2 Sheets—Sheet 1.

W. H. NAUMAN.

Grain-Drill.

No. 205,892. **Patented July 9, 1878.**

Fig. 1.

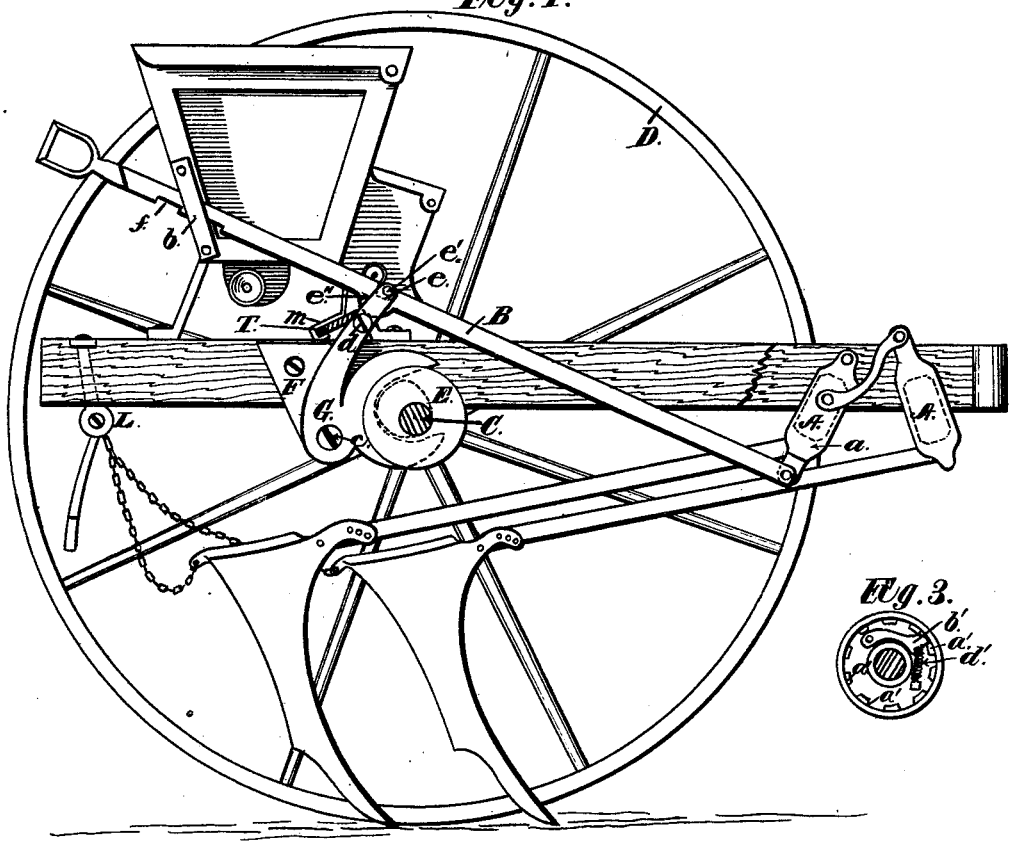
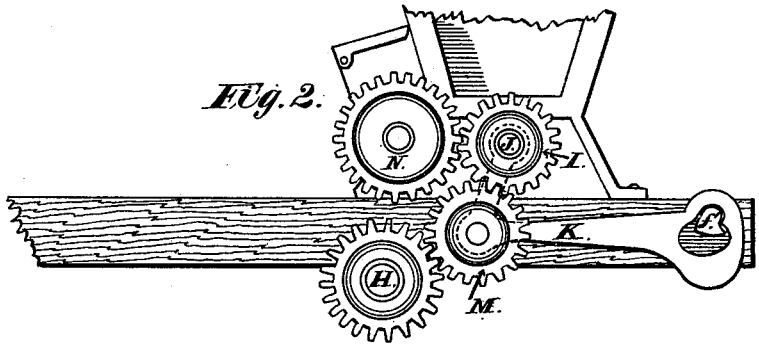


Fig. 3.

Fig. 2.



Witnesses;
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Wm Ritchie

Inventor;
William H. Nauman
by his Attys.
Peck & Co.

