Aug. 31, 1965 E. C. BREKELBAUM ETAL 3,203,564

FRONT END AND OVERSHOT LOADER

Filed July 6, 1962 5 Sheets-Sheet 1

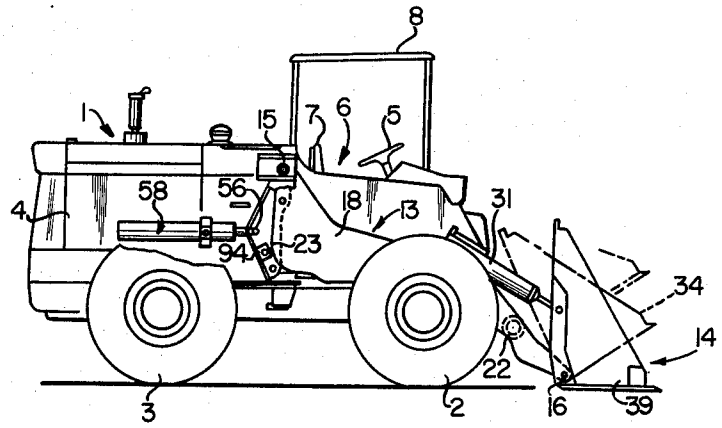

FIG I

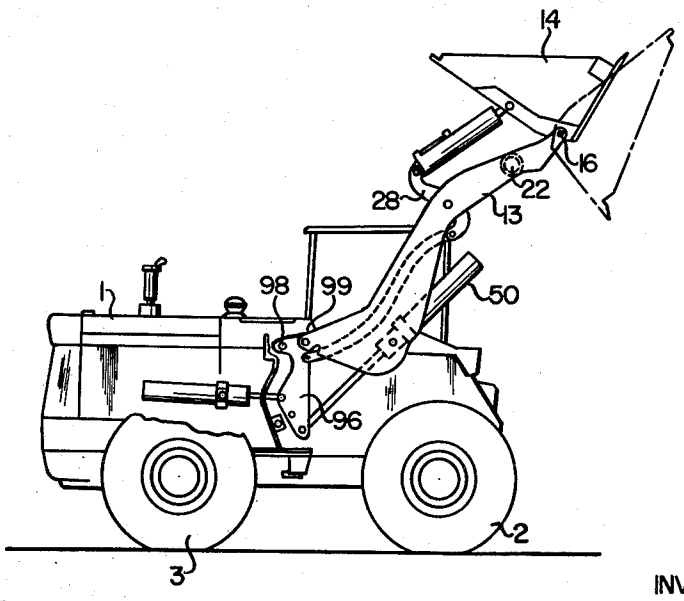

FIG II

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FRONT END AND OVERSHOT LOADER

Filed July 6, 1962 5 Sheets-Sheet 2

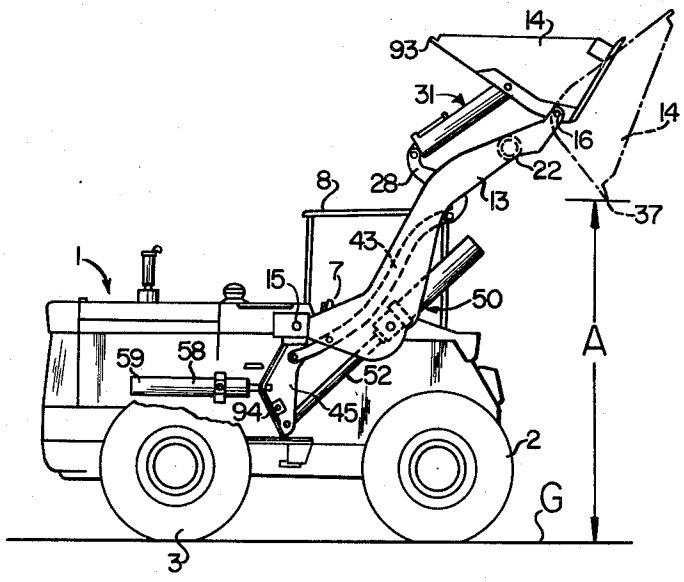

FIG 2

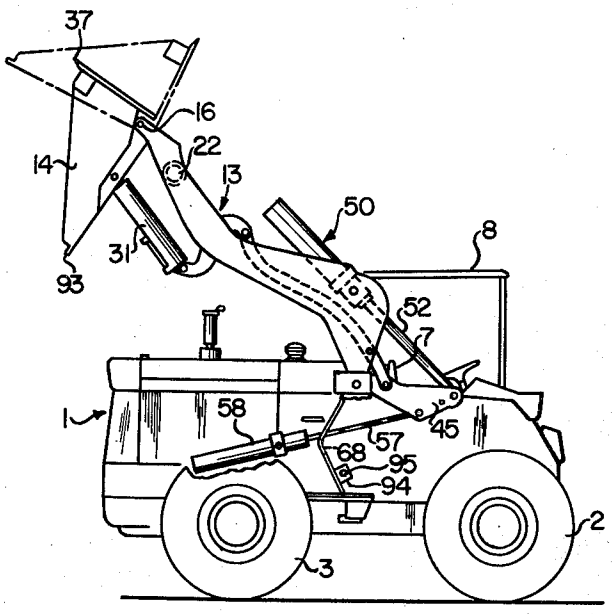

FIG 3

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FRONT END AND OVERSHOT LOADER

