3 Sheets—Sheet 1.

F. M. NEEDHAM.

WHEEL-CULTIVATOR.

No. 187,043. Patented Feb. 6, 1877.

Fig. 1.

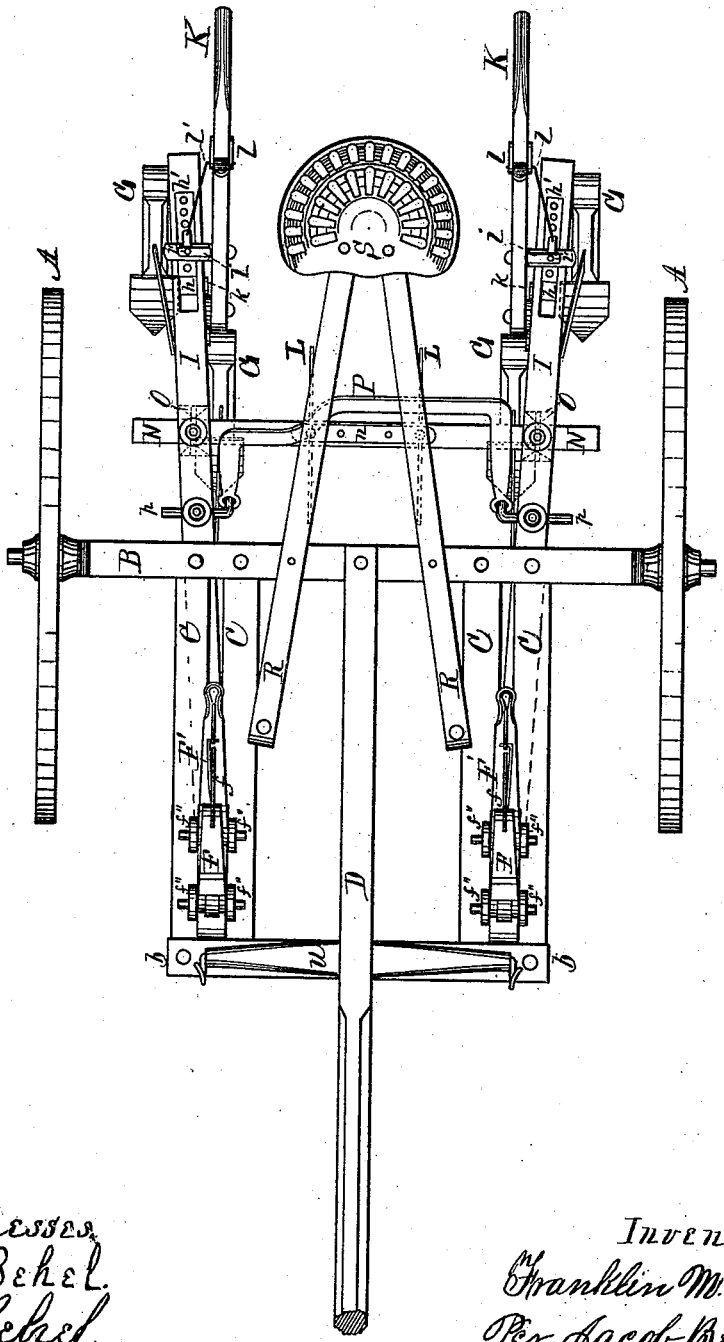

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Fig. 2.

