

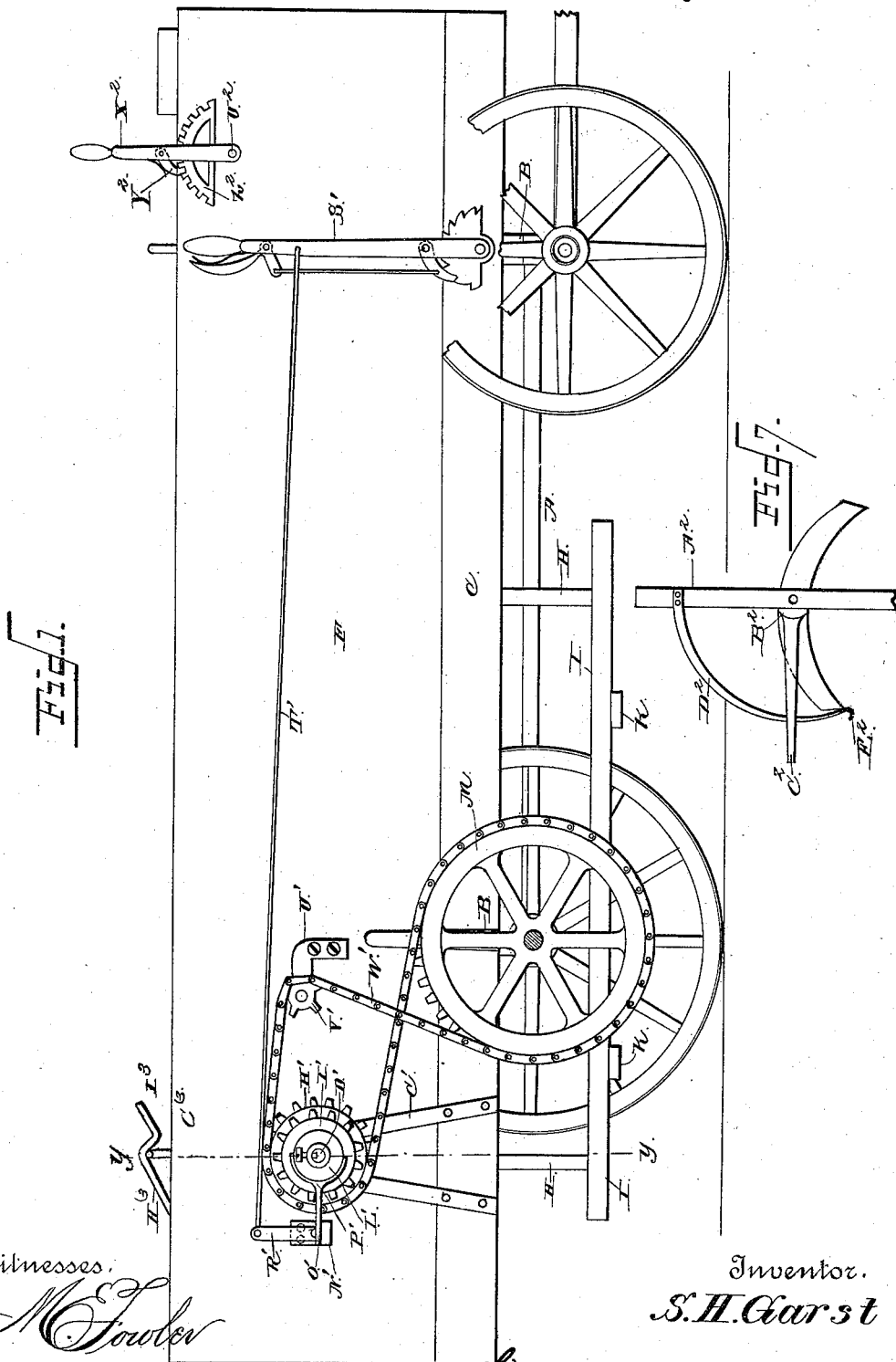
(No Model.)

4 Sheets—Sheet 1.

S. H. GARST.
MANURE DISTRIBUTER.

No. 383,639.

Patented May 29, 1888.



Witnesses.

M. E. Fowler
J. W. Garner

Inventor.

S. H. Garst

By *his* Attorneys.

