

June 21, 1966

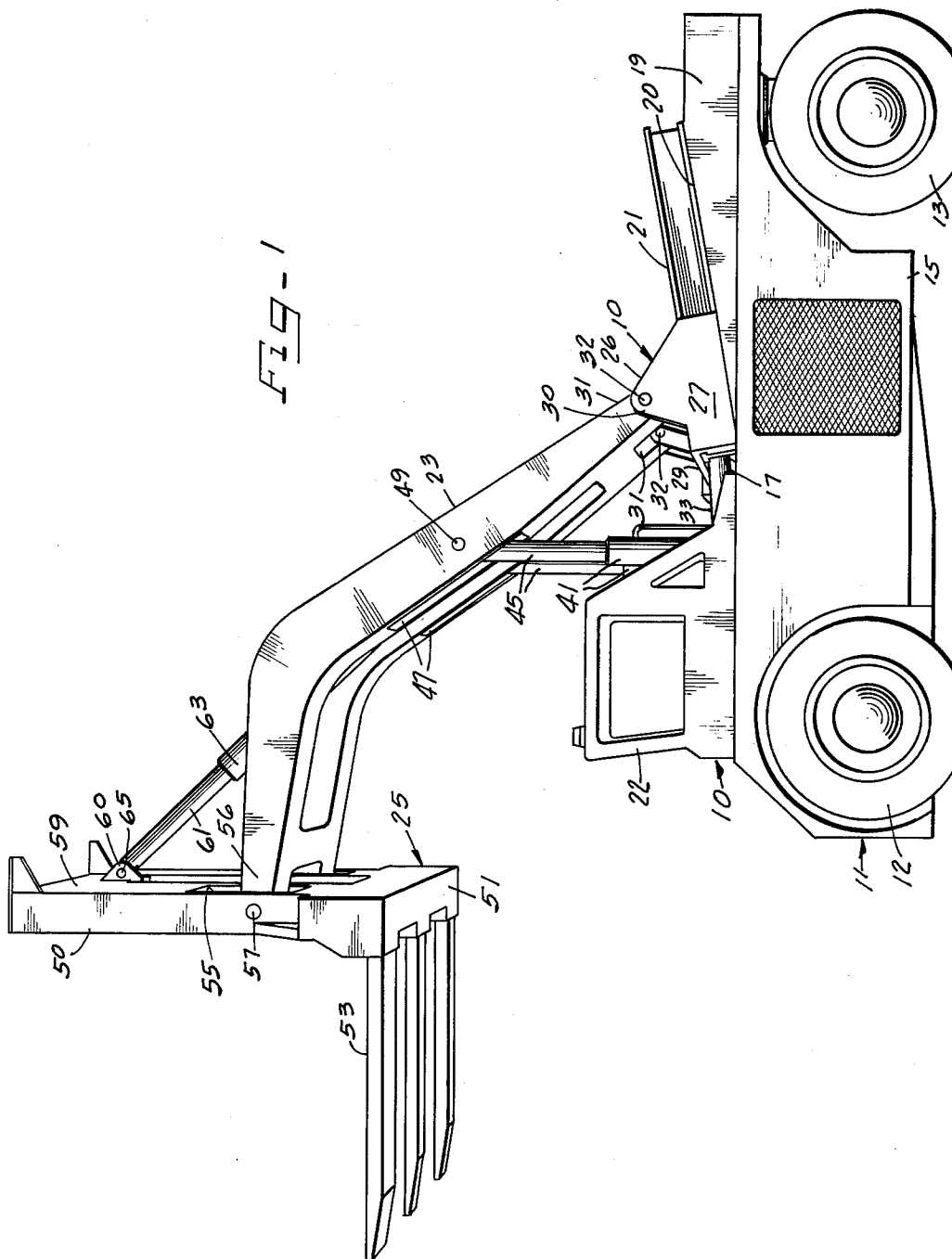
J. L. RILEY

3,257,014

MOBILE LOADER

Filed Sept. 14, 1964

2 Sheets-Sheet 1



INVENTOR.
JOSEPH L. RILEY

BY *Hill, Sherman, Mann, Chase & Simpson*

ATTORNEYS

June 21, 1966

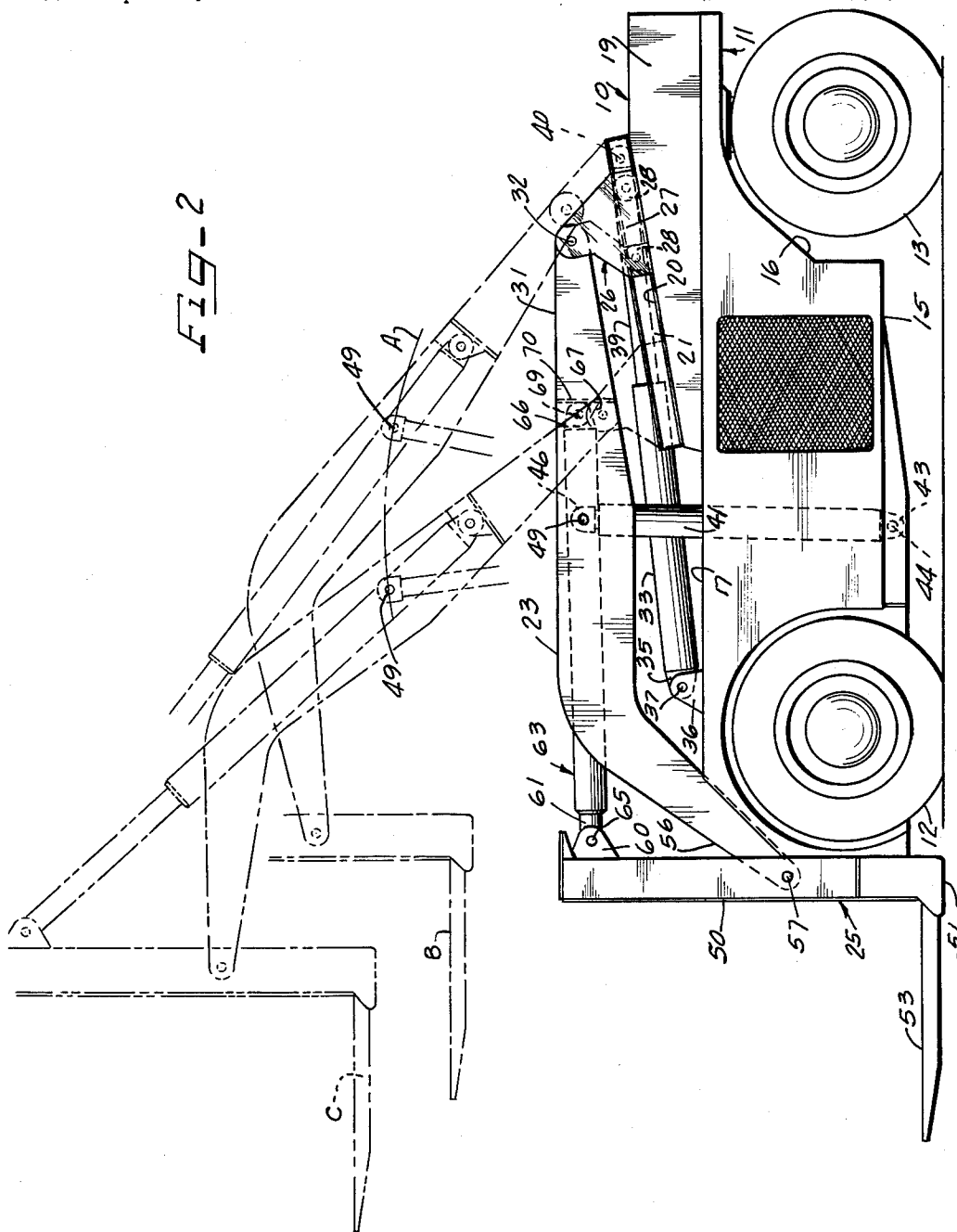
J. L. RILEY

3,257,014

MOBILE LOADER

Filed Sept. 14, 1964

2 Sheets-Sheet 2



INVENTOR.

JOSEPH L. RILEY

Kill, Sherman, Muni, Shaw & Simpson

BY

ATTORNEYS

1

3,257,014

MOBILE LOADER

Joseph L. Riley, Milwaukie, Oreg., assignor of thirty-three and one-third percent each to A. G. Sturdivant and Roger C. Sullivan, both of Chicago, Ill.
Filed Sept. 14, 1964, Ser. No. 396,184
3 Claims. (Cl. 214-140)

This invention relates to improvements in mobile loaders and more particularly relates to an improved form of loader adapted for gathering, lifting, transporting and loading heavy articles.

A principal object of the present invention is to provide an improved form of loader of the self-propelled type for picking up and loading heavy articles, as well as excavating and loading loose material, and arranged with a view toward utmost simplicity and efficiency in construction and operation.

