

(No Model.)

3 Sheets—Sheet 1.

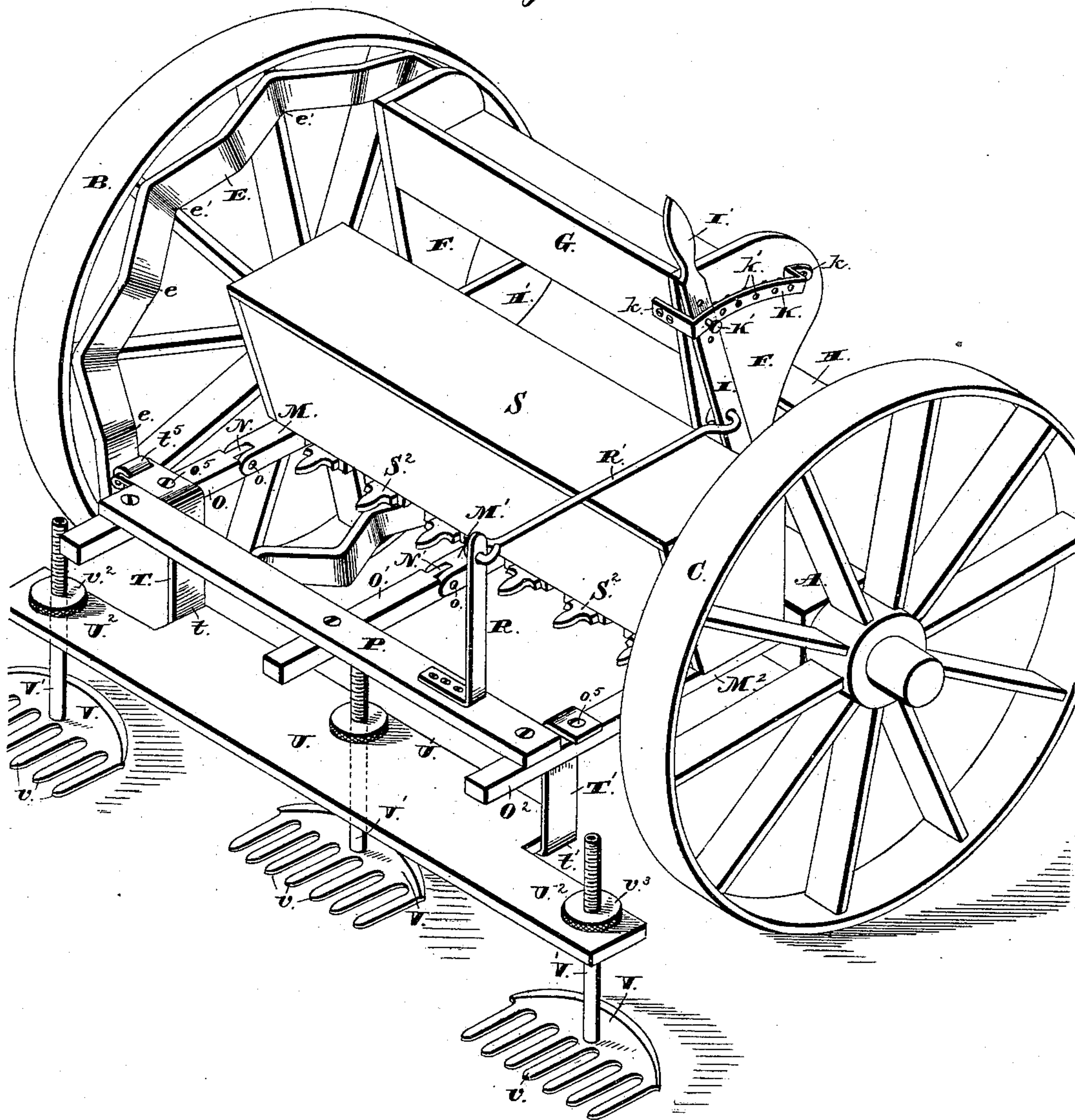
R. B. NORMENT.