C. A. Howden

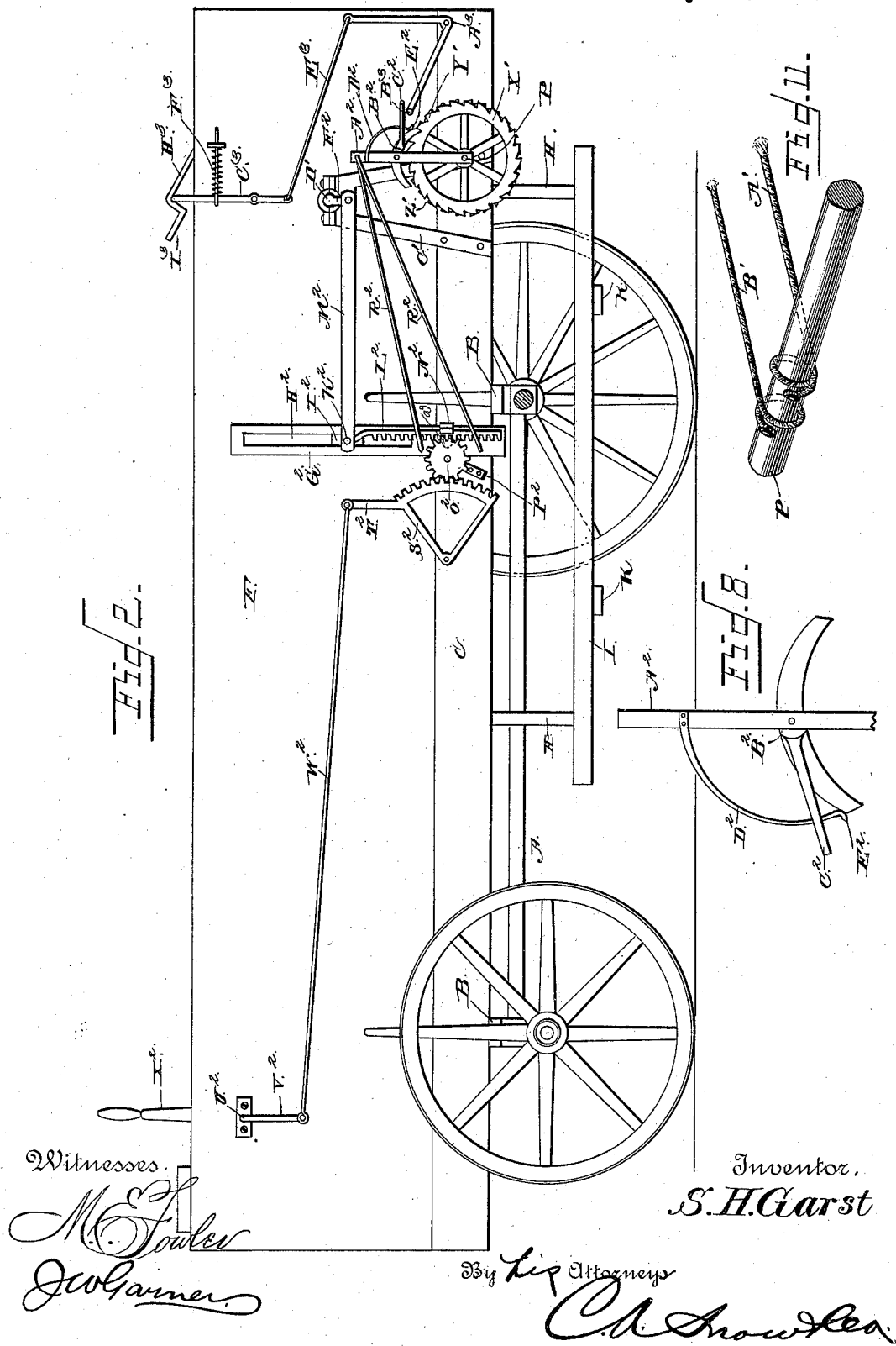
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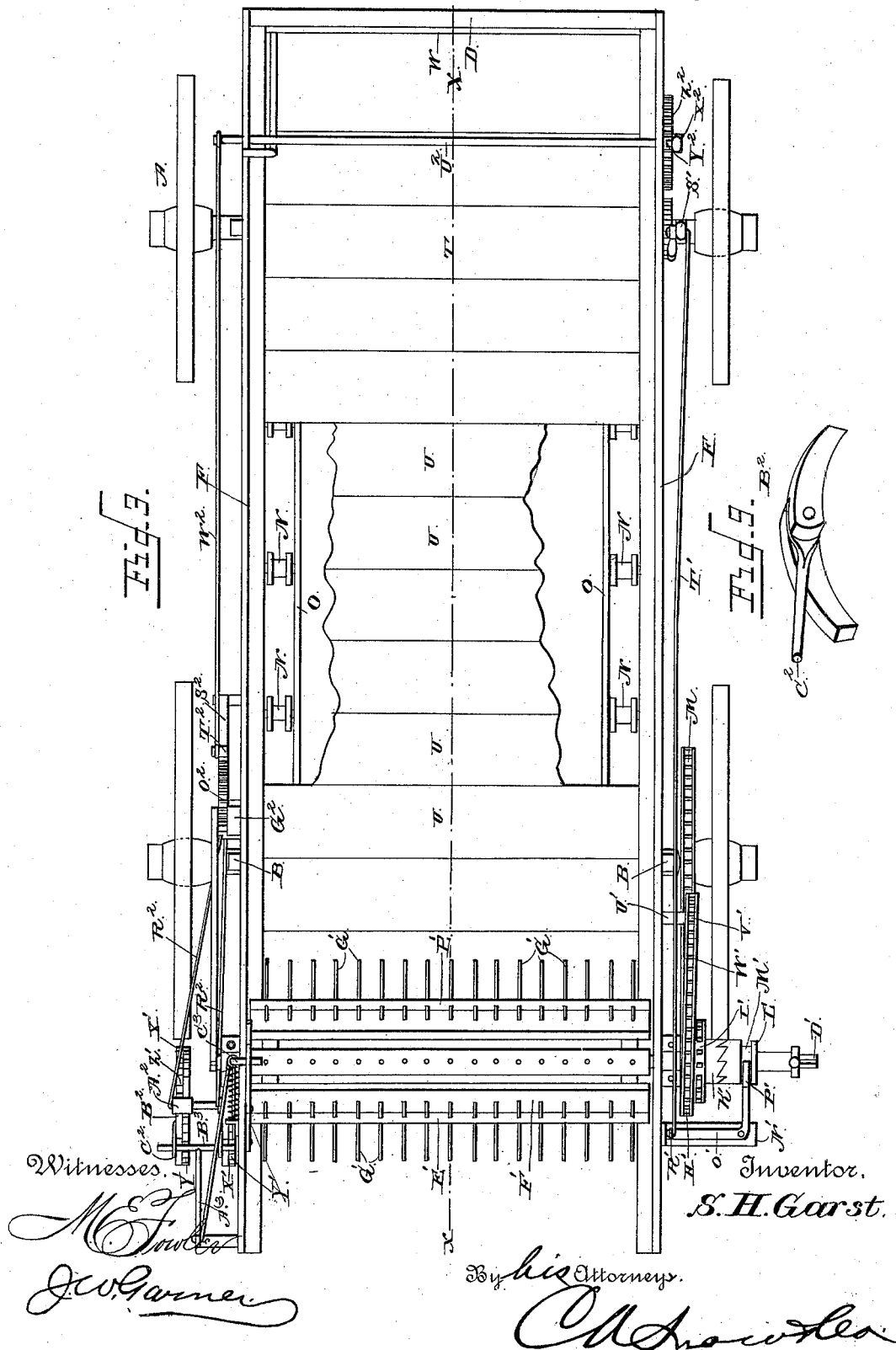
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4 Sheets—Sheet 3.

