

Nov. 29, 1949

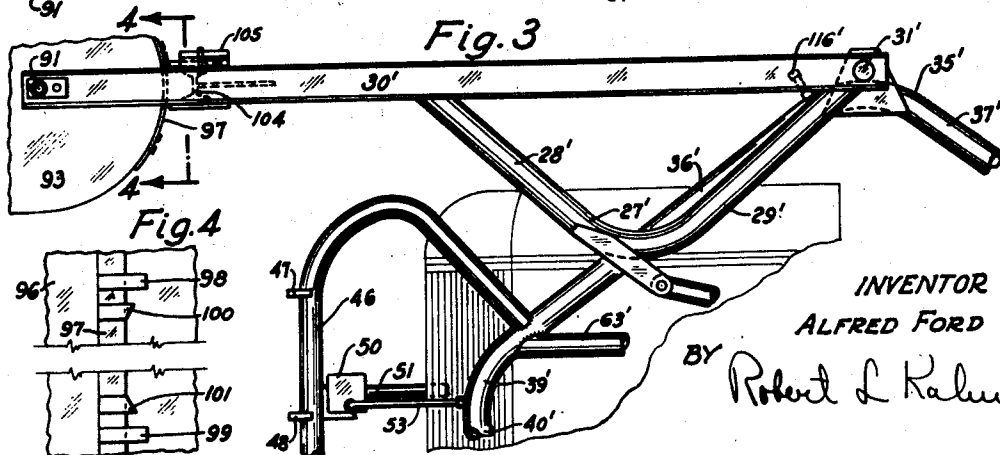
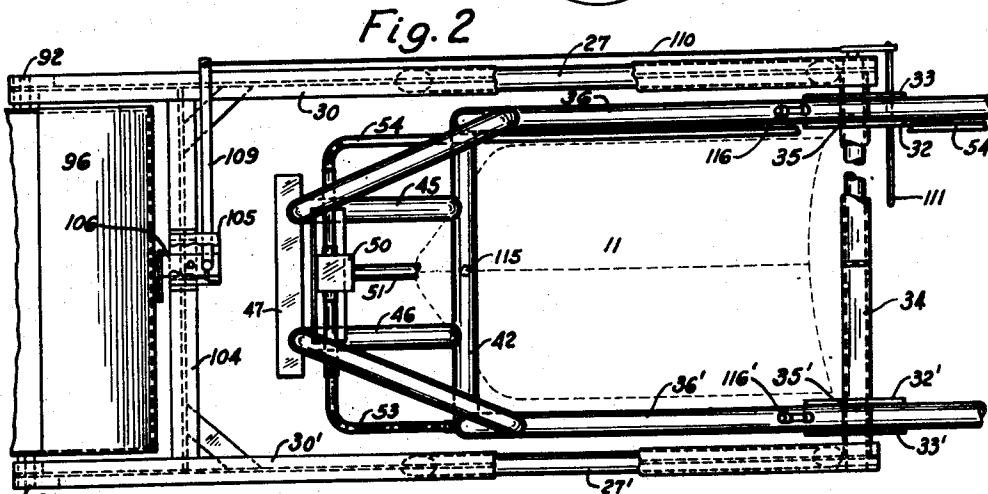
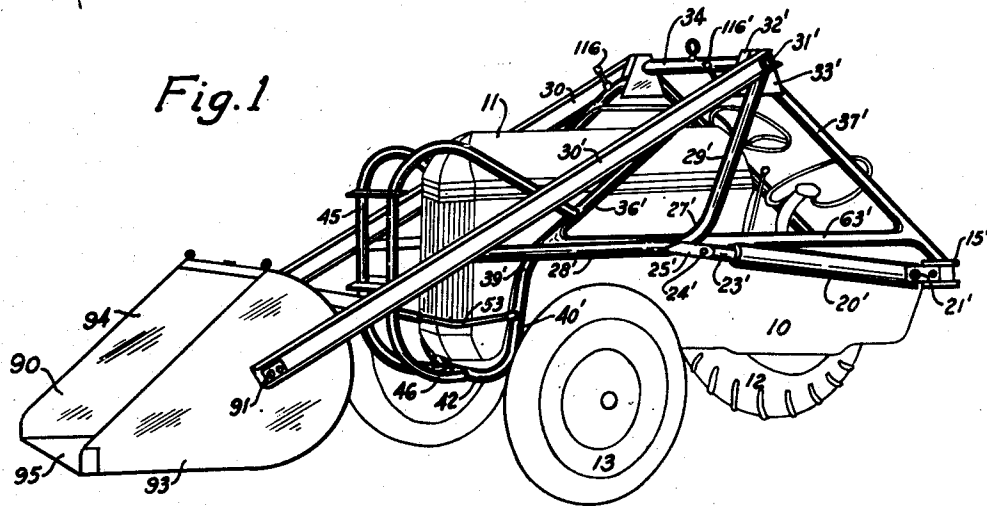
A. FORD

