

(No Model.)

2 Sheets—Sheet 1.

P. P. GARDNER.

CULTIVATOR, CORN PLANTER, RAKE, AND ROLLER.

No. 343,168.

Patented June 8, 1886.

Fig. 1.

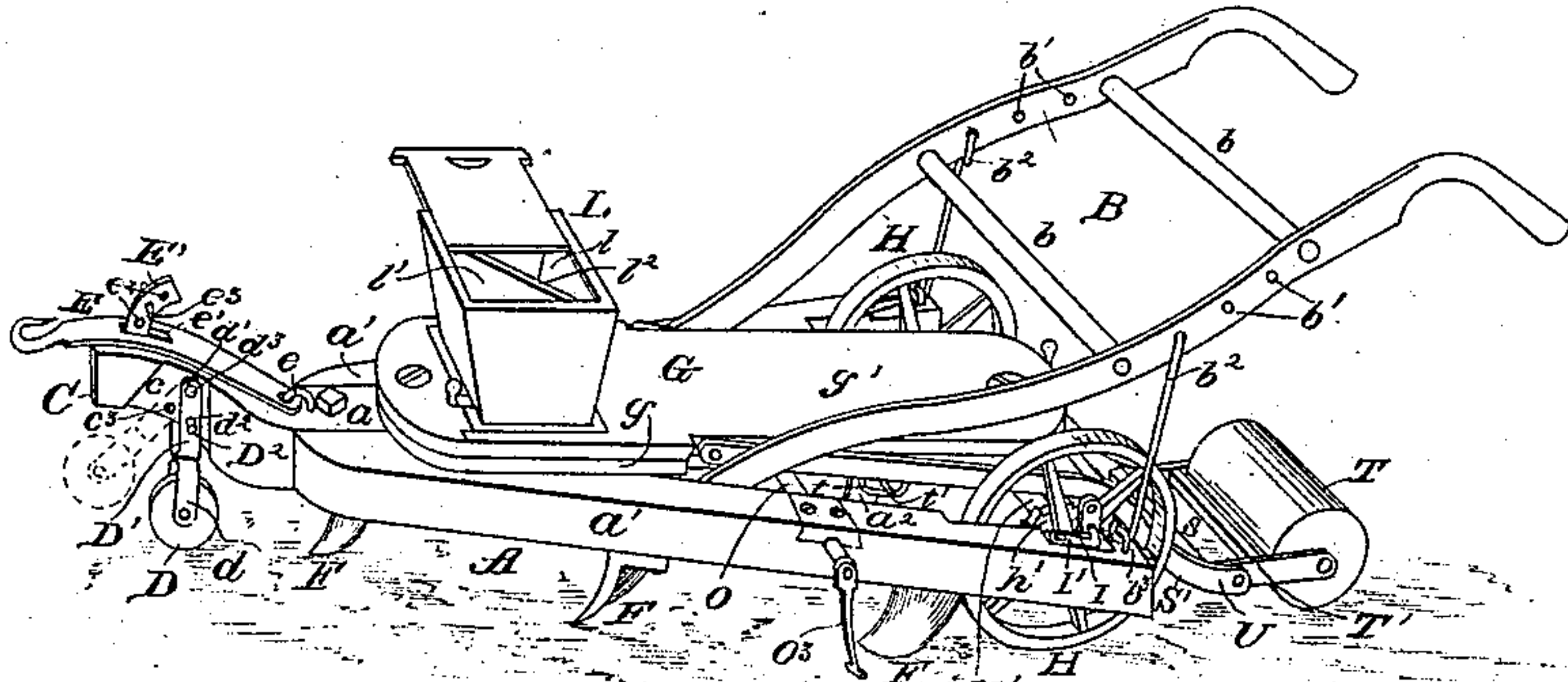


Fig. 2.

