

No. 858,698.

PATENTED JULY 2, 1907.

N. H. BLOOM.
FERTILIZER DISTRIBUTER.
APPLICATION FILED DEC. 22, 1906.

3 SHEETS—SHEET 1.

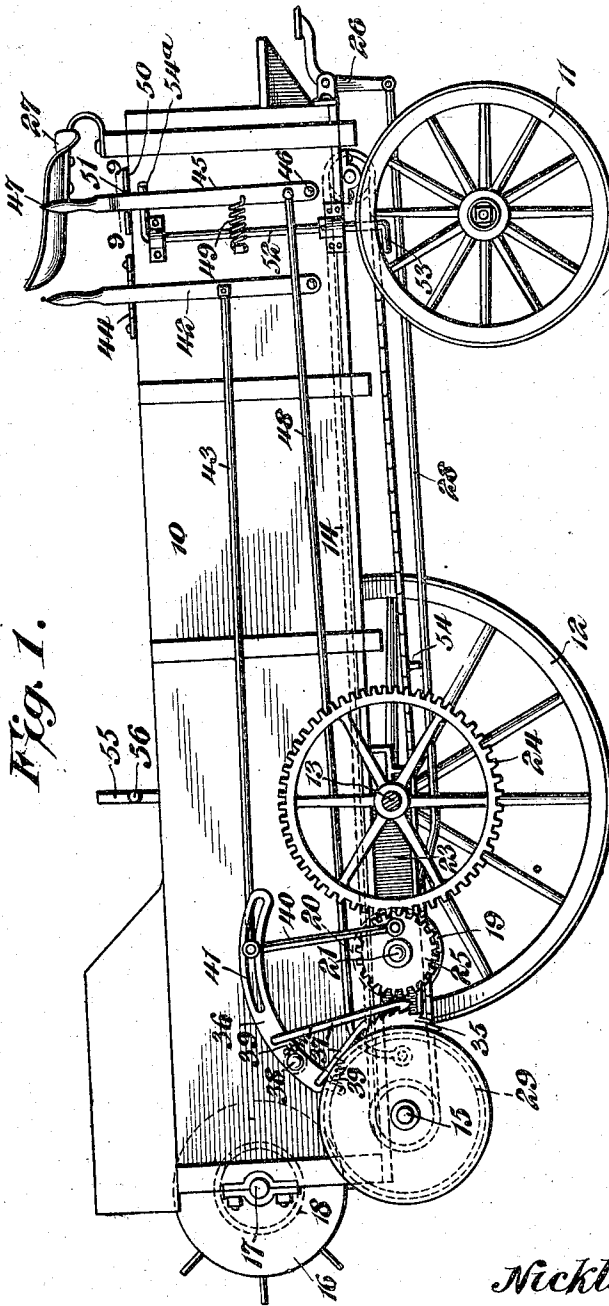


Fig. 1.

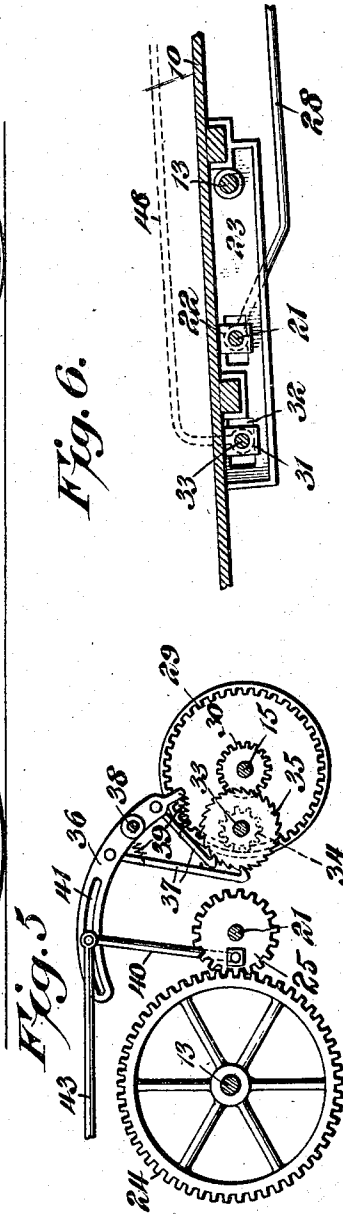


Fig. 5.