2 Sheets—Sheet 2.

W. H. NAUMAN.

Grain-Drill.

No. 205,892. Patented July 9, 1878.

Fig. 4.

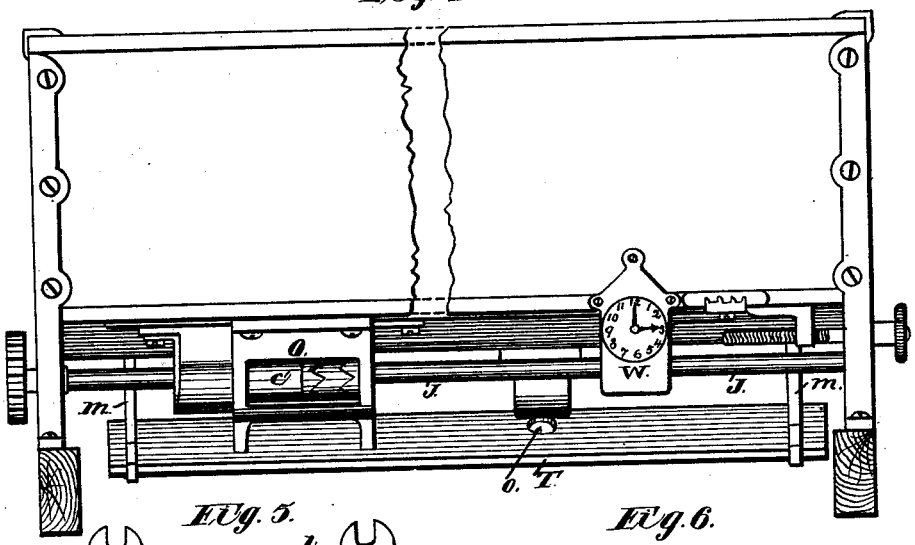

Fig. 5.

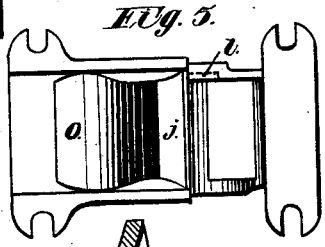

Fig. 6.

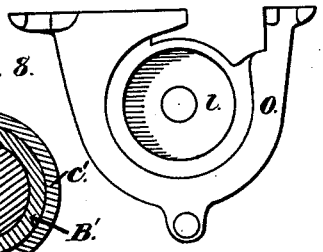

Fig. 8.

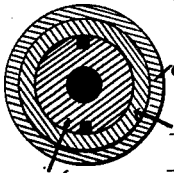

Fig. 9.

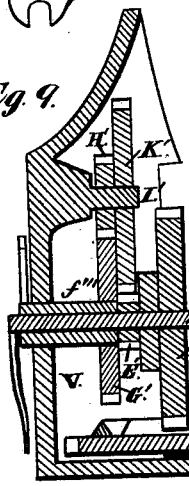

Fig. 7.

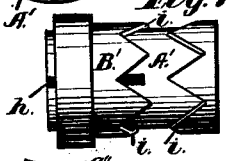

Fig. 10.

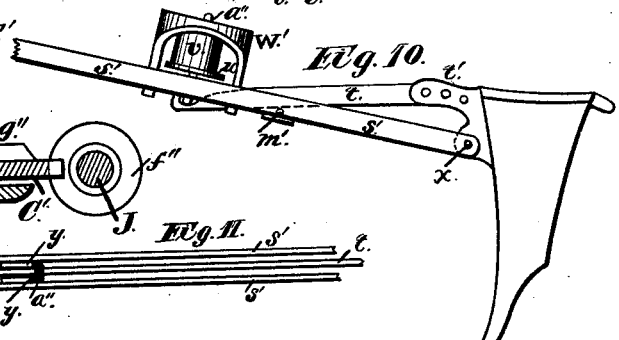

Fig. 11.

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by his attys
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UNITED STATES PATENT OFFICE.

WILLIAM H. NAUMAN, OF DAYTON, OHIO.