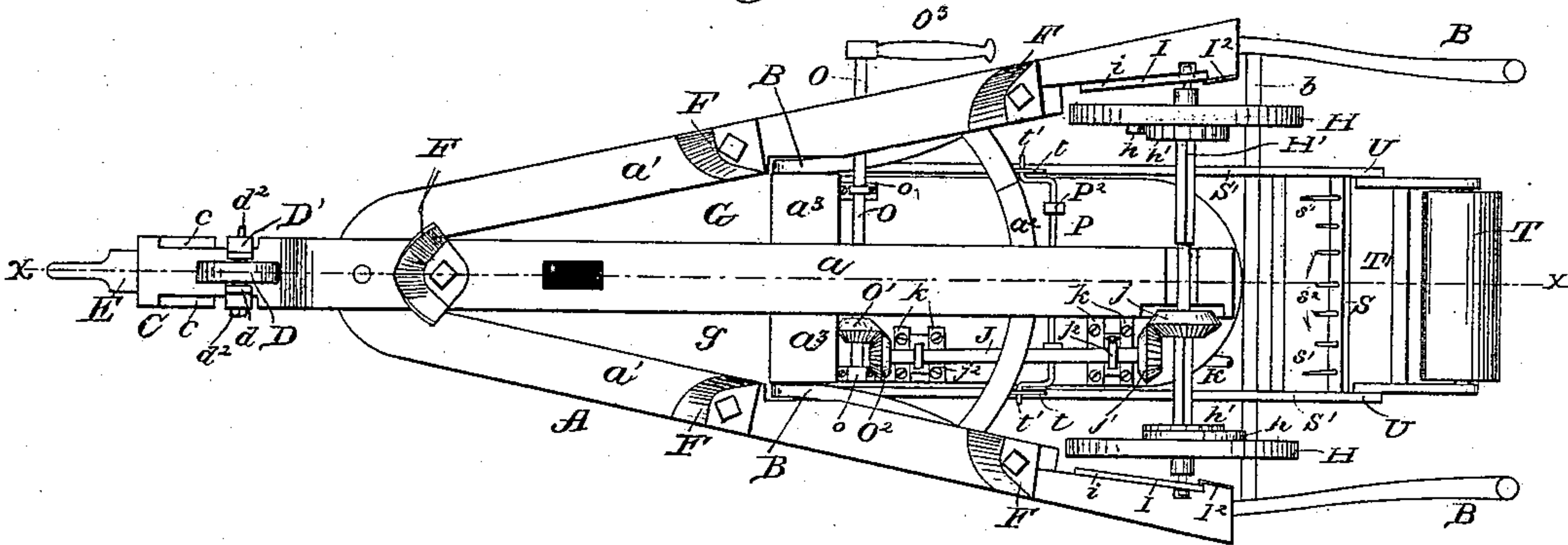
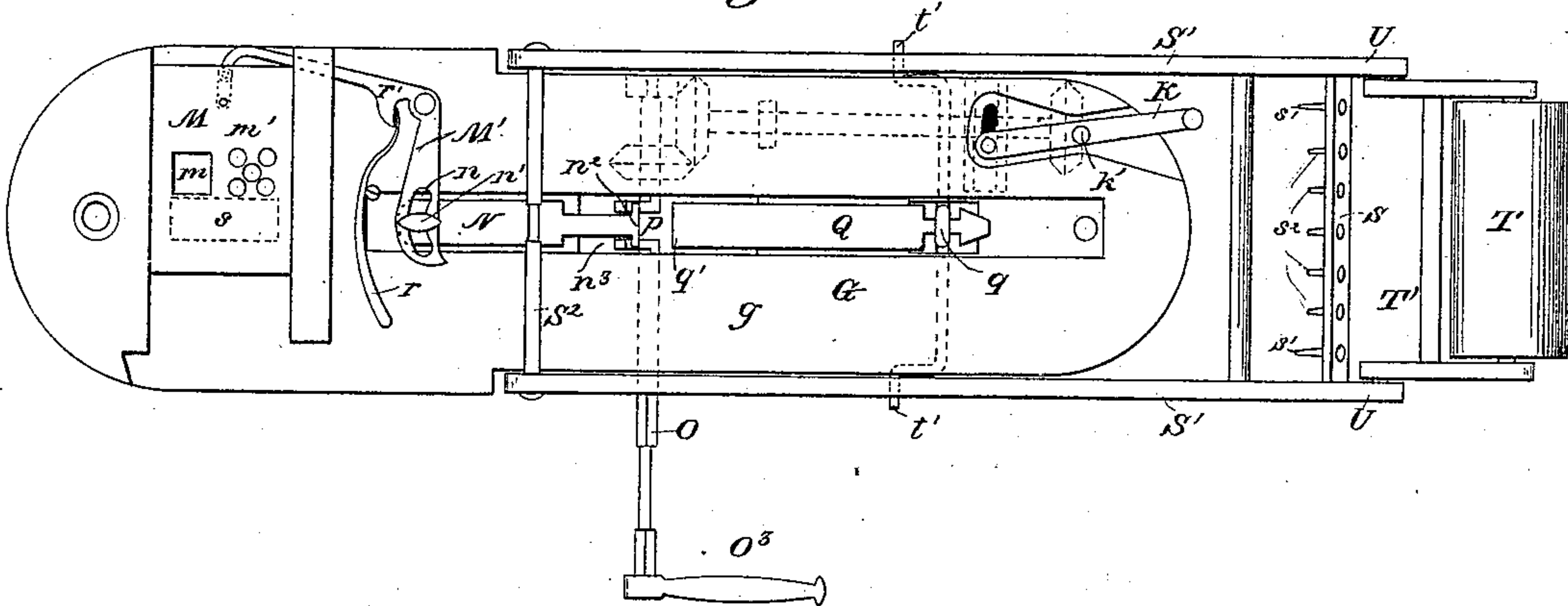


Fig. 4.