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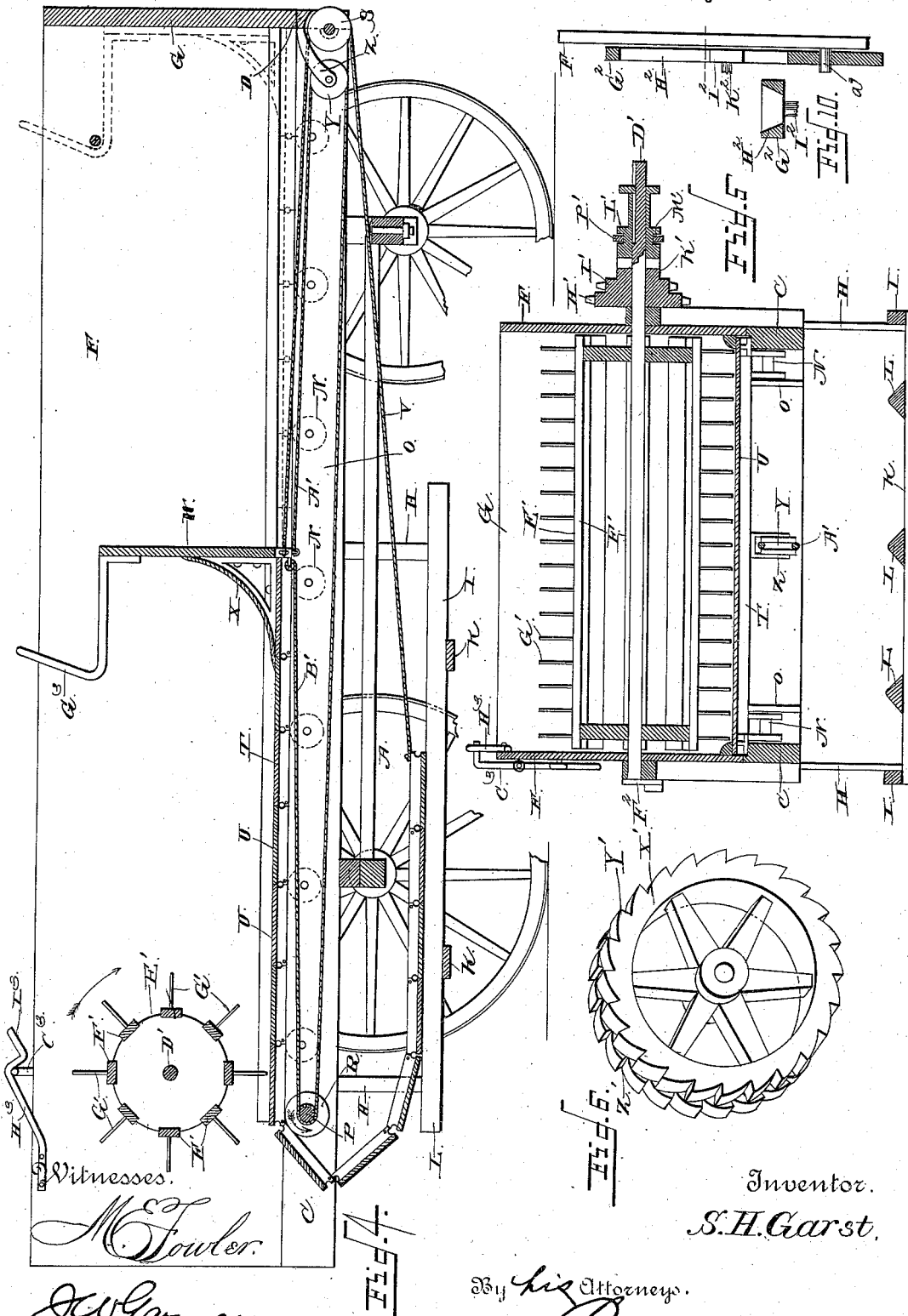
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J. W. Garner

