Jan. 11, 1949. LE GRAND H. LULL 2,458,949

LOAD CARRIER MOUNTING

Filed Nov. 9, 1945 5 Sheets-Sheet 1

FIG 2

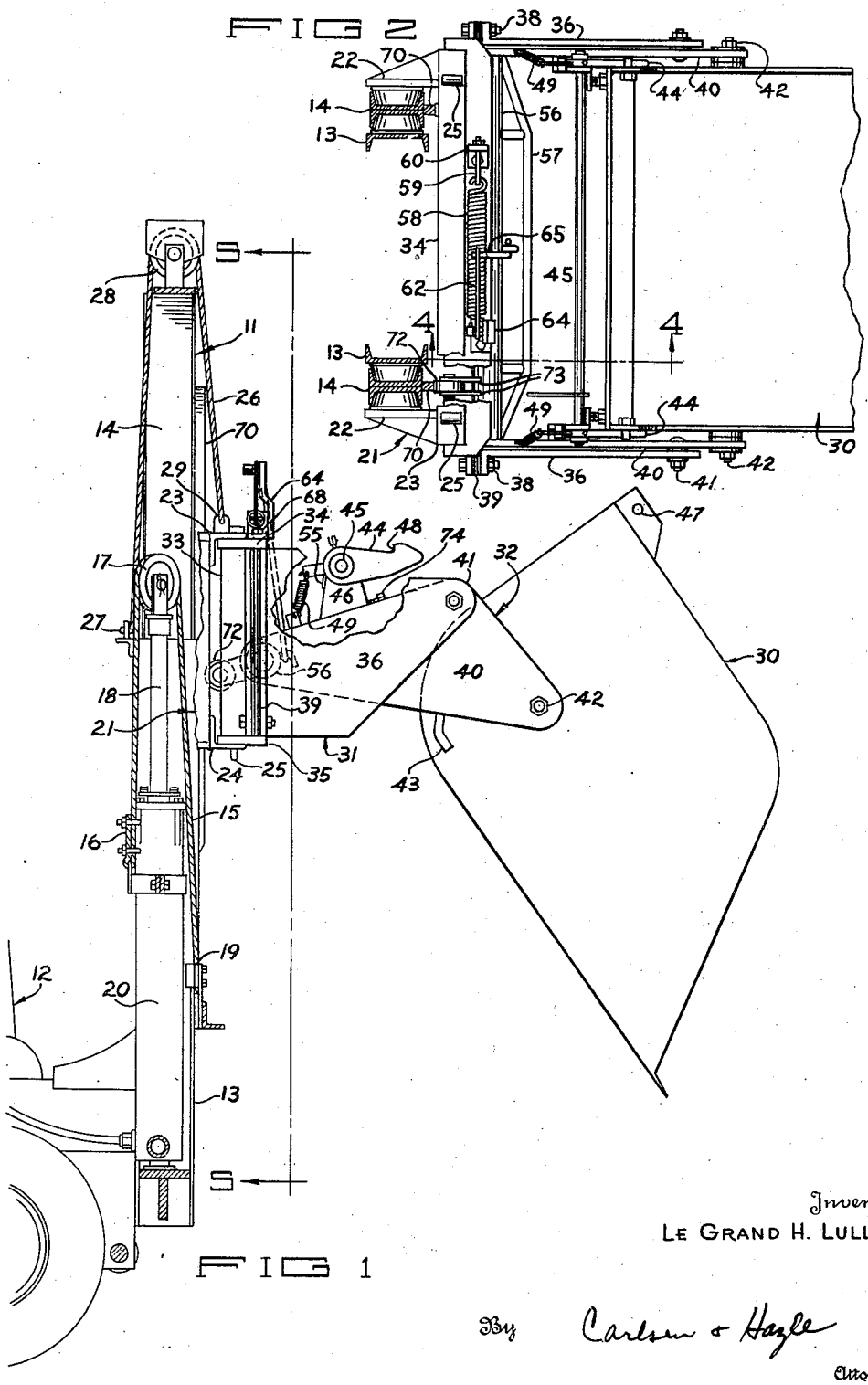


FIG 1

Inventor
LE GRAND H. LULL

By Carlson & Hayle
Attorneys

Jan. 11, 1949. LE GRAND H. LULL 2,458,949

LOAD CARRIER MOUNTING

Filed Nov. 9, 1945 5 Sheets-Sheet 2

FIG 3

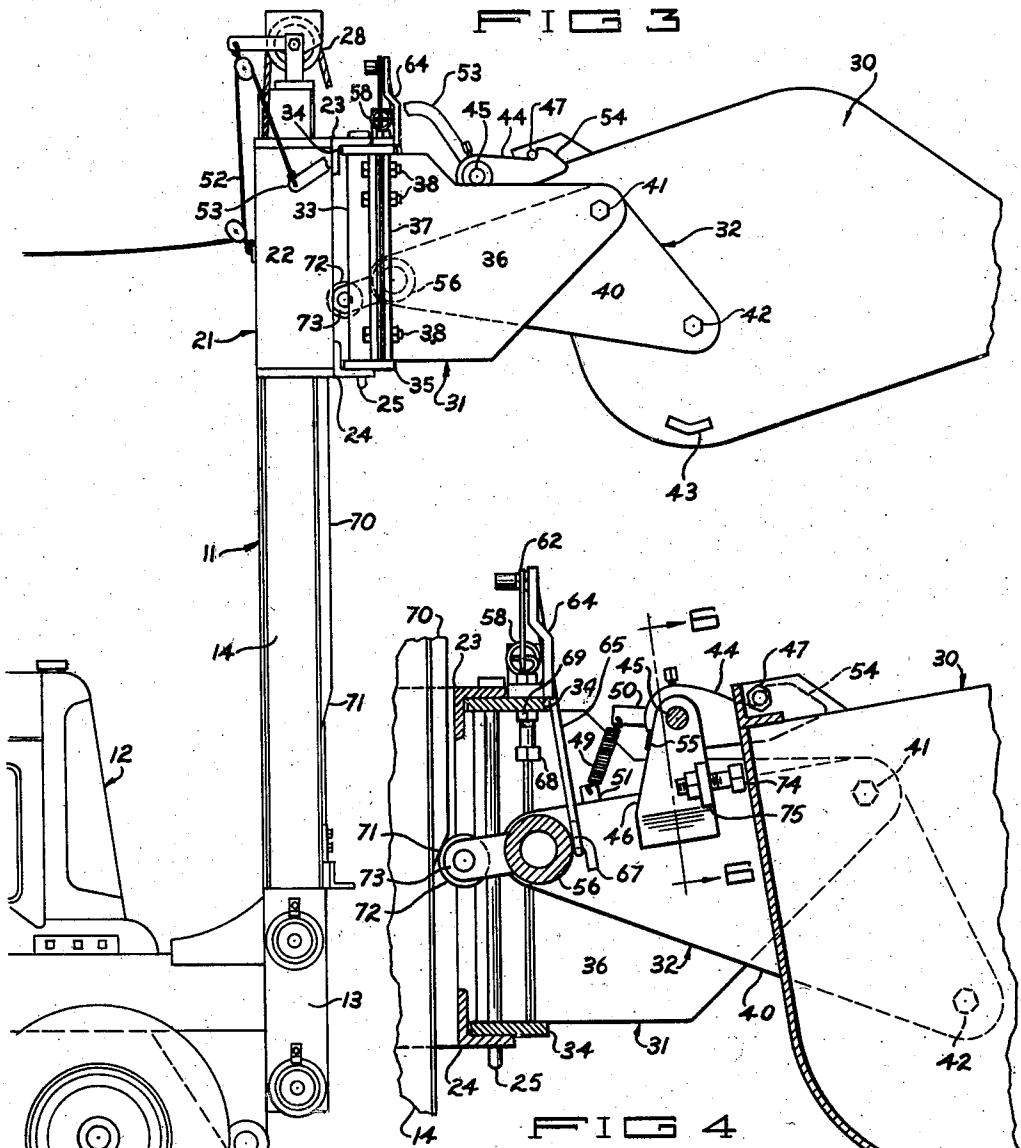


FIG 4

Inventor
LE GRAND H. LULL

By Carlsen & Hayes
Attorneys

Jan. 11, 1949. LE GRAND H. LULL 2,458,949

LOAD CARRIER MOUNTING

Filed Nov. 9, 1945 5 Sheets-Sheet 3

FIG 5

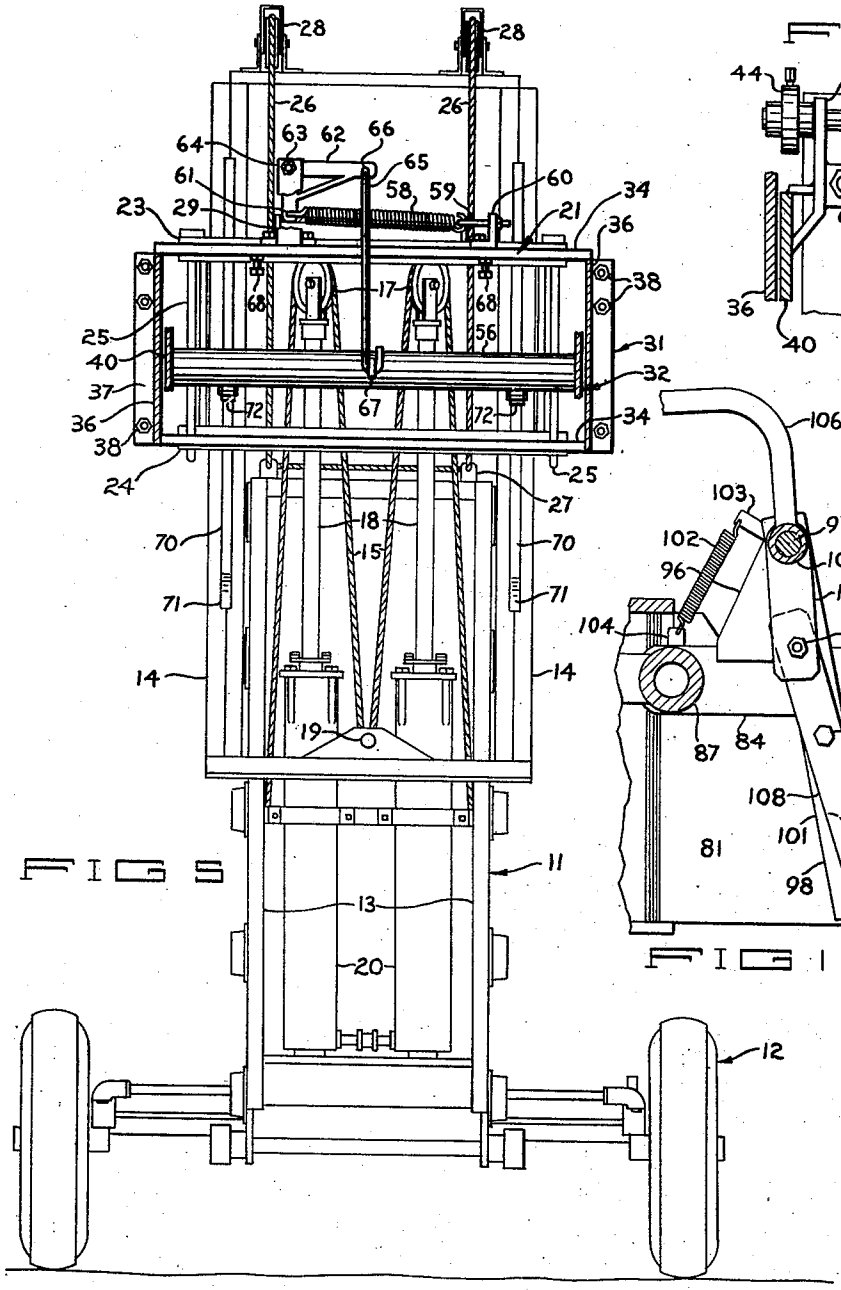


FIG 6

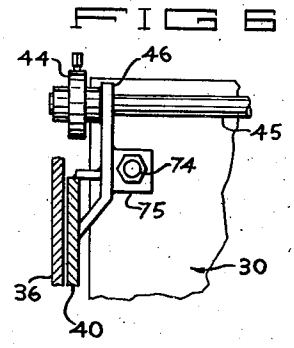


FIG 10

Inventor
LE GRAND H. LULL

By Carlson & Hayle

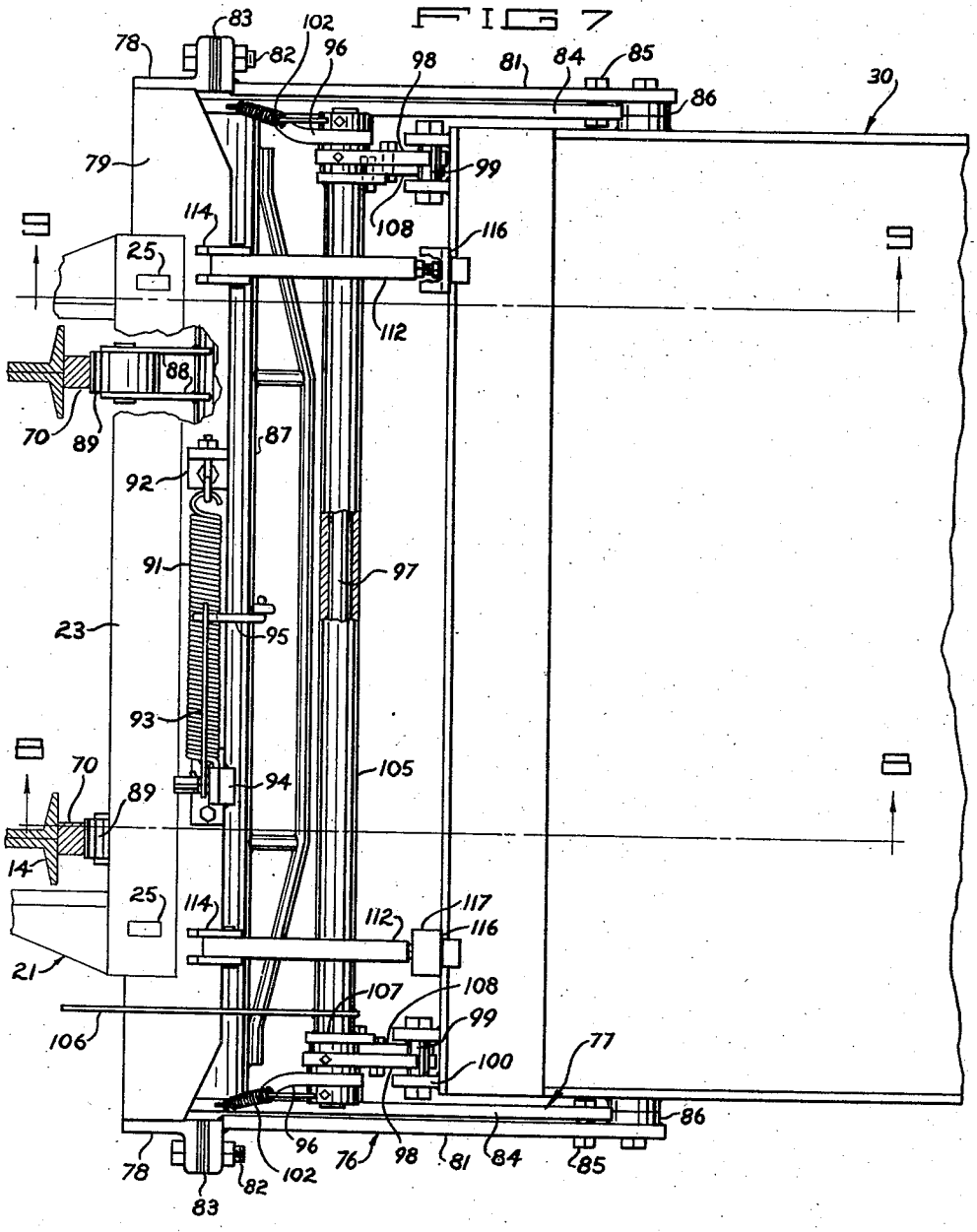
Attorneys

Jan. 11, 1949. LE GRAND H. LULL 2,458,949

LOAD CARRIER MOUNTING

Filed Nov. 9, 1945 5 Sheets-Sheet 4

FIG 7



Inventor

LE GRAND H. LULL

By Carlson & Hazle

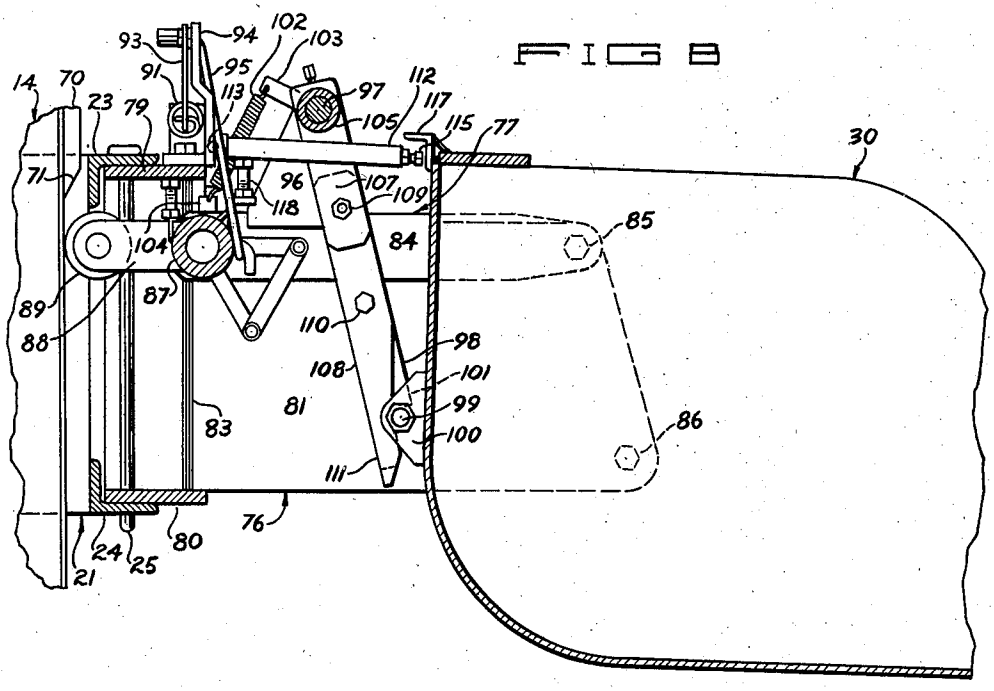
Attorney

Jan. 11, 1949. LE GRAND H. LULL 2,458,949

LOAD CARRIER MOUNTING

Filed Nov. 9, 1945 5 Sheets-Sheet 5

FIG 8



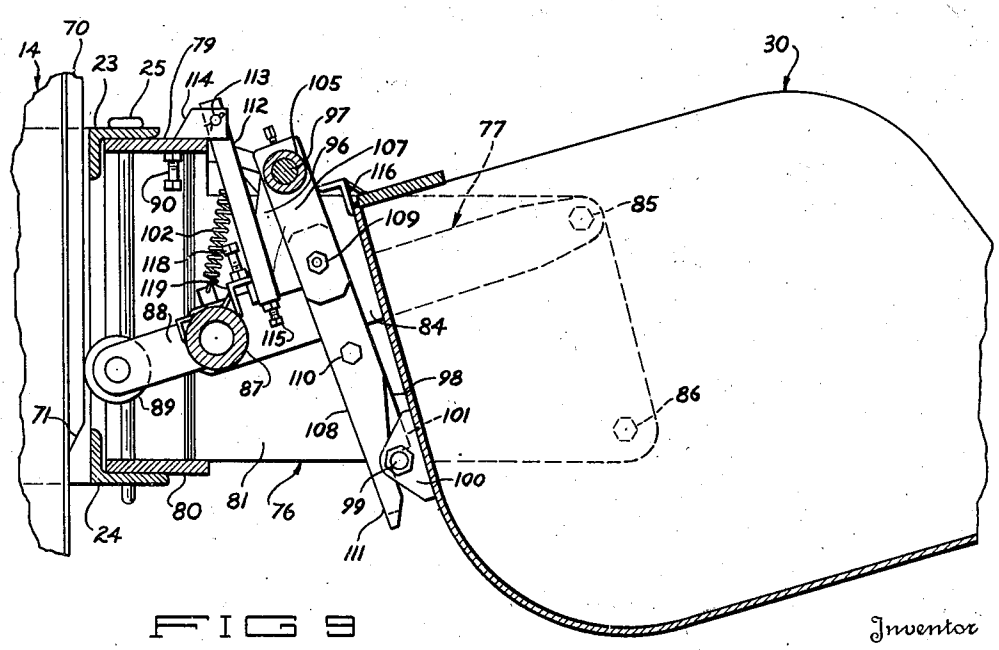


FIG 9

Inventor
LE GRAND H. LULL

By Carlson & Hayden
Attorney

Patented Jan. 11, 1949

2,458,949

UNITED STATES PATENT OFFICE

2,458,949

LOAD CARRIER MOUNTING

Le Grand H. Lull, Minneapolis, Minn.

Application November 9, 1945, Serial No. 627,694

25 Claims. (Cl. 214—113)

1

This invention relates to improvements in load handling devices or loaders, which are supported on and operated by an automotive vehicle such as a tractor.