Filed July 6, 1962 5 Sheets-Sheet 3

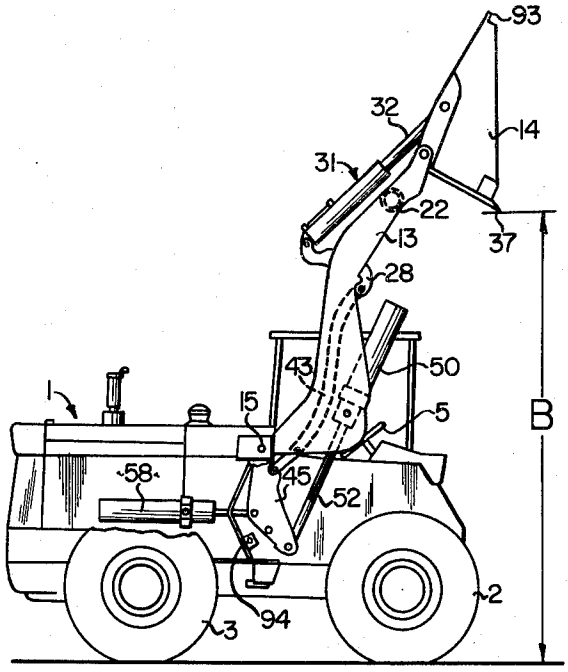

FIG 4

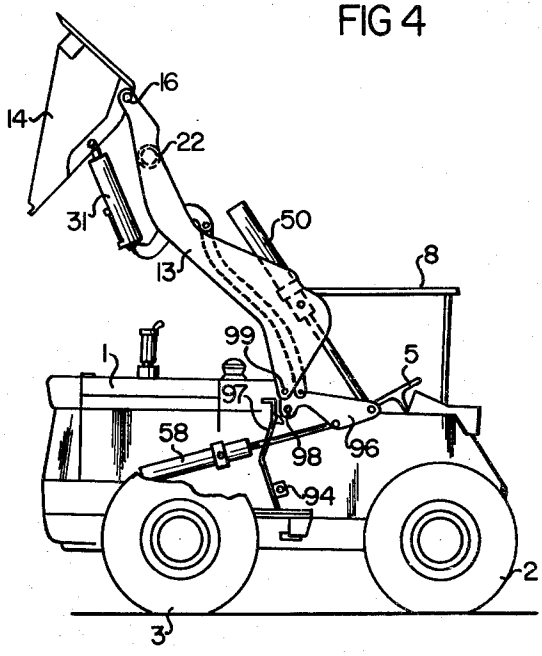

FIG 12

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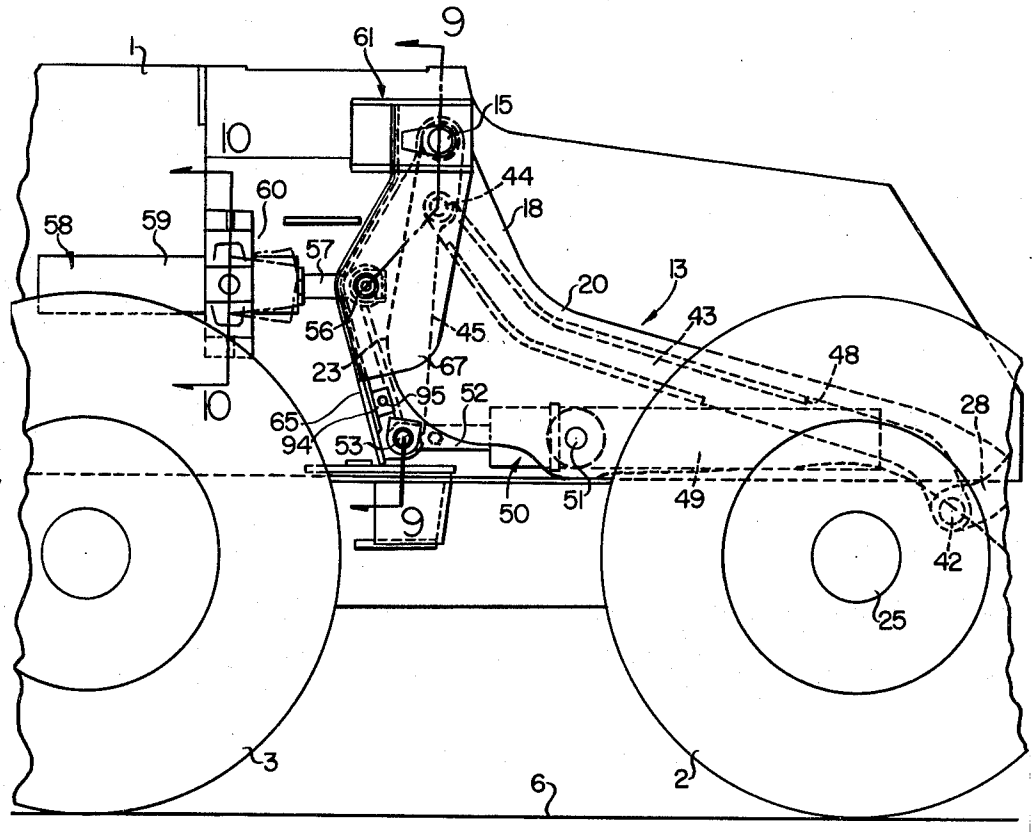

