E. D. MEAD.
Grain-Drill.

No. 205,285. Patented June 25, 1878.

Fig. 1.

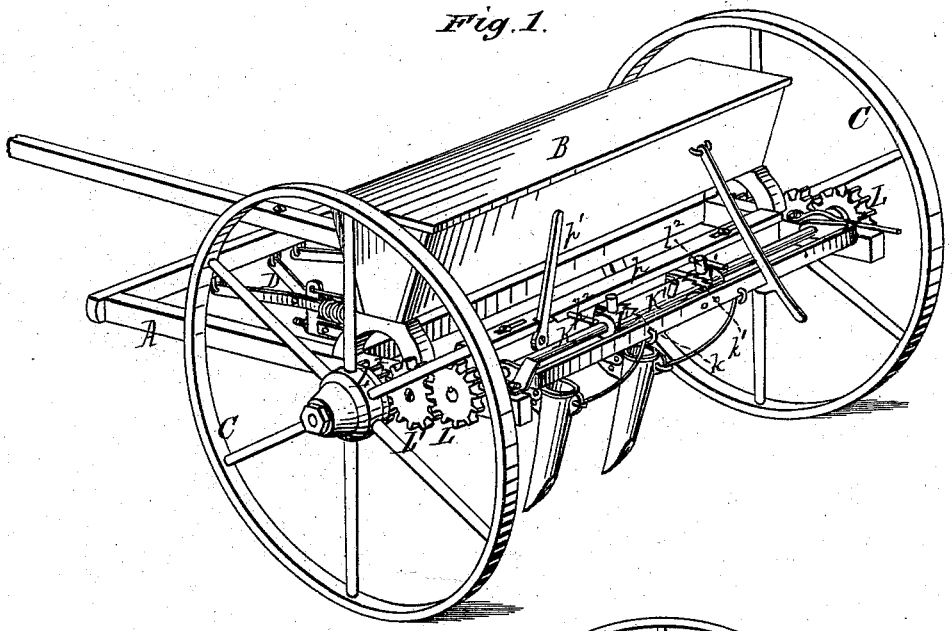


Fig. 2.

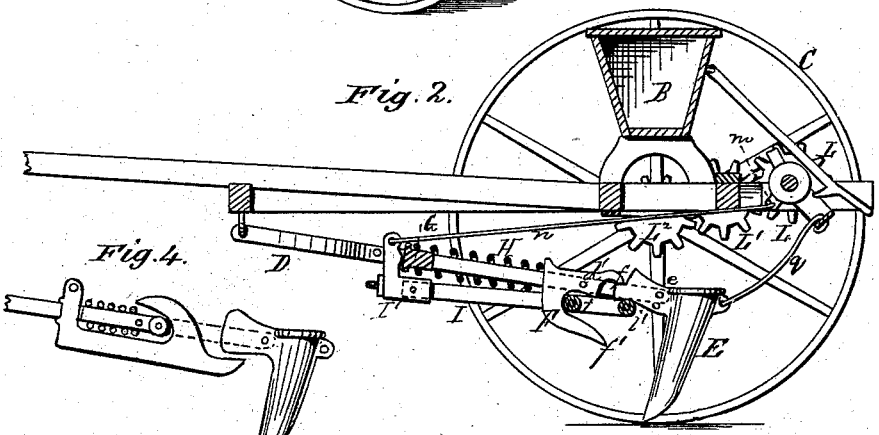


Fig. 4.

Fig. 3

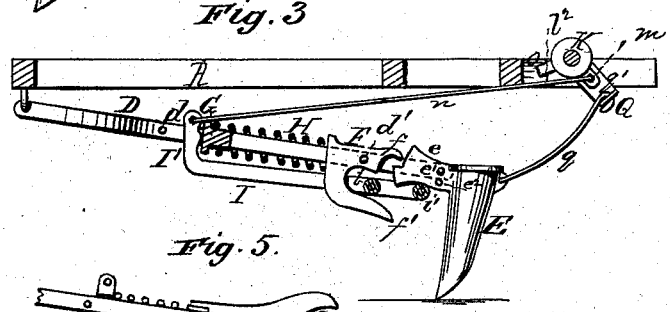
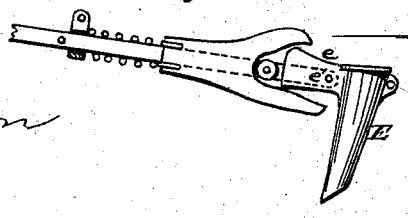


Fig. 5.