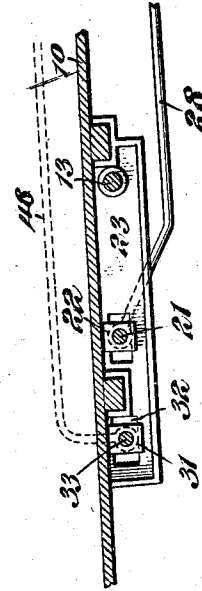


Fig. 6.

Witnesses
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E. J. Siggel

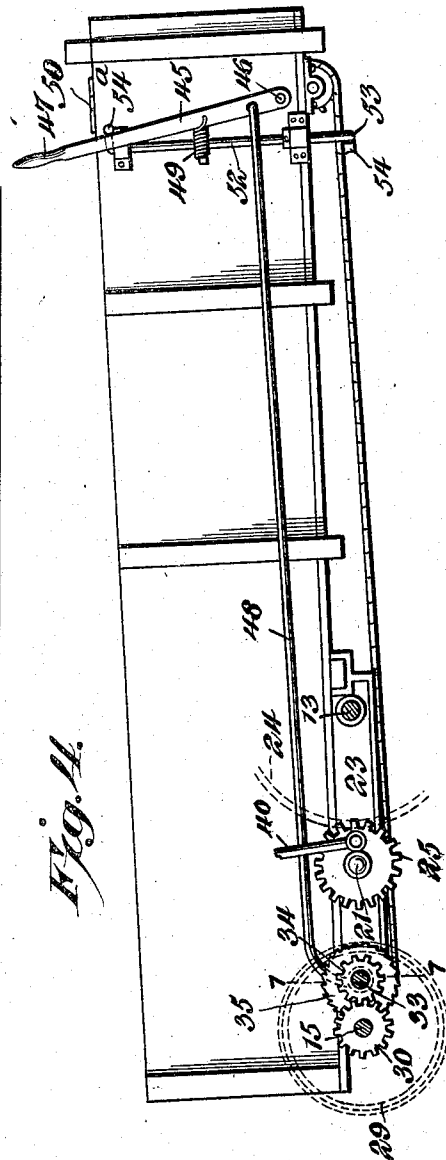
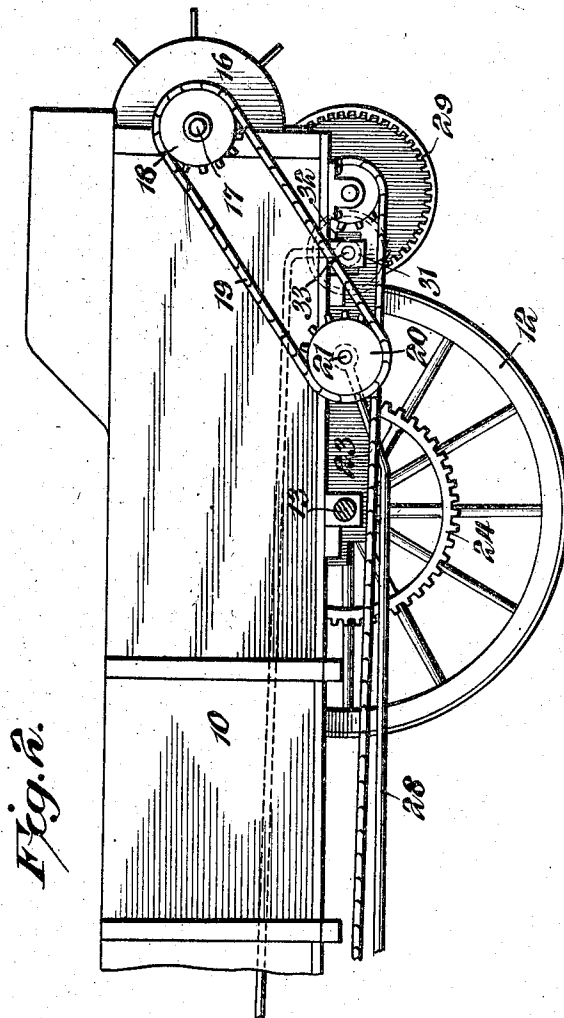
Attorney

