(No Model.) 3 Sheets—Sheet 1.

D. B. MERRELL.

MANURE SPREADER.

No. 419,463. Patented Jan. 14, 1890

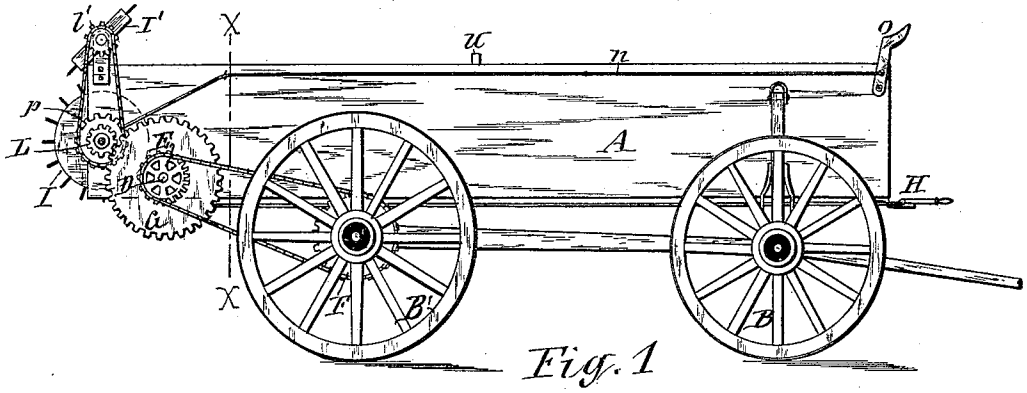


Fig. 1

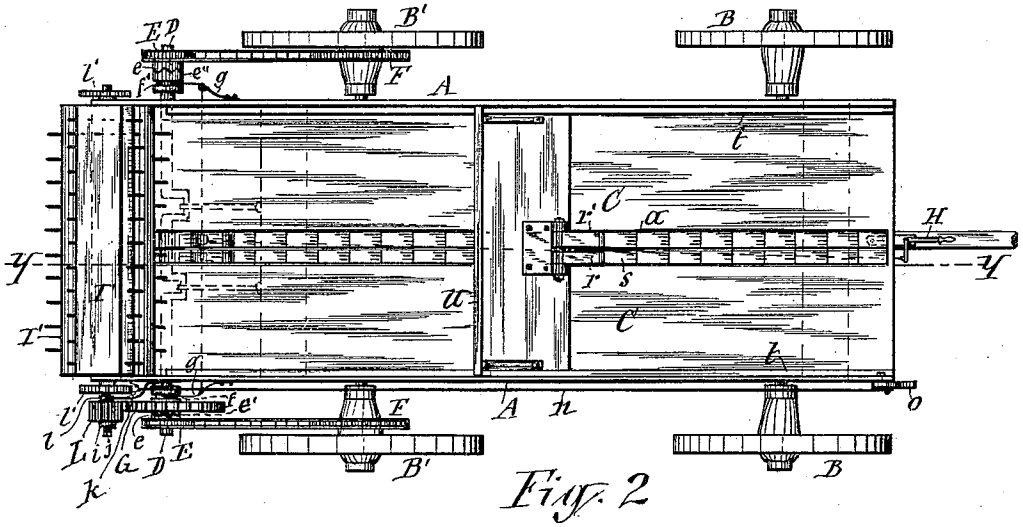


Fig. 2

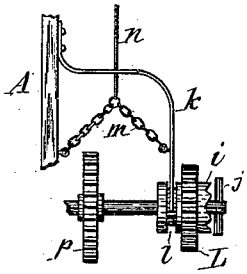


Fig. 8

WITNESSES:

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J. J. Laass.

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(No Model.)

3 Sheets—Sheet 2.

D. B. MERRELL.

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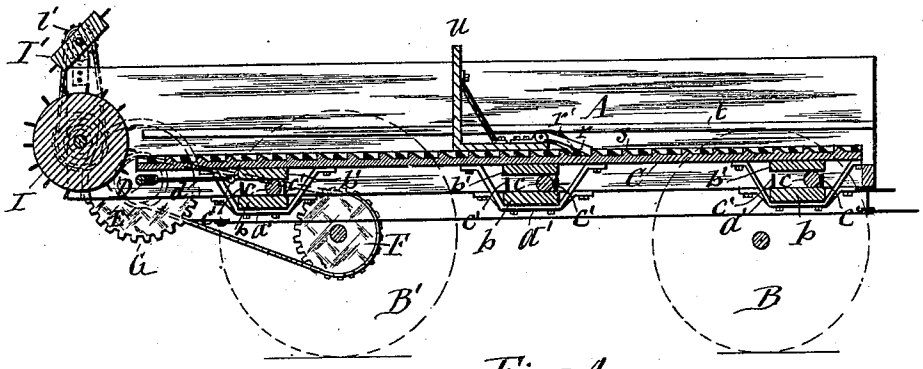


