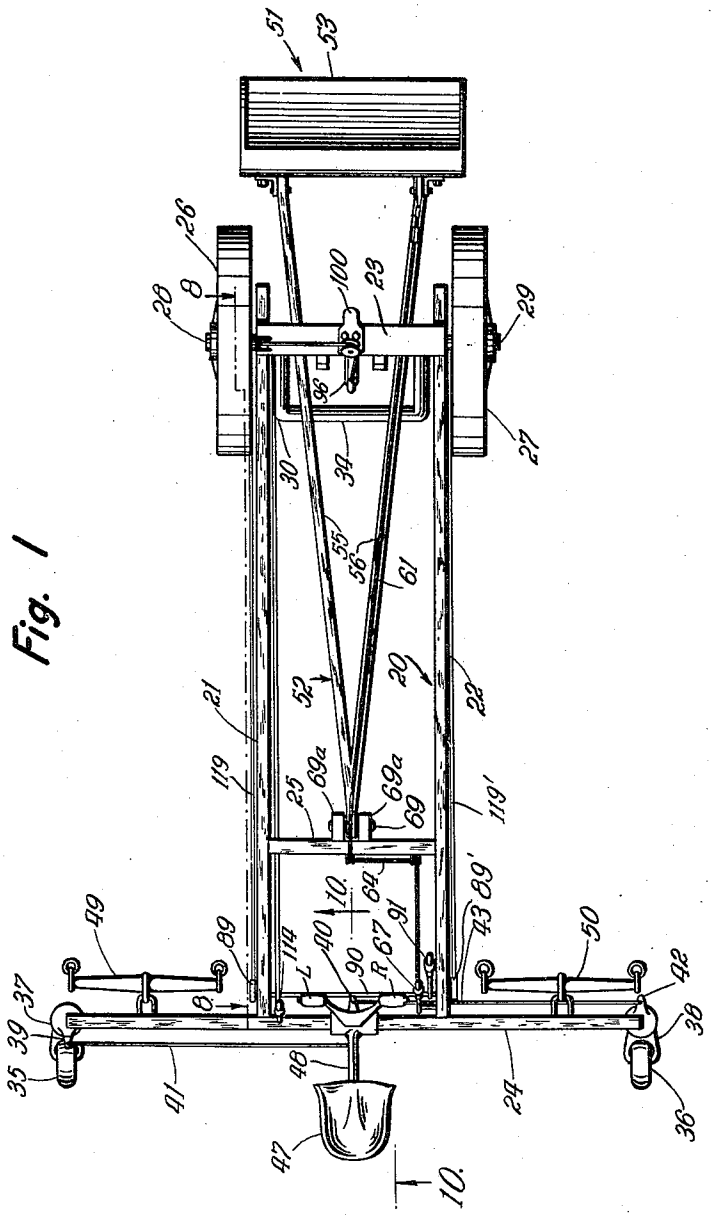
Nov. 25, 1941. E. B. NEWELL 2,264,050

SCOOP LOADER

Filed Nov. 25, 1940 4 Sheets-Sheet 1

Fig. 1



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SCOOP LOADER

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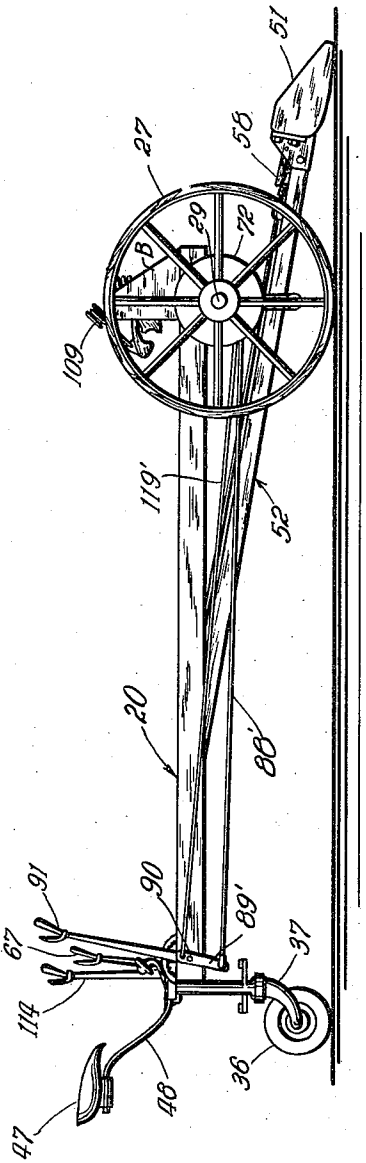

