

No. 622,957.

Patented Apr. 11, 1899.

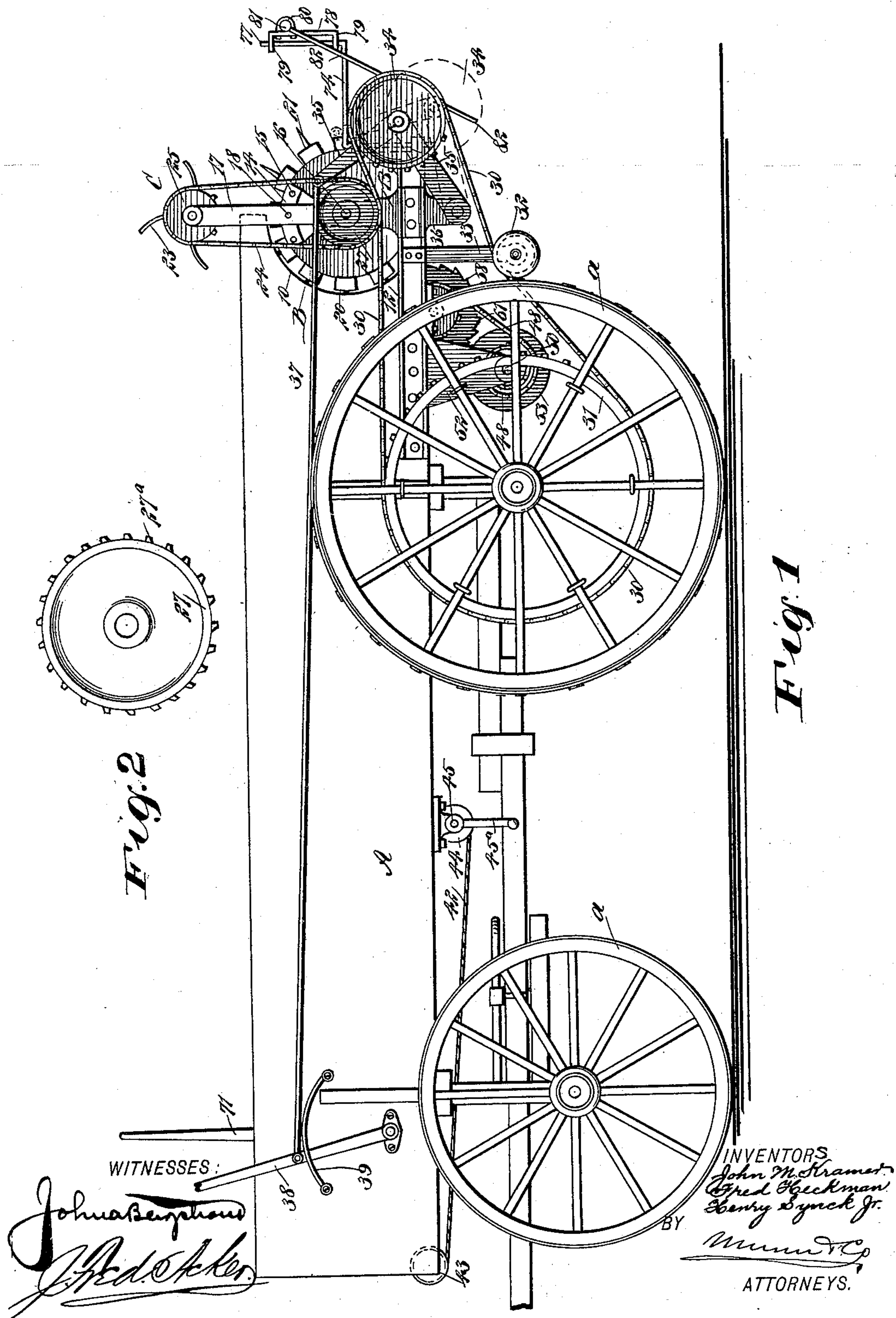
J. M. KRAMER, F. HECKMAN & H. SYNCK, JR.

MANURE DISTRIBUTER.

(Application filed Dec. 22, 1898.)

(No Model.)

4 Sheets—Sheet 1.



WITNESSES:

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BY

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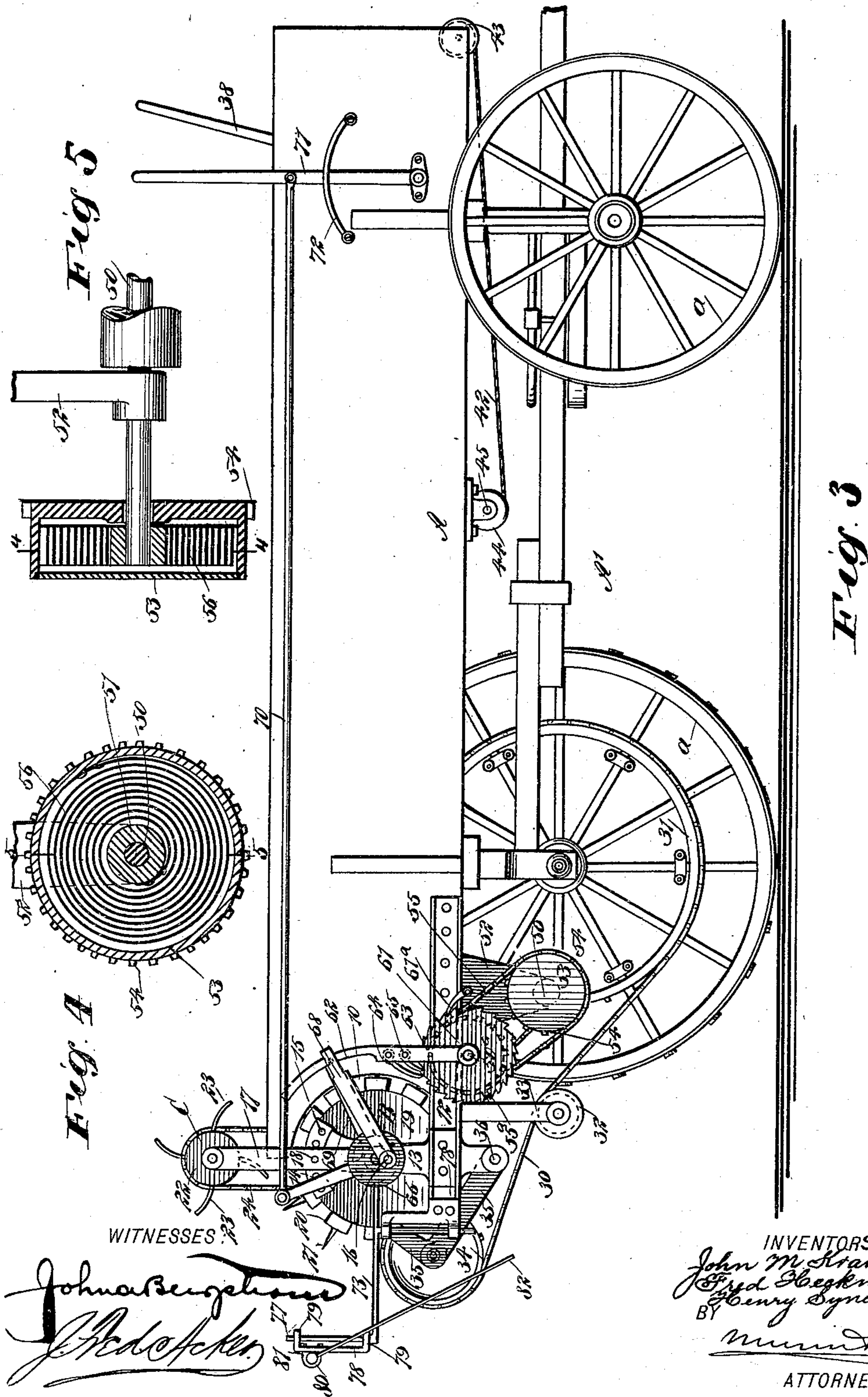
