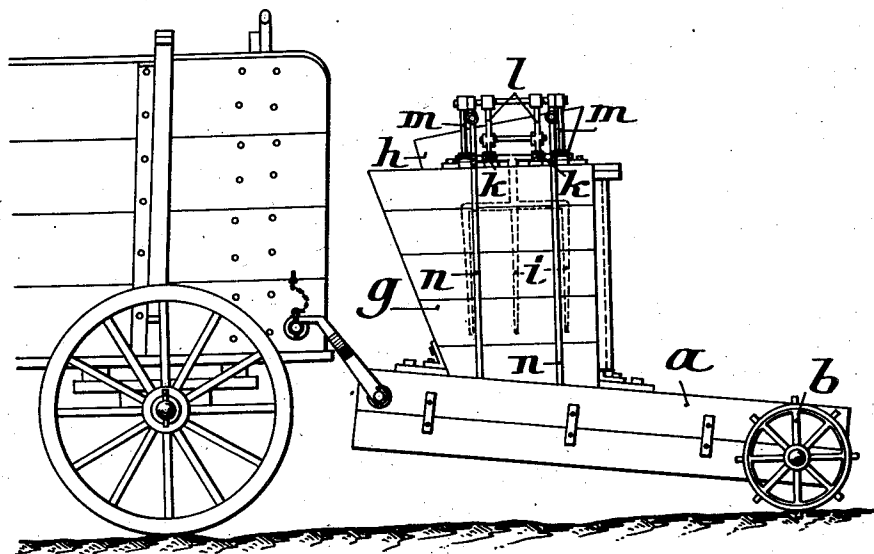


A. SPIES.
MANURE DRILL.
APPLICATION FILED JULY 28, 1908.

Patented Oct. 26, 1909.
2 SHEETS—SHEET 1.

938,177.

Fig. 1.



WITNESSES

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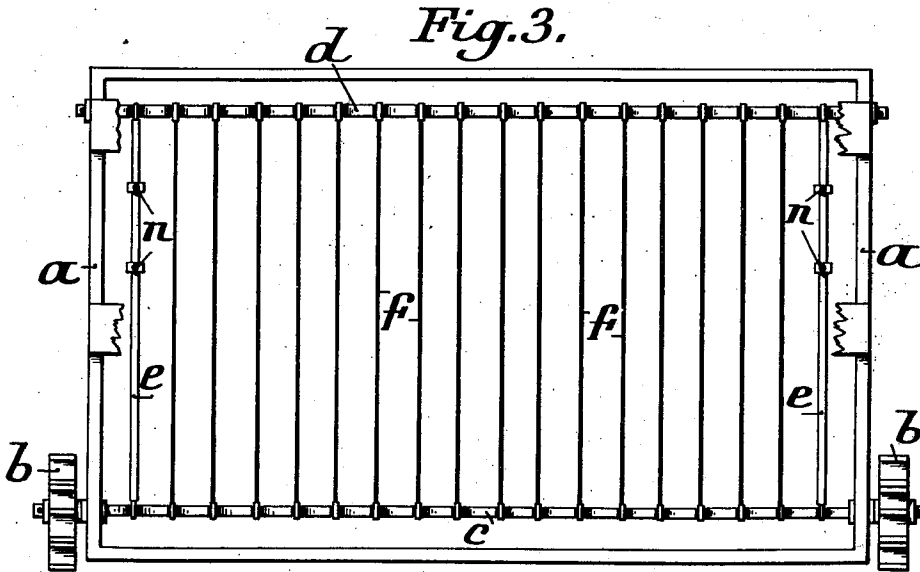
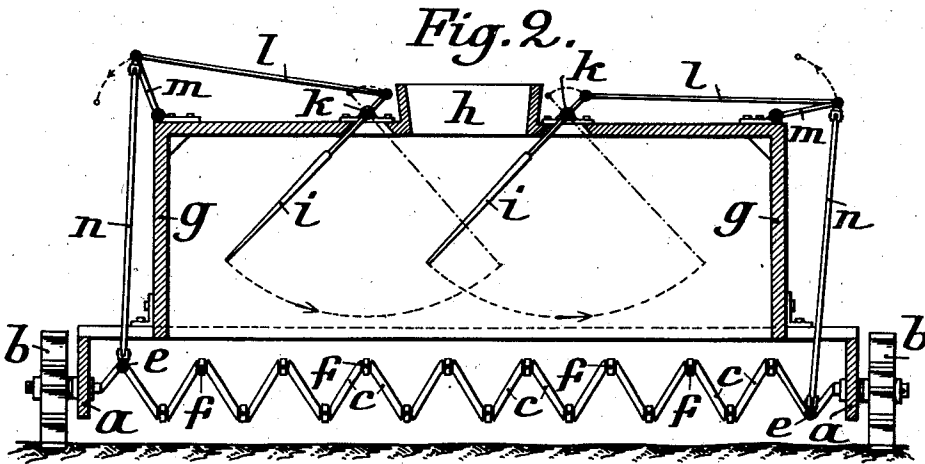
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WITNESSES

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UNITED STATES PATENT OFFICE.

ALBERT SPIES, OF CLEVE, GERMANY.

MANURE-DRILL.

938,177.

Specification of Letters Patent.

Patented Oct. 26, 1909.

Application filed July 28, 1908. Serial No. 445,768.

To all whom it may concern:

Be it known that I, ALBERT SPIES, agriculturist, a subject of the German Emperor, residing at Cleve, 4 Nassauer Allee, Germany, have invented certain new and useful Improvements in or Relating to Manure-Drills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a manure-drill adapted to deposit or discharge manure, more especially dung, in equal and uniform distribution.