WITNESSES

Ray B. Brown
John H. Siggers

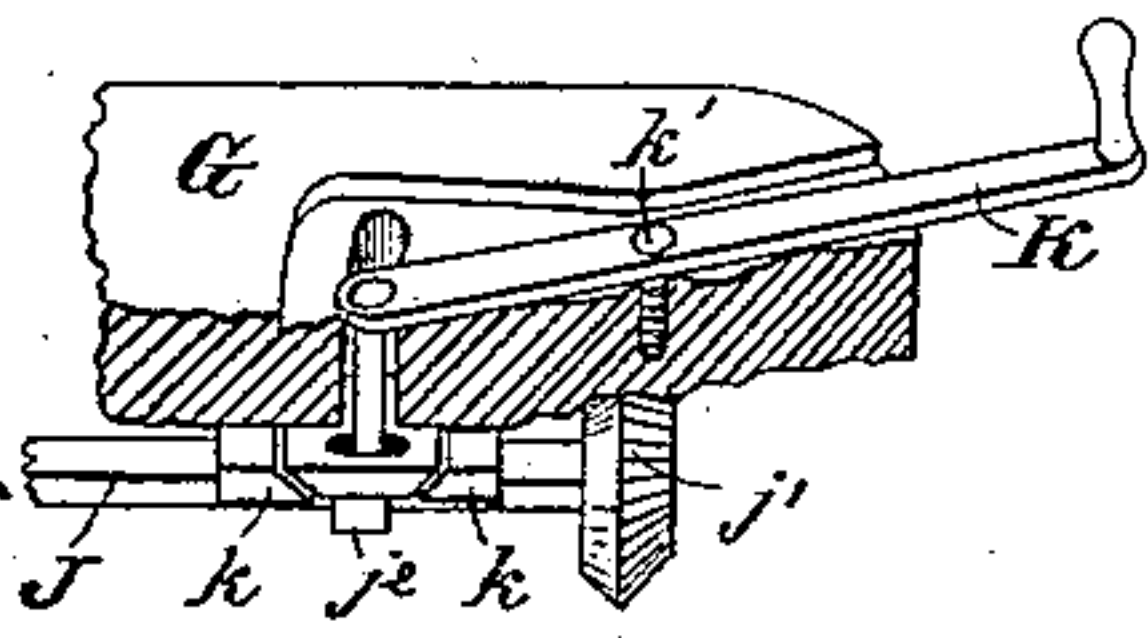


Fig. 5.

INVENTOR

Patrick P. Gardner:

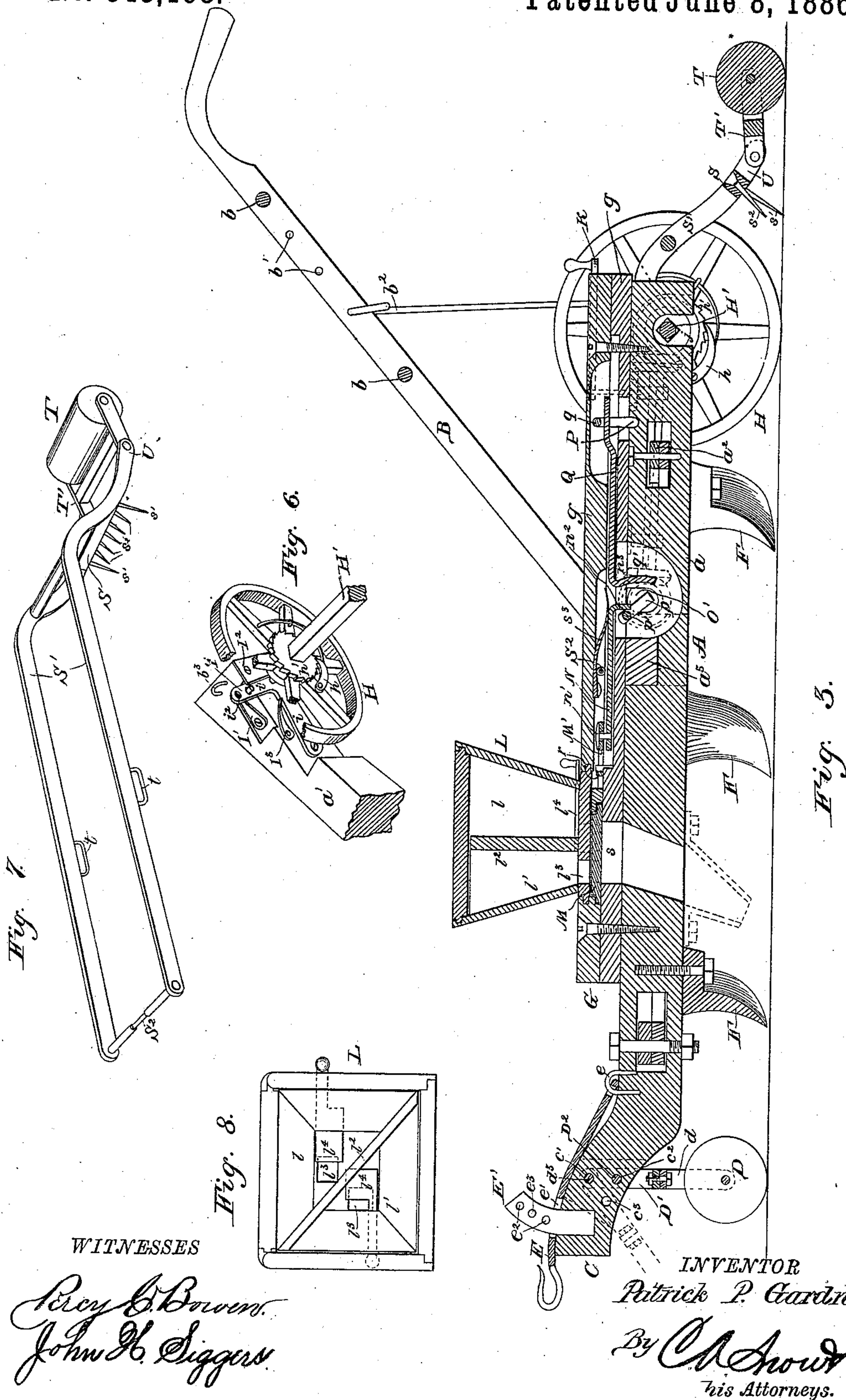
By C. Snowden
his Attorneys.

2 Sheets—Sheet 2.

CULTIVATOR, CORN PLANTER, RAKE, AND ROLLER.

No. 343,168.

Patented June 8, 1886.



UNITED STATES PATENT OFFICE.

PATRICK P. GARDNER, OF BRADFORD, ASSIGNOR OF ONE-HALF TO JAMES B. MARTIN, OF KENDALL CREEK, PENNSYLVANIA.

CULTIVATOR, CORN-PLANTER, RAKE, AND ROLLER.

SPECIFICATION forming part of Letters Patent No. 343,168, dated June 8, 1886.

Application filed October 21, 1885. Serial No. 180,538. (No model.)

To all whom it may concern:

Be it known that I, PATRICK P. GARDNER, a citizen of the United States, residing at Bradford, in the county of McKean and State of Pennsylvania, have invented a new and useful Improvement in a Combined Cultivator, Corn-Planter, Rake, and Roller, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to improvements in a combined seeding and cultivating machine; and it consists in the novel construction and combination of the various parts, substantially as hereinafter fully set forth, and specifically pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view of my improved seeder and cultivator. Fig. 2 is a bottom plan view. Fig. 3 is a vertical longitudinal section on the line $x x$ of Fig. 2. Fig. 4 is a detail view of the platform or table for supporting the operating devices. Fig. 5 is a detail of the clutch mechanism for throwing the driving-shaft out of gear with the seed-dropping devices. Fig. 6 is a view in detail of one end of the axle or driving-shaft. Fig. 7 is a view of the continuously-reciprocating rake and the pressure-roller. Fig. 8 is a top plan view of the hopper with the slide therein.

