Feb. 26, 1929. 1,703,600

J. C. SELL

MATERIAL LOADING AND HANDLING MACHINERY

Filed Sept. 19, 1925 3 Sheets-Sheet 1

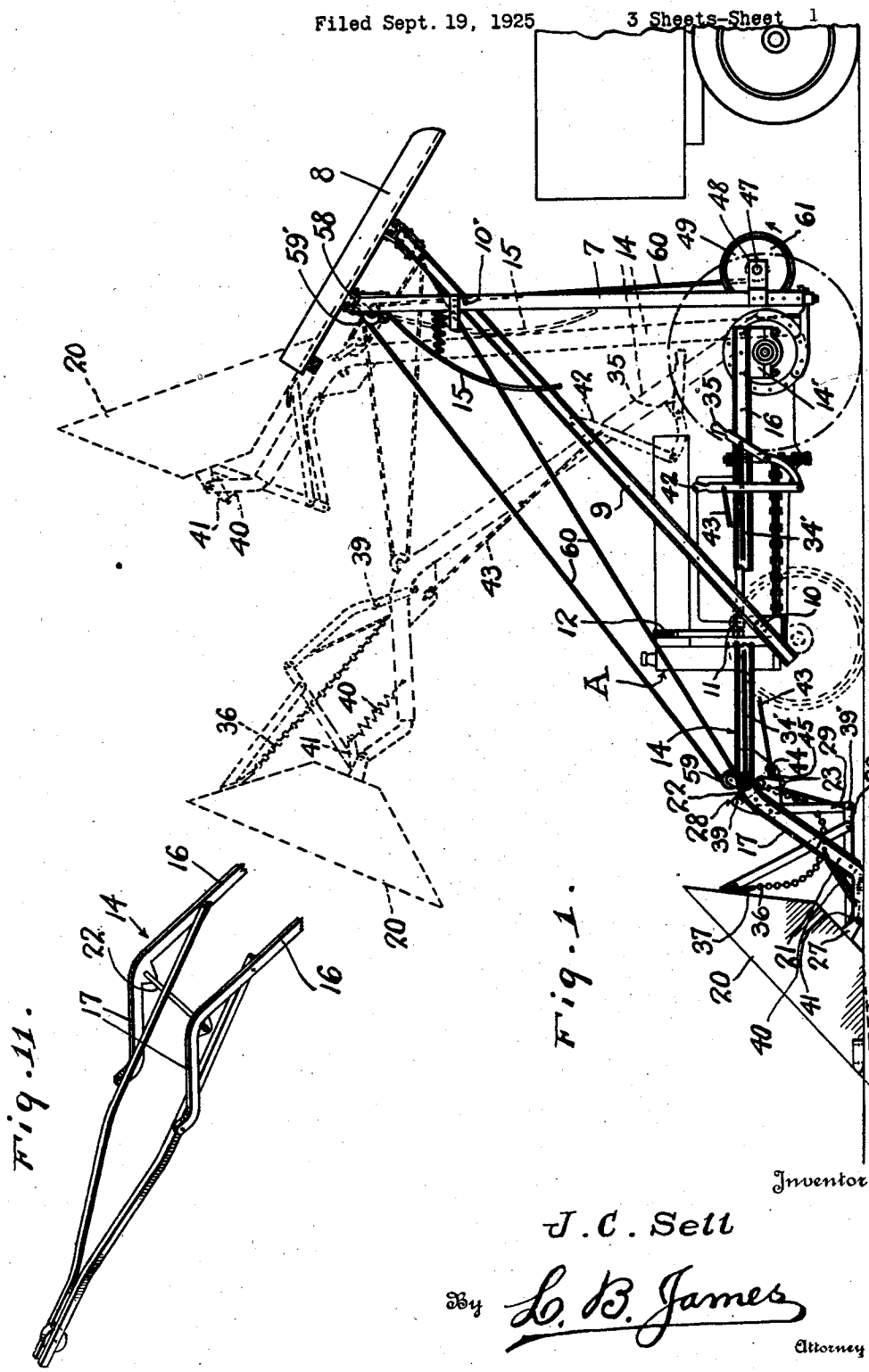


Fig. 1.