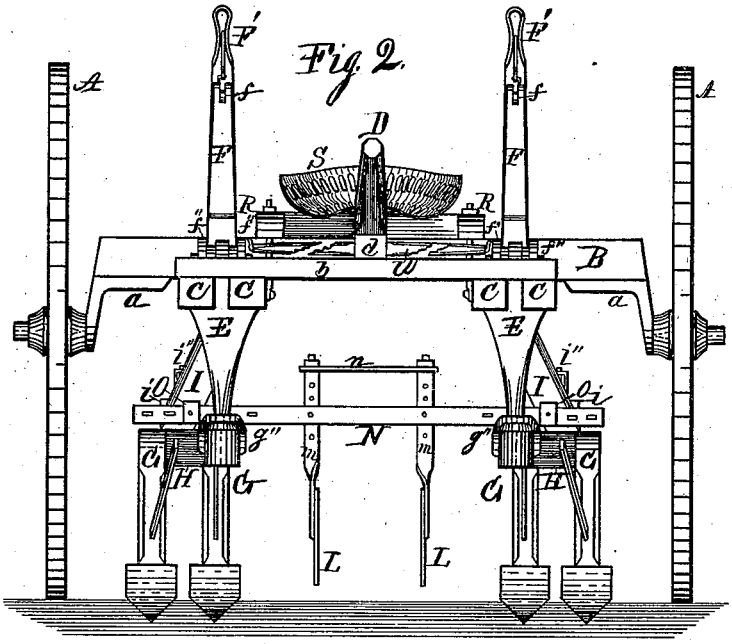
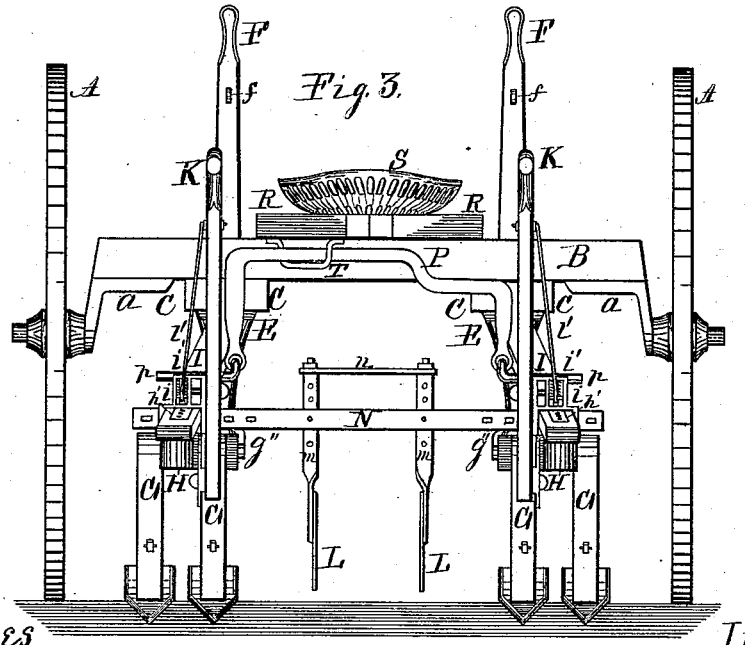


Fig. 3.



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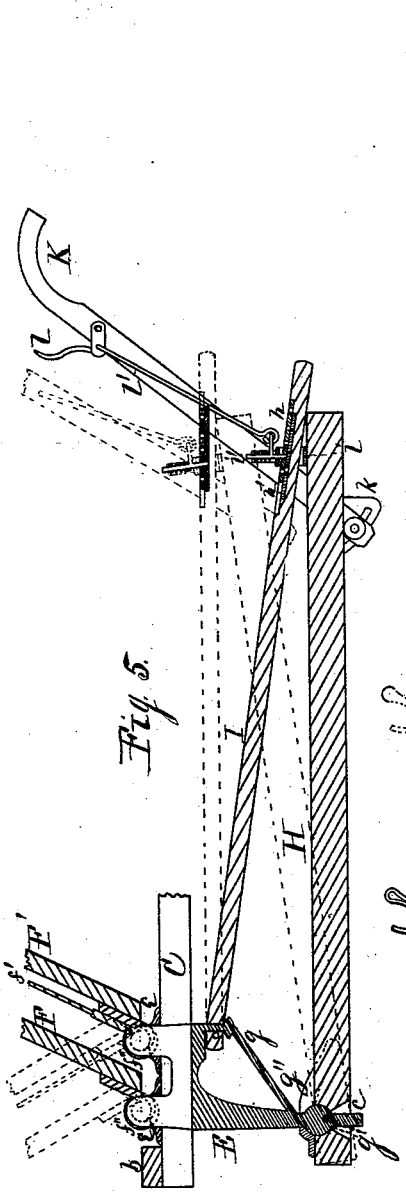

Fig. 5.

