

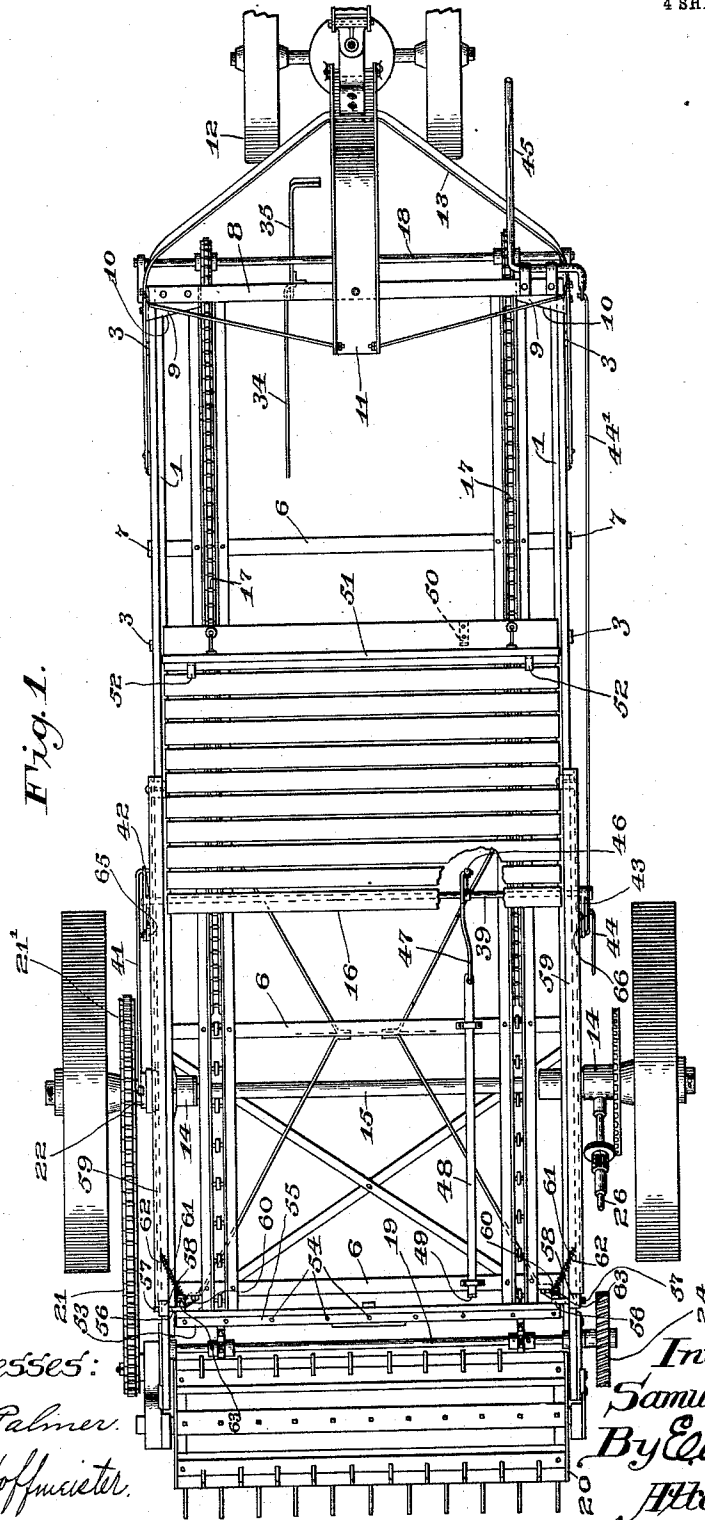
S. K. DENNIS.
MANURE SPREADER.
APPLICATION FILED OCT. 20, 1911.

1,018,743.

Patented Feb. 27, 1912.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
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F. W. Hoffmeyer.