Referring by letter to the annexed drawings, in which similar letters of reference denote corresponding parts in all the figures, A designates the frame of my improved cultivator and seeder, which consists of a middle longitudinal beam, a , and two side beams, a' , arranged in an inclined position or at an angle thereto, and in the same horizontal plane, the forward ends of said inclined beams a' being secured or connected to the middle beam, a , at or near the front end thereof. At or near the middle the inclined side beams are connected and braced by a curved bar, a^2 , and the middle beam, a , is provided with bearing-blocks or shoulders a^3 , to which the forward lower ends of the handles B are pivotally connected. The forward end of the middle beam, a , is bent upwardly or provided with an inclined neck, C. The vertical side faces of the bent end of the middle beam are recessed as at c and have transverse apertures c' c^2 c^3 .

D is a bearing-roller journaled in a bracket,

d , pivoted or swiveled at its upper end in a supporting-band, D' , having apertures d' d^2 , through the upper end of which a pin, d^3 , passes to pivotally connect said band D' to the inclined neck or end of the middle beam. The roller is held in a vertical position when the device is used as a seeder by means of a pin, D^2 , that passes through the lower aperture, d^2 , of the band D' and the aperture c^2 of the beam; and when the machine is used as a cultivator the band is adjusted so as to bring its lower aperture, d^2 , to register with the aperture c^2 , and thus bring the roller out of contact with the ground.

E designates a draft-link pivotally connected at its rear end to a bracket or loop, e , and having a longitudinal slot, e' , near its front end, through which slot a curved arm, E' , passes. A wiffletree is connected to an eye at the front end of the link E, to draw the machine forward, and the curved arm E' has two or more apertures, e^2 , through one of which a stop pin or bolt, e^1 , passes to limit the play of the said draft-link E. The upper ends of the handles B are braced and connected by cross-bars b , and the side bars of said handles are provided with two or more apertures, b' , through which the upper ends of the brace-rods b^2 are passed to secure the handles firmly and securely in position, while at the same time permitting them to be adjusted nearer to or farther from the frame of the planter, the lower ends of said brace-rods b^2 being pivotally connected to eyes b^3 , secured to the rear ends of the side beams of the frame A.

F designates shovels or cultivator-blades secured to the under surface of the middle and side beams, a a' , and arranged as shown in Fig. 1. When the machine is to be used as a planter, only the first three cultivator-blades are employed; but when the seed and fertilizer dropping devices are to be thrown out of use and the machine used as a cultivator all of the cultivator-blades, five in number, are used to throw the earth upon the corn or hills.

G designates a table or platform secured upon the main frame and supporting the hopper, its seed-slide actuating devices, the marker, and the continuously-moving raker-frame, as will be presently described. The table is preferably made in two longitudinal sections,

g g', which are detachably fitted and bolted together and to the main frame A, to permit ready access to the various parts for the purpose of repairs, &c.

H designates the driving and supporting wheels to the rear end of the main frame, said wheels being loosely mounted on a shaft, H'. The driving-wheels are provided with pawls *h*, that are normally kept in engagement with ratchets *h'* on the shaft H', to rotate the same; and the ends of this shaft are supported in the lower ends of supporting-brackets I. These brackets comprise two arms, *i i'*, arranged at an angle to each other, the arm *i* of each bracket being pivoted at its front end to a recessed portion of the side beams of the main frame and the arm *i'* thereof having two or more apertures, *i²*, through one of which a locking-latch, I', is adapted to pass to hold the axle securely in place while permitting of its vertical adjustment, said latch I' being pivoted to the upper face of the rear ends of the side beams of the frame. The arms *i'* are arranged between the inner faces of the side beams and guide-plates I², and when the latch I' is out of engagement therewith the shaft or axle and driving-wheels are free to move or reciprocate up and down on the pivot of the arms *i*, and thus accommodate the main frame for use as a cultivator, to permit the blades to enter the ground to any desired depth; but when the machine is to be used as a seed-planter the latches I' are thrown into engagement with one of the apertures of each of the arms *i*, a pawl, I³, limiting the upward adjustment of the brackets I, by fitting in the angle formed by the arms *i i* thereof and pivoted to the inner faces of the side beams, *a'*. The driving shaft or axle carries at or near its middle a beveled gear wheel or pinion, *j*, that meshes with a similar pinion, *j'*, on a shaft, J, journaled in boxes *j²*. These boxes *j²* are mounted or secured so as to slide laterally in ways or blocks *k*, secured to the under surface of the table section *g*, and to the rear one of these boxes *j²* is connected a pin of a lever, K, pivoted at *k'* to the table-section *g*, and extending rearwardly beyond the same within convenient reach of the operator, who grasps the handles B to guide the machine, whereby, when the lever K is adjusted, or its front end thrown inwardly toward the middle of the table-section *g*, the journal-box *j²* of the rear end of the shaft J will also be thrown or moved toward the middle of the table and out of its normal position, and will carry with it the rear end of the shaft J, and throw the bevel gear-wheel *j'* of said shaft out of engagement with the wheel *j* of the driving-shaft, this mechanism being provided for throwing the driving-shaft out of engagement with the seed-slide-actuating devices.