Fig. 11.

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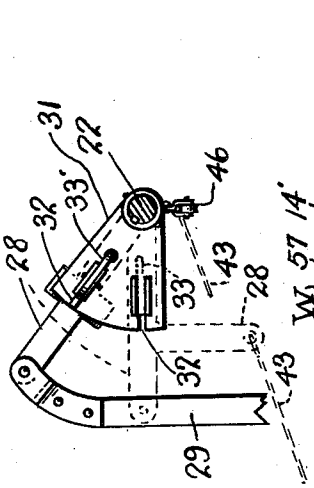


Fig. 5.

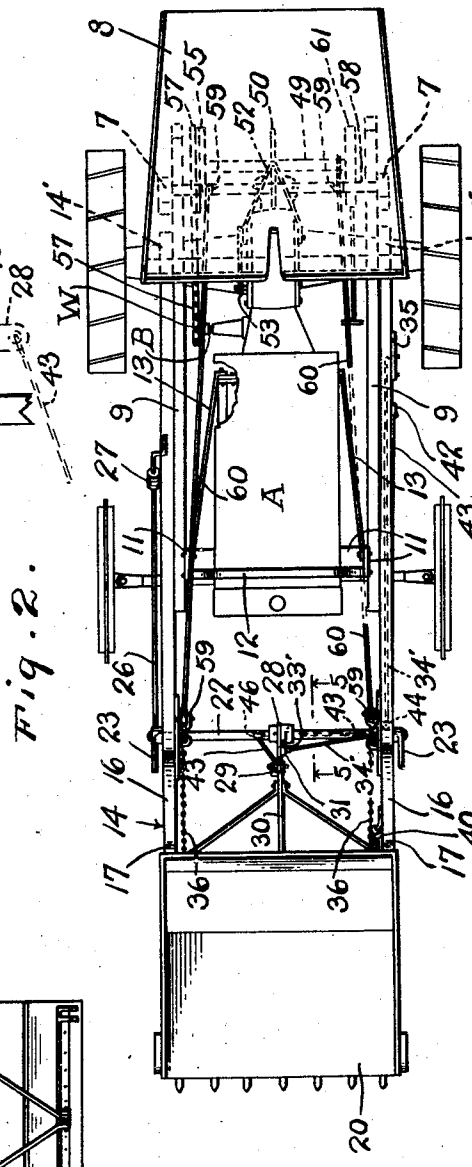


Fig. 2.

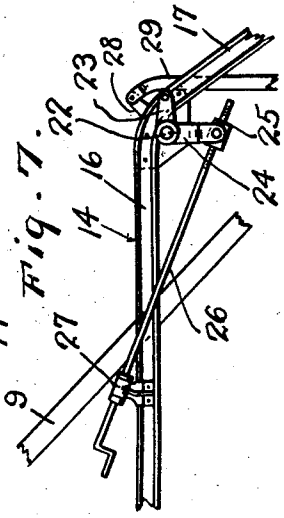


Fig. 7.

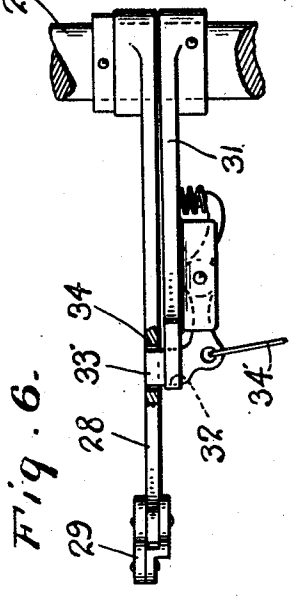


Fig. 6.

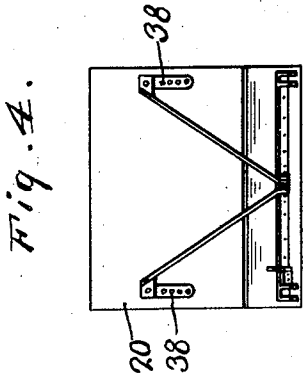


Fig. 4.