IMPROVEMENT IN GRAIN-DRILLS.

Specification forming part of Letters Patent No. **205,892**, dated July 9, 1878; application filed August 2, 1877.

To all whom it may concern:

Be it known that I, WILLIAM H. NAUMAN, of Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Grain-Drills; and I do hereby declare the following to be a full, clear, and exact description of the same.

This invention relates to that class of grain-drills in which the drag-bars are attached alternately to two connected swinging bars hung in the front part of the frame, and by which the hoes can be shifted from a straight to a zigzag rank, or vice versa.

My improvements consist, first, in the application to the swinging bars of an arm, which may be operated by hand from the rear, to change the rank of the hoes, or which may be connected to a cam mechanism either upon the axle or hub of the carriage-wheel, whereby the hoes will have a constant reciprocating movement; second, in the construction and application to the operating gearing and lifting-bar of a peculiarly-constructed lever, whereby the seed mechanism will be thrown out of gear and stopped upon raising the hoes from the ground; third, in the construction and application of a perforated adjustable board, whereby the grass-seed can be thrown in the front or in the rear of the hoes without making it necessary to shift the grass-seed hopper.

In the accompanying drawings, Figure 1, Sheet 1, is a side elevation of my improved drill, with a wheel removed and a portion of the near side beam broken away. Fig. 2, Sheet 1, is a side elevation of the opposite side of the drill, showing the gearing for operating the seed mechanism. Fig. 3, Sheet 1, is a detail view of the hub-ratchet in elevation. Fig. 4, Sheet 2, is a rear elevation of the hopper, showing the application of the feed-wheels, land-measure, and grass-seed shifter. Fig. 5, Sheet 2, is a plan view of my improved seed-cup. Fig. 6, Sheet 2, is an end elevation of the same. Fig. 7, Sheet 2, is a side elevation of my improved feed-wheel. Fig. 8, Sheet 2, is an end elevation of the same. Fig. 9, Sheet 2, is a central sectional view in side elevation of my improved land-measure. Fig. 10, Sheet 2, is a side elevation of the spring-hoe. Fig. 11, Sheet 2, is a plan view of parts of the same.

Like letters of reference indicate the same parts in all the figures.

I construct the frame-work of my drill and mount the hopper and grass-seed box thereon in the usual manner. The swinging beams A, to which the front ends of the drag-bars are attached, are constructed and connected as shown and claimed in my Patent No. 181,588, granted to me August 29, 1876. To shift the hoes, however, I provide the following mechanism, reference being had to Fig. 1. The end plate *a* of the rear beam A extends below the beam, and projects laterally under the side beam of the drill-frame to form a bearing, to which is pivoted the forward end of an arm, B. The arm is a flat metal bar, extending rearwardly and upwardly, as shown, along the side of the drill, and through a bearing-plate, *b*, until it terminates in a convenient handle just in the rear of the hopper.

Either upon the axle C or the hub of one of the carriage-wheels D is keyed an eccentric or cam confined between two concentric disks that form a wheel, E, the cam being represented by the dotted lines.

Upon a bearing-plate, F, attached to the side beam just under the end of the hopper, is pivoted at *c* a lever, G, of the shape shown, having a bifurcated portion encompassing the cam between the disks of the wheel E, and an upward extension whose top end lies against the outer side of the arm B. In the top of the arm, at the point of intersection, is a slot, *e*, (represented in dotted lines,) in which a stud, *e'*, projecting from the inner top side of the arm of the lever G, fits and is held by a screw, *d*, passed through the lever G and under a widened portion, *e''*, of the arm B.

It can be readily understood how the revolution of the cam-wheel E would cause the oscillation of the lever G, and consequently the reciprocation of the arm B and of the drag-bars connected to the beams A. By this means the hoes would be constantly changing their rank during the operation of the drill, to free themselves of rubbish and to act in a measure as harrows. To prevent this motion, it is only necessary to withdraw the screw *d*, when the arm B would fall sufficiently to disengage its slot from the stud of the lever G. It could then be operated from the rear by the hand to adjust the ranks of the hoes, slots *f*

in its under edge, in connection with a pin in the bearing-plate *h*, serving to hold the lever adjusted at any desired point.

