thereto. Each post 4 is connected pivotally at its upper end to a forwardly extending frame arm 5. Bucket 6 is, in turn, mounted pivotally on the forward ends of frame arms 5. Conventional cylinder piston assemblies 7, 8 are provided to actuate frame arms 5 and bucket 6 respectively. Locking assemblies 9, 10 are carried by yoke 3 for cooperating with front and rear support members or pins 11, 12 mounted on tractor 1 to secure loader 2 thereon.

Yoke 3 is comprised of a transverse cross member 13 and parallel, rearwardly extending side members 14. The width of yoke 3 is such that it will accommodate the front end of tractor 1. When in the operating position shown in FIG. 3, yoke 3 is horizontally disposed. Each post 4 is attached to the rear end of one of the side members 14 and extends upwardly therefrom at a right angle. Cross braces 15, connecting posts 4 and side members 14, complete the rigid frame portion of loader 2.

The operating portion of loader 2 includes frame arms 5, of inverted V configuration, pivotally connected adjacent their rear ends to posts 4. Bucket 6 is pivotally mounted on the front ends of frame arms 5. Cylinder piston assemblies 7 are each pivotally attached to the foot of a post 4 and the apex segment of the frame arm 5. Expansion or contraction of these assemblies will result in the raising or lowering of the frame arms. Similarly, cylinder piston assemblies 8, each pivotally attached to the apex segment of a frame arm 5 and to the bucket 6, act to tip the said bucket. These assemblies 7, 8 will, in operation, be suitably connected to the hydraulic system of the tractor for the supply of actuating fluid.

The means for disengagably locking loader 2 on tractor 1 will now be described. Spaced, horizontal pins 11, 12 disposed transverse to the longitudinal axis of the tractor, are fixed in brackets 15, 16 mounted on its sides. Front pins 11 are located at the front end of tractor 1 at a point roughly coplanar with its front axle and rear pins 12 are located at a point roughly half way between the front and rear axles. A clevis 17 is provided at the rear end of each side member 14. A locking element 18 is pivotally mounted at the entrance of the pocket 19 of clevis 17. Locking element 18 will permit the entry of pin 12 into pocket 19 but, when a locking bolt is thrust through opening 20, will prevent withdrawal of the pin. A bracket 9 is attached to the underside of each side member 14 at a point adjacent its front end. Bracket 9 comprises a downwardly depending segment 22 and a horizontally, rearwardly extending segment 23. A slot 24, opening rearwardly, is therefore defined by bracket 9. Each slot 24 is adapted to receive a front pin 11.

It will be understood that there are a number of equivalents of the locking means described. For example, sockets, carried by the tractor could be adapted to receive the rear ends of the side members. A pin dropped through a bore through the socket housing and side member could lock the assembly together. The important feature is that a transverse member or pin be provided at the front of the tractor about which the side member may pivot during loading and unloading and which will support the side member in the operative position. Any variety of means may be used to support and lock the rear end of each side member in place.

A lug 25 also extends downwardly from the underside of each side member 14 intermediate bracket 21 and clevis 17. The function of these lugs will be described below.

The method of operation of the invention is illustrated in FIGS. 4–6 inclusive. When not on the tractor, loader 2 will rest with its cross member 13 and bucket 6 in contact with the ground. Cylinder piston assembly 7 will be fully extended and cylinder piston assembly 8 will be fully extended and cylinder piston assembly 8 will be fully contracted. To mount loader 2, tractor 1 will be driven up to it so that its front end extends between the side members 14 of yoke 3 and front pins 11 come into contact with the undersides 14A. The hydraulic system of tractor 1 is then hooked up to the cylinder piston assemblies. Upon contraction of assembly 7, side members 14 pivot about pins 11; lugs 25 prevent members 14 from slipping off the pins. As a result of the pivoting of side members 4, yoke 3 is moved into a roughly horizontal position. Tractor 1 is simultaneously driven forward; bucket 6 will prevent loader 2 from moving forward and side members 14 will therefore slide rearwardly on pins 11 until each clevis 17 locks on a pin 12. A bolt is then thrust through opening 20 in each locking element 18 to lock pin 12 therein. The loader is then ready for operation.

To disengage the loader, clevis 17 is unlocked and assemblies 7, 8 are contracted to bring bucket 6 into contact with the ground. Tractor 1 is then backed up to cause the loader frame to slide to the front where it rests on pins 11. Cylinder piston assembly 8 is then expanded to pivot side members 14 upwardly; simultaneously, tractor 1 is slowly backed up until the loader is resting on the ground.

