(No Model.) 7 Sheets—Sheet 1.

I. M. MILBANK.

COMBINED CART, FERTILIZING, AND SEEDING MACHINE.

No. 304,842. Patented Sept. 9, 1884.

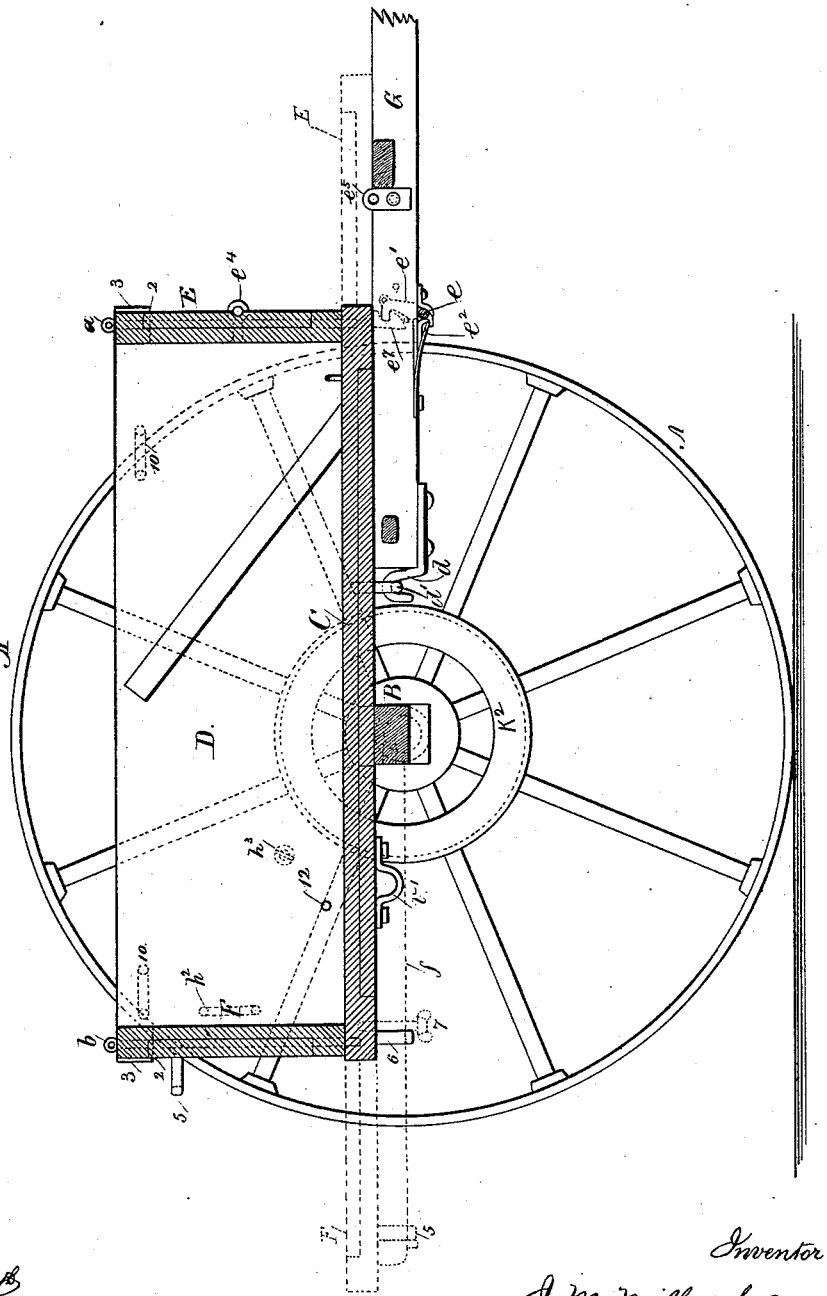

Fig. 1.

Witnesses
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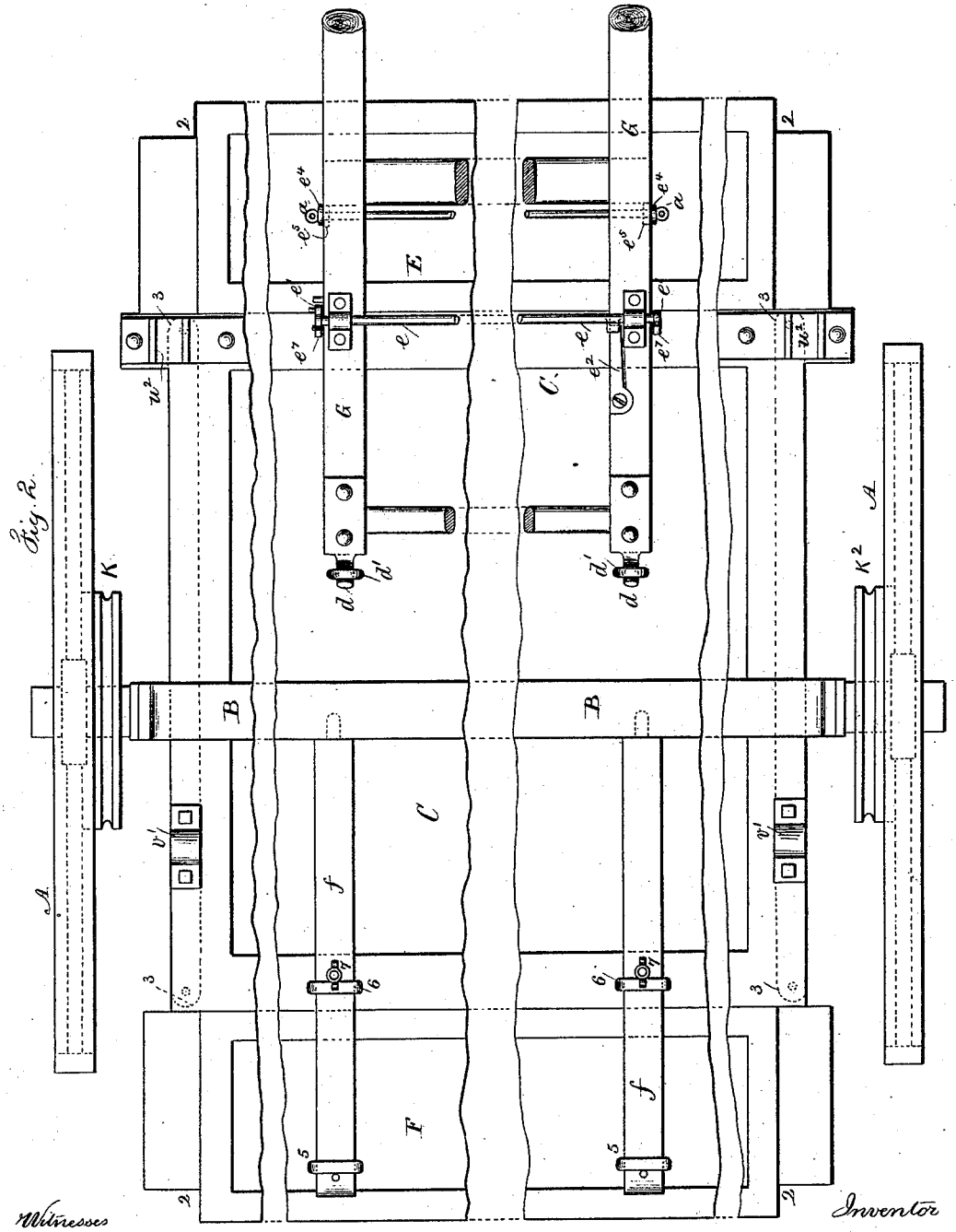
(No Model.) 7 Sheets—Sheet 2.