The present invention more particularly relates to certain improvements in the type of loader shown in my co-pending application, Serial No. 515,783, filed December 27, 1943, now United States Patent No. 2,394,458, issued Feb. 5, 1946. This loader comprises an upright extensible tower or frame mounted upon a tractor and operated by a hydraulic cylinder, or cylinders, and an arrangement of cables to raise and lower a carrier member upon which the actual load carrier, such as a material bucket or the like is detachably mounted. It is found to be very desirable to tilt the bucket or other carrier as it is lifted in order to prevent the material from running out or falling off and it is in connection with such tilting and associated features that my present invention is chiefly concerned.

The primary object of the invention is to provide a mechanism by which the bucket or load carrier may be tilted to a degree or angle greater than possible in any previous construction and to such extent that the material will not fall out as it is lifted and transported from place to place. Another object is to provide a bucket tilting mechanism which is completely automatic in its operation, is fully adjustable as required both to initially determine the tilt angle and to maintain it as wear occurs and which embodies means for holding the bucket level, or substantially so, when it is lowered and is being thrust into a load. A further object is to provide bucket latching means of novel and advantageous construction for unlatching the bucket to dump its contents from its elevated and tilted positions, and which latch mechanism is so arranged as to be undisturbed by tilting of the bucket so that the bucket will under no circumstances be accidentally unlatched.

These and other more detailed and specific objects will be disclosed in the course of the following specification, reference being had to the accompanying drawings, in which—

Fig. 1 is a side elevation, partially broken away and in vertical section showing one form of my present invention, and showing the bucket in dumping position.

Fig. 2 is a partial plan view of the load carrier assembly shown in Fig. 1, with certain parts of the loader tower or frame shown in horizontal section.

Fig. 3 is a side elevation similar to Fig. 1 but showing the bucket in its tilted transport position.

2

Fig. 4 is an enlarged fragmentary detail vertical sectional view taken substantially along the line 4—4 in Fig. 2.

Fig. 5 is a front elevation, showing the carrier mechanism in section along the line 5—5 in Fig. 1.

Fig. 6 is an enlarged fragmentary detail sectional view along the line 6—6 in Fig. 4.

Fig. 7 is a plan view of a modified form of carrier mounting, a part of the bucket and other parts of the structure being broken away.

Fig. 8 is a vertical sectional view along the line 8—8 in Fig. 7.

Fig. 9 is a similar view along the line 9—9 in Fig. 7, but showing the bucket in tilted position.

Fig. 10 is a fragmentary detail sectional view illustrating the operation.

The loader itself will be first described and it is, of course, understood that this loader is identical in all essential respects to that shown in my previously identified prior application and only such parts thereof as essential to an understanding of my present invention will be described herein.

Referring now more particularly and by reference characters to the drawing, the loader comprises an upright tower 11 supported at the front end of a tractor 12 or other suitable automotive vehicle. The tower 11 comprises an inner rigidly supported frame 13 and an outer vertically movable frame 14 the sides of which are slidable with respect to the corresponding sides of the inner frame. The outer frame 14 is raised and lowered by means of cables 15 secured at 16 to the inner frame, trained over pulleys 17 on plungers 18, and secured at their other ends 19 to the lower end of the outer frame. The plungers 18 are vertically positioned by hydraulic fluid pressure in cylinders 20 supported in the inner frame 13 and it will be readily evident that upward movement of the plungers will elevate the outer frame 14, and vice versa. Fluid under pressure is supplied to the cylinders 20 by a suitable pump and control system (not shown) powered by the tractor engine and under control of the operator.