A further object of the invention is to provide a boom type of loader for picking up and lifting heavy articles, such as logs, slabs of steel, ingots and the like, so arranged as to give the load lifting device a forward reach for picking up and lifting heavy articles from the ground and enabling the load lifting device to be retracted over the front supporting wheels of the loader, to enable transportation of the load in its elevated position without overbalancing the loader.

Still another object of the invention is to provide a novel and improved loader particularly adapted for picking up, lifting and transporting heavy articles, so arranged as to give the lifting device a relatively long forward reach beyond the forward end of the supporting main frame for the loader by mounting the lifting device on a transversely pivoted boom and by mounting the boom for movement by power along the main frame of the loader.

Another and important object of the invention is to provide a more stable form of loader for loading bulky and heavy articles, such as logs, ingots, slabs and the like, of a simpler and more compact construction than former loaders, in which stability is attained by mounting the boom for rectilinear movement back and forth with respect to the main frame for the loader.

A still further object of the invention is to provide an improved form of loader having a tiltable load lifting device transversely pivoted to the end of the boom and a carriage mounted on the main frame of the loader for rectilinear movement therealong, and forming a transverse pivotal support for the boom, together with elevating means for the boom, elevating the boom into its various positions along the frame for the loader, and accommodating the boom to be moved along the frame for the loader, to retract or give the lifting device a forward reach to pick up and elevate a load or to position the load for unloading, without affecting the efficiency of lifting or longitudinal positioning of the boom.

These and other objects of the invention will appear from time to time as the following specification proceeds and with reference to the accompanying drawings wherein:

FIGURE 1 is a perspective view of a loader constructed in accordance with the principles of the present invention; and

FIGURE 2 is a view in side elevation of the loader shown in FIGURE 1 with certain parts removed in order to show certain details of the loader not shown in FIGURE 1.

In the embodiment of the invention illustrated in the drawings, I have shown a loader 10 having a main frame 11 supported on front wheels 12, which may be drive wheels and may be driven from a suitable motor in a conventional manner. The main frame 11 is also shown as being supported on rear steering wheels 13, which

2

may be turned for steering by a conventional form of power steering unit, which is no part of the present invention, so need not herein be shown or described further.

The main frame 11 comprises spaced side frame members 15, 15 extending partially over the front wheels 12 and forming fenders therefor, and having undersurfaces 16 spaced from, and generally conforming to the steering wheels 13, to accommodate steering movement thereof. The side frame members 15 have plain top surfaces 17 having spacer rails 19 extending therealong from the central to rear end portion of said main frame. The spacer rails 19 have inclined forward surfaces 20 inclined upwardly from the forward end portion thereof toward the rear end portion thereof, and forming supports for channeled guide tracks 21 extending along said inclined surfaces, for the length thereof.

An operator's compartment or cab 22 is shown in FIGURE 1 as being mounted on the top surface of one side frame member 15 to one side of a boom 23 and lifting jacks 41 for said boom. The cab may be pivotally mounted on said surface to face in the direction shown during a loading operation, and may be turned outwardly of said boom 23 180° to face in an opposite direction during travel of the loader from place to place. The cab 22 may also be positioned at right angles to its supporting side frame member 15. The cab and positioning means therefor is no part of the present invention so need not herein be shown or described further.

It should here be understood that the machine is generally symmetrical about the longitudinal center thereof, particularly as to the support and operating structure for the boom 23 and a load pick up and lifting device 25 pivotally mounted thereon.

The load pick up and lifting device is herein shown as being a fork frame, although it may be in the form of a scoop or dipper bucket, a gripper type of lifting device, for lifting logs and the like, or of various other conventional forms.

Since the machine is generally symmetrical along the longitudinal axis of the main frame 11 and the support and operating structure for the boom 23 and lifting device 25 is the same on one side of the machine as the other, one side only of the machine need herein be shown and described.

The channeled guide tracks 21 are shown in FIGURES 1 and 2 as having their flanges facing outwardly and as forming a support and guide for a carriage 26 mounted thereon for movement therealong. The carriage 26 has parallel outer legs 27 extending downwardly along the outer sides of the guide tracks 21 and connected together by a bridge 29 extending across the spaced guide tracks 21 and slidably extending along the top faces of the flanges of said channeled guide tracks 21. A pair of parallel spaced rollers 28 is suitably mounted on the inside of each leg 27, for engagement with the top flanges of the channeled guides 21, to retain the carriage thereto.

It should there be understood that while I have shown rollers for retaining the carriage to the channeled guide tracks, that rollers need not necessarily be used, but bearing blocks (not shown) or any other suitable form of retaining means may be used in place of the rollers.

