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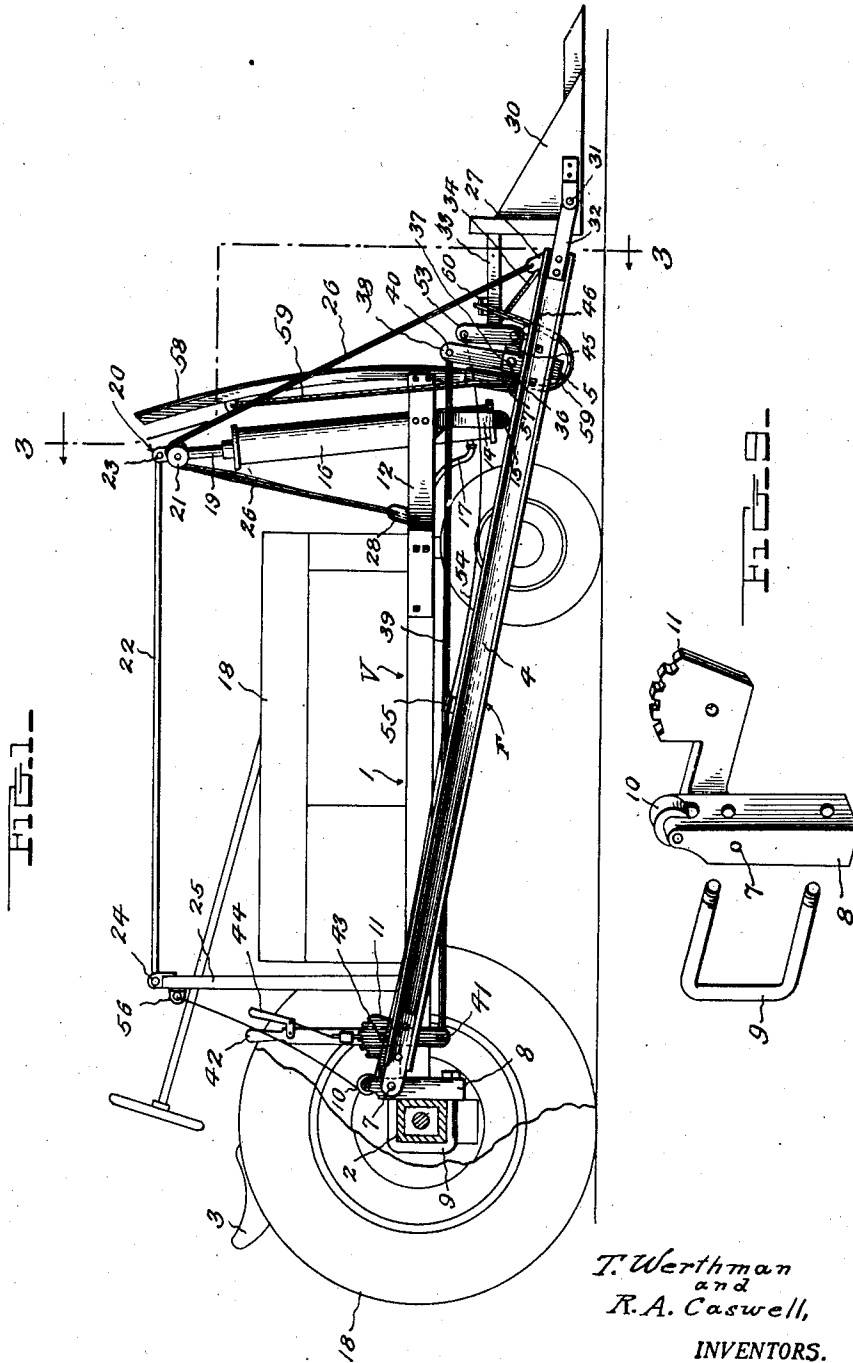
T. WERTHMAN ET AL