The loader assembly further includes a carrier frame 21 comprising side plates 22 slidably supported alongside the sides of the outer tower frame 14 for up and down movements both with, and with respect thereto. These side plates 22 are rigidly joined by upper and lower cross bars 23 and 24 having forwardly turned flanges apertured near their ends to receive vertical and removable fastening pins 25. The carrier frame 21 is raised and lowered, as the tower frame 14 correspondingly moves, by means of cables 26 which are

secured at one end at 27 to the upper rear portion of the rigid inner frame 13, trained over pulleys 28 mounted atop the outer frame 14, and secured at their other ends at 29 to the upper cross bar 23. This arrangement is such that the upward movement of the outer frame 14 will pull upon the cables 26 to pull the carrier frame 21 upwardly, and vice versa.

As will be obvious, and as more fully explained in my prior application, the loader structure is such that, from a lowered collapsed position at which the frames 13 and 14 are at substantially the same level and the carrier frame 21 down near the ground, the upward movement powered by the cylinders 20 will both project the outer tower frame 14 upwardly and elevate the carrier frame to the top thereof so that a very high lift will be obtained. At the same time, in the collapsed position the loader requires but comparatively little head room.

The cross bars 23 and 24 and removable pins 25 provide convenient means for mounting or dismounting any particular load handling or carrying device. As here shown this device takes the form of a material bucket or scoop 30 and for connecting this bucket, or other similar device, to the carrier frame 21 I provide a novel mechanism forming the subject matter of this invention.

This mechanism, as shown in Figs. 1 through 6, comprises a first or mounting frame designated generally at 31 which is mounted on the carrier frame 21, and a second or tilting frame designated generally at 32 which supports the bucket 30 and is tiltably supported on said first frame 31.

The first or mounting frame 31 comprises rear upright angles or mounting members 33 which are rigidly joined by upper and lower cross bars 34 and 35 adapted to fit between the aforesaid cross bars 23 and 24 of the carrier frame 21. These cross bars 34 and 35 are also apertured to pass the pins 25 and it will be apparent that the frame 31 may thus be readily attached to or detached from the loader. The frame 31 further comprises transversely spaced and forwardly projecting side plates 36 the rear edges of which are outwardly turned at 37 to fit the outwardly turned webs of the angles 33. Bolts 38 connect these parts and between them are mounted a series of shims 39. By increasing or decreasing the number of these shims 39 the plates 36 and all parts attached thereto may be moved forwardly or rearwardly with respect to the outer tower frame 14. The purpose of such adjustment will be later pointed out.

The second or tilting frame 32 comprises side plates 40 which are pivotally mounted by pins or bolts 41 at upper medial points to upper forward corners of the side plates 36. The side plates 40 are located inwardly of, and parallel to, the side plates 36 and project at lower corner portions forwardly of the plates 36 alongside the bucket 30. These forward portions of the side plates 40 are pivotally attached at 42 to opposite sides of the bucket 30 and these pivots 42 are so located that the bucket will normally of its own weight tilt forwardly and downwardly to a dumping position (Fig. 1). Such dumping movement is limited by stops one of which is shown at 43 and which contact the lower edges of the plates 40 as will be clearly apparent.

To normally hold the bucket 30 against such dumping movements I provide latches 44 secured near opposite ends of a latch shaft 45 which is journaled transversely between and through

brackets 46 welded or otherwise suitably secured to the side plates 40. The latches are further so positioned that they project forwardly alongside upper lateral corners of the bucket, when it is in normal position, and these forward ends of the latches releasably engage latch pins 47 laterally projecting from the bucket. The latches 44 are notched at 48 for this purpose and they are normally urged upwardly to maintain engagement with the pins by springs 49 stretched between arms 50 on the latches and lugs 51 on upper edges of the side plates 40. The latches may be released by a trip rope 52 (Fig. 3) connected to an arm 53 on the latch shaft 45 and a pull on this rope will swing the latches down to clear the pins 47 and allow the bucket to tilt forwardly to dumping position. On restoring the bucket to normal position the pins 47 ride up on nose surfaces 54 on the latches to depress them as necessary for reengaging the pins and the latches are held in proper position for this camming action by stops 55 located in the path of the arms 50.

The rear ends of the side plates 40 extend toward but terminate some distance forwardly of the forward sides of the movable fame 14, and these ends are rigidly joined by a cross member in the form of a tube 56 welded or otherwise secured to the plates and rigidly trussed as indicated at 57. The rear ends of the side plates 40, and of course the tube 56 are normally pulled upwardly about the pivots 41 by a strong retractile coil spring 58 located above the upper cross bar 34. One end of this spring 58 is adjustably attached by an eye bolt 59 (Fig. 5) to a bracket 60 upon the cross bar 34 while the other end of the spring is hooked at 61 to the lower arm of a bell crank 62 pivotally mounted at 63 upon a bracket 64 also secured to said cross bar. A link 65 is connected at 66 to the other arm of the bell crank 62 and depends therefrom at its lower end forwardly of the tube 56 to a hook 67 secured to the tube and upon which the link is hooked. The spring 58 thus tends to so swing the bell crank 62 as to pull the link 65 upwardly and this motion is transmitted to the tube 56 and plates 40 to elevate their rear ends, and of course tends to lower the bucket pivots 42. Such spring biased movement of the parts is limited by stop screws 68 which depend from the upper cross bar 34 into the path of the tube 56 and these screws are adjustable as clearly indicated in Fig. 4 at 69 so that the normal level of the parts, including bucket 30, may be readily adjusted.

As in the loader shown in my prior application the movable tower frame has upright guide bars 70 or means forming upright guide surfaces, on each forward surface and these bars are tapered off or rearwardly and downwardly angled at lower ends as indicated at 71. Above these ends the forward surfaces of the bars 70 project forwardly some distance from the sides of the frame 14. Cooperating with said guide bars are rollers 72 which are arranged rearwardly of the tube 56 and supported therefrom by rigidly affixed bearing brackets 73. The rollers 72 are so spaced that they will contact the guide bars 70 as the carrier frame 21 moves upwardly, the bars terminating at such height above the lower ends of the frame 14 that the rollers will only reach the bars after the bucket has been elevated some distance above its lowermost loading position.

In its normal or loading position the bucket 30 stands with its rear upper corner portions immediately forward of stop screws 74 adjustably

mounted in lugs 75 rigidly secured to the brackets 46. Said screws extend forwardly from the brackets and in position to engage the rear of the bucket and prevent it from tilting back as might otherwise occur when the bucket is being thrust into a load or pile of material.