2,489,629

LOADER ATTACHMENT FOR TRACTORS

Filed Jan. 12, 1948

2 Sheets-Sheet 1



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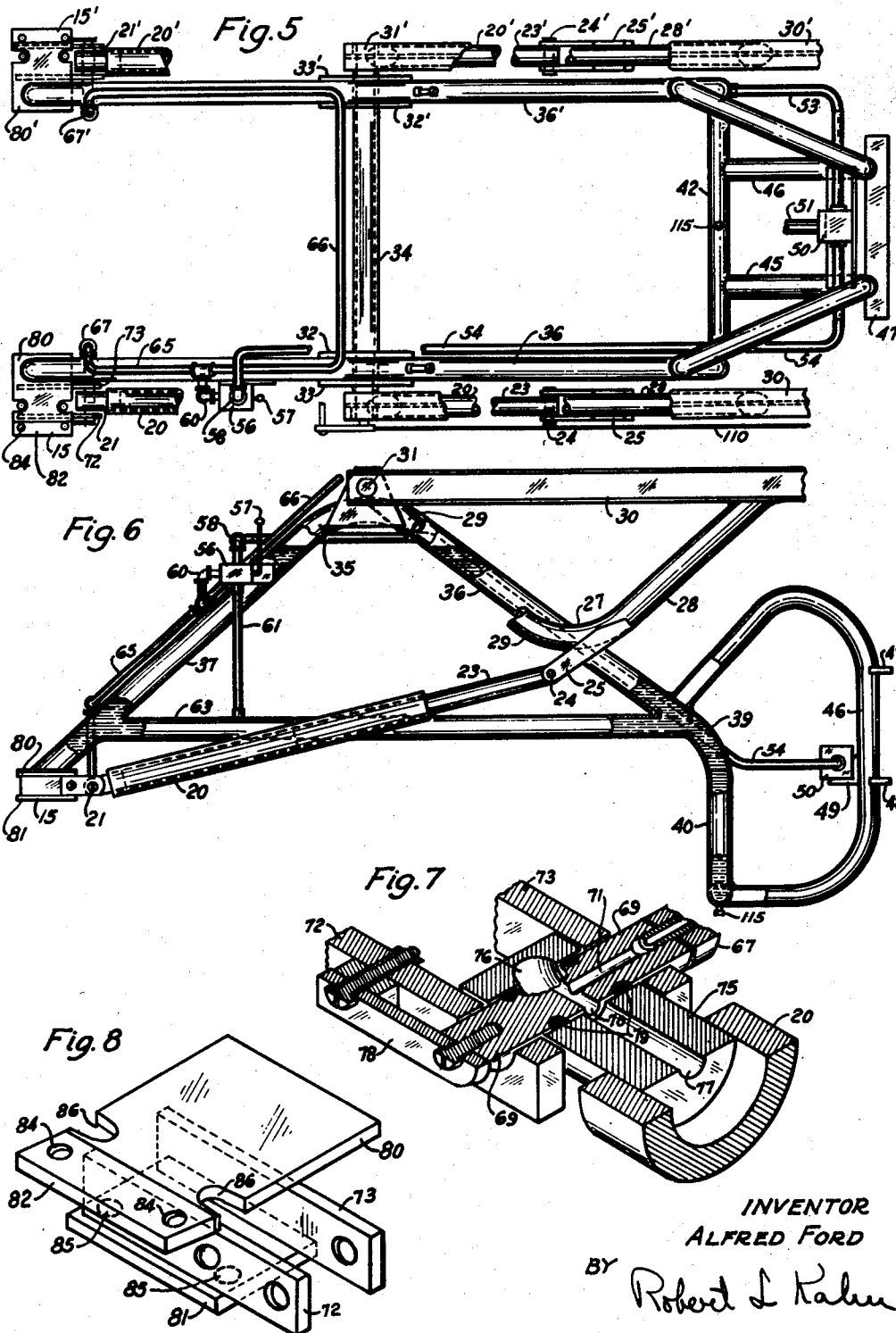
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2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

2,489,629

LOADER ATTACHMENT FOR TRACTORS

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4 Claims. (Cl. 214-140)

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This invention relates to a loader for use as an accessory with tractors and particularly to a power operated loader in connection with shovels, rakes and other loading implements. The loader forming the subject matter of this invention is adapted to be attached to a tractor to form a part thereof and is provided with a pump and a liquid circulating system for developing the lifting effort in connection with loading.