CULTIVATOR.

No. 299,935.

Patented June 3, 1884.

Fig. 1.



Witnesses:
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(No Model.)

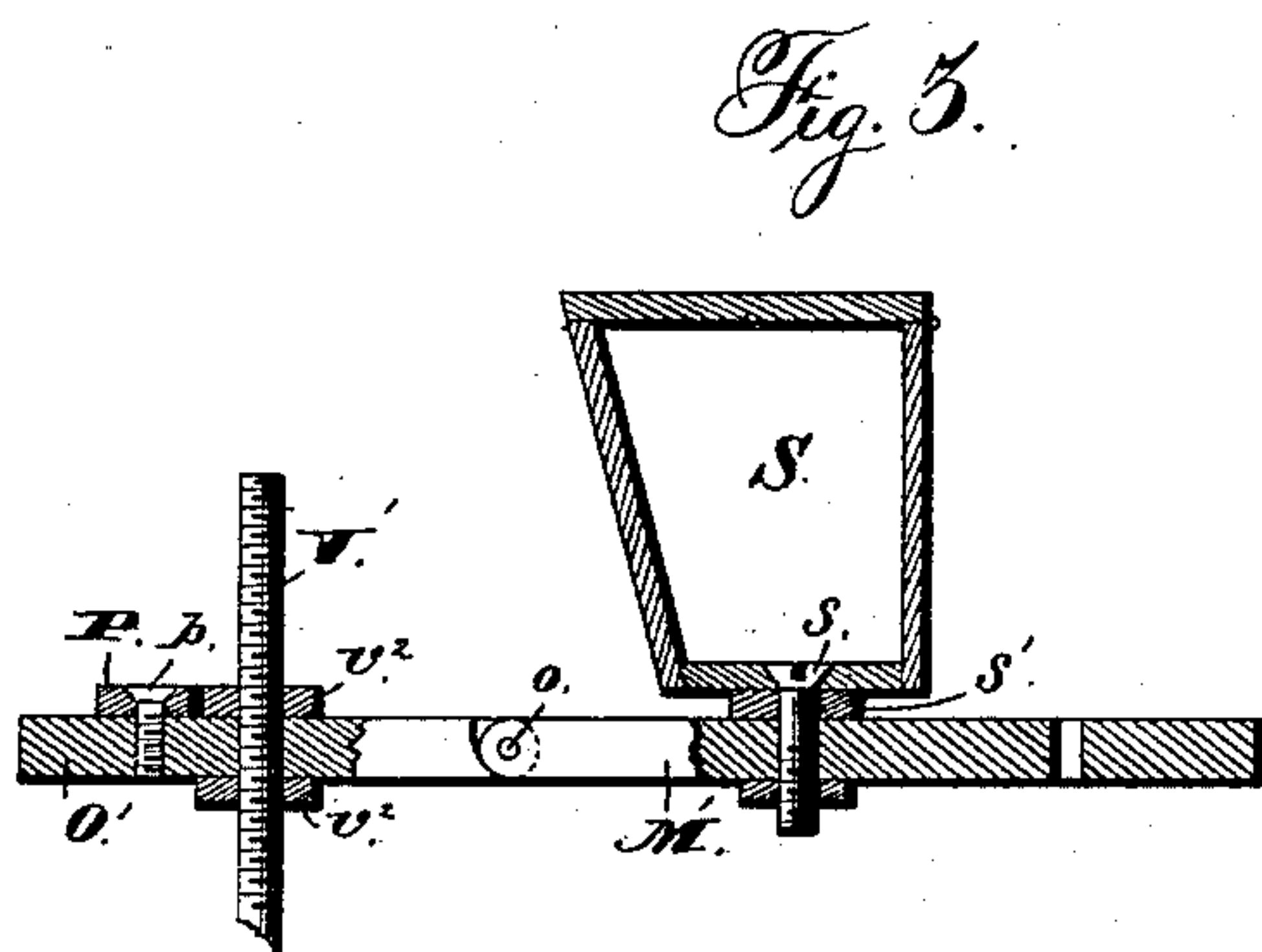
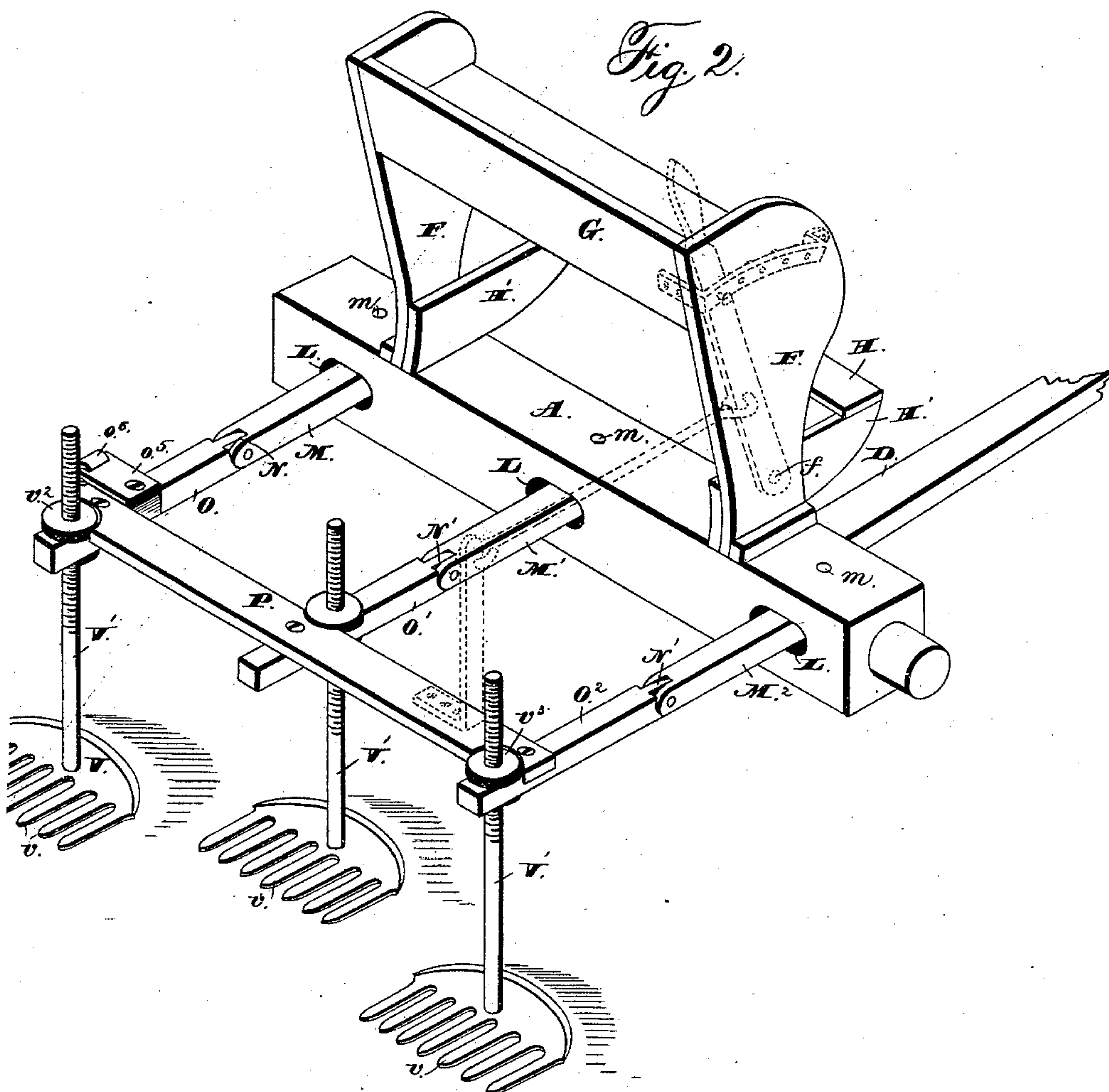
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UNITED STATES PATENT OFFICE.

