(No Model.) 3 Sheets—Sheet 1.

W. H. GROVE.

WHEEL PLANTER.

No. 382,644. Patented May 8, 1888.

Fig. 1.

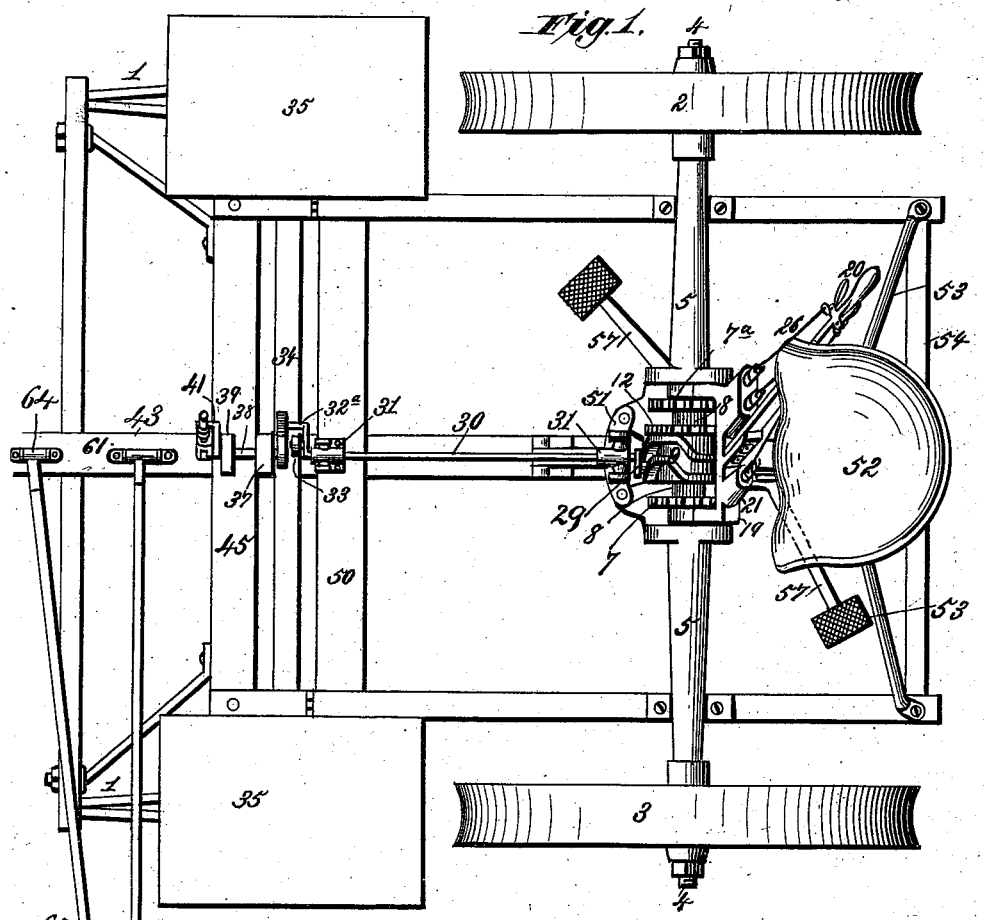


Fig. 2.

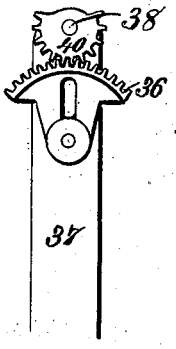
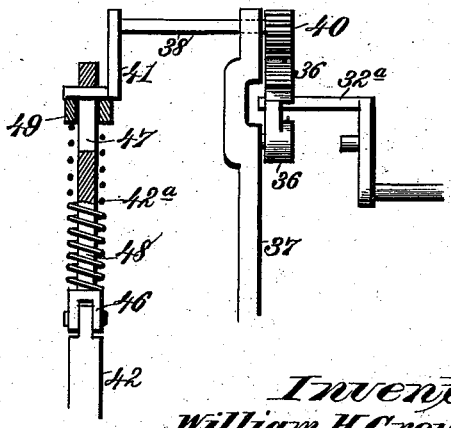


Fig. 3.



Witnesses.
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Inventor.
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By James L. Norris.
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(No Model.)

