J. R. BRADEN.

GRAIN LOADING MACHINE.

APPLICATION FILED FEB. 8, 1908.

962,194. Patented June 21, 1910.

4 SHEETS—SHEET 1.

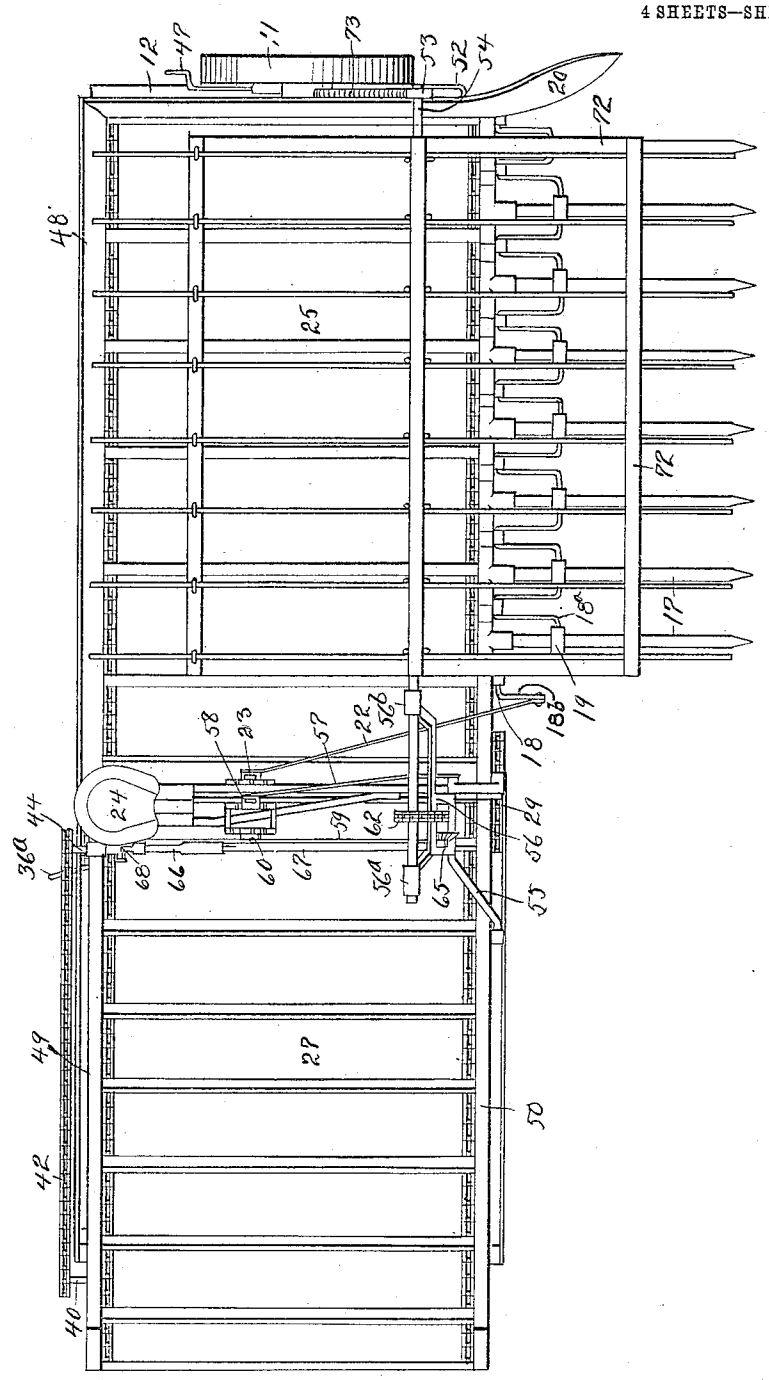

Fig. 1

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4 SHEETS—SHEET 2.