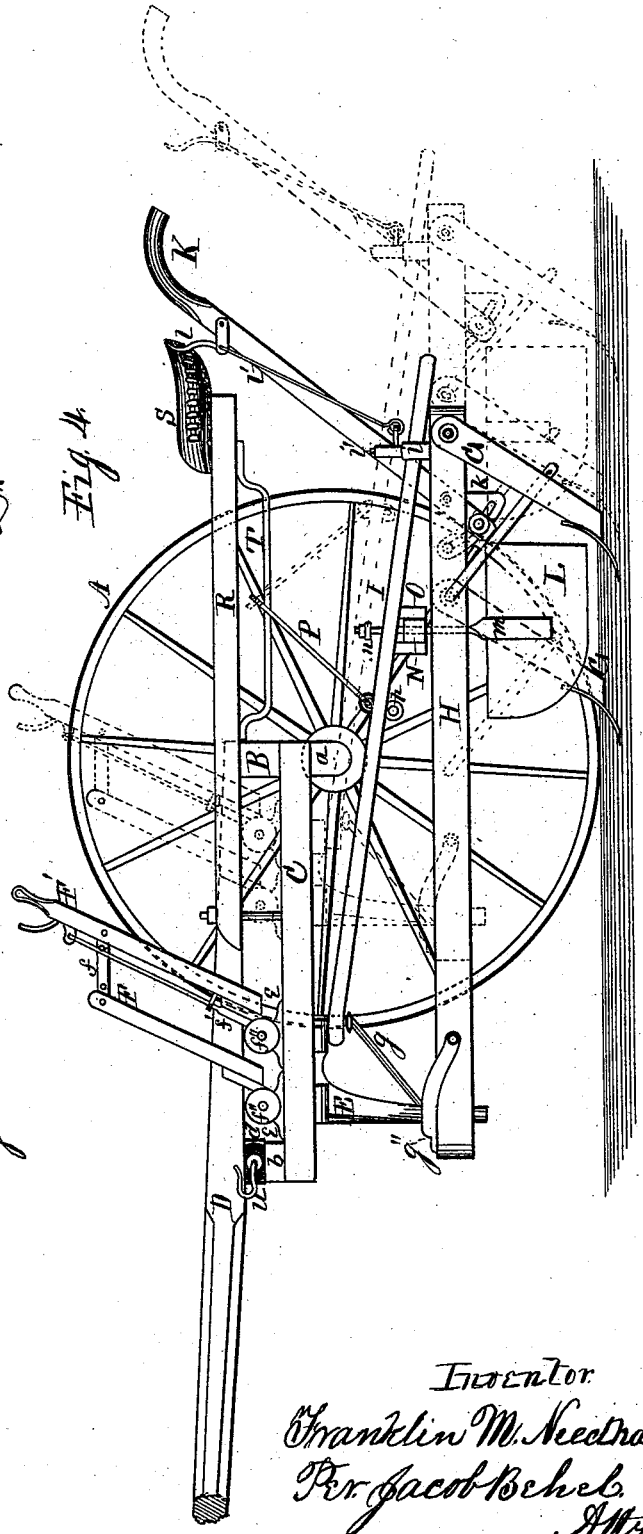

Fig. 4.

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UNITED STATES PATENT OFFICE.

FRANKLIN M. NEEDHAM, OF ROCKFORD, ILLINOIS.

IMPROVEMENT IN WHEEL-CULTIVATORS.

Specification forming part of Letters Patent No. **187,043**, dated February 6, 1877; application filed November 29, 1876.

To all whom it may concern:

Be it known that I, FRANKLIN M. NEEDHAM, of the city of Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Wheeled Cultivators, which improvements are fully set forth in the following specification, reference being had to the accompanying drawings.

My invention relates to that class of cultivators known as the combined riding and walking cultivator; and consists in the devices, the construction, arrangement, and combinations of the parts represented in the accompanying drawings, which I now proceed to describe.

In the drawings, Figure 1 is a plan view of my improved cultivator, of which Fig. 2 is a front end, and Fig. 3 a rear end, elevation, and Fig. 4 is a side elevation, in which one of the wheels is omitted, and the dotted lines show the position of the parts when adjusted as a walking cultivator. Fig. 5 is a detached vertical lengthwise central section of one of the drag-bars and the parts therewith connected, in which the dotted lines represent the parts in an elevated position, locked for transportation, or for turning at the ends in cultivating.

In the figures, A represents the carrying-wheels, fitted to revolve on crank axle-arms *a*, secured to an axle-tree, B. Beams C are secured to the axle-tree toward its ends in pairs, in such a manner as to form narrow slots between the beams of each pair. These beams extend forward, and are connected at their forward ends by a cross-bar, *b*. A tongue, D, of ordinary form is secured centrally to the axle-tree and to the cross-bar *b*, by means of an open bracket, *d*, interposed between them at their junctional point.

Instead of the tongue D, two beams may be employed, united at their forward ends, and diverging, as they extend backward, toward the cross-bar *b* and axle-tree, to which they may be secured, forming a tongue as usually employed in cultivators.

These parts are firmly secured in place by sufficient bolts, and constitute the main frame of my improved cultivator.

E are pendants, fitted with arms which project upward through the slots formed by the beams C, and through caps *e*, which are mortised to receive them. These pendants and caps are fitted to slide back and forth on the beams C, for the purpose of changing the machine so as to be properly balanced in neck-draft when employed either as a riding or as a walking cultivator.

