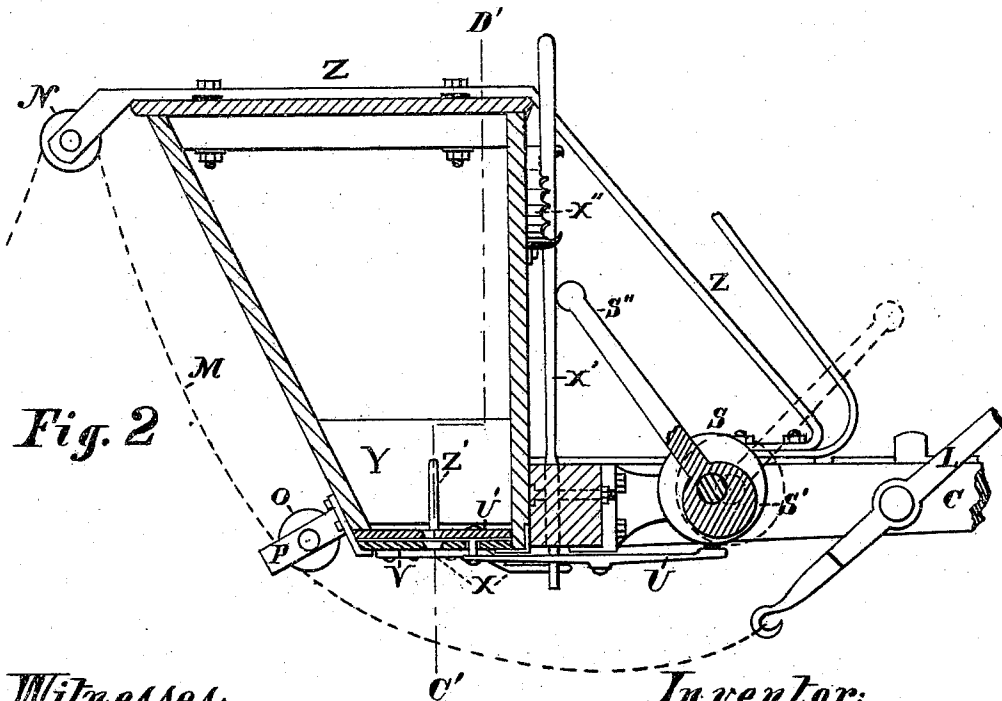
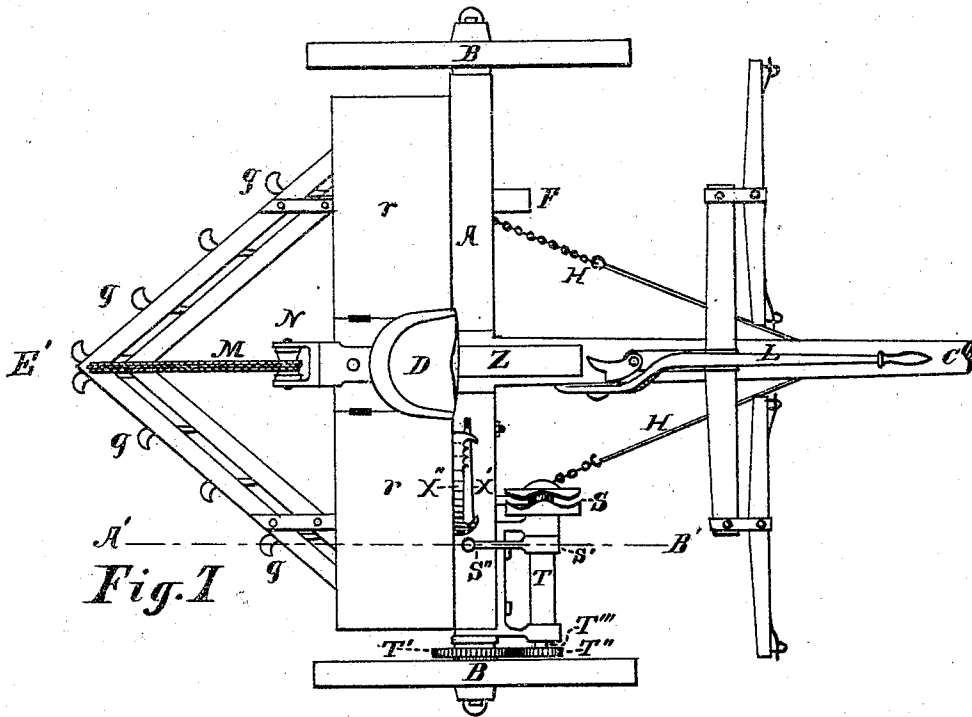