RICHARD B. NORMENT, OF EAST LAKE, FLORIDA.

CULTIVATOR.

SPECIFICATION forming part of Letters Patent No. 299,935, dated June 3, 1884.

Application filed April 24, 1884. (No model.)

To all whom it may concern:

Be it known that I, RICHARD B. NORMENT, of East Lake, in the county of Orange, and in the State of Florida, have invented certain new and useful Improvements in Cultivators; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 shows a perspective view of my machine from the rear; Fig. 2, a similar view with the fertilizer-box removed; Fig. 3, a detail vertical sectional view of the fertilizer-box and the vibrating supporting-arms; and Fig. 4, a plan view of the machine with the seat removed, a portion of the main supporting-axle being broken away to show the manner of pivoting the swinging arms therein.

Letters of like name and kind refer to like parts in each of the figures.

The object of my invention is to provide an improvement in the class of agricultural machines known as "wheeled cultivators;" and to this end it consists in the construction, arrangement, and combination of parts, as hereinafter described, and more specifically pointed out in the claims.

In the drawings, A designates the supporting-axle, upon which are journaled in the ordinary way the two supporting-wheels B C, which in my machine are preferably to be four feet in diameter. Attached to the axle which forms the main part of the frame of the machine are the shafts D D, which can be of any desired form. They are, as shown in the drawings, to be rigidly attached to said axle, so that it cannot turn or rock independently of them.

On the inner side of the wheel B is fixed or fastened in any desired way the wave cam-track E, consisting of a ring having raised portions *ee*, extending inward toward the center of the machine, with intervening depressions, *e' e'*. This ring I preferably make separate from the wheel, of cast or wrought iron, and bolt or otherwise fasten it in place. Upon the top of axle A are fixed the seat-standards F F, supporting between their upper ends the seat G. A suitable foot-rest, H, is supported on arms H' H', extending forward from standards F F. One of said standards, preferably

the one on the right-hand side of the machine, has pivoted to it at *f* a lever, I, which extends up along and above the standard, being provided with a suitable handle, I', at its upper end.

To the side of the standard is bolted a segmental strip of metal, K, said segment being curved on a circle having for its center the pivotal point of the lever I. This strip, as shown, is fastened to the standard side at its ends *kk*, so that throughout its length between such ends it will stand parallel to and at a distance from the standard slightly greater than the thickness of lever I. The strip and the standard are provided with a series of coinciding holes, *k' k'*, and the lever is also provided with a hole, which, as the lever is swung on its pivot, will coincide successively with the holes in the strip and standard.

By means of a pin, K', inserted through one of the holes in the strip, the hole in the lever, and the coinciding hole in the standard, the lever can obviously be firmly fixed at any desired adjustment.

Extending horizontally through the axle from front to rear are openings L L L, preferably three in number. Such openings are oblong or elliptical in transverse section, to allow the swinging or vibration of the arms M M' M², which extend through them, and are pivoted on vertical pins *m*, passing vertically up through the axle, and situated in the same vertical plane parallel to or coincident with the axis of said axle. The arm M, which is situated close to the drive-wheel B, extends forward beyond the axle to a point in front of the periphery of the cam-ring or wave-track E. In bearings *m' m'* on the side of this arm near its forward end is journaled an anti-friction roller, *m²*, which is adapted to be engaged by the wave-track as the machine is moved forward. The arms M M' M² extend some distance to the rear of the axle, and at their extreme rear ends are slotted vertically at N N N, to receive the tongues N' N' N² on the forward ends of the short bars O O' O². Pins *o o o*, passing horizontally through the slotted ends of the arms and the tongues on the bars, pivot such arms and bars together. This construction will obviously allow the bars O O' O² to be swung up and down on the

pivot-pins *o o o*, but will insure the vibration of the bars with the vibrating arms, such vibration being horizontal. The bars *O O' O²* are connected by a cross bar or rod, *P*, which is pivoted to and upon each bar by a pin, *p*. With such construction the bar *P* serves as a connecting-rod to transmit to bars *O'* and *O²* and the arms *M'* and *M²*, of which they form extensions, any vibratory movements of bar *O* and arm *M*, and to keep the arms and bars parallel.