Fig. 4

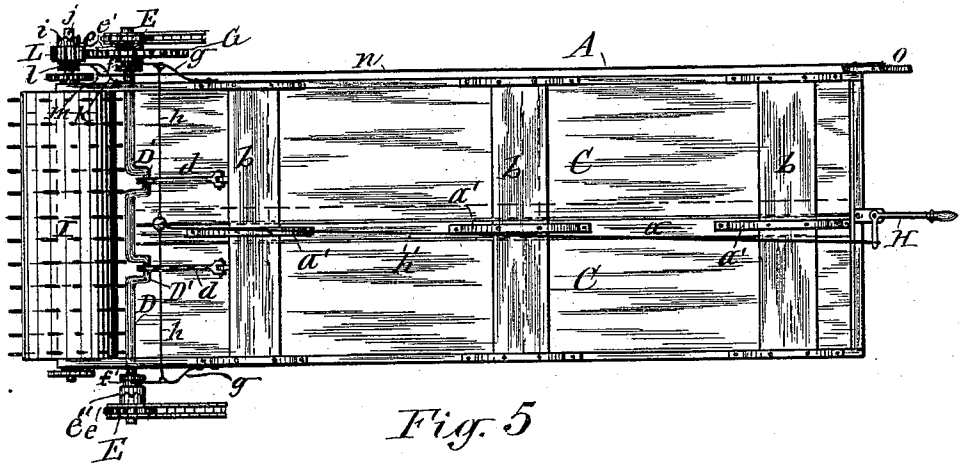


Fig. 5



Fig. 9

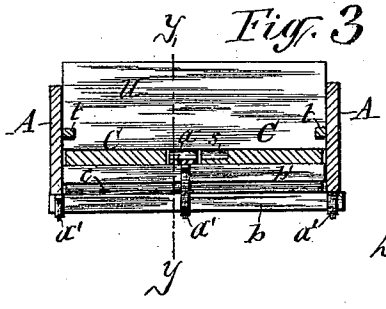


Fig. 3

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(No Model.)

3 Sheets—Sheet 3.

D. B. MERRELL.

MANURE SPREADER.

No. 419,463. Patented Jan. 14, 1890.