In operation as the carrier frame 21 is elevated to a certain point the rollers 72 will contact the angular lower ends 71 of the guide bars 70. It being understood that prior to this time the rollers 72 just clear the forward surfaces of the frame 14 it will then be apparent that the rollers in contacting the ends 71 will be forced to roll up over and along the forward edges of the bars 70 as the carrier continues to rise, and in doing so the rollers will of necessity be moved both downwardly and forwardly. This motion, transmitted through the brackets 73 and tube 56 to the rear ends of the side plates 40 tilts the entire frame 32 downwardly to a considerable degree at its rear end. As a result the forward ends of the side plates 40, carrying the bucket pivots 42 are forced upwardly and forwardly tilting the bucket 30 upwardly at its forward edge so that material therein will not spill over this edge as it is raised and transported from place to place. It will be noted that the latch mechanism for the bracket is in no way disturbed by this tilting action and that the bucket may be unlatched for dumping its contents at any time. The bucket, of course, returns to normal level position when it is lowered and the rollers 72 move downwardly off the guide bars 70, the spring 58 bringing this about, and the whole action is entirely automatic.

Varying the number and thickness of the shims 39 has the effect of moving the rollers 72 forwardly or rearwardly both to initially determine the degree to which the bucket is tilted to compensate for the effects of wear after long use.

The action of the guide bars 70 in forcing the rollers 72 both downwardly and forwardly, together with the effective leverages between the rollers and the pivot points 41 and 42 results in the bucket being tilted to quite a sharp angle as compared to the tilt possible in the mechanism of my prior application, and this added tilt is found to be of considerable advantage in preventing spillage of loose material from the bucket.

The mechanism shown in Figs. 7–10 is similar to that just described but is possibly more satisfactory in a heavy duty loader. The loader itself remains the same and such parts thereof as appear in these views are given the same reference characters, while the bucket, differing only as to size, is again designated at 30. The guide bars 70 and angular lower ends 71 are also identical and are so indicated.

Like the first described construction this modification includes a first or mounting frame, here indicated generally at 76, and a second or tilting frame indicated at 77. Said first frame comprises rear upright angles or mounting members 78 rigidly joined by upper and lower cross bars 79 and 80 adapted to be positioned between the cross bars 23 and 24 of the carrier frame 21 and removably attached thereto by the pins 25. The frame 76 further comprises forwardly extending parallel side plates 81 and at rear ends these are outwardly flanged and secured by bolts 82 to the angles 78. Shims 83 are again provided and for exactly the same purpose.

The tilting frame 77 includes side bars or plates 84 located inwardly of and parallel to the side plates 81 and, as in the previous construction, these plates 84 are pivotally attached, as by pins or bolts 85, to the forward upward corners of the side plates of the mounting frame. And here also tilting of the frame 77 is caused to tilt the bucket 30 but in this case the bucket is pivotally attached at 86 to lower forward corners of the side plates 81. This pivot is, however, as in the first modification of my invention, located forwardly of and below the pivot connection between the two frames and is so located with respect to the center of gravity of the bucket that it will normally and of its own weight tilt toward dumping position.

The rear ends of the side plates 84 terminate forwardly of the movable tower frame 14 some distance and they are rigidly joined by a trussed cross member or tube 87 from which rearwardly extend bearing brackets 88 carrying rollers 89 in position to engage the guide bars 70. The rear ends of the side plates 84 are also upwardly biased, until such motion is limited by stop screws 90 carried by the upper cross bar 79 as previously described, by a strong coil spring 91 again arranged above the said cross bar 79 and attached at one end to a bracket 92 and at its other end to a bell crank 93 carried by another bracket 94. A link 95 connects the bell crank 93 to the tube 87 to pull the same upwardly and when the tube is against the stop 90 it is, of course, understood that the bucket 30 is held substantially level as it is shown in Fig. 8.

Bucket latch mechanism is arranged between the frame 77 and the bucket and comprises brackets 96 secured to upper edges of the side plates 84 rearwardly of the bucket and supporting a transversely journaled shaft 97. Latches 98 are secured to this shaft 97 and depend downwardly and forwardly therefrom to points adjacent transversely positioned latch pins 99 secured by brackets 100 to the rear of the bucket. The latches 98 are forwardly and downwardly notched, as at 101, to engage over the pins 99 and when so engaged will obviously hold the bucket from dumping while locking it to the tilting frame 77. The latches are normally urged forwardly at lower ends to maintain and return to latching engagement with the pins 99 by springs 102 stretched between arms 103, affixed to the ends of the shaft 97, and lugs 104 upon the upper edges of the side plates 84.

Between the brackets 96 a sleeve 105 is journaled upon the shaft 97 and this sleeve is provided with a lever arm 106 to which the trip rope (not shown) is attached, the arm extending rearwardly as clearly shown. The weight of the arm 106 tends to cause the sleeve 105 to turn counterclockwise upon the shaft as it is viewed in the drawing and this action tends to normally keep straight a toggle-like latch release means which comprises upper and lower arms 107 and 107 pivotally connected at their overlapping ends at 109. The upper arms 107 are secured to the sleeve 105 to oscillate therewith while the lower arms 108, below pivots 109, are fulcrumed at 110 upon the latches 98 to oscillate with respect thereto. The lower ends of these lower arms 108 are reduced in width to form fingers 111 which normally stand immediately behind the pins 99 inside of the latches.

The foregoing arrangement is such that oscillation of the sleeve 105 by a pull on the trip rope will swing the upper toggle arms 107 rearwardly at their lower ends imparting to the fingers 111 an opposite forward movement. The fingers in so moving crowd the latches 98 out of engagement with the pins 99 to allow the bucket

to dump and the leverage obtained by the toggle action is such as to release the latches against the relatively tremendous load of a large bucket, without difficulty.

To prevent the bucket from tilting backward at its upper rear edge when being thrust into a pile I again provide stop means in this case comprising swingable stop arms 112 pivoted at 113 at rear ends to brackets 114 secured atop the upper cross bar 79. The arms 112 normally extend forwardly from these pivots to points immediately behind the upper rear corner portions of the bucket (Fig. 8) and carry adjustable stop screws 115 to contact the bucket and prevent its so tilting. Angles 116 are secured to the bucket and have rearwardly overhanging webs 117 which will prevent the stop arm 112 from kicking up at forward ends.

The arms 112 are held up in position when the bucket is level by operating screws or dogs 118 attached by brackets 119 to the tube 87 in position to upwardly engage the arms forwardly of their pivots 113. In order to allow the bucket to tilt to transport position as in Fig. 9 the stop arms 112 must obviously swing downwardly to clear and this they do since, as the bucket is tilted, the tube 87 moves downwardly and the dogs 118 allow the arms to reach almost a vertically hanging position. When the bucket is again leveled the dogs will, of course, reengage the stop arms and restore them to the position of Fig. 8.