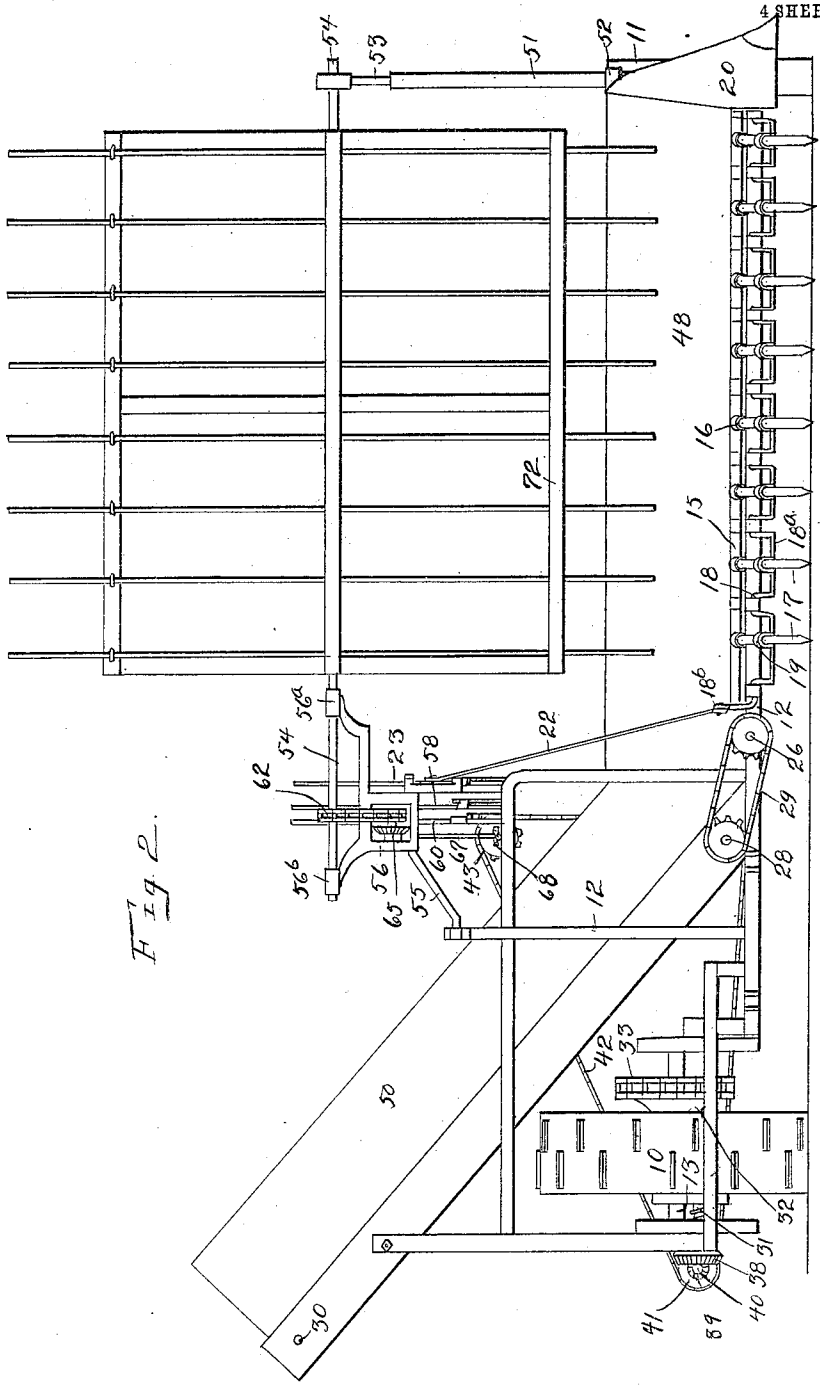

Fig 2.

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4 SHEETS—SHEET 3.

Fig. 3.