F and F′ are levers, having cam-formed feet, which are pivoted to the upward-projecting ends of the pendants above the caps *e*, and are fitted in such a manner that when the levers are thrown forward in the position represented in dotted lines in Fig. 5, the parts will be free to slide lengthwise on the beams C, and when the levers are drawn back into the rearward inclined position represented in the drawings, the cam action of the levers on the pendants E and the caps *e* will force these parts in contact with the beams with sufficient force to hold them in their adjusted position. These levers are connected in pairs near their upper ends by bars *f* pivoted therein, so that their relative movements shall be uniform. The levers F′ are each provided with a sliding pawl, *f′*, fitted to engage the notched upper portion of the pendant to which the levers are pivoted, and are employed for the purpose of locking the levers in pairs to hold the parts fixed in position when adjusted.

The sliding pawls are operated by means of thumb-levers connected therewith, and pivoted to the levers near their handle ends. *f″* are wheels journaled on the outward-projecting ends of the pivots, which connect the levers F and F′ to the pendants, and when the levers are thrown forward, as shown in dotted lines, the pendants will be released and the rollers will rest on the beam, and the pendants, and the parts thereto attached, will be free to be moved back and forth to change their position on the beam, for the purpose of properly balancing the machine in neck-draft when used either as a riding or a walking machine, and in shifting the pendants, and the parts thereto attached, the wheels will roll on the beams and serve to reduce the friction.

The shovels and shovel-standards (represented at G) may be constructed and applied to the drag-bars H, as similar parts in cultivators now in use are constructed and ap-

plied. The pendants E are constructed with a brace, *g*, in their rear angle, to give strength in the line of draft. These pendants are also provided with an enlargement of globular form, near their lower ends, as at *g'*.

The drag-bars H are provided with a vertical mortise near their forward end, as at *c*, flaring lengthwise on the lower side, and fitted with a semi-spherical recess on their upper sides, to receive the lower half of the globular enlargement on the pendants.

g'' are loops, of clevis form, fitted to span the pendants above the globular enlargements, and to receive the upper half thereof; also to clasp the drag-bar, to which they are secured. These parts form the joints, of ball-and-socket form, that connect the drag-bars to the pendants in such a manner as to permit of a free vertical and lateral movement of their rear ends, and to prevent any axial or rolling movement thereof, so as to hold the shovel-standards, with shovels thereto attached, and secured to the drag-bars in the usual manner, in a vertical working position, and to permit of their free vertical and lateral movements, for the purpose of thorough cultivation, and of transportation. The suspension-braces I are pivoted at their forward ends on the upper and vertical portion of the braces *g*, and extend rearward over the rear ends of the drag-bars, and near their rear ends, on the upper sides, are grooved to receive the perforated plates *h*, which are fixed in the bottom of the grooves, and lie below the surface of the brace. Perforated plates *h'* are fitted to the grooves in the suspension-braces, and rest on the plates *h*, and are about even with the surface of the brace, and are fitted to slide lengthwise in the grooves limited by their ends.

i are brackets, of the form represented in the drawing, secured to the rear ends of the drag-bars, and are fitted with an opening to receive the rear ends of the braces in such a a manner as to slide freely therein. The brackets *i* are fitted with a vertical spring-bolt *i'*, to enter the holes in the plates *h* and *h'*, and are employed for the purpose of limiting the up-and-down movements of the drag-bars, to regulate the depth of plowing, and hold them in an elevated position, for the purpose of turning at the ends in cultivating, and for transporting the machines from place to place.

The working depth of the plows is controlled by changing the spring-bolts *i'* into the different holes in the plates *h'*. By changing the spring-bolts into the holes in the plates *h'* toward their forward ends will lessen the running depth of the plows, and by changing them toward their rear ends will increase their running-depth; and to hold the plows in an elevated position the drag-bars must be raised until the spring-bolts drop into the holes in the plates *h*, as represented in the dotted-line view in Fig. 5.

K are ordinary cultivator-handles, and are pivoted to the inside of brackets *i*, and are made to be adjusted higher or lower by means of the radially-slotted bracket *k*, secured to the drag-bars, the handles secured thereto in an adjustable manner by means of a bolt passing through the slot in the bracket, and through the handle. Thumb-levers *l* are pivoted to the handles K near their handle ends, and are connected to the spring-bolts *i'* by means of rods *l'*, and are employed for the purpose of operating the spring-bolts *i'*, in raising and lowering the drag-bars, having the shovels thereto attached.