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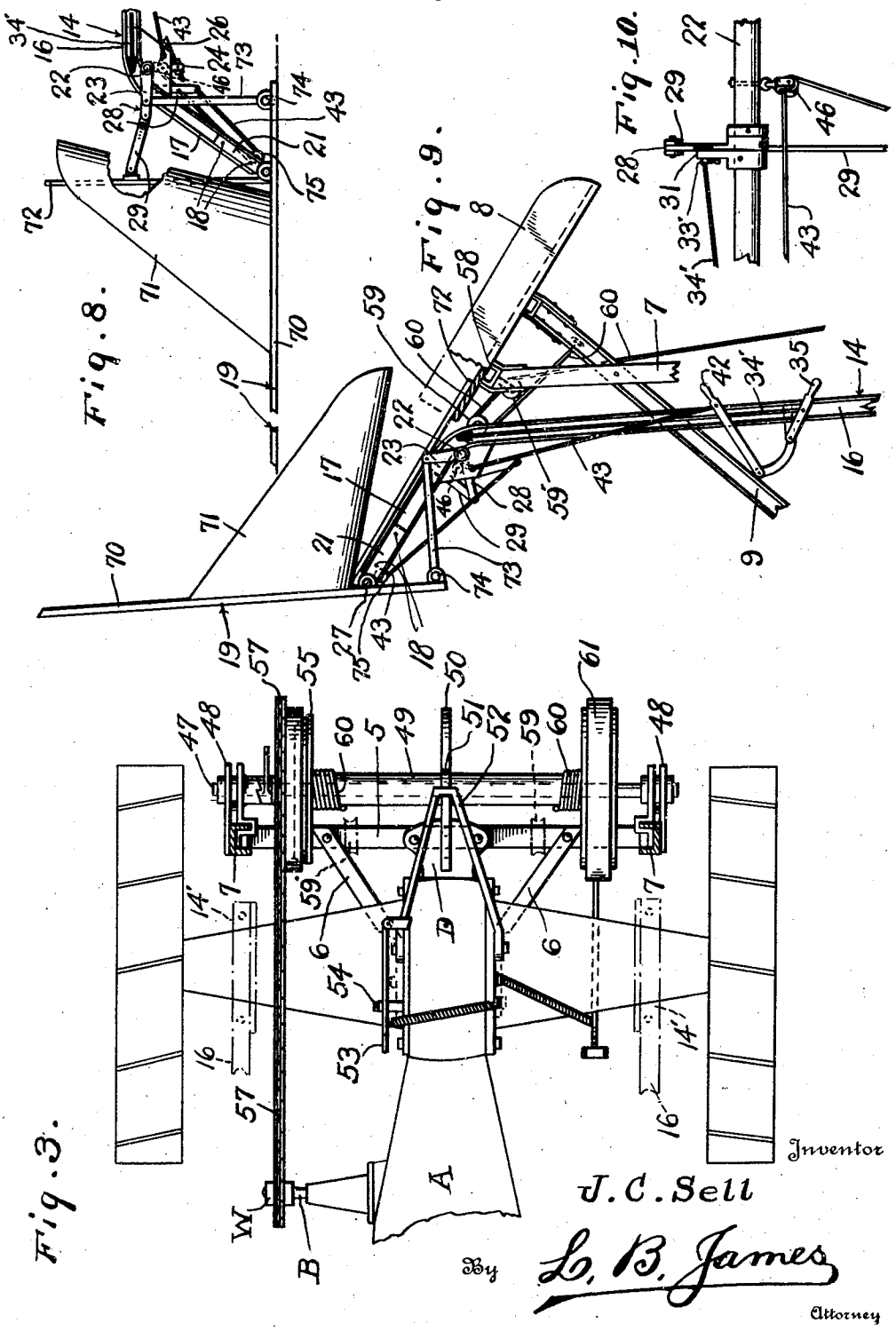


Fig. 8.

