

No. 873,030.

PATENTED DEC. 10, 1907.

S. K. DENNIS & F. W. RICE.

MANURE SPREADER.

APPLICATION FILED AUG. 3, 1907.

4 SHEETS—SHEET 1.

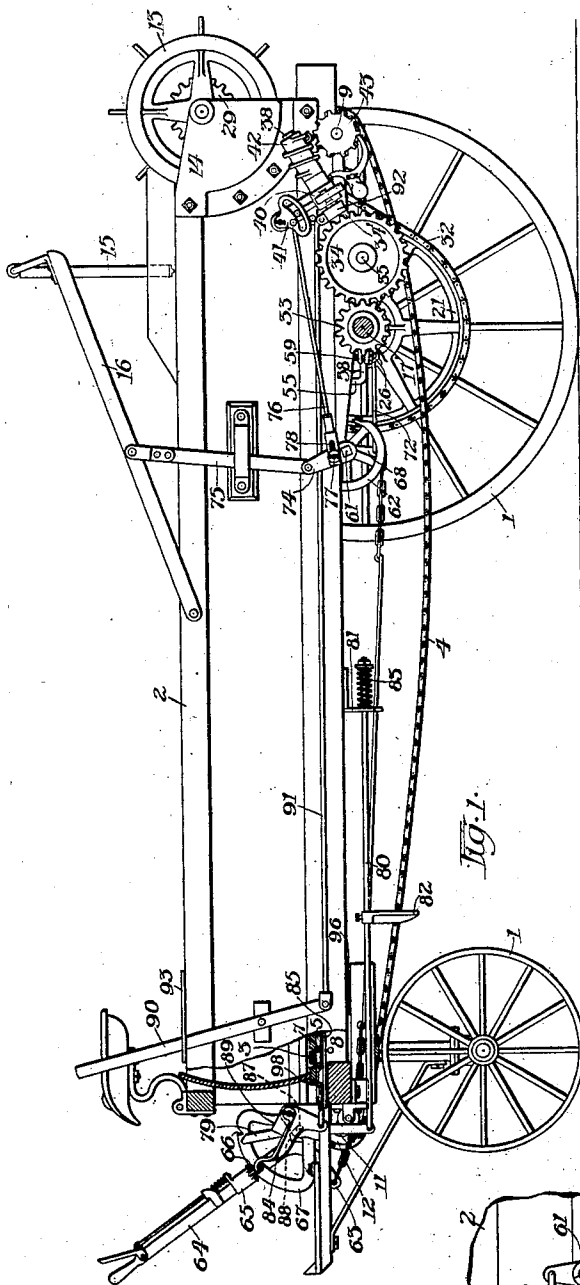


Fig. 1.

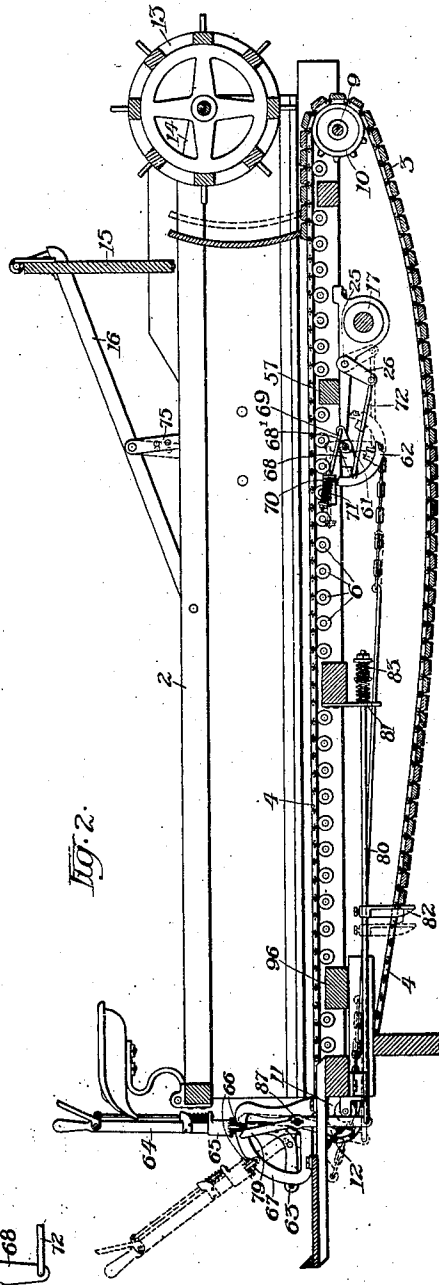


Fig. 2.

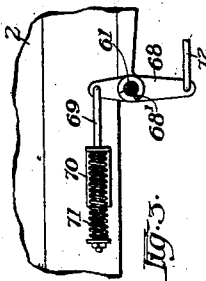


Fig. 3.