Fig. 4

By his Attorneys.

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UNITED STATES PATENT OFFICE.

STEPHEN H. GARST, OF GREENVILLE, OHIO.

MANURE-DISTRIBUTER.

SPECIFICATION forming part of Letters Patent No. 383,639, dated May 29, 1888.

Application filed July 6, 1887. Serial No. 243,582. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN H. GARST, a citizen of the United States, residing at Greenville, in the county of Darke and State of Ohio, have invented a new and useful Improvement in Manure-Distributers, of which the following is a specification.

My invention relates to an improvement in manure-distributers; and it consists in the peculiar construction and combination of devices, that will be more fully set forth hereinafter, and particularly pointed out in the claims.

In the drawings, Figure 1 is a side elevation of a manure-distributer embodying my improvements. Fig. 2 is a similar view of the opposite side of the same. Fig. 3 is a top plan view. Fig. 4 is a vertical longitudinal sectional view taken on the line *xx* of Fig. 3. Fig. 5 is a vertical transverse section on line *yy* of Fig. 1. Figs. 6, 7, 8, 9, and 10 are detail views. Fig. 11 is a detail view of the drum and the ropes for working the flexible platform.

A represents the running-gear of a wagon, and B the front and rear bolsters, upon which are supported a pair of longitudinal beams, C, which have their front ends connected by a cross-bar, D.

F represents the side boards, which are secured on the upper edges of the beams C, and have their front ends connected together by a front board, G. From the side beams, C, depend four standards or hangers, H, at the rear portion of the body, formed by the beams and boards above the side, and the lower ends of the said standards or hangers are secured to longitudinal parallel bars I.

K represents a pair of cross bars, which connect the under sides of the bars I, and on the said cross-bars are secured longitudinal parallel bars or slats L, which are triangular in cross-section, as shown in Fig. 5. One of the bearing-wheels on the rear axle is provided with a sprocket-wheel, M, which is rigidly secured thereto and rotates therewith.

On the inner side of the side beams, C, are a series of anti-friction rollers, N, which are journaled on spindles extending from the side beams to bars O, which are arranged at a suitable distance from the inner side of the said side beams.

P represents a drum, which is journaled be-

tween the rear ends of the beams C, and is provided with disks or rollers R, which bear against the inner rear sides of the beams C. At the front end of the frame or body is a pulley, S.

T represents a flexible platform, which comprises a series of transverse boards, U, arranged side by side and hinged together, as shown. This platform is supported upon the rollers N, and normally serves to form the bottom of the wagon-body.

V represents a rope, which passes over the pulley S, and has one end connected to the front end of the flexible platform and the other end connected to the rear end of the said flexible platform.

W represents a transverse vertical board, which is secured to the front end of the platform T. To the inner side of this board is secured the upper edge of a rearward-extending concave shield, X, which shield is preferably made of sheet metal.