Loaders for use with tractors and provided with liquid circulating systems are well known and widely used. Such loaders, however, have certain undesirable features which render their manufacture expensive and make the loaders susceptible to frequent breakdown. Thus it is old to provide a loader with a high pressure pump driven by the tractor engine or by a special engine. Such pumps are generally of the gear type and must develop pressures as high as 1,000 pounds per square inch in order to generate the required loading effort. The loaders of the prior art have generally been constructed in such a manner that dirt was difficult to keep out of the liquid circulating system and such dirt generally tended to circulate with the liquid. As a result, excessive wear on the pump teeth resulted and made it difficult to develop the necessary pump pressure.

Another drawback of the loaders of the prior art has been in connection with the flexible hose forming part of the high pressure liquid circulating system. Such hose is difficult to maintain in a liquid tight condition and must be checked constantly to insure that the hose is in proper condition for withstanding the high liquid pressure.

An additional drawback of prior art loaders has been the complexity of the framework and the expense of manufacturing the loader and maintaining the same in operating condition.

A loader embodying the present invention is substantially free of the above drawbacks and is characterized by mechanical simplicity making for economy in manufacture and ease of maintenance. A structure embodying the present invention provides a liquid circulating system wherein a sump for dirt is provided thus permitting dirt to settle out of the way of the fluid circulating path. By virtue of this, the liquid is free of suspended dirt or particles and the pump, usually of the gear type, may be operated with maximum efficiency under most favorable conditions. In addition, the present invention provides a liquid circulating system free of flexible hose and having a framework which is simple,

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strong and highly effective both from mechanical and liquid circulating viewpoints. An additional feature resides in the construction of brackets whereby the loader may be attached to or adjacent the rear wheels of a tractor.

Referring now to the drawing, Figure 1 is a perspective view of a loader embodying the present invention mounted on a tractor. Figure 2 is a top plan view with certain parts broken away of the loader and tractor shown in Figure 1. Figure 3 is a side detail of a part of the loading means and a portion of the tractor engine. Figure 4 is a detail on line 4-4 of Figure 3. Figure 5 is a top plan view of the loading means similar to Figure 2 but showing the rear portion of the loader and showing the mounting brackets. Figure 6 is a side elevation with certain parts in section of part of the loader to illustrate the fluid storage part of the system. Figure 7 is a perspective of part of a pivot with the top broken away to illustrate the flow of fluid through the pivot. Figure 8 is an enlarged perspective of a bracket for mounting the loader.

Tractor 10 may be of any desired construction having an engine suitably disposed under hood 11 and having rear wheels 12 (only one is shown) and front wheels 13. Bolted to the frame of the tractor by brackets 15 and 15' to be described in detail later is a loader forming the subject matter of this invention. This loader comprises cylinders 20 and 20' pivotally mounted to bracket 15 and 15' by means of pivots 21 and 21'. Where duplicate parts on opposite sides are provided, such parts will bear similar number with one set of numbers being primed. For ease in description only one set of numbers will be specifically referred to. Cylinder 20 has slidably disposed therein piston 23 whose free end is pivotally secured at 24 to bracket 25 of the loader frame. Bracket 25 is rigidly attached to bent tubular member 27 having arms 28 and 29 respectively. Arms 28 and 29 are rigidly attached to beam 30. Beam 30 is pivotally secured at 31. Pivot 31 is part of cross member 34 and extends transversely of the loader so that the two ends function as pivots on opposite sides of the loader.

Welded between plates 32 and 33 carried by cross member 34 is elbow 35 of a bowed pipe having arms 36 and 37 respectively. Arm 36 has elbow 39 from which pipe portion 40 extends downwardly. Transversely spaced pipe portions 40 and 40' are connected together at their lower ends by cross pipe 42. Pipe 42 and pipe portions 40 and 40' are connected together to provide for fluid flow between the same.