2,301,102

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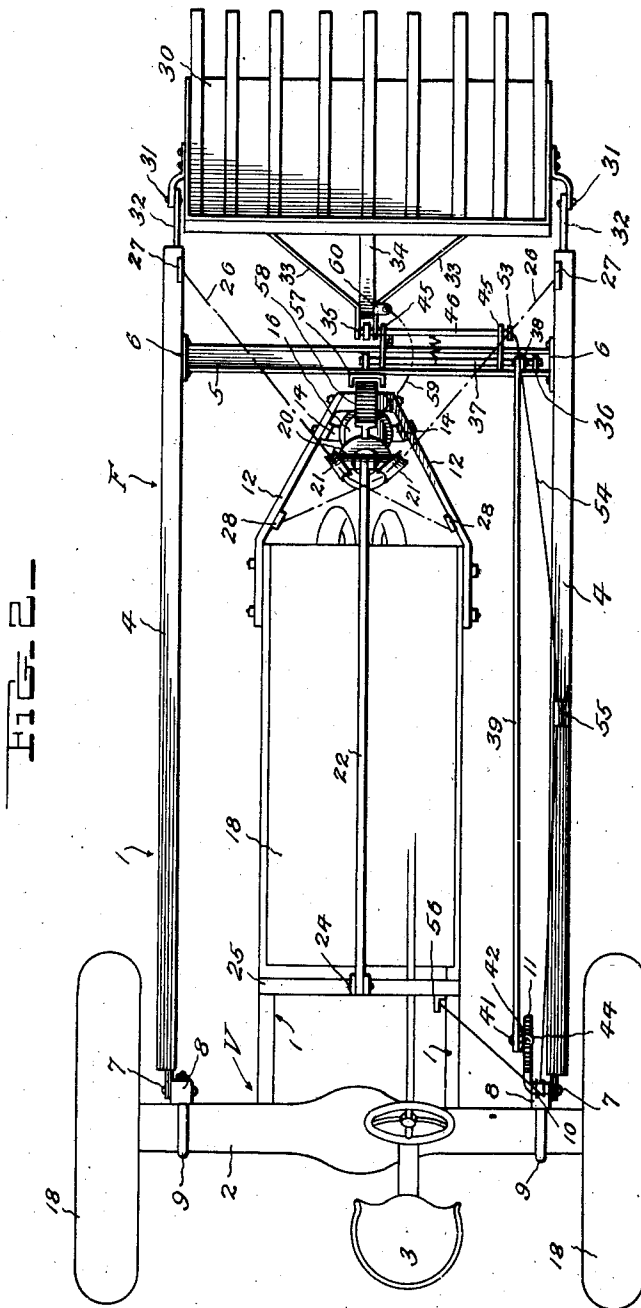
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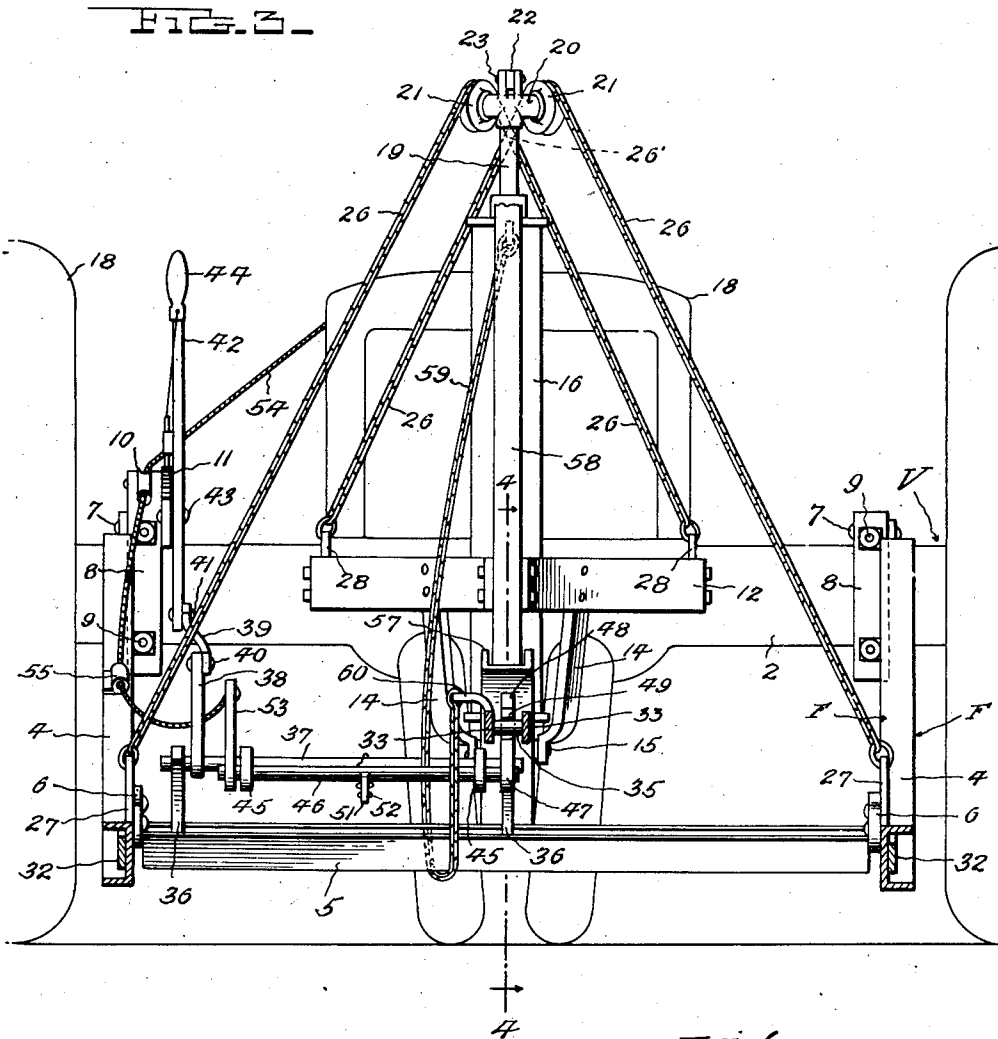