3 Sheets—Sheet 2.

W. H. GROVE.

WHEEL PLANTER.

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Fig. 4.

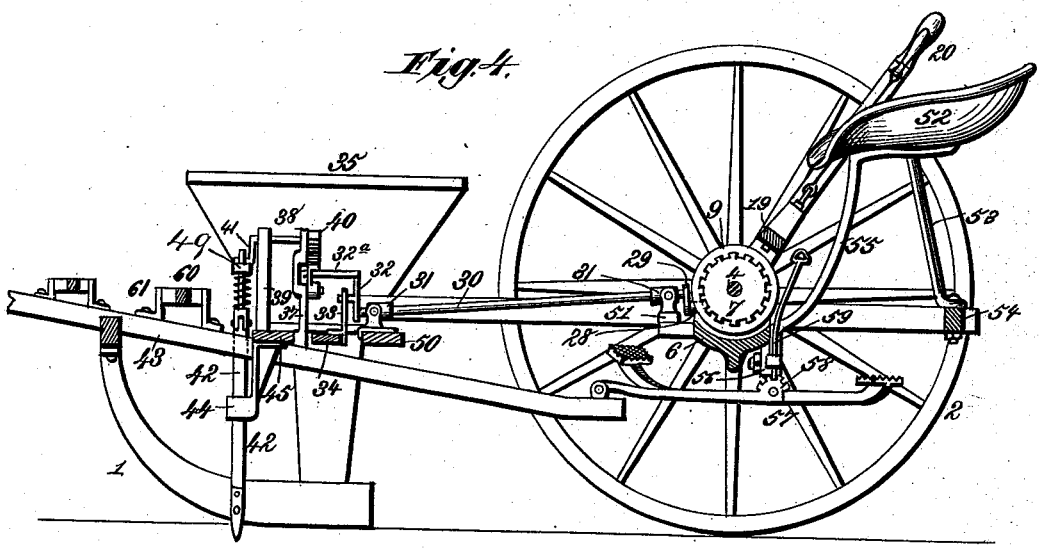


Fig. 5.

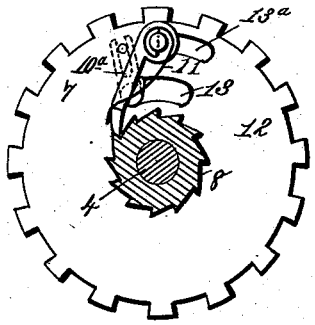


Fig. 6.

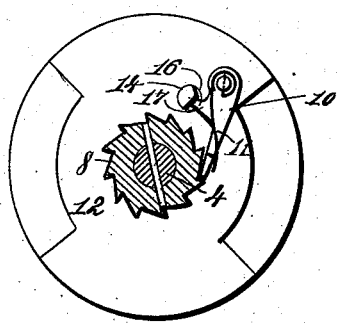
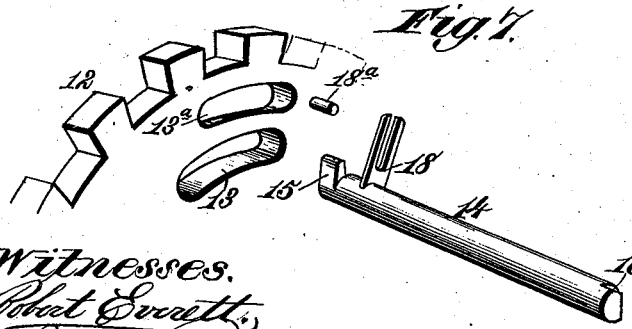


Fig. 7.