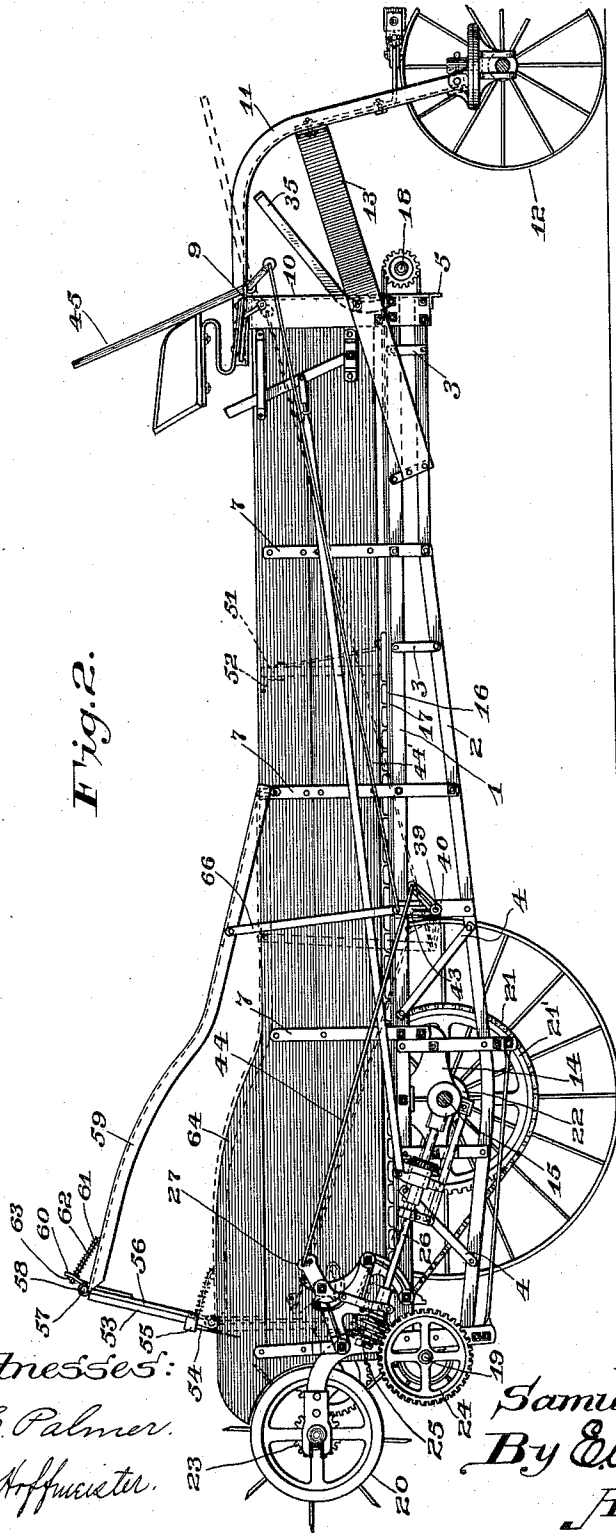
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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.



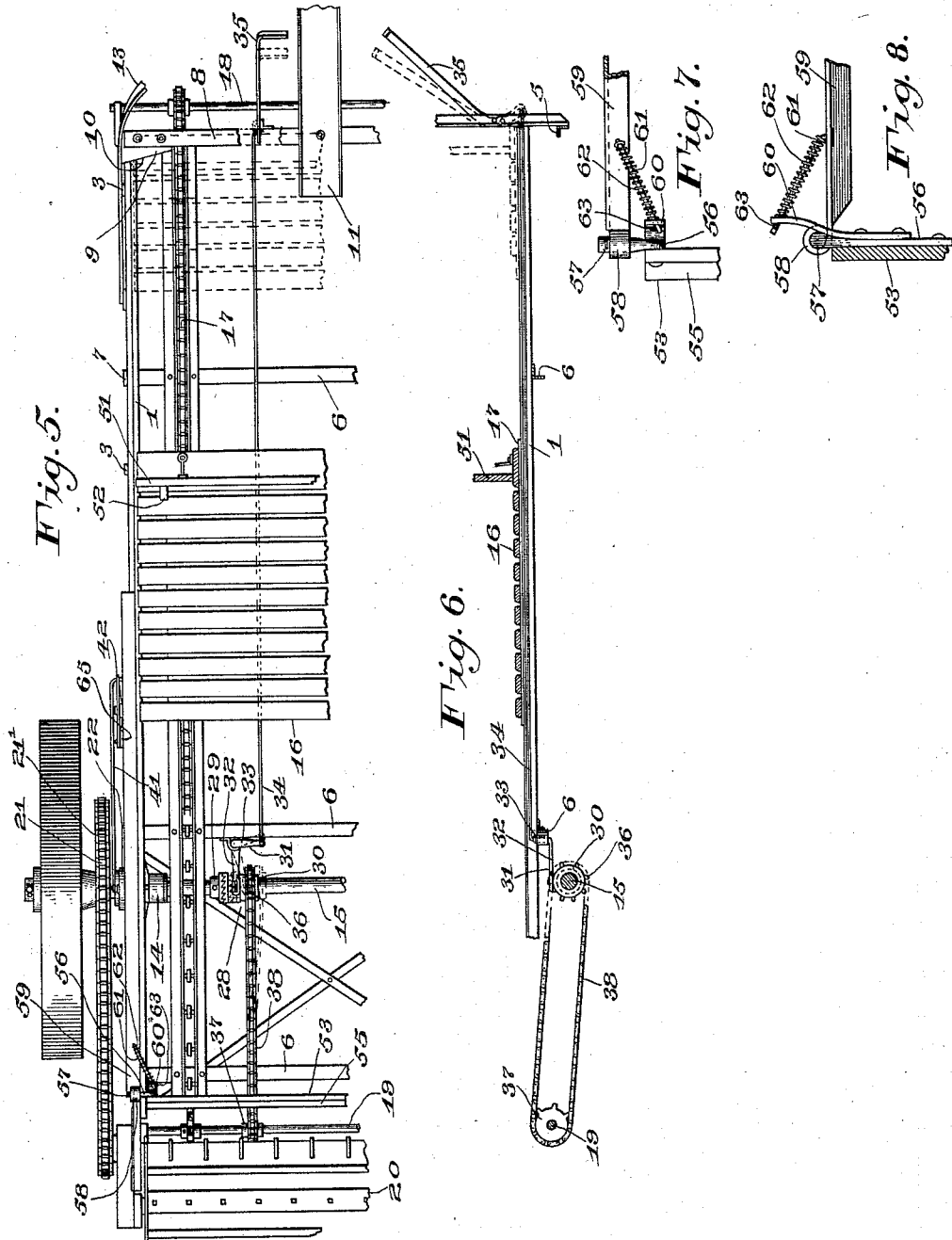
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UNITED STATES PATENT OFFICE.