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A protective framework comprising members 45 and 46 extends between two points of cross pipe 42 and suitable points on elbows 39 and 39'. If desired, braces 47 and 48 may be provided to extend between members 45 and 46. As is evident in Figure 1, this protective framework is designed to be in front of the radiator of the tractor. It is understood that members 45 and 46 may be tubular but are preferably sealed from the remainder of the system so that no fluid flow occurs.

Carried by the protective framework, in this particular instance, by cross member 49 is pump 50 of any suitable design. In practice, pump 50 may be of the gear type and be provided with shaft 51 for connection to the front end of the crank shaft of the tractor engine or to a separate engine. Pump 50 has inlet pipe 53 and outlet pipe 54 and is adapted to operate on any suitable liquid such as oil, water or the like. Inlet pipe 53 is tapped in to any part of the frame for liquid storage, as elbow 39'. The inlet is tapped in at any point of the system preferably at the same level or above pump 50.

Outlet pipe 54 of the pump extends along the loader and goes to valve 56 having control handle 57. Valve 56 is a three-way valve having connections 58, 60 and 61. It is understood that valve 56 in loading position will provide for liquid flow from 58 to 60. In an unloaded position of the valve, liquid will flow from 58 and 60 to 61. A neutral position of the valve will cut off 60 from both 58 and 61. Inasmuch as such valves are well known and readily available in the market, a detailed description thereof is deemed to be unnecessary. Pipe 61 extends down across pipe 63 which bridges the ends of arms 36 and 37. The junctions of the ends of pipe 63 and arms 36 and 37 permit a liquid flow therebetween.

Valve connection 60 goes to pipes 65 and 66 respectively going to opposite sides of the loader. Pipes 65 and 66 terminate in fittings 67 and 67' which are coaxial with pivots 21 and 21' of the cylinders. In Figure 7 is a perspective section of one of the two pivots. Thus fitting 67 is rigidly joined to pivot member 69 having transverse bore 70 and axial bore 71 between bore 70 and fitting 67. Rigid frame members 72 and 73 are suitably apertured to support pivot member 69. Rockable around pivot member 69 is cylinder support block 75 having chamber 76 encircling member 69 as the part having bore 70. Block 75 has bore 77 connecting chamber 76 and cylinder 20. Cylinder 20 is rigidly connected as by welding to block 75. Thus a sealed liquid path from fitting 67 to cylinder 20 is provided while permitting the cylinder to rock.

In order to maintain pivot member 69 rigidly in position, end plate 78 may be bolted to pivot member 69 and frame member 72. Pivot member 69 is preferably provided with annular grooves 79 on opposite sides of chamber 76 in the assembled position of the parts. These grooves are packed with suitable material such as leather, rubber, or other packing material to provide a tight seal against the high pressure of liquid within the cylinder interior.

The mounting of the loader at the rear of the tractor may be accomplished by brackets, one of which is shown in perspective in Figure 8. Thus frame members 72 and 73 for each cylinder support extends between rigid parallel plates 80 and 81. The frame members and parallel plates are bolted or welded together to form a rigid

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assembly. Plate 80 is substantially larger than plate 81 and has portions extending beyond the sides of frame members 72 and 73. Thus part 82 of the plate is suitably apertured at 84 to provide holes for mounting fenders for the tractor.

As clearly evident in Figure 5, part 82 is on the outside with relation to the tractor. Bottom plate 81 is apertured at 85 for securing to the tractor frame. Cut-outs 86 in plate 80 provide clearance for bolts passing through apertures 85.

Referring now to beams 30 and 30', the free ends carry any suitable loading means, such as for example scoop or shovel 90. Shovel 90 is pivoted at 91 and 92 to beams 30 and 30'. Shovel 90 has sides 93 and 94, bottom 95 and curved back 96. Curved back 96 is provided, along part of its length at least, with reinforcing strip 97 extending along the center thereof. Reinforcing strip 97 carries top and bottom stop members 88 and 99 respectively and latch blocks 100 and 101. Extending across beams 30 and 30' is cross beam 104 disposed adjacent the shovel back. Cross beam 104 carries mounting plate 105 upon which is pivotally secured dog 106. Dog 106 cooperates with reinforcing strip 97 and the latch and stop bars associated therewith. Dog 106 is controlled by rod 109 extending to the side of the loader and connected to link 110 and handle 111.

Dog 106 is so shaped that it cooperates with stops 98 and 99 to limit the travel of the shovel on its pivots. Stops 100 and 101 are adapted to cooperate with dog 106 to lock the shovel in either one of two positions for loading or unloading for example. From these locked positions dog 106 may be released by handle 111 permitting the shovel to turn on its pivot to another position.