Fig. 9.

Fig. 10.

Fig. 3.

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Patented Feb. 26, 1929. 1,703,600

UNITED STATES PATENT OFFICE.

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MATERIAL LOADING AND HANDLING MACHINERY.

Application filed September 19, 1925. Serial No. 57,364.

This invention relates to material loading and handling machinery and more particularly to loading mechanisms for tractors.

The primary object of this invention resides in the provision of a loading mechanism for tractors adapted to be operated by the engine of the tractor.

Another object of this invention resides in the provision of a loading mechanism for tractors consisting of an elevating unit adapted to support different types of implements, the same being of such construction that they can be readily connected to the elevating unit for different operations.

A further object of this invention resides in the provision of a loading mechanism for tractors consisting of an association of units adapted to cooperate in performing the functions of their adoption.

A still further object of this invention resides in the provision of a loading mechanism for tractors consisting of an elevating unit adapted to support different types of implements capable of manipulation through means carried by the elevating and co-related units.

In addition to the aforesaid objects, this invention resides in the provision of a loading mechanism for tractors consisting of an elevating unit capable of supporting implements of various types so as to be manipulated to perform their individual functions.

Among the important features of this invention is the provision of implements adapted to be elevated and dumped through the instrumentality of controlling means carried by the elevating means in connection with the implements.

With these and other objects in view, this invention resides in certain novel features of construction, arrangement and combination of elements to be hereiafter set forth in the specification, illustrated in the accompanying drawings and pointed out in the appended claims and, while the disclosure depicts my present conception of the invention, the right is reserved to make such changes in construction as come within the scope of the claims.

In the accompanying drawings forming a part of this application:

Fig. 1 is a side view of a loading mechanism forming the subject matter of this application;

Fig. 2 is a plan view thereof;

Fig. 3 is an enlarged plan view partly in section of the rear end of a tractor showing the power transmitting elements of this invention;

Fig. 4 is a rear view of the scoop;

Fig. 5 is a detail sectional view on line 5—5 of Fig. 2;

Fig. 6 is an enlarged plan view thereof;

Fig. 7 is a detail side view of the tilting mechanism which regulates the implements to be elevated;

Fig. 8 is a side view of a sweep rake connected in operative position to the elevating unit of this invention, the same being in lowered position;

Fig. 9 is an enlarged side view thereof in elevated and dumped position;

Fig. 10 is a detail rear view of the elements carried by the rock shaft of the elevating unit;

Fig. 11 is a detail perspective view of a crane unit secured to the elevating unit.

In the present illustration of this invention the letter A designates a tractor of a well known make, the same being provided with the usual draw-bar D and power transmission shaft B to which is adapted to be keyed a sprocket wheel W.

Secured beneath the draw-bar is a laterally extending beam 5 suitably braced from the adjacent portion of the tractor by brace rods 6.

Inclined forwardly and extending upwardly from the beam 5 are standards 7 having a rearwardly inclined chute 8 secured to their uper ends which is in turn further supported by diagonally disposed brace beams 9 rigidly secured to the forward portion of the tractor as at 10 and fastened to the exterior surfaces of the standards 7 by suitable fastening elements 10′. The means through which the forward ends of the brace beams are secured to the tractor preferably consists of plates 11 secured to the tractor by certain fastening elements thereof and, to support the weight of the aforesaid beams, a yoke 12 straddles the top of the tractor with its ends secured to the plates 11 on opposite sides of the tractor. The rigidity of these plates 11, and thus the lower or forward ends of the brace beams, is further maintained through the instrumentality of brace-rods 13 fastened rearwardly thereof and to the engine or other suitable portion of the tractor. These braces 13 also relieve longitudinal stress of the brace beams 9 against the plates 11.

Through the relative disposition of the brace beams 9 and standards 7, the brace

beams 9 function as guide rails for side beams of an elevating unit 14 pivotally secured as at 14′ to or in the region of the rear axle of the tractor, while the standards support bumpers 15 adapted to absorb shock directed against the standards when the elevating unit reaches its upper limitation.