By reference to Fig. 3 the second part of my invention will be clearly understood. It is well known that the feed mechanism of drills is usually driven by means of a gear-wheel attached to the hub of either one of the carriage-wheels, or by having it keyed to the axle together with one of the supporting-wheels, the other being loose, and that when the drill is being turned on that wheel as a pivot the seeding mechanism necessarily stops, inasmuch as the wheel does not revolve.

In a like manner, in going over rutty or uneven ground, when the drill has to go in a zig-zag manner, first on one wheel and then on the other, the seeding mechanism has in consequence an intermittent action, and does not sow uniformly.

It is my purpose to remedy this difficulty by keying the driving gear-wheel H to the axle C, Fig. 2, and not to the wheel-hub, and by attaching the wheels to the axle by means of inside hub-ratchets, one of which is shown in elevation in Fig. 3. The outer side of the hub is recessed, and its inner rim is provided with gear-teeth *a'*, which form ratchets. Over the end of the axle C is then slipped a disk, on the inner side of which is pivoted a dog, *b'*, held in engagement with the teeth *a'* by means of a spiral or other spring, *d'*. This disk snugly fits into the aperture of the recess in the hub, and it is keyed to the axle, so that when the wheels revolve forward the axle also revolves with them; but when they revolve backward the dogs will slip over the ratchets and the axle will remain stationary.

It can now be readily understood how, when either wheel advances in the act of turning the drill around or otherwise, the axle and driving-gear wheel H will revolve continuously and uninterruptedly.

Another advantage of this arrangement is that in backing the drill the seeding mechanism ceases its action automatically, and does not require that the feed-gears be disengaged.

The second part of my invention is illustrated in Fig. 2. H is the driving-gear wheel, keyed to the axle C. I is the gear-wheel, keyed upon the end of the seed-wheel shaft J; and loosely hung upon this shaft, next to the inner side of the gear-wheel, is an arm, K, extending downward, as represented by the dotted lines, and then rearward, as shown, to the end of the side beam of the drill-frame. Through the end of this bell-crank arm is a heart-shaped recess, as shown; and in this recess works a cam, *f'*, of the shape shown, which is keyed upon the end of the crank-arm to which the rear lifting-bar L is connected. Upon the arm K, at its angle, is pivoted the gear-wheel M, connecting the wheels H and I, and meshing with the wheel I is the wheel N, keyed upon the end of the grass-seed wheel-shaft. Now, upon raising the lifting-bar L, and with it the hoes, the cam *f'* draws backward the arm K and disengages the wheel M from the wheel H; or should the wheel H be fastened, as is usual, upon the wheel D, when the drill was backed the wheel M would be automatically forced out of engagement with the wheel H, thereby stopping the seeding mechanism; or should any rubbish be thrown up and caught in the gears, the wheel M would yield and prevent the cogs from being broken.

I am aware that it is not new to employ an intermediate loose gear-wheel hung upon a gravitating arm, and consequently disclaim the principle involved.

The feed-wheel, Figs. 7 and 8, is composed of two parts, a hub, A', and a sleeve, B', the latter fitting over the former and attached thereto, so as to revolve with it, but free to slide thereon, by means of the keys fitting in longitudinal diametrical slots *h*. One end of the hub is of increased diameter, as shown, and terminates in serrations *i*. The sleeve, likewise, is of two diameters, the smaller of which coincides with the larger of the hub, and its edge is serrated to correspond with the serrations *i*. The larger portion snugly fits into a carrying-sleeve, and serves to prevent the grain from passing out at the end of the cup. This wheel revolves upon the shaft J inside of a non-rotating adjustable cylinder, *c'*, in the seed-cup, such as was patented to me October 17, 1876.

The present feed-wheel has these advantages: There is a continuous channel between the smooth portion of the hub and the bottom of the seed-cup, so that there is no danger of crushing the grain, while at the same time the edges of the serrations regulate the size of the channel and serve to force the grain to the discharge-orifice.

