

G. E. HOPKINS.
ROTARY CULTIVATOR.

No. 174,245.

Patented Feb. 29, 1876.

Fig. 1.

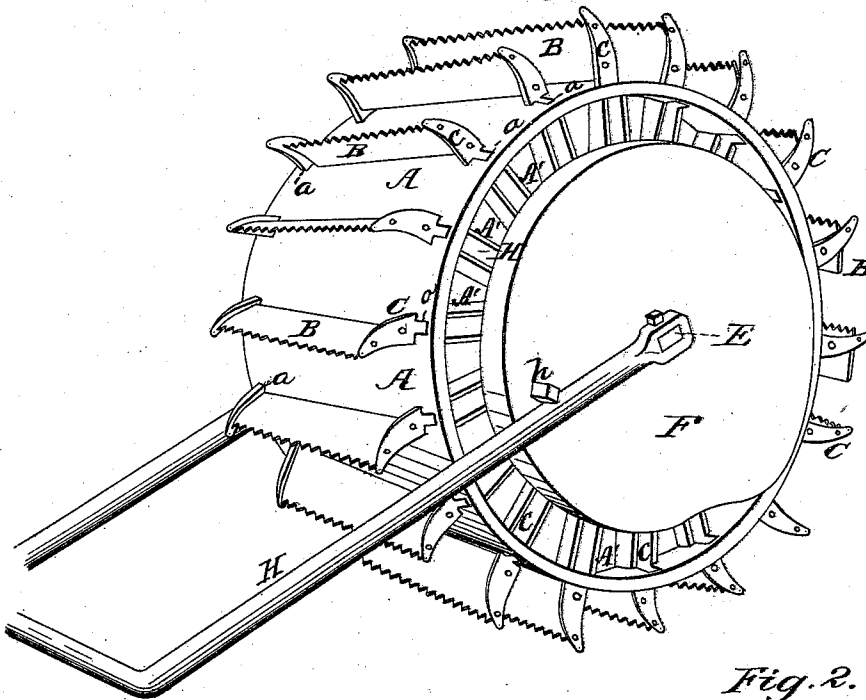


Fig. 2.

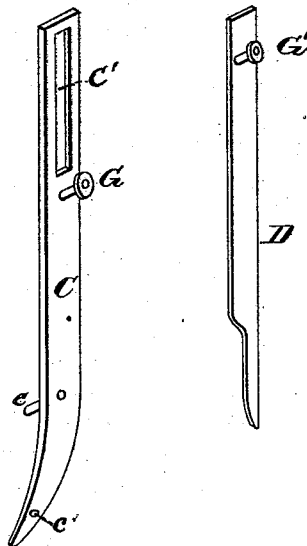


Fig. 3.

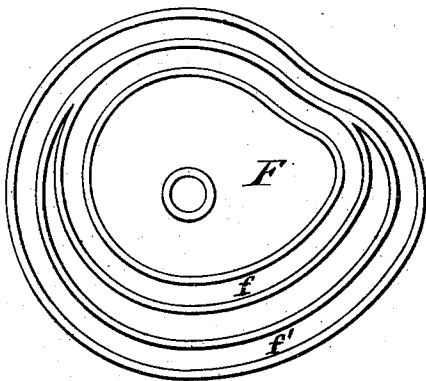
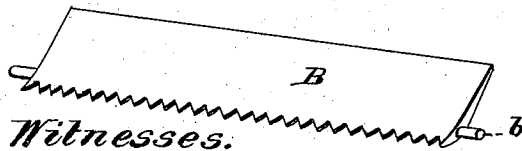


Fig. 4.



Witnesses.
J. N. Reed
J. D. Cook

Inventor.
Geo E Hopkins

UNITED STATES PATENT OFFICE

GEORGE E. HOPKINS, OF WALLA WALLA COUNTY, WASHINGTON TERRITORY,
ASSIGNOR OF ONE-HALF HIS RIGHT TO J. D. COOK, OF SAME PLACE.

IMPROVEMENT IN ROTARY CULTIVATORS.

Specification forming part of Letters Patent No. 174,245, dated February 29, 1876; application filed
July 7, 1874.