The operation of this mechanism is similar to that previously set out and it will be apparent that, as the carrier rises the engagement of the rollers 89 with the guide bars 70 will swing the rear ends of the side plates 84 downwardly. This motion is transmitted through the latches 98 to the bucket 30 along lines eccentric to the pivots 86 so that the bucket is tilted sharply upward at its forward edge as seen in Fig. 9. As the carrier descends the bucket will of course be leveled again by action of the spring 91.

It is understood that suitable modifications may be made in the structure as disclosed, provided such modifications come within the spirit and scope of the appended claims.

Having now therefore fully illustrated and described my invention, what I claim to be new and desire to protect by Letters Patent is:

1. In a loader having an upright guide surface and a carrier frame movable upwardly and downwardly with respect thereto, a first frame rigidly supported by said carrier frame, a second frame tiltably supported on said first frame for downward swinging movements at one end, a tubular cross member on said second frame, means carried by said cross member for engagement by said guide surface as the frames move upwardly and operative thereby to tilt said second frame, and a load carrier operatively connected to and tiltable with said second frame.

2. In a loader of the character described, a first frame supported for up and down movements, a second frame pivotally supported on the first frame for tilting movements as the first frame moves up and down, said second frame comprising side plates connected by a cross member, and a bucket connected to and tiltable with said second frame.

3. In a loader of the character described, a first frame supported for up and down movements, a second frame pivotally supported on the first frame for tilting movements as the first frame moves up and down, said second frame comprising side plates connected by a cross member, a bucket tiltably supported with respect to said second frame, and means located between said cross member and the pivotal connection between the first and second frames and normally locking the bucket to said second frame for tilting movements therewith.

4. In a loader having an upright guide member, a first frame non-tiltably supported for up and down movements along said guide member, a second frame tiltably supported on the first frame and having side portions connected by a rigidly mounted cross member, means carried by said cross member for engagement with the said guide member to tilt the second frame as the frames move up and down, and a load carrying device connected to and tiltable with said second frame.

5. In a loader having an upright loader frame and a guide member on a forward side thereof, a carrier frame movable upwardly and downwardly along said loader frame, a first frame supported from said carrier frame, a second frame pivotally supported on the first frame at a point forwardly of the loader and carrier frames, means carried by the rear end of the second frame for engaging said guide member to tilt the frame, a load carrier device connected to and tiltable with said second frame, and said engaging means being spaced rearwardly in a substantially horizontal plane from the pivot connection between the said first and second frames.

6. In a loader having an upright loader frame and a guide member on a forward side thereof, a carrier frame movable upwardly and downwardly along said loader frame, a first frame supported from said carrier frame, a second frame pivotally supported on the first frame at a point forwardly of the loader and carrier frames, means carried by the rear end of the second frame for engaging said guide member to tilt the frame, a load carrier device pivotally supported for tilting movements independently of said second frame, latch means normally locking said load carrier device to said second frame, and said latch means being located rearwardly of the pivot connection between said first and second frames.

7. In a loader of the character described having an upright guide member and a carrier movable upwardly and downwardly with respect thereto, a supporting and tilting mechanism for a load handling device comprising in combination, a first frame supported on said carrier, a second frame pivotally supported on the first frame and pivotally supporting the said device, means carried by the second frame cooperating with the guide member to tilt the frame and load handling device as a unit, and latch means located between said means and the pivot connection between the first and second frames for locking the load handling device with respect to said second frame.

8. In a loader having an upright frame, a guide member on the forward side of the frame, and a material bucket, mechanism for supporting and tilting the bucket, comprising in combination, a carrier frame mounted for up and down movements with respect to said guide member, a mounting frame on the carrier frame, side plates pivoted between their ends to said mounting frame and having forward ends supportably connected to the bucket, means rigidly connecting the rear ends of the side plates, and rollers

carried by said connecting means and cooperating with the guide member to tilt the side plates and bucket.

9. In a loader having an upright frame, a guide member on the forward side of the frame, and a material bucket, mechanism for supporting and tilting the bucket, comprising in combination, a frame mounted for up and down movements with respect to said guide member, side plates pivoted between their ends to said frame and having forward ends supportably connected to the bucket, means carried by the rear ends of the side plates and cooperating with the said guide members to swing said rear ends downwardly as the bucket is raised, and spring means normally biasing the rear ends of said side plates in an upward direction.

10. In a loader having an upright frame, a guide member on the forward side of the frame, and a material bucket, mechanism for supporting and tilting the bucket, comprising in combination, a frame mounted for up and down movements with respect to said guide member, side plates pivoted between their ends to said frame and having forward ends supportably connected to the bucket, means carried by the rear ends of the side plates and cooperating with the said guide member to swing said rear ends downwardly as the bucket is raised to thereby tilt the bucket upwardly at its forward edge, and spring means carried by said movable frame and connected to the said side plates to normally and yieldably urge them in an upward direction.

11. In a loader having an upright frame, a guide member on the forward side of the frame, and a material bucket, mechanism for supporting and tilting the bucket, comprising in combination, a frame mounted for up and down movements with respect to said guide member, side plates pivoted between their ends to said frame and having their forward ends pivotally connected to the bucket, latch means carried by the side plates and normally locking the bucket against downward dumping movements at its forward edge, stop means preventing opposite swinging movements of the bucket with respect to the side plates, and means carried by the side plates for engaging the said guide member to tilt the side plates and bucket as a unit.

12. In a loader having an upright frame, a guide member on the forward side of the frame, and a material bucket, mechanism for supporting and tilting the bucket, comprising in combination, a frame mounted for up and down movements with respect to said guide member, side plates pivoted between their ends to said frame and having forward ends supportably connected to the bucket, means carried by the rear ends of the side plates and cooperating with the said guide members to swing said rear ends downwardly as the bucket is raised, and spring means normally biasing the rear ends of said side plates in an upward direction, the said spring means including a bell crank biased in one direction by the spring and connected to said side plates.