FIG 5

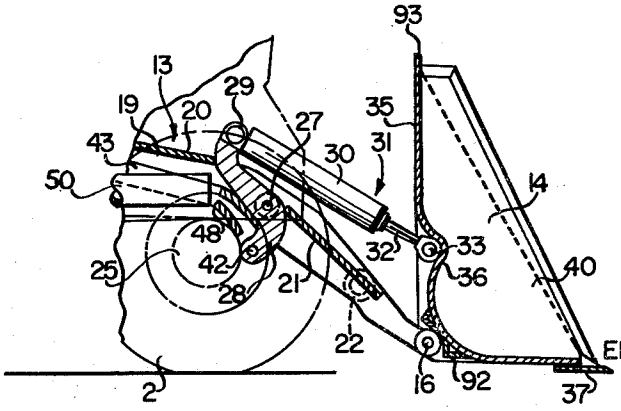

FIG 6

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Aug. 31, 1965 E. C. BREKELBAUM ETAL 3,203,564

FRONT END AND OVERSHOT LOADER

Filed July 6, 1962 5 Sheets-Sheet 5

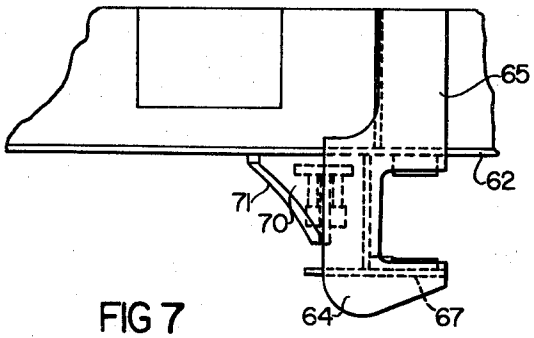

FIG 7

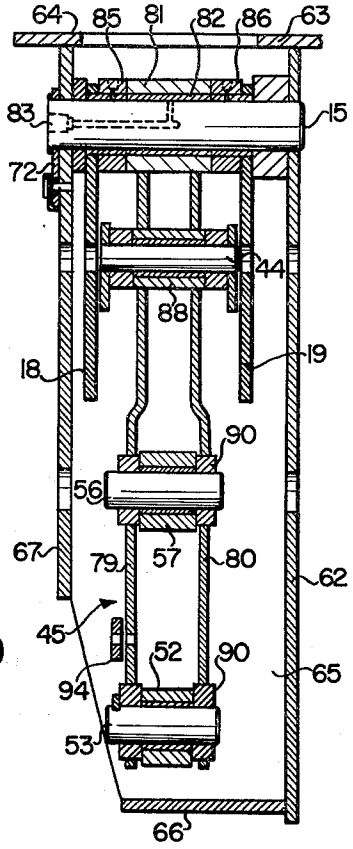

FIG 9

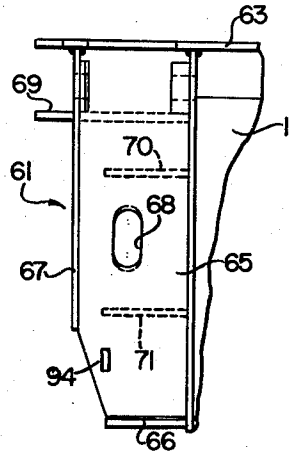

FIG 8

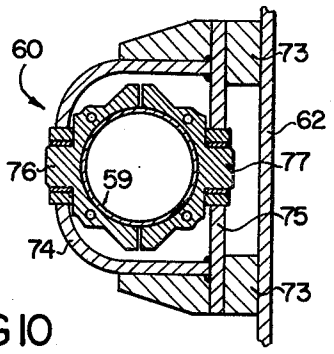

FIG 10

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United States Patent Office 3,203,564 Patented Aug. 31, 1965

3,203,564
FRONT END AND OVERSHOT LOADER

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Filed July 6, 1962, Ser. No. 208,041
10 Claims. (Cl. 214—140)

This invention relates generally, as indicated, to a front end and overshot loader and more particularly to certain improvements in front end loaders of the type disclosed in the copending application of Bernard A. Kuhl, Serial No. 24,062, filed April 22, 1960, entitled "Front End Loader" now Patent No. 3,076,571.

In such application, there is disclosed a front end loader having a compact and simplified bucket or scoop lifting assembly obtaining excellent height and reach. The bucket or scoop lifting booms are pivoted to the tractor a substantial distance behind the back rest of the operator's seat and steering wheel while still approximately in the middle of the tractor. With the arm geometry disclosed in such application, there is provided a front end loader with excellent front loading capabilities.

However, in certain loading operations, it may be desirable to load either forwardly or rearwardly of the tractor. With conventional front end loaders, it is impossible to load rearwardly of the tractor and, with conventional overshot loaders, it is generally impossible to load effectively forwardly of the tractor due to height and reach limitations.

It is accordingly a principal object of the present invention to provide a tractor-loader of a more highly versatile character which can load both to the front and rear of the tractor and which can obtain greater height and reaches for such selective loading.

It is a further principal object of the present invention to provide an attachment for such front end loaders whereby they can readily be converted into overshot loaders.

A further object is the provision of a special mounting member for the bucket lifting arms of a conventional front end loader which can quickly convert the same into an overshot loader.

Still another object is the provision of such attachment which can readily immobilize the mounting member when not in use so that the loader may operate in the conventional front loading manner.

A still further object is the provision of a highly versatile front end and overshot loader incorporating all the advantageous features of the front end loader disclosed in said aforementioned copending application.

Other objects and advantages of the present invention will become apparent as the following description proceeds.

To the accomplishment of the foregoing and related ends, the invention, then, comprises the features hereinafter fully described and particularly pointed out in the claims, the following description and the annexed drawings setting forth in detail certain illustrative embodiments of the invention, these being indicative, however, of but a few of the various ways in which the principles of the invention may be employed.