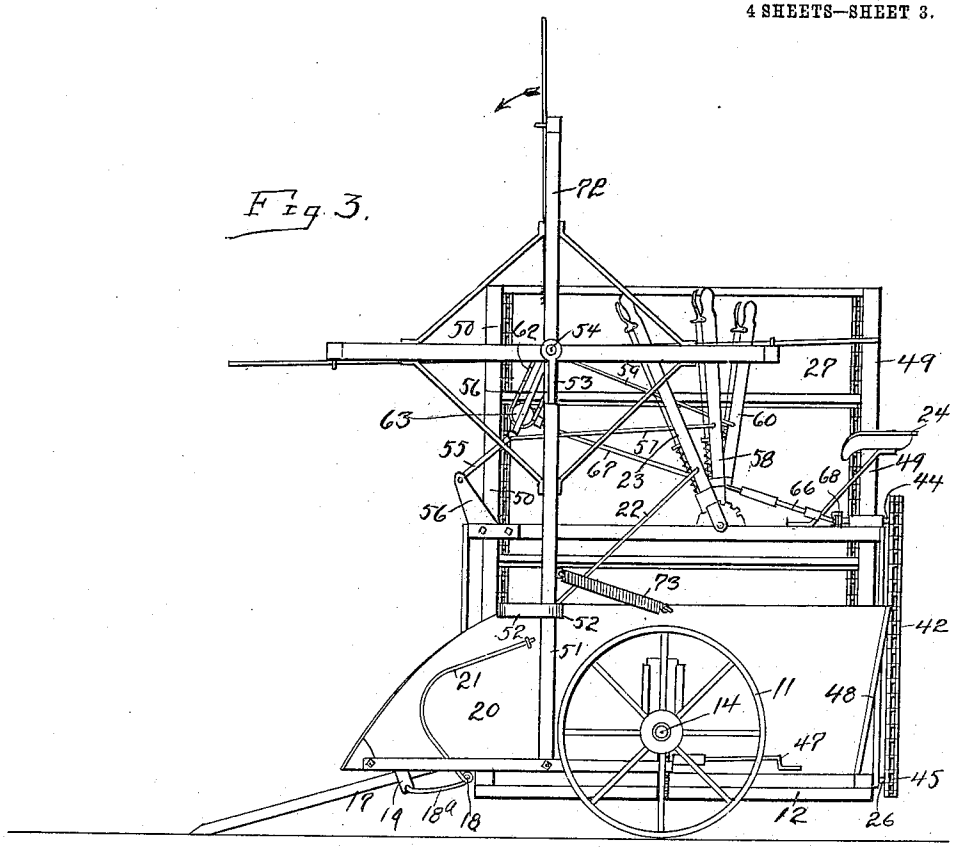
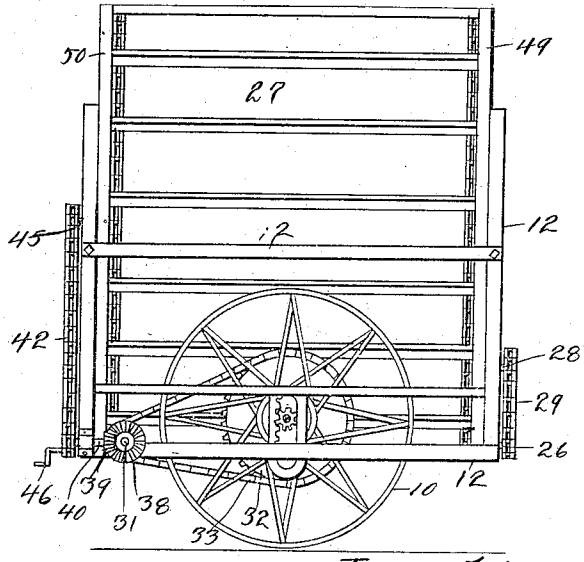


Fig. 4.



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4 SHEETS—SHEET 4.

Fig. 5.

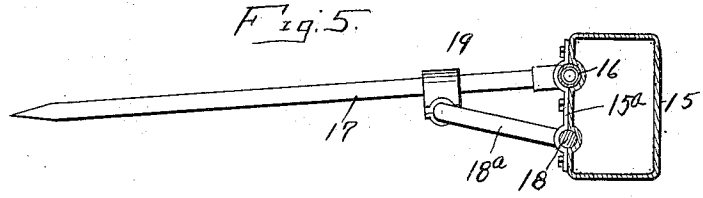

Fig. 6.

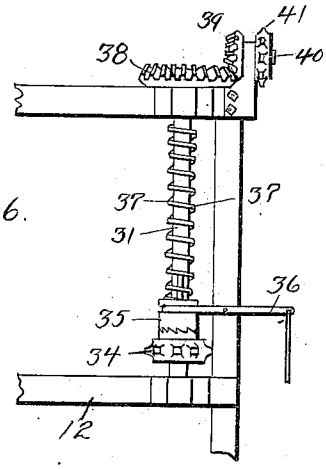

Fig. 8.

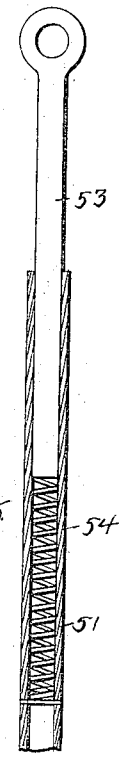

Fig. 7.