Drain plug 115 is provided at cross pipe 42 and filling plugs 116 and 116' are provided at the two frames near the top.

The loader operates as follows: Assuming that pump 50 is driven, liquid will go from inlet 53 to outlet 54. If the valve handle is set to an idle position then liquid will go from 58 through the valve to pipes 61 and 63. The liquid will circulate idly within the tubular liquid containing portion of the frame. It is understood that the pipe system consisting of pipes 36, 37, 40, 63, their corresponding primed parts, the various elbows and cross pipe 42 will be charged with a suitable liquid introduced through the filler plugs. It is preferred to leave some airspace within the liquid storage system to allow for variations in liquid volume with temperature. Now if the valve handle is turned for loader operation, the pump outlet is connected to cylinders 20 and 20' and the full pressure developed by the pump is applied in parallel to these cylinders. The pressure within the cylinders forces pistons 23 and 23' outwardly. This causes beams 30 and 30' to rock upwardly raising the shovel. At any desired shovel position, the valve may be turned to a neutral position in which case the cylinders will be sealed by valve connection 60 being sealed off from the remaining valve connections. If the shovel is to be lowered, the valve is turned to an idle position. Means for rocking the shovel on its pivots may be provided. The dog cooperates with the latching and stop blocks on the shovel back in the usual manner.

Sediment in the system will collect in the bottom of the liquid storage system and may be removed through the drain plug.

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What is claimed is:

1. A loading attachment for tractors or the like comprising a pair of triangularly shaped tubular frames lying in spaced vertical planes generally parallel to the tractor length, each of said frames having an apex at the top and sloping sides terminating in front and rear legs, means for supporting the frames in fixed position, means for anchoring the rear legs on a tractor, said front legs having extensions to a lower level than said rear legs, a transverse tubular member joining the free ends of said extensions, said triangular frames and transverse member being hollow and providing a connected liquid path for storage or circulation, said transverse member having a drain plug and being at the lowest level of the entire attachment, a pump having an inlet connected to said liquid storage system at some region above the level of said transverse member, said pump having an outlet connected to a three way valve, a conduit from the second valve connection to said liquid storage system, a cylinder pivotally secured at each rear leg, fluid lines from the third valve connection to each cylinder, a piston for each cylinder, a pair of arms pivotally mounted adjacent the top apices of said tubular frames, rigid means joining said pistons to said arms for moving the same, said arms being adapted to have a load at the arm ends, said valve being adapted to have one position where fluid from the pump outlet is fed directly back to the storage system, another position of the valve being adapted to direct fluid from the pump outlet into said cylinders for raising said arms, another valve position sealing the cylinders to maintain the arms in an elevated position and an unloading position where the cylinders are connected to the storage system for lowering the arms.

2. The structure according to claim 1 wherein the pivotal mounting for each cylinder includes a drilled pivot pin, said pin having an axial passage and a connected transverse passage, the connection between the rear leg and axial pin passage being rigid, said cylinder having a part encircling the pivot pin at the region of the transverse passage and being rotatable around the pin, said pivot pin having packing between it and the encircling part to provide a fluid tight connection through the cylinder

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whereby rigid pipe may be used throughout the entire system.

3. The structure according to claim 1 wherein said means for anchoring the rear legs to a tractor include the following for each side of the attachment: a pair of spaced horizontal plates, a pair of spaced vertical plates extending between said horizontal plates and rigidly attached thereto, the bottom plate being adapted to be attached to a tractor and the top plate being adapted to support a fender and said vertical plates having mounted thereon said cylinder.

4. A loading attachment for tractors and the like comprising a hollow rigid sealed frame adapted to have liquid under pressure circulating therein, a pair of arms pivotally attached to said frame and being movable up and down and being adapted to be loaded at the ends of said arms, a pair of cylinders and pistons, one cylinder and piston being provided for each arm and being connected between a portion of the arm and frame, said cylinders being in fluid communication with said frame to receive fluid under pressure, said attachment including pump and valve means for generating and controlling fluid pressure, said attachment frame having rear legs for attachment to a tractor and having two brackets, each bracket including a pair of spaced horizontal plates, a pair of spaced vertical plates extending between said horizontal plates and rigidly attached thereto, the bottom plate being adapted to be attached to a tractor and the top plate being adapted to support a fender and said vertical plates having rotatably mounted thereon a cylinder.

ALFRED FORD.

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