The cup O, in which the wheel just described revolves, is constructed as shown in Figs. 5 and 6. It is cast in one piece with the bridge *j*, and is an integral part thereof.

The essential improvement consists in forming a recess, *l*, in the end of the cup. (Shown by dotted lines in Fig. 5.) In this recess the end of the feed-wheel is confined, and by this arrangement all danger of crushing the grain between the end of the wheel and the case is avoided.

In Figs. 1 and 4, *m m* are two brackets attached to the under side of the grass-seed hopper at each end. In these brackets are slots inclined downward and to the rear, in which a board, T, can slide longitudinally. This board is arranged under the grass-seed cups, and is provided with a series of apertures, *o*, arranged vertically under the discharge-orifices of the seed-cups, so that the seed will fall through them in front of the drill-hoes.

When it is desirable to have the seed fall in the rear of the hoes, it is only necessary to slide the board T until the discharge orifices and apertures are out of line, when the seed will slide down the inclined side of the board and drop over its rear edge behind the hoes.

W, Fig. 4, shows a front elevation of my improved land-measure and its location upon the rear side of the hopper. It consists of a case, V, Fig. 9, in the bottom of which is pivoted a gear-wheel, C′, which is revolved by means of a worm, *f‴*, upon the shaft J.

D′ E′ are two gear-wheels of a cone upon a central shaft, F′, to which the longer index-hand is attached. The wheel D′ receives its motion from the wheel C′ through a worm, *g‴*. The smaller index is secured upon a sleeve, *f‴*, on the inner end of which is a gear-wheel, G′. This latter gears with the cone-wheel H′, upon a shaft, I, that projects from the side of the case. The small wheel E′ gears with the large wheel K′ on the shaft I′, and thus transmits motion to the short index.

Figs. 10 and 11 represent a spring-hoe. *s s′* are the two parallel bars of the drag-bar, pivoted to the hoe at *x*. *t* is a shorter bar or lever, pivoted at its rear end to the upper bracket *t′* of the hoe, and having its forward end, which is wedge-shaped and hooked, passed between the bars *s′*.

In a housing, W′, rigidly attached upon the bars *s′*, is a rubber spring, *v*, confined upon a central pin, *a″*, that projects through the top of the housing, and has a thread cut upon its lower end, on which a disk-nut, *u*, works to regulate the compression of the spring. The lower end of the pin *a″* passes between the bars *s′*, and is held from moving in any but a longitudinal direction by shoulders *y*, Fig. 11. The lower end of the pin also rests in the hooked portion of the arm *t*, which latter passes over a pin, *m′*.

When the point of the hoe meets with an obstruction it turns upon the pivot *x*, forcing the arm *t* forward until its wedge-shaped end presses up the pin *a″* and its disk-nut *u*, thereby compressing the spring. After the obstacle is passed, the spring *v*, reacting, causes the arm to be thrown back, thus resetting the hoe.

Having thus fully described my invention, I claim as follows:

1. The detachable arm B, united at its forward end to one of the connected swinging beams A, and capable of adjustment to the lever G, operated by a cam, E, or equivalent device, whereby the hoes can be either adjusted in straight or zigzag ranks by hand or have a constant reciprocating motion, substantially as specified.

2. The arm B, having a widened portion, *e″*, and a slot, *e*, in combination with the stud *e′* and the screw *d* of the arm G, substantially as specified.

3. In combination with the cam-wheel E and arm B, connected to the beams A, the trifurcated lever G, pivoted to the bearing-plate F, substantially as specified.

4. The bell-crank arm K, hung upon the shaft J, and having pivoted to it the loose gear-wheel M, and provided in its rear with a heart-shaped aperture, in combination with the cams *f′* upon the lifting-bar, whereby the driving-gears become automatically disengaged when the drill is backed or when the hoes are lifted, as and in the manner set forth.

5. The perforated adjustable grass-seed distributer T, hung in brackets under the hopper, whereby the seed can be made to fall either in the front or in the rear of the hoes, as specified.

Witness my hand this 24th day of July, A. D. 1877.

WILLIAM H. NAUMAN.

Witnesses:
CHAS. M. PECK,
WM. RITCHIE.