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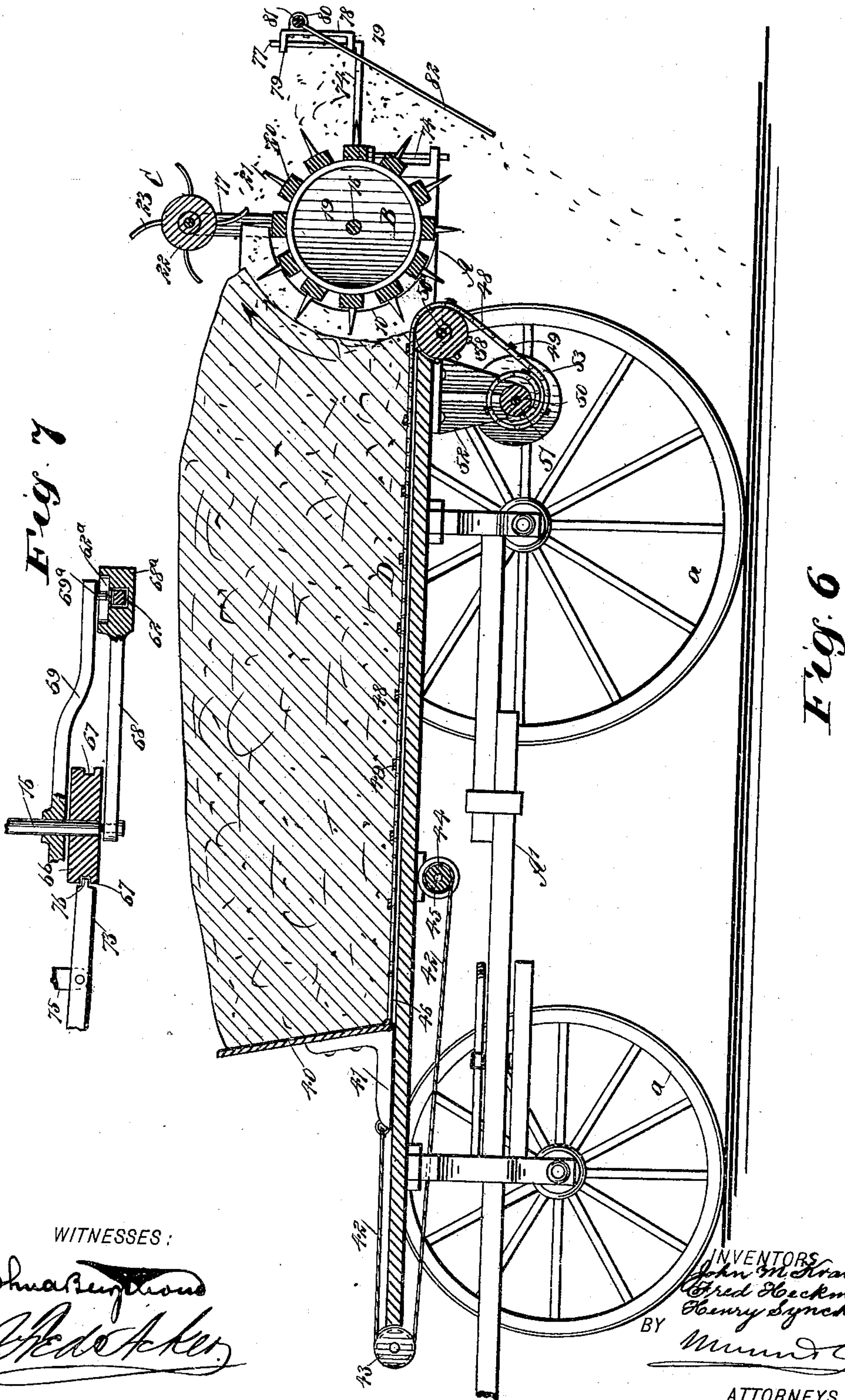
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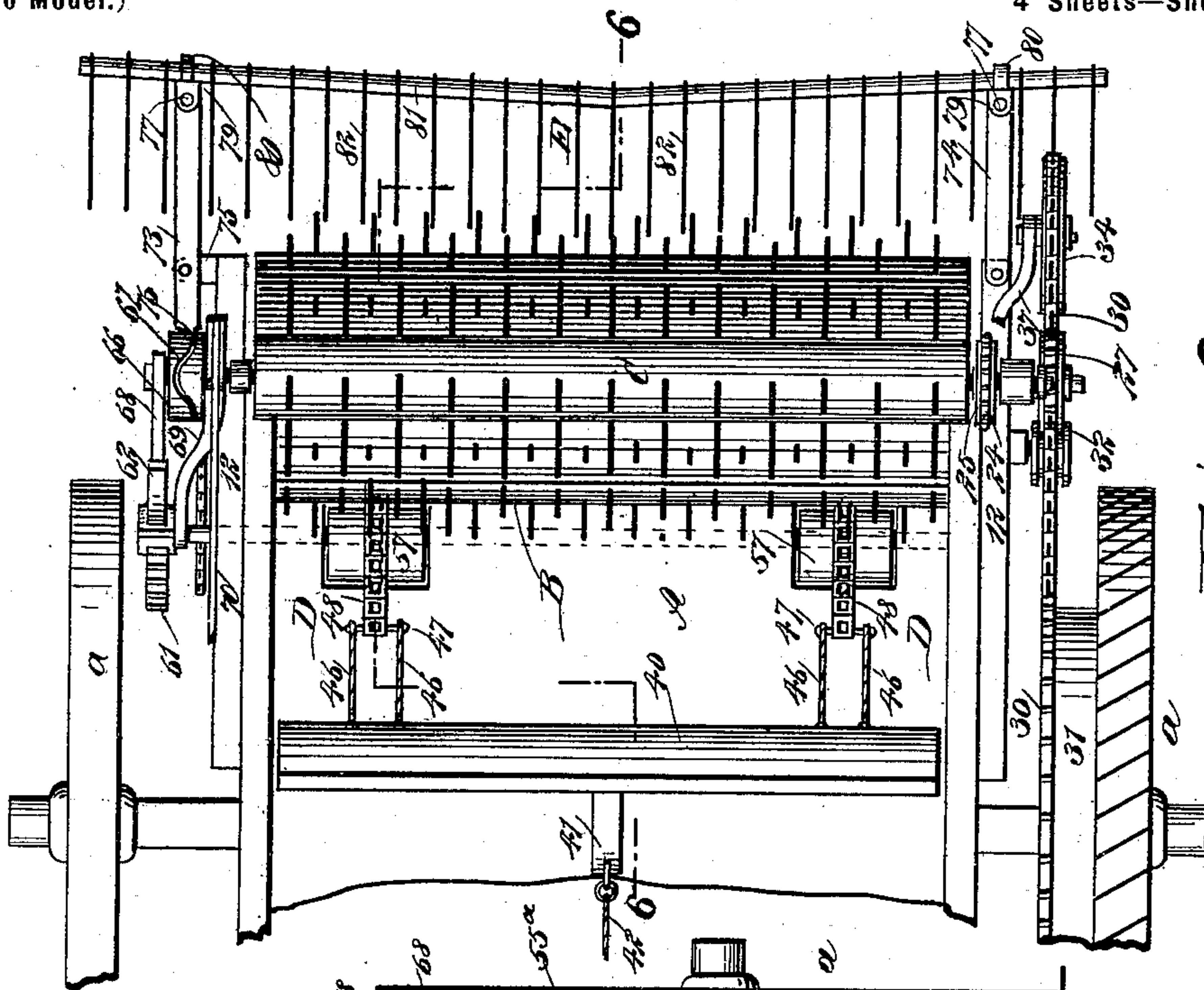