I. M. MILBANK.

COMBINED CART, FERTILIZING, AND SEEDING MACHINE.

No. 304,842. Patented Sept. 9, 1884.

Fig. 2.



Witnesses

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(No Model.) 7 Sheets—Sheet 3.

I. M. MILBANK.

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No. 304,842. Patented Sept. 9, 1884.

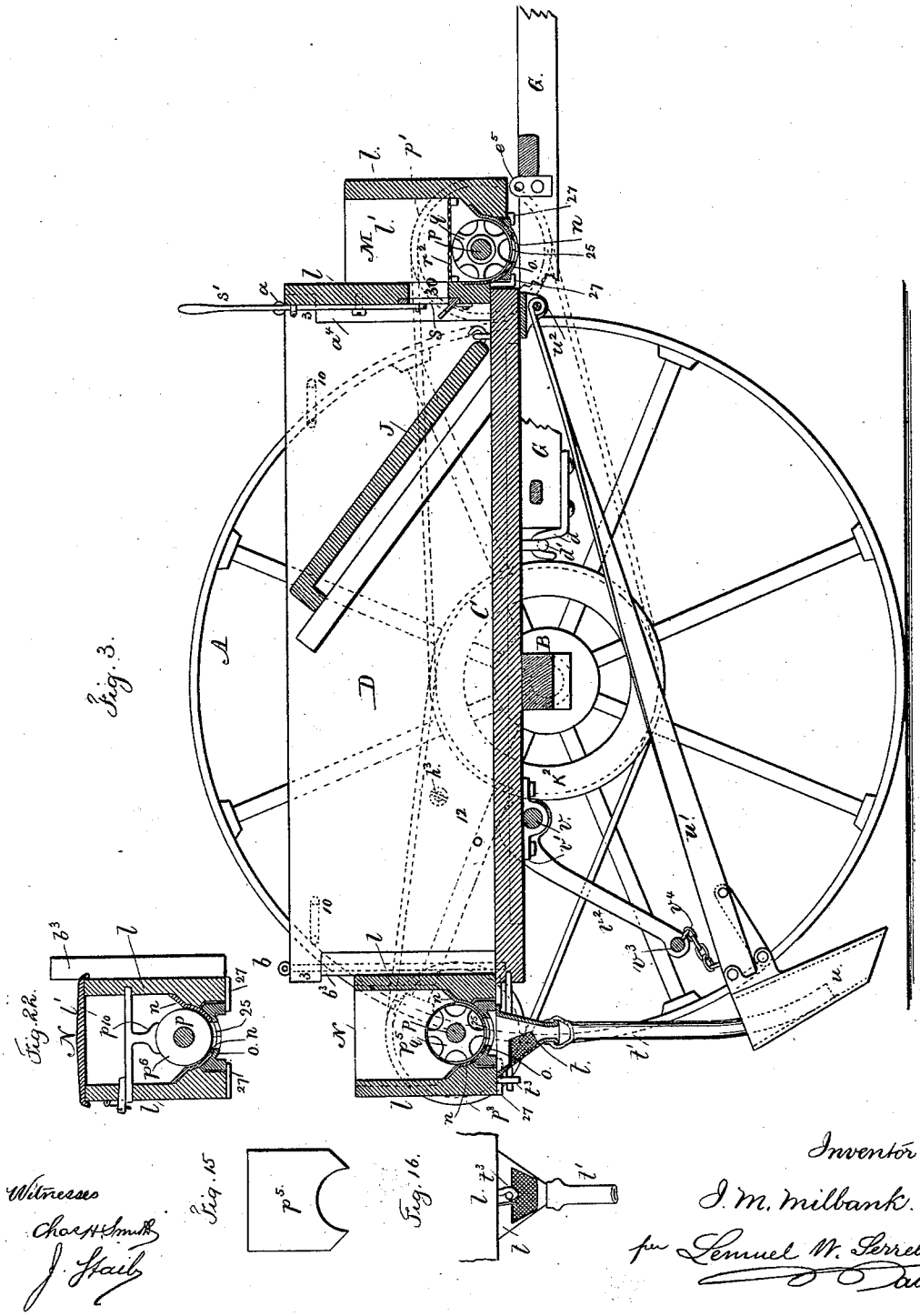

Fig. 3.

Fig. 22.

Fig. 15

Fig. 16.