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UNITED STATES PATENT OFFICE.

JOHN R. BRADEN, OF ROWAN, IOWA.

GRAIN-LOADING MACHINE.

962,194. Specification of Letters Patent. Patented June 21, 1910.

Application filed February 8, 1908. Serial No. 415,237.

To all whom it may concern:

Be it known that I, JOHN R. BRADEN, a citizen of the United States of America, and resident of Rowan, Wright county, Iowa, have invented a new and useful Grain-Loading Machine, of which the following is a specification.

The object of this invention is to provide means for receiving shocks of bound grain and elevate and deliver said shocks to a wagon.

A further object of this invention is to provide means for collecting from the ground bundles of bound grain and conveying said grain laterally and upwardly to and deliver the same upon a wagon.

A further object of this invention is to provide means for adjusting the altitude and inclination of a rake employed to collect bundles of bound grain.

A further object of this invention is to provide means for adjusting the altitude of a reel employed to collect bundles of bound grain.

A further object of this invention is to provide means for adjusting a reel forward and rearward relative to a machine on which said reel is mounted.

A further object of this invention is to provide improved means for conjunctively driving a belt conveyer and a reel.

My invention consists in the construction, arrangement and combination of elements hereinafter set forth, pointed out in my claims and illustrated by the accompanying drawing, in which—

Figure 1 is a plan of the complete machine. Fig. 2 is a front elevation of the complete machine. Fig. 3 is a left end elevation of the machine. Fig. 4 is a right end elevation of the machine. Fig. 5 is a detail elevation showing the means employed to support and operate the rake teeth. Fig. 6 is a detail plan of a clutch connecting mechanism employed in the machine. Fig. 7 is a detail elevation, partly in section, of a mechanism employed to support one end of and drive the reel. Fig. 8 is a detail elevation, partly in section, of means for supporting the opposite ends of the reel.

In the construction of the machine as shown, the numeral 10 designates a traction wheel and the numeral 11 designates a supporting wheel. A machine frame, indicated generally by the numeral 12, and of any desired form or construction, is supported at one end on an axle 13 in the traction wheel 10 and is supported at the opposite end on an axle 14 in the supporting wheel 11. The main frame 12 preferably is formed of a plurality of bars and tubes suitably shaped and connected and braced to carry the operating devices hereinafter described and may be varied as desired for different sizes or styles of machine adapted to the performance of different work. A front bar 15 of the frame 12 is provided with journal bearings in which a rod 16 is mounted. The preferred construction of the bar 15 is shown in Fig. 5, in which it is made of pressed steel shaped on its forward face with an upper and lower row of concaved seats and provided with a cap plate 15^a shaped with an upper and lower row of concaved seats and adapted to be bolted to the bar, the seats conjunctively forming an upper and lower row of journal bearings. The rod 16 is mounted in the upper row of journal bearings. Rake teeth 17 are pivoted at their rear ends on the rod 16 and extend forward and downward from the bar 15 in such position that in the advance of the machine the attenuated forward end portions of said teeth travel in proximity to the surface of the ground. A crank shaft 18 is mounted for oscillation in the journal bearings formed by the lowermost row of seats in the bar 15 and a plurality of cranks 18^a on said shaft extend forward and upward from said bar. The forward ends of the cranks 18^a are journaled in the lower portions of collars 19 loosely mounted on the rake teeth 17 and adapted to slide longitudinally thereof.

An apron, guide board or wing 20 is mounted on the frame 12 at and extending forward and rearward from the left end of the bar 15 and a spring 21 is mounted on said apron and is coiled about and fixed to the adjacent end portion of the crank shaft. It is the function of the spring 21 to balance the weight of the rake teeth and cranks 18^a and tend to lift them. A crank 18^b is formed on the inner end portion of the crank shaft 18 and is connected by a rod 22 to a lever 23 fulcrumed on the frame 12 within reach of an operator riding on a seat 24 carried by said frame. The lever 23 is of conventional form and is provided with a segmental rack and ratchet devices for holding the lever in any position in which it is manually adjusted. It is the function of the lever 23, rod 22 and crank 18^b to os-