Y represents a pulley, which is journaled in a bracket, Z, that projects rearward from the front bar, D.

A' represents a rope, which has one end secured to the roller P and coiled thereon, and from thence the said rope passes forward around the pulley Y and then backward, and has its opposite end attached to the front board of the platform.

B' represents a rope, which has its front end attached to the front end of the platform, and its rear end connected to and coiled upon the roller P in the direction opposite the coils of the rope A'.

From the upper sides of the beams C, at the rear ends thereof, project standards C', in which is journaled a transverse shaft, D'. To that portion of the said shaft which is between the standards is secured a cylinder, E', which is provided with longitudinal parallel slats F', from which project radial teeth G'. The said cylinder is rigid with the shaft D', and is thereby adapted to rotate therewith. One end of the shaft B' extends through and projects beyond one side of the frame or body, and is provided with a longitudinal groove or feather, as shown.

H' represents a sprocket-wheel, which is loosely mounted on the projecting end of the shaft D'.

I' represents a smaller sprocket-wheel, which

may be either bolted to the outer side of the wheel H' or formed integrally therewith, and from the outer side of the wheel I' projects a central sleeve, K', which is rigidly formed therewith, and is also loosely secured on the shaft.

L' represents a sliding clutch, which is feathered on the outer side of the shaft D', is adapted to engage the sleeve K', and thereby lock the sprocket-wheels H' and I' to the shaft, and on the outer end of the said clutch is formed an annular peripheral groove, M'.

N' represents the bracket-arm, which is bolted to and projects from one side of the bed or body, and is arranged behind the projecting end of the shaft D'. To this bracket-arm is fulcrumed a lever, O', which has one end extended forward to form a yoke-arm, P', that engages the groove of the sliding clutch, and the opposite end of the said lever is bent at right angles to form an arm, R'.

S' represents a hand-lever, which is fulcrumed to the bed or body near the front end thereof, and the said lever is connected to the arm R' by means of a rod, T'.

U' represents a bracket, which projects from one side of the bed or body, at a slight distance in advance of the projecting end of the shaft D', and to the said bracket is loosely journaled a small idlesprocket-wheel or pulley, V', which is arranged out of line with the sprocket-wheels H' and I'.

W' represents an endless sprocket-chain, which is crossed, passes around a sprocket-wheel, M, over the sprocket-pulley V', and over one of the wheels H' or I', according to the speed at which it is desired to rotate the cylinder when the machine advances. If the sprocket-chain passes over the wheel H', the cylinder will rotate slowly; but if it engages the wheel I' the cylinder will be rotated at a higher rate of speed, as will be very readily understood.

By means of the lever S', the lever O', connected thereto, and the sliding clutch L', the sprocket-wheels H' and I' may be rigidly locked to the shaft D', when it is desired to rotate the cylinder when the machine is in motion; or the clutch may be moved out of engagement with the sleeve K', so as to permit the sprocket-wheels to turn idly on the shaft D', and thereby cause the cylinder to remain at rest, when the machine is in motion and not in operation.

One of the spindles of the drum P projects beyond the bed or body on the side opposite the projecting end of the shaft D'. On the said projecting spindle of the drum P is rigidly secured a pair of wheels, X', which are of the same size, and are arranged at a slight distance apart. Each of the said wheels is provided with two series of peripheral ratchet-teeth, Y' and Z', which extend in opposite directions.

A² represents a pair of levers, which are pivoted to the projecting spindles of the drum and bear against the outer side of the wheel X'. To each of the said levers is pivoted a detent

or pawl, B², having a pair of oppositely-extending arms, one of which is adapted to engage the ratchets Y', and the other is adapted to engage the ratchets Z'. The said dogs or detents are also provided with rearward-extending tappet-arms C².

D² represents a pair of springs, one of which is secured to each lever A². The said springs curve rearward and downward from the said levers and have their lower ends curved to form offsets E². The said offsets are either adapted to bear upon the upper side of the rearward-extending engaging arms of the dogs or detents, to keep the same in engagement with the ratchet-teeth Y' of the wheels X', as shown in Fig. 2, or, when the dogs or detents are turned so that their front arms are caused to engage the teeth Z', the said springs, by bearing against the rear end of the rear detent-arms, maintain the said detent in this position, as shown in Fig. 8.

F² represents a crank which is on one end of the shaft D' above the wheels X'.

G² represents a lever, which is provided in its upper end with a longitudinal slot, H², the said slot being beveled on opposite sides. (See Fig. 10.)