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3 SHEETS—SHEET 2.



Witnesses
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B. J. Foster

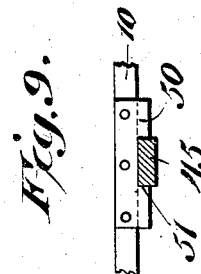
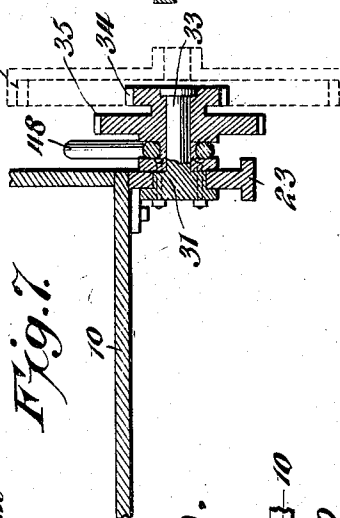
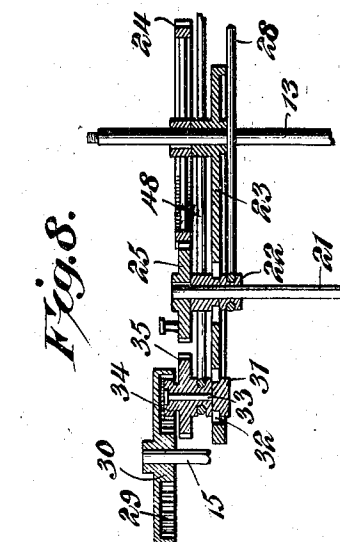
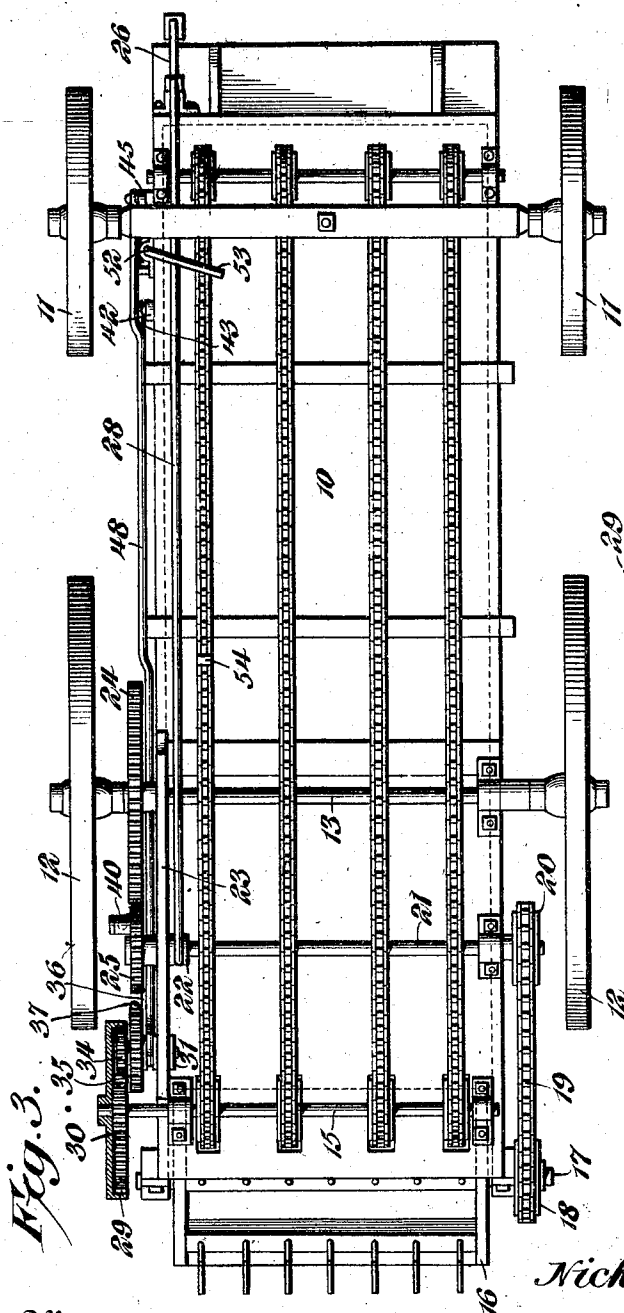
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3 SHEETS—SHEET 3.