Fig. 9

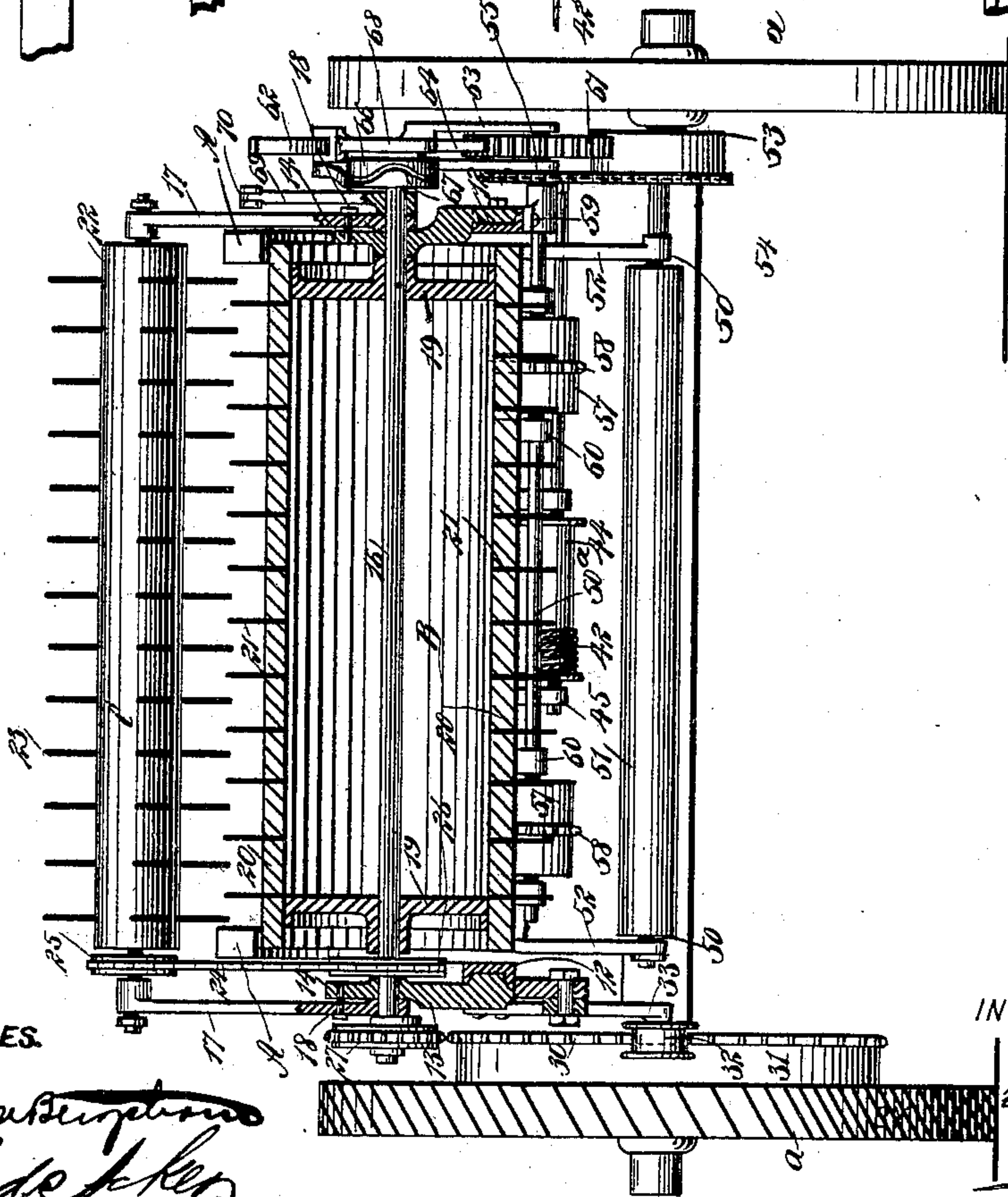


Fig. 8

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UNITED STATES PATENT OFFICE.

JOHN M. KRAMER, FRED HECKMAN, AND HENRY SYNCK, JR., OF
MARIA STEIN, OHIO.

MANURE-DISTRIBUTER.

SPECIFICATION forming part of Letters Patent No. 622,957, dated April 11, 1899.

Application filed December 22, 1898. Serial No. 700,014. (No model.)

To all whom it may concern:

Be it known that we, JOHN M. KRAMER, FRED HECKMAN, and HENRY SYNCK, Jr., of Maria Stein, in the county of Mercer and State of Ohio, have invented a new and Improved Manure-Distributor, of which the following is a full, clear, and exact description.

The object of our invention is to provide a machine for distributing manure so constructed that the load of manure will be automatically fed to a distributing-beater, a retarding-beater being employed in connection with the distributing-beater, the retarding-beater serving to hold back any lumps of material until such material has been shredded or reduced properly for distribution.

Another object of the invention is to provide a distributing-fork which is automatically operated in conjunction with the distributing-beater, the fork being so constructed that the manure may be distributed beyond the sides of the receptacle in which it is carried and beyond the ends of the distributing-beater.

Another object of the invention is to provide an exceedingly simple, durable, economic, and automatic arrangement for feeding the manure to the distributing-beater, and, furthermore, to provide a simple means for regulating the feed and for throwing the operative mechanism in and out of gear.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the left-hand side of the improved manure-distributor. Fig. 2 is a side elevation of a driving-pulley for the main shaft. Fig. 3 is a side elevation of the right-hand side of the manure-distributor. Fig. 4 is a section through a spring-drum used in connection with the drum-shaft of the conveyer of the device, the section being taken on the line 4 4 of Fig. 5. Fig. 5 is a section taken substantially on the line 5 5 of Fig. 4. Fig. 6 is a longitudinal vertical

section taken at a point near the center of the body of the machine, the wheels on one side of the machine having been removed and the section being taken on the line 6 6 of Fig. 9. Fig. 7 is a detail section through a portion of the actuating device for the distributing fork or rake. Fig. 8 is a transverse vertical section taken through the distributing-beater and that portion of the machine at which the beater is located, and Fig. 9 is a plan view of the rear end portion of the machine.