L are shield-plates, to which are secured the uprights *m*, which pass upward through the shield-bar N, and are held in place therein, by pins or bolts passing transversely through the bar N, and the uprights *m*, and are made vertically adjustable, by means of a series of holes in the uprights. The uprights are also fitted with a connecting-bar, *n*, held in place by screw-nuts, and is employed to give firmness to the shields. These shields are also made laterally adjustable by means of extra holes, in both the shield-beam and the connecting-bar *n*, to carry the shield-plates nearer to or farther from the plants. O are brackets that embrace the shield-bar loosely, and is held in place thereon by means of bolts or pins passing through the brackets and through a mortise in the shield-bar, to permit of a pivoted motion on the shield-bar, and for the purpose of lateral adjustment the bar is fitted with a series of mortises toward its ends.

The shields, as described, are secured in place on the machine, by bolting the brackets to the under sides of the braces I in such position as to bring the shield-plates about centrally opposite the front shovels, and are employed in the cultivation of young plants, for the purpose of protecting them from being injured by the earth and clods thrown by shovels. This shield-bar also serves the purpose of connecting the gangs of shovels, to cause a uniform parallel lateral movement thereof, and in all lateral movements the shield-plates will preserve their parallel position relatively with the line of draft.

P represents an arched sway-bar, constructed as represented, with loop-hinged arms *p*, connected to its ends, and is applied to the machine by securing the hinged arms *p* to the braces I in a laterally-adjustable manner, by means of screw eyebolts, passing upward through the braces. This sway-bar is made adjustable laterally, for the purpose of adjusting the gangs of shovels farther from or nearer to each other, to cultivate closer to or farther from the plants, and is employed when the shield is removed, and when applied to the machine, the crowning portion of the arched sway-bar is supported in an upright position to carry it over the plants by means of the staple-formed loop T, secured to the under side of the seat-frame, in which it is free to move, to permit of lateral and vertical move-

ment of the drag-bars. The seat-frame is composed of two beams, R, placed in V form, secured to each other, and to the seat S, at their rear ends, and are supported on the axle-tree, at which point they are held in place by steady-pins, and extend forward of the axle-tree, having their forward ends connected to the beams C by screw-bolts, by means of which the seat is held in place, and may be adjustable in height.

T is a loop of staple form, secured to the under side of the seat-frame, for the purpose of securing the sway-bar, to carry it in position over the plants. U represents an evener, pivoted in the open bracket *d*, between the tongue and cross-bar *b*.

The machine, when used as a riding cultivator, will require the pendants and the parts thereto attached to be adjusted to or near the forward ends of the beams C, as represented in the drawings, so that the downward draft on the pole will balance the weight of the driver when seated on the machine, in which position his feet will rest on the braces I, by means of which he will make the required lateral movements of the shovels attached to the drag-bars to properly cultivate the plants, and by means of the handles and the parts therewith connected will control and manage their up-and-down movements.

When the machine is to be used as a walking cultivator, it will require the pendants and the parts thereto attached to be moved rearward, as represented in dotted lines in Fig. 4, and the operator will control the movements of the shovels, by means of the handles K.

I claim as my invention—

1. The pendants E, with upward-projecting arm fitted to enter the slots formed by the beam C, in pairs on each side, and capable of lengthwise adjustment on the beams, in combination with the drag-bars, carrying one or more shovels, for the purpose of balancing the machine in neck-draft, when used either as a riding or as a walking machine.

2. The levers F and F′, having cam-formed feet, in combination with the pendants, and caps *e*, for the purpose of fixing the pendants in position on the beams C, as hereinbefore set forth.

3. The combination of the levers F and F′, connecting-bar *f*, and sliding pawl *f′*, fitted to engage the notched upper portion of the pendants to which the levers are pivoted, to hold the levers in pairs locked, as and for the purpose hereinbefore set forth.

4. The combination of the pendents and wheels *f″* journaled thereto, and operating as described, for the purpose of reducing the friction in sliding the pendants back and forth on the beams C, as hereinbefore set forth.

5. The pendants, fitted with the globular enlargement *g′*, in combination with the drag-bars H and loops *g″*, these parts constructed and applied as hereinbefore set forth.

6. The brackets *i*, fitted with spring-bolts *i′*, in combination with the drag-bars and suspension-braces, and perforated plates *h* and *h′*, to hold the drag-bars in an elevated position, as and for the purpose hereinbefore set forth.

7. The brackets *i*, fitted with spring-bolts *i′*, in combination with the drag-bars, suspension-braces, and perforated sliding plates *h′*, for the purpose of regulating the depth of cultivation, as hereinbefore set forth.

8. The arched sway-bar P, having arms *p* hinged thereto, and connected to the suspension-braces I, in a laterally-adjustable manner, by means of eye or hook bolts, and held in an upright position by staple-formed loop T, these parts constructed, arranged, and operating as and for the purpose hereinbefore set forth.

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