SAMUEL K. DENNIS, OF CHICAGO, ILLINOIS, ASSIGNOR TO INTERNATIONAL HARVESTER COMPANY, A CORPORATION OF NEW JERSEY.

MANURE-SPREADER.

1,018,743.

Specification of Letters Patent.

Patented Feb. 27, 1912.

Application filed October 20, 1911. Serial No. 655,711.

To all whom it may concern:

Be it known that I, SAMUEL K. DENNIS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Manure-Spreaders, of which the following is a specification.

My invention relates to manure spreaders, and in particular to the construction of and means for controlling the movement of the end gate; the object of my invention being to provide a construction having few parts and wherein the supporting arms of the end gate mechanism form guards for the upper edges of the side walls of the receptacle when the latter is being filled.

These objects are attained by means of the mechanism illustrated by the accompanying drawings, in which—

Figure 1 represents a top plan view of a manure spreader having my invention embodied in its construction; Fig. 2 is a side elevation of Fig. 1; Fig. 3 is a side elevation, partly in section, of the rear end of the machine, designed to illustrate the operation of the mechanism for returning the movable apron forming the bottom of the receptacle to its initial position; Fig. 4 is a side elevation of the rear end of the machine, designed to illustrate the manner of connecting the end gate controlling means with the clutch shipping mechanism; Fig. 5 represents a top plan view of part of the machine, designed to illustrate the construction and operation of the mechanism for returning the movable bottom of the receptacle to its initial position; Fig. 6 is a sectional side elevation of part of Fig. 5; Fig. 7 represents a top plan view of a detached detail of the end gate supporting mechanism; and Fig. 8 is a side elevation of Fig. 7.

The same reference characters designate like parts throughout the several views.

The bed frame of the machine is of steel construction and includes upper and lower side sill members 1 and 2, respectively, upon opposite sides thereof, that are connected near their front ends by means of short vertically arranged truss members 3, and at their rear ends with other truss members 4 that are inclined from the vertical; 5 represents a transversely arranged sill member connecting the front ends of side sill members 2, and 6 represents other transversely

arranged sill members connecting the side members at intervals toward their rear ends.

7 represents vertically arranged truss members having their lower ends secured to the side sills and their upper portions to the side walls of the receptacle.

8 represents a transverse frame member at the front of the machine, having opposite ends thereof connected to inwardly turned portions 9 of the upper ends of vertically arranged bars 10, that have their lower ends secured to sill members 1 and 2 upon opposite sides of the machine.

11 represents a forwardly and downwardly curved bar having its rear end secured to the central portion of frame member 8 and its lower front end connected with a front truck mechanism 12, a part only of the truck being shown, and 13 represents a frame member having a U-shape, with its rearwardly extending leg portion secured to the vertical bars 10 and to the sill members 1 and 2 upon opposite sides of the machine, and its head portion to member 11, as shown in Figs. 1 and 2.

14 represents rear axle supporting brackets secured to frame members 1 and 2 upon opposite sides of the machine, and in which the rear axle 15 is journaled.