E. R. POWELL.
 COMBINED WHEEL-HARROW AND SEED-SOWER.
 No. 173,810. Patented Feb. 22, 1876.



Witnesses:
 L. A. Atwood
 L. A. Royer

Inventor:
 Edwin R. Powell,
 Per, C. C. Royer,
 Attorney.

E. R. POWELL.
COMBINED WHEEL-HARROW AND SEED-SOWER.
No. 173,810. Patented Feb. 22, 1876.

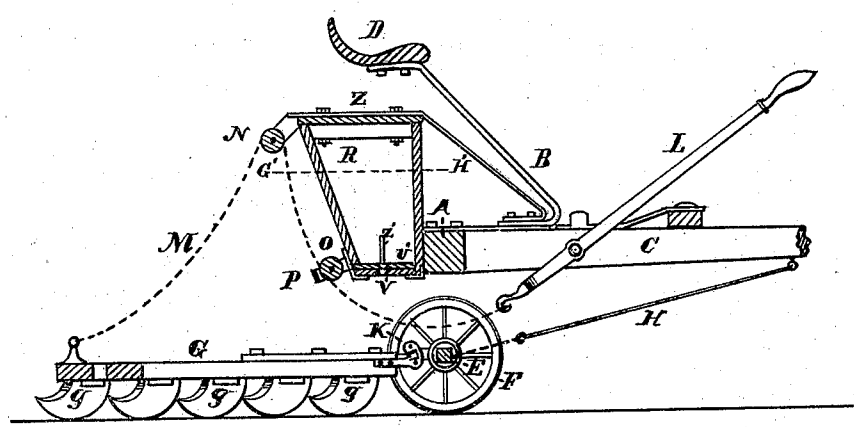


Fig. 3

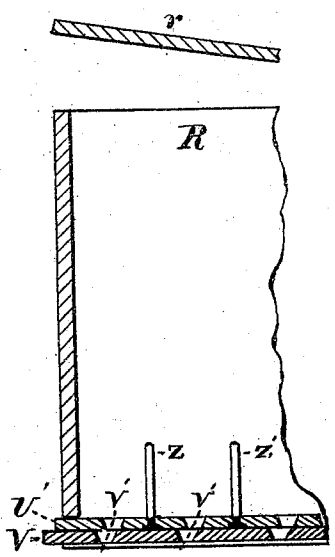


Fig. 4

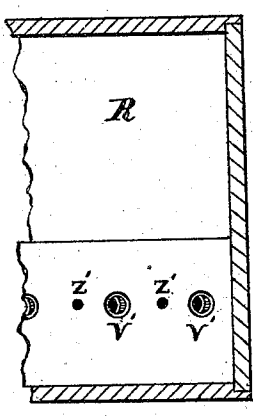


Fig. 5

Witnesses:
L. A. Atwood
L. A. Rogers

Inventor:
Edwin R. Powell,
Per, E. C. Rogers,
Attorney.

UNITED STATES PATENT OFFICE.

EDWIN R. POWELL, OF WINOOSKI, ASSIGNOR OF TWO-THIRDS HIS RIGHT TO
FREDERICK C. KENNEDY AND LUTHER C. DODGE, OF BURLINGTON, VT.