A pair of spaced bifurcated connectors 30 extends upwardly of each leg 27, intermediate the ends thereof. Each pair of connectors 30 has an arm 31 of the boom 23 extending between the furcations thereof and pivotally connected thereto, as by pivotal pins 32, 32. A fluid pressure operated jack 33 is herein shown as being provided to retain the carriage 26 in position along the channeled guide tracks 21 and to move said carriage along said guide tracks to position the lifting device forwardly or rearwardly of the main frame 11, and to give

3

said lifting device a forward thrusting action to pick up articles from the ground. As shown in FIGURE 2, the hydraulic jack 33 has a connector ear 35 extending forwardly therefrom between spaced connector ears 36 extending upwardly of the top surfaces of the side frame members 15, along opposite sides of the longitudinal axis of the machine. A pivot pin 37 is provided to pivotally connect said jack between said connector ears 36. The opposite end of the jack 33, which may be a piston rod 39, is pivotally connected to the carriage 26 at the longitudinal center thereof on a pivot pin 40.

The boom 23 is raised and lowered by means of a pair of laterally spaced hydraulic jacks 41 extending along the insides of the side frame members 15 and having connector ears 43 depending therefrom, pivotally connected to the main frame 11 adjacent the bottom thereof, as by pivot pins 44. The opposite ends of the hydraulic jacks 41 are shown as being piston rods 45 having connectors 46 extending upwardly of the upper ends of said piston rods within hollow portions 47 of the boom 23, and pivotally connected to said boom as by transverse pivot pins 49. The jacks 41 may thus elevate and lower the boom and support the boom to be extended and retracted with respect to the main frame 11 by movement of the carriage along the channeled guide track 21, and when so supporting the boom may move about the axes of the pivot pins 44, with the pivot pins 49 moving along a relatively large radius arc A during backward and forward movement of the boom. This enables the carriage 26 to raise and lower the forward end of the boom a distance greater than the travel of the jacks 41, when the jacks 41 are supporting the boom in their extended positions, by movement of the carriage downwardly along the channeled guide track 21, toward the forward end of the machine.

The lifting device 25 is herein shown as including parallel spaced uprights 50 extending upwardly of a base 51 and having a plurality of parallel spaced tines or fingers 53 mounted thereon in a conventional manner, and extending forwardly therefrom. The uprights 50 have rearwardly opening hollow portions 55 therein, into which extend furcations 56 of the bifurcated forward end portion of the boom 23. Transverse pivot pins 57 are provided to pivotally connect the furcations 56 to the uprights 50.

The uprights 50 are suitably connected together adjacent their upper end portions and are shown in FIGURE 1 as having a plate 59 extending thereacross, having a bifurcated connector 60 extending rearwardly therefrom and spaced a substantial distance above the pivot pins 57. The connector 60, as shown in FIGURES 1 and 2 has a piston rod 61 of a hydraulic jack 63 extending therebetween and pivotally connected thereto as by a transverse pivot pin 65. The opposite end of the hydraulic jack 63 extends along the boom 23 rearwardly of the points of connection of the jacks 41 thereto and has an ear 66 extending rearwardly therefrom, connected between spaced connectors 67 on a transverse pivot pin 69. The connectors 67 are shown in FIGURE 2 as extending forwardly of a transverse wall 70 of the boom 23.

Since the boom 23 is within the margins of the side frame members 15, the lifting device 25 may be lowered beneath the level of engagement of the wheels 12 and 13 with the ground, and may be tilted back and forth in its lowered positions or in any of its elevated positions by operation of the hydraulic jack 63.

The loading device may be advanced into the material to be picked up by movement of the machine along the ground propelled by the drive wheels 12, or by movement of the carriage 26 along the guide rails 21 by operation of the hydraulic jack 33 depending upon the weight and type of load to be picked up. When the loading device 15 is on the ground or below the normal ground level, or in any of its elevated positions, it may be given a forward thrust by the supply of fluid under pressure

4

to the piston rod end of the hydraulic jack 33, moving the carriage 26 forwardly along the guide track 21 and during this forward thrust, the hydraulic jacks 41 will be pivotally moved about the axes of the pivot pins 44 and support the pivot pins 49 and boom 23 for movement with the carriage 26 about a relatively shallow arc, in all positions of adjustment of the boom 23 with respect to the main frame 11.

The lifting device may readily pick up articles from below the normal ground level along which the wheels 12 and 13 ride and when picking up heavy loads, such as hot ingots, may be retracted to be positioned over the front drive wheels 12, as in the broken line position B in FIGURE 2, thereby enabling the loader to lift far heavier loads than possible where the lifting device overhangs the front of the main frame 11 in all positions of elevation of the lifting device, with the tendency for the load carried by the lifting device to rock the main frame about the front wheel axes.