Fig. 2

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Fig. 3

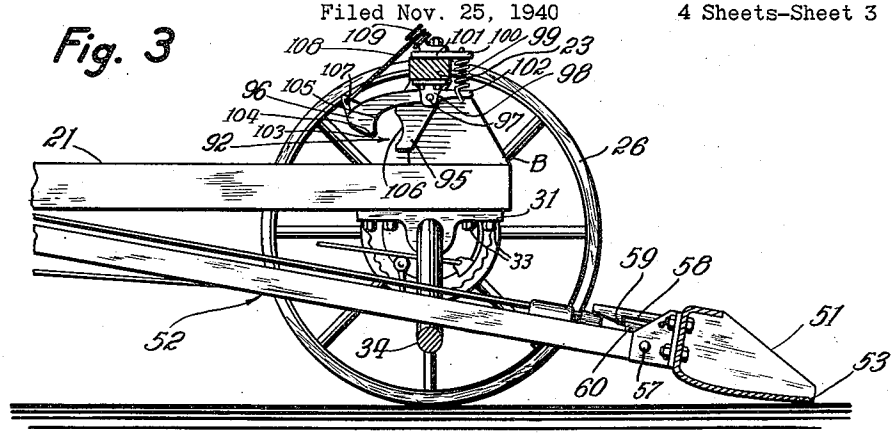

Fig. 4

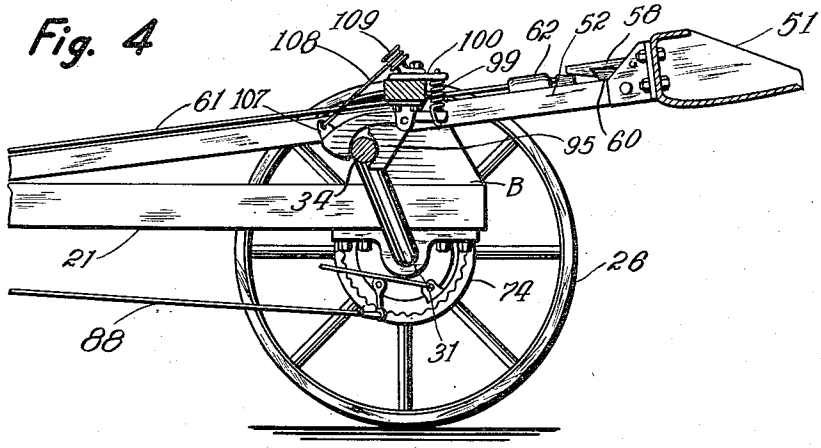

Fig. 5

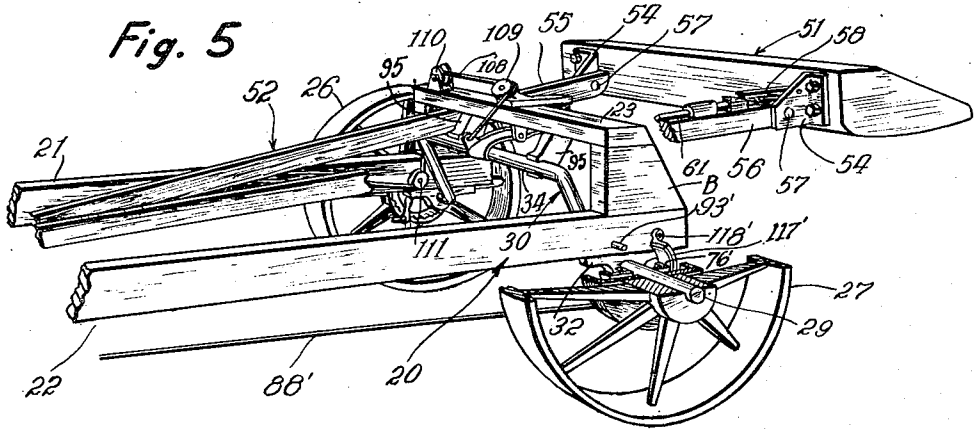

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Fig. 6

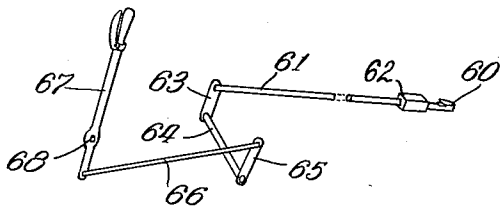


Fig. 7

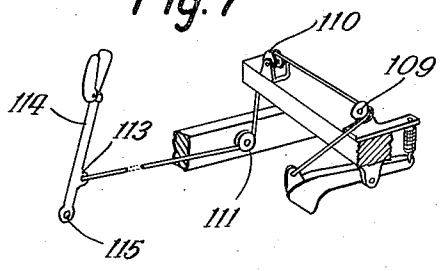


Fig. 8

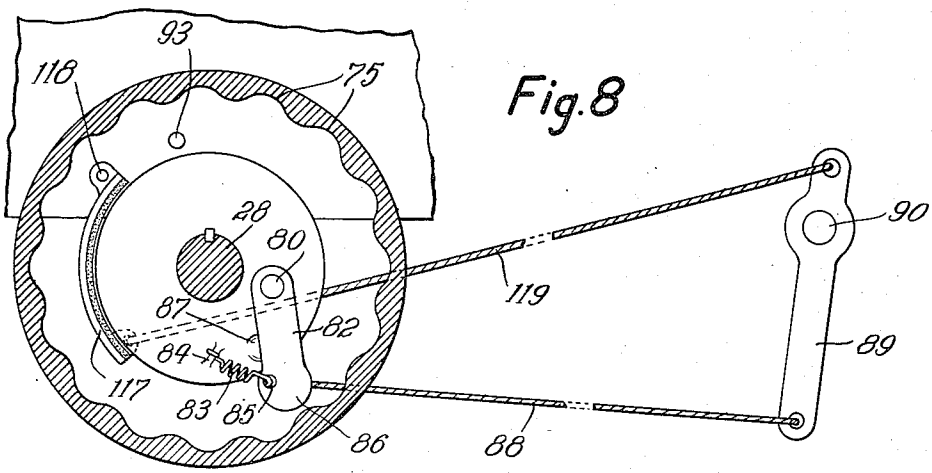


Fig. 10

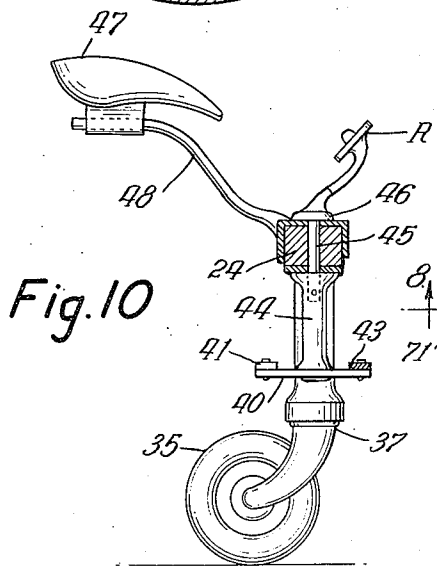
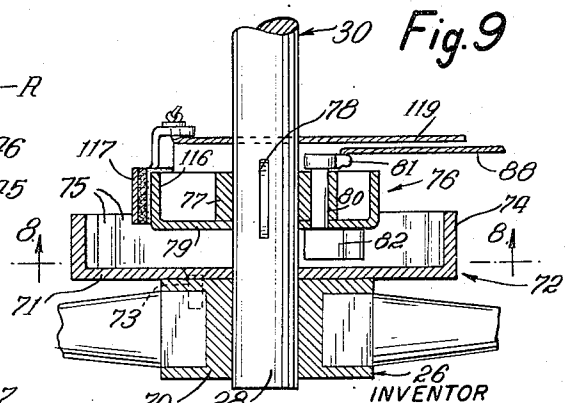


Fig. 9



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SCOOP LOADER

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Application November 25, 1940, Serial No. 366,986

6 Claims. (Cl. 214—140)

This invention has to do with a vehicular scooping machine wherein a scoop is lowerable into a loading position in which it is loadable pursuant to advancement of the machine and subsequently elevatable to facilitate transportation of the load to a remote place for dumping.