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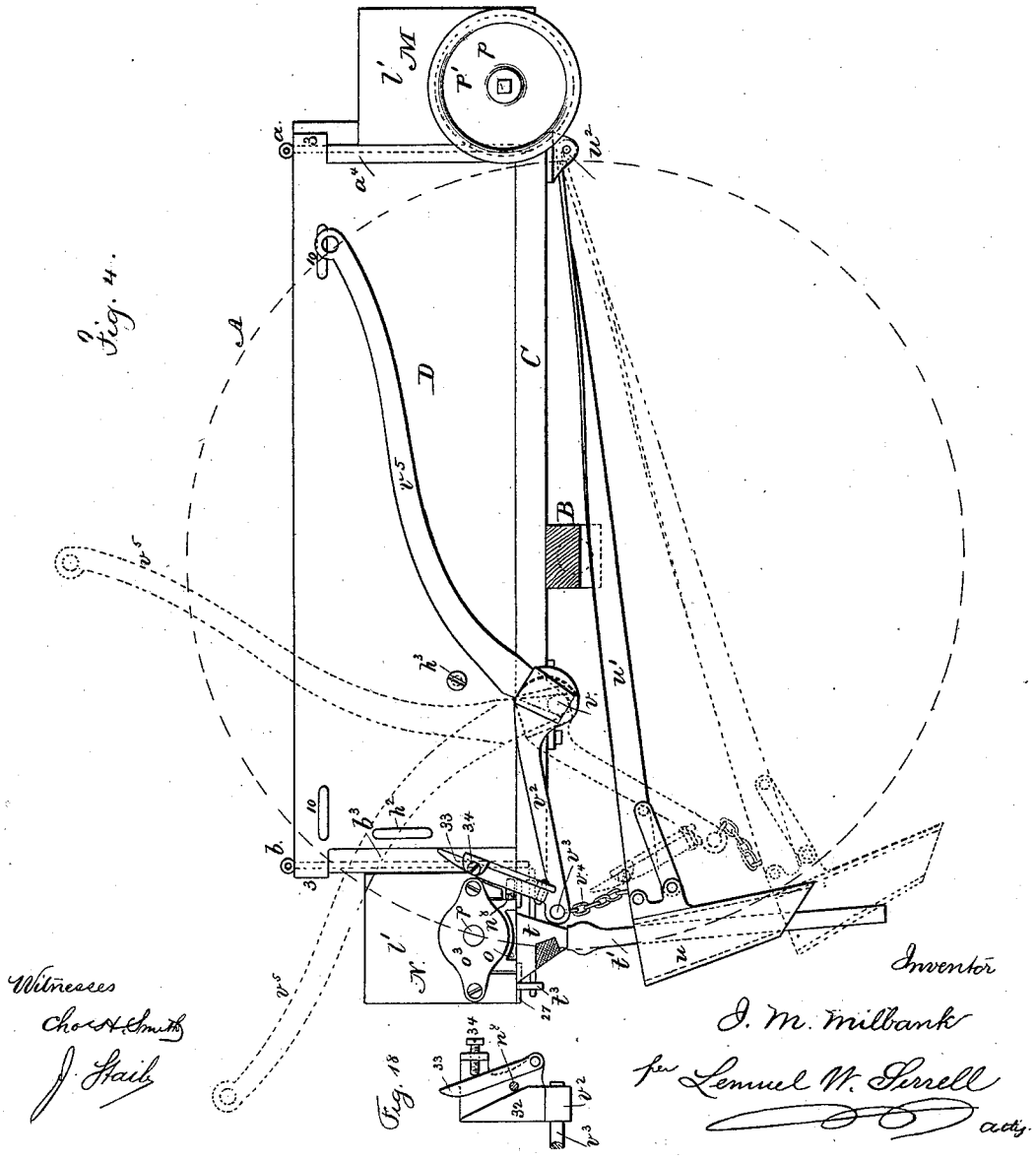
(No Model.) 7 Sheets—Sheet 4.

I. M. MILBANK.

COMBINED CART, FERTILIZING, AND SEEDING MACHINE.

No. 304,842. Patented Sept. 9, 1884.



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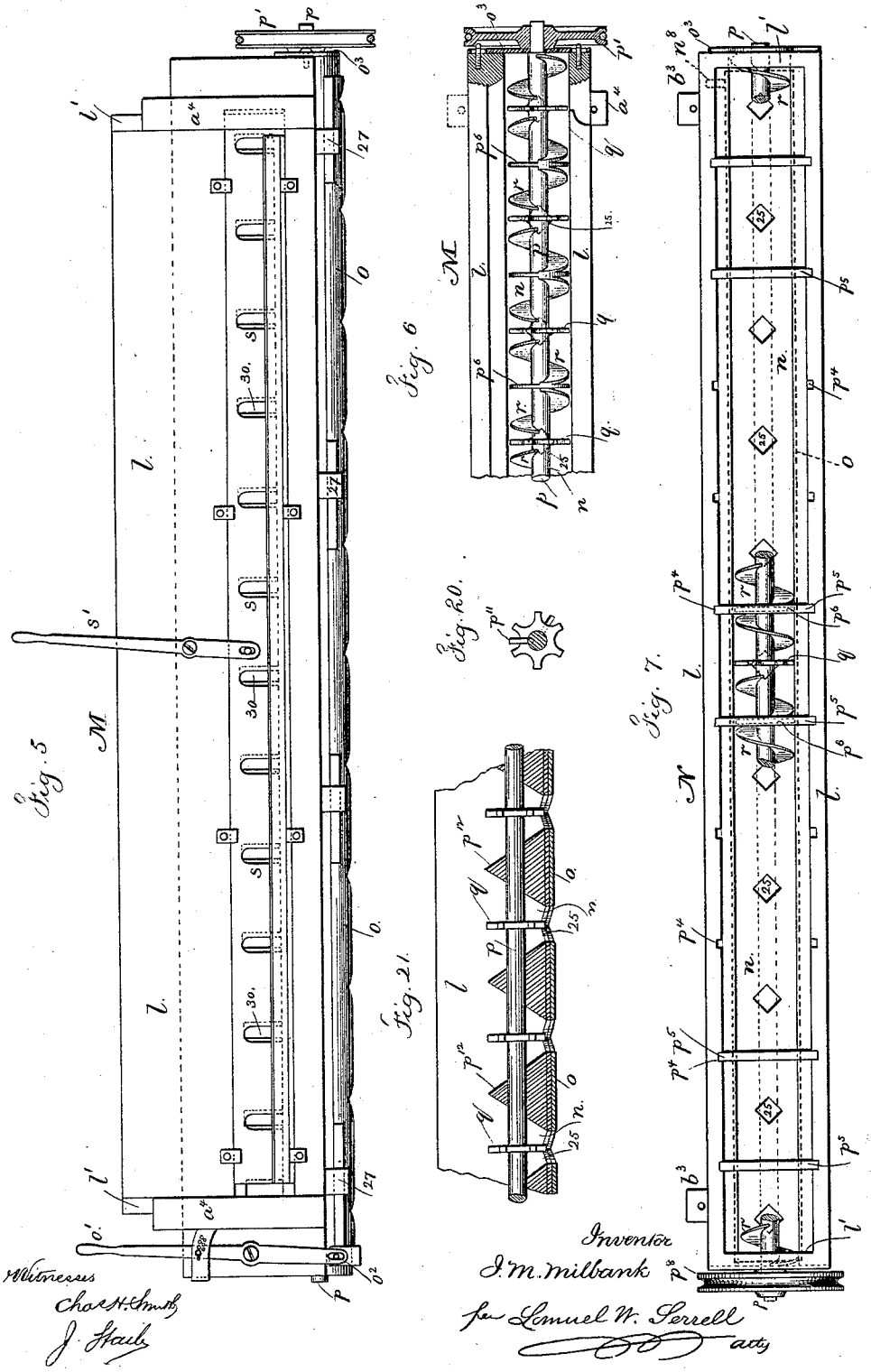
(No Model.) 7 Sheets—Sheet 5.

I. M. MILBANK.

COMBINED CART, FERTILIZING, AND SEEDING MACHINE.

No. 304,842. Patented Sept. 9, 1884.



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I. M. MILBANK.

COMBINED CART, FERTILIZING, AND SEEDING MACHINE.

No. 304,842. Patented Sept. 9, 1884.

Fig. 8.