To the cross-bar *P* is fixed the standard *R*, the upper end of which is connected with the lever *I* by the rod *R'*, so that by moving the lever forward or backward the bar *P* will be raised or lowered, and the bars *O O' O²* consequently swung up or down on their pivot-pins *o o o*, to raise or lower their rear ends. The connecting-rod *R'* is hooked or looped through holes in the lever *I* and standard *R*, so as to allow of free vibration of the arms and bars at any adjustment.

Upon the vibrating arms *M M' M²* is supported the fertilizer hopper or box *S*. It is attached to the arms by pivotal pins or bolts *s s s*, so as to allow of parallel motion of the arms as they vibrate. The hopper-bottom does not rest directly upon the arms, but upon washers *s' s' s'* around the bolts *s s s*, between it and the arms. These washers serve to prevent undue friction between the lower surface of the hopper-bottom and the arms. As the arms vibrate, the hopper will then receive a vibrating motion sufficient to sift or discharge the fertilizer within through the series of discharge-openings *S' S' S'*, which, as shown, are provided with suitable slide-valves, *S² S²*, to regulate the rate of discharge, or to close any number or all of the openings, as desired.

The position, form, and number of the openings can be varied to suit any particular work for which the machine is to be used.

Supported from the rear ends of bars *O* and *O²* by means of the standards *T T'* is the board *U*. These standards are rigidly fixed to the board at their lower ends, *t* and *t'*, while their upper ends, *t² t³*, are bent so as to extend over the tops of the bars *O O²*, respectively, to which they are pivotally attached by pins or bolts *o⁵*, passing down through the standard ends and bars.

If desired, washers can be placed around the bolts between the standard ends and bars.

The standard *T* at its upper end extends over beyond the side of bar *O*, and carries the anti-friction roller *t⁵*, suitably journaled in its extreme end. In the drawings the standard end is shown as forked, and having the ends of the fork turned backward, to surround and hold the end of the roller-pin. I do not limit myself to such construction or manner of supporting the roller in the standard end. This roller is so situated as to engage the cam-track *E* on the inner side of the wheel *B*.

The projections and depressions of the track are of such number and so situated with relation to each other that as the wheel revolves

the roller on the forward end of arm *M* will occupy one of the depressions, while the roller on the arm *O* will be in engagement with one of the projecting portions of the track. The bar made up of the two parts *M O* will therefore be situated on its vertical pivot-pin *m*, and as the other bars are connected with this bar, as described, they must also vibrate with it. The fertilizer box or receptacle, being carried upon and pivotally connected with the arms *M M' M²*, will by the movement of such arms receive a reciprocating motion, which will cause the fertilizer within it to be sifted down and discharged through the openings in the hopper or receptacle bottom. The rapidity of such discharge, as indicated hereinbefore, is regulated by means of the slides *S² S²*.

The standards *T* and *T'* at their lower ends are bent at right angles, and to the horizontal portions *t⁶ t⁶* thereof is rigidly fastened the board *U*, which consists of the main portion *U'*, extending between the supporting-wheels *B* and *C*, and the portions *U² U²*, extending just behind and beyond the wheel on either side of the machine.

The cultivator hoes or knives *V V* are attached to the lower ends of shanks *V' V'*, which I preferably make hollow, but which, as shown in Fig. 2, can be made solid. The knives are crescent-shaped, and made sharp at their forward curved edges.