An object of the present invention is the provision of an improved scoop loading machine of simple rugged construction including a scoop upon a beam that is pivotal within a vertical plane for lifting and lowering the scoop respectively between carrying and loading positions, and a manually controlled clutch for establishing a driving connection with a traction wheel of the machine for pivoting said beam.

Another object of the present invention is the provision of a scoop loading machine in which a pivoted beam in support of a scoop upon its free end is raised and lowered by a crank axle which is clutchable by a manually controlled clutch to a traction wheel on a main bearing thereof for rotation therewith.

Another object of the present invention is the provision of a scoop loading machine as the foregoing wherein there is latch means for releasably supporting the beam and scoop in the elevated position and means for automatically disengaging the clutch when the beam and scoop become elevated.

Another object of the invention is the provision of a machine of the present class including a beam pivotal vertically about its back end and having a forwardly directed scoop pivotally connected upon its forward end so that it will swing downwardly into dumping position when unlatched.

A further object of this invention is the provision of a scoop loading machine having a vertically adjustable scoop at the front of a longitudinal frame and laterally disposed frame extensions at the rear thereof for the attachment of draft animals.

A still further object is the provision of a scoop loading machine including a longitudinal frame with a pair of laterally and closely spaced support and traction wheels at the front of such frame, a crank axle connectible for rotation with said wheels and having a throw bearing therebetween for lifting a scoop, draft extensions projecting laterally at the rear of the frame, and dirigible wheels respectively upon said extension and spaced apart more distantly than the traction wheels.

These and other desirable objects encompassed by and inherent to the invention will later appear.

In the drawings:

Fig. 1 is a plan view of a machine embodying the present invention;

Fig. 2 is a side elevational view of the machine;

Fig. 3 is a fragmentary side elevational view showing the scoop in the loading position;

Fig. 4 is a view like Fig. 3, but illustrating the scoop in the carrying position;

Fig. 5 is a fragmentary perspective view showing the scoop in the carrying position;

Fig. 6 is a perspective view of a latch for the scoop and a control linkage therefor;

Fig. 7 is a perspective view of an automatic latch mechanism for retaining the scoop in the carrying position, and controls for such mechanism;

Fig. 8 is a view taken substantially upon the line 8—8 of Fig. 1 and showing a clutch engageable to cause a crank axle of the machine to be rotated with the traction wheels and thus elevate the scoop to the carrying position;

Fig. 9 is a horizontal fragmentary sectional view showing details of the aforesaid clutch; and

Fig. 10 is a vertical sectional view taken on the line 10—10 of Fig. 1.

Referring now to the drawings and particularly to Figs. 1 and 2, the machine will be seen to comprise a longitudinal frame 20 including a pair of side rails 21 and 22, a front cross member 23, a back cross member 24 of which the ends project laterally beyond the main part of the frame, and an intermediate cross member 25. The just recited parts of the frame may be made of any sufficiently strong rigid material as wood or steel and may be secured together by any standard means. Spacer blocks B are secured between the cross piece 23 at its ends and the side rails 21 and 22.

A pair of support and traction wheels 26 and 27 are freely rotatable upon the end or main bearing sections 28 and 29 of a crank axle 30, which bearing sections are journalled in bearing members 31 and 32 secured upon the under sides of the longitudinal frame members 21 and 22 by bolts 33; see Figs. 3, 4 and 5. Thus the wheels 26 and 27 support the front end of the frame 20 irrespective of the rotative position of the throw bearing section 34 formed by the central portion of the crank axle.

