(No Model.)

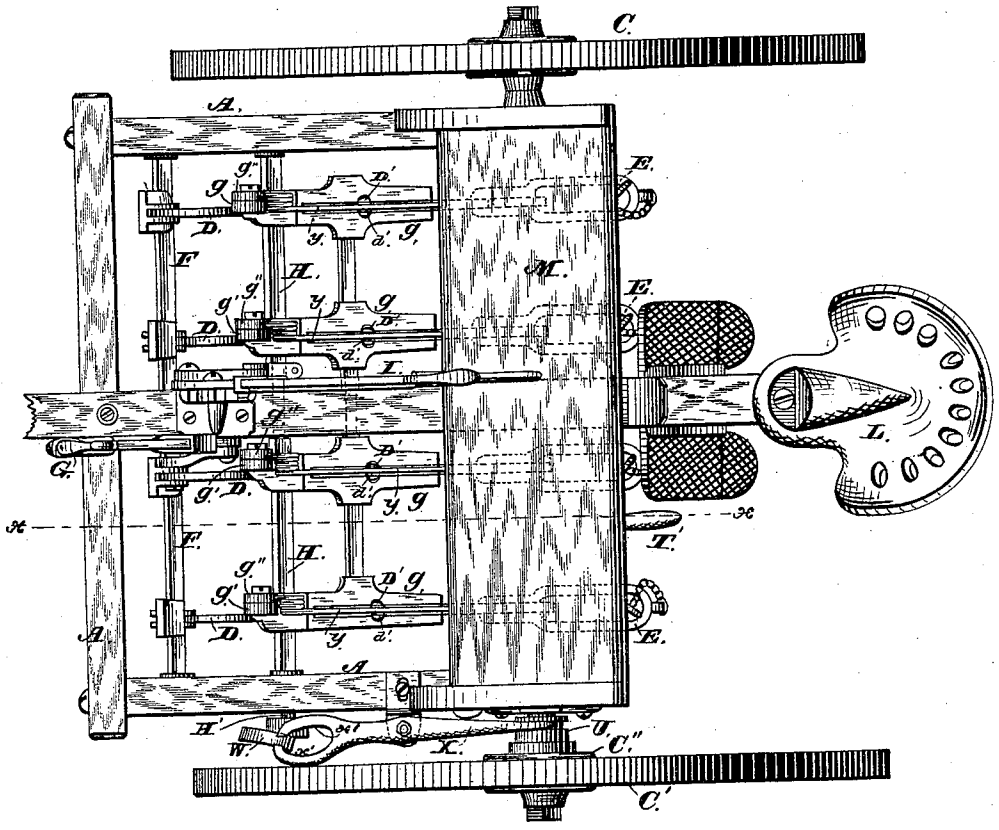
3 Sheets—Sheet 1.

S. B. HART.

Grain Drill.

No. 238,683. Patented March 8, 1881.

Fig 1.



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(No Model.) 3 Sheets—Sheet 2

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Fig. 2.