A represents a box-body resembling a wagon-body and consisting of a bottom and sides, the front and rear ends of the body being open. The body may be mounted upon the running-gear A' of an ordinary farm-wagon provided with four wheels *a*. The rear end of each side of the body is provided with a circular recess 10, extending practically from top to bottom.

At each side of the box-body, at the bottom, a channel-iron 12 is secured, which extends beyond the rear end of the said body, and near the rear end of each channel-iron an upwardly-extending standard 13 is erected, and each standard terminates at the top in a segment 14, provided with a series of apertures 15. A shaft 16 is mounted in the standards 13 below the segments 14, and near each end of the shaft 16 an adjustable standard 17 is mounted on the boxes of the shaft 16, and these standards may be adjusted forwardly or rearwardly through the medium of pins 18, which are passed through the standards and into the apertures in the aforesaid segments 14, as is best shown in Figs. 1, 3, and 8.

A distributing-beater B is secured on the shaft 16, which shaft may be termed the "drive-shaft." This beater preferably comprises two heads 19, which may be of metal and which are secured to the shaft, bars 20, extending from one head to the other across their peripheries, and teeth or pins 21, carried by the said bars. Above the distributing-beater a smaller retarding-beater C is mounted to turn in the upper ends of the hangers 17. This retarding-beater consists, preferably, of a solid cylindrical body 22 and fingers 23, which extend from the body, the fin-

gers being arranged in rows, and the said fingers are curved, their convexed surfaces facing the direction of rotation. The two beaters B and C are revolved in the same direction, the curved fingers of the retarding-beater passing over the teeth of the distributing-beater, the latter teeth being preferably straight. The retarding-beater is driven through the medium of a belt 24, preferably a chain belt, which is passed over a sprocket-wheel 25, secured to the shaft of the retarding-beater and located near the left-hand end of the said shaft, the belt 24 passing also over a sprocket-wheel 26, secured upon the drive-shaft 16 near the left-hand end of the distributing-beater.

A driving-pulley 27 is secured upon the left-hand end of the drive-shaft 16, and this driving-pulley is provided with peripheral teeth 27^a, as shown in Fig. 2, which teeth are given a rearward inclination in order to present hook-surfaces to the links of a chain belt 30 when the machine is to be drawn forward, thus providing for a strong hold, yet permitting the said belt 30 to slide over the teeth when the machine is moved rearward. The belt 30 is passed over a large sprocket-wheel 31, usually attached to the spokes or the hub of the left-hand rear wheel of the machine, as shown in Fig. 1. The driving-belt 30 is passed over a tension-pulley 32, journaled upon a pendant 33, extending from the left-hand channel-iron 12, and the said driving-belt is further carried over an idler 34, which is mounted at the junction of the members of a bell-crank lever 35, one member of the bell-crank lever being pivoted upon a projection 36, carried downwardly from the left-hand channel-iron below the left-hand upright 13, as shown in Fig. 1. A connecting-rod 37 is pivoted to the other member of the bell-crank lever 35 and to a lever 38, fulcrumed upon the left-hand side of the body convenient to the driver's seat, (not shown,) the lever 38 operating within a suitable guide 39. When the lever 38 is carried forwardly, the bell-crank lever is operated and the driving-belt is brought in engagement with the driving-pulley 27. When, however, the lever 38 is carried rearward, the bell-crank lever will be carried downward and the idler 34 will drop to the dotted position shown in Fig. 1 and the driving-belt will be carried out of engagement with the driving-pulley.

The distributing-beater is so located relative to the floor of the receptacle for the manure that as the pins or teeth 21 pass upward they will lift the manure directly from the bottom almost in a vertical direction, so that there will be no resistance in a forward direction on the mass of manure or any resistance against the feed device employed to supply the manure to the distributing-beater. The supply device D consists of a slanting standing board or moving end-gate 40, located at the front of the body of the machine,

the said moving end-gate being of such dimensions that it may readily slide between the side-boards of the body. Shoes 41 are secured to the moving end-gate at its front central portion, and a cable 42 is attached to the end-gate, which cable is passed over a guide pulley or roller 43 at the forward end of the machine and back over a windlass 44, the shaft 45 whereof is journaled to the bottom portion of the body, as shown particularly in Figs. 1, 3, and 6, and the said shaft 45 is adapted to receive a crank 45^a. (Shown in Fig. 1.)

Near each end of the moving end-gate two cords or cables 46 are attached to the rear surface of the said end-gate, as shown in Fig. 9, and each pair of cables is connected by a cross-bar or pin 47. A chain 48 is secured to each of the pins or connecting-bars 47, and these chains are connected by cross-bars 49, as shown particularly in Fig. 6. At the rear of the body, below the same, a tension-shaft 50, provided, preferably, with an attached drum 51, is journaled in brackets or hangers 52, projected downward from the channel-irons 12, as shown in Figs. 1, 3, and 6. At one end, preferably the right-hand end, of the shaft 50 a winding-barrel 53 is located. One end of a spring 56 is so secured within the barrel that the tendency of the spring will be to cause the shaft 50 and its drum to turn in a direction to wind thereon the chains 48 of the conveyer of the feed mechanism, since the rear ends of the chains 48 are secured to the drum 51. The attachment of the conveyer to the drum 51 is omitted in Fig. 8 in order to better illustrate the parts back of the drum and shaft.