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IMPROVEMENT IN GRAIN-DRILLS.

Specification forming part of Letters Patent No. **205,285**, dated June 25, 1878; application filed April 18, 1878.

To all whom it may concern:

Be it known that I, EDWIN D. MEAD, of Shortsville, county of Ontario, State of New York, have invented certain new and useful Improvements in Grain-Drills, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 represents a perspective view of a grain-drill embracing my improvements. Fig. 2 is a vertical longitudinal section through the same, in line with one of the draw-bars; and Fig. 3 is a similar view of one of the drill-tubes and its attachments, showing the tooth in the act of yielding or being tripped. Figs. 4 and 5 show modifications hereinafter described.

Similar letters of reference denote corresponding parts wherever used.

My invention consists first in a novel arrangement of the drill tubes or teeth in connection with the draw-bars, for adapting them to yield to obstructions such as would be liable to injure or break them, and also for freeing them from clogging matter such as would interfere with their proper operation.

It further consists in placing the yielding teeth under the control of the attendant, either on the machine or behind it, whereby he is enabled at will to trip them for passing an obstruction, or for freeing them from obstructing or clogging matter.

The means employed for carrying out my invention in practice will be best understood from the following description with reference to the drawings, in which—

A is the main frame of the machine, B the grain-box, and C C the carrying and driving wheels, said parts being of any usual or preferred construction, and arranged in any suitable or convenient manner.

The draw-bars D are, by preference, made double, or of two straps or bars, parallel for the main portion of their length, but diverging at their forward ends, for giving them a laterally-bracing form at said end, where they are hinged to a transverse bar connected with or forming a part of the main frame. These straps or bars are secured to each other at suitable distances apart by intermediate blocks or sleeves and through bolts or rivets at d d', and are separated or left open at their rear ends to receive a tongue or arm, e, on the forward face of the tooth or tube E, which is united to the draw-bar by a pivotal connection at e^1. In advance of this tongue or arm is a **U** or **V** shaped block or cam-plate, F, arranged with its arms f f' or open end facing the drill tooth or tube, as shown, and rigidly united to the bar by the through-bolt at d', or other convenient means for that purpose.

In front of the cam-block F is a second block, G, grooved on its sides and fitting between and sliding upon the parallel straps of the draw-bar as ways or guides, and between these blocks F and G is arranged a spring, H, made by preference in spiral form, and surrounding the draw-bar, as shown; but the form and arrangement of the spring may be varied, if desired, and still the desired result hereinafter described attained. The arrangement is such that the tension of the spring tends to hold the block G away from the block F, for a purpose which will be explained.

In front of the block G is an upright arm, I′, either rigidly or adjustably connected with a sliding bar or rod, I, lying underneath the draw-bar, said arm, when adjustable, serving to regulate the tension of the spring. By preference the bar I is also composed of parallel straps provided at and near their rear ends with intermediate friction-rollers i i', the former resting within the open end of the **U**-shaped block F, and upon its lower inclined arm, as shown, and the latter i', at the rear end of said rod, resting underneath and serving to uphold the arm e on the drill-tooth with said tooth in working position.

The arm f of the block F, or a lip thereon, overhangs the arm e, as shown, preventing the latter from being thrown up farther than is required for giving the drill-tooth its proper pitch or working position; but the latter may be varied when required by the adjustment of the tooth itself, one or more additional holes at e^2 being provided in the arm e for varying its point of attachment to the draw-bar.

The spring H, under the arrangement described, serves, through the block G, to force the arm I′ and rod or bar I forward until the pin or roller i rests in the bottom of the con-

cavity in the block F, where there is but a very slight forward inclination given to the face of the arm *f*, upon which said pin or roller rests, and in this movement of the bar I the roller *i'* is forced up snugly against the arm *e* on the tooth E, and serves to uphold said arm with sufficient force to maintain the tooth in working position against the ordinary strain or action of the earth thereon.