From the rear side of the blade proper the teeth *v v* extend. These teeth, which are like rake-teeth, can be increased or diminished in number, as desired. They extend horizontally rearward from the knives, and as said knives pass along just under the surface of the ground and vibrate from side to side the teeth act to bring sticks, stones, and other rubbish to and upon the surface by the sifting of the fine earth down between them. The teeth also act to mix thoroughly with the soil the fertilizer which is dropped in front of the knives from the fertilizer-box, hereinbefore described. The knife-shanks *V' V'* pass up through the knife-board *U*, and are screw-threaded at their upper ends, as shown. They are fixed at any vertical adjustment with reference to the board by means of the nuts *v² v³*, screwed upon them and bearing against the upper and lower sides of the board, respectively. With this construction the adjustment of the knives can be easily and readily changed by loosening the nuts, moving the knife-shanks up or down, and then tightening up the nuts against the board again.

To raise the knives over any obstruction, or to accommodate their position to any unevenness in the ground to be passed by them, the knife board or frame can be quickly raised or swung up and lowered again by means of the hand-lever and connecting-rod hereinbefore described, and shown in the drawings.

In Fig. 2 I show my machine as slightly modified to adapt it for use where the plants to be cultivated are quite high. The board in

this form is removed, and the knife-shanks are adjustably fastened to the bars $O O' O^2$ near their rear ends in the same way as they were fastened to and in the board U in the other form of machine. The shank of the middle knife passes up through the bar O' just forward of the cross or connecting bar P .

The fertilizer box or hopper can be pivotally attached to and carried upon the vibrating bars or left off, as desired.

Upon the bar O is a metal clip, o^5 , which carries journaled in it an anti-friction roller, o^6 , for engaging the wave-track on the drive-wheel.

If desired, the cross-bar P can be so situated and extended out at the side as to enable the roller to be journaled in its end, and still be in position to engage the wave or cam track, to impart a reciprocating motion to the bar, and a vibrating motion to the arms $M O$, $M' O'$, and $M^2 O^2$, and through them to the cultivator-knives.

The operation of my machine is as follows: The knives and the vibrating frame or board carrying them are adjusted to the proper height by adjusting the knife-shanks up through the bar or bars, and by movement of the adjusting-lever to raise or lower the board or frame. For most purposes the knives are adjusted to pass along through the soil just below the surface thereof, so as to stir and loosen such surface. The depth of the cut can be accurately adjusted to suit any kind of plant being cultivated. This nice adjustment is especially desirable in the culture of orange groves, for the roots of the orange tree form a thick mat quite near the surface, so that plowing or deep cutting would destroy the roots and kill the trees. By proper adjustment of the knives my cultivator is made a shallow-cutting one, adapted to stir and loosen the surface without injuring the tree-roots, and by means of the hand-lever and connecting-rod is under complete control of the driver, who can raise or lower the cutter-frame to compensate for any irregularities in the surface passed over, and can thereby prevent unearthing of the roots, even when the ground is uneven. The knives as they vibrate pass along just under the surface of the soil, loosen it, and then sift it down between the teeth on their rear sides, so as to bring sticks, stones, and rubbish upon the top of the ground, where they can be easily and quickly gathered up.

When it is desired to fertilize the soil, any suitable fertilizing material is placed in the hopper, and any desired number of the feed-openings are opened by movement of the sliding valves therefor. By the reciprocations of the hopper the fertilizer is sifted down and caused to fall out through the openings in front of the cultivator-knives. As these knives pass forward, stirring up the soil and sifting it between their teeth, the fertilizer is intimately mixed with the soil by such stirring and sifting action of the knives and teeth.

When it is desired to transport the machine

from one field to another, or to stop the vibration of the knives for any reason, the hand-lever is thrown forward until the vibrating knife-carrying frame is swung up, so that the anti-friction roller on its side passes out of engagement with the wave or cam track. The vibration of the cutters and frame will obviously then cease, for when the forward roller on the side of arm M has been moved inward by one of the projections on the track there is nothing to throw the end of the arm outward again.