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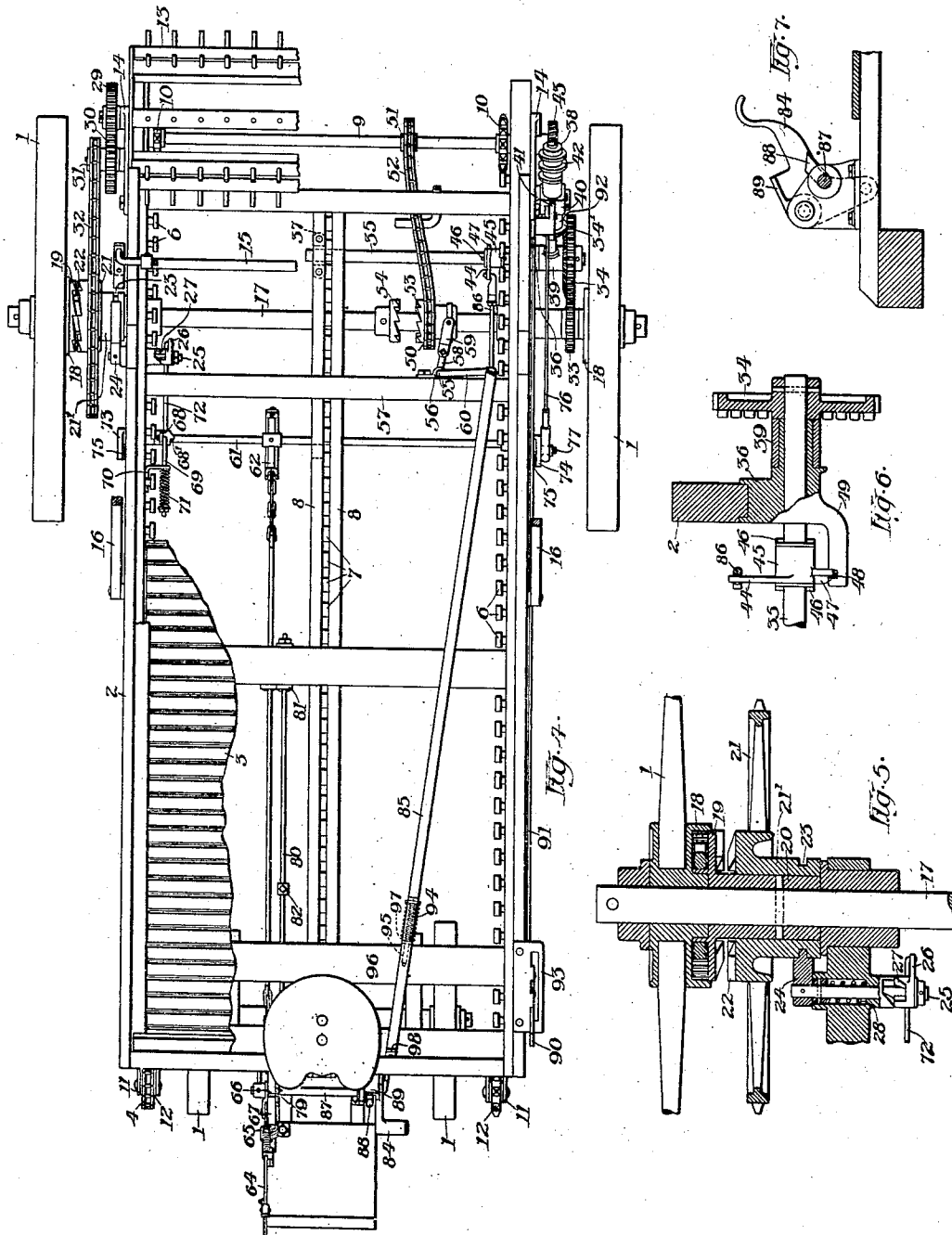
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4 SHEETS—SHEET 2.



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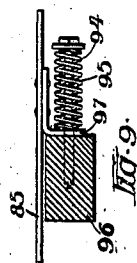
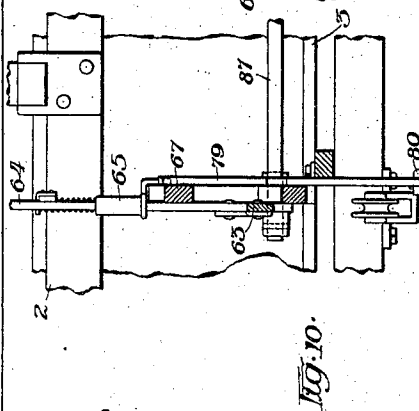
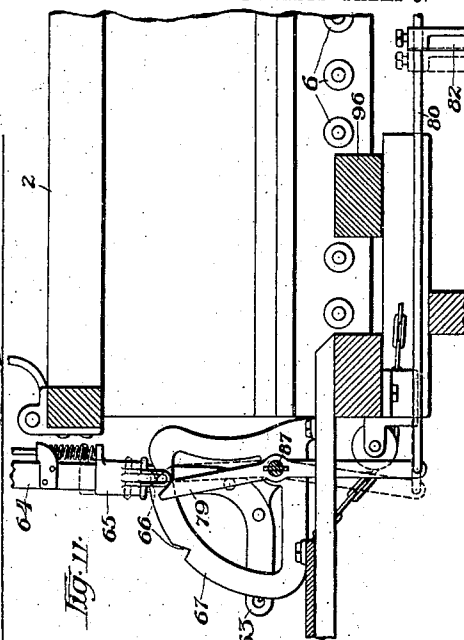
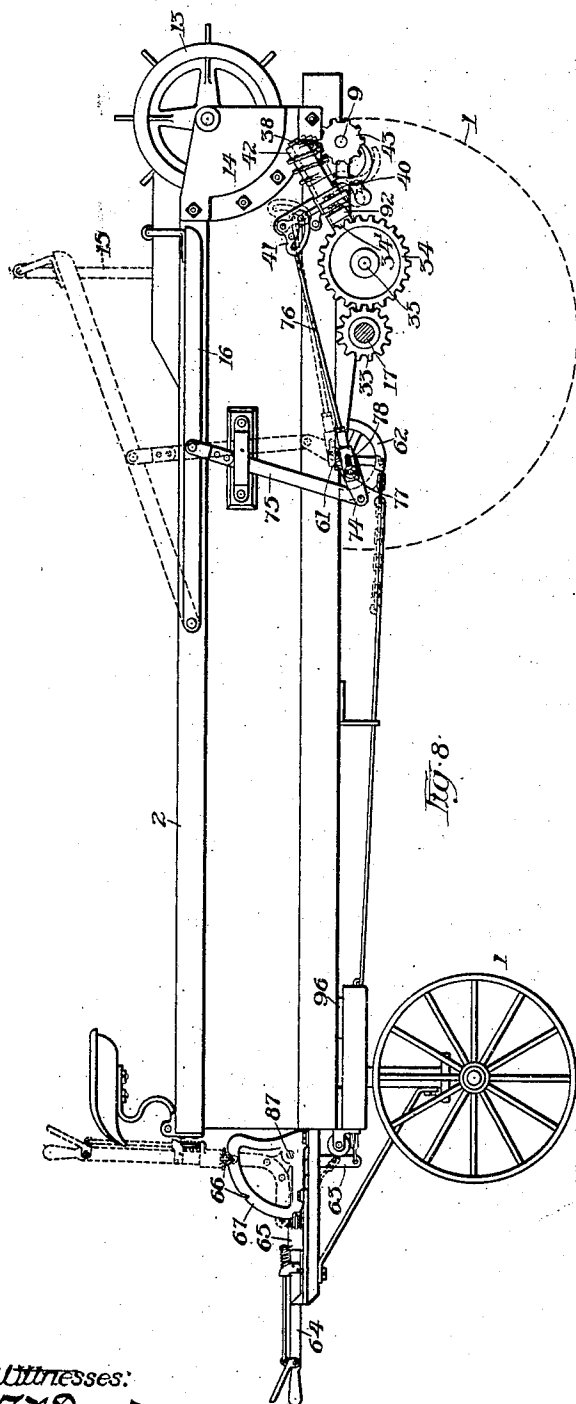
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4 SHEETS—SHEET 3.