In said annexed drawings:

FIG. 1 is a side elevation of a front end and overshot loader in accordance with the present invention, the boom and scoop being shown in its lower digging position in full lines and in its initial tilt-back position in dot-dash lines;

FIG. 2 is a side elevational view similar to FIG. 1 showing the position of the lifting arms and bucket when the bucket is raised to the front of the tractor for conventional front loading;

FIG. 3 is a side elevational view similar to FIGS. 1 and 2 showing the bucket and lifting booms moved to the overshot loading position;

FIG. 4 is a side elevational view similar to FIG. 3 showing the extended height that may be obtained in the front loading position with the employment of the overshot loading attachment of the present invention;

FIG. 5 is a fragmentary enlarged side elevation of such loader illustrating the details of the overshot loading attachment;

FIG. 6 is a fragmentary longitudinal vertical section on a somewhat reduced scale than that of FIG. 5 showing the scoop boom structures and linkage in digging position;

FIG. 7 is a fragmentary top plan view of the mounting bracket employed with one form of the present invention;

FIG. 8 is a front elevation of such mounting bracket as seen from the right in FIG. 7;

FIG. 9 is an enlarged vertical section taken substantially on the line 9—9 of FIG. 5;

FIG. 10 is an enlarged vertical section of the trunnion mounting for the overshot cylinder taken on the line 10—10 of FIG. 5;

FIG. 11 is a side elevation similar to FIG. 4 of a further form of front end and overshot loader in accordance with the present invention; and

FIG. 12 is a side elevation similar to FIG. 3 showing the bucket and lifting booms of the further embodiment moved to the overshot loading position.

Referring now more specifically to the drawings and first to FIG. 1, it will be seen that the front end and overshot loader of the present invention comprises a tractor 1 having front and rear pairs of wheels 2 and 3, respectively, all of which are driven by an engine (not shown) in compartment 4. Generally, the rear pair of wheels 3 are the steering wheels actuated by the steering wheel 5 in the driver's compartment 6 provided near the front end of the tractor 1. Behind the steering wheel 5 is the operator's seat 7 which includes the usual visible back rest. Since the loader of the present invention may be employed as an overshot loader in that the loading bucket or scoop will be moved over the top of the driver's compartment, a roof 8 is provided over the compartment 6 to protect the driver from falling material or the like.

The tractor may be driven adjacent the side of a truck body when the pair of booms shown generally at 13 are in the raised or elevated position and a load of material is contained within the scoop or bucket 14 positioned at the distal ends thereof, which it is desired to dump or load into such truck body.

Such lifting booms 13 are pivotally proximally connected by pins 15 to opposite sides of the tractor at a zone which is spaced a substantial distance to the rear of the back rest of the seat 7 and a substantial distance below the top edge of the back rest. However, the pivot pin connection 15 for the boom structures 13 is still approximately intermediately located between the pairs of wheels 2 and 3 near the top of the tractor 1. The distal ends of the booms 13 are pivotally connected as indicated by pins 16 to the back of the trough-shape bucket or scoop 14.

As best shown in the detail views of FIGS. 5, 6 and 9, each boom structure 13 comprises a pair of parallel side plates 18 and 19 joined together by a top web plate 20, which in the digging position of the boom 13, extends downwardly and forwardly from adjacent the boom proximal pivot 15, and by another web plate 21 (FIG. 6) which extends downwardly and forwardly along the downwardly and forwardly extending front portion of the boom 13 at a zone spaced just rearwardly from the boom-scoop pivot 16. The front end portions of the booms 13 are joined together by a transversely extending tubular brace member shown at 22 having its ends securely at-

tached, as by welding, or equivalent expedient, to the respective booms 13.

The lower edge of the boom structure side plates 18 and 19, in the front digging position, extends downwardly and slightly rearwardly of the boom proximal pivot 15 as indicated at 23 and curves around to extend generally horizontally to pass closely adjacent and above the axle 25 supporting the front set of wheels 2. From such axle, the lower edge of the boom side plates then inclines downwardly to the distal scoop pivot 16. The top edge of the boom side plates as defined by the web 20 initially extends downwardly and forwardly at a relatively substantial angle to the horizontal and then extends at a rather small angle to the horizontal substantially parallel to the bottom edge to pass over the axle 25 and then downwardly inclined to the scoop pivot 16. In this manner, the boom structures 13 are of an approximate S-shape.

Referring now particularly to FIG. 6, pivotally connected to each boom 13 by pin 27 between the top webs 20 and 21 is an S-shape link 28, one end of which, in turn, is pivotally connected by the pin 29 to the cylinder 30 of the double acting scoop-actuating piston-cylinder assembly 31, hereinafter referred to as tilt cylinder 31. Piston rod 32 of the tilt cylinder 31 is pivotally connected by the pin 33 to the back of the scoop 14 at a zone which is substantially directly above the connection 16 of the boom distal end with the scoop 14 when the boom and scoop are in the FIG. 6 digging position. In the condition of the parts illustrated in FIG. 2, the tilt cylinder 31 is partially extended so that when the piston rod 32 is fully retracted in the cylinder 30, the scoop 14 will be tilted back as indicated by the dotted line position 34 in FIG. 1. As the scoop 14 is thus tilted back, the cylinder 30 swings downwardly about the pivot 29. The web 21 may, for example, be in the form of a trough having a V-sectional shape so as to clear the tilt cylinder 31 in its lowermost position.

The piston rod 32 of each of the tilt cylinders 31 on each side of the tractor is thus pin-connected to the back of the scoop 14 shown at 35 which is provided with the recesses shown at 36 accommodating such pins 33. A front digging edge 37 may be provided on the scoop and the scoop sides 39 and 40 enclose the ends of the trough-shape bottom or back 35 providing the bucket structure. In the illustrated embodiment, the back of the scoop or bucket is shown longer than the bottom or front to facilitate overshot loading as will hereinafter be described.

