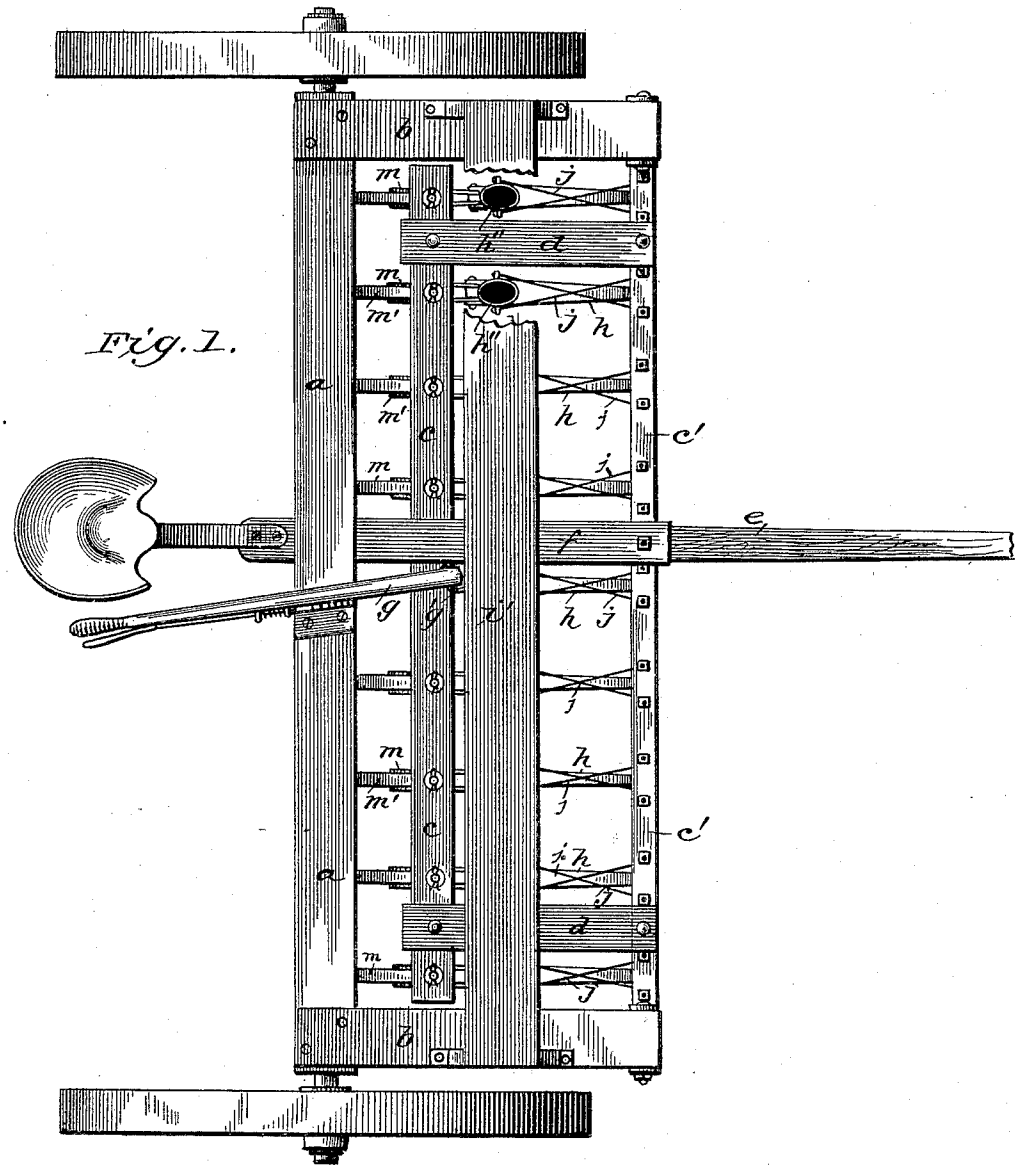
(No Model.) 3 Sheets—Sheet 1.

H. S. HOWARD.

SEEDING MACHINE.

No. 427,420. Patented May 6, 1890.

Fig. 1.



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Fig. 2.