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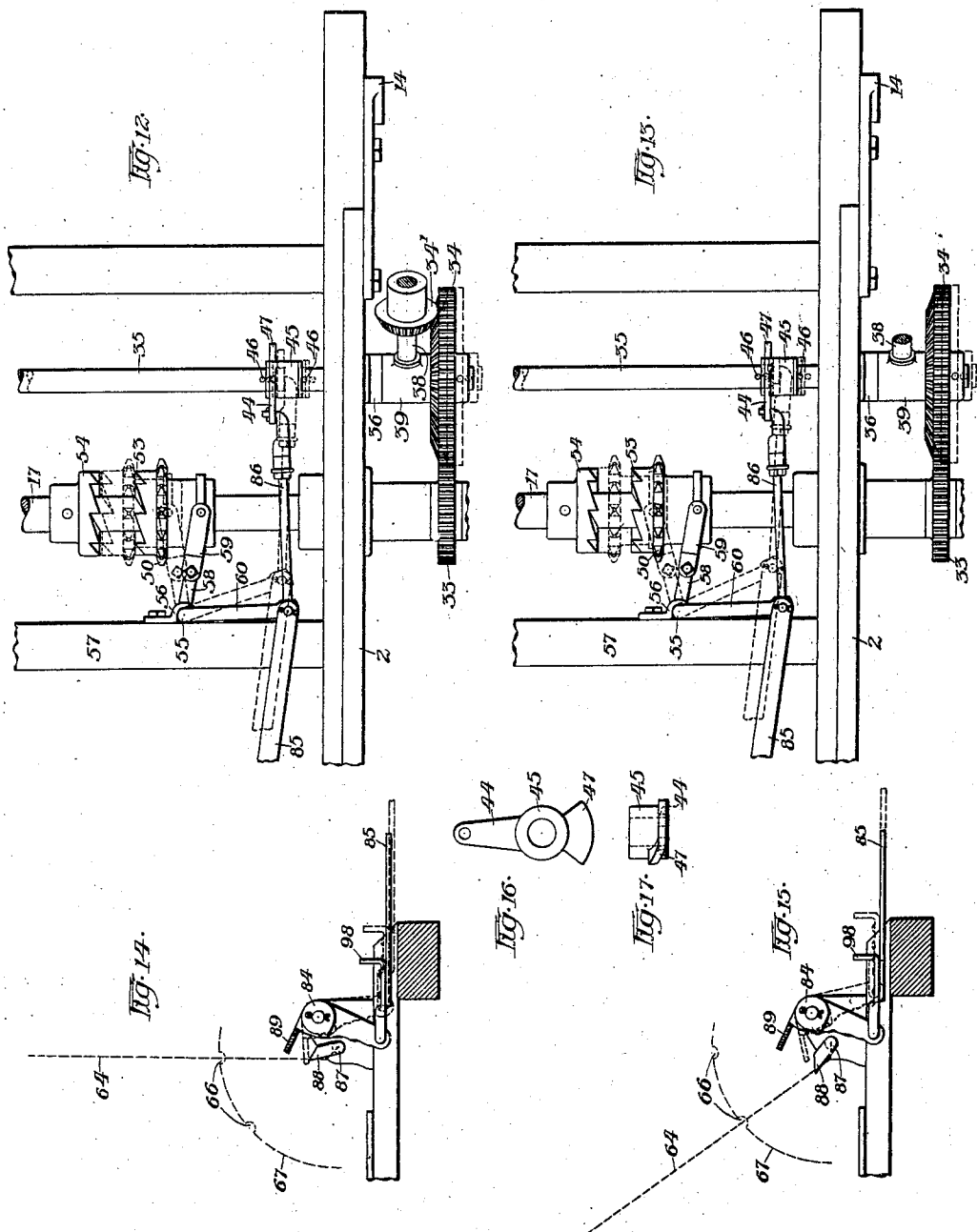
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

SAMUEL K. DENNIS AND FRANK W. RICE, OF CHICAGO, ILLINOIS, ASSIGNORS TO
INTERNATIONAL HARVESTER COMPANY, A CORPORATION OF NEW JERSEY.