L designates the hopper, secured upon the front end of the table G, and divided into two compartments, *l l'*, by a vertical partition, *l²*, one of said compartments being adapted to receive corn or other seed and the other to re-

ceive a fertilizing substance. Each of the compartments of the hopper has a discharge-opening, *l³*, in its bottom, and each opening is covered or protected by an independent slide, *l⁴*, which slides work in grooves provided therefor in its bottom. Each slide *l⁴* can be adjusted to any desired distance, by hand, to regulate the amount of corn or fertilizer to be distributed, and they can be used to shut off the discharge of seed or fertilizer, or they may be adjusted to permit only seed or fertilizer to be sown independently of each other.

M designates the reciprocating seed-slide, arranged to slide in ways or guides beneath the hopper, to permit the discharge at predetermined and at regular intervals, and to secure an even and regular planting of the corn and equal distribution of fertilizer. The reciprocating slide M is provided at one edge with a single aperture or discharge-opening, *m*, which lies beneath the discharge-opening in the compartment for the corn; and at its opposite edge said reciprocating slide is provided with a series of smaller openings, *m'*, which are arranged to register with and cut off the material from the discharge-exit from the fertilizer-compartment of said hopper.

M' designates a bell-crank lever pivoted to the table-section *g* at the junction of its two arms, one arm of said lever being pivotally connected to the reciprocating seed-slide M, to actuate the same, and the other arm thereof is slotted at its other end, as at *n*, and fitted over a headed stud, *n'*, to pivotally connect the said arm to a reciprocating bar or link, N. This reciprocating bar or link N is fitted to slide longitudinally of the table within a groove formed in the lower section, *g*, thereof, and at its rear end it has a lip or tongue, *n²*, that projects through a slot or cut-away portion, *n³*, of the lower table-section, *g*, at or near the middle thereof.

O designates a shaft arranged transversely across the lower surface of the table G and the slot *n³* in the lower section thereof, and said shaft journaled in bearings *o* at the sides of the table. This shaft is provided with a bevel gear-wheel, O', that meshes with a similar gear-wheel, O², on the rear end of the shaft J, and said shaft O is revolved through motion from the driving-shaft H', transmitted by the shaft J and the bevel gear-wheels *j j'* O' O², as clearly shown in Fig. 2. The shaft O projects at one end beyond the machine-frame and table, and is provided with a marker-arm, O³, that is rotated and strikes the ground at regular predetermined intervals as the shaft O is revolved, and said shaft is further provided with bent crank-arms *p*, that are connected near their lower ends by a cross-bar, *p'*, said crank-arms revolving with the shaft and working in the slot or cut-away portion *n³* of the table.

P designates a shaft journaled in bearings *p²* on the lower face of the platform, and having a crank-arm, *q*, at its middle that projects through a slot in the table-section *g*, and

said arm is pivotally connected to a link, Q, that works or reciprocates in a groove or guide in the upper surface of the table-section, and at its front end said link Q is provided with a tongue, q' , that projects through the opening or slot n^3 , and is normally kept in the path of rotation of the crank-arm of the shaft O, and serves to cause the shaft P to oscillate in its bearings for a purpose presently described.

The link N has its lip also normally held in the path of rotation of the crank of the shaft O by means of a spring, r , rigidly secured at one end to the table-section g and bearing at its opposite free end on a shoulder or lug, r' , of the bell-crank M' , this spring serving to hold the reciprocating seed-slide through the medium of one arm of the bell-crank lever, so that its discharge-openings $m m'$ do not register with the openings in the bottom of the hopper to cut off the flow of seed and fertilizer, and in addition to holding the tongue of the link in the plane of rotation of the crank of the shaft O, so that when the tongue of the link is struck by the crank in its rotation the link N will be drawn rearwardly, turn or oscillate the bell-crank lever M' on its pivot, and reciprocate the seed-slide so that its discharge-apertures $m m'$ will register with the apertures in the bottom of the hopper and with the openings s , formed or cut in the table-section g , to permit the passage of the corn and fertilizer from the platform or table and hopper to the ground, and after the crank has ceased to act upon the tongue of the link to draw it rearwardly the spring r serves to force said link forwardly again to its normal position, and to draw the seed-slide apertures from coincidence with hopper and platform apertures, to cut off the discharge of seed and fertilizer.