Referring now to FIGS. 5 and 6, the lower end of the S-shaped intermediate link 28 for each boom assembly is pivotally connected by pin 42 to the distal end of another slightly more shallow S-shape link 43 which has its proximal end pivotally connected by pin 44 to a triangular overshot member 45, also pivotally connected to the side of the tractor by the pivot pin 15 in the embodiment of the invention illustrated in FIGS. 1 through 10. The pivot pin 44 is thus fixed with respect to the overshot member 45. Such S-shape link 43 is preferably of rectangular sectional configuration and may be cut away as indicated at 48 to accommodate cylinder 49 of piston-cylinder assembly 50. Such cylinder is pivoted by means of a trunnion mounting or like 51 between the side plates 18 and 19 within the boom structure 13. The rod 52 of such piston-cylinder assembly is pin-connected as at 53 to the lower pointed end 54 of the triangular overshot member 45. Thus not only are both S-shape links 28 and 43 accommodated substantially entirely within each boom structure 13, but also the hoist piston-cylinder assembly 50. In this manner, a clean lifting arm or boom structure mechanism is provided on each side of the tractor and most of the working parts thereof are protected within the boom side plates.

The lateral or rearward apex of the triangular overshot member 45 as seen in FIGS. 1 and 5, for example, is connected by pin 56 to the rod 57 of overshot piston-cylinder assembly 58. The cylinder 59 of such assembly is pivotally mounted by means of a trunnion mounting as indicated at 60 to the side of the tractor 1 just above and inside each of the rear wheels 3. It can now be seen that extension and retraction of the piston rod 57 will cause swinging of the overshot member 45 about the pivot 15, extension rotating the member 45 in a counterclockwise direction as viewed in FIG. 1 and retraction in a clockwise direction. It can now be seen that both the boom structure arms 13 and the overshot members 45 on each side of the machine are pivoted about the pins 15 and in order more firmly to support such pins at both ends, brackets or the like 61 may be provided secured to each side of the tractor.

With reference to FIGS. 5, 7, 8 and 9, it will be seen that each such bracket may comprise a side mounting plate 62 secured to the tractor frame, a top plate 63 extending inwardly of the tractor and outwardly of the plate 62 having a U-shape outer end portion 64. A back plate 65 extends downwardly from the top plate 63 terminating in horizontal bottom plate 66. Also extending downwardly from the top plate 63 is an outer plate 67 having the planar configuration shown more clearly in FIG. 5 and which is broken away in FIGS. 1, 2 and 4. The back plate 65 is bent as indicated in FIG. 5 and at such bent portion, a central elongated aperture 68 is provided accommodating the piston rod 57 of the overshot cylinder 58. Spaced below the top plate 63 is a further horizontal member 69 having the same configuration as the U-shaped outer portion 64 of the plate 62. Brace plates 70 and 71 may be provided extending between the side plate 62 and the back plate 65. In this manner, the pin 15 will be held firmly supported at both ends and as seen in FIG. 9, a key 72 may be provided welded to such pin 15 and secured to the outer plate 67.

As seen in FIG. 10, the trunnion mounting for the cylinder 59 may also be secured to the side plate 62 with spacers 73 being employed properly to space the yoke members 74 and 75 supporting trunnions 76 and 77 in the respective bushings.

The overshot member 45, as seen in FIG. 9, may comprise two spaced plates 79 and 80 with the top apex of such member having a support collar 81 with bushing 82 therein providing the bearing between the overshot member 45 and the pin 15. A grease fitting or the like 83 may be provided properly to lubricate such bearing. Spacers 85 and 86 also provided with grease fittings may be employed properly to center the overshot member 45 between the side plates 18 and 19 of the boom 13. These spacers are in reality the upper bushings of the boom 13. The pin 44 to which the S-shape link 43 is pivoted extends through a collar 88 with a bushing also being provided. The pivots provided by the pins 53 and 56 comprise bosses 90 in each of the side plates 79 and 80 through which the pins 56 and 53 may extend. Bushings are also provided surroundings such pins interiorly of the ends of the rods 52 and 57.

For normal front end digging and loading, the overshot member 45 may be immobilized as by pin-connecting the same to bracket 61 and the piston-cylinder assembly 58 may actually be removed from the machine. A forwardly extending flange 94 may be provided on the bracket 61 suitably secured thereto as by welding and a pin 95 may be employed thus to lock the overshot member 45 in its immobilized position. For such normal front end loading operation, the operator drives the tractor 1 into the bottom of a pile of material while the boom structures 13 are down and the scoop 14 is in digging position, as shown in full lines in FIG. 1. After the scoop 14 has penetrated the pile of material, the operator actuates an appropriate valve (not shown), fully to retract the tilt cylinders 31 to move the scoop to the dotted line position 34 in FIG. 1 while the tractor 1 continues to move into the pile. At the same time, the operator actuates another valve (not shown) to swing the booms 13 up about the

boom pivot 15 by supplying hydraulic fluid from an engine driven pump to the blind ends of hoist piston-cylinder assemblies 50. As the boom structures 13 swing upwardly, the scoop 14 tilts backwardly but not in direct relation to the angle of swing of the booms 13 by reason of the provision of the linkage mechanism shown in detail in FIGS. 5 and 6.