The barrel 53, which is loosely mounted, is provided with sprocket-teeth 54 and is connected by a chain belt 55 with a sprocket-wheel 55^a, secured upon the feed-shaft 50^a. (Shown in Figs. 3, 6, and 8.) This connection so controls the spring that the speed of the winding-drum can be accommodated to the amount of chain or web from the body that is ready for winding, since the winding-drum must necessarily wind faster at first than toward the last, when the load is about empty and the winding-drum is well filled.

The shaft 50^a is journaled immediately at the rear of the body A and above the winding-drum 53 in a bearing or hanger 59, projected from the left-hand channel-iron 12, and in other bearings 60, secured to the bottom portion of the body, if desired, as shown in Fig. 8. The shaft 50^a, which is a feed-shaft, is provided near each of its ends with a short drum 57, having a sprocket-gear 58 at its center, the sprocket-gears being adapted to enter the links of the conveyer-chains 48, the conveyer-chains passing over these sprockets to the winding-drum 53. At the right-hand end of the feed-shaft 50^a a ratchet-wheel 61 is secured, and above the said ratchet-wheel a guide-rod 62 is located, the upper portion of

the said guide-rod being rearwardly curved, as shown in Fig. 3, while the lower portion 63 of the said guide-rod is bifurcated and is journaled upon the feed-shaft 50^a and straddles the ratchet-wheel 61. In the forked or bifurcated portion 63 of the guide-rod preferably two dogs 64 and 65 are mounted, one near the other, and both dogs are arranged for engagement with the ratchet-wheel 61, so that no matter to what extent the guide rod or bar 62 may be moved it will communicate motion to the ratchet-wheel, and consequently to the feed-shaft 50^a, to a greater or a less extent. The ratchet-wheel 61 is prevented from moving rearwardly by a pawl 61^a.

At the right-hand end of the main shaft 16 a cam 66 is secured, the said cam being provided with a serpentine peripheral groove 67, as is best shown in Figs. 8 and 9. A pitman 68 is connected with the outer face of the cam 66 through the medium of a suitable wrist-pin, and the said pitman 68 is provided with a head 68^a at its rear end, having an opening therein adapted to receive the upper curved portion of the guide rod or bar 62, as shown in Fig. 7, and in the inner face of the head 68^a is a transverse recess 62^a. A bell-crank lever 69 is loosely mounted on the box of the drive-shaft 16 between the bearings for the distributing-beater and the cam 66. One member of this bell-crank lever is provided with a pin 69^a, which enters the transverse recess 62^a in the pitman-head 68^a, while the other member of the bell-crank lever 69 is attached to the rear end of a rod 70, which rod is carried forward and is pivotally attached to a lever 71, journaled at the right-hand side of the body and held to move within a suitable guide 72, as shown in Fig. 3. By moving the lever 71 forward or rearward the pitman 68 will be carried up or down the curved portion of the guide-rod 62, and consequently the movement of the guide-rod will be rendered greater or less and the ratchet-wheel 61 will be moved to a greater or less extent, thus causing the moving end-gate to be drawn rearward more or less rapidly. In this manner the feed of the manure to the distributing-beater is controlled.

It is evident that as the machine advances the feed mechanism will operate to carry the manure to the distributing-beater and that the retarding-beater will prevent any material passing from the distributing-beater which is not in fit condition to be delivered to the ground and that the forward movement of the machine will likewise revolve the two beaters. After the moving end-gate 40 of the feed mechanism has reached the end of the body A the two plain cables 46 will engage with the short drums 57 on the feed-shaft 50^a and the conveyer-chains will have passed the sprocket-gears 58 on said drums. Consequently at such time the feed mechanism will cease to operate. The moving end-gate is restored to its normal position by turning the

windlass 44, which will draw the said moving end-gate to the front portion of the body.

It is frequently desirable to distribute manure over a surface of greater width than the width of the vehicle or conveyance carrying the manure. When such a distribution of the manure is desired, we provide a distributing-rake E, which is shown in Figs. 1, 4, 6, and 9. In attaching the distributing-rake two arms 73 and 74 are employed, which are horizontally attached to the channel-irons, the right-hand arm 73 being pivoted upon an offset 75 from the right-hand channel-iron, while the left-hand arm 74 is pivoted directly upon the channel-iron. The right-hand arm 73 is provided with a finger 76, which is adapted to travel in the race 67 of the cam 66. Each arm 73 and 74 is provided with an upright section 77 at its rear end, and upon each upright section of each arm 73 and 74 a bracket is loosely mounted, each bracket consisting, as shown in Figs. 1, 3, and 6, of an upright member 78, forwardly-extending eyes 79, located at the ends of the body, which eyes receive the upright portions of the arms 73 and 74, and an eye or bearing 80, which is formed at the upper rear portion of the body 78 of the brackets. Within the rear bearings a shaft 81 is mounted, which may be termed the "head" of the distributing-rake, and teeth 82 are projected downwardly and forwardly from this head. Thus it will be observed that the manure is received from the distributing-beater by the said distributing-rake, and at the forward movement of the machine the rake is given a rapid vibratory laterally-reciprocating movement, which will effectually distribute the manure over the ground at points beyond the sides of the box-body, as well as immediately at the rear of the said body, the action of the distributing-rake being best shown in Fig. 6.