The back end of the frame 20 is dirigibly carried by castors 35 and 36 within swivels 37 and 38 which are mounted beneath the ends of the cross piece 24. The swivel 37 is provided with

an arm 39 which is connected to the back end of a foot actuated cross arm 40, Fig. 10, by a tie rod 41. The front end of said cross arm is operably connected with an arm 42 on the swivel 38 by a tie rod 43. In Fig. 10 the cross arm 40 is shown fixed to the lower end of a spindle 44 of which the upper end is fixed to the lower end of a pin 45 rotatively disposed in the cross piece 24. Left-hand and right-hand foot pedals L and R are integral with a base plate 46 and this plate is non-rotatively associated with the upper end of the pin 45. The just described connections between the pedals L and R and the castors 35 and 36 enable an operator to pivot these castors for guiding the vehicle in a manner well understood, while sitting upon a seat 47 carried by a standard 48.

Draft animals can be hitched to single trees 49 and 50 for propelling the machine and in manipulating the machine they may be guided, in the usual manner, in the direction the castor wheels 35 and 36 are turned by means of the foot pedals L and R.

The machine includes a scoop 51 in which the load is picked up and carried. Such load may consist of solid or loose earth, rubbish, fertilizing substances or any scoopable material. The scoop is forwardly directed since it is mounted upon the front end of a beam generally designated 52 and presents a bottom cutting edge 53 forwardly while in the scooping and carrying position. A pair of brackets 54 are secured to the back side of the scoop 51 and are pivotally connected with diverging legs 55 and 56 of the beam 52 by pivot pins 57. There is also a locking stud 58 secured upon the back wall of the scoop and having a latch portion 59 thereon cooperable with a latch member 60 as shown in Figs. 3, 4 and 5 for maintaining the scoop in the loading and carrying position. Said latch member 60 is upon the end of a rod 61 which is axially slidable within a spring chamber 62 containing a spring (not shown) which acts upon the rod 61 in a manner constantly urging said rod backwardly. This rod 61 extends backwardly along the upper side of the member 56 of the beam 52 where it is pivotally connected with the upper end of an arm 63 which is fixed upon an end of a rod 64 that is rotatively attached to the frame cross piece 25; see Figs. 1 and 6. An arm 65 is fixed upon the opposite end of the rotatable shaft 64 and the upper end of this arm is pivotally connected with a rod 66 of which the back end is pivotally connected with the lower end of a hand operated lever 67. It will be seen that the operator by grasping the upper end of the lever 67 for pivoting this lever counter-clockwise about a fulcrum support 68 therefor will cause the rod 61 and the latch member 60 to be moved forwardly to disengage the lug 59 and thus permit the scoop 51 to pivot by the force of gravity downwardly about the pivot pins 57 into the dumping position.

The members 55 and 56 of the beam 52 are secured together at their back ends where the beam is pivotally attached to the frame by a pivot pin 69 mounted in a pair of spaced-apart blocks 69a which are suitably secured to the frame cross member 25. The beam 52 is pivoted upwardly about said pin 69 for elevating the scoop 51 from the loading position illustrated in Fig. 3 to the carrying position illustrated in Figs. 4 and 5 by connecting the crank axle 30 for rotation with the traction wheels 26 and 27 while the vehicle is being advanced. When this rotation of the crank axle 30 occurs the throw bearing section 34 thereof is moved upwardly through an arcuate path while bearing against the undersides of the beam members 55 and 56 and thus lifting the beam and the scoop.

Clutches are associated with each of the traction wheels 26 and 27 for connecting these wheels with the crank axle, and inasmuch as these clutches are of similar construction a detailed description is given of only that clutch associated with the wheel 26, the clutch being illustrated in Figs. 8 and 9. Referring now to these two figures, 8 and 9, the hub 70 of said wheel 26 will be seen to have secured thereto the web portion 71 of a drum 72, in this instance by means of a plurality of bolts 73. The inner periphery of the flange 74 of the drum is provided with a series of circumferentially spaced notches 75. When the clutch is disconnected the wheel 26 and the drum 72 rotate freely upon the main bearing portion 28 of the axle 30.