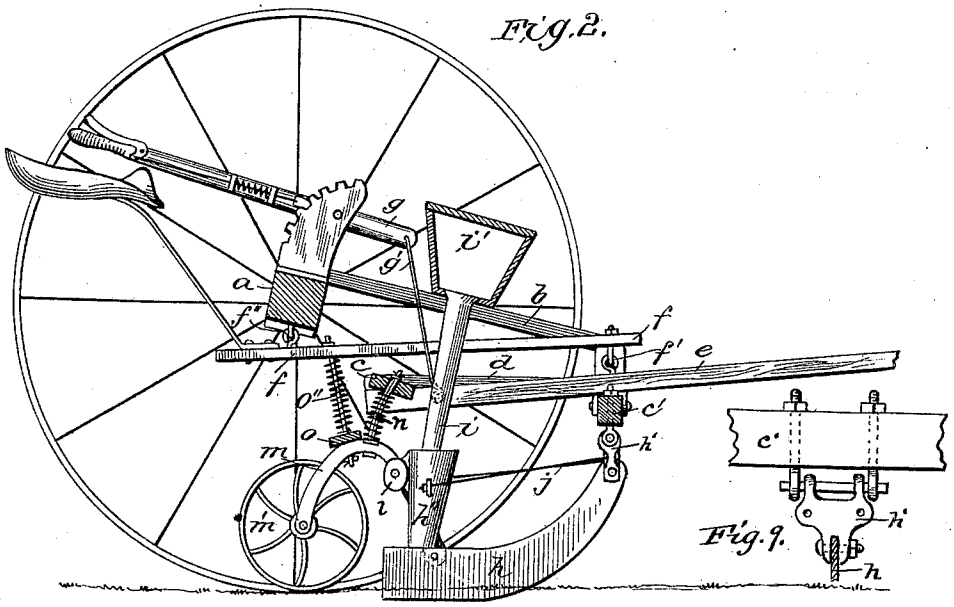
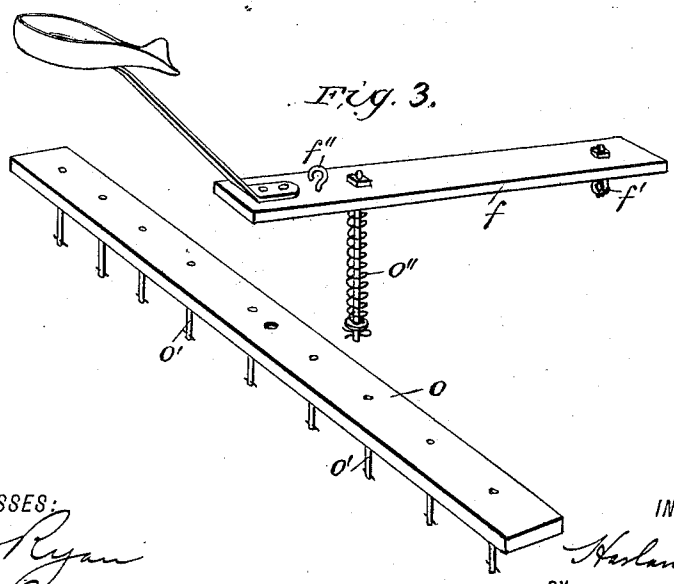


Fig. 9.

Fig. 3.



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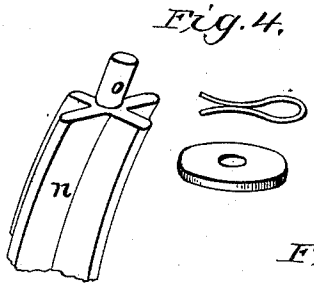
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No. 427,420. Patented May 6, 1890.

Fig. 4.



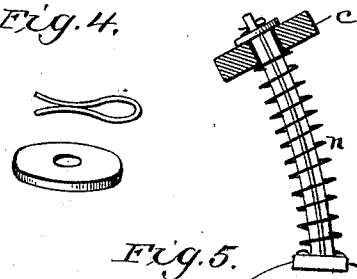


Fig. 5.