MANURE-SPREADER.

No. 873,080.

Specification of Letters Patent.

Patented Dec. 10, 1907.

Application filed August 3, 1907. Serial No. 386,942.

To all whom it may concern:

Be it known that we, SAMUEL K. DENNIS and FRANK W. RICE, citizens 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.

Our invention relates to that type of manure spreaders having a body mounted upon carrying wheels, a movable apron forming a bottom for the body, a distributing cylinder mounted at the rear end of the body, an end gate mounted in front of the cylinder and adapted to be raised and lowered vertically in a manner to allow the load to be delivered toward the cylinder during the spreading operation, or to shield the cylinder during the loading operation; the object of our invention being to provide improved means for adjusting the various operative parts and controlling their movements. We attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a manure spreader embodying our invention and having a portion thereof broken away for the purpose of better illustrating the same. Fig. 2 is a sectional side elevation of a part of Fig. 1. Fig. 3 is a detail of part of the gear shifting mechanism. Fig. 4 is a top plan view of Fig. 1, with the greater part of the movable apron removed. Fig. 5 is a sectional detail representing a portion of the gear shipping mechanism in connection with a part of the cylinder driving mechanism. Fig. 6 is a detail, partly in section, representing a part of the gear shipping mechanism connected with the apron advancing means. Fig. 7 is a detached detail, partly in section, showing the manner of mounting the foot lever, which is operative to reverse the direction of movement of the apron. Fig. 8 is a side elevation of a part of the spreader designed to illustrate the manner of manipulating the end gate controlling means and the mechanism for advancing the apron. Fig. 9 is a detached detail illustrating a part of the gear shipping means connected with the change speed devices and the apron return mechanism. Fig. 10 is a front elevation, partly in section, of a hand lever and associated parts mounted at the front of the machine. Fig. 11 is a side elevation of Fig. 10. Fig. 12 is a detail plan view of a part of the clutch and gear shipping mechanism connected with the

apron returning mechanism and the speed changing mechanism forming part of the apron advancing means. Fig. 13 is a like view and of the same parts as represented in Fig. 12 and is designed to illustrate the manner in which the parts may be adjusted. Fig. 14 is a detached detail, partly in section, and designed to illustrate the movement of the foot lever in connection with the gear shifting means. Fig. 15 is a like view of the same parts illustrating a further movement thereof. Fig. 16 is an end elevation of a gear shipping cam; and Fig. 17 is a plan view of the part shown in Fig. 16.

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

1 represents the carrying wheels, upon which is suitably mounted a body 2, having a movable apron 3 forming its bottom, which apron comprises slats extending transversely relative to the body and connected by means of chains 4 at their outer ends and a central chain 5 intermediate their ends, the apron being supported by rollers 6 mounted upon the outside members of the body frame and other rollers 7 mounted between frame members 8 extending lengthwise of the body and arranged centrally thereof.

9 is a cross shaft mounted in suitable bearings at the rear end of the body and having secured thereto, at opposite ends thereof, sprocket wheels 10, and mounted at the forward end of the body in suitable brackets 11, upon opposite sides thereof, are idler sprocket wheels 12. The chains 4 are received by the sprocket wheels in a manner to control the movement of the apron in either direction.

13 represents a distributing cylinder mounted at the rear end of the body in suitable bearings supported by side plates 14 at opposite sides of the body, and 15 is a safety board or gate pivotally mounted at the rear ends of side levers 16 that have their forward ends pivotally connected with the sides of the body; the levers being adapted to swing about their pivotal connection in a manner to move the safety board in a vertical direction.

Motion is communicated to the various operative parts of the machine by means of the rear axle 17, being rotatably mounted in suitable bearings secured to the body frame and the carrying wheels mounted upon said axle and connected therewith by means of a common form of backing ratchets 18 cooperating

with pawl plates 19 secured to said axle; the pawl plate upon the right-hand side of the machine being provided with an extended hub portion 20 forming a bearing for a main driving sprocket wheel 21, which wheel is adapted to slide longitudinally upon said bearing and is provided with clutch teeth 22 upon the outer face of its hub portion that are adapted to engage with similar teeth upon the inner face of the pawl plate 19. A groove 23 is formed around the inner end of the hub 21, and a fork member 24 is received by said groove, which fork member is secured to one end of a longitudinally movable rod 25 mounted in a fixed part of the frame and having secured to its opposite end a lever 26, said lever being provided with a cam face 27 adapted to oppose a similar cam face forming part of the fixed frame when said rod is rocked in its bearing in a manner to cause said rod to move lengthwise in one direction in said bearing, and 28 represents a spring coiled about the rod and operative to move the rod in an opposite direction. The distributing cylinder shaft is provided with a pinion 29, and meshing therewith is a pinion 30 mounted upon a stud secured to a fixed part of the machine, and integral with the pinion is a sprocket wheel 31. A chain 32 transmits motion from the main sprocket wheel 21 to wheel 31, and by means of the pinions to the distributing cylinder.