IMPROVEMENT IN COMBINED WHEEL-HARROWS AND SEED-SOWERS.

Specification forming part of Letters Patent No. **173,810**, dated February 22, 1876; application filed
January 13, 1876.

To all whom it may concern :

Be it known that I, EDWIN R. POWELL, of Winooski, county of Chittenden and State of Vermont, have invented sundry new and useful Improvements in Combined Wheel-Harrows and Seed-Sowers, and of which the following is a specification:

The machine, adjusted for use, consists of a sulky-frame, upon which is placed a seed-box (portable or fixed) having an adjustable perforated bottom, and a perforated and vibrating bottom over the same, to which vibrating bottom is attached, by means of elongated vertical pins, a series of oscillating arms running up through the center of the seed-box and fixed in the center of their length to a cross-bar by loose pivots, this cross-bar being portable, and, when adjustable for use, is fitted into a slide at either end of the seed-box. On the outside of the seed-box, and fixed at front of the main axle, is a metallic frame carrying a shaft, at one end of which is a gear meshing with a larger gear on the hub of the sulky-wheel. At the other or inner end of this shaft is a cam, having in its face a wave-shaped groove. Running in this cam-groove, and on its lower side, is an oscillating lever, which connects with the vibrating bottom of the seed-box, giving it (the bottom) twenty-four motions to each revolution of the sulky-wheel. On this cam-shaft, between the gear and cam, and close to the latter, is an eccentric collar, with a lever attached to it, which, when thrown out from the seed-box, disconnects the gears, and, when drawn to the seed-box, meshes the gears, rotating the shaft and cam, oscillating the lever, and vibrating the upper bottom of seed-box, as stated. At the front of the seed-box, and within reach of the driver, is a vertical adjusting-bar having a spring-crank moving over a perforated locking-plate. The vertical bar passes down through the sulky-axle, under it, and to the adjustable bottom of the seed-box, the operating of which adjusting-bar admits of the perforations in the two bottoms of the seed-box, to be opened or closed, more or less, to suit kind and quantity of material sowed.

When so desired, the perforations may be entirely closed, the gears thrown out of mesh, and the apparatus used as a wheel-harrow only.

The invention further consists in combining the above seed sowing mechanism with my improvements in wheel harrows and grain-planters, for which Letters Patent were granted to the petitioner under date of November 29, 1870, and numbered 109,754.

Figure 1 is a top view of the seed-sowing device and harrow combined, ready for use. Fig. 2 is an enlarged section through the seed-sowing device on line A' B', Fig. 1. Fig. 3 is a section through the seed-sower and harrow on line E' F', Fig. 1. Fig. 4 is an enlarged section through the seed-sower on line C' D', Fig. 2. Fig. 5 is an enlarged section through the seed-sower on line G' H', Fig. 3.

A in the drawing represents an axle-tree; B B, wheels; C, a rigid tongue; and D, a driver's seat, (all of which may be of any usual construction,) constituting a sulky-frame, which is employed to drag and carry the harrow or coverer proper, as required. E represents the harrow-axle, and F F a pair of wheels, constituting a truck, which forms the medium of attachment and support for the front end of the harrow. g g g represent the harrow-teeth, and H H drag rods and chains attaching the truck-axle E to the rigid tongue C. K represents adjustable clevises on the harrow-wood, engaging with perforated lugs on the axle E. L represents a hand-lever for elevating the rear end of the harrow G. M is a chain attaching the rear end of the harrow G to the elevating hand-lever L. N is a grooved pulley affording an elevated support for the chain M, and O a supplementary pulley reflexing the chain M to the line of draft of the lower end of the lever L. P is a U-shaped bracket providing bearings for the lower pulley O. R is a seed-box having a sloping back, r r being covers to the same. S represents a wave-shaped-groove cam; S', an eccentric collar, and S'' a lever for throwing gears T' and T'' in and out of mesh. T is an eccentric sleeve inclosing a rotating shaft, T'''. T' is a large gear, se-