With such linkage, the scoop 14 will be tilted back at a slower rate than the rate of angular movement of the booms 13. As the boom structures 13 are elevated from the FIG. 1 to the FIG. 2 position by the hoist piston-cylinder assemblies 50, the link 43 pivotally fixed to the overshot member 45 at 44 will cause the S-shape intermediate link 28 to pivot in a clockwise direction as viewed in FIGS. 1 and 2 in effect tilting the scoop forwardly as the booms are raised. Thus in the maximum height obtainable by the extension of the piston-cylinder assemblies 50 alone, the scoop is in its maximum load carrying position and when it is desired to dump the contents of the scoop, the operator actuates a valve (not shown) to open the rod end of the tilt cylinder 31 to a vent through large size tubing and, at the same time, to introduce fluid under pressure from such engine driven pump into the blind end of the cylinder, whereby the scoop 14 will be swung clockwise as seen in FIG. 2 about its pivot connection 16 to the distal ends of the boom structures 13. As the scoop 14 swings to its dumping position, a stop 92 on the scoop 14 engages a corresponding stop on the booms, thereby to jar the contents of the scoop for ready sliding therefrom. In this thus obtained FIG. 2 dot-dash line dumping position of the scoop 14, the lip 37 of the scoop may, for example, be three feet from the front peripheries of the forward wheels 2 and approximately ten feet from the ground G (dimension A). It it is necessary to reach further as into a wide body dump truck or railroad car, the booms 13 may be lowered and, of course, as the height A decreases, the reach or distance from the wheels 2 forwardly will increase.

The aforementioned normal front end digging and loading is that which may be accomplished by the machine disclosed in the aforementioned copending application of Bernard A. Kuhl, Serial No. 25,062 entitled "Front End Loader," filed April 22, 1960, now Patent No. 3,076,571 and, of course, alone, forms no part of the present invention.

With the improvements of the present invention, it is possible to obtain with such mechanism a greater height for conventional front end loading and, moreover, optional loading both to the front end of the tractor and to the rear end of the tractor, or overshot loading.

With the overshot member 45 free to move and with the overshot piston-cylinder assembly 58 properly connected both to the member 45 and the trunnion mounting 60 and the hydraulic lines thereof connected to the engine driven hydraulic pump through suitable valving, not shown, the operator can then employ such piston-cylinder assembly 58 to obtain both greater height in the front loading operation of the machine and also optionally overshot loading. With the position of the parts in the FIG. 2 position, the operator can then actuate a valve (not shown) to allow fluid under pressure to enter the blind end of the cylinder 59 causing the piston rod 57 to extend pivoting the entire overshot member 45 and the boom structure 13 connected thereto about the axis of the pivot pin 15. In this manner, the operator can move the structure from the FIG. 2 to the FIG. 4 position to increase the front loading height from the dimension A to the dimension B. With the extension of the piston-cylinder assembly 58 in such illustrated embodiment, the loading height at the front end of the vehicle can be extended approximately four feet.

If it is desired to load at the rear of the machine, the tilt cylinders 31 will be maintained substantially in their retracted position and further extension of the rod 57 will cause the overshot member 45 to swing to the FIG. 3 position and with the hoist piston-cylinder assemblies 50 maintained in their extended position, the boom structures 13 will pivot over the top of the machine to the overshot loading position shown. As the piston-cylinder assembly 58 moves the overshot member through its swinging stroke about the pivot 15, the operator can actuate the valving (not shown) controlling the tilt cylinder assemblies 31 to maintain the scoop 14 in a substantially level maximum load carrying position as the scoop moves over the top of the machine. When in the FIG. 3 position, the operator may then retract the tilt cylinder assemblies 31 causing the scoop to tilt to the full line position shown dumping the material from the back lip 93 of the scoop 14. A mechanical stop similar to stop 92 may be provided on the scoop 14 as shown in FIG. 6 to relieve shock loads on the tilt cylinder assemblies 31 and the S-shape links mounting the blind ends thereof. With the configuration of the scoop illustrated, it is possible to obtain greater reach by not retracting the tilt cylinder assemblies 31 to the maximum extent especially when handling loose materials such as sand, gravel, sugar beets, or the like.

Although in overshot loading, the hoist piston-cylinder assembly 50 will normally be actuated first to elevate the booms to the FIG. 2 position and then the piston-cylinder assemblies 58 will be actuated to swing the booms and the load over the top of the tractor, it will be understood that a skillful operator will be able to actuate both piston-cylinder assemblies 50 and 58 simultaneously to a certain extent. When returning the bucket or scoop to its digging position, both piston-cylinder assemblies 50 and 58 may be actuated simultaneously.

When the boom and scoop are in the overshot loading position as seen in FIG. 3, it will be noted that the center of gravity of the scoop and boom lifting structures is still well within the wheel base of the tractor. This is, of course, true in both the front loading position of FIG. 2 and in the overshot loading position of FIG. 3 primarily because the boom pivot 15 is substantially between the pairs of wheels 2 and 3 and in the middle of the tractor. Moreover, with the pivot near the top of the tractor, the length of the boom structure from the proximal pivot 15 to the distal pivot 16 need not be as great to obtain the desired height and reach requirements for both front and overshot loading.

It can now be seen that there is provided a highly versatile loader wherein the boom structures are pivoted both to the machine frame and to the overshot mounting member so that the boom structures may be swung bodily by the movement of such member over the top of the machine to an overshot loading position. In this manner, the overshot cylinder assemblies 58 can pivot bodily the triangular linkage provided by the pivots 15, 53 and 51, with the pivot connection 53, 51 being lengthened also to lift the booms. During such lengthening, the link 43, which is pivoted at 44 to the overshot member 45, maintains the scoop 14 in its level position causing an automatic self-leveling of the scoop during the initial elevation of the boom structures. If it is desired not to operate the mechanism as an overshot loader, the overshot member may be immobilized and the overshot cylinder assembly 58 may then be removed. However, the overshot cylinder assembly 58 in its static condition will, of course, serve the same function maintaining the member 45 in its position fixed with respect to the pivot 15.