Also when the lifting device is in position B, shown in FIG. 2, and the hydraulic jacks 41 are fully extended, the lifting device may readily be elevated to position C, by the admission of fluid under pressure to the piston rod end of the jack 33, to move the carriage along the guide track 21 in a forward direction. This enables the load to be kept away from the operator's cab, particularly when loading hot material, and besides increasing the height to which the load may be elevated, is an added safety feature of the machine.

While I have herein shown and described one form in which the invention may be embodied, it may readily be understood that various modifications and variations in the invention may be attained without departing from the spirit and scope of the novel concepts thereof.

I claim as my invention:

1. In a mobile loader,

a wheel mounted self-propelled main frame including a pair of parallel spaced side frame members having an upwardly inclined track extending therealong from the central to rear end portions of said side frame members,

a carriage mounted for movement along said track and retained from tilting movement with respect thereto, a boom supported at its rear end on said carriage and transversely pivoted thereto and extending along said main frame to a position adjacent the forward end thereof,

said boom being disposed within the inner margins of said side frame members for lowering movement therebetween,

a load lifting device transversely pivoted to the forward end portion of said boom and extending in advance thereof,

a fluid pressure operated jack pivotally connected between said boom and load lifting device for tilting said load lifting device with respect to said boom and maintaining said loading lifting device in various selected positions with respect to said boom,

a longitudinally extending fluid pressure operated jack transversely pivoted between said main frame and carriage for moving said carriage and boom along said track by power and holding said carriage in position on said track, and

a third fluid pressure operated jack transversely pivoted to said main frame adjacent the lower end thereof and having transverse pivotal connection with said boom intermediate the ends thereof and pivoting about its axis of connection to said main frame upon movement of said carriage along said track, and supporting said boom for movement about a relatively shallow arc, and also reacting against said boom to effect lifting of said lifting device to an elevation beyond the extreme lifting position of said hydraulic jack, upon movement of said carriage along

5

said track from the rear to the forward end portion of said track.

2. A mobile loader comprising,
 - a wheel mounted main frame including a pair of parallel spaced connected side frame members, 5
 - a boom of lesser width than the space between said side frame members and extending along said main frame between said side frame members, and having a forward end portion movable downwardly between said side frame members, 10
 - a load lifting device adapted to be supported in advance of said main frame,
 - a transverse pivot pin pivotally connecting said boom to said load lifting device, 15
 - a fluid pressure operated hydraulic jack extending along said boom,
 - a transverse pivot pin pivotally connecting said jack to said boom adjacent the rear end thereof,
 - another transverse pivot pin pivotally connecting said jack to said load lifting device, 20
 - pivotal support means for said boom including parallel spaced inclined tracks extending along each side frame member, from a position adjacent the central portion of said main frame to a position adjacent the rear end thereof and inclined upwardly with respect to said main frame as said tracks extend therealong, 25
 - a carriage extending along the outer sides of said tracks and guided for movement therealong,
 - a transverse pivotal supporting connection between the rear end portion of said boom and said carriage and movable elevating and support means for said boom supporting said boom for movement along said main frame and elevating and lowering said boom with respect to said main frame comprising: 30
 - a pair of laterally spaced fluid pressure operated 35

6

jacks transversely pivoted to said main frame adjacent the lower end thereof for rocking movement with respect thereto, and

pivot pins connecting the opposite ends of said hydraulic jacks to said boom and supporting said boom for movement about a relatively flat arc upon movement of said carriage along said track and reacting against said boom to effect elevation thereof upon movement of said carriage along said tracks from the rear to the forward ends thereof.

3. A mobile loader in accordance with claim 2 wherein the tracks are in the form of outwardly opening channels and are inclined downwardly from the rear toward the center of said main frame to give said boom and load lifting device a forward thrust and to effect elevation thereof, when said hydraulic jacks supporting said boom are held from extensible movement, as said carriage moves from the rear to the front of said main frame, wherein said carriage extends downwardly along said outwardly opening channels and is supported thereon for movement therealong, and wherein retaining means are provided on the inner sides of said carriage and engage between the flanges of said channels to retain said carriage from tilting movement with respect to said main frame.

References Cited by the Examiner

UNITED STATES PATENTS

1,650,255	11/1927	Bonnister	214—134
2,741,378	4/1956	Wagner	214—140
2,887,236	5/1959	Mindrum	214—140
3,155,251	11/1964	Williamson	214—140

HUGO O. SCHULZ, *Primary Examiner.*