To all whom it may concern:

Be it known that I, GEORGE E. HOPKINS, of the county of Walla Walla, in the Territory of Washington, have invented a Combination Spading-Plow, of which the following is a specification:

My invention relates to rotary spading-plows or cultivators, and consists of a slotted drum, provided around its periphery with cutting-blades, pivoted to and secured and held in position on arms, which engage, by means of a projecting stud thereon, in eccentric grooves in a stationary cam secured to the stationary shaft on which the cylinder revolves, whereby, as the instrument is drawn along, the cylinder is caused to revolve, and carrying the spades with it causes them, by reason of the studs on the arms thereof, following in the grooves in the stationary cam, to enter the earth with a straight vertical movement, then assume a horizontal position, passing under and through the earth, and lifting it up and dropping it at the rear of the machine in an inverted position, all as and for the purposes hereinafter set forth and claimed.

In the drawings, Figure 1 is a perspective view of my invention complete. Fig. 2 is a detached view of the operating-arms of the spades; Fig. 3, a detached view of the eccentric, for giving the spades their peculiar movement. Fig. 4 is a detached view of the spade.

A is a heavy metallic or other cylinder, provided at each side, around its periphery, with slots *a*, and revolving loosely upon a central shaft, E. B are the spades or cutting-blades, made sharp, or with saw-teeth, as shown, and of a slightly-curved form, as shown in Fig. 4. C are arms pointed and curved at the front end and slotted at the rear C', provided with a pin, *c*, roller-stud G, and a perforation, *c'*. These arms slide, and are secured in bearings or guides A' formed in the heads of the cylinder A. The spades B are secured in position by trunnions *b* thereon entering the holes *c'* at the end of arms C, and are held from tilting in a forward direction by pins *c*, upon which they rest. D is the stop-arm, cut away at the front end, and provided at the rear with a stud, G'. These arms C D, when in position, rest one above the other—

the one, D, beneath—with the stud G' passing through the slot C' and sliding in the bearings A'. F is a cam keyed to the shaft E and stationary therewith, provided around its inside face with two channels or grooves, *f f'*, into which the projecting studs G G' of the arms enter and slide, the stud G of the arm C, to which the blades B are secured, entering the outside channel *f'*, and the stud G' of the stop-arm D entering the smaller channel *f*. H is a handle for drawing the machine along, held in a straight central position by being keyed to the shaft E, and by a stop, *h*, on the cam F.

The parts all being together, and secured in position, as shown in Fig. 1, the operation of the machine is as follows: The spades first being close down to the cylinder, with the small ends of stops D engaging over the rear edge of the blades, thus holding them in a straight rigid position, as the machine is drawn along, the studs G G' follow in the channels of the cam F. By the construction of direction of these channels *f f'*, the two arms carrying the blades are advanced together, and the blades propelled or forced down straight into the earth. The forward movement continuing, the inner channel *f* now separates from or approaches the center, while the outside one, *f'*, keeps on the same. Thus the stop-arm D is drawn back and releases the blades, which, on the continuance of the movement, and the resistance of the earth, are caused to assume a flat horizontal position, cutting under, and a layer of earth from the ground. The movement still continuing, the blades, carrying a slice of earth, are lifted out of the ground, and the weight of the earth on the pivoted blade causes the blade, as it is lifted from the ground, to revolve or tilt over, and deposit the earth in an inverted position back on the ground. As the cylinder continues to revolve, the blades, by their gravity, drop back against the studs *c*, and the channels *f f'*, changing the arms C, are drawn in, and the arms D advanced until the end of arm D comes over the rear of the blades, when, the channels again changing, both the arms carrying the blades are drawn in in a position to again enter the earth and repeat the operation, as above set

forth. Thus it will be seen that an effective spading plow or cultivator is secured, and one that causes and insures the proper inversion of the soil.

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

1. The cylinder A *a*, revolving loosely upon a stationary shaft, E, slotted at each side around its periphery, and constructed around each head with guides A', as and for the purposes described.

2. The arms C, constructed with slot C', stud G, pin *e*, and hole *c'*, as and for the purposes described.

3. The stop-arm D, with roller stud G', as and for the purposes described.

4. In combination with the arm C, constructed with hole *c'* and pin *e*, the curved saw-toothed blade B, with trunnion or pivot bearings *b*, as and for the purposes described.

5. In combination with the cylinder A and cam F, the arms C D, as and for the purposes described.

7. The combination of cylinder A, cam F, arms C D, and blades B, as and for the purposes described.

G. E. HOPKINS.

In presence of—

A. H. SIMMONS,
J. D. COOK.