S designates a rake bar having a series of teeth, $s' s^2$, arranged to act upon the ground, to clear the furrow of leaves, stones, &c., said rake-bar being arranged in rear of the machine and supported in curved side bars, S' , which extend upwardly and forwardly of the machine-platform. The side bars, S' , are connected together at their front ends by a cross-bar, S^2 , which fits between the table-sections $g g'$ and in a groove in the lower surface of the upper section, g' . The side bars lie alongside of the side edges of the table or platform, and are provided with loops or eyes t at or near the point where the ends of the shaft P project from the side edges of the platform or table, the ends of said shaft being bent to form crank-arms t' , which engage or fit in the loops t of the raker-frame $S' S^2$, and serve to reciprocate said frame to give the rake-bar S a continuous vertical movement when the shaft P is oscillated through motion from the crank-shaft O, transmitted by the link Q. The weight of the raker-frame serves to keep the crank-arm q of the shaft P normally elevated and in its forward position, and thus keep the link Q normally pressed forward, so that its tongue lies in the plane of rotation of the crank-shaft

O, except when its said link is forced rearwardly by the crank striking its tongue, and thus oscillate the shaft P and reciprocate the raker-frame. The front cross-bar, S^2 , lies over the rear end of the link N, and is normally kept depressed upon said link, to keep the latter in place by means of a spring, s^3 , secured at one end within a recess in the upper table-section, and free at its other end to bear on said link N and cross-bar S^2 , which serves as a pivot for the raker-frame in its reciprocating movements. The seed-slide and raker-frame reciprocating devices are all hid from view and protected by the upper table-section, g' , which is recessed or cut away on its under surface at proper points, to permit of the proper movement of the various devices, said section g' being detachably secured or bolted to the table-section g , to permit its ready removal for the purpose of repairs, &c.

T designates a roller journaled in the side bars of the roller-frame T' , the front ends of which are pivoted to arms U in rear of the raker-bar S, and said frame and roller are free to work or move independent of the raker-bar and frame, being loosely connected to said frame and of such a weight as to keep the roller in contact with the ground at all times. The gear-wheels $j j'$ are keyed on their shafts $H' J$, so as to permit of their removal and exchange for similar wheels having a different number of teeth, so that the seed-slide can be operated more rapidly or at a slower rate, to vary the distance apart at which the seed and fertilizer are distributed, as will be very readily understood.

The machine may be converted into a drill by attaching a conducting tube or spout or boot to the under surface of the middle beam, a , so that it will register with the discharge-opening s therein, and guide the seed and fertilizer to the hill. The teeth s' of the rake-bar S are arranged at each end of the said bar, and are longer than the teeth s^2 thereof, which are arranged between the outer teeth, s' . The shorter teeth, s^2 , serve to gather up the stones and leaves, &c., and deposit them at regular intervals by the reciprocation of the raker-frame, and when the machine is used as a cultivator the raker-frame ceases its reciprocatory movements, and the rake-teeth s^2 carry the stones and leaves, &c., with it, until, when crossing a hill, the longer teeth, s' , elevate the frame and bar a sufficient distance to permit the stones, &c., to escape from the teeth s^2 , and are deposited in the furrow between the hills.

The operation of my invention is obvious. When the machine is to be used as a corn-planter and fertilizer-distributor, the seed-slides t' are properly adjusted to regulate the quantity of seed and fertilizer to be distributed, and the bevel-wheel j' of the shaft J thrown into engagement with the bevel-wheel of the shaft H' . When the machine is drawn across the field (the horse being attached to the draft-link E and the caster-wheel D, and bearing-

wheels H adjusted in a vertical position to bring the cultivator-blades out of the ground) the driving-shaft H' is rotated, which in turn revolves the shaft J and the crank-shaft O, the crank of which acts alternately upon the tongues of the links Q and N. The link N oscillates the bell-crank lever M', which reciprocates the seed-slide, and the slide, link, and bell-crank are forced back to their normal positions by the spring r, to bring the tongue of the link in the path of the crank to be acted upon again, to repeat the above movements. The tongue of the link Q, when struck by the crank of the shaft O, forces said link rearwardly and oscillates the shaft P, which in turn reciprocates the raker-frame, giving a continuous vertical movement thereto.

If it is desired to employ the machine for cultivating purposes, the bearing-wheel D is adjusted so as to be out of contact with the ground and the shaft H' is adjusted so as to bring its wheels H above the plane of the cultivator-blades, to permit them to enter the ground to the required depth, or said shaft is disconnected from the latches I', and given a free up-and-down movement in connection with its pivoted supporting-brackets to accommodate itself to the surface of the ground.