The teeth 21 of the distributing-beater are made to taper at their outer ends, as shown in Fig. 1, and said teeth are thin, sharp, and stiff, whereby they are enabled to cut much better through the body of the manure and at much less expenditure of power than are straight teeth or pins, such as are usually employed and which frequently clog.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. In a manure-spreader or like machine, a receptacle for manure, a conveyer located in said receptacle, mechanism for propelling and for regulating the speed of the said conveyer and a spring-controlled winding device for the conveyer, for the purpose specified.

2. In a manure-spreader or like machine, a receptacle for the manure, a conveyer adapted to receive the load within the receptacle, the said conveyer having connected conveyer-belts, a tension-controlled device to which the said belts are attached, for winding the conveyer, and a distributing-beater arranged to

receive the material carried by the conveyer, substantially as described.

3. In a manure-spreader or like machine, a receptacle, a conveyer within the receptacle, a feed device for the conveyer, a tension-controlled device for winding the conveyer, a distributing-beater arranged to operate upon the material delivered by the conveyer, and a retarding-beater adapted to act in conjunction with the distributing-beater, as and for the purpose specified.

4. In a manure-spreader or like machine, a receptacle for the manure, a conveyer adapted to receive the load within the receptacle, a spring-controlled winding-shaft for the conveyer, a feed-shaft over which the conveyer passes, means for regulating the movement of the feed-shaft, and a distributing-beater arranged to receive the material carried by the conveyer, substantially as described.

5. In a manure-spreader or like machine, a conveyer, a feed device for the conveyer, and a spring-controlled winding device for the conveyer, substantially as specified.

6. In a manure-spreader or like machine, a conveyer, a feed-shaft for the same, a spring-controlled shaft for winding the conveyer, the said shaft being provided with a winding-barrel having sprocket-teeth, and a chain connecting the winding-barrel with a sprocket-wheel on the feed-shaft, substantially as described.

7. In a manure-spreader or like machine, a conveyer provided with connected conveyer-belts, and a spring-controlled winding-shaft connected with the said belts, as specified.

8. In a manure-spreader or like machine, a conveyer provided with connected conveyer-belts, a feed-shaft provided with pulleys over which the belts pass, and a spring-controlled winding-shaft, connected with the said belts, substantially as described.

9. In a manure-spreader or like machine, a receptacle, a conveyer within the bottom of the receptacle, a feed-shaft for the conveyer, a ratchet-wheel on said feed-shaft, a guide-bar provided with dogs engaging with the teeth of said ratchet-wheel, a pitman connected with a drive-shaft and having sliding connection with the guide-bar, and means connected with the said pitman for moving the same to regulate the throw of the guide-bar, substantially as described.

10. In a manure-spreader or like machine, a receptacle, a conveyer within the bottom of the receptacle, a feed-shaft for the conveyer, a ratchet-wheel on the feed-shaft, a guide-bar pivoted on the shaft above the ratchet-wheel, the guide-bar being provided with dogs engaging with the teeth of the said wheel, a pitman connected with a drive-shaft and having sliding connection with the guide-bar, an angle-lever connected with the said pitman, and an adjusting-lever connected with the angle-lever, substantially as set forth.

11. In a manure-spreader or like machine,

a receptacle, a conveyer within the receptacle, and comprising a moving end-gate and chain belts connected by cables with the end-gate, a feed-shaft for the conveyer having sprocket-gears adapted to receive the chain belts of the conveyer, and a device for regulating the movement of the feed-shaft, the said chain belts at the end of the travel of the end-gate passing from the sprocket-gears, as and for the purpose set forth.

12. In a manure-spreader or like machine, a receptacle, supports pivotally attached to the said receptacle, a vibratory rake carried by said supports, and means for delivering the manure to said rake, whereby the manure is distributed over a wide area and whereby the streaming of the manure is avoided, for the purpose specified.

13. In a manure-spreader or like machine, a receptacle, a distributing-beater mounted to revolve at one end of the said receptacle, and a retarding-beater mounted to revolve above the distributing-beater, a conveyer located within the receptacle, comprising a moving end-gate and belts connected therewith, a spring-controlled winding-shaft to which one end of the said belts is secured, a windlass, and a connection between the said windlass and the moving end-gate of the conveyer, the windlass being adapted to return the conveyer to normal position, as described.

14. In a manure-spreader or like machine, the combination, with a receptacle, a distributing device located at one end of the said receptacle, and an end-gate normally located at the opposite end of the receptacle, and mounted to slide within the same, of connected conveyer-belts attached to the rear face of the said end-gate, a tension-controlled winding-shaft to which the said belts are attached, the said shaft being located near the rear of the receptacle, a feed-shaft provided with pulleys over which the conveyer-belts pass, means for regulating the movement of the feed-shaft, a windlass, and a connection between the said windlass and the forward portion of the moving end-gate, for the purpose set forth.