L² represents a rack-bar, which is arranged on the outer side of the lever G². The lower portion of the said rack-bar is secured in a guiding-clamp, N², bolted to the said lever, and to the upper end of the rack-bar is pivoted a pitman, M², by means of a bolt, K², which extends through slide-blocks I², fitted in the beveled slots of lever G². This enables the rack-bar to be vertically adjusted on lever G². The rear end of the said pitman is pivoted to the wrist-pin of the crank F².

O² represents a spur-pinion, which is journaled to a bracket, P², that projects from the beam C in advance of the lever G². This spur-pinion meshes with the teeth of the rack-bar L².

R² represents a pair of rods, which have their front ends pivoted to the lever G² at points above and below the pivotal bolt a'. (See Figs. 2 and 10.) The rear ends of the said rods are pivoted to the upper ends of the levers A².

S² represents a spur-sector, which is pivoted to the beam C in advance of the pinion O², and engages the same. From the upper corner of this sector projects an arm, T².

U² represents a rock-shaft, which extends across the front end of the bed or body, and is journaled in the side boards thereof. One end of the said rock-shaft is provided with a crank-arm, V², that is connected to the upper end of the sector-lever T² by a rod, W². To the opposite end of the said rock-shaft is secured a hand-lever, X², which is on the same side of the bed or body with the lever S', and is provided with a spring-actuated detent, Y², adapted to engage the teeth of a segment-plate, Z², and thereby secure the lever at any desired adjustment.

The bolt K² serves to clamp the blocks I²,

and also provide a securing or pivotal point for the rack-bar L^2 and the pitman M^2 . The lever G^2 is fulcrumed upon a journal which extends outward from the beam C. The lever or link G^2 does not move up or down, but has only an oscillating motion. The longitudinal motion given to the lever G^2 is derived from the pitman M^2 . It will be understood that both the pitman M^2 and the rack-bar L^2 are pivoted to the blocks I^2 , so that as the rack-bar L^2 is raised up or down by the pinion O^2 the blocks I^2 are raised or lowered, and as the pitman M^2 is journaled to the blocks I^2 said pitman follows the movement of said blocks. Raising the block and pitman gives the lever G^2 a shorter oscillating movement, while lowering the pitman and blocks gives the lever G^2 a longer movement. This short and long movement of the lever G^2 causes the pawls or detents to engage a less or greater number of ratchet-teeth in the wheels X' .

A^3 represents a bell-crank lever, which is fulcrumed to one side of the main frame in rear of the wheel X' . At the front end of the forward-extending arm of this lever is a cross-head, B^3 , which is arranged under the rear end of the tappet-arm C^2 .

C^3 represents a lever, which is fulcrumed to one of the side boards of the bed or body near the upper edge thereof, and has its upper end bent inward at right angles to form a horizontal arm. Its lower end is connected to the vertical arm of the bell-crank lever by a rod, E^3 .

F^3 represents a coiled extensible spring, which bears against the rear side of the upper portion of the lever C^3 . From the upper side of the front board, W, on the flexible platform, at one end thereof, projects a horizontal rod, its front end bent upward to form a vertical rod, G^3 , the upper end of which is bent outward nearly at right angles.

H^3 represents a spring-detent, which projects from one of the side boards of the bed or body, normally engages the upper end of the lever C^3 to retain the said lever in a vertical position, and is provided at its front end with a forward-extending upwardly-inclined arm, I^3 .

The operation of my invention is as follows: The platform is normally in the position indicated in Fig. 3, when stretched longitudinally over the rollers N and forming the bottom of the bed or body, the front end of the said platform being in contact with the front end of the bed or body. The latter is then filled with manure. When the machine is started and it is desired to spread the manure on the ground, the driver moves the lever S' to cause the clutch L' to engage the sleeve K' , and thereby lock the sprocket-wheels H' and I' to the cylinder-shaft D' , as before described, and the rotation of the sprocket-wheel M, attached to one of the supporting-wheels of the machine, is imparted to the cylinder by the cross-chain W, thus causing the cylinder to rotate in the direction indicated by the arrow in Fig. 4. As the said cylinder turns, its teeth engage the manure in contact with the cylinder and