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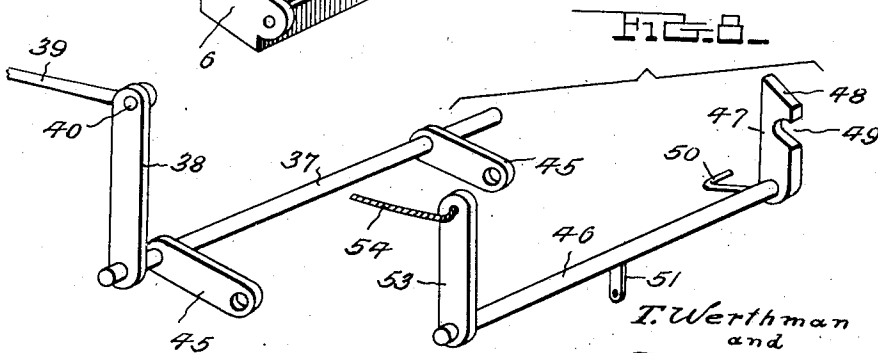
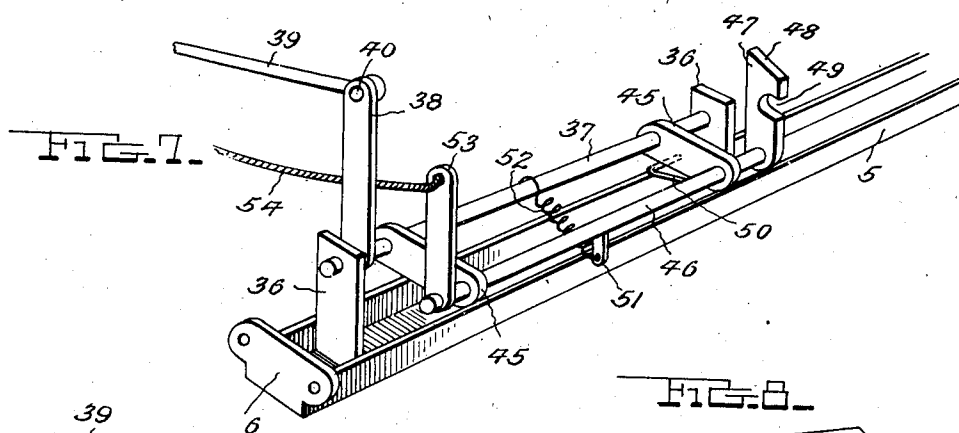
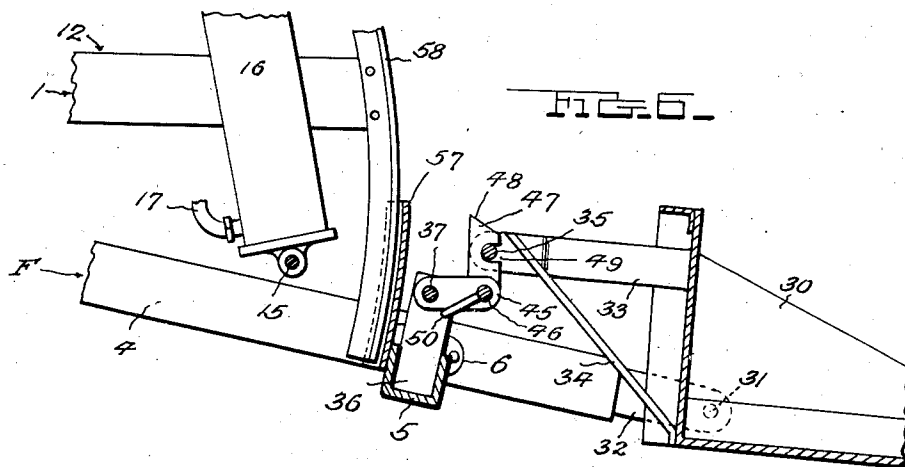
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2,301,102