13. In a loader having an upright frame, a guide member thereon, and a material bucket, mechanism for supporting the bucket comprising a mounting frame supported for up and down movements with respect to said upright frame, side bars pivotally attached at forward ends to said mounting frame and having means at their rear ends cooperating with the guide member to swing the bars downwardly as the mounting frame moves upwardly, the said bucket being

pivotally supported upon said mounting frame, and means connected between the said bars and the bucket for translating said downward movement of the bars to upward tilting movement of the forward edge of the bucket.

14. In a loader having an upright frame, a guide member thereon, and a material bucket, mechanism for supporting the bucket comprising a mounting frame supported for up and down movements with respect to said upright frame, side bars pivotally attached at forward ends to said mounting frame and having means at their rear ends cooperating with the guide member to swing the bars downwardly as the mounting frame moves upwardly, the said bucket being pivotally supported upon said mounting frame, latch means normally engaging the bucket to prevent dumping movement thereof, and said latch means being normally connected between the side bars and the bucket to tilt the bucket upwardly at its forward edge responsive to said downward movement of the side bars.

15. In a loader having an upright frame, a guide member thereon, and a material bucket, mechanism for supporting the bucket comprising a mounting frame supported for up and down movements with respect to said upright frame, side bars pivotally attached at forward ends to said mounting frame and having means at their rear ends cooperating with the guide member to swing the bars downwardly as the mounting frame moves upwardly, the said bucket being pivotally supported upon said mounting frame, means connected between the said bars and the bucket for translating said downward movement of the bars to upward tilting movement of the forward edge of the bucket, and stop means normally located in position to prevent said tilting movement of the bucket but movable to inoperative position responsive to said dowward movement of the side bars.

16. In a loader having an upright frame, a guide member thereon, and a material bucket, mechanism for supporting the bucket comprising a mounting frame supported for up and down movements with respect to said upright frame, side bars pivotally attached at forward ends to said mounting frame and having means at their rear ends cooperating with the guide member to swing the bars downwardly as the mounting frame moves upwardly, the said bucket being pivotally supported upon said mounting frame, means connected between the said bars and the bucket for translating said downward movement of the bars to upward tilting movement of the forward edge of the bucket, stop arms swingably supported and normally located in position to engage the rear of the bucket and prevent said tilting movement thereof, and means carried by the side bars normally upwardly engaging said stop arms but adapted to move downward as the bars move downward and thereby enable the arms to swing downward and clear the bucket.

17. In a loader having a frame and a bucket tiltably mounted for upward movement at its rear end to dump its contents, a latch mechanism comprising a swingably supported latch member notched at one end, a pin carried by the bucket for engagement with said notch, and a toggle mechanism for releasing the latch comprising a first arm and a second arm pivotally connected, the second arm being fulcrumed on the latch and adapted at its end to bear against the pin to crowd the latch out of engagement therewith,

responsive to swinging movement of the first arm, and means for swinging said first arm.

18. In a loader having an upright frame, a guide member and a material bucket, mechanism for supporting the bucket comprising in combination, a mounting frame operatively supported for up and down movements on said upright frame, side members having end portions turned toward said guide member, said side members being pivotally supported on the mounting frame and having means on their said end portions cooperating with the guide member to swing the side members in an upright plane as the mounting frame moves upwardly, the said bucket being pivotally supported on said mounting frame, latch means operative to hold the bucket against pivotal movements, and said latch means being normally operative to connect the side members to the bucket in such manner as to swing the forward edge of the bucket upwardly responsive to said swinging movement of the side members.

19. In a loader having a frame and a material bucket pivotally supported on the frame for upward tilting movements at its forward edge, mechanism operative to tilt the bucket, a swingably supported stop arm normally positioned to engage the rear of the bucket and prevent such tilting movement, and means operative by said tilting mechanism to swing said stop arm to a position at which it will clear the bucket as it is tilted by said mechanism.

20. In a loader having a frame and a material bucket pivotally supported on the frame for upward tilting movements at its forward edge, mechanism operative to tilt the bucket, a swingably supported stop arm normally positioned to engage the rear of the bucket and prevent such tilting movement, means operative by said tilting mechanism to swing said stop arm downwardly to clear the bucket as it is tilted by said mechanism, and means for limiting the stop arm movement in an upward direction so that it cannot kick-up clear of the bucket.

21. In a loader of the character described, a first frame operatively supported for up and down movements, a second frame pivotally supported on said first frame, means for tilting the second frame as the first frame travels, a bucket supported on said frames in such manner as to be tilted from a normal position when the second frame is tilted, and an adjustable stop member carried by the first frame and downwardly engaging the second frame for leveling the bucket in its said normal position.

22. In a loader of the character described having an upright guide member and a carrier frame movable upwardly and downwardly with respect thereto, a bucket supporting frame structure secured to and projecting forwardly from said carrier frame, a material bucket tiltably supported by said frame structure, means engageable rearwardly with said guide member and operative to be moved forwardly thereby to tilt the bucket as it is raised, and adjusting shims removably mounted between the carrier frame and the said frame structure whereby the frame structure and said guide member engaging means may be adjusted forwardly and rearwardly with respect to said guide member.

23. In a loader having a frame supported for up and down movements and a material handling bucket pivoted on the frame for up and down tilting movements at its material receiving edge, a latch normally locking the bucket in a level position, and a stop screw supported by the frame and engaging the back of the bucket to hold its material receiving edge from tilting upwardly as it is thrust into the material for loading.

24. In a loader of the character described, a first frame operatively supported for up and down movements, a second frame pivotally supported on said first frame, means for tilting the second frame as the first frame travels, a bucket supported on said frames in such manner as to be tilted from a normal position when the second frame is tilted, and a stop screw threaded on the first frame and adjustably positionable to engage the second frame for adjusting the said normal position of the bucket.

25. In a loader having a frame and a bucket tiltably mounted for upward movement at its rear end to dump its contents, a latch mechanism comprising a swingably supported latch member notched at one end, a pin carried by the bucket for engagement with said notch, and mechanism for releasing the latch comprising an arm mounted on the latch and manually movable against the pin to crowd it out of the notch and release the bucket.

LE GRAND H. LULL.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,301,102	Werthman et al.	Nov. 3, 1942
2,375,337	Wilson	May 8, 1945
2,386,519	Wagner et al.	Oct. 9, 1945
2,394,458	Lull	Feb. 5, 1946
2,394,809	Ross	Feb. 12, 1946
2,395,634	Martin	Feb. 26, 1946
2,405,312	Mandt	Aug. 6, 1946

FOREIGN PATENTS

Number	Country	Date
329,460	Great Britain	May 22, 1930