In moving the machine from one field to another the driving-wheel pawls are disconnected from the ratchets of the shaft H', and said driving-wheels are permitted to rotate freely on the shaft without affecting the other parts of the machine.

Various changes in the form and proportion of parts and details of construction can be made without departing from the principle or sacrificing the advantages of my invention.

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

1. The combination of a frame, a vertically-movable rake-frame pivoted thereto, the seed-dropping devices, a driving-shaft, a crank-shaft, an intermediate shaft geared with the driving and crank shafts, and mechanism intermediate of the crank-shaft and the rake and seed-dropping mechanism for simultaneously operating the latter, substantially as described.

2. The combination of a frame, a continuously-movable rake, mechanism on the frame for actuating the rake, and a roller pivoted to and movable independently of the rake-frame, substantially as described.

3. The combination of the frame, a continuous vertically-moving rake, the seed-dropping mechanism, and a roller pivoted to the rake-frame, substantially as described.

4. The combination of the frame, the seed-dropping devices, a marker actuated simultaneously with the seed-dropping mechanism, and a vertically-moving rake, substantially as described.

5. The combination of the frame, the seed-dropping mechanism, a marker operated simultaneously therewith, a continuous verti-

cally-moving rake, and a roller pivoted to the rake-frame, substantially as described.

6. The combination of the frame, a driving-shaft mounted therein, a crank-shaft geared to the said driving-shaft, a continuous vertically-moving rake, and connections between said crank-shaft and the rake for operating the latter, substantially as described.

7. The combination of the frame, a driving shaft, a crank-shaft geared to the driving-shaft, a reciprocating seed-slide, a bell-crank lever connected to said slide, and a link connected to the bell-crank lever and normally held in the path of rotation of the crank of the shaft, substantially as described.

8. The combination of the frame, a driving-shaft, a crank-shaft geared therewith, a continuous vertically-moving rake, an oscillating shaft connected with the rake-frame, and having a link normally in the plane of rotation of the crank, a reciprocating seed-slide, a spring-actuated bell-crank lever connected to said slide, and a link pivotally connected to the bell-crank lever and maintained thereby in the plane of rotation of the crank-shaft, substantially as described.

9. The combination of the frame, a driving-shaft, a crank-shaft, an intermediate shaft geared to the driving and crank shafts, the seed-dropping mechanism, a reciprocating rake, and a lever for throwing the driving and intermediate shafts out of engagement, substantially as described.

10. The combination of a frame, a driving-shaft journaled therein, a crank-shaft, also journaled on the frame, an intermediate shaft arranged at right angles to the driving and crank shafts and geared thereto, laterally-movable boxes in which the intermediate shaft is journaled, a pivoted lever for actuating the boxes to throw the intermediate shaft in and out of gear with the driving and crank shafts, the seed-dropping mechanisms, and intermediate devices between the crank-shaft and the seed-dropping devices for actuating the latter, substantially as described.

11. The combination of the frame, a driving-shaft mounted therein, the seed-dropping mechanism, a crank-shaft for actuating the said mechanism, an intermediate shaft geared to the driving and crank shafts, a reciprocating rake-frame carrying rake-teeth, an oscillating shaft journaled in the frame and having crank-arms connected with the rake-frame, a link pivoted to the oscillating shaft and arranged in the plane of rotation of the crank-shaft, and a roller mounted in a frame and pivotally connected with the reciprocating rake-frame, substantially as described.

12. The combination of the frame, a driving-shaft journaled therein, a crank-shaft, an intermediate shaft geared to the driving and crank shafts, sliding journal-boxes in which the intermediate shaft is mounted, a pivoted lever connected with one of said sliding boxes, the seed-dropping mechanism, an oscillating shaft having a link arranged to be struck by

the crank-shaft, a hinged rake-frame connected with bent arms of the oscillating shaft, and a roller pivoted to the rake-frame in rear of the rake-bar supported therein, substantially
5 as described.

13. The combination of a frame, a driving-shaft carrying the bearing-wheels, the brackets I, having the driving-shaft journaled therein, and each comprising two angular arms,
10 one of which is pivoted to the frame and the other perforated, a pivoted latch for each bracket adapted to enter one of the apertures

of one arm thereof and to adjust the bracket and driving-shaft vertically, and pivoted pawls engaging one arm of the brackets, substantially as described. 15

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

PATRICK P. GARDNER.

Witnesses:

MOSES SULLIVAN,
A. P. HUEY.