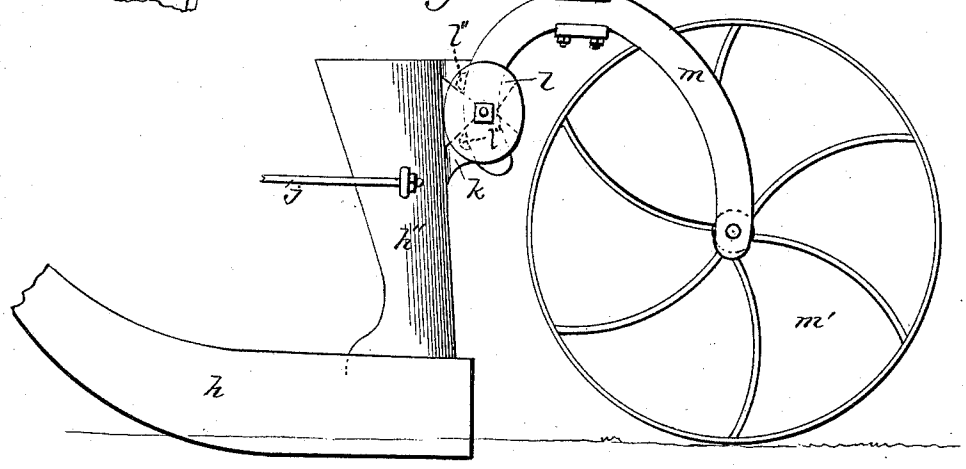


Fig. 6.

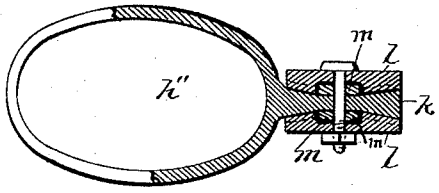
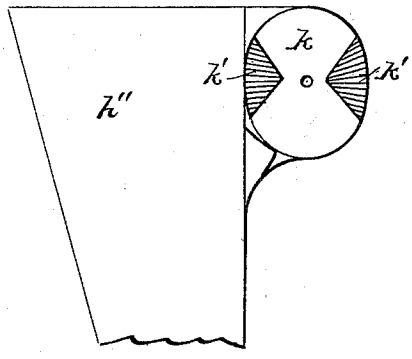


Fig. 8.



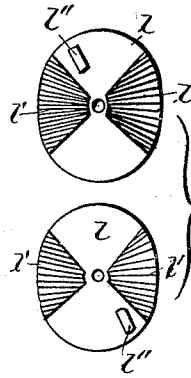


Fig. 7.

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UNITED STATES PATENT OFFICE.

HARLAN S. HOWARD, OF MADISON, WISCONSIN.

SEEDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 427,420, dated May 6, 1890.

Application filed December 19, 1889. Serial No. 334,303. (No model.)

To all whom it may concern:

Be it known that I, HARLAN SMITH HOWARD, a citizen of the United States, residing at Madison, in the county of Dane and State of Wisconsin, have invented certain new and useful Improvements in Seeding-Machines, of which the following is a specification, reference being had therein to the accompanying drawings, in which—

Figure 1 represents a plan view of my machine complete, a portion of the seed-hopper being broken away to better show some of the parts; Fig. 2, a longitudinal vertical sectional view of the machine; Fig. 3, detail perspective views of the seat-beam and a pressure-bar connected thereto; Fig. 4, a detail perspective view of the upper end of one of the curved pressure-rods and its attachments; Fig. 5, a detail side elevation of one of the drill-tubes and furrow-openers and pressure-wheels attached thereto; Fig. 6, a horizontal sectional view showing connection of wheel-arms to grain-spout of shoe; Fig. 7, a detail view of the adjustable corrugated disks employed to clamp the pressure-wheel arms to the grain-spout of shoe; Fig. 8, a detail view of the lug on rear end of grain-spout, and Fig. 9 a detail view of connection between shoes and front beam of the frame.

The object of this invention will fully appear in the course of this specification.

In the drawings, *a* designates a suitable axle supported pivotally upon a pair of transporting-wheels and provided near its ends with a pair of forwardly-projecting arms *b*, these arms being rigidly bolted to the axle. Hung pivotally to the forward ends of the arms *b* is a rigid horizontal frame consisting of the long transverse beams *c c'* and the short end beams *d d*. The pole or tongue *e* is rigidly secured to this frame about midway between its ends. The seat-beam *f* is arranged in line with the tongue and pivotally secured to the same by means of eyebolts *f'*, this seat-beam extending rearwardly under the axle and pivotally hung thereto by means of another pair of eyebolts *f''*, the driver's seat being mounted upon the extreme rear end of the beam. An operating-lever *g* is pivoted upon a toothed segment secured upon the axle and extended back within a convenient reach of the driver's seat, the forward end of this lever being connected by a pivoted link *g'* to the rear end of the tongue.