16 represents a common form of movable apron that forms a bottom for the receptacle and includes carrier chains 17, that are operatively connected with transversely arranged shafts 18 and 19 at the front and rear ends, respectively, of the machine.

20 represents the distributing cylinder rotatably mounted at the rear end of the receptacle and to which motion is transmitted from the axle by means of a sprocket chain 21, a main sprocket wheel 21¹, clutch mechanism 22 connecting the sprocket wheel with the axle, and pinion 23 at one side of the machine. Motion is transmitted from the axle to the movable apron by means of a common form of gear mechanism at the opposite side of the machine, said mechanism including a worm wheel 24 secured to the end of shaft 19 and a worm 25 secured to the rear end of a shaft 26, that extends forward and downward toward the axle and may be raised or lowered at its rear end in a manner to cause the worm to engage with the worm wheel or be disengaged therefrom, and 27 represents a swinging lever mecha-

nism that is operatively connected with the shaft in a manner to perform that function.

28 represents a clutch mechanism mounted upon the axle, including a toothed member 29 secured to the axle, a toothed member 30 slidably mounted upon the axle and adapted to engage with the fixed clutch member, and 31 a clutch shipping lever pivotally mounted upon a fixed part of the frame of the machine, having an arm 32 connected with the sliding clutch member and an arm 33 connected by means of a bar 34 with a foot lever 35, pivotally mounted upon the front end of the machine adjacent the operator's seat. 10
15 Integral with the sliding clutch member is a sprocket wheel 36 that is operatively connected with a sprocket wheel 37 by means of a chain 38, the sprocket wheel 37 being secured to shaft 18, that actuates the movable apron. 20

39 represents a transverse rock shaft journaled in bearings 40 secured to frame members 1 and 2, upon opposite sides of the machine.

41 represents a clutch shipping rod connecting the clutch mechanism 22 with one member 42 of a double armed lever secured to the end of the rock shaft. Secured to the opposite end of the rock shaft is a bell crank lever 43, having one arm thereof connected with lever 27 by means of a rod 44, and the other arm, by means of a rod 44¹, with a hand lever 45, pivotally mounted at the front end of the machine within convenient reach 35 of the operator.

46 represents an arm secured to the rock shaft intermediate its ends; 47 a link connecting the arm with the front end of a tripping bar 48 that is slidably mounted 40 upon the frame of the machine, and having at its rear end a turned-up portion 49 that is adapted to contact with a clip 50 secured to the front end of the movable apron in a manner to draw the bar rearward and turn 45 the rock shaft in its bearings as the apron nears the limit of its rearward movement toward the distributing cylinder, and, through the associated mechanism, disengages the clutch mechanism 22 and thereby 50 causes the distributing cylinder to cease rotating.

51 represents a follower secured to the front end of the apron and having rearwardly projecting brackets 52 secured to 55 opposite ends thereof upon its rear upper edge.

53 represents an end gate provided with a series of teeth 54 along its lower edge that are driven through a bar 55, to which the 60 lower edge of the end gate is secured.

56 represents strap hinge members having their vertical body portions secured to the gate at opposite ends thereof and provided at their upper ends with transverse horizontal pintles 57 that are loosely received

by eye portions 58 formed upon the rear ends of end gate controlling bars 59, that extend forward from the distributing cylinder to substantially the center of the length of the receptacle and have their front ends pivotally connected with the side walls thereof. 70

60 represents vertically arranged bars secured to opposite ends of the end gate and projecting above the axis of its hinge connection with bars 59. 75

61 represents links having their front ends secured to bars 59, and inclining upward, rearward and inward, have their rear ends slidably received by openings in the upper ends of bars 60, and 62 represents compression springs encircling the links and operative to yieldingly resist a swinging movement of the end gate in a rearward direction, pins 63 through the rear ends of the links operating to limit a swinging movement of the gate in an opposite direction. 80
85 As is common in this class of machines, the side walls of the receptacle, at their rear ends, are provided with raised portions 64 that curve downward and forward at their 90 front ends, and the end gate controlling bars 59 have corresponding curves and being formed of angle sections having horizontal and vertical webs, they operate as guards for the upper edges of the side walls of the 95 receptacle when the end gate is lowered to a position to retain the material when the receptacle is being filled.

For the purpose of raising and lowering the end gate, the controlling bars 59 are 100 connected intermediate their ends upon one side of the machine by means of a link 65 to the remaining arm of the double armed lever 42, and upon the opposite side by means of a link 66, coaxially with rod 44¹, 105 with the bell crank lever 43.