15. The combination, with a receptacle, a distributing device located at one end of the receptacle, a forward end-gate mounted to slide within the said receptacle, and a conveyer located at the bottom portion of the said receptacle, leading from the end-gate to and beyond the distributing device, of a feed-shaft having pulleys over which the longitudinal portions of the conveyer are arranged to pass, a spring-controlled winding-shaft to which the longitudinal portions of the conveyer are secured, a feed mechanism arranged to control the movement of the feed-shaft, a winding device connected with the forward face of the moving end-gate, and a spreader-rake mounted to reciprocate at the rear of the main distributing device, the said rake being adapted to extend beyond the end por-

tions of the main distributing device, for the purpose set forth.

16. In a manure-spreader or a like machine, the combination, with a receptacle, a distributing-beater mounted at the rear of the said receptacle, and provided with peripheral tapering teeth, a retarding-beater mounted to revolve above the distributing-beater, the retarding-beater being provided with curved teeth adapted to cooperate with the teeth of the distributing-beater, a forward end-gate held to slide in the said receptacle, and a conveyer connected with the said end-gate at its rear face, the conveyer consisting of chain belts and slats connecting the belts, of a tension-controlled winding-shaft to which the rear ends of the conveyer-belts are attached, a feed-shaft provided with pulleys over which the chains of the conveyer-belts pass; a ratchet-wheel attached to the said feed-shaft, a guide-bar pivoted on the shaft above the ratchet-wheel, the guide-bar being provided with dogs engaging with the teeth of the said wheel, a pitman connected with a drive-shaft and having sliding connection with the guide-bar, an angle-lever connected with the said pitman, and an adjusting-lever connected with the angle-lever, for the purpose set forth.

17. In a machine for distributing manure and for other purposes, the combination, with a receptacle, a distributing device located at the rear of the said receptacle, and a conveyer located within the said receptacle, the conveyer consisting of a forward end-gate mounted to slide in the receptacle, chain belts having slatted connection, each chain belt being connected with the end-gate through the medium of a pair of cables, and means for returning the end-gate from a rearward to a forward position, of a feed-shaft provided with drums having sprocket-gears adapted to receive the chain belts of the conveyer, and a tension-controlled winding-shaft to which the rear ends of the conveyer are secured, for the purpose set forth.

18. In a machine for distributing manure and for other purposes, the combination, with a receptacle, a distributing device located at the rear of the said receptacle, and a conveyer located within the said receptacle, the conveyer consisting of a forward end-gate mounted to slide in the receptacle, chain belts having slatted connection, each chain belt being connected with the end-gate through the medium of a pair of cables, and means for returning the end-gate from a rearward to a forward position, of a feed-shaft provided with drums having sprocket-gears arranged to receive the chain belts of the conveyer, a tension-controlled winding-shaft to which the ends of the chain belts are secured, a ratchet-wheel attached to the feed-shaft, a guide-bar loosely mounted on the feed-shaft, the upper portion whereof is curved and the lower portion arranged to straddle the said ratchet-wheel, a pair of dogs carried by the guide-bar and

adapted for engagement with the ratchet-wheel, a pitman having a crank connection with the drive-shaft of the distributing device, the said pitman being mounted to slide on the curved portion of the guide-bar, an angle-lever loosely mounted on the drive-shaft of the distributing device, one member whereof is connected with the said pitman, and an adjusting-lever connected with the other member of the angle-lever, whereby the throw of the guide-bar may be regulated and consequently the movement of the feed-shaft, for the purpose set forth.

19. In a manure-spreader or a like machine, the combination, with a receptacle, a distributing mechanism located at one end of the receptacle, and a conveyer leading to the distributing mechanism, of a cam provided with a serpentine track, the said cam being attached to a revolving shaft of the distributing mechanism, supports pivotally attached to the said receptacle, the supports extending to the rear of the distributing devices arranged to receive material from the conveyer, and a rake-head carried by said supports, the said rake-head extending beyond the end portions of the main distributing device, and provided with teeth extending downwardly and forwardly at the rear of the main distributing device, whereby the material to be distributed may be carried to points beyond the sides of the receptacle, for the purpose set forth.

20. In a manure-spreader or like machine, the combination with a wheel-supported receptacle, a conveyer located within the receptacle, a rotary distributing-beater arranged to receive material from the conveyer, and a rotary retarding-beater mounted above the distributing-beater, of a driving-belt driven from one of the wheels supporting the receptacle, an angle-lever pivoted at one end to the said receptacle, a shifting-lever connected with the other end of the angle-lever, an idler for the said driving-belt carried by the said angle-lever, a tension-pulley for the driving-belt, a driving-pulley for the shaft of the distributing-beater, and a driving-belt connecting the said shaft with the shaft of the retarding-beater, the shifting-lever being arranged to control the movement of the driving-belt to and from the driving-pulley of the distributing-beater, as specified.

21. In a manure-spreader or like machine, a conveyer, a feed device for the same, and means for winding the conveyer as it is fed by the feed device, substantially as set forth.

22. In a manure-spreader or like machine a conveyer, a feed device for the same, and means for winding the conveyer, the said means being controlled by the feed device, substantially as described.

23. In a manure-spreader or like machine a receptacle, a flexible conveyer within the receptacle and a spring-controlled winding attachment connected with the said conveyer

to wind up the same, substantially as described.

24. In a manure-spreader or like machine,
a receptacle, a conveyer within the recepta-
5 cle, mechanism for operating the conveyer,
a device for regulating the speed of the conveyer,
a tension-controlled device for winding the conveyer,
means for limiting the travel of said conveyer, and means for returning

the conveyer to normal position, substantially as described.

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