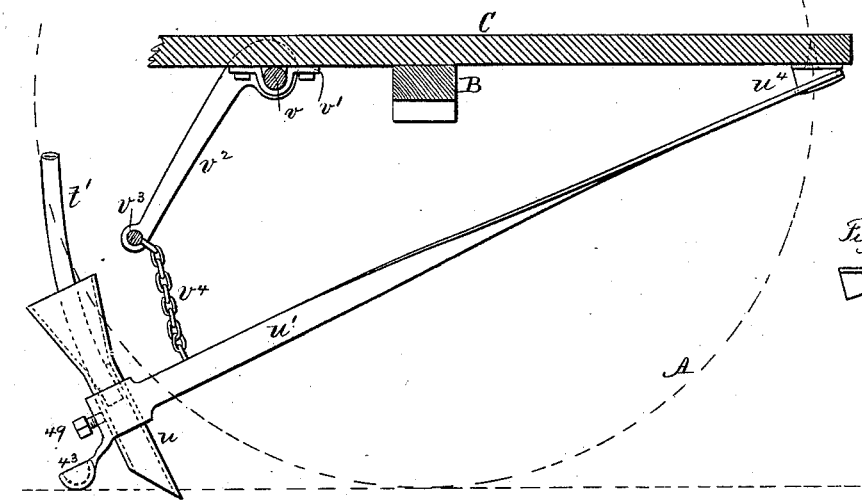


Fig. 17.

Fig. 9.

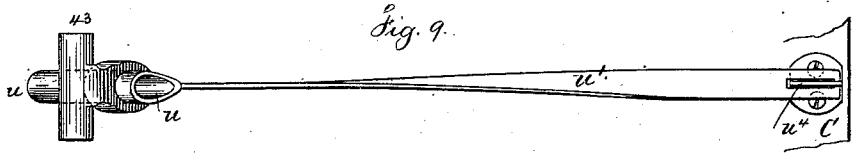


Fig. 10.

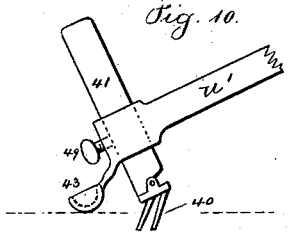


Fig. 11.

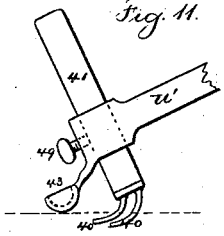


Fig. 12.

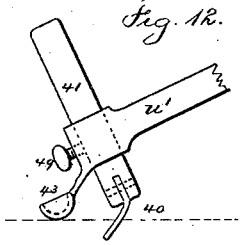


Fig. 23.

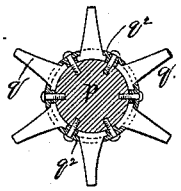


Fig. 19.

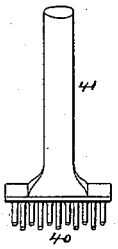
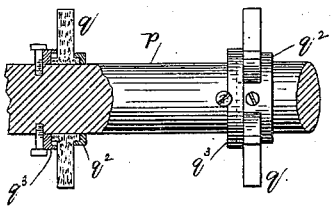


Fig. 24.



Witnesses

Chas. H. Smith

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(No Model.) 7 Sheets—Sheet 7.

I. M. MILBANK.

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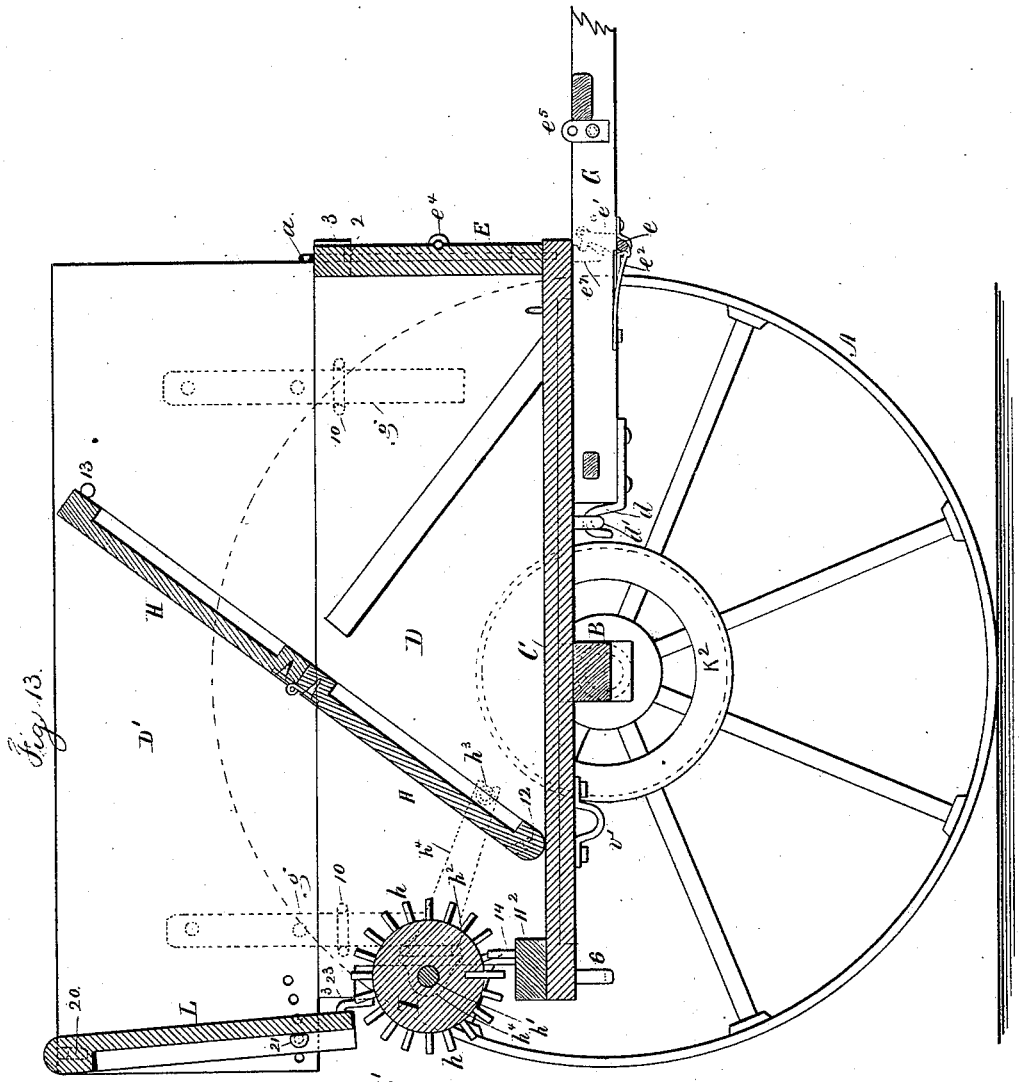

Fig. 13.