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UNITED STATES PATENT OFFICE

2,301,102

LOADER

Theodore Werthman and Richard Andrew Caswell, Cherokee, Iowa

Application March 3, 1941, Serial No. 381,567

8 Claims. (Cl. 214-140)

The device forming the subject matter of this application is a loader of that sort in which a scoop-carrying frame is mounted for swinging movement on a vehicle, the frame being swung upwardly to elevate the scoop and its load, and the scoop being released, to tilt and discharge its load.

Among the objects of the invention are the following: the provision of novel means for imparting vertical swinging movement to the scoop-carrying frame; such a disposition of the flexible elements which impart swinging movement to the frame, that the flexible elements will serve as effective, diverging guys for the cylinder and piston mechanism which constitutes a portion of the means for raising and lowering the scoop-carrying frame; the provision of novel means for guiding the scoop frame in its upward and downward swinging movement; and the provision of novel means for holding the scoop in working position, and for releasing the scoop to discharge its contents.

The invention aims further, to supply a device of the class described in which gears, winding drums, brakes, clutches, sprocket chains and the like will be unnecessary. The machine will operate in low head room, and it can be used in sheds, under trees, and in other places where head room is limited. The number of parts which an operator must manipulate are reduced. The device may be assembled easily with and removed from a tractor, and the construction is such that the weight carried by the tractor is reduced.

It is within the province of the disclosure to improve generally and to enhance the utility of devices of that type to which the present invention appertains.

With the above and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, may be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawings:

Fig. 1 shows, in side elevation, a device constructed in accordance with the invention, parts being broken away, and parts appearing in section;

Fig. 2 is a top plan;

Fig. 3 is a transverse section on the line 3-3 of Fig. 1;

Fig. 4 is a fragmental, vertical, longitudinal section, taken on the line 4-4 of Fig. 3;

Fig. 5 is a horizontal section, on the line 5-5 of Fig. 4;

Fig. 6 is a sectional view, similar to Fig. 4, but showing the scoop in a different position with respect to the surface of the soil;

Fig. 7 is a perspective view showing the cross bar of the scoop-carrying frame and parts which are mounted on it, especially the rock shaft, the latch shaft and associated elements;

Fig. 8 is a perspective view showing the rock shaft and the latch shaft in spaced relation;

Fig. 9 is a perspective view showing the lever segment, and the means for mounting the lever segment and the scoop-carrying frame on the rear axle housing of a tractor.

The drawings disclose a motor-propelled, wheel-mounted vehicle of the tractor type, designated generally by the letter V and presenting no patentably characteristic features. The vehicle parts germane to the invention hereinafter described are a main frame 1, a rear axle housing 2 and an operator's seat 3.