Witnesses
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UNITED STATES PATENT OFFICE.

NICKLAS H. BLOOM, OF NASHUA, IOWA.

FERTILIZER-DISTRIBUTER.

No. 858,698.

Specification of Letters Patent.

Patented July 2, 1907.

Application filed December 22, 1906. Serial No. 349,121.

To all whom it may concern:

Be it known that I, NICKLAS H. BLOOM, a citizen of the United States, residing at Nashua, in the county of Chickasaw and State of Iowa, have invented a new and useful Fertilizer-Distributor, of which the following is a specification.

This invention relates particularly to that class of distributors or spreaders, wherein the material is delivered from the rear end of a vehicle body during the movement of the vehicle over a field, and the primary object is to provide novel mechanism of a simple and practicable character that automatically delivers the material at any desired rate of speed, automatically returns the conveying mechanism after the fertilizer has been delivered and stops it, and at the same time is so constructed that the operation of the mechanism can be stopped by the driver of the machine whenever desired.

In one aspect the invention is an improvement on the structure disclosed in co-pending application, Serial No. 300,892, filed Feb. 13, 1906 by Joseph H. Bloom and myself. No claims are made in this application to the structure set forth in said co-pending application.

An embodiment of the invention that is at present considered the preferable one is disclosed in the accompanying drawings, wherein:—

Figure 1 is a side elevation of the distributor. Fig. 2 is an elevation of the rear portion of the opposite side. Fig. 3 is a bottom plan view with portions shown in section. Fig. 4 is a view similar to Fig. 1, but illustrating portions of the gearing removed. Fig. 5 is a detail sectional view, showing the gearing removed from the vehicle body. Fig. 6 is another detail sectional view, showing the means for mounting the boxing. Fig. 7 is a cross sectional view on the line 7—7 of Fig. 4. Fig. 8 is a horizontal sectional view through the gearing, and Fig. 9 is a detail sectional view on the line 9—9 of Fig. 1.

Similar reference numerals designate corresponding parts in all the figures of the drawings.

In the embodiment illustrated a vehicle body 10 is employed, which may be of any desired construction and is mounted on front wheels 11 and rear wheels 12, the latter constituting driving means for the mechanism hereinafter described, and suitably connected to the rear axle 13 so as to rotate the same. A conveyer 14 of any suitable character operates in the bottom of the body and includes a rear shaft 15 that projects beyond one side of the said body. Co-operating with the conveyer is a distributor drum or spreader 16 that is journaled on the rear end of the body, and has its shaft 17 projecting beyond the opposite side of the body to the projecting end of the shaft 15. The projecting end of the shaft 17 carries a sprocket wheel 18 around which passes a sprocket chain 19, that also passes around another sprocket wheel 20. This sprocket wheel 20 is