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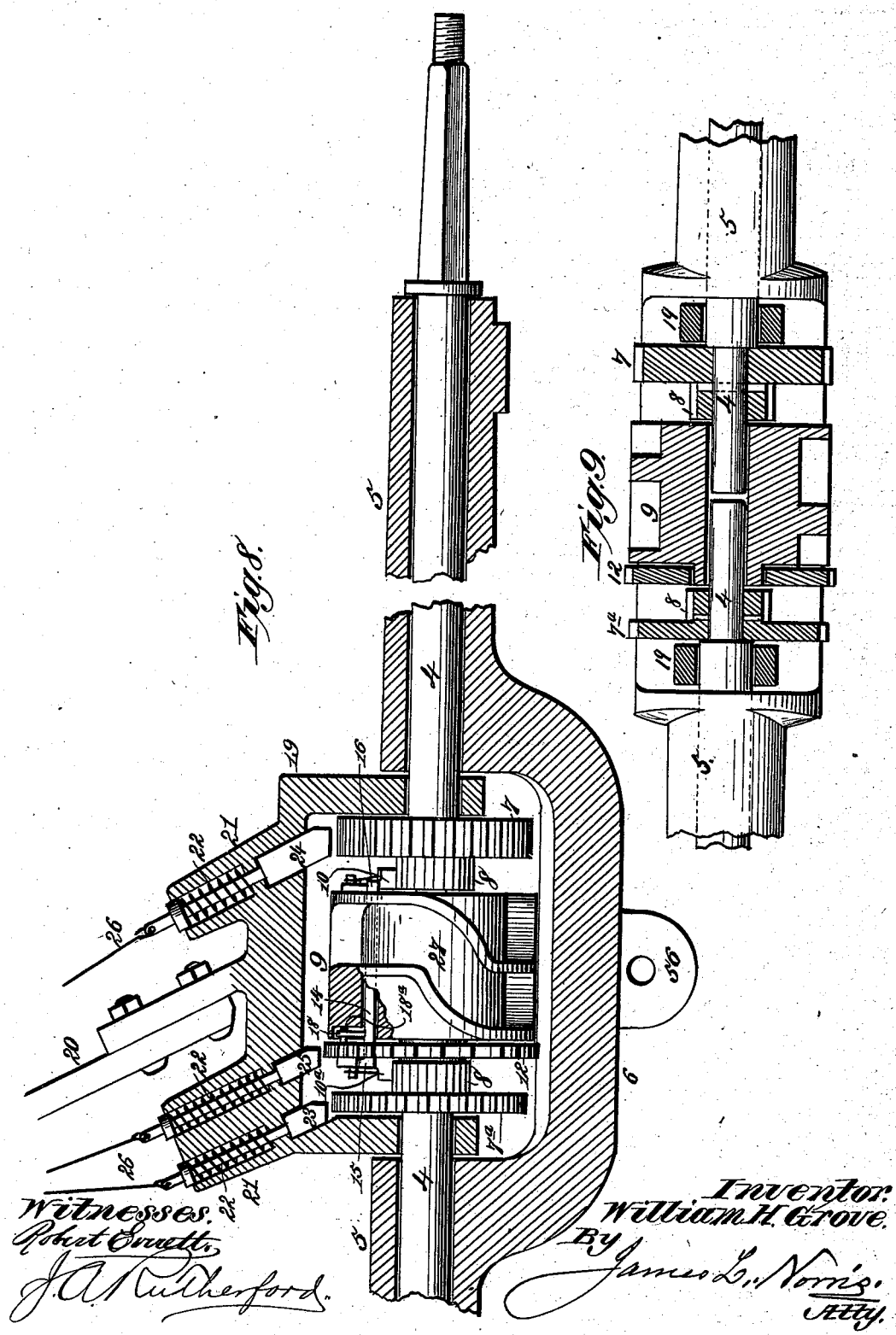
(No Model.)

3 Sheets—Sheet 3.

W. H. GROVE.

WHEEL PLANTER.

No. 382,644. Patented May 8, 1888.



UNITED STATES PATENT OFFICE.

WILLIAM H. GROVE, OF CIRCLEVILLE, OHIO, ASSIGNOR OF ONE-HALF TO CLIFTON R. DRESBACH, OF SAME PLACE.

WHEEL-PLANTER.

SPECIFICATION forming part of Letters Patent No. 382,644, dated May 8, 1888.

Application filed December 15, 1887. Serial No. 257,995. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. GROVE, a citizen of the United States, residing at Circleville, in the county of Pickaway and State of Ohio, have invented new and useful Improvements in Wheel-Planters, of which the following is a specification.