The means for communicating motion to the apron are mounted upon the left-hand side of the machine and comprise a spur gear 33 secured to and rotating with the axle and meshing with a gear wheel 34 secured to the outer end of a shaft 35 mounted in bearings 36 and 37 secured to the outside and central frame members of the body, respectively; said shaft being adapted to move longitudinally through said bearings, the wheel 34 being provided with a series of concentric lines of teeth upon its inner face that are adapted to mesh with a pinion 34' slidably mounted upon a shaft 38, said shaft having its lower forward end mounted in a bearing sleeve 39 that is rotatably mounted upon a portion of the bearing 36, and its upper rear end supported in a movable bearing piece 40 that is controlled by a swinging cam lever 41 in a manner to swing the shaft 38 about the axis of shaft 35 for the purpose of causing a worm 42, secured to shaft 38, to engage with or be disengaged from a worm wheel 43 secured to the outer end of the cross shaft 9, with which the apron is operatively connected. The shaft 35 may be moved lengthwise by means of a lever 44, having a sleeve portion 45 mounted loosely upon shaft 35 and secured against lateral movement thereon by means of pins 46, the sleeve portion being provided with a spirally arranged rib 47 that is received by a notch 48 formed in an arm 49 forming part of the bearing bracket

36, the rib being operative in a manner to cause the shaft to move lengthwise when the lever is moved in one direction and cause the gear carried thereby to be disengaged from said pinion.

To return the movable apron to its initial position there is provided a sprocket wheel 50 loosely mounted upon the axle and adapted to slide lengthwise thereon and connected with a sprocket wheel 51, secured to shaft 9, by means of a chain 52; the sprocket wheel 50 being provided with clutch teeth 53 on its hub portion adapted to engage with a toothed clutch member 54 secured to the axle, when the sprocket wheel is moved along the axle in one direction, and to be disengaged therefrom when moved in an opposite direction. To move said sprocket wheel along the axle there is provided a bell crank lever 55, mounted in a vertically arranged bearing 56, secured to a cross member 57 of the body frame, said bell crank having a rearwardly extending arm 58, to which is secured a fork 59 that embraces the hub of the sprocket wheel in a well-known way and which is operative to control the movement thereof, and 60 represents a laterally extending arm forming a part of said bell crank.

The mechanism whereby the operator is enabled to control the movements of the various operative parts of the machine comprises a rock-shaft 61 arranged in front of and parallel with the axle, and mounted in suitable bearings secured to the body frame members, and secured to said rock-shaft intermediate its ends, is a sector 62, which sector is flexibly connected with an arm 63 of a hand lever 64 pivotally mounted on the foot board at the front of the machine and having a common form of sliding hand controlled detent 65 mounted thereon and adapted to engage with either of two notches 66 formed in a sector 67 secured to the foot board adjacent to the hand lever. The flexible connection between the hand lever and sector 62 permits the hand lever to rock the shaft in one direction only, and for the purpose of rocking it in an opposite direction there is provided a two armed lever 68 loosely mounted upon said shaft and adapted to have a limited independent movement, which movement is controlled by a pin 68' engaging with a suitable stop shoulder on the hub of the lever, and a link 69 having its rear end pivotally connected with one arm of said lever and its forward end slidably mounted in a bracket 70 secured to the body frame; and having a coiled spring 71 surrounding the link and operative against the forward side of the bracket in a manner to draw the link in a forward direction, and through its connection with lever 68 yieldingly oppose a movement of the rock-shaft when said hand lever is moved in one direction, and to cause said rock-shaft to turn in an opposite direc-

tion when the hand lever is released. The other arm of lever 68 is connected, by means of a link 72, with the cam lever 26 forming part of the clutch shipping mechanism connected with the main sprocket wheel 21; the arrangement of the arms and links being such that when the hand lever is in the position shown by full lines in Fig. 8 the shaft 61 has been rocked in its bearings to its full limit in a forward direction, caused partly by the force of the spring 71 acting through its link connection with lever 68, and other means to be described later. When in this position the main sprocket wheel is unclutched from the adjacent dog plate and the clutch shipping parts are in the position shown in Fig. 5, and the pin 68¹, moving around with the rock-shaft, is in the position shown in Fig. 3 relative to the stop shoulder on lever 68.

Secured to opposite ends of the rock-shaft, outside of its supporting bearings, are arms 73 and 74, and said arms are pivotally connected with the side levers 16 of the end gate mechanism by means of vertically arranged links 75, and arm 74 is connected with the worm controlling cam 41 by means of a link 76, having a slot at its forward end that receives a stud 77 secured to the arm 74, and a spring 78 is mounted in the slot in a manner to yieldingly control the effective operative length of the link.

With the parts in their various positions as shown in Fig. 8, the arms 73 and 74 are depressed by means of the weight of the end gate acting through the pivoted side levers and the connecting links, and the rock-shaft 61 is thereby rocked to the limit of its forward movement, which limit is beyond the effective force of the spring 71, and the worm 42 is disengaged from the worm wheel 43 by means of the swinging cam lever 41 operating upon the shaft 38.

When the hand lever has been moved to a position as shown in Fig. 1, the rock-shaft has been rotated rearward and the arms 73 and 74, through the connecting links, have raised the end gate; the pin 68¹ is in contact with the stop shoulder on lever 68, and the link connection between arm 74 and the cam lever 41 is in position to cause the latter to swing in a manner to allow the worm to engage with the worm wheel. When the hand lever is moved to the position shown by full lines in Fig. 2, the spring 71 has been compressed by the movement of lever 68 and the cam lever 26 has thereby been swung forward in a manner permitting spring 28 to move the rod 25 and allow the clutch members to engage with each other; and in this position of the parts the worm has engaged with the worm wheel unless prevented by means of the teeth contacting, and if such be the case the spring 78 will yield sufficient to allow of the effective length of the link 76

being shortened and it will cause the parts to engage as soon as they are in proper position.