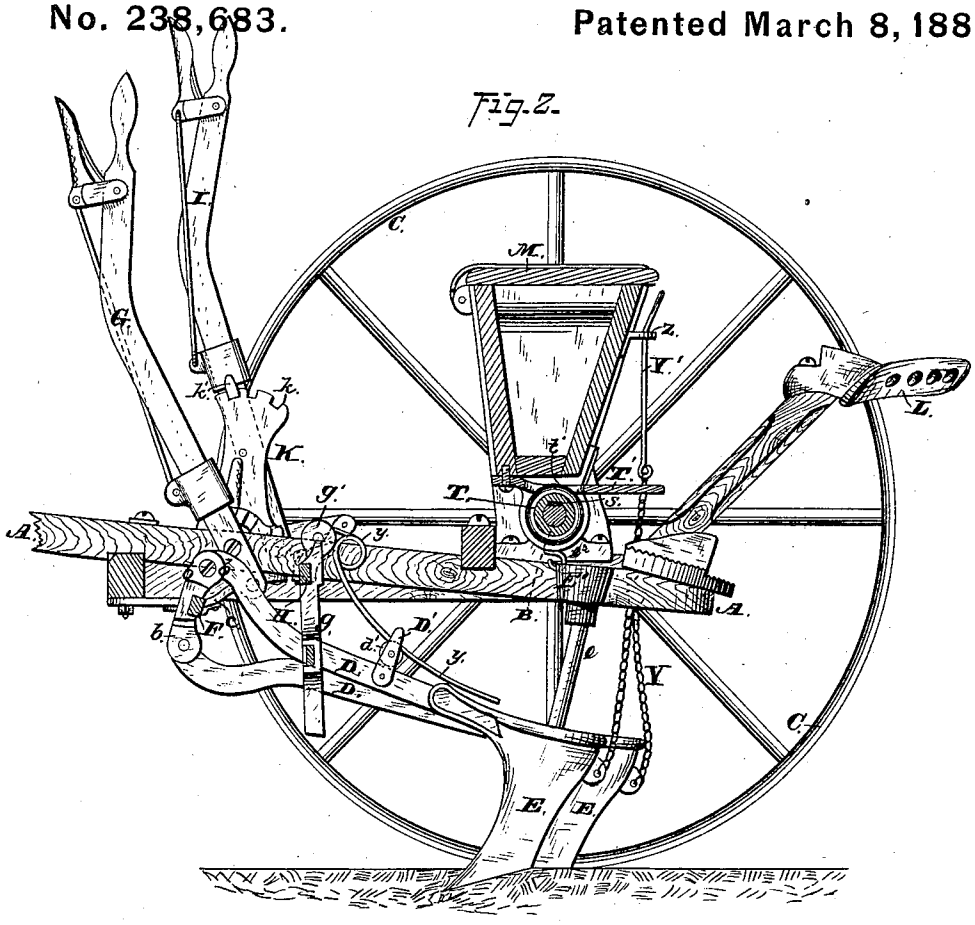
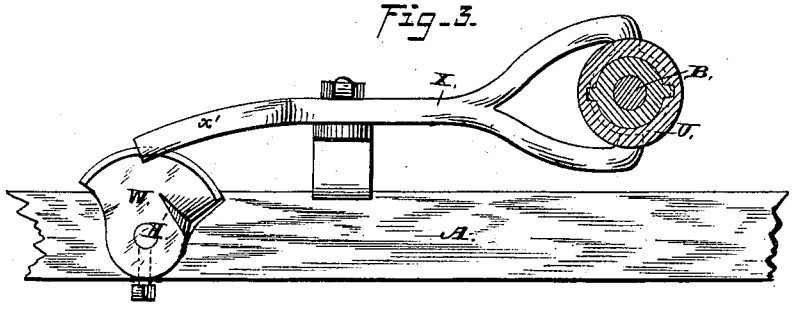


Fig. 3.



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Fig. 4.

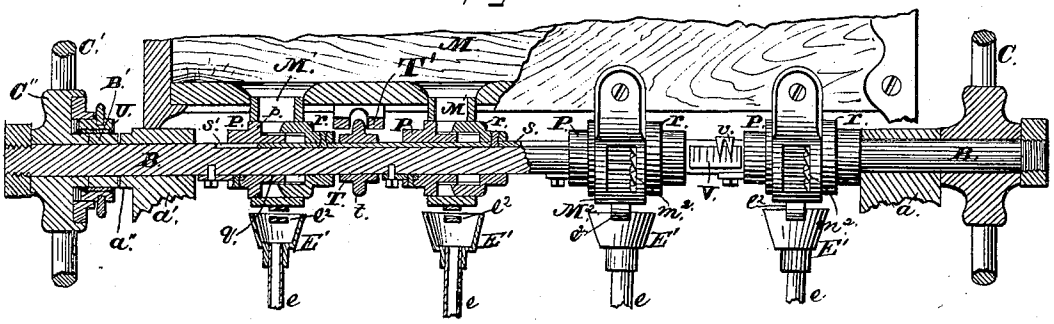


Fig. 5.

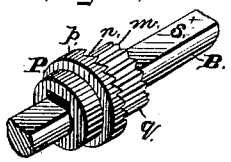


Fig. 6.

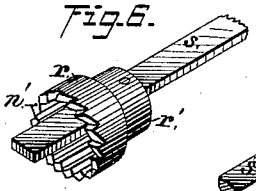


Fig. 7.

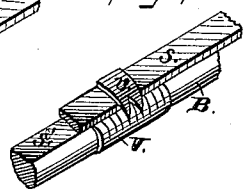


Fig. 8.

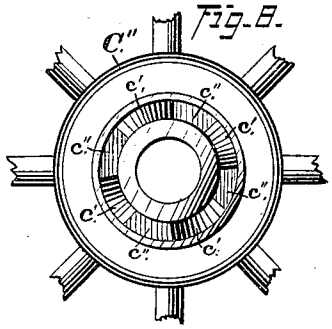


Fig. 9.

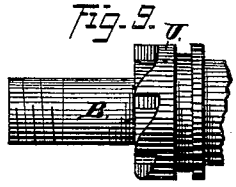


Fig. 10.