beneath the vehicle body and having its opposite end journaled in a reciprocatory boxing 22, that is mounted in a supporting plate 23 secured to the body. The axle 13 is also journaled in the supporting plate, as clearly shown in Fig. 6. Mounted on the axle adjacent to the supporting plate is a master gear 24, and co-operating with this master gear is a crank gear 25 that is fixed to the adjacent end of the shaft 21. It will thus be evident that if the gear 25 is in mesh with the master gear 24, the shaft 21 will be revolved and consequently the spreader or distributor drum will be rotated. The crank gear is, however, movable into and out of mesh with the master gear 24, and this movement is effected by means of a suitable foot lever 26, fulcrumed upon the front portion of the vehicle in convenient relation to the foot of a driver seated on the seat 27. The lever 26 has a link connection 28 with the end of the shaft that is journaled on the reciprocatory boxing, and thus it will be seen that by operating the foot lever 26, the boxing 22 will be reciprocated thereby moving the crank gear 25 into and out of mesh with the master gear 24.

Fixed to the projecting end of the conveyer shaft 15 are internal and external toothed gears 29 and 30, the latter being located within the former and of considerably less diameter than the same. Another reciprocatory boxing 31 is slidably mounted in a guide-way 32, formed in the rear end of the supporting plate 23, and this boxing 31 is provided with a stud 33 on which is journaled a drive gear 34. The drive gear 34 is disposed between the gears 39 and 30 and is movable into mesh with either upon the movement of the boxing 31, as will be evident. It is furthermore so arranged that it may assume an intermediate position out of mesh with both. The said gear wheel 34 is provided with a ratchet wheel 35 and a lever 36 fulcrumed upon the side of the vehicle is provided with dogs 37, that co-operate with the ratchet wheel, said dogs being connected to the lever 36 at opposite sides of the fulcrum 38 of said lever and having suitable springs 39 connected thereto, so as to insure their co-operation with the ratchet wheel. A pitman 40 has a crank connection with the crank gear 25 and its upper end is slidable in a longitudinal slot 41, formed in one arm of the lever 36. It will thus be evident that upon the rotation of the crank gear 25 by the master gear 24, the lever 36 will be oscillated thereby operating the dogs, rotating the ratchet wheel and revolving the drive gear 34. If said drive gear is in mesh with the internal tooth gear 29, the conveyer 14 will be moved rearwardly; if said drive gear is in mesh with the gear 30, said conveyer will have a return movement, and if the drive gear is in its intermediate position, or out of mesh with both the gears 29 and 30, the conveyer will be at a standstill. It is to be observed in this connection that the rear feed of the conveyer will be much slower than the return, due to the difference in diameters of

the gears 29 and 30. At the same time the speeds can be readily varied by adjusting the upper end of the pitman longitudinally in the slot 41 of the lever 36, thereby placing said pitman at different distances from the fulcrum 38. This adjustment is secured by a suitable hand lever 42, fulcrumed on one side of the vehicle body contiguous to the driver's seat 27 and having a link connection 43 with the pitman 40. A rack 44 is associated with the lever 42 to hold it in different positions.

For the purpose of effecting the movement of the drive gear 34 to its different positions, the following mechanism is preferably employed: A hand lever 45, fulcrumed as shown at 46 upon one side of the vehicle body, has its upper end 47 disposed in convenient relation to the driver's seat 27. This hand lever has a link connection 48 with the boxing 31. The lever is urged rearwardly by a spring 49 connected thereto and to the vehicle body. It is arranged to be held against movement by the spring, however, by a holding device or plate 50, secured to the body and having a notch 51 that receives said lever. A vertical rock shaft 52 is journaled on the side of the vehicle and has at its lower end an inwardly extending arm 53 that projects beneath the conveyer, said conveyer having a pin or projection 54 arranged to strike the arm. The upper end of the rock shaft 52 has another arm 54^a disposed in angular relation to the arm 53 and arranged behind the lever 45. It will thus be evident that upon the rearward movement of the conveyer, the projection 54 will be moved forwardly and will strike the arm 53, thereby operating the shaft, swinging the arm 54^a outwardly and disengaging the lever 45 from the holding device 50. The lever thus being free will be moved rearwardly by the spring 49, effecting a corresponding movement of the boxing 31. The conveyer includes in its make-up the usual follower 55, which extends above the vehicle body and has a laterally projecting portion or lug, as 56, arranged to strike the upper end of the lever 45 upon the reverse or return movement of the said conveyer, so as to move the lever 45 against the action of the spring 49.