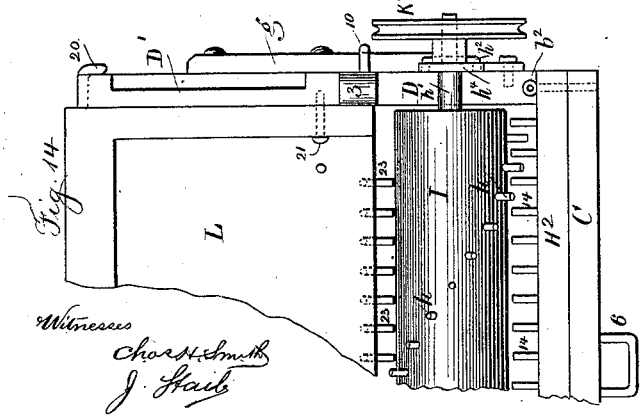

Fig. 14.

Witnesses
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Atty

UNITED STATES PATENT OFFICE.

ISAAC M. MILBANK, OF GREENFIELD HILL, CONNECTICUT.

COMBINED CART, FERTILIZING AND SEEDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 304,842, dated September 9, 1884.

Application filed February 28, 1883. (No model.)

To all whom it may concern:

Be it known that I, ISAAC M. MILBANK, of Greenfield Hill, in the county of Fairfield and State of Connecticut, have invented an Improvement in a Combined Cart, Fertilizing and Seeding Machine, of which the following is a specification.

The numerous agricultural implements that are now required in farming render it necessary to provide extensive shed-room for protecting such implements from the weather, and they are a great expense to purchase, besides which those implements that are not in use are liable to become rusty and get out of order.

The object of my present invention is to combine with a cart the various appliances needed for the different kinds of work about a farm, so that the farmer has only the special care of one main implement, and of the incidental appliances thereto, which occupy but little room, and are easily housed when not in use, and are brought out in succession and applied to the cart or carried loosely in the cart itself, and driven from place to place on the farm and used as necessity requires. To illustrate, the cart is available for carting manure or fertilizers from the heap or store-house to the place of use, and upon such cart are appliances for spreading the same. These are available for fertilizers or manure to be spread as desired. When grain is to be drilled in, the seeder is placed at the back of the cart, and if fertilizer is to be spread at the same time the fertilizer hopper or box is placed in front. If fertilizer is to be drilled in with the grain, it can be put with it in the seed-hopper, and when a greater quantity is desired for the larger grain or seed, (like corn, for instance, planted at considerable distances apart in drills,) the fertilizer can be placed in adjoining box to the corn-box, and the tube from the fertilizer-box be diverted obliquely to the furrows made for the corn. In sowing broadcast it is of course necessary to cover the grain, and it is much better to do this while the seed and fertilizer are being sowed. This obviates the usual objectionable trampling over the ground directly after the sowing is finished. I combine with the cart movable rakes and seed-sowing drills, so as to use one or both, according to the character of the work that is being done. The cart itself can be used as a dump-cart, or for the conveying of hay, fodder, ensilage, or other materials from the field.

I will first describe the cart and the peculiarities of its construction, and then the appliances that are added thereto, by means of which it is available for its various uses.

In the drawings, Figure 1 is a vertical section transversely of the cart-axle. Fig. 2 is an inverted plan of the cart, partially broken to occupy less space. Fig. 3 is similar to Fig. 1, with the seeding and fertilizing attachments. Fig. 4 is an elevation of the box of the cart with the devices for stopping the seeding mechanism. Fig. 5 is a view of the rear side of the fertilizing-hopper. Fig. 6 is a plan and partial section at one end of the same. Fig. 7 is a plan of the seeding-hopper with part of the shaft removed. Fig. 8 shows the drill for receiving the seed. Fig. 9 is an inverted plan of the same. Figs. 10, 11, 12 show the rakes and coverers. Fig. 13 represents the cart of Fig. 1 with the manure-spreader added, and Fig. 14 is a rear view of one end of the same. Fig. 15 represents one of the partition-plates used in the seed-box. Fig. 16 shows the hopper that is placed below each opening of the seed-box. Fig. 17 represents one of the pivots for the drag-bar of the seed drill or coverer. Fig. 18 shows the inclines for operating the cut-off for the seed. Fig. 19 is an elevation of one of the coverers. Fig. 20 shows one of the wipers separately. Fig. 21 is a partial section of the seed-box in a modified form, and Fig. 22 represents the guide for the feed-shaft in the seed-box. Fig. 23 is a cross-section of the shaft of the seed or fertilizer box, showing the wiper or agitator made with removable rubber teeth; and Fig. 24 is a sectional elevation of part of said shaft, showing two of the wipers or agitators thereon.

The wheels A are preferably made with a wide metal tire and spokes; but they may be of any desired character. The axle B crosses beneath the floor C of the cart, and is bolted on. The floor C and sides D are permanently connected together, so as always to remain in position. The cart is much wider than usual, so as to be adapted to receive the parts hereinafter described. The front board, E, and tail-board F are movable. They are notched at their upper angles, at 2, to pass below the projecting portions 3 of the sides, and are held

in place by rods *a b*, that pass vertically through holes in 3 and in the bottom of the cart. The pole or shafts G are connected by hooks *d* to eyes *d'* in the bottom C of the cart; or these eyes may be upon the axle, and there is a cross-rod, *e*, upon the shafts, with latches *e'* at the ends, that engage with hooks e^3 upon the under side of C. When these parts are in place, the cart can be used for carting manure, earth, or any other material, and dumping the same by unlatching the latches *e'* after the tail-board F has been removed, and allowing the cart to swing on the axle and the eyes to turn in the hooks of the shafts. The reverse movement brings the parts back to place and the spring e^2, acting above a toe upon the shaft *e*, throws the latches into the hooks and holds the parts in place.

To adapt the cart to carrying cornstalks, fodder, or ensilage, the front board, E, is to be disconnected and laid upon the shafts, as seen in Fig. 2 and by dotted lines in Fig. 1, and then the rods *a* are to be inserted through the eyes e^4 on the front board and e^5 on the shafts, to hold such front board in place as a platform or extension of the floor C of the cart. The tail-board F is to be used in a similar manner; and to hold the same I employ movable sills *f*, that are passed through loops 5 on the tail-board, and then through loops 6 on the under side of the cart-floor C, as seen in Fig. 2 and by dotted lines in Fig. 1. There should be pins at the ends of the sills *f*, passing into holes in the side of the axle, and pins or screws at 7, to prevent the sill-pieces *f* drawing out of the loops when in use.

This cart, when converted into a vehicle adapted to long fodder, ensilage, hay, or grass, is rendered still better for hay or grass by placing additional sides, D', above the sides D, so as to raise them sufficiently to prevent hay or grass coming into contact with the wheels. These additional sides, D', are connected to the sides D by stake-pieces *g*, fastened upon the sides D', (see Fig. 14 and by dotted lines in Fig. 13,) which stakes enter the loops 10 upon the sides D.