A second drum 76 has a hub portion 77 secured non-rotatively to the axle 30 by one or more keys 78. Journalled within the web 79 of the drum 76 is a short shaft 80 which has arms 81 and 82 fixed upon opposite of its ends. A spring 83 has one end hooked about an apertured ear 84 and its opposite end hooked within an aperture 85 within a head 86 upon the end of the arm 82 whereby the shaft 80 and the arms 81 and 82 are normally held at a clockwise limit of oscillative movement, Fig. 8, in which the arm 82 bears against a stud 87 which is also upon the drum web 79. The lower end of the arm 81 is connected by a cable 88 with the lower end of an arm 89 which is fixed upon a cross shaft 90; see Figs. 1 and 8. Also fixed upon this cross shaft is a hand lever 91 which is within convenient reach of the operator. The cross shaft 90 is mounted for rotation upon the frame members 21 and 22, there being an arm 89' upon the right side of the frame member 22 that corresponds to the arm 89 and a cable 88' leading from the arm 89', Fig. 2, to the clutch mechanism, similar to that shown in Figs. 8 and 9 but associated with the traction wheel 27.

Assuming that the vehicle has been advanced while the scoop 51 is in its loading position illustrated in Fig. 3 and has thus become charged with a load, the operator will cause the scoop to be elevated by grasping and pushing forwardly upon the lever 91 whereby the arm 82, Figs. 8 and 9, will be pivoted to carry the head 86 thereon into one of the notches 75 upon the drum 72 whereupon this drum which rotates with the traction wheel 26 will impart through the arm 82 a component of force causing rotation of the drum 76 and of the bearing section 28 of the crankshaft 30 to which it is keyed. Simultaneously the clutch associated with the wheel 27 will similarly establish a driving connection between said wheel and the crank axle whereby said axle is caused to rotate with the traction wheels.

Upon the throw-bearing section 34 reaching the elevation in which the scoop has been raised to the carrying position, such throw-bearing section will engage an automatic latching device generally designated 92 in Fig. 3 and which will hold the axle in this rotative position until manually released as will be described presently. Also upon the axle 30 being rotated sufficiently for elevating the scoop 51 into the carrying position, a pin 93, Fig. 8, which is anchored in the machine frame, will be engaged by the arm 82

whereby this arm is pivoted clockwise and dislodged from the notch 75 in which it had been disposed. A corresponding pin 93', Fig. 5, disengages the clutch associated with the traction wheel 27. Thereupon the wheels 26 and 27 rotate freely upon the main bearing sections of the crank axle while the latch mechanism 92 maintains the scoop in the carrying position.

Referring now to Figs. 3, 4 and 5 the latch mechanism 92 will be seen to comprise fixed jaw members 95 upon the frame cross piece 23 and a movable jaw member 96 which is pivoted at 97 to a bracket 98 which is fixed to the underside of said cross piece. A contraction spring 99 connected between an extension 100 of a plate 101 upon the upper side of the cross piece 23 and a tail portion 102 of the pivoted jaw member 96 constantly urges said member 96 to rotate counterclockwise. The jaw member 96 is provided with a striking cam surface 103 which, when abutted by the throw bearing portion 34 when the latter is moving upwardly, will cause the jaw 96 to pivot clockwise for admitting said bearing section into the space between the jaws as illustrated in Fig. 4. Thereupon the spring 99 will cause the jaw 96 to pivot counter-clockwise for carrying the point 104 beneath and behind the bearing section 34 while the arcuate sections 105 and 106 of the jaw members retainingly clasp said bearing section. With the loaded scoop thus supported and with the wheels now freely rotatable upon the axle main bearings 28 and 29 the machine may be taken to any desired place for dumping.