The operation of the mechanism may be briefly described as follows:—In the first position the apron 55 is at the front end of the vehicle body and said body being loaded with fertilizer, the lever 26 is moved so that the crank gear 25 is out of mesh with the master gear 24. The machine can thus be driven to the field, or place where it is desired to distribute the fertilizer, without operating the mechanism. Having reached the starting point, the lever 45 is moved forward and is engaged in the notch 51 of the holding plate 50, and the lever 26 is operated to throw the gear 25 into mesh with the gear 24. It will thus be evident that the spreader drum 16 will be revolved and inasmuch as the gear 34 will be in mesh with the interiorly toothed gear, 29, the conveyer will be moved rearwardly, thus delivering the material to the rotating drum. The speed of the conveyer can be altered by adjusting the lever 42. As the apron 55 reaches the end of the vehicle body, the projection 54 of the conveyer will strike the arm 53, thus operating the rock shaft 52 and disengaging the lever 45 from the holding plate. When so disengaged, the spring 49 will swing the lever 45 rearwardly, thereby disengaging the drive

gear from the gear 29 and engaging it with the gear 30. The return movement of the conveyer will then take place, and this return movement will be at a greater speed, than the delivery movement. As the apron reaches its original position at the forward end of the vehicle body, the part 56 will strike the lever 45, moving the same forwardly and thus moving the gear wheel 34 to its intermediate position out of mesh with both the gears 29 and 30. Consequently the conveyer will be stopped in a position to permit the reloading of the vehicle.

From the foregoing, it is thought that the construction, operation, and many advantages of the herein described invention will be apparent to those skilled in the art, without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a fertilizer distributor, the combination with a conveyer, of gears connected thereto, a movable support, a drive gear loosely journaled on the support and movable into mesh with either of the first mentioned gears to respectively move the conveyer in opposite directions, means movably engaging the drive gear for rotating the same, said means being movable with the gear upon the movement of the support, and means for moving the support to effect the change of the drive gear from one of the first mentioned gears to the other.

2. In a fertilizer distributor, the combination with a conveyer, of relatively fixed gears of different diameters connected thereto, a drive gear movable into mesh with either of the first mentioned gears to respectively move the conveyer in opposite directions at different speeds, means movable with the drive gear for rotating the same, and means for effecting a change of the drive gear from one to the other of the gears of different diameters.

3. In a fertilizer distributor, the combination with a conveyer, of relatively fixed gears of different diameters connected thereto, a drive gear movable into mesh with either of the first mentioned gears to respectively move the conveyer in opposite directions, said drive gear being also movable to an intermediate position out of co-action with both gears, means for rotating the drive gear, and means for automatically effecting its change from one to the other and the movement to the said intermediate position.

4. In a fertilizer distributor, the combination with a conveyer, of external and internal tooth gears connected thereto, a drive gear movable into mesh with either the external or internal tooth gear, means for thus moving the drive gear, and means adjustable with the drive gear for rotating the said drive gear when it is in mesh with either gear.

5. In a fertilizer distributor, the combination with a conveyer having a shaft, of external and internal tooth gears mounted on the shaft the former being located inside the latter, a drive gear arranged within the internal tooth gear and movable into mesh with the same or with the external gear, means for thus moving the drive gear, and means movable with the drive gear for rotating the said drive gear when the same is in mesh with either gear.