In carrying out the invention, there is provided a carrying frame F, embodying side rails 4 and a forward cross bar 5. The cross bar 5 is an upwardly-opening channel, as Fig. 7 shows, the ends of the cross bar being connected to the side rails 4 by means of brackets 6. The carrying frame F is adapted to be swung vertically at the will of an operator, the rear ends of the side rails 4 being pivoted at 7 to yoke blocks 8, secured by U-bolts 9 to the rear axle housing 2 of the vehicle V. In the upper end of one of the yoke blocks 8 (Fig. 9), a sheave 10 is journaled, and the said yoke block carries a forwardly-extended segment 11.

An approximately V-shaped extension 12 is secured to the forward portion of the main vehicle frame 1, and may be regarded as a part thereof. Depending hangers 14 are secured to the frame extension 12 and carry a pivot element 15, whereon the lower end of a fluid pressure cylinder 16 is mounted, the construction being such that the cylinder has small swinging movement, longitudinally of the vehicle V. The actuating fluid delivered to the cylinder 16 may be oil, supplied through a conduit 17 (Figs. 1 and 4), assembled with the lower portion of the cylinder and with a pressure pump (not shown) located within the engine hood 18 of the vehicle V.

The piston structure which reciprocates in the cylinder 16 is indicated sufficiently by a piston rod 19, to the upper end of which a cross head

20 is secured, pulleys 21 being rotatably mounted on the cross head and being located on opposite sides of the piston rod. In order to sustain the cylinder and piston structure substantially in the position shown in the drawings, and to prevent a possible rearward bending of the piston rod 19 under the weight that is imposed upon it by the carrying frame F and associated parts (Fig. 1), the forward end of a brace 22 is pivoted at 23 to the upper end of the piston rod, the rear end of the brace being pivoted at 24 to an arch 25 rigidly mounted on the vehicle frame 1.

Flexible elements 26 are provided and have their forward ends secured at 27 to the forward ends of the side rails 4 of the carrying frame F. The flexible elements 26 are looped over the pulleys 21 on the cross head 20 of the piston rod 19, the pulleys having a rearward convergence in top plan (Fig. 2), to the end that the rear portions of the flexible elements may be crossed conveniently behind the piston rod, and close to the pulleys, as indicated at 26' in Fig. 3. The rear ends of the flexible elements 26 are anchored at 28 on the extension 12 of the vehicle frame 1. Referring to Fig. 2, it will be noted that the aforesaid disposition of the flexible elements 26 results in a construction wherein the cylinder and piston structure 16—19 receives the sustaining benefit of what amounts to four downwardly-diverging guys.

As shown to best advantage in Figs. 1, 2 and 5, a scoop 30 is provided, the word "scoop" being construed to mean any appliance suitable for handling the particular material upon which the machine is to work. The scoop 30 is pivotally mounted at 31, for vertical swinging movement, between brackets 32 which project forwardly from the side rails 4 of the carrying frame F. The rear wall of the scoop 30 is supplied with rearwardly converging arms 33, strengthened by a brace 34, and connected near their rear ends by a keeper pin 35 (Fig. 3).

Bearing posts 36 are mounted in the cross bar 5 of the carrying frame F, and in them a rock shaft 37 is journaled. Rocking movement is imparted to the shaft 37 by an upstanding arm 38 which it carries, the forward end of a link 39 being pivoted at 40 to the arm, the rear end of the link being pivoted at 41 to a lever 42, which is fulcrumed at 43 on the segment 11 and provided with a latch mechanism 44 adapted to cooperate with the segment. The lever 42 is conveniently accessible from the operator's seat 3.

Reverting to Fig. 7, the rock shaft 37 has fixed, forwardly-extended arms 45, in which a latch shaft 46 is mounted to rock. At its inner end, the shaft 46 carries an upstanding latch 47, bevelled at 48 for initial engagement with the keeper pin 35 on the arms 33 of the scoop 30, and provided with a seat 49 for the reception of the keeper pin. The latch shaft 46 is supplied with a rearwardly-extended, angular stop 50, so located as to engage beneath one of the arms 45 on the rock shaft 37.