Referring now to the embodiment of the invention disclosed in FIGS. 11 and 12, the tractor, boom structures 13, and scoop 14 will be identical in form to that disclosed in the FIGS. 1 through 10 embodiment.

The overshot member 96 will, however, be of a slightly different configuration in that it is provided with a top offset pivot to the bracket 97 indicated at 98 with the boom structures 13 being pivoted to the top of the

overshot member 96 as indicated at 99. In this manner, as the overshot member is swung by the overshot cylinder assemblies 58, the boom structures will pivot bodily about the pivot 98 instead of the pivot 99. The overshot member 96 will be substantially the same as the overshot member 45 with the exception of the additional rearwardly offset pivot 98 securing the same to the bracket 97 and thus the tractor 1. When the hoist cylinders 50 are actuated, the booms 13 will initially be pivoted about the pivots 99 to the front loading position. Then, instead of continuing about the same pivot as in the FIGS. 1 through 10 embodiment, the boom structures will then be pivoted about the rearwardly offest pivot 98 to the overshot loading position seen in FIG. 12. Thus the scoop pivot 16, for example, will move initially along an arc described from the pivot 99 and then along an arc described from pivot 98. It can now be seen that the scoop will move rearwardly and upwardly an increased distance equal to the distance between such pivots 98 and 99. In this manner, the overshot cylinder 58 pivots bodily the quadrilateral linkage provided by the pivots 51, 53, 98 and 99 again with the pivot connection 53, 51 being lengthened initially to lift the booms to front loading position. The mounting bracket for the overshot members 96 is shown partially broken away in FIGS. 11 and 12 better to illustrate the configuration of the overshot member 96.

It is then apparent that there is provided a loader having all the advantages of the front end loader disclosed in the aforementioned copending Kuhl application and additionally having a highly versatile loading feature obtaining more height in the front loading condition and an optional overshot loading.

Other modes of applying the principle of the invention may be employed, change being made as regards the details described, provided the features stated in any of the following claims or the equivalent of such be employed.

We, therefore, particularly point out and distinctly claim as our invention:

1. In a loader comprising a mobile tractor having ground-engaging propelling means and a forwardly facing operator's seat from which the operator may control the movements of said tractor, and a forwardly extending material handling assembly and actuating means therefor pivotally mounted on said tractor for swinging in a vertical plane from a lower material pick-up position to an upper hoist and dump position, said assembly comprising a pair of hollow booms having rear portions which are pivotally connected to the respective sides of said tractor, rearward of said seat and which, when said booms are in such lower position, extend downwardly and forwardly from such boom pivot, said booms also having front portions disposed forwardly of the front end of said tractor and close to the ground when said booms are in such lower position, a material handling scoop pivotally connected to the front ends of said booms for tilting movements about a horizontal axis for scooping material therein and for dumping such material therefrom, and a three part linkage associated with each boom for tilting said scoop to different angular positions with respect thereto, said linkage comprising a first link disposed substantially in its entirety within said boom and pivotally connected at one end to a point below the boom-tractor pivot, an intermediate link pivotally connected between its ends to an intermediate portion of said boom, and a third variable length link pivotally connected at its respective ends to said intermediate link and said scoop in radially spaced relation to the boom-scoop pivot effective to tilt said scoop to different angular positions relative to said boom in response to change in length of said third link, the other ends of said first and intermediate links being pivotally connected together, the pivot connections of said booms of said first link and of said intermediate link to said boom and to said first link defining the corners of an articulated quadrangle which changes the angular position of said scoop with respect to the boom as the latter is swung about the boom pivot; a hoist cylinder connected in operative association with each boom to swing said assembly as aforesaid, said cylinder having one end pivotally connected below the boom and first link pivotal connections and extending generally horizontally into said boom when the latter is such lower position, and having an intermediate portion pivotally connected to said boom to swing the latter upwardly when said cylinder is extended; an overshot member pivotally connected to said tractor, said boom, said first link and said one end of said cylinder being pivotally connected to said overshot member, said pivotal connection for said first link being located on said overshot member at a point below said boom pivotal connection as aforesaid, and said pivotal connection for said cylinder being located on said overshot member at a point below said boom and first link pivotal connections as aforesaid, and means operative to swing said overshot member and thus said booms, cylinders, and three part linkages pivotally connected thereto about said member-tractor pivot to move said scoop to an overshot loading position when said hoist cylinder is thus extended

2. A loader as set forth in claim 1 including means operative to immobilize said overshot mounting plate with respect to said tractor, said means comprising a flange means secured to said tractor and extending parallel to said overshot member, and pin means adapted to be inserted through apertures in said flange means and said overshot member when said apertures are brought into algnment, said pin means when so disposed locking said overshot member in such immobilized position.