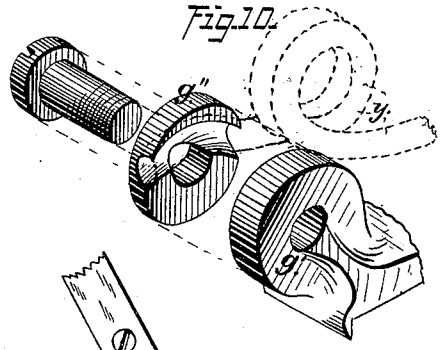
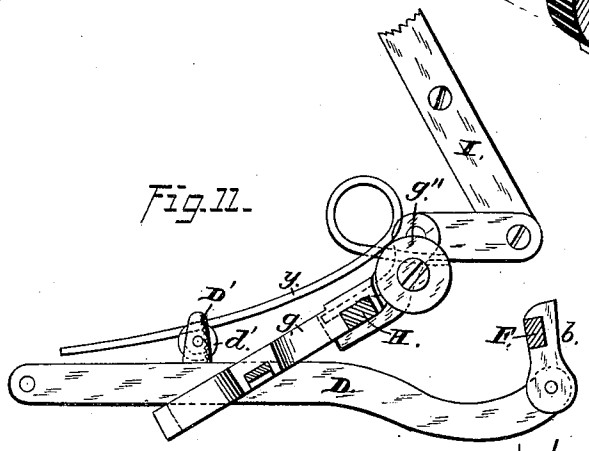


Fig. 11.



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UNITED STATES PATENT OFFICE.

STACY B. HART, OF PEORIA, ILLINOIS.

GRAIN-DRILL.

SPECIFICATION forming part of Letters Patent No. 238,683, dated March 8, 1881.

Application filed October 4, 1880. (No model.)

To all whom it may concern:

Be it known that I, STACY B. HART, a citizen of the United States, residing at Peoria, in the county of Peoria and State of Illinois, have invented new and useful Improvements in Grain-Drills, of which the following is a specification.

This invention relates to that class of grain-drills in which the drill boots or teeth are carried by drag-bars capable of vibration independently of each other, and in which a series of rotary feed-wheels take the grain from a common feed-box and deliver it to the teeth. Its objects are to provide for the prompt simultaneous lowering and the holding down of the drag-bars by a yielding pressure, while leaving them free to vibrate independently when the teeth meet obstructions, to automatically place the feed devices in and out of operation simultaneously with the lowering and raising of the drill-teeth, and to simplify the feed regulating and indicating devices.

The invention consists, first, in a certain novel combination and arrangement, in relation to the drag-bars of a grain-drill and their raising and lowering devices, of a series of springs which are automatically caused to either bear upon said bars when lowered or decrease their pressure upon the same when raised by the action of said raising and lowering devices, as hereinafter more particularly described; second, in the combination, in a grain-drill, with the drill-teeth and devices for raising and lowering the same, and the traveling-wheel axle having the feed-wheels mounted thereon, of automatic mechanism connected with said raising and lowering devices and traveling-wheel axle for clutching or engaging said axle with one of the traveling wheels simultaneously with the lowering of the drill-teeth, and unclutching or disengaging the said axle and wheel as the drill-teeth are raised, whereby the feed devices and drill-teeth are placed in and out of operation simultaneously; third, in the combination, with the two-part adjustable feed-wheels carried by the axle of a grain-drill and a bar sliding upon the axle longitudinally and connected to the adjustable parts of said feed-wheels, of a scale fixed upon the axle and an index or pointer fixed upon said sliding bar, and suitable means for shifting said bar, whereby the adjustment of the feed-wheels may be readily determined, as hereinafter more particularly explained.

In the accompanying drawings, Figure 1 is a top view of a grain-drill provided with my improvements. Fig. 2 is a vertical longitudinal section on line *x x* of Fig. 1 Fig. 3 is a detached view of the devices for placing the feed-wheels in and out of operation. Fig. 4 is a view, in detail, partly in section, illustrating the feed regulating and indicating devices. Figs. 5, 6, and 7 are detail perspective views of said devices. Figs. 8 and 9 are views, in detail, of the devices for placing the feed-wheels in and out of operation. Figs. 10 and 11 are detail views of the devices for lowering and raising the drag-bars.

The letter A indicates the main frame of the implement, the side beams of which are bolted to the under sides of two blocks, *a*, in which are formed the bearings of the axle B, the projecting ends of which form the spindles of the traveling wheels C C′, the latter of which is arranged for connection to and disconnection from the axle by means of a suitable clutch, as will be hereinafter more particularly described.