Intermediate its ends (Figs. 7 and 8), the latch shaft 46 is equipped with a depending finger 51, a retractile spring 52 being connected to the finger and anchored on the rock shaft 37. The end of the latch shaft 46 which is remote from the latch 47 has an upstanding arm 53, whereunto is connected a flexible operating member 54, extended backwardly through a fairleader 55 on one side rail 4 of the frame F (Fig. 3), and beneath the sheave 10 on the axle housing 2, to a

cleat 56 (Fig. 2) on the arch 25, near the operator's seat 3.

An upright, arcuate, trough-shaped guide 57 (Figs. 4 and 3) is secured to the cross bar 5 of the frame F, and in the guide, an arcuate track 58 is slidably received, the track being mounted on the extension 12 of the main vehicle frame 1. The guide 57 and the track 58 cooperate to hold the carrier frame F against lateral swinging movement, and take much strain off the frame pivots shown at 7 in Fig. 1.

Downward swinging movement of the frame F is limited by a chain or other suitable means 59 (Figs. 1 and 3), secured at its upper end to the track 58, and secured at its lower end to an offset 60 on one of the arms 33 of the scoop 30, a proper space (Fig. 1) being maintained between the bottom of the scoop and the surface on which the machine is operated. It is possible, as herein-after explained, for an operator to tilt the scoop 30 on its pivotal mounting 31, thereby to regulate the distance between the working edge of the scoop and the ground. When the scoop 30 comes into contact with the material to be raised, the scoop is swung to the latched position of Fig. 6.

The gross operation of a machine of the kind shown in this application is well known and need not be gone into. The raising and lowering of the scoop frame F is accomplished by means of the cylinder 16 and the piston rod 19, together with the chains 26, a governed supply of pressure fluid, preferably oil, being admitted to the cylinder 16, by way of the conduit 17.

When the latch 47 of Figs. 6, 7 and 8 is engaged with the scoop keeper 35 which is connected at 33 with the scoop 30, the frame F and the scoop 30, at a fixed angle to each other, can be raised and lowered with the pivot elements 7 of Fig. 1 as an axis of swinging movement.

The angle between the scoop 30 and the scoop frame 4, and consequently the angle between the bottom of the scoop and the soil can be changed, as shown in Figs. 4 and 6, at the will of an operator. The adjustment last referred to is accomplished through a train of parts including the hand lever 42 and the link 39 of Fig. 1, and the arm 38 and the rock shaft 37 of Fig. 7. When the shaft 37 is rocked, the arms 45, the latch shaft 46, the latch 47 (interengaged with the keeper 35), and the arms 33 of the scoop 30, swing the scoop upwardly and downwardly, with respect to the surface of the soil, on the pivot elements indicated at 31 in Fig. 1.

The releasing of the scoop 30, for movement about the pivot elements 31, to assume a dumping position, is brought about by a train of parts including the flexible element 54 of Fig. 1, the arm 53 of Fig. 7, the shaft 46, and the latch 47, the seat 49 of the latch being released from the keeper 35 which is carried by the scoop.

The purpose of the spring 52 of Fig. 7 is to restore the latch 47 to the upright position shown in that figure, so that the keeper 35 which is carried by the scoop 30 can engage the beveled end 48 of the latch, tilt the latch and engage in the seat 49. The stop 50, engaging beneath the corresponding arm 45, checks the latch 47, responsive to the pull of the spring 52, in the upright position shown.

The advantages incident to the crossing of the lifting chains 26 at 37 in Fig. 3 and the cooperation between the guide 57 and the track 58 of Fig. 6, have been dealt with hereinbefore. When the frame F swings downwardly to the position of

Fig. 1, it does so without jar, since the actuating fluid can be eased out of the cylinder 16, by way of the conduit 17.