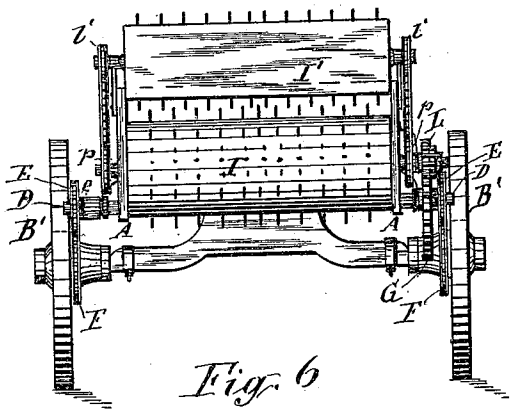


Fig. 6

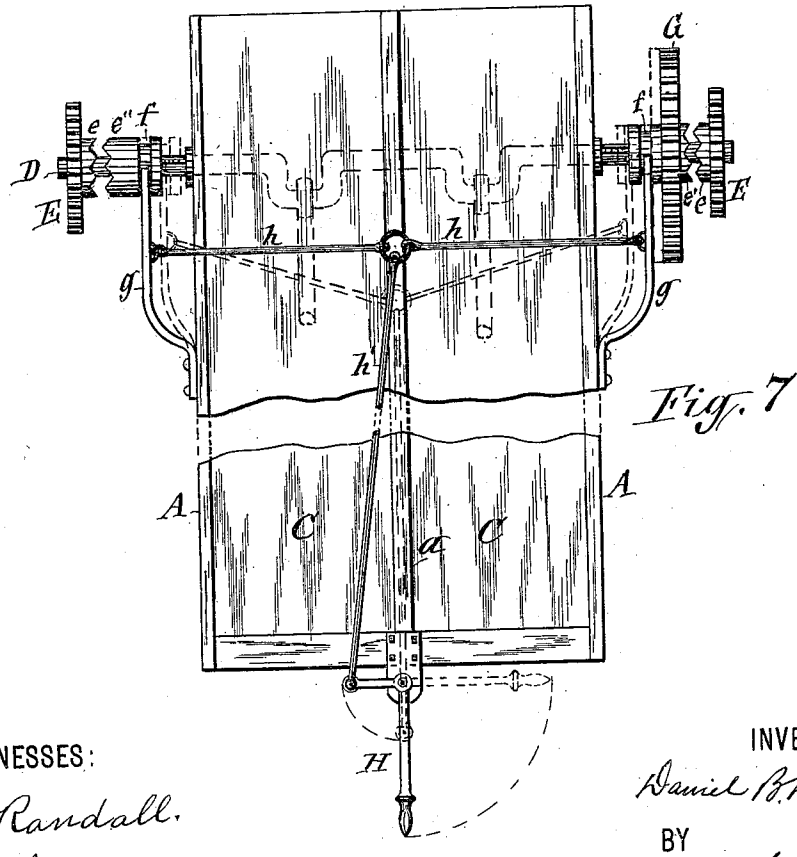


Fig. 7

WITNESSES:

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UNITED STATES PATENT OFFICE.

DANIEL B. MERRELL, OF CANANDAIGUA, NEW YORK.

MANURE-SPREADER.

SPECIFICATION forming part of Letters Patent No. 419,463, dated January 14, 1890.

Application filed December 14, 1888. Serial No. 293,617. (No model.)

To all whom it may concern:

Be it known that I, DANIEL B. MERRELL, of Canandaigua, in the county of Ontario, in the State of New York, have invented new and useful Improvements in Manure-Spreaders, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to the class of manure-spreaders which have a vehicle-body provided with a longitudinally-reciprocating floor, which, in conjunction with an end-board moving from the front end to the rear end of the body, carries the manure to a rotary beater, which distributes the manure from the rear end of the body.

My present invention consists in an improved organization of a manure-spreader which is very efficient and convenient in its operation, as hereinafter fully described, and specifically set forth in the claims.

In the annexed drawings, Figure 1 is a side elevation of a manure-spreader embodying my improvements. Fig. 2 is a plan view of the same. Fig. 3 is a transverse section on line *x x*, Fig. 1. Fig. 4 is a vertical longitudinal section on line *y y*, Figs. 2 and 3. Fig. 5 is an inverted plan view, taken above the running-gear, to show more clearly the devices for throwing the driving-shaft of the machine in and out of gear. Fig. 6 is a rear end elevation of the machine. Fig. 7 is a special plan view of the aforesaid devices for throwing the driving-shaft in and out of gear. Fig. 8 is a detached plan view of the devices for throwing the beater out of gear, so as to allow the floor to be moved while the beater is retained dormant; and Fig. 9 illustrates a modification of the support of the floor of the body.

Similar letters of reference indicate corresponding parts.

A represents the body or box for carrying the manure to be spread, said body being mounted on the axles of carrying and traction wheels B B′. The bottom or floor of the body is arranged movably longitudinally and preferably divided from end to end at the center, and between the adjacent edges thereof is a longitudinal strip *a*, which is secured stationary to the body in any suitable manner, in this case represented in the form of brackets *a′ a′*, rigidly attached to the said strip and to cross-bars *b b*, which latter are firmly secured at their ends to the sides of the body A.

The two longitudinal floor-sections C C are carried on suitable rollers *c c*, mounted on horizontal bars, which may be secured to the vehicle in any suitable manner and are extended under the floor. The roller *c* may be either elongated to extend across the entire width of the floor and interposed between a cross-bar *b′*, secured to the floor, and the cross-bar *b*, secured to the body, as hereinbefore stated, and as shown in Fig. 3 of the drawings, or the rollers may be made narrow, of the form of caster-wheels, pivoted to brackets *o o*, secured to the under side of the floor and traveling on longitudinal bars *o′*, as shown in Fig. 9 of the drawings, which latter bars may be secured to the bolsters of the vehicle in any suitable manner. When the roller is supported on the cross-bar *b*, the movement of said roller is limited by suitable stops *c′ c′*, which may consist simply of pins projecting upward from the cross-bars *b b* at opposite sides of the respective rollers.