Manual release means for the latch mechanism 92 includes an apertured ear 107 upon the upper side of the movable jaw 96 and a cable 108 which passes successively over rotatable spools 109, 110 and 111, Figs. 5, 7 and 1 and forwardly to an apertured ear 113 upon a hand lever 114. It will be seen that when the operator grasps the lever 114, which is pivoted to the frame by a pin 115, and moves this lever backwardly that the cable will exert an upward force upon the movable jaw 96 and thus release the crank portion of the axle whereby it may swing downwardly because of its own weight and the weight of the scoop 51 and the beam 52 thereon. In lowering the scoop 51 from the carrying position to the loading position the speed at which the crank axle is allowed to rotate is governable by brakes of which one is illustrated in Figs. 8 and 9. This brake includes a flange as 116 upon the drum 76 and a brake shoe 117 which is pivotally connected with the machine frame by a pin 118. The lower end of this brake shoe 119 is connected by a cable 119 with a portion of the arm 89 above the cross shaft 90. A cable 119' corresponding to the cable 119 is connected between the upper end of the arm 89', Figs. 1 and 2, and a brake shoe 117' similar to the brake shoe 117 but associated with the assembly at the hub of the wheel 27.

Normally the scoop is loaded by advancing the machine while the scoop is lowered so that its cutting edge 53 slides beneath the load. Next the lever 91 is pressed forwardly to engage the clutches and cause elevation of the load to the carrying position whereupon the machine is driven to the dumping place. While the scoop remains elevated the lever 67 is grasped and drawn backwardly whereby the latch 60 is released and the scoop allowed to swing downwardly about the pins 57. Upon again reaching the loading point the machine will be brought to rest, the latch mechanism 92 released by drawing the lever 114 backwardly, and the brake shoes 117 and 117' applied to the drums 76 and 76' by pulling backwardly upon the lever 91 to regulate the speed at which the scoop descends. When the edge 53 reaches the ground the scoop pursuant to further lowering will pivot counterclockwise, Fig. 3, about the pins 57 sufficiently to permit relatching of the latch 60 with the stud 58, preparatory to receiving another load.

It should be understood that the invention is not limited to the specific form or environment herein illustrated, but extends to other arrangements, details and structures falling within the spirit of the invention.

I claim:

1. In a machine of the class described, a frame, bearing means disposed transversely of and upon said frame, a crank axle comprising a throw bearing section and main bearing sections at opposite ends of the throw bearing section, said main bearing sections being journalled in said bearing means, traction wheels respectively associated with said main bearing sections and journalled for rotation coaxially thereof, a beam extending longitudinally of the frame, pivotal connecting means connecting a back section of said beam with the frame for pivotal movement about a transverse horizontal axis, a forwardly directed scoop upon a front section of the beam, an intermediate section of said beam being disposed in vertical alignment with said throw bearing section and supported thereby for causing movement of said beam about said pivotal connecting means incident to rotation of the axle, clutch means disposed between at least one of said wheels and said axle and engageable to cause such rotation of the axle with said wheel, means manually actuatable to engage the clutch means while the throw bearing section is in a lower position whereby said axle is rotated to elevate said throw bearing section, said beam and said scoop, means operable to disengage said clutch upon predetermined elevation of said scoop, and manually releasable means operable to support said throw bearing section in the elevated position.

2. In a machine of the class described, a frame, including a transverse member adjacently to the front thereof, running gear for said frame and comprising a traction wheel, a beam extending longitudinally of the frame, pivotal means connecting a back section of said beam with the frame for pivotal movement about a transverse horizontal axis at a substantially back portion of the frame, a forwardly directed scoop upon a front section of the beam, lift means engageable with a section of the beam between said pivotal means and said scoop and drivable to elevate said section and said scoop incident to pivoting the beam about said pivotal means, clutch means disposed between said lift means and said wheel and engageable to cause said lift means to be driven from said wheel, means manually actuatable to engage the clutch means whereby the lift means is operated to pivot said beam while elevating said scoop, means operable to disengage said clutch upon predetermined elevation of said scoop, and manually releasable means upon said transverse member and operable to support said scoop in the elevated position.