What is claimed is:

1. In a loader of the class described, a vehicle, 5
a frame mounted to swing vertically on the vehicle, a scoop carried by the frame; lifting mechanism comprising as constituent parts, a fluid pressure cylinder and a piston structure mounted to reciprocate therein, one of said constituent 10
parts being pivotally assembled with the vehicle, a substantially horizontal brace having its forward portion pivotally connected to the other of said constituent parts, means for carrying the rear portion of the brace for vertical swinging 15
movement on the frame, and a flexible element terminally connected to the vehicle and to the frame, the flexible element being slidably engaged intermediate its ends with said other of the constituent parts of the lifting mechanism. 20

2. In a loader of the class described, a vehicle, 25
a frame mounted to swing vertically on the vehicle, a scoop carried by the frame, a fluid pressure cylinder carried by the vehicle and located practically in the median longitudinal plane of the frame, a piston structure mounted to reciprocate in the cylinder, flexible elements slidably assembled with the piston structure and means for connecting each flexible element to the vehicle and to the frame, at opposite sides of the vehicle and the frame, the flexible elements being 30
crossed, to maintain them slidably assembled with the piston structure, and to cause them to furnish a four-way guy reinforcement for the piston structure.

3. In a loader of the class described, a vehicle, 35
a frame, means for mounting the frame to swing vertically on the vehicle, a scoop carried by the frame, means for raising and lowering the frame, and upright, slidably interengaged members fixed respectively to the frame and to the vehicle and cooperating to limit lateral movement of the frame, the interengaged members being curved on radii having their origin at said means, said member of the frame being spaced from the corresponding member of the vehicle, longitudinally of the vehicle, to prevent scoop-thrust from being carried backwardly into said corresponding member of the vehicle. 40

4. A loader of the class described, constructed as set forth in claim 3, and wherein the interengaged members comprise a track on the vehicle and a channel shaped guide on the frame and receiving the track, the length of the guide being much less than the length of the track. 45

5. A loader of the class described, a vehicle, a frame mounted for vertical swinging movement on the vehicle, a scoop mounted on the frame for vertical swinging movement, a keeper carried by the scoop, a rock shaft supported on the frame, 50
a latch shaft disposed approximately parallel to the rock shaft, means for supporting the latch

shaft from the rock shaft, a latch on the latch shaft and engageable with the keeper, to hold the scoop against dumping, means for operating the rock shaft to change the angle between the scoop and the frame, and means for operating the latch shaft independently of the rock shaft, to release the latch from the keeper and to permit the scoop to dump.

6. A loader of the class described, a vehicle, a frame mounted for vertical swinging movement on the vehicle, a scoop mounted on the frame for vertical swinging movement, a keeper carried by the scoop, arms fixed on the rock shaft, a latch shaft journaled on the arms, a latch on the latch shaft and engageable with the keeper, to hold the scoop against dumping, spring means connected to the rock shaft and to the latch shaft for rotating the latch shaft to position the latch for engagement with the keeper, a stop on the latch shaft and engageable with one of the arms to maintain the latch in keeper-engaging position, against the action of the spring means, means for operating the rock shaft to change the angle between the scoop and the frame, and means for operating the latch shaft, to release the latch from the keeper and to permit the scoop to dump. 55

7. A loader of the class described, a vehicle, a frame mounted to swing vertically on the vehicle, a scoop mounted to swing vertically on the frame, a keeper carried by the scoop, a rock shaft journaled on the frame, a latch shaft, a latch on the latch shaft and engageable with the keeper to hold the scoop against dumping, journaling means supporting the latch shaft from the rock shaft, spring means carried by the shafts for rocking the latch shaft to dispose the latch in keeper-engaging position, and a stop on the latch shaft and engageable with a portion of the journaling means, to maintain the latch in keeper-engaging position, against the action of the spring means, means for operating the rock shaft to change the angle between the scoop and the frame, and means for disengaging the latch from the keeper, to permit the scoop to dump. 60

8. In a loader of the class described, a vehicle, a frame mounted to swing vertically on the vehicle, a scoop carried by the frame, a fluid pressure cylinder carried by the vehicle and located practically in the median longitudinal plane of the frame, a piston structure mounted to reciprocate in the cylinder, rearwardly converging pulleys carried by the piston structure, flexible elements looped over the pulleys, and means for connecting each flexible element to the vehicle and to the frame, at opposite sides of the vehicle and the frame, the flexible elements being crossed, to maintain them slidably assembled with the pulleys, and to cause them to furnish a four-way guy reinforcement for the piston structure.

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