The described movable floor receives a longitudinally-reciprocating motion by the following mechanisms: Across the bottom of the body A, near the rear end thereof, is extended a driving-shaft D, which is journaled in suitable bearings secured to the body or other suitable part of the vehicle, said shaft being either formed with cranks D′ D′, as shown, or provided with eccentrics, which are connected with the movable floor-sections by pitmen *d d*. On opposite ends of the said driving-shaft are loosely mounted sprocket-wheels E E, which by means of drive-chains are connected with sprocket-wheels F F, rigidly attached to the traction-wheels B′ B′. One side of each of the sprocket-wheels E E has affixed to it a clutch-face *e*. Adjacent to the clutch-face of one of the sprocket-wheels is a gear-wheel G, mounted on the driving-shaft D movably longitudinally and locked circumferentially thereon either by a spline and groove or any other suitable and well-known construction of the same. On one side of said gear-wheel is a rigid clutch-

face e', adapted to interlock with the clutch-face e of the adjacent sprocket-wheel, and the hub at the opposite side of the gear-wheel is grooved circumferentially, as shown at f. A similar clutch e'', with a similarly-grooved hub f', slides on the opposite end of the driving-shaft, and is connected therewith by a spline and groove or equivalent longitudinally-sliding and circumferentially-locking coupling, and adapted to engage the clutch-face e of the adjacent sprocket-wheel E. The described clutches are held normally in engagement by means of suitable springs or spring-arms g g, which are attached at one end to the outer sides of the body A, and have their free ends bifurcated and extending into the circumferential grooves of the hubs f f'. The engagement of said clutches causes the driving-shaft D to partake motion from the sprocket-wheels E E, which are driven by the sprocket-wheels F F, attached to the traction-wheels B' B', and the rotation of said driving-shaft imparts longitudinal reciprocating motion to the floor C by means of the cranks or eccentrics on said shaft and pitmen connecting the same with the floor, as hereinbefore described.

In order to allow the clutches to be thrown out of engagement and thus hold the said floor stationary while taking the machine to and from the field, I extend across the under side of the body rods h h, coupled together under the center of the body and connected at their outer ends to the spring-arms g g. From the junction of the said rods to the front end of the machine is extended a longitudinal rod h', the front end of which is connected to a suitable lever H, pivoted to the body A. By means of this lever the longitudinal rod can be drawn forward, thereby drawing the cross-rods h h inward, and by drawing the spring-arms g g with them the hereinbefore-described clutches are thrown out of engagement.

I denotes the rotary beater, which is arranged across the rear end of the body and has its shaft journaled in suitable boxes, which may be secured either to said body or to some other suitable support on the vehicle, said beater being of the usual form, and consists of a cylinder armed with radial spikes, for the purpose of casting the manure from the end of the body A. The shaft of said beater has mounted loosely on one of its ends a pinion L, which has its toothed face enlarged in width and meshing with a narrower toothed face of the gear-wheel G, so as to be maintained in gear during the lateral movement of the pinion. A clutch-face i on the outer side of the said pinion is adapted to engage with a pin j, secured to the beater-shaft, by sliding the pinion toward the said pin, and when so engaged the pinion transmits rotary motion to the beater. The pinion is held normally in its said engagement by means of a suitable spring, preferably of the form of an elastic arm k, which is secured at one end to the outer side of the body A and has its free end engaging a circumferential groove l in the exterior of the hub of the pinion.

Inasmuch as it is sometimes desired to maintain the beater dormant for a short period during the movement of the floor C, for the purpose of allowing the manure to be properly packed in front of the beater, I arrange the driving mechanism of the beater so as to allow it to be thrown out of gear with the floor-actuating mechanism, and for that purpose I preferably employ the following means for releasing the pinion L from the clutch-pin on the shaft: a flexible coupling m, which may consist of a chain connected at opposite ends, respectively, to the outside of the body A and to the free end of the spring-arm k, as shown in Fig. 8 of the drawings, and a rod n is connected at one end to the central portion of the said flexible coupling and extended to the front of the machine, where it is connected with a suitable hand-lever o, pivoted to the body A. By means of this lever the rod n can be drawn forward, and the resultant central deflection of the coupling m draws the pinion L away from the clutch-pin j and releases the clutch-face of the pinion from said pin.

In connection with the beater proper I, I employ a supplemental rotary beater I', disposed above and axially parallel therewith, said supplemental beater receiving rotary motion from the shaft of the beater proper I by means of sprocket-wheels p p, secured to the shaft of the latter, and drive-chains connecting said sprocket-wheels with similar wheels l' l' on the shaft of the supplemental beater. I do not, however, limit myself to the use of said wheels and chains, inasmuch as the same result can be attained by means of gear-wheels. When it is desired to employ a very deep body or box A, one or more additional beaters may be arranged above the beater I' and driven by suitable and well-known means.