6. In a fertilizer distributor, the combination with a conveyer including a shaft, of external and internal tooth gears fixed to the shaft, the former being located within the latter, a reciprocatory boxing, a drive gear journaled on the boxing and movable into mesh either with the internal tooth gear or with the external tooth gear upon the movement of said boxing, said drive gear having a ratchet wheel, means for reciprocating the boxing, a lever, dogs mounted on the lever and co-acting with the ratchet wheel, and means for oscillating the lever.

7. In a fertilizer distributor, the combination with a vehicle body, of a conveyer movably mounted thereon and

movable beneath the same, reversible means for moving the conveyer in opposite directions, a hand lever mounted on the front portion of the body and connected to said reversible means for controlling the movement thereof, a device for preventing the movement of the hand lever, and an upright rock shaft journaled on the body alongside the lever, said shaft having an arm at its lower end that extends beneath the body into the path of movement of the conveyer and having another arm at its upper end disposed in a position to engage the hand lever and disengage it from said holding means.

8. In a fertilizer distributor, the combination with a vehicle body, of distributing means mounted thereon including a conveyer movable beneath the body, reversible means for driving the conveyer in opposite directions, a hand operated device movably mounted on the side of the body at the front end thereof for determining the direction of the movement of the conveyer, means for holding the device in a predetermined position, a rock shaft journaled on said side of the body, an arm fixed to the lower end of the rock shaft and extending beneath the body into the path of movement of the conveyer, and another arm fixed to the upper end of the rock shaft and extending behind the hand operated device, said latter arm engaging said device and releasing it from its holding means when the lower arm is swung by the conveyer.

9. In a fertilizer distributor, the combination with a conveyer, of reversible means for moving it in opposite directions, a hand lever having connections with the reversing means for controlling said reversible means, a spring connected to the hand lever independently of the reversing means, connections for moving said hand lever in one direction, a device for preventing the movement of the hand lever, and means actuated by the conveyer for releasing the lever from said holding device to permit its actuation by the spring.

10. In a fertilizer distributor, the combination with a conveyer, of reversible means for moving it in opposite directions, a hand lever controlling said reversible means, a spring connected directly to the hand lever for moving the same in one direction, a device for preventing the movement of the hand lever, and a rock shaft having an arm disposed in the path of movement of a portion of the conveyer and having another arm disposed in a position to release the lever from said holding means and permit its actuation by the spring.

11. In a fertilizer distributor, the combination with a conveyer, of an internal and external gear connected thereto, a drive gear movable into mesh with either the external or internal gear, means for rotating the drive gear, means for moving the drive gear into mesh with either of the first mentioned gears, said means including a controlling device, a spring for moving the controlling device in one direction, means for holding the controlling device against movement by the spring, and means automatically operated by the conveyer to free the controlling device and permit its movement by the spring.

12. In a fertilizer distributor, the combination with a conveyer, of an internal and external gear connected thereto, a drive gear movable into mesh with either, means for rotating the drive gear, and means for moving it into mesh with either the internal or external gear, said means including a hand lever, a spring for moving the hand lever in one direction, a device for preventing the movement of the hand lever, and means actuated by the conveyer for releasing the lever from said holding device to permit its actuation by the spring.

13. In a fertilizer distributor, the combination with a conveyer, of an internal and external gear connected thereto, a drive gear arranged between and movable into mesh with either of the said gears, means for rotating the drive gear, and means for thus moving said drive gear, said latter means including a hand lever, a spring for moving the hand lever in one direction, a device for preventing the movement of the hand lever, and a rock shaft having an arm disposed in the path of movement of a portion of the conveyer and another arm disposed in a position to move the lever out of engagement with the holding device upon the movement of the said rock shaft by the conveyer.