The invention consists essentially in depositing or strewing the dung through a grate the several bars of which are alternately moved up and down, whereby a uniform distribution of the dung in the soil is obtained. The desired result is more effectively obtained by making the grate-bars of a very flexible material and by giving these bars a certain sag or dip whereby a shaking or vibratory movement is produced apart from the up and down movement. For this purpose the bars may preferably be made of wires, chains, flexible bands, wire ropes or the like.

The movement of the bars may be obtained in various ways, a very suitable way consisting in connecting the bars, wire-ropes or similar elements of the grate at both ends to the pins of two parallel multiple crank shafts. Forks which oscillate in the feeding box or hopper are used to distribute the dung over the grate. These forks are preferably moved from the crank shafts of the grate.

The accompanying drawings show by way of example one form of carrying out the invention.

Figure 1 is a side elevation of a manure drill attached to a dung-cart, Fig. 2 is a cross section taken at a right angle to the direction of drive, Fig. 3 is a top view of the grate.

The frame *a* of the grate is mounted on two wheels *b* and may be coupled to a dung-cart in such manner that its front end is higher than its rear end, whereby a certain inclination rearward is obtained. The axle of the wheels *b* forms a multiple crank shaft *c*. A similar crank shaft *d* is mounted in the front end of the frame and is coupled at both ends to the shaft *c* by means of rigid

connecting rods *e*. From each crank-pin of the shaft *c* extends a grate-bar or element *f* to the corresponding pin of shaft *d*, the bars or elements being mounted on the pins by means of rings. In the construction shown the grate-bars consist of wire-ropes having a certain sag.

Over the grate a box *g* provided with a feeding hopper *h* is arranged in which two or more forks *i* rotatably mounted at *k* oscillate. These forks are connected by rods *l* to levers *m*, which in turn are connected to rods *n* articulated to the rods *e*.

While the cart is driven the dung is thrown from the cart into the hopper *h*. Owing to the drive the multiple crank shaft *c* is rotated, which motion is transmitted to shaft *d* by the connecting rods *e*. At the same time the forks *i* in the box *g* are oscillated by the mechanisms *n*, *m*, *l*, *k*, and distribute the dung fed into the hopper, over the grate. By the rotation of the crank shafts *c* and *d* the wire ropes *f* are moved up and down, and are also given a vibratory or shaking motion due to their sagging. The dung is thus uniformly loosened and deposited while moving rearward on the inclined grate.

Having thus described the nature of my said invention and the best means I know of carrying the same into practical effect, I claim:

1. A manure drill comprising a frame open at the bottom and supported on wheels, a rear shaft journaled in the frame and connected with said wheels, a front shaft journaled in the frame and coupled with the rear shaft, and a distributing grate correlated with the two said shafts and consisting of elements adapted to move up and down when said wheels are rotated, substantially as described.

2. A manure drill comprising a frame entirely open at the bottom and supported on wheels, a rear shaft journaled in the frame and connected with said wheels, a front shaft journaled in the frame and coupled with the rear shaft, and a distributing grate correlated with the two said shafts and having grate bars of flexible material adapted to move up and down and simultaneously to vibrate, substantially as described.

3. In a manure drill the combination of a frame entirely open at the bottom and supported on wheels, a cranked rear shaft having a number of cranks, a front cranked

shaft with a corresponding number of cranks, a distributing grate having a number of grate bars each of which is separately correlated with a crank on the front shaft and with a crank on the rear shaft so as to move up and down when the wheels are rotated, substantially as described.

4. In a manure drill the combination of a frame entirely open at the bottom and supported on wheels, a cranked rear shaft having a number of cranks, a front cranked shaft with a corresponding number of cranks, a distributing grate having a number of flexible grate bars each of which is separately correlated with a crank on the front shaft and with a crank on the rear shaft to move up and down and to simultaneously vibrate when the wheels are rotated, substantially as described.

5. In a manure drill the combination of a frame entirely open at the bottom, a front and a rear shaft journaled in the frame, a distributing grate correlated with the shafts, a feed box arranged over the grate, forks pivotally mounted in the box, and means for oscillating the forks whereby the manure is distributed over the grate, substantially as described.

6. In a manure drill the combination of a frame entirely open at the bottom and supported on wheels, front and rear shafts journaled in the frame, rods pivotally coupling the said shafts, a distributing grate correlated with the shafts, a feed box arranged over the grate, forks pivotally mounted in the box and connected with said rods whereby said forks are oscillated as the coupled shafts revolve, substantially as described.

7. In a manure drill in combination with a manure cart, a frame entirely open at the bottom and supported on wheels, coupled

front and rear shafts journaled in the frame, and a distributing grate having a rearward inclination said grate correlated with said shafts and having elements adapted to move up and down when said wheels are rotated, substantially as described.

8. In a manure drill in combination with a manure cart, a frame entirely open at the bottom and supported on wheels, coupled front and rear shafts journaled in the frame, and a distributing grate having a rearward inclination, said grate correlated with said shafts and having grate bars of flexible material adapted to move up and down and simultaneously to vibrate, substantially as described.

9. In a manure drill, the combination of a frame open at the bottom and supported on wheels, a plurality of flexible grate bars, means operatively connected with the wheels for moving the grate bars up and down, a hopper above said grate bars, and stirring means in said hopper.

10. In a manure drill, the combination of a frame open at the bottom, a rear and a front shaft each having a number of cranks, flexible grate bars connected each at each end to certain of said cranks, rigid connecting rods connecting other of said cranks, a hopper mounted on said frame above said grate bars, stirring forks pivoted at their upper ends for movement in said hopper, links connecting said forks with said rigid connecting rods, and wheels on one of said shafts.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

ALBERT SPIES.

Witnesses:

BESSIE F. DUNLAP,
LOUIS VANDORN.