This cart is converted into a spreader for manure or coarse fertilizer by taking away the tail-board F and either allowing the front board, E, to remain in the position shown in Fig. 2 to form a platform for the attendant, or else by placing it or the back board in the position shown at E, Figs. 2 and 13, to form a box for containing surplus manure and placing the movable inclined partition H between the sides D D', hooking its notched lower edge beneath the stud 12, and resting it near its upper edge against studs 13, so as to form one side of a hopper for the manure or fertilizer. This movable side may be lifted or turned on the studs 12 to move the fertilizer toward the roller I. I also provide a movable bar, H^2, with vertical pins 14, and place the same upon the floor C and secure it by pins b^2, and I provide a roller, I, with rows of pins *h*, arranged spirally or otherwise, and at the ends of this roller there are shafts *h'* and movable bearings h^4, with tails that can be passed through the loops h^2 at the sides D of the cart, and their ends are held by bolts or pins h^3, so that the roller I, with pins, can be put into place and held securely, and it can be rotated by a belt from a pulley, K, on the wheel A, that passes around a pulley, K', on the shaft *h'*. By this means the roller, as it revolves, will, by its pins *h*, carry through between the pins 14 the manure that may be placed between the inclined hopper board or partition H and the roller I, and in so doing the manure will be delivered and scattered broadcast upon the surface.

The attendant replenishes the manure or fertilizer from time to time from the box of the cart, and it is advantageous to employ a tail-board, L, that is hung at its upper edge by pins 20, that enter notches in the top of the movable sides D', and this tail-board may be swung on the pins 20 and held at the bottom by the pins 21, that are passed into the desired holes in the curved rows of holes in the sides D'. This adjustment serves to vary the quantity of fertilizer sown by increasing or lessening the quantity in contact with the roller. I also prefer to employ a row of combing-teeth, 23, at the bottom edge of this movable tail-board, for clearing out the manure or fertilizer from between the teeth *h* on the roller I. These combing-teeth may be inclined backwardly and be longer than those shown, so as to deliver the fertilizer from between the pins. By this construction I am able to provide a large hopper at the side of and above the roller I, so that manure, plaster, or other fertilizer may be placed therein and scattered by the action of the roller as it revolves.

This device is not intended to be used with grain sown in drills, but only with broadcast sowing. The partition H being movable at its upper end allows the attendant to raise the same for throwing the manure toward the revolving roller and for agitating the fertilizer and preventing its becoming clogged.

I provide a movable box or trough, that is to be placed in the front of the cart after the front board, E, has been removed, or at the back of the cart after the tail-board F has been removed. Usually, however, two such boxes will be provided, so that one may be used for fertilizers, such as bone-dust or guano, and the other for seed or grain, and these boxes or hoppers may be used together or separately, as desired, and sometimes seed and grain will be sown at the same time from one hopper, and these two boxes or hoppers allow for one kind of seed being sown from one and fertilizers from the other. I have, for convenience, marked one box M, the other as N. Each box is preferably provided with vertical sides *l*, ends *l'*, and inclines connecting the vertical sides with the semicircular stationary bottom *n*, the latter being of metal, and in which are holes 25, and below this there is a movable curved metal slide, *o*, in which are similar holes to the holes 25. This slide *o* sets closely against

the under surface of the stationary bottom *n*, and it is supported by projections or fingers 27, or other suitable devices, that extend from the sides *l*, so that the said slide *o* is kept in place; but it may be moved endwise, so as to open the seed-delivery, by causing the holes in *o* to coincide with the holes 25 in *n;* or said holes may be closed, or partially so, by the end movement of *o*, thus regulating the delivery of grain, seeds, or fertilizer from the box or closing the same entirely. This end movement may be given to the slide *o* by the hand-lever *o'*, Fig. 5, which at its lower end acts upon the pin o^2, that projects from the slide *o;* or this movement may be given in any suitable manner, or automatically when the drills are raised, as hereinafter specified.

Within each box there is a shaft, *p*, with wipers or stirrers *q* upon it. These wipers are elastic and star-shaped, as seen in Fig. 3. They are preferably made of soft india-rubber, and one is applied upon the shaft *p* over each of the openings 25, and the ends of the wipers move close to the inner surface of the curved bottom of the box or hopper. The rubbers may be separate pieces of flexible material set into radial sockets or into openings in the shaft. It is preferable to provide in addition the propellers or conveyer-blades *r* at each side of the wipers. These conveyer-blades are short twisted or spiral sections, which are attached upon the rods or shafts *p*, the elastic wipers intervening between one conveyer and the next. These conveyers are to stand with the blades inclined in opposite directions, so that the seeds or fertilizers will be moved from each side toward the holes 25, and these conveyers scrape the bottom of the box and keep it clean. The wipers, being elastic, agitate the seeds or fertilizer at the holes and prevent the same clogging; but the grains or seeds are not broken or injured, and in case the seeds or fertilizers clog the same are freed and forced through the openings by the wipers. The conveyer-blades may be perforated with holes of any desired size, so as to lessen their action in forcing the material along in the box or hopper. It is preferable to use the boxes without covers, so that the operation of the seed or manure distributers may be examined and any defect rectified. If desired, movable covers may be provided, and the same can be carried in the cart. In some instances I provide grooves p^4 in the inner faces of the sides *l*, as seen in Fig. 7, so as to receive movable partitions p^5, that hold the seed in compartments or sections, instead of requiring a larger quantity of seed to fill the box. In these cases the under edge of the movable partition is semicircular, as seen in Figs. 3 and 15, and a disk, p^6, is employed on the shaft *p* at such partition, so as to prevent the seed scattering along in the concave bottom of the box. These disks p^6 also steady the conveyers, and support the shaft centrally in the bottom of the box. At one end of the box there is a movable head, o^3, (see Figs. 4 and 6,) so as to close up the end of the box, but to allow of the shaft *p*, wipers *q*, blades *r*, and disks p^6 to be drawn out endwise for cleaning or for changes, as may become necessary.

To prevent seed or other material getting below the wipers or conveyers and springing the shaft up, I prefer to use bearing-pieces p^{10}, Fig. 22, that rest upon the edges of the disk at suitable distances apart, or upon the shaft. These bearing-pieces should be movable. There are to be projecting pins p^{11}, Fig. 20, near the sides of the flexible wipers, to break up or remove any lumps of fertilizer or any foreign substance that might otherwise obstruct the operation of the parts in sowing seeds or spreading fertilizing material.

At the end of the shaft *p* of the box M there is a pulley, *p'*, removably attached, and by a belt to the pulley K it is rotated when the sower is in use. The shaft *p* of the box N is provided with a removable pulley, p^8, that is rotated by a belt to the pulley K^2.

When the sowing-box is used for plaster, guano, or bone-dust, I place within the same a screen, r^2, (see Fig. 3,) which prevents lumps and unbroken pieces passing down to the wipers and blades and prevents injury. The same screen may be used with seed, especially corn, to prevent pieces of the cob getting in between the revolving parts.