The elevating unit 14 preferably consists of forwardly directed beams 16 having their outermost portions 17 directed diagonally forward and toward the ground, the same having apertures for the reception of suitable fastening elements 18 utilized to removably secure implements, such as a sweep rake 19, scoop 20, or other similar implement having suitable bearing arms 21. Adjacent the forward end of the elevating unit and extending laterally beyond the beams thereof is journaled a rock-shaft 22 having arms 23 secured to its opposite extremities, one of which is provided with a right angularly disposed portion 24 pivotally supporting a threaded block 25 for the reception of a threaded rod 26 rotatably secured to the adjacent side of the elevating unit in a bearing 27 to regulate the angular relation of a trip arm 28 carried by the shaft. This operation of the trip arm 28, carried by the rockshaft 22, readily tilts the scoop or other implement, journaled in the bearings 27 through the instrumentality of a link 29 pivotally connected to the trip at one end and to a suitable connection 30 of the implement.

The aforesaid trip arm 28 is loosely journaled on the rock-shaft preferably between the beams of the elevating unit and in close relation to a segment 31, which is provided with elongated apertures 32 through which spring-pressed dogs 33 and 33′ are adapted to extend into an aperture 34 formed in the trip arm 28 to establish rigidity between the implement and elevating unit while being loaded. With the scoop journaled in the beams of the elevating unit, the trip arm is normally engaged by the dog 33 to establish rigidity between the shaft and trip arm, thereby causing the same to move in unison for adjusting the inclination of the scoop relative to the ground and to permit the scoop to be elevated by the beams in such position whereby, when elevated to the desired elevation, a flexible element 34′ connected to the dog 33 will be pulled through the instrumentality of a lever 35, carried by one beam of the elevating unit to release the trip, whereupon the scoop will overbalance and dump either forwardly into a wagon in front of the tractor or into the chute, in accordance with the position occupied by the elevating beams.

In order to limit the dumping position of the scoop so as to permit it to return to normal position when lowered, chains 36 are extended from the shaft to clips 37 secured to the scoop. These clips are preferably provided with a plurality of apertures 38 for the reception of the end links of the chains to vary the dumping movement of the scoop so as to dispose the pivotal point 39 to the proper side of a line passing through the center of the shaft and connecting link of the scoop. To cushion the jar of the scoop, when dumping, and to assist in returning it to normal position, after being dumped, a coil spring 40 is secured to an arm 41 on the scoop and anchored at its opposite end to the adjacent beam.

Secured to that beam of the elevating unit which supports the lever 35 is a lever 47, through the instrumentality of which, and a flexible element 43 connected at the pivotal point 39 of the scoop regulating links, the scoop is returned to normal position. This flexible element extends over a pulley 44 on one beam of the elevating unit through an aperture 45 therein and around a pulley 46, carried by the rock-shaft, with its extremity secured at the point stated.

Rotatably mounted on shaft 47, supported by bearings 48 which are secured to the standards 7, is a double windlass 49 having its intermediate flange 50 provided with notches 51 adapted to receive a pawl 52 to lock the windlass against clockwise movement. The aforesaid pawl is disengaged from the notches by perpendicular movement of a lever 53 secured thereto, the same being lodged either above or beneath a stud 54 in its path of movement to retain the pawl in the selected position.

Associated with the windlass is a suitable clutch 55 having a sprocket wheel 56 thereon and, through the provision of a chain 57 or other similar element, power is transmitted to the windlass from the sprocket wheel W of the tractor.

Loosely secured to the forward ends of the beams of the elevating unit and cross-beams 58 of the standards 7 are sheaves 59 and 59′ which are adapted to accommodate cables 60 extending from the windlass by first passing over sheaves 59 and around sheaves 59′ with their free ends anchored to the standards by suitable fastening elements. This arrangement of the aforesaid elements permits the cables to draw the elevating unit toward the standards with the least resistance and readily permits the standards to gravitate upon freeing the clutch and a brake 61 associated with the windlass.