The operation of raising and depressing the horizontal frame is as follows:

To depress the frame it is simply necessary to elevate the rear end of the operating-lever, whereupon the axle will be permitted to rock in a forward direction, so as to depress the forward ends of the arms *b*, thereby permitting the horizontal pivoted frame composed of beams *c* and *d* to fall the desired distance. By means of a spring-actuated bolt (of the usual construction) on the operating-lever and the toothed segment the frame may be held at any desired elevation.

To elevate the frame *c d*, the operator simply depresses the rear end of the operating-lever, which action will raise the said frame through the medium of the pivoted rod or link *g'* and cause the axle and arms *b* to assume their normal horizontal positions.

The pivoted horizontal frame *c d* carries the seeding mechanism, which is constructed as follows: Pivotally secured by means of brackets *h'* to the under side of the beam *c'* are the rearwardly-extending shoes *h*, provided with the usual seed-spouts *h''*, into which the seed is conveyed through hose *i* from the hopper *i'*, mounted upon the arms *b* or at any other suitable point. The spouts and shoes are rigidly braced by the crossed rods *j*, which extend from ears formed on the brackets *h'* to ears formed on the spouts *h''*, the ends of the rods passing through holes in the ears and drawn tight by means of nuts.

Formed in the rear side of each spout *h''* near its top is a lug or wing *k*, provided with a central bolt-hole and duplicate beveled projections *k'* at diametrically-opposite points on both sides, these beveled or semi-conical projections being provided with radial ribs or corrugations, as shown.

Clamped on opposite sides of the lug *k* by means of a horizontal bolt and disks *l* are the forward ends of the arched parallel bars *m*, between the rear ends of which and in direct line with the shoe *h* is journaled the presser-wheel *m'*. To raise or lower the presser-wheel with respect to the shoe, it is simply necessary to loosen the connecting-bolt and turn the disks *l* in either direction (in a forward direction to lower and vice versa to

raise) and tighten the bolt again, these disks being prevented from turning by corrugated projections l', which engage the projections k' on the lug. In this way the wheel may be rigidly but adjustably held in any position with respect to the shoe, so that the seed may be planted deeply or shallow, as the farmer may desire.

To prevent the arms m oscillating on the connecting-bolt, the inner faces of the disks l are provided with stop-lugs l'', the lug on one disk being adjusted to bear against the forward edge of the adjacent arm m above the bolt, while the lug on the other disk bears against the arm m below the bolt, thereby preventing the slightest oscillation of the arms attached to the wheel.

If it is desired to permit the shoe to fall below the adjusted point with respect to the wheel, in order that it may drop into depressions in the field while operating, a limited downward movement may be allowed it by simply removing one of the disks (the right-hand one in the drawings) and turning its smooth side inward, when the arms m will be allowed to oscillate freely between the lower lug l'' and the forward corrugated projections l' k', as is evident. Thus permitting the shoes a limited downward movement with respect to the presser-wheels is very advantageous in that it adapts the machine for thorough planting on rough lumpy ground, inasmuch as the shoes will be permitted to accommodate themselves to the irregular surface and will not be lifted out of the ground whenever the presser-wheels are elevated by lumps or other objects, as is evident.

If it is desired to permit the presser-wheels to have free up-and-down movement with respect to the shoes, this may be accomplished by simply removing both disks and turning their smooth faces inward, thereby permitting the bars m to oscillate freely between the corrugated projections k' on the lug k.

Rigidly connected to each one of the arches and extending upwardly therefrom and passing loosely through apertures in the pressure-beam c of the swinging frame are curved metallic rods n, provided with washers on their upper projecting ends to prevent them being withdrawn from their apertures in the pressure-beam, the washers being held on the rods by means of removable split pins.

Coil-springs surround the rods n and exert a constant downward pressure upon the presser-wheels and shoes, thereby permitting them to yield independently of each other to conform to the irregular undulations of the soil, and at the same time to insure every shoe being pressed firmly into the soil the distance for which it is set.

If it is desired to increase the pressure upon the wheels and shoes, a transverse beam o (shown in Figs. 2 and 3) may be connected to the arches of the presser-wheels by short depending bolts o', (passed down between the bars of the arches,) and kept pressed normally down by means of a spring surrounding a vertical rod o'', connecting this bar o to the seat-beam f. In this way the driver may depress the drills simultaneously by simply pressing down with his feet on the beam o. A portion of the weight of the driver and the constant pressure of the spring or rod o'' will also serve to augment the pressure on the drills.