My invention consists in the construction and combination of parts in a wheel-planter, as hereinafter set forth, whereby the seed-dropping devices and hill-marker are actuated from cam-gearing on the planter-axle and provision made for adjusting the various parts of the machine to maintain a proper distance between the hills and rows during the operation of planting.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of a planting-machine embodying my improvements. Figs. 2 and 3 are detail views of the marker-actuating mechanism. Fig. 4 is a vertical longitudinal section of my improved planting-machine. Figs. 5 and 6 are opposite side views of the cam and its attached pawls, with axle and pawl-actuating ratchet-gears in section. Fig. 7 is a perspective view of a portion of a perforated cogged disk forming part of the mechanism for disengaging the cam-pawls from their actuating ratchet-gears and for setting the cam forward or back on the axle to start the seed-dropping devices at the proper time, showing, also in perspective, a bolt or pin that is carried by the cam through which it is passed, and having eccentrics to raise the cam-pawls, said pin being connected with the cogged disk and forming therewith part of the mechanism for setting the cam and for throwing the cam-pawls out of gear. Fig. 8 shows the cam and connected gearing in front elevation on the divided axle, with the tubular axle-bearings and the lever-connections of the axle and cam-gearing in section, and a portion of the cam broken away to show the pin for raising the cam-pawls. Fig. 9 is a top view of the inner portions of the divided axle and tubular bearings, their outer ends being broken away, and shows the cam, the ratchet-gears, the cogged disk, and the lower parts of the lever-connections in horizontal section.

The numeral 1 designates the furrow-openers or runners supporting the forward end of the frame 2, and 3 the ground-wheels supporting the rear end. These ground-wheels are securely fixed to a divided axle, 4, Figs. 8 and 9, journaled in long tubular bearings 5, that are fastened rigidly to opposite sides of the runner-frame, as shown in Fig. 1, and connected centrally by a depending yoke, 6, cast integral with their inner ends.

Each half of the divided axle 4 has keyed thereon, as shown in Fig. 9, a pinion, 7 or 7^a, and a ratchet-wheel, 8, and a cam-disk, 9, is mounted loosely on the inner ends of the divided axle between said ratchet-wheels. To each side of the cam 9, as shown in Figs. 5, 6, and 8, is pivoted a pawl, 10 or 10^a, and the cam also carries springs 11 to hold these pawls in engagement with the ratchet-wheels 8, through which the cam 9 is actuated from both sides by the rotation of the axle and ground-wheels. On a hub projecting from one end of the cam is loosely mounted a centrally-perforated cogged disk, 12, having near its periphery concentric slots 13 and 13^a, for purposes hereinafter explained. A bolt or pin, 14, is passed through the cam-disk 9 near the under sides of its pawls 10 and 10^a, as shown in Fig. 8. One end of this bolt or pin 14 passes through the slot 13 of the cogged disk 12, and is provided with an excentric-lug, 15, for engaging and lifting the pawl 10^a, which is located on the outer side of said disk, the pawl-pivot attached to the cam being passed through the slot 13^a of the cogged disk. On the other end of the bolt or pin 14 is an eccentric shoulder, 16, for engaging a projection, 17, on the pawl 10 to lift said pawl also. A slotted arm, 18, projects from the bolt or pin 14 in position to engage a pin or stud, 18^a, on the inner side of the cogged disk 12, and in order to provide room for this arm between the cam and cogged disk the cam is recessed on that end, as shown in Fig. 8.

A yoke, 19, is mounted loosely on the divided axle 4 at the outer sides of the pinions 7 and 7^a, as shown in Figs. 1, 8, and 9. This yoke supplies an attachment for a hand-lever, 20, and is formed with boxes 21 for inclosing springs 22 that retract a set of pawls, 23, 24,

and 25, which are connected with the upper end of the lever 20 by rods 26 in the usual manner, the pawls being adapted to engage the pinions 7 7ª and cogged disk 12, for purposes hereinafter explained.