The particular sweep rake adapted to be substituted for the scoop heretofore set forth consists of ground engaging tines 70 having side guards 71 mounted thereon adjacent the rear end of the rake, and a pivoted rear wall 72 remains between the side guards when it is in normal position and assumes a downwardly directed position so as to readily lodge on top of the chute when elevated and released by the trip lever.

In that the sweep rake is considerably

wider than the scoop, the link connecting the trip with the same is dispensed with and similar links 73 are likewise connected to the arms on the ends of the rock-shaft with their opposite ends pivotally engaging the sweep rake as at 74. With this association of elements, the trip operating lever performs its usual functions as does the setting lever, except that the cable extending therefrom passes over the pulley 46 around a pulley 75 with its free end connected to an extension on the trip lever to return the rear wall 72 of the sweep rake to normal position after dumping.

With this invention fully described, it is apparent that important improvements are introduced over my Patent No. 1,435,879 and, through the association of the coacting and correlated elements and units, various implements can be assembled in operative positions to perform their intended functions.

Having thus described my invention, what I claim and desire to protect by Letters Patent is:

1. In a tractor driven loading machine, a pair of frame arms pivoted to the tractor to swing between horizontal digging position and vertical discharging position, said frame arms having their forward ends extending forwardly and downwardly and terminating in forwardly extending feet adapted to rest on the ground in the digging operation, a scoop having a forward digging edge and a discharging rear end, a pivotal connection centrally of the under side of the scoop and connecting the scoop to the frame arms, means to raise said frame arms from digging to discharging position, a lock shaft connecting said frame arms rearwardly of said pivotal connections, means moving with the frame arms for locking said shaft, a segment fixed on said shaft, a latch carried by the segment, an arm pivoted on the shaft adjacent the segment, a second arm extending rearwardly from the scoop, a link connecting the last two mentioned arms, the arm on the shaft being engageable by said latch, and means for releasing the latch and thereby permitting the scoop to tilt to dumping position.

2. In a tractor driven loading machine, a pair of frame arms pivoted to the tractor to swing between horizontal digging position and vertical discharging position, said frame arms having their forward ends extending forwardly and downwardly and terminating in forwardly extending feet adapted to rest on the ground in the digging operation, a scoop having a forward digging edge and a discharging rear end, a pivotal connection centrally of the under side of the scoop and connecting the scoop to the frame arms, means to raise said frame arms from digging to discharging position, a lock shaft connecting said frame arms rearwardly of said pivotal connections, means moving with the frame arms for locking said shaft, a segment fixed on said shaft, a latch carried by the segment, an arm pivoted on the shaft adjacent the segment, a second arm extending rearwardly from the scoop, a link connecting the last two mentioned arms, the arm on the shaft being engageable by said latch, means for releasing the latch and thereby permitting the scoop to tilt to dumping position, a spring urging the scoop to dumping position.

3. In a tractor driven loading machine, a pair of frame arms pivoted to the tractor to swing between horizontal digging position and vertical discharging position, said frame arms having their forward ends extending forwardly and downwardly and terminating in forwardly extending feet adapted to rest on the ground in the digging operation, a scoop having a forward digging edge and a discharging rear end, a pivotal connection centrally of the under side of the scoop and connecting the scoop to the frame arms, means to raise said frame arms from digging to discharging position, a lock shaft connecting said frame arms rearwardly of said pivotal connections, means moving with the frame arms for locking said shaft, a segment fixed on said shaft, a latch carried by the segment, an arm pivoted on the shaft adjacent the segment, a second arm extending rearwardly from the scoop, a link connecting the last two mentioned arms, the arm on the shaft being engageable by said latch, means for releasing the latch and thereby permitting the scoop to tilt to dumping position, a spring urging the scoop to dumping position, and means to drawing the scoop back to digging position against the action of said spring.

In testimony whereof I affix my signature.

JOHANN C. SELL.