When the hand lever 45 is moved to the position shown by full lines in Fig. 2, the rock shaft 39 is turned to the forward limit of its range of movement, the bell crank 110 lever 43 has, through its connection with the swinging lever mechanism 27, lowered the rear end of shaft 26 in a manner causing worm 25 to engage with worm wheel 24, the double armed lever 42 has, through its connection with clutch mechanism 22, caused 115 sprocket wheel 21¹ to be operatively connected with the axle and the links 65 and 66 with their lever arm connections with the rock shaft have raised the end gate controlling bars and the end gate, and the machine is ready to begin its spreading operation. 120

When the end gate is raised to the position shown by full lines in Fig. 2, the axes of the pivotal connection between links 65 and 66 125 and the lever arms upon the rock shaft have passed in front of a line drawn through the axis of the rock shaft and the axis of the pivotal connection of the upper ends of said links with the end gate supporting bars and 130

said bars are thereby, by means of this toggle action of the parts, self-locked in an elevated position, and when the rock shaft is turned rearward by the operator sufficient to bring the axis of the links in rear of such line, the end gate is free to descend if the apron has been returned sufficient to carry the follower away from the path of the descending gate; otherwise the bar 55 will contact with the brackets 52 secured to the follower. It is desirable that the follower be moved as near as possible to the distributing cylinder before the apron actuates the clutch tripping bar 48, and as the cylinder will continue to rotate for a period after it has been disconnected from the source of power, and the end gate being free to fall at this time, it is necessary to provide means for preventing the descent to a position where it would come in contact with the rotating cylinder, and such is the function of the brackets 52.

What I claim as my invention, and desire to secure by Letters Patent, is:

1. A manure spreader including, in combination, a receptacle having side walls, a distributing cylinder rotatably mounted at the rear end of said receptacle, an end gate adapted to close the end of said receptacle adjacent said cylinder, means for raising and lowering said end gate, said means including supporting bars having their front ends pivotally connected with the side walls of said receptacle upon opposite sides thereof, said end gate being pivotally connected with the rear ends of said bars, bracket members secured to said end gate and extending above the axis thereof, and compression springs operative between said brackets and said bars in a manner to yieldingly resist a swinging movement of said gate in one direction, means for swinging said bars about their pivotal connection in a manner to raise or lower said end gate, said bars fitting closely upon the upper edges of the side walls of said receptacle in a manner to form guards therefor when said end gate is lowered to a closing position.

2. A manure spreader including, in combination, a receptacle having side walls, a distributing cylinder rotatably mounted at the rear end of said receptacle, said side walls having raised portions adjacent said cylinder that curve downward and forward at their front ends toward the body portion of said side walls, an end gate adapted to close the end of said receptacle adjacent said cylinder, means for raising and lowering said end gate, said means including supporting bars having their front ends pivotally

connected with the side walls of said receptacle upon opposite sides thereof and in front of said raised portions, said end gate being pivotally connected with the rear ends of said bars, brackets secured to said end gate and extending above the axis thereof, links having one end thereof pivotally connected with said bars and the opposite end thereof slidably received by openings in said brackets, and springs encircling said links and operative to yieldingly resist a swinging movement of said gate in one direction, means for swinging said bars about their pivotal connection in a manner to raise or lower said end gate, said bars being curved in a manner to fit closely upon the upper edges of the body and raised portions of the side walls of said receptacle in a manner to form guards therefor when said end gate is in a closed position.

3. A manure spreader including, in combination, a receptacle, a distributing cylinder rotatably mounted at the rear end of said receptacle, a movable apron forming the bottom of said receptacle, means for advancing said apron toward said cylinder, a follower secured to the front end of said apron, means for automatically suspending the action of said apron advancing means when said follower has reached a predetermined position adjacent said cylinder, an end gate adapted to close the end of said receptacle adjacent said cylinder, means for raising and lowering said end gate, said means including supporting bars having their front ends pivotally connected with the side walls of said receptacle upon opposite sides thereof, said end gate being pivotally connected with the rear ends of said bars, means operative to swing said bars about their pivotal connection in a manner to raise or lower said end gate, said means including a rock shaft journaled at the bottom of said receptacle and connected with the means for suspending the action of the apron advancing means, lever arms secured to opposite ends of said shaft, links pivotally connecting said arms with said end gate supporting bars, a rocking movement of said shaft in a direction to raise said end gate causing said arms and links to move to a self-locking position when said end gate has been raised to an open position, brackets secured to said follower, said end gate engaging with said brackets when said rock shaft is turned in an opposite direction.

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Witnesses:

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