79 represents a lever pivoted coaxially with the hand lever, having an inclined surface at its upper end adapted to engage with the sliding detent 65 in a manner to disengage it from the sector when moved in one direction, and its lower end pivotally connected with a sliding bar 80, supported at its rear end by a bracket 81 and having a depending arm 82 secured thereto, which arm is adapted to contact with the apron in a manner to cause the bar to slide forward and rock the lever 79 about its pivot and cause its upper end to release the detent and allow the hand lever to swing forward to the position shown by dotted lines in Fig. 2 by means of the force of spring 71, acting through the rock-shaft and its associated parts, and a spring 83 surrounds the bar at its rear end and is operative against the bracket 81 in a manner to return the bar to its original position as soon as the resistance is removed. The cylinder operating and apron advancing means are now unclutched from their respective driving means, and the manually controlled mechanism for returning the apron to its initial position for receiving a load is operative in the following manner: 84 represents a foot lever pivotally mounted upon the foot board and having its lower arm pivotally connected with a sliding bar 85; the rear end of said bar being pivotally connected with the laterally projecting arm 60 of the bell crank lever 55, and it is also connected with lever 44 by means of a link 86.

The hand lever 64 is secured to one end of a rock-shaft 87, supported in suitable bearings, and at the opposite end the shaft is provided with a turned up portion 88 adjacent said foot lever that is adapted to contact with a laterally projecting lip 89, forming part of said foot lever, in a manner to limit the movement of said foot lever in a forward direction, as shown in Fig. 14.

90 represents a hand lever pivotally mounted upon the body and having its lower end connected, by means of a link 91, with a member 92, operatively connected with the slidable pinion 34¹, that is adapted to mesh with either of the concentric rows of teeth upon the inner face of the gear 34, as the hand lever is adjusted in either direction relative to a toothed holding rack 93, secured to the upper edge of the body and embracing said hand lever.

When it is desired to adjust the change speed gear forming part of the means for moving the apron rearwardly toward the distributing cylinder, the operator depresses the foot lever 84 until the lip portion 89 contacts with the turned up portion 88 of rock-shaft 87, which movement of the lever is sufficient to cause link 86 to rock the lever 44 about its axis in a manner to cause the spiral

rib upon its hub portion to cooperate with the notch in the part 49 and slide the shaft 35 and thereby cause gear 34 to be disengaged from the pinion, when the latter may be moved in either direction along its supporting shaft by means of hand lever 90, and when the pressure is removed from the foot lever a spring 94 surrounding a stud 95, secured to one of the cross bars 96 of the body frame, the spring operating between the outer end of the stud and a clip 97 secured to the bar 85 in a manner to return the foot lever to its initial position.

When the apron has reached its limit of rearward movement the mechanism for moving it in that direction, and also the means for driving the distributing cylinder, are automatically disconnected, as before described, and the hand lever 64 is moved forward to the position shown in Fig. 1; the turned up portion of the rock-shaft upon which the hand lever is mounted being in the position represented in Fig. 15, and the foot lever 84 may then be depressed sufficient to cause the bar 85 to operate the bell crank lever 55 in a manner to cause the sprocket wheel 50 to engage with the clutch member 54, and thereby move the apron in a forward direction. When the apron has nearly reached its limit of forward movement it contacts with a bracket 98 secured to the bar 85 and forcibly moves the bar forward and elevates the foot lever and disconnects the clutch members.

What we claim as our invention, and desire to secure by Letters Patent, is:

1. In a manure spreader, the combination of a body mounted upon carrying wheels, a movable apron operative along the bottom of said body, a distributing cylinder mounted above and at the delivery end of said apron, levers upon opposite sides of said body, said levers having their forward ends pivotally connected with said body, an end gate pivotally connected with the rear end of said levers, means for moving said levers about their pivotal axes, said means comprising a rock-shaft mounted below said body, arms secured to opposite ends of said shaft, links connecting said arms with said levers intermediate the ends of the latter, and means for rocking said shaft.

2. In a manure spreader, the combination of a body mounted upon carrying wheels, a movable apron operative along the bottom of said body, a distributing cylinder mounted above and at the delivery end of said apron, a rotatable axle, means for transmitting motion from said axle to said cylinder, a clutch mechanism forming part of said motion transmitting means, levers upon opposite sides of said body, said levers having their forward ends pivotally connected with said body, an end gate pivotally connected with the rear ends of said levers, means for mov-

ing said levers about their pivotal axes, said means comprising a rock-shaft mounted below said body, arms secured to opposite ends of said shaft, links connecting said arms with said levers intermediate the ends of the latter, an arm loosely mounted upon said shaft in a manner permitting a limited independent movement of said arm relative to said shaft, and a connection between said arm and said clutch mechanism, and means for rocking said shaft.

3. In a manure spreader, the combination of a body mounted upon carrying wheels, a movable apron operative along the bottom of said body, a distributing cylinder mounted above and at the delivery end of said apron, a rotatable axle, means for transmitting motion from said axle to said cylinder, a clutch mechanism forming part of said motion transmitting means, levers upon opposite sides of said body, said levers having their forward ends pivotally connected with said body, an end gate pivotally connected with the rear ends of said levers, means for moving said levers about their pivotal axes, said means comprising a rock-shaft mounted below said body, arms secured to opposite ends of said shaft, links connecting said arms with said levers intermediate the ends of the latter, an arm loosely mounted upon said shaft in a manner permitting a limited independent movement of said arm relative to said shaft, a connection between said arm and said clutch mechanism, means for positively rocking said shaft in one direction, and a spring operative to rock it in an opposite direction.