cured to the hub of wheel B, meshing with and rotating a smaller gear, T'', which latter is secured to, and rotates, the shaft T''' within the eccentric sleeve T. U represents an oscillating lever connecting the cam S with a countersunk apertured upper bottom, U', in the seed-box R, one end of which lever has a sleeve or roller running in the groove of the cam S, the other end a stud engaging with the bottom U'. V is an adjustable bottom in the seed-box R, being perforated with countersunk apertures to correspond with those in the upper bottom U'. The countersinks in the bottoms prevent any lodgment at the bottom of the seed-box or between the bottoms. X represents a rigid arm, secured to the adjusting-bottom V, and engaging with a slot in the lower end of the spring-adjusting lever X', and X' represents an adjusting spring-lever for operating, moving to and fro in a line with the axle-tree A, the adjustable bottom V of the box R. X'' represents a corrugated locking-plate, secured to the front of the seed-box R. Y' is a series of partitions in the seed box R to strengthen the bottom of the box and prevent shifting of the contents of the same when on a hillside or uneven ground. Z represents a broad flat stay, passing from the pole C to and over the seed-box R, the front end being turned under for the purpose of elasticity, and the back end formed into a Y or yoke, the whole forming an elevated support for the pulley N, the seed-box R, which is firmly secured in position, supporting the stay. Z' represents a series of agitating-pins secured to the vibrating bottom U' and operated by the same.

In operation, the seed or other material to be distributed is placed in the seed-box R. The quantity per acre is then regulated by throwing the adjusting spring-lever X' to or from the driver, he being in the seat D. The lever being a strong spring pressing toward the corrugated locking plate X'', it (the lever) is firmly held in position by engaging with the corrugation that may be at the point of set of the lever. The harrow or cover G being attached to the sulky-frame, the lever L is thrown forward to allow the harrow G to fall to the ground. The driver draws the shipping-lever S'' toward the box R, which act meshes the gears T' and T'', rotating the shaft T''' and

cam S, causing the lever U to oscillate, and the upper bottom of the seed-box R to vibrate, sowing the seed, &c., evenly upon the ground to (in turn) be covered by the harrow G.

In passing to and from the field, or if, from any cause, it is desirable to throw the apparatus out of action, the lever S'' is thrown forward, disconnecting the gears T' and T'', and the lever L drawn back, raising the harrow G from the ground, or rather its back end is raised from the ground, causing it to move by means of the wheels F F, attached to its front end.

The vertical pins Z' serve to prevent any lodgment or packing of seeds or fertilizers by keeping such seeds or fertilizers in a state of constant agitation.

What I claim as my invention is—

1. In a seeding-machine, the combination, with a seed-box, of an adjustable bottom and a vibrating bottom or slide, the perforations in both being countersunk and so placed in the seed-box that the larger diameters of the perforations are on the upper side of the bottoms, as and for the purpose herein set forth.

2. In a seeding-machine, the combination, with a seed-box, of an adjustable and a vibrating bottom having a series of vertical agitating-pins, substantially as and for the purpose set forth.

3. In a seeding-machine, the gears T' and T'', eccentric sleeve T, shaft T''', lever S'', wave-shaped-groove cam S, and oscillating lever U, (combined as herein described,) operating the vibrating bottom of the seed-box, and operated by the rotating of the wheel B, substantially as set forth.

4. In a seeding-machine, the adjusting spring-lever X', working at its upper end in or along a corrugated locking-plate, X'', and connected to a rigid arm, X, on the adjusting-bottom V, substantially as and for the purpose herein set forth.

5. In a seeding-machine, the broad flat stay Z secured to the pole, being bent under at one end and having a pulley-yoke at the other end, as and for the purposes herein set forth.

EDWIN R. POWELL.

Witnesses:

LORENZO A. ATWOOD,
DAVID J. FITZGERALD.