The letter D designates the drag-bars, provided at their rear ends with the usual drill-teeth E, and having their forward ends pivoted to arms *b*, projecting from a rock-shaft, F, extending across the front of the frame, as shown in Fig. 1. The arms *b* project alternately from opposite sides of the shaft, so that when said shaft is turned every alternate drag-bar will be moved longitudinally forward and the others rearward, so that the drill-teeth may be arranged either in a single row or in two ranks, as shown and described in my Letters Patent No. 221,408. The rock-shaft is operated by a hand-lever, G, mounted on the tongue, and having its short arm connected by a link, *c*, with one of the arms *b*, the lever being provided with a suitable latch, which engages with a rack-plate secured to the tongue.

To the rear of the rock-shaft F there is mounted in the frame a similar rock-shaft, H, having a series of longitudinally-slotted arms, *g*, projecting from one side, and each having at one end a lug, *g′*, extending somewhat beyond the opposite side of the shaft. The drag-bars D pass through the slots in these arms *g*, which

thus serve, in connection with the shaft H and a hand-lever, I, to raise and lower said bars, as shown in my patent before referred to.

The hand-lever I is pivoted to a standard, K, rising from the tongue, and having at its top a rack, *k*, with which the latch *k'* engages to hold the lever in position.

From the upper edge of each of the drag-bars rises a bifurcated post, D', between the two prongs of which is journaled a friction-roller, *d'*, upon the periphery of which bears a spring, *y*, one end of which is secured to the lug *g'* of the slotted arm *g* by being clamped between the side of said lug and a washer, *g''*, which is grooved, as shown in Fig. 10, to receive the end of said spring. A suitable bolt and nut confine the washer to the lug. When the arms *g* are thrown down to lower the drag-bars the springs *y* bear upon the rollers *d'*, forcing the drag-bars all down simultaneously, and holding them well to the ground, while still allowing them to rise when the teeth strike any unusual obstruction. By a proper adjustment of the washer before the bolt is tightened the spring may be caused to bear with greater or less force upon the friction-roller, as desired.

Upon the end of the shaft H which projects outside the frame, as shown at H', Figs. 1 and 3, is fixed a cam, W, consisting of a metal segment having its outer edge bent obliquely and fitting loosely between the prongs *x' x'* of a forked lever, X, which is fulcrumed on a bracket extending outward from the side beam of the frame. This lever X extends rearwardly, and has its rear end also bifurcated, the prongs embracing a clutch, U, and entering a groove therein. This clutch is mounted on an enlargement, B', of the axle, being prevented from turning on said enlargement by the ordinary feather and groove, but having a lateral movement thereon.

The hub C'' has formed in its inner side an annular chamber or groove, *c'*, from the flat inner wall of which project teeth *c''*, with which the teeth of the clutch U are adapted to engage, and thus lock the wheel to the axle, so that the latter will be rotated when so locked and carry with it the feed-wheels which are fixed upon it.

When the hand-lever I is moved outward the rock-shaft H is turned to throw the slotted arms *g* down to lower the drag-bars, and at the same time the cam W, which is fixed to said shaft, is turned to cause the lever X to shift the clutch U outward and engage its teeth with the teeth *c''* of the wheel C'.

The axle is thus locked to the wheel, and, as before explained, the feed-wheels are placed in operation simultaneously with the lowering of the teeth to the ground. The reverse or inward movement of the lever I causes the shaft H to rock in the opposite direction, and the drag-bars and teeth are raised, the clutch releases the wheel, and the axle and feed-wheels cease to revolve, this being the condition of the parts when the implement is on the road to and from the turning in the field, or moving from place to place when not in use.

The hopper or grain box M extends, as usual, transversely across the frame, and is secured thereto directly over the axle, which, in this machine, and also in that described in my patent before referred to, carries the feed-wheels.