4. In a manure spreader, the combination of a body mounted upon carrying wheels, a movable apron operative along the bottom of said body, a distributing cylinder mounted above and at the delivery end of said apron, a rotatable axle, means for transmitting motion from said axle to said cylinder, a clutch mechanism forming part of said motion transmitting means, levers upon opposite sides of said body, said levers having their forward ends pivotally connected with said body, an end gate pivotally connected with the rear ends of said levers, means for moving said levers about their pivotal axes, said means comprising a rock-shaft mounted below said body, arms secured to opposite ends of said shaft, links connecting said arms with said levers intermediate the ends of the latter, a two-armed lever loosely mounted upon said shaft in a manner permitting a limited independent movement of said lever relative to said shaft, a link connection between one arm of said lever and said clutch mechanism, a link pivotally connected with the other arm, a coiled spring surrounding said link and operative between a fixed resistance and the link in a manner to rock said two-armed lever in one direction, and manually opera-

tive means for rocking said shaft and lever in an opposite direction.

5. In a manure spreader, the combination of a body mounted upon carrying wheels, a
5 movable apron operative along the bottom of said body, a distributing cylinder mounted above and at the delivery end of said apron, a rotatable axle, means for transmitting
10 motion from said axle to said cylinder, a clutch mechanism forming part of said motion transmitting means, levers upon opposite
15 sides of said body, said levers having their forward ends pivotally connected with said body, an end gate pivotally connected
20 with the rear ends of said levers, means for moving said levers about their pivotal axes, said means comprising a rock-shaft mounted
25 below said body, arms secured to opposite ends of said shaft, links connecting said arms with said levers intermediate the ends of the
30 latter, a two-armed lever loosely mounted upon said shaft in a manner permitting a limited independent movement of said lever
35 relative to said shaft, a link connection between one arm of said lever and said clutch mechanism, a link pivotally connected with
40 the other arm, a coiled spring surrounding said link and operative between a fixed resistance and the link in a manner to rock
45 said two-armed lever in one direction, a sector secured to said rock-shaft, a hand lever pivotally mounted upon said body, and a
50 flexible connection between said lever and said sector whereby said lever is operative to rock said shaft in one direction in opposi-
55 tion to the force of said spring.

6. In a manure spreader, the combination of a body mounted upon carrying wheels, a
movable apron operative along the bottom of
40 said body, a distributing cylinder mounted above and at the delivery end of said apron, a rotatable axle, means for transmitting motion
45 from said axle to said apron, said means comprising a gear shipping mechanism, levers upon opposite sides of said body, said
50 levers having their forward ends pivotally connected with said body, an end gate pivotally connected with the rear ends of said
55 levers, means for moving said levers about their pivotal axes, said means comprising a rock-shaft mounted below said body, arms
secured to opposite ends of said rock-shaft, links connecting said arms with said levers intermediate the ends of the latter, a link
60 connecting one of said arms with said gear shipping mechanism, and means for rocking said shaft.

7. In a manure spreader, the combination of a body mounted upon carrying wheels, a
60 movable apron operative along the bottom of said body, a distributing cylinder mounted above and at the delivery end of said apron, a rotatable axle, means for transmitting motion
65 from said axle to said movable apron, said means comprising an apron shaft, a

worm wheel upon said shaft, a second shaft having a worm adapted to engage with said
worm wheel, said second shaft being adapted to swing in a manner to cause said worm to
engage with or to be disengaged from said
70 worm wheel, means for swinging said shaft, said means comprising a swinging cam engaging with said shaft, levers upon opposite
75 sides of said body, said levers having their forward ends pivotally connected with said body, an end gate pivotally connected with
the rear ends of said levers, means for moving said levers about their pivotal axes, said means comprising a rock-shaft mounted below
80 said body, arms secured to opposite ends of said rock-shaft, links connecting said arms with said levers intermediate the ends of the
latter, a link connecting one of said arms with said swinging cam, and means for rocking
85 said shaft.

8. In a manure spreader, the combination of a body mounted upon carrying wheels, a
movable apron operative along the bottom of said body, a distributing cylinder mounted
90 above and at the delivery end of said apron, a rotatable axle, means for transmitting motion from said axle to said distributing cylinder, said means comprising a clutch mechanism,
95 means for transmitting motion from said axle to said apron, said means comprising a gear shipping mechanism, levers upon opposite sides of said body, said levers having
their forward ends pivotally connected with said body, an end gate pivotally connected
100 with the rear end of said levers, means for moving said levers about their pivotal axes, said means comprising a rock-shaft mounted below said body, arms secured to
opposite ends of said shaft, links connecting said arms with said levers intermediate the
105 ends of the latter, a link connecting one of said arms with said gear shipping mechanism, an arm loosely mounted upon said shaft in a manner permitting a limited independent
movement of said arm relative to said shaft, a link
110 connection between said arm and said clutch mechanism, and means for rocking said shaft.

9. In a manure spreader, the combination of a body mounted upon carrying wheels, a
115 movable apron operative along the bottom of said body, a distributing cylinder mounted above and at the delivery end of said apron, a rotatable axle, means for transmitting motion
120 from said axle to said distributing cylinder, said means comprising a clutch shipping mechanism, means for transmitting motion from said axle to said apron, said means
comprising a gear shipping mechanism, a rock shaft mounted below said body, an arm
125 loosely mounted upon said shaft in a manner permitting a limited independent movement of said arm relative to said shaft, a link connection between said arm and said clutch
shipping mechanism, a second arm secured
130

to said rock-shaft, and a link connection between said second arm and said gear shipping mechanism, a hand lever pivotally mounted at the front of said body, said lever
 5 being connected with said rock-shaft in a manner permitting it to rock said shaft in a direction to cause said motion transmitting means to become operative, a toothed rack concentric with the pivotal connection of
 10 said lever, a spring pressed detent mounted upon said lever and adapted to engage with said toothed rack, a supplemental lever pivoted adjacent to said hand lever and having one end adapted to contact with said detent
 15 in a manner to disengage it from said rack when said lever is moved in one direction, a sliding bar mounted upon said body, said bar having its forward end pivotally connected with the opposite end of said supplemental lever, a contact piece secured to said
 20 bar and adapted to contact with said apron when it has reached a predetermined limit of movement in a manner to cause said supplemental lever to disengage said detent, and a
 25 spring operatively connected with said rock-shaft in a manner to rock it in a direction to cause said motion transmitting means to become inoperative when said hand lever has been disengaged from said rack.