My cultivator is adapted for use in the cultivation of a great variety of plants and vegetables. Where they are planted in rows close together, it is intended that the wheels shall each run between rows, and that the outer knives shall pass along between the same rows as the wheels, while the center knife occupies the space between the two rows which are on the inner sides of the wheels.

The number of the knives can of course be increased or diminished, as desired, to adapt the machine for the cultivation of any particular class of plants, without departing from my invention.

Having thus fully set forth the nature and merits of my invention, what I claim as new is—

1. In combination with the series of vibrating arms, the bars hinged to the rear ends of the arms, the frame carrying the knives supported upon these bars, means for imparting a vibrating motion to the arms and bars, and means for raising and lowering the knife-frame, substantially as shown and described.

2. In combination with the series of jointed vibrating arms and the bar connecting their rear ends, the cultivator-knives, suitably supported at or near the rear ends of the arms, means for causing the arms to vibrate, and means for raising and lowering the rear ends of the series of arms to raise and lower the knives, substantially as shown and described.

3. In combination with the series of jointed vibrating arms connected together and carrying the knife-frame, the wave-track on one of the drive-wheels, the roller at one end of the series of arms, adapted to engage the wave-track on the wheel, and means for swinging up the rear ends of the jointed arms and the attached frame, to carry the roller out of engagement with the wave-track and stop the vibration of the bars and frame, substantially as shown and described.

4. In combination with the vibrating bar or arm M , pivotally attached to the main axle or frame, and carrying on its forward end a roller adapted to engage a wave or cam track on one of the drive-wheels, vibrating arms $M' M^2$, the bars $O O' O^2$, hinged to the vibrating arms, a roller carried on the arm O and adapted to engage the wave-track on wheel, the knife-frame supported upon and carried by the bars $O O' O^2$, and the connecting bar or rod between such bars, substantially as shown and described.

5. In combination with the series of vibrating arms consisting of the portions pivoted to the axle or frame on vertical pins, and the bars hinged to the rear ends of such portions, the connecting-rod between the bars, the cultivator-knife frame supported on the end bars of the series, the standard attached to the connecting bar or rod, the adjusting-lever, and suitable connecting means between the standard and lever, substantially as and for the purpose described.

6. In combination with the series of vibrating arms for carrying the vibrating knife-frame, the fertilizer box or hopper provided with suitable discharge-openings supported upon and pivotally connected with the arms, so as to be reciprocated or shaken as the arms vibrate, substantially as and for the purpose described.

7. In combination with the series of vibrating knife-carrying arms consisting of the horizontally-vibrating portions $M M' M^2$ and the bars $O O' O^2$, from which are supported the knives, the fertilizer box or hopper provided with suitable discharge-openings supported on and attached to portions $M M' M^2$ by means of pivot-bolts or pins, substantially as and for the purpose described.

8. In combination with the arm M , passing through and pivoted in the axle A , and carrying at or near its front end a roller adapted

to engage the wave-track E on the wheel B , the arms $M' M^2$, also pivoted to the axle, the bars $O O' O^2$, hinged to the rear ends of the arms, the connecting-bar P between them, and the board U , carrying the cultivator-knives, and supported from bar O^2 by standard T' , and from bar O by standard T , bent over the bar, and carrying the roller t^5 , adapted to engage the wave-track on wheel B , substantially as and for the purpose described.

9. In combination with the horizontally-vibrating knife-frame and means for vibrating it, the series of horizontal knives carried by the frame, each provided with a series of teeth or tines projecting from its rear side, substantially as and for the purpose described.

10. In combination with the vibrating knife-frame, and means for vibrating it, the horizontal knives, made sharp on their front sides, having the teeth or tines extending from their rear sides, and provided with the shanks extending upward and attached to the frame, substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand this 19th day of April, A. D. 1884.

RICHARD B. NORMENT.

Witnesses:

SAMUEL NORMENT,

HENRY C. HAZARD.