U denotes the end-board, which is arranged movably lengthwise of the body A to push the manure toward the beater I. This end-board is supported in a vertical position by a forwardly-extending base thereof running under longitudinal ribs t, secured to the inner sides of the body, immediately above the aforesaid base. Said end-board is moved by means of a pawl r, pivoted to the base of the end-board and engaging a longitudinal ratchet s, secured to the movable floor C at the edge adjacent to the stationary strip a. Each rearward movement of said floor thus causes the floor to push rearward with it the aforesaid end-board. Another pawl r', pivoted to the base of the end-board U, engages a longitudinal ratchet on the stationary strip a and holds the end-board in its position during the reverse or forward movement of the floor C. Instead of attaching the ratchet to the strip a, two ratchets may be attached, respectively, to the side ribs t t, and two pawls

connected to the base of the end-board accordingly. In this manner the said end-board is carried from the front end of the body A to the beater I at the opposite end, and thus the manure contained in the body A is crowded against the face of the beater, which casts and distributes the manure from the rear end of the machine.

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

1. In a manure-spreader, the manure-box having an inflexible longitudinally-reciprocating floor divided lengthwise and sustained in a uniform plane by stationary supports under the floor, and anti-friction rollers interposed between the floor and its supports, substantially as set forth and shown.

2. In a manure-spreader, the manure-box having an inflexible floor divided lengthwise at the center of its width, and each section reciprocating longitudinally and sustained in a uniform plane by stationary supports under the floor, anti-friction rollers interposed between the floor and its supports, the end-board arranged movably lengthwise of the body, a stationary ratchet extending lengthwise of the body, a ratchet attached lengthwise to the reciprocating floor, and two pawls connected to the aforesaid end-board, one of said pawls engaging the ratchet of the floor to move the end-board with the same, and the other pawl engaging the stationary ratchet to prevent retrograde movement of the end-board, substantially as described and shown.

3. In combination with the body and driving-shaft, the floor of said body composed of two reciprocating longitudinal inflexible sections sustained in uniform planes during their movement by supports secured to the stationary portion of the body, a strip between said floor-sections secured stationary to the body, two cranks on the driving-shaft, and pitmen connecting said cranks, respectively, with the two movable floor-sections, as set forth and shown.

4. In combination with the body and driving-shaft, the floor of said body composed of two reciprocating longitudinal inflexible sections and a strip between said floor-sections secured stationary to the body, two cranks on the driving-shaft, pitmen connecting said cranks with the movable floor-sections, a longitudinally-movable end-board, longitudinal ratchets respectively on the aforesaid stationary strip and on the adjacent portion of the movable floor, and pawls connected to the movable end-board and adapted to engage alternately the said ratchets, substantially as described and shown.

5. In combination with the body and longitudinally-reciprocating inflexible floor, bars rigidly secured to the stationary portion of the body and extending across the same beneath the said floor, and rollers interposed between said bars and floor, substantially as set forth.

6. In combination with the body, a longitudinally-reciprocating inflexible floor, bars secured to the body and extending across the same beneath the floor, rollers interposed between said bars and floor, and stops on the cross-bars at opposite sides of the rollers to limit the motion of the latter, substantially as described and shown.

7. In combination with the driving-shaft, movable floor, and beater, mechanism for transmitting motion from said driving-shaft to the floor and beater, and a clutch adapted to throw the beater out of gear independently of the actuating mechanisms of the floor, substantially as described and shown.

8. In combination with the driving-axle, movable floor, and beater, a gear-wheel mounted loosely on the axle, a clutch for tying and releasing said gear-wheel to and from the axle, a pinion mounted movably longitudinally on the shaft of the beater and having an enlarged face meshing with a narrower face of the aforesaid gear-wheel and provided with a circumferentially-grooved hub on one side and with a clutch-face on the opposite side, a clutch part secured stationary on the aforesaid shaft, a spring-arm secured at one end to the body of the machine and having its free end engaging the groove of the pinion-hub, a flexible coupling connected at opposite ends, respectively, with the free end of the spring-arm and with the aforesaid body, a rod connected to the central portion of the aforesaid coupling and extended to the front of the machine, and a lever on the latter connected with the said rod, substantially as described and shown.

In testimony whereof I have hereunto signed my name, in the presence of two witnesses, at Canandaigua, in the county of Ontario, in the State of New York, this 10th day of December, 1888.

DANIEL B. MERRELL. [L. S.]

Witnesses:

WILLIS H. TUTTLE,

C. A. CARMICHAEL.