By securing and mounting the seat-beam and seat as shown and described the weight of the driver will tend to balance the machine on its axle-spindles, and thereby relieve the horses' necks of all weight or strain. The strain on the horses' necks has always been a drawback with this class of machines; but my manner of arranging the frame and seat-beam materially overcomes this objection.

An essential advantage in constructing and operating the machine in the manner shown and described is that the shoes and wheels attached to the swinging frame c c' d d are raised bodily from the ground by a simple movement of the operating-lever, the said frame remaining always in a horizontal position whether the planting mechanism be in operation or not. It will be also observed that the weight of the driver and the frame will be thrown upon the planting devices, thus insuring a positive pressure upon the shoes and covering-wheels at all times.

The manner of connecting the pressure or covering wheels to the shoe-spout has many advantages, as hereinbefore pointed out, inasmuch as the machine may thereby be adapted to various kinds of planting.

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

1. The combination, with an axle mounted on wheels and capable of a rocking movement thereon and forwardly-projecting beams b, secured to this axle so as to rock with it, of a horizontal frame pivotally hung to the forward ends of the said beams b, a series of seed-planting devices carried by the said horizontal frame, and devices supported on the axle and connected to the said frame for raising and lowering it, whereby when the said frame is raised from the ground the axle will rock and the beams b assume a horizontal position, and thereby lift the planting devices and frame bodily off the ground, substantially as described.

2. The combination, with the axle and wheels, of the projecting arms b b, a frame pivotally hung from the ends of the arms b b, the tongue connected to this frame, the seat-beam connected to the said tongue and to the under side of the axle, a seat mounted on the rear end of the seat-beam, planting mechanism mounted on said frame, and means for elevating and depressing said frame and planting mechanism bodily, substantially as and for the purpose set forth.

3. The combination of the axle and wheels, the frame hung thereto, the tongue, the seat-

beam, the shoes and attached presser-wheels, the connecting-bar *o*, and the coil-spring for depressing said bar *o*, substantially as described.

4. The combination, with an axle pivotally supported on wheels, and arms *b b*, projecting forwardly therefrom and rigidly secured thereto, of a frame pivotally hung to these arms and consisting of front and rear beams *c c'* and end beams *d d*, means for raising and lowering this frame, shoes pivotally hung to the front beam *c'* of the said pivotally-hung frame, arms connected to the shoe-spout and carrying pressure-wheels, and upright rods secured to these arms and extending up through apertures in the rear beam *c* of the pivotally-hung frame, as and for the purposes set forth.

5. The combination of a beam, a bracket or plate *h'*, hung thereto, a shoe connected at its forward end to this plate, a seed-spout *h''*, carried by the said shoe, and rods *j*, connecting the shoe to the said plate *h'*, these rods crossing each other at a point intermediate their ends, substantially as described.

6. The combination of an axle supported pivotally upon transporting-wheels and provided with forwardly-projecting beams, a horizontal frame pivotally hung to the said forwardly-projecting beams and carrying pivotally-hung shoes, a tongue secured to this horizontal frame, a seat-beam connected to the axle, arms *m*, connected to the shoe-spouts, a bar *o*, connecting the said arms *m*, and a pressure-spring interposed between seat-beam and the said bar *o*, substantially as described.

7. The combination of a seed-spout and shoe, the former having a lug cast on its rear side, the lug having portions of its two faces corrugated, presser-wheel arms clamped on opposite sides of the said lug, and disks and a connecting-bolt, the said disks being provided with corrugations and lugs on one side and smooth on their opposite sides, substantially as and for the purpose described.

8. The combination of a frame, a shoe pivotally connected to the said frame and carrying a seed-spout, said seed-spout being provided upon its rear side with a lug *k*, arms *m*, clamped upon the opposite sides of the said lug *k*, a horizontal bolt and disks for clamping the said arms, the said disks having their outer sides smooth and their inner faces provided with stop-lugs *l'' l''*, one of these lugs being located above the said bolt and the other one below it, and a presser-wheel carried by the said arms and located directly in the rear of the said seed-spout, all arranged as and for the purposes specified.

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

HARLAN S. HOWARD.

Witnesses:

J. G. KANOUSE,

J. W. BLAKESLEE.