14. In a fertilizer distributor, the combination with a conveyer including a shaft, internal and external toothed gear wheels mounted on the shaft, a reciprocatory boxing movable transversely of the shaft, a drive gear journaled on the boxing and movable therewith into and out of coaction with either the internal or external toothed gear, means for rotating the drive gear, a hand lever, a link connecting the hand lever and boxing, a spring connected to the lever for moving the same in one direction, a rock shaft, an arm carried by the rock shaft and disposed in the path of movement of a portion of the conveyer, another arm carried by the rock shaft and associated with the lever to move the same when the rock shaft is operated, and a device engaged by the lever to hold it against movement by the spring.

15. In a fertilizer distributor, the combination with a conveyer, of means for moving the conveyer in opposite directions, a hand lever controlling said means, a spring for moving the hand lever in one direction, a device for preventing the movement of the hand lever, means actuated by the conveyer for releasing the said lever from the device to permit its actuation by the spring, and means actuated by the conveyer for moving the lever against the action of the spring.

16. In a fertilizer distributor, the combination with a conveyer, of means for moving the conveyer in opposite directions, a hand lever controlling said means, a spring for moving the hand lever in one direction, a device for preventing the movement of the hand lever, and means actuated by the conveyer for releasing the lever from said holding means to permit its actuation by the spring, said lever having a portion disposed in the path of movement of the conveyer on its return movement and being moved thereby to stop the conveyer.

17. In a fertilizer distributor, the combination with a conveyer, of an internal and external tooth gear connected thereto, a drive gear movable into mesh with either the internal or external gear and being also movable to an intermediate position out of mesh with both, means for rotating the drive gear, and means for moving it into said mesh and to its said intermediate position, said latter means including a controlling lever, a spring for moving the lever in one direction, a device for holding the lever against movement by the spring, and means automatically operated by the conveyer to free the controlling lever and permit its movement by the spring, said lever also having a portion disposed in the path of movement of the conveyer on its return movement to move said lever against the action of the spring and carry the drive gear to its said intermediate position.

18. In a fertilizer distributor, the combination with a conveyer, of relatively fixed internal and external gears of different diameters connected thereto, a drive gear movable into mesh with either the external or internal gears to respectively move the conveyer in opposite directions, said drive gear also being movable to an intermediate position out of coaction with both gears, means for rotating the drive gear, means for automatically effecting its change from one to the other and its movement to the said intermediate position.

19. In a fertilizer distributor, the combination with a conveyer including a shaft, of external and internal tooth gears fixed to the shaft, the former being located in the latter, a reciprocatory boxing, a drive gear journaled on the boxing and movable into and out of coaction with either the external or internal tooth gears upon the movement of said boxing, and means movably associated with the drive gear for operating the same, said means being adjustable with the boxing.

20. In a fertilizer distributor, the combination with a vehicle body, of a conveyer operating therein and including an apron, said conveyer having a shaft, internal and external tooth gears mounted on the shaft, a reciprocatory boxing, a drive gear journaled on the boxing and movable therewith into and out of mesh with the internal and external gears, said drive gear being also movable to an intermediate position out of mesh with both, a hand lever having a link connection with the boxing, a spring for moving the lever in one direction, a device for holding the lever against movement by the spring, a rock shaft having

an arm disposed in the path of movement of a portion of the conveyer and having an arm that engages the lever to release it from the holding device, said lever also having a portion disposed in the path of movement of the apron to move it against the action of the spring, a ratchet wheel associated with the drive gear, a lever, dogs carried by the lever and operating on the ratchet wheel, a master gear, a reciprocatory boxing movable transversely of the master gear, means for reciprocating the boxing, a crank gear journaled on the boxing and co-acting with the master wheel, being movable into and out of mesh therewith upon the reciprocation of the boxing, a pitman connected to the

crank gear and to the lever, and being adjustable longitudinally of the latter, and a hand lever having a link connection with said pitman to effect the said longitudinal movement. 15

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

NICKLAS H. BLOOM.

Witnesses:

R. F. WENTWORTH,

H. F. DU BOIS.