3. In a boom and scoop assembly for a loader comprising a pair of hollow generally S-shape booms, which, in their lower material pick-up position, extend downwardly and forwardly from their upper ends and extend forwardly and downwardly toward their lower ends, an overshot member to which the upper ends of said booms are pivotally connected for swinging in vertical planes from such lower position to an upper hoist and dump position, a scoop pivotally connected to the front ends of said booms for tilting movement to different angular positions with respect to said boom to scoop material therein, to hoist such material responsive to upward swinging of the front ends of said booms, and to dump such material therefrom, and a pair of link assemblies extending from pivot points on said overshot member through the respective booms to pivot points on said scoop radially spaced from the respective boom-scoop pivots, said link assemblies including first links of generally S-shape form extending substantially longitudinally within said booms curving downwardly and forwardly from pivotal connections at their upper ends with said member and thence curving downwardly and forwardly toward their lower ends, second links having lower ends pivotally connected to the lower ends of the respective first links and having intermediate portions pivotally connected intermediate the ends of the respective booms, and third variable length links having their ends pivotally connected to the upper ends of the respective second links and to said scoop as aforesaid operative when increased in length to tilt said scoop, the pivotal connections of said booms and first links with said overshot member, of said second links with said booms, and of said first and second links with each other defining the corners of articulated quadrangles effective to tilt said scoop with respect to said booms as the latter are swung upwardly from such lower position to an upper hoist position from which the material therein may be dumped by extending said third link, and means operative to pivot said overshot member and thus said booms, cylinders, and link assemblies pivotally connected thereto for further swinging of said booms to an overshot loading position

from which the material within the scoop may be dumped by retracting said third links.

4. The boom and scoop assembly as set forth in claim 3 including a hoist piston-cylinder having the piston end pivotally connected to said overshot member and the cylinder end pivotally connected to said booms, said hoist piston-cylinder being operative to swing said booms upwardly from such lower position to said upper hoist position from which the material within said scoop may be dumped by extending said third links.

5. An overshot loader comprising a tractor having front and rear pairs of wheels, a pair of booms pivoted to the sides of said tractor substantially intermediate said pairs of wheels, a material handling scoop pivotally connected to the distal ends of said booms, an overshot mounting member also pivotally connected to the side of said tractor, said overshot mounting member and said booms being coaxially pivotally connected to said tractor, hoist means pivotally interconnecting the lower end of said member and said booms for hoisting said scoop to a front loading position, and means operative to pivot said member when said booms are in such front loading position to swing the scoop backwardly over said tractor to an overshot loading position.

6. A loader comprising a tractor, ground-engaging means supporting said tractor for mobility on each side thereof, a pair of booms pivotally connected to the sides of said tractor substantially in the middle and adjacent the top of said tractor, a material handling scoop pivotally connected to the distal ends of said booms, an overshot mounting member pivoted to each side of said tractor, said overshot mounting members and booms being coaxially pivotally connected to said tractor, hoist piston-cylinder assemblies pivotally connected to said booms and members operative to swing said booms upwardly to a front loading position, and means operative optionally to swing said booms over the top of said tractor to an overshot loading position.

7. An overshot loader comprising a tractor having front and rear pairs of wheels, a pair of booms pivoted to the sides of said tractor substantially intermediate said pairs of wheels, a material handling scoop pivotally connected to the distal ends of said booms, an overshot mounting member also pivotally connected to the side of said tractor, hoist means pivotally interconnecting the lower end of said member and said booms for hoisting said scoop to a front loading position, means operative to pivot said member when said booms are in such front loading position to swing the scoop backwardly over said tractor to an overshot loading position, and means to immobilize said overshot mounting member with respect to said tractor, said means comprising a flange means secured to said tractor and extending parallel to said overshot member, and pin means adapted to be inserted through apertures in said flange means and said overshot member when said apertures are brought into alignment, said pin means when so disposed locking said overshot member in such immobilized position as aforesaid.

8. An overshot loader comprising a tractor having front and rear pairs of wheels, a pair of booms pivoted to the sides of said tractor substantially intermediate said pairs of wheels, a material handling scoop pivotally connected to the distal ends of said booms, an overshot mounting member also pivotally connected to the side of said tractor, hoist means pivotally interconnecting the lower end of said member and said booms for hoisting said scoop to a front loading position, and means operative to pivot said member when said booms are in such front loading position to swing the scoop backwardly over said tractor to an overshot loading position, said booms being pivotally connected to said overshot mounting member, said member-tractor pivot being rearwardly offset from said boom-member pivot, thus increasing the distance that said scoop moves upwardly and rearwardly during pivotal movement of said overshot mounting member as aforesaid.

9. A loader comprising a tractor, ground-engaging means supporting said tractor for mobility on each side thereof, a pair of booms pivotally connected to the sides of said tractor substantially in the middle and adjacent the top of said tractor, a material handling scoop pivotally connected to the distal ends of said booms, an overshot mounting member pivoted to each side of said tractor, hoist piston-cylinder assemblies pivotally connected to said booms and members operative to swing said booms upwardly to a front loading position, and means operative optionally to swing said booms over the top of said tractor to an overshot loading position, said booms being pivotally connected to said member, said member-tractor pivot being rearwardly offset from said boom-member pivot, thus increasing the distance that said scoop moves upwardly and rearwardly during pivotal movement of said overshot mounting member as aforesaid.

10. An overshot loader comprising a tractor, a pair of ground-engaging wheels supporting said tractor for mobility at opposite ends thereof, an overshot member pivotally connected to said tractor on each side and adjacent the top thereof, a pair of booms pivotally connected to said overshot members on each side of said tractor at a point substantially intermediate said pair of wheels, a material handling scoop pivotally connected to the distal ends of said booms, means interconnecting said members and booms operative to swing said booms upwardly to a front loading position, means responsive to such upward swinging of said booms to maintain said scoop in a load maintaining condition, and means interconnecting said members and tractor operative to swing said booms and scoop over the top of said tractor to a rear loading position, said overshot members being pivoted to said tractor slightly horizontally offset from the pivotal connections of said booms to said overshot members, whereby said scoop is adapted to be raised upwardly an increased distance equal to the distance between said boom and overshot member pivots during swinging movement of said overshot members.

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