I claim:

1. The self-mounting tool-carrying implement for tractors which comprises: a pair of boom-supporting uprights arranged in transversely-spaced substantially coplanar relationship for attachment to the sides of a tractor; forwardly-extending boom means having the rear end thereof attached to the uprights for pivotal movement about a transverse axis between an extended and a retracted position; tool means mounted on the forward end of the boom means adapted to support the front end of the implement while attaching the rear end thereof to a tractor; a pair of elongate support members rigidly

attached adjacent their rear ends to the uprights in transversely-spaced substantially coplanar relation to one another, said support member cooperating with the tool means to support the implement in free-standing position when demounted from the tractor, and said support members cooperating with the uprights and the tractor when attached to the sides of the latter to define a mobile base for the boom and tool means; servomotor means connected between the boom means and base therefor, said servomotor means being operative upon actuation with the rear end of the implement mounted upon a tractor to raise and lower the tool means, and said servomotor means being operative upon actuation with the implement demounted and the tractor supporting the rear end thereof to raise the support members off the ground into a substantially horizontal position; and, implement mounting means mountable on the tractor for releasably fastening the implement thereto and supporting the rear end of the latter while being connected, said mounting means including two-part connecting means and guide means, said connecting means having one part carried on the rear end of the implement and the other part adapted to be mounted on the sides of the tractor in position to engage said first-mentioned part upon forward movement of said tractor between the support members with the latter supported in substantially horizontal position, said guide means being mountable on the sides of the tractor in position to engage the support members upon forward movement of the tractor therebetween, and said guide means being spaced forwardly of said tractor-mounted connecting means part a distance such that it cooperates therewith to prevent the implement from falling forward while remaining in position relative to the center of mass of said implement so as to constitute the sole support for the rear end thereof until completely mounted.

2. In combination: a tractor having a driver compartment located at the rear end thereof forwardly of the rear axle; a pair of boom-supporting uprights arranged in substantially coplanar relation and transversely-spaced for attachment on opposite sides of the tractor forwardly of the driver's compartment; forwardly-extending boom means having the rear end thereof connected to the uprights for pivotal movement about a transverse axis between an extended and a retracted position; tool means mounted on the front end of the boom means; a pair of elongate support members having their rear extremities rigidly connected to the uprights in position to project forwardly therefrom in substantially coplanar relation to one another, said support members cooperating with the uprights to define a base for the boom and tool means when mounted on the tractor, and said base cooperating with the tool means to support said boom means in free-standing position when demounted from the tractor; servomotor means connected between the base and boom means operative upon actuation to move same relative to one another between their extended and retracted positions; two-part connecting means having one part carried by the rear extremity of the base and the other part mounted on opposite sides of the tractor forwardly of the driver compartment, said parts being positioned and adapted to engage one another and cooperate to form a releasable connection upon forward movement of the tractor between the support members with the latter supported in retracted position; and, guide means mounted on the sides of the tractor ahead of the tractor-mounted connecting means part in position to engage and lift the support members free of the ground upon forward movement of the tractor therebetween, said guide means cooperating with the tool means to support the boom means while the base is being connected to the tractor, and said guide means cooperating with the connecting means to support the base on the tractor in cantilever fashion so as to enable the tool means to be lifted free of the ground upon actuation of the servomotor means into extended position.

3. The improved method for mounting a free-standing tool-carrying implement on a tractor when said implement includes a boom, a tool at the front end of the boom adapted to support the latter, a pair of transversely spaced uprights with support members projecting forwardly therefrom cooperating to define a base pivotally attached to the rear end of the boom and cooperating with the tool to support said implement in free-standing position, servomotor means interconnecting the boom and base operative upon actuation to move same relative to one another between extended and retracted positions, and connecting means carried by said base and tractor adapted to form a releasable connection therebetween when said tractor is positioned between said support members with the latter supported in retracted position, which includes the steps of: continually and exclusively supporting the rear end of the implement with the front end of the tractor until the support members can be raised free of the ground into retracted position and said tractor moved forwardly therebetween to complete the connection, and thereafter carrying both the front and rear ends of the implement in cantilever fashion upon the front end of the tractor by supporting the base therewith at longitudinally spaced points located behind said implement's center of mass so that the tool can be lifted free of the ground upon actuation of the servomotor into extended position.