When the box is employed for fertilizers, it is preferable to use the one marked M, and to place it at the front of the cart in place of the front board, E, the end portions at a^4 being adapted to set below the projections 3 of the sides D and be held by the movable pins *a*. The boxes may be provided with cleats on both sides, so that they may be placed on either the front or the back of the cart. The side *l* of the box is provided with openings 30, that are partially covered by a slide, *s*, that is held under cleats, and can be moved by the lever *s'* to cover the openings more or less. The movable inclined partition J is hooked at its lower end in between the sides D, and rests on cleats and forms a hopper, into which bags of guano or other fertilizer are emptied from time to time and passed down through the said openings 30 and scattered by the sowing devices before described. This partition can be swung up toward the box, so as to press the guano or fertilizer in the hopper up toward the openings 30. If seeds or grains are to be sowed broadcast, they may be supplied in the same manner; or the grain, may be poured into the box M from the cart, or from bags. I remark that the quantity sown will depend upon the size of the openings 25, which are varied, as aforesaid, or closed, and the sizes of the pulleys p' p^8 are to be such that the proper speed of rotation is given to the shaft *p* as the cart is drawn along.

It is usually preferable to sow broadcast from the box M at the front of the cart, as it allows for the use of the rakes or coverers, hereinbefore described; but the seeds can be dropped from the box at the back of the cart

and scattered broadcast by falling upon an inclined board placed beneath the openings and sloping forward, so that the seeds will fall in front of the coverers.

The box N is represented as applied at the back of the cart and taking the place of the tail-board F and being held by the rods *b*, passing through the projections 3 and through holes in the cleats b^3, Figs. 6 and 7. The wipers, blades, and other parts of the box N are the same, substantially, as those before described. I, however, have shown the same in connection with drills that deliver the seed in rows and usually form their own furrows.

Beneath each opening 25 in the bottom of the box N there is a hopper-shaped receptacle, *t*, with an elastic or flexible tube, *t'*, passing down into the drill *u*, so as to deliver the seeds thereinto. This receptacle *t* is preferably formed with a wire-gauze in an opening at one side, so that an attendant, either walking or riding on a step at the back of the cart, can observe whether or not the seeds are dropping properly. I prefer that these receptacles *t* and tubes *t'* shall be removable, so as to be taken off when not needed. I have shown a stud at one side of *t* entering a hole in the back edge of the cart-floor C, and a spring-hook at the bottom edge of the box N, to receive and hold a stud at the other side of *t*, as represented at t^2, Fig. 16. The drill *u* is to be of any desired character. It will usually be tubular. I have shown one shape in Fig. 3 and another shape in Fig. 8. It is large enough to be drawn up over the flexible tube *t'* when the implement is going to the field or returning. Each drill is upon a drag-bar, *u'*, formed of a flat bar of metal, that extends forward and is pivoted near the under side of the front edge of the floor C. The drag-bars are flat, and near the front end the greatest width is horizontal, so that they will be sufficiently stiff. These bars are twisted, so that at the back end the greatest width is vertical where the drill or coverer is applied. In some instances each drag-bar is received between two flanges, u^2, (see Figs. 3 and 4,) and a movable pin inserted through the parts; but I sometimes provide a slot in the front end of the arm or drag-bar *u'* and fasten a flange-plate, u^4, (shown separately in Fig. 17,) upon the under side of C, the flange having a hook at its front edge, so that the drag-bar *u'* may be hooked over this flange and swung back to place, as seen in Fig. 8, the flange serving as a guide to keep the drag-bar and drill in its proper position laterally, and the hook retaining or allowing the arm *u'* to be easily disconnected. The drag-bar can be most easily applied or removed when the shafts are lowered down.

I employ a cross-shaft, *v*, of any suitable character, held in bearings *v'* beneath C, and provided with arms v^2 at the respective ends and in the middle, if required, and a lifter-bar, v^3, between the ends of v^2, and there are chains v^4 between the lifter-bar v^3 and the drag-bar or arms *u'* of the drills, so that by turning the shaft *v* the drills may be all raised or lowered together. It is preferable to employ two lengths of drag-bars, so that the drills, rakes, or coverers will be alternately forward and backward of each other. Upon one of the arms v^2 there is a socket for the reception of a lever, v^5, by which the shaft can be turned. This lever v^5 is curved, as shown in Fig. 4. It can be entered either way into the socket, so as to be convenient for the attendant in the cart, or, when turned the other way, for the attendant at the back of the cart. At the end of one of the arms v^2 there is an incline, 32, (see Figs. 4 and 18,) so that when the arm is raised up this incline comes into contact with the pin n^8 on the slide *o*, and moves the same to shut the holes 25 and stop the delivery of seed or fertilizer.

I provide a hinged opener, 33, and a screw, 34, upon a plate at the front of the incline 32. By adjusting the screw 34 the opener 33 will be moved, and as the arm v^2 is forced down this opener 33 acts in the opposite direction to the incline 32, and moves the pin n^8 and slide *o* to open the seed-discharge, thus regulating the quantity of seed sown. The extent to which the same is opened having been thus adjusted, the parts work automatically as the drills are raised and lowered at the head lands, or whenever it becomes necessary to raise or lower the drills.

I combine with the drag-bar *u'*, after removing the drill, a coverer, Fig. 10, the shank of which fits the hole in the back end of the drag-bar, and can be moved up or down and secured by the thumb-screw at any point preferred. The teeth of this coverer are made flat on the under side, the better to hold and press down the seed, and the teeth in one row are arranged to cover the spaces between the teeth in the rows next to it. These covering-teeth are sufficiently inclined backwardly, as shown, to press downward and not draw up the earth or soil. A leveler or graduator, 43, is attached to the end of the drag-bar, which regulates the depth that the grain is planted, and at the same time assists in covering and smoothing the ground. If only small or grass seed is to be sown, it is only necessary to run the graduator to cover the seed. If more weight is needed in any case, the graduator being open on the top, such can be filled with dirt. The lower part of the drill *u* is made the same size as the shank 41 of the coverer 40, so that either can be fixed at any given point by the thumb-screw 49, and the graduator in either case regulates the depth of the covered seed. Holes or indentations are made in the shanks and drills to take the points of the thumb-screws to hold them firmly in place when set. I also combine with said drag-bar other tools, held and graduated in the same manner, to scratch and rake the ground and not designed to cover grain, but more for the purpose of tearing out small weeds or breaking up the top surface of the soil, and when corn or the like is being planted in drills the intermedi-

ate drag-bars, with the scratchers, can be run at the same time to eradicate the weeds and fine the surface. It is much better to do this work at one time than to go over the ground again in some other manner soon or directly after planting the corn. In some of these scratchers the teeth are inclined more or less backward, like a smoothing-harrow, and by turning the shanks partially around, the teeth will also incline obliquely and act as pulverizers.

In Figs. 23 and 24 I have shown the wiper q as composed of separate movable rubbers having enlarged bases, that are introduced sidewise into the notched ring q^2, that is permanently fastened upon the shaft p, so that said wipers can be removed or replaced when injured or worn out, and there is a movable ring, q^3, around the shaft p, and held thereto by screws. This ring keeps the bases of the rubbers in their recesses. By loosening the screws the ring can be slipped along on the shaft when the rubbers are removed or replaced.