The periphery of the cam-disk 9 is formed with a cam race or groove, 27, to engage a roller, 28, carried by a crank, 29, on the rear end of a rock-shaft, 30, which is journaled in pivoted journal-boxes 31 near each end. The shaft 30 extends in the longitudinal center of the machine, and its forward end is inclined slightly downward, as shown in Fig. 4. On the forward end of this rock-shaft 30 is a double-armed crank, 32, one arm of which connects with a slot in a casting, 33, secured to a horizontal slide-bar, 34, the opposite ends of which enter the seed-boxes 35 and actuate any suitable seed-dropping devices. Another arm, 32ª, of the double-armed crank engages a segment-gear, 36, pivoted to a standard, 37, supported by the forward end of the runner-frame. In the upper end of this standard 37 is journaled the rear end of a short shaft, 38, the forward end of which is journaled in another standard, 39, as shown in Fig. 4. On the rear end of the shaft 38 is a segment-gear, 40, meshing with the segment-gear 36, Figs. 2 and 3, and to the forward end of said shaft 38 is attached a crank or pitman, 41, for actuating a marker-rod, 42, which moves vertically in guideways formed in the tongue or draft-pole 43, and in a guide-casting, 44, secured to a forward cross bar, 45, of the runner-frame. The marker-rod is formed in two sections jointed at 46, as shown in Figs. 3 and 4. The upper section, 42ª, of this marker-rod is formed with a slot, 47, to engage the crank or pitman 41, and is surrounded by a spiral spring, 48, the upper end of which has a bearing against a loose movable collar, 49, that rests directly beneath the crank-arm of the pitman 41, so that in case the lower end of the marker-rod should meet any obstruction in its downward movement the spring 48 and collar 49 will yield sufficiently to prevent injury or breakage. In order to enable the lower end of the marker-rod to yield backward or laterally, if required, its lower end may be jointed and provided with break-pins in the usual manner. By supporting the shaft 30 in pivoted journal-boxes 31 at its forward and rear ends all binding at the ends of the shaft is prevented when the shoes or runners 1 are raised in the act of turning the machine, and the shaft is also enabled to yield with any unsteady movement of the machine in passing over rough or uneven ground, without interfering with the proper action of the seed-dropping mechanism. The forward pivoted journal-box 31 is supported on a cross-bar, 50, of the runner-frame, while the rear one is supported on a strap, 51, fastened to forward projections or lugs on the yoke 6, that connects the tubular bearings of the divided axle.

It will be seen that the seed-dropping devices and marker-rod are actuated simultaneously through the rock-shaft 30, which is operated by the cam-disk 9, driven from both ground-wheels 3 through the pawls 10 10ª and the ratchet-wheels 8 on the divided axle. Should either ground-wheel fail to revolve, for any reason, the other wheel and axle will be sufficient to drive the cam 9, and so the marker and seed-dropping mechanism will be actuated uniformly and without interruption. It will also be seen that in turning the machine, while the pivotal ground-wheel is stationary or moved backward, the ratchet-wheel and pawl of that side will slip by each other without interrupting or obstructing the rotation of the cam.

Whenever it is desired to throw the cam-disk 9 out of gear with its actuating mechanism, the pawl 25 will be forced down into engagement with the cogged disk 12 and the lever 20 will be moved slightly backward to rotate said disk and connected eccentric-pin 14, and thereby disengage the pawls 10 and 10ª from the adjacent ratchet-wheels.

Should the machine gain or lose ground while in operation, so as to cause the hills to be planted farther apart or closer together, as the case may be, the operator can set the cam-disk 9 forward or back by moving the lever 20 in a corresponding direction, while the pawl 25 and cogged disk 12 are engaged, thereby causing the seed-dropping devices to be started at the proper time to drop the seed in line with former rows, as indicated by the marker. The machine can, if necessary, be moved forward or back to bring the seed-boxes 35 in line with the row last planted, and without actuating the marker or seed-dropping devices, by first throwing the cam-disk 9 out of gear, then forcing the pawls 23 and 24 into engagement with the pinions 7 and 7ª, and then throwing the lever 20 forward or back, as required, to rotate the divided axle and attached ground-wheels. These various adjustments of the machine are all accomplished through a single lever, 20, in easy reach of the driver.

The driver's seat 52 is partly supported by rods 53, secured to the runner-frame near the ends of the rear cross-bar, 54, and partly by a rod or bar, 55, securely bolted to a lug, 56, on the rear part of the yoke 6, that connects the bearings of the divided axle. To the lower end of the bar 55 is fulcrumed a double-armed treadle, 57, the forward end of which is pivotally connected with the rear end of the pole or tongue 43, which is fastened to the forward cross-bar, 45, of the runner-frame. On the treadle is a segmental rack, 58, Fig. 4, to engage a bolt or latch, 59, by which the treadle can be locked in any position to which it may be turned. By raising this latch 59 and bearing with the foot on either the forward or rear treadle-arm, as may be required, the rear end of the pole 43 can be raised or lowered to slightly elevate the shoes 1 or force them into the ground, according to the character of the soil, or to vary the depth of the furrows.