cause the same to be evenly distributed from the rear end of the bed or body onto the ground. As the cylinder rotates, its crank F^2 imparts oscillating motion to the lever G^2 by reason of the pitman M^2 . The oscillating motion of the lever G^2 is communicated to the levers A^2 by the rods R^2 . The lever C^2 being normally engaged by the spring-detent H^3 , the bell-crank lever A^3 is maintained in the position indicated in solid lines in Fig. 2, with its cross-head B^3 lowered and out of contact with the tappet-arms C^2 of the pawls or detents, and the springs D^2 keep the rear ends of the said dogs or detents in engagement with the teeth Y' of the wheels X' . Inasmuch as the rods R^2 have their front ends pivoted to the lever G^2 on opposite sides of the fulcrum of the same, the levers A^2 are caused to oscillate simultaneously in opposite directions, as will be readily understood, thereby causing one of the dogs or detents B^2 to slip idly forward on the teeth Y' of one of the wheels X' , and causing the other dog or detent to move rearward in engagement with one of the teeth Y' of the other wheels, X' , and thereby the drum P is kept in constant rotation in the direction indicated by the arrow in Fig. 4. This rotation of the said drum causes the rope B' to be wound thereupon and to draw rearwardly on the front end of the flexible platform, and the lower side of the rope A' uncoils from the drum, thus slacking the upper portion of the said rope, and thereby permitting the front end of the platform to be drawn rearwardly by the rope B' . The rear end of the said platform thereupon moves downward over the rollers R and bears upon the bars L. The rope V has its upper side tightened as the front end of the platform moves rearward, and thereby causes the lower side of the rope V to draw the lower end of the platform on the bars L. It will be readily understood from the foregoing that as the platform moves rearward it presents the manure to the cylinder, and thereby keeps the latter constantly at work in distributing the same. By the time that the board W reaches the cylinder the manure has been entirely discharged from the platform. The function of the shield X, which is adapted to the contour of the cylinder, is to prevent any of the manure from remaining lodged in the lower front corner of the platform.

The speed at which the cylinder rotates may be regulated by applying the sprocket-chain W' to either of the wheels H' or I' , and the speed of the sliding platform may be regulated and caused to coincide with the rate of rotation of the cylinder by moving the lever X^2 so as to actuate the sector S^2 and cause the pinion O to either raise or lower the rack-bar L^2 , and thereby regulate the stroke of the levers A^2 . By this means any desired quantity of manure may be distributed to a given area of land, even while the machine is in motion.

When the front end of the sliding platform reaches the rearward limit of its movement, the tappet-rod G^3 strikes against the lower side

of the arm I³ at the spring-detent H³, thereby raising the said arm and causing the detent to release the lever C³. As soon as the detent slips from the lever, the spring F³ forces the lever C³ forward, thereby causing the rod E³ to move rearward and partly turn the bell-crank lever A³, and causes the cross-bar B³ to turn the dogs or pawls B² to the position indicated in Fig. 8, with their front ends engaging the teeth Z' of the wheels X', which causes the rotation of the said wheels to be reversed, as will be readily understood. This reverse rotation of the wheels X' causes the drum P to rotate in the contrary direction from that indicated by the arrow in Fig. 4, which causes the platform to be returned to its initial position in its front end bearing against the front end of the bed or body.

A machine thus constructed is adapted to spread manure in any desired quantity upon a field, is automatic in its operation, and will be found of great utility to farmers.

Having thus described my invention, I claim—

1. In a manure-spreader, the body having the sliding flexible platform forming the bottom therefor, the drum P, and the ropes A' B', both connected to the front end of the platform and wound in reverse directions on the drum P, as set forth.

2. In a manure-spreader, the body having the sliding flexible platform forming the bottom of the body, the drum P, the ropes A' B', wound in reverse directions on the drum and connected to opposite sides of the front end of the platform, and the rope V, connected at its ends to the ends of the platform and passed around a roller at an intermediate point, as set forth.

3. In a manure-spreader, the body having the sliding flexible platform forming the bottom therefor, the drum P at the rear end of the body, over which drum the platform passes to turn the platform beneath the body, ropes connecting the drum with the platform, and a depending guide-frame below the body to receive the platform as it leaves the drum, as set forth.

4. In a manure-spreader, the body having the sliding flexible platform forming the bottom therefor, and the depending guide-frame below the body formed with the angular-shaped slats L, as set forth.

5. In a manure spreader, the body having the sliding flexible platform forming the bottom for the body, and the hangers H, depending from the body and carrying a horizontal guide-frame, I, which is composed of an open framework entirely independent of and entirely below the body, as set forth.

6. In a manure-spreader, the body having the sliding flexible platform forming the bottom for the body, the guide frame depending from the body and open at both ends, said platform passing over and resting upon the supporting-frame as it leaves the body, the rope V, connecting the ends of the platform,

the drum P at the rear end of the body, over which drum the platform passes as it leaves the body, and the ropes A' B', wound in reverse directions on the drum and connected to the front end of the platform at different points, as set forth.

7. The combination of the drum P, for operating the sliding bottom, having the ratchet-wheels X', the oscillating levers A², having the pawls engaging the said ratchet-wheels, the oscillating lever G², having the vertically-movable rack-bar L², the rods connecting the said lever G² to the levers A², the pinion engaging the rack-bar L², and means for rotating the said pinion, and thereby adjusting the rack-bar, for the purpose set forth, substantially as described.