The feeding devices are of that class in which the grain is delivered through a cup or case in a continuous stream by means of a feed-wheel having a circumferential groove or channel to carry the grain, the wheel being made in two parts, so that the width of the groove or channel may be varied to increase or diminish the rate of delivery of the grain to the drill-teeth. In Fig. 4 the feed-wheels are shown in diametric section as attached to the axle, and Figs. 5 and 6 are perspective views of the two parts of a wheel separated. The part P of the wheel is fixed to the axle, and comprises the toothed cylinder *q* and a head or enlargement, *p*, thereon, to form one side of the grain-channel. The cylinder is provided with teeth *m*, and the head with teeth *n*, as shown in Fig. 5. The other and adjustable part of the wheel consists of a sleeve, *r*, which fits loosely upon the cylinder *q*, and is provided with teeth *n'*. A portion of this sleeve *r* is constructed as shown at *r'*, to fit more closely to the axle, and is secured to a sliding bar, *s*, which has its bearing upon one side of the axle, substantially as shown at *s'*. This bar *s* extends nearly the whole length of the axle, being allowed sufficient play on its bearing to properly shift the sleeves *r* and pass between the axle and fixed portion P of the feed-wheels. Each of the series of sleeves *r* are fixed to bar *s*, as shown in Fig. 4, so that they will all be shifted simultaneously by the longitudinal movement of said bar, and as said sleeves are moved toward or from the head *p* it will be seen that the grain-channels of the feed-wheels will be widened or narrowed, and the quantity of grain delivered thus regulated. The feed-wheels are arranged so that their grooves will come directly under the spouts or tubes M', leading down from the feed-box, and terminating in casings M^2, which surround the wheels and have openings m^2, through which the grain drops into the grain-cups E', suspended from the bottoms of the casings and provided with tubes *e*, preferably rubber, which lead down into the drill-teeth. These cups are suspended by hooks e^2, fixed to the casings M^2, and curve forward and upward. The cups are provided with slots or holes, which pass over these hooks, said slots or holes being formed at such distance from the edges of the cups that the latter must be turned horizontally in order to be placed upon or taken off the hooks. The cups and tubes assume a vertical position by gravity when suspended, and thus liability to accidental detachment is obviated.

Upon the axle B, between two of the feed-wheels, is loosely mounted a sleeve, T, which is secured to the bar *s*, and is provided with a peripheral rib, *t*, which extends into a slot in a hand-lever, T', which is pivoted at one end to the front portion of the bottom of the feed-box, while its other end extends rearward of the

box to form a handle. Upon another portion of the axle, between two of the feed-wheels, is fixed a plate, V, upon which are inscribed suitable lines or graduation-marks, and from the sliding bar *s* a pointer, *v*, projects partially across the plate. The movement of the bar *s* is so arranged that the position of the pointer *v* with relation to the marks on plate V will indicate the position of the adjustable sleeves *r* with relation to the heads *p* of the feed-wheels, and thus, by observation of the pointer and plate and moving the lever T′, the sleeves *r* may be adjusted to widen or narrow the grain-channels of the feed-wheels to deliver any desired quantity of grain, the quantity for each mark of the plate having been previously determined.

To the rear sides of each of the drill-teeth E are attached chains Y, which extend upward and are connected to rods Y′, which are arranged to play vertically through eyes *z*, projecting from the rear wall of the feed-box. The upper ends of these rods terminate in rings *y*′, or any other suitable-shaped handles, which prevent the rods from slipping out of the eyes, and serve as convenient means by which the driver, on his seat L in rear of the feed-box, may draw up the rods and chains, and thus raise any one or more of the drill-teeth from the ground to clear it of any kind of rubbish, or to avoid obstructions.

I am aware that in seed-drills in which the feed-wheels are carried by a shaft separate from the traveling-wheel shaft automatic devices have been operated by the drill-teeth raising and lowering devices to connect the feed-wheel shaft with the traveling-wheel shaft, and I do not claim such an arrangement of devices.

What I claim is—

1. The combination, with the rock-shaft H, slotted arms *g*, and the lever for operating said shaft, of the springs *y*, secured to the lugs *g*′, and arranged to bear upon the tops of the bars when the arms *g* are lowered, substantially as described.

2. In a grain-drill, the combination, with the drill-teeth and devices for raising and lowering the same, and the traveling-wheel axle having the feed-wheels mounted thereon, of automatic mechanisms connected with said raising and lowering devices and traveling-wheel axle for clutching or engaging said axle with one of the traveling wheels simultaneously with the lowering of the drill-teeth, and unclutching or disengaging said axle and wheel as the drill-teeth are raised, substantially as and for the purpose set forth.

3. The combination, with the rock-shaft H, drill-teeth, and intermediate connections, of the cam W, lever X, traveling wheel C′, axle B, carrying the feed-wheels, and a suitable clutch, operated by the said lever X, for connecting the traveling wheel to and disconnecting it from said axle, substantially as described.

4. The combination, with the two-part feed-wheels mounted upon the axle B, and composed of the fixed portions P and adjustable sleeves *r*, and the sliding bar *s*, connecting said sleeves, of a suitable scale fixed to said axle and a pointer or index arranged upon said bar, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

STACY B. HART.

Witnesses:
ALBERT H. NORRIS,
JAMES A. RUTHERFORD.