As shown in Fig. 1, a rod, 60, is hinged in bearings 61 on the draft-pole 43 in advance of the seed-boxes. This rod 60 projects laterally at a right angle with the line of draft and carries a shoe or line-marker, 62, at its outer end. It is also provided with a brace, 63, pivoted in bearings 64 on the pole 43, so that both the rod 60 and its brace can be turned or swung over to project laterally from either side of the draft-pole. The laterally-projecting rod 60 is of such length that during the operation of the machine the line-marker 62 will make a slight furrow in the soil at the proper distance to indicate the position to which the hill-marker 42 is to be brought in planting the return-row. In turning the machine at the end of a row the line marker or indicator 62 will be made to register with the indentation or impression produced by the hill-marker 42 between the last two hills, and the rod 60 will then be shifted to the other side of the machine to enable the shoe or marker 62 to make another slight furrow, over which the hill-marker will subsequently move in planting the next row. An adjustable line marker or indicator of the character described affords a simple and convenient means of determining the proper distance between the rows.

The machine as designed for ordinary use will plant four double hills—say three feet apart—at each revolution of the ground-wheels; but it will be understood that by increasing or diminishing the diameter of these wheels the distance between the hills can be varied as required.

What I claim as my invention is—

1. In a wheeled planter, the combination, with a divided axle from which the seed-dropping devices are actuated, and ground-wheels and pinions secured to said axle, of a lever loosely mounted on the divided axle and provided with pawls to engage said pinions, whereby the axle and ground-wheels can be revolved forward or back to move the machine into position to bring the seed-boxes in line with rows already planted, substantially as described.

2. In a wheeled planter, the combination, with a divided axle and ground-wheels and ratchet-gears secured to said axle, of a cam loosely mounted on the axle to actuate a marker and seed-dropping devices, and pawls pivoted on each side of the cam to engage said ratchet-gears, substantially as described.

3. In a wheeled planter, the combination, with a divided axle, ratchet-gears secured to the axle, and a cam mounted loosely on the axle and provided with pawls to engage the ratchet-gears, of a pin supported transversely in the cam and having eccentrics to engage and lift the cam-pawls, a cogged disk having a slot to permit the passage of one end of said pin, and a pawl and lever to engage the cogged disk and actuate the pin so as to throw the cam out of gear, substantially as described.

4. In a wheeled planter, the combination, with a divided axle, ground-wheels, pinions, and ratchet-gears secured to said axle, a cam loosely mounted on the axle to actuate a seed-dropping mechanism, and pawls pivoted to both sides of the cam to engage the ratchet-gears, of a pin passed transversely through said cam and having eccentrics to engage the pawls, a cogged disk mounted loosely on the hub of the cam and engaged with one end of the eccentric-pin, and a pawl and lever to engage and actuate said disk for throwing the cam out of gear and setting it forward or back to start the seed-dropping devices at the right moment to drop the seed in line with former rows, substantially as described.

5. In a wheeled planter, the combination of a divided axle, ground-wheels and ratchet-gears secured to said axle, pawls pivoted to the sides of the cam to engage said ratchet-gears, a seed-dropping mechanism actuated by a slide-bar, a rock-shaft engaged with said cam and slide-bar, a vertically-movable marker, and means for actuating the marker from the rock-shaft, substantially as described.

6. In a wheeled planter, the combination, with a vertically-movable marker, a cam on the planter-axle, and a rock-shaft actuated by said cam, of a segment-gearing and crank-connections located between said marker-rod and rock-shaft, whereby the marker is forced into the ground, and a spring and movable collar on the marker-rod to render it yielding and prevent breakage, substantially as described.

7. In a wheeled planter, the combination of a vertically-movable hill-marker located between opposite seed-boxes, and a line-marker or indicator having a hinged connection with the draft-pole and capable of being turned to project from either side of the planter, whereby it can be made to register on one side of the planter with the impression made by the hill-marker centrally between the hills last planted, and then be turned to the other side of the planter to indicate the proper distance for the hills on the next return-row, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

W. H. GROVE.

Witnesses:

JAMES L. NORRIS,

J. A. RUTHERFORD.