3. In a machine of the class described, a longitudinal frame including a transverse frame member, bearing means disposed transversely of and upon said frame, a crank axle comprising a throw

bearing section and main bearing sections at opposite ends of the throw bearing section, said main bearing sections being journalled in said bearing means, traction wheels respectively at opposite sides of the frame and journalled for rotation coaxially of said main bearing sections, a beam extending longitudinally of the frame and between said wheels, pivotal connecting means connecting a back section of said beam with the frame for pivotal movement about a transverse horizontal axis, a forwardly directed scoop upon a front section of the beam, an intermediate section of said beam being in vertical alignment with said throw bearing section and engageable thereby for imparting upward movement to said beam and scoop about said pivotal connecting means incident to rotation of the axle, clutch means disposed between at least one of said wheels and said axle and engageable to cause such rotation of the axle with said wheel, means for disengaging said clutch upon the throw bearing section and said scoop attaining a predetermined elevation, said transverse frame member being adjacently to the elevated position of said throw bearing section, and manually releasable latch means upon said transverse member and operable to grasp said throw bearing section upon attainment thereby of such elevated position.

4. In a loading machine of the class described, a longitudinal frame, bearing means upon and arranged transversely of said frame adjacently to the front end thereof, a crank axle including main bearings journalled in said bearing means and a throw bearing section between said main bearings, traction wheels for said machine and journalled coaxially of said main bearings and respectively associated therewith, a beam arranged longitudinally of said frame with an intermediate section in vertical alignment with said throw bearing, means pivotally connecting a back end section of the beam with the frame for pivotal movement in a vertical plane, a scoop, means pivotally connecting said scoop upon the front end of said beam to permit pivotal movement of said scoop between a forwardly directed horizontal position and a vertical dumping position, releasable latch means for holding said scoop in the forwardly directed position, said axle being rotatable in said bearing means to carry the main bearing upwardly against said beam for pivoting the same upwardly and thus lifting said scoop from a loading position to a carrying position, clutch means engageable to connect the axle with the traction wheels to effect such rotation, means for disengaging the clutch means when the throw bearing attains an elevated position corresponding to the carrying position of said scoop, means for retaining said throw bearing in the upwardly position, an operator's seat upon a rear portion of said frame, manually operable control means for effecting engagement of the clutch means and arranged accessibly to said seat, and manually operable control means for releasing said retaining means and also arranged accessibly to said seat.

5. In a machine of the class described, a frame including a longitudinal main body and lateral extensions from each side of said main body adjacently to its back end, supporting guide wheels respectively upon said frame extensions outwardly from the main body, an operator's seat upon the back of said main body, foot pedals accessibly in front of said seat, steering gear interconnecting said pedals and said guide wheels, draft animal attaching means upon each of said frame extensions, a traction wheel upon the front of said frame, a beam extending longitudinally of the frame, pivotal means connecting a back section of said beam with the frame main body for pivotal movement about a transverse horizontal axis, a forwardly directed scoop upon a front section of the beam, lift means engageable with an intermediate section of the beam and drivable to elevate the beam and scoop incident to pivoting said beam about said pivotal means, clutch means disposed between said lift means and said wheel and engageable to cause the lift means to be driven by said wheel, and means accessible from said seat and manually operable to effect engagement of said clutch means.

6. In a machine of the class described, a frame including a longitudinal main body and lateral extensions from each side of said main body adjacently to its back end, supporting guide wheels respectively upon said frame extensions outwardly from the main body, an operator's seat upon the back of said main body, foot pedals accessibly in front of said seat, steering gear interconnecting said pedals and said guide wheels, draft animal attaching means upon each of said frame extensions, a crank axle including main bearings journalled in opposite sides of the frame main body adjacently to the front and a throw bearing between said main bearings, support wheels adjacently to the sides of the frame main body and journalled coaxially of and respectively upon the main bearing sections of said crank axle, a beam extending longitudinally of the frame, pivotal means connecting a back section of the beam with a substantially back portion of the frame main body for pivotal movement about a transverse horizontal axis, a forwardly directed scoop upon a front section of the beam, an intermediate section of the beam being disposed for engagement by the throw bearing section of the crank axle upon rotation thereof for causing upward movement of the scoop and beam while pivoting the latter about said pivotal means, clutch means disposed between at least one of said support wheels and said axle and engageable to cause such rotation of the axle with said wheel, and means accessible from said seat and manually actuatable to effect engagement of said clutch.

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