30 10. In a manure spreader, the combination of a body mounted upon carrying wheels, a movable apron operative along the bottom of said body, a distributing cylinder mounted above and at the delivery end of said apron,
 35 a rotatable axle, means whereby motion is transmitted from said axle to said apron to move said apron rearward toward said cylinder, a gear shipping mechanism forming part of said motion transmitting means,
 40 means whereby motion is transmitted from said axle to said apron to return said apron to its initial position, said means comprising a toothed clutch member secured to said axle, a second clutch member slidably
 45 mounted upon said axle and adapted to engage with said fixed member, a sprocket wheel integral with said second clutch member, an apron driving shaft, a sprocket wheel secured to said shaft, a chain received by
 50 said two sprocket wheels, means for adjusting said slidable clutch member, said means comprising a bell crank lever movable about a vertical axis, said bell crank having a fork member engaging with said slidable clutch
 55 member, and a laterally projecting arm, a foot lever mounted upon said body, a hand lever mounted upon said body and connected with said gear shipping mechanism, a stop controlled by said hand lever and
 60 adapted to limit the movement of said foot lever in one direction, and a bar connecting said foot lever with said laterally projecting arm of said bell crank lever.

11. In a manure spreader, the combination of a body mounted upon carrying wheels,

a movable apron operative along the bottom of said body, a distributing cylinder mounted above and at the delivery end of said apron, a rotatable axle, means whereby motion is transmitted from said axle to said apron to
 70 move said apron rearward toward said cylinder, a gear shipping mechanism forming part of said motion transmitting means, means whereby motion is transmitted from said axle to said apron to return said apron
 75 to its initial position, said means comprising a toothed clutch member secured to said axle, a second clutch member slidably mounted on said axle and adapted to engage with said fixed member, a sprocket wheel integral with said second clutch member, an
 80 apron driving shaft, a sprocket wheel secured to said shaft, a chain received by said two sprocket wheels, means for adjusting said slidable clutch member, said means comprising
 85 a bell crank lever movable about a vertical axis, said bell crank having a fork member engaging with said slidable clutch member, and a laterally projecting arm, a foot lever mounted upon said body, a hand lever
 90 mounted upon said body and connected with said gear shipping mechanism, a stop controlled by said hand lever and adapted to limit the movement of said foot lever in one direction, a bar connecting said foot lever with
 95 said laterally projecting arm, and a spring operative to return said bar and its associated parts to their initial position when pressure is released from said foot lever.

12. In a manure spreader, the combination of a body mounted upon carrying
 100 wheels, a movable apron operative along the bottom of said body, a distributing cylinder mounted above and at the delivery end of said apron, a rotatable axle, means whereby
 105 motion is transmitted from said axle to said apron to move said apron rearward toward said cylinder, a gear shipping mechanism forming part of said motion transmitting means, means whereby motion is transmitted from said axle to said apron to return
 110 said apron to its initial position, said means comprising a toothed clutch member secured to said axle, a second clutch member slidably mounted upon said axle and adapted to engage with said fixed member, a sprocket
 115 wheel integral with said second clutch member, an apron driving shaft, a sprocket wheel secured to said shaft, a chain received by said two sprocket wheels, means for adjusting
 120 said slidable clutch member, said means comprising a bell crank lever movable about a vertical axis, said bell crank having a fork member engaging with said slidable clutch member, and a laterally projecting arm, a
 125 foot lever mounted upon said body, a hand lever mounted upon said body and connected with said gear shipping mechanism, a stop controlled by said hand lever and adapted to limit the movement of said foot lever in
 130

one direction, a bar connecting said foot lever with said laterally projecting arm, a clip secured to said bar, said clip adapted to contact with said apron when the latter has reached a predetermined limit of movement in a manner to cause said bar to disengage said clutch members.

13. In a manure spreader, the combination of a body mounted upon carrying wheels, a movable apron operative along the bottom of said body, a distributing cylinder mounted above and at the delivery end of said apron, a rotatable axle, means whereby motion is transmitted from said axle to said apron to move said apron rearward toward said cylinder, said means comprising a gear shipping mechanism and a change speed mechanism, said change speed mechanism including a longitudinally movable shaft, means whereby motion is transmitted from said axle to said apron to return said apron to its initial position, said means comprising a toothed clutch member secured to said axle, a second clutch member slidably mounted upon said axle and adapted to engage with said fixed member, a sprocket wheel integral with said second clutch mem-

ber, an apron driving shaft, a sprocket wheel secured to said shaft, a power transmission chain received by said two sprocket wheels, means for adjusting said slidable clutch member, said means comprising a bell crank lever movable about a vertical axis, said bell crank having a fork member engaging with said slidable clutch member, and a laterally projecting arm, a foot lever mounted upon said body, a hand lever mounted upon said body and connected with said gear shipping mechanism, a stop controlled by said hand lever and adapted to contact with said foot lever in a manner to limit a movement thereof in one direction, a bar connecting said foot lever with said laterally projecting arm, a cam lever mounted upon said longitudinally movable shaft, and operative against a fixed resistance to slide said shaft in its bearings when said lever is moved about its axis, and a link connection between said cam lever and said laterally projecting arm.

SAMUEL K. DENNIS.
FRANK W. RICE

Witnesses:

M. VAN DER VLIET,
CHARLES H. MANGOLD.