By combining the devices herein described with the cart the farmer has only the care of one implement, and the same is in use for some purpose or another almost all the time, and the separate parts that are brought into use from time to time, according to the season, can be laid aside when not required, and will occupy but little space. The hopper or box for seeds or fertilizers having vertical sides, there is less tendency for the seeds or fertilizer to clog than there is in the hoppers or boxes having inclined sides. The disks p^6 on the shaft p set tightly against the semicircular bottom, and form partitions that divide up such box into small receptacles adapted to very small seeds, such as radish or onion.

In Fig. 21 I have shown the partitions p^{12} with double-inclined sides and semicircular bottom to set into the bottom of the seed-box. The shaft p passes through these partitions, and the object of using such partitions is to cause the seeds to run down to the holes, over which the agitators or wipers q revolve with the shaft p. These prevent the seeds remaining in the semicircular bottom of the seed-box.

It is generally preferable to provide removable covers to the seed-boxes, as seen in Fig. 22, so that they can be put on whenever it is necessary to prevent rain getting into the boxes. These covers are most conveniently carried in the cart, so as to be available whenever necessary.

I do not herein claim the devices represented in Figs. 13 and 14, and reserve the right to make a separate application for a patent on the same.

I claim as my invention—

1. The combination, with the wheels, axle, floor C, sides D, and shafts, of the front board, E, movable rods a, and eyes e^4 and e^5, by which the front board can be held in place as an extension of the floor C, substantially as set forth.

2. The combination, with the wheels, axle, floor, sides, and shafts, of the tail-board F, rods b, sill-pieces f, and loops 6, whereby the tail-board can be held in place as a rearward extension of the floor C, substantially as set forth.

3. The combination, in a seed or fertilizer sower, of a box for the seed or fertilizer having openings in the semicircular bottom, a slide fitting said bottom, a revolving shaft, wipers or agitators of india-rubber on said shaft directly over the openings in said bottom, and inclines attached upon and revolving with said shaft and between the wipers, for feeding the seed or fertilizer to the openings in the bottom, as set forth.

4. The combination, with the box having a semicircular bottom, with holes and a slide fitting said bottom, of a revolving shaft, spiral blades, and flexible wipers on said shaft, and a grating, r^2, over the spiral blades and wipers, for the purposes and as set forth.

5. The cart provided with sides that are recessed or notched, and a movable front or tail board to fit the recessed sides, in combination with a removable box having a perforated bottom, a slide fitting the same, a revolving shaft and wipers or agitators, said box being adapted to occupy the space of the front or tail board that is removed, whereby the cart is changeable into a sower for fertilizers and seeds, substantially as set forth.

6. The combination, with the cart and the box M, for sowing seeds or fertilizers, of the semicircular bottom with openings therein, a slide fitting said bottom, the movable slide s for the openings in the sides of the box, and the movable incline J within the cart, substantially as set forth.

7. The combination, with a cart having wheels, sides, floor, and shafts, and a removable box for sowing seeds or fertilizer, of a range of removable drills, drag-bars carrying said drills, and pivoted at their front ends, and means for raising or lowering such drills, substantially as set forth.

8. The drag-bar u', having a slot at the front end, in combination with the flanged hook u^4 and the seed drill or rake, substantially as set forth.

9. The combination, with a cart having a floor, sides, shafts, and wheels, and a removable seed or fertilizer distributing box having a shaft and agitators, of the receptacles t, flexible tubes t', drills, and drag-bar, substantially as set forth.

10. The notched ring q^2, fast upon the shaft p, in combination with said shaft p, the removable rubbers having enlarged bases within said ring q^2, and the movable ring q^3, for holding the rubbers in place, substantially as set forth.

11. The combination, with the box having a semicircular bottom and openings therein, of a revolving shaft, wipers or agitators upon said shaft over the openings in the bottom, and disks p^6, also on said shaft, and fitting closely

the semicircular bottom, so as to prevent the seed or fertilizer passing between the disks and bottom, as set forth.

12. The combination, with the box having a semicircular bottom and openings therein, of a revolving shaft, wipers or agitators with flexible tapering teeth or projections, disks p^6, for separating the seed-box into compartments, and spiral blades between the disks and agitators, for feeding the seed or fertilizer to the openings in the box, substantially as set forth.

13. The combination, with a seed or fertilizer box having grooves in the sides of the box, of a revolving shaft within said box, disks p^6 upon the revolving shaft, and removable partitions p^5, fitting said grooves and having semicircular lower ends to set closely to the disks p^6, substantially as set forth.

14. The combination, with the seed or fertilizer box and the cart, of the sides D, projections 3 with holes therein, and pins b, passing through said holes and into holes in the side of the box for connecting the box with the cart, as set forth.

15. The combination, with a cart having wheels, axle, and floor, of the shafts pivoted to the cart, the rod e, bearings for said rod upon the shafts, latches at the end of said rod, and hooks e^7 upon the cart, as set forth.

16. In a combined cart, seed-sower, and fertilizer-distributer, the wheels, axle, and shaft, and a body that is wider than it is long, in combination with the removable front and tail boards, substantially as set forth.

17. The combination, with a cart having wheels, axle, sides, shafts, and removable front board, of a removable box, M, attached to the front of the cart, and having openings in its sides above the floor of the cart, a removable partition, J, pivoted to the floor of the cart, and inclines upon the side of the cart, for supporting said partition, substantially as and for the purposes set forth.

18. The drag-bar u', formed as a flat twisted bar with a socket at its end, in combination with a drill or coverer made with a shank to fit such socket, and a clamping-screw for securing the shank in said socket, as set forth.

19. In combination with the box for holding seed or fertilizer, with openings in the bottom, the slide below such openings, and the inclines 32 33, and means for operating the same, substantially as set forth.

20. In combination with the shaft v, arms v^2, rod v^3, drag-bars u', and connections between rod v^3 and drag-bars, the lever v^5 and the socket upon the shaft v for said lever, substantially as set forth.

21. The drag-bar u', with a socket at its rear end, and the removable drill or coverer, in combination with the leveler 43, secured to the socket of the drag-bar, substantially as set forth.

22. The combination, in a seeder or fertilizer-spreader, of a box for holding the seeds or fertilizer, having an opening in the bottom, the agitator or wiper q, and a shaft to revolve the same adjacent to the opening, and screw-blades r at each side of the agitator, set at opposite inclinations, to move the material toward the opening, substantially as set forth.

23. The combination, in a seed-sower and fertilizer-distributer, of a box having a semicircular bottom with openings therein, a revolving shaft, screen-blades upon said shaft, wipers or agitators of india-rubber, also upon said shaft, and pins p^{11}, projecting from the shaft and adjacent to the rubber agitators, as set forth.

Signed by me this 21st day of February, A. D. 1883.

ISAAC M. MILBANK.

Witnesses:
GEO. T. PINCKNEY,
CHAS. H. SMITH.