cillate the crank shaft 18 and raise and lower the rake teeth 17 as said lever is operated manually, in order that the rake teeth may pass beneath bundles of grain at times or ride over obstructions or remain inoperative at other times. A belt conveyer 25 is mounted on suitable drums or driving devices arranged horizontally in and at right angles to and at the rear of the bar 15. One of the drums or driving devices is carried by a shaft 26 mounted for rotation in the frame 12 at right angles to and adjacent the right end of the bar 15 and the other drum may be an idler journaled in the frame 12 adjacent and at right angles to the outer end of the bar 15. Provision is thus made for mounting the belt conveyer 25 in horizontal position at the rear of and adjacent the rake teeth 17. A belt conveyer 27 is mounted in inclined position leading to the right and upwardly from the inner portion of the belt conveyer 25, and communicating therewith. The belt conveyer 27 extends around drums or driving devices mounted in the frame 12, one of which driving devices is carried by a shaft 28 journaled in the frame 12 adjacent to and parallel with the shaft 26 and connected thereto by sprocket gearing 29. The other drum may be an idler carried by a shaft 30 at the extreme upper and right end of the machine. Thus provision is made for mounting the elevating conveyer 27 in alinement and communication with the horizontal conveyer 25. The sprocket gearing 29 is on the forward end portions of the shafts 26 and 28. A counter-shaft 31 is mounted for rotation in the frame 12 at the rear of and parallel with the axle 13 of the traction wheel 10 and a sprocket wheel 32 on the axle 13 is connected by a chain 33 to a sprocket wheel 34 loosely mounted on said counter-shaft and provided with a clutch member. A clutch member 35 is feathered to the counter-shaft 31 and is adapted to be moved longitudinally on said counter-shaft and controlled by manually-operated clutch levers 36, 36ª, fulcrumed on the frame 12. The clutch member 35 normally is pressed into engagement with the clutch member on the sprocket wheel 34 by an expansive coil spring 37 on the counter-shaft 31. A bevel gear 38 on the outer end portion of the counter-shaft 31 meshes with a bevel gear 39 on a short shaft 40 journaled in the frame 12. A sprocket wheel 41 is mounted on the opposite end portion of the short shaft 40 and is engaged by a sprocket chain 42 at the rear of the machine. The sprocket chain 42 extends upward and inward and engages a sprocket wheel 43 on a short shaft 44 journaled in the frame 12 parallel with the shafts 40, 26, 28 and 30 and said chain extends from said sprocket wheel 43 downward and around and in engagement with a sprocket wheel 45 on the rear end of the shaft 26. Thus is the motion of the traction wheel 10 communicated through the axle 13, sprocket wheel 32, chain 33, wheel 34, clutch member 35, counter-shaft 31, bevel gear 38, bevel gear 39, shaft 40, sprocket wheel 41, chain 42, sprocket wheel 43, shaft 44, and sprocket wheel 45 to the end of driving the shaft 26 in the desired direction. The shaft 26 drives the conveyer 25 in the desired direction and by means of the sprocket gearing 29 drives the elevating conveyer 27 in the same direction. Provision is made for raising and lowering the frame 12 relative to the tread surface on which the wheels 10 and 11 travel by means of adjusting devices 46, 47 (Figs. 3 and 4). These adjusting devices are shown conventionally and may be of any well known form susceptible of raising and lowering the bearings on the frame relative to the axles and I do not make any claim to invention of the form thereof.

Side-boards 48, 49 and 50 are provided at the rear of the conveyer 25 and on either side of the conveyer 27 respectively to prevent bundles of bound grain falling off the sides of said conveyers. Thus far in the description provision has been made for inserting rake teeth beneath bundles of grain, either isolated or collected into shocks and receive said bundles on a horizontal conveyer, carrying said bundles by said horizontal conveyer to an elevating conveyer and carrying said bundles to a point of delivery at the top of the elevating conveyer. It is intended that this machine shall be employed in conjunction with a wagon or other vehicle driven alongside of this machine and adapted to receive the bundles from the delivery end of the elevating conveyer. It is desirable, however, to provide means for insuring the delivery of the bundles of grain, either isolated or collected in shocks, upon the horizontal conveyer 25. To this end, a reel is provided and said reel is constructed and mounted as follows: A tube 51 is pivoted at its lower end on the frame 12 and rises vertically therefrom outside the wing or apron 20. The tube 51 extends through a loop or bracket 52 on the apron 20 and is adapted for oscillation in said loop. A rod 53 is mounted loosely in and telescopes relative to the tube 51 and an expansive coil spring 54 in said tube presses on and normally raises said rod (Fig. 8). A journal bearing is formed on the upper end portion of the rod 53 and a reel shaft 54 is journaled at one end in said bearing. A toggle lever is provided and one member 55 of said lever is pivoted at one end on a bracket 56 on the frame 13. The other member 56 of the toggle lever is joined at its lower end to the upper end of the first member and the joint thereof is connected by a rod 57 to a manu-