8. In combination with the body, the flexible platform forming the bottom therefor, the drum P, connecting with the platform for working the same, the revolving cylinder E', the pawl-and-ratchet mechanism for moving the drum P, the oscillating lever G², the vertically-movable bar L², carried by the bar G², the pitman connecting with the lever G², and the rods connecting the oscillating lever to the pawl-and-ratchet mechanism of the drum, as set forth.

9. In a manure-distributor, the body, in combination with the flexible platform forming the bottom for the body, the rotating cylinder at one end of the body, the drum P, for operating the platform, the pawl-and-ratchet mechanism for working the drum, the oscillating lever G², the sliding block carried by the lever, the vertically-movable rack-bar L², connected to the sliding block, the pitman connecting the shaft of the rotating cylinder to the sliding block, the rods connecting the lever G² to the said pawl-and-ratchet mechanism, and hand operating mechanism for moving the bar L², and thereby adjusting the throw of the oscillating lever G², as set forth.

10. The combination, in a manure-distributor, of the bed or body having the sliding flexible platform constituting its bottom, said platform having the tappet-arm G³ at its front end, the drum P, arranged at the rear end of the bed or body and on which the sliding platform is supported, the said drum being provided with the ratchet-teeth Y' and Z', extending in opposite directions, the oscillating levers A², having the double-ended dogs or pawls adapted to engage either of the series of ratchet-teeth on the wheels X', the spring-actuated lever A³, adapted to reverse the dogs, and thereby impart retrograde rotation to the drum, for the purpose set forth, and the detent H³, to normally secure the lever A³ out of the engagement with the dogs or pawls, the said detent having the arm I³ arranged in the path of the tappet-arm G³, for the purpose set forth, substantially as described.

11. The combination, with the body having the depending frame, of the sliding platform forming the bottom of said body and adapted to be turned to rest on the depending frame, the

drum P, for operating the sliding platform, and having the ratchet-wheels X', provided with the ratchet-teeth Y' and Z', extending in opposite directions, the oscillating levers A²,
 5 having the double-ended pawls or dogs normally engaging the teeth Y', the sliding platform having the tappet-arm G³ at its front end, the bell-crank lever A³, having the cross-bar B³, adapted to engage the dogs or pawls
 10 and trip the same, the lever C³, connected with the bell-crank lever, the spring F³, normally bearing forward against the said lever C³, the spring-detent H³, to lock the said levers B³, and having the inclined arm I³ arranged in
 15 the path of the tappet-arm G³, for the purpose set forth, substantially as described.

12. In combination with the bed or body, the sliding flexible platform forming the bottom therefor, mechanism for sliding the platform in one direction, and tripping devices to
 20 cause the said mechanism to bring the platform back to its initial position, and the head-board W for the front end of the platform, as set forth.

13. In combination with the bed or body, the sliding platform therefor, the gearing for working the platform, the ratchet mechanism engaging with said gearing to determine the
 25 direction of movement of the platform, and the tripping devices to engage the ratchet mechanism when the platform reaches a certain point to change the direction of movement of the platform, as set forth.
 30

14. In combination with the bed or body, the sliding platform forming the bottom therefor, the gearing for working the platform to
 35 and fro, the ratchet mechanism to engage the gearing to determine the direction of rotation of the same, and the consequent direction of
 40 movement of the platform, and the adjusting means to regulate the throw of the ratchet mechanism and the consequent speed of the

platform, and the tripping devices to engage the ratchet mechanism when the platform reaches a certain point, as set forth. 45

15. In a manure-spreader, the body, the sliding flexible platform forming the bottom therefor, the drum P, for operating the platform, the ratchet mechanism for working the
 50 drum, and the tripping device carried by the platform to engage the ratchet mechanism, whereby, when the platform has reached a certain point, the tripping device strikes the
 55 ratchet mechanism, when the continued movement of the machine causes the drum P to draw the platform back to its initial position.

16. In a manure-spreader, the bed or body, the sliding platform forming the bottom therefor, the drum P, the cords A' B', wound in reverse directions on the drum and connected to
 60 the platform, the ratchet mechanism for the drum, and the tappet-arm G³, carried by the platform to operate the ratchet mechanism and change the direction of the rotation of the
 65 drum, and the consequent direction of movement of the platform, as set forth.

17. The combination, with the body having the depending frame, of the drum P, the sliding bottom adapted to pass beneath the body
 70 and be supported on the frame, ratchet-wheel X', having the teeth Y' Z' extending in opposite directions, the oscillating lever A², the pawl pivoted to the said lever and having the
 75 oppositely-extending arms to engage the teeth Y' Z' alternately, and the spring-detent D², secured to the lever A, as set forth.

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

STEPHEN H. GARST.

Witnesses:

JOHN H. SIGGERS,
 M. E. FOWLER.