ally-operated lever 58 fulcrumed on the frame 13 adjacent the seat 24. The lever 58 is of conventional form and is provided with a segmental rack and detent devices to hold said lever in any position in which it is placed manually. The upper end portion of the member 56 of the toggle lever is forked and spread apart and each arm thereof is provided with journal bearings 56^a, 56^b to receive the inner end portion of the reel shaft 54 and it also is connected by a rod 59 to a manually-operated lever 60 fulcrumed on the frame 12 adjacent the seat 24. The lever 60, also of conventional form, is provided with a segmental rack and detent devices adapted to hold said lever in any position in which it may be adjusted manually. A sprocket wheel 61 is mounted on the inner end portion of the reel shaft 54 between the arms of the forked member 56 and is connected by a sprocket chain 62 to a sprocket wheel 63 on a short shaft 64 (Fig. 7). The short shaft 64 is journaled in the arms of the forked member 56 and also carries a bevel gear 65. A shaft is provided and formed of two members 66, 67. The member 66 is connected by a universal coupling 68 to the short shaft 44 and is provided with a socket 69 angular in cross section and adapted to receive a sliding engagement with the angular end portion of the member 67. The forward end portion of the shaft member 67 is journaled in a bearing 70 carried by one of the arms of the forked member 56 and a bevel gear 71 is mounted on said shaft member and meshes with the bevel gear 65, (Fig. 7). A reel 72 is mounted rigidly on the reel shaft 54 and is driven thereby. The motion of the short shaft 44 is communicated through the universal coupling 68, shaft member 66, socket 69, shaft member 67, bevel gear 71, bevel gear 65, shaft 64, sprocket wheel 63, chain 62 and sprocket wheel 61 to the reel shaft 54, to the end of rotating said reel shaft and reel 72 thereon in the direction of the arow *a* in Fig. 3.

It is the function of the lever 60 to move the reel 72 and connected parts forwardly and rearwardly to the machine on which it is carried and the forward movement of said reel relative to the machine is resisted and the rearward movement thereof is assisted by a retractile coil spring 73 connecting the tube 51 to the apron 20. It is the function of the lever 58 and toggle lever connected thereto by the rod 67 to raise and lower the reel shaft 54 and reel thereon to the machine on which it is carried by flexing the toggle lever to a greater or less degree. Of course, flexing of the toggle lever lengthens and shortens the distance between said lever and the short shaft 44 and hence it is desirable to make a connecting shaft of telescoping members 66, 67 as described. The universal coupling 68 is employed because the short shaft 44 is in horizontal position while the connecting shaft is in inclined position. In the operation of raising and lowering the reel shaft and reel, the expansive spring 54 in the tube 51 balances the weight of the outer portion of the reel. Thus is provision made for insuring the delivery of bundles of bound grain, either isolated or collected in shocks, from the rake teeth 17 to the lateral conveyer 25.

I claim as my invention—

1. A grain loader, comprising, in combination, a wheeled frame, a longitudinal rake carried by said frame, said rake comprising a plurality of teeth fixedly secured to a rotatable shaft, a crank shaft journaled parallel to said rotatable shaft, and having sliding connections between its cranks and said teeth, means for rotating said crank shaft, to raise or lower said teeth, a reel located above said rake, and means to revolve said reel.

2. A grain loader, comprising, in combination, a wheeled frame, a longitudinal rake carried by said frame, a horizontal conveyer and an inclined conveyer in communication with said rake, a plurality of cranks slidably connected to the teeth of said rake, whereby to adjust their elevation, a reel mounted for vertical and longitiudinal adjustment above said rake, and means to regulate such adjustment.

Signed by me at Rowan, Iowa, this 14th day of August, 1907.

JOHN R. BRADEN.

Witnesses:
R. H. KEITH,
J. W. ALLEN.