When the tooth meets an obstruction which would be liable to break or injure it, the downward pressure of the arm *e* upon the roller *i* and rod I causes the roller to move downward and backward on the arm *f'*, and, the roller *i'* at the same time moving backward under the arm *e* toward the pivot of said arm, its power to uphold said arm is diminished; and as the inclination of the arm *f'* increases toward its outer end, and the power of resistance of the rod I to the deflection of the drill-tooth diminishes, the latter is quickly folded or turned backward into position, adapting it to ride over the obstruction without injury. As soon as the obstruction is passed the spring H forces the rod I forward, causing its rear end to ride upward on the cam-arm *f'* for lifting the arm *e*, and causing the tooth to again assume its working position.

It will be seen that at the beginning of this tripping or yielding movement the inclination of that part of arm *f* over which the roller *i* moves is so very slight as to nearly lock the tooth against the backward movement; but, the lock once released or broken, the inclination becomes greater, thus facilitating both the yielding and the return movement of the tooth.

For placing the yielding teeth under the control of the attendant or driver, I have shown a transverse shaft, K, mounted in suitable bearings on the main frame in rear of the grain-box, and provided at its ends with spur wheels or pinions L, to which motion is imparted, through intermediate gears L^1, from gear-wheels L^2, mounted upon and connected by backing-ratchets with the hubs of the carrying-wheels C.

The shaft K has one or more hubs, K', secured to and rotating with it, provided at its ends with ratchet-faces *k k'*, as shown, and adjacent to this ratchet-hub sleeves or collars *l* l^1 are arranged, one on each side, mounted loosely on the shaft K, and provided with ratchet-faces on the sides or ends adjacent to the ratchet-hub K'. These collars are provided with pendent arms *m*, with each of which one end of a rod, *n*, is connected, said rods extending forward, and being connected at their opposite ends to the upper ends of the upright arms I' on the sliding bars I.

By this arrangement it will be seen that when the collars *l* l^1 are thrown into engagement with the ratchet-hub K', to which a forward rotation is imparted by the shaft K, the arm *m* will be rocked back, and, acting through the rod *n*, will serve to draw the supporting-bar I, with which it is connected, back with it, overcoming the tension of the spring H and releasing the drill-tooth, allowing it to rock back for passing over an obstruction, or for freeing it from clogging matter.

The links *n* may all be connected with a single long sleeve or roller, *l*, and thus operated simultaneously from a single clutch; or half of the hoes—the alternate ones—may be connected with a series of collars, and operated simultaneously by a sliding movement of the collars into engagement in one direction, and the other half by a movement in the other direction.

Ordinarily, for clearing the hoes of obstructing matter, it will be sufficient to trip the alternate hoes, thereby giving sufficient space between the remaining hoes for clogging matter to escape; or, if preferred, a double-ratcheted hub, K', may be employed, one for each two adjacent hoes, and a sliding ratchet-collar for each, one being adapted to be engaged with one side and the other with the opposite side of the ratchet-hub, so that any one or all the teeth may be tripped at will.

The sliding collars are provided each with a spur, l^2, which, after the hoe or tooth has been tripped, is brought by the further rotation of the collar into contact with an inclined standard or spur, *o*, on the frame A, which throws the collar out of engagement with the ratchet-hub K', when the action of the spring H will cause the tooth to resume its working position.

For throwing the collars *l* l^1 into engagement with the hub K', a transversely-sliding bar, *p*, is shown, mounted in suitable guides on the frame, and adapted to be moved by a lever, p^1, extending up within convenient reach of the driver, seated on the grain-box B. This bar *p* has arms or forks p^2, which engage with the collars *l* l^1, for moving them into engagement with the ratchet hub or hubs when required.

The above-described arrangement is designed to employ the traction of the carrying-wheels C C for tripping the hoes; but it will be apparent that the sleeve or rollers with which the bars I are connected may be provided with a lever or levers extending up within reach of the driver, who, by vibrating said lever or levers, can thus trip the hoes directly, either separately or simultaneously, according to the arrangement of the rollers and levers, and without the aid of the traction of the machine.

The hoes E are connected by links, cords, or chains *q* with a lifting-bar or roller, Q, made in the form of a transverse bar, having crank-arms *q'* at its ends, which embrace and turn freely on the shaft K, or on hubs or sleeves forming bearings for said shaft.

By rocking the bar Q by any suitable or convenient arrangement of lever, or through the medium of shaft K, the hoes may be raised or lowered as desired.

Having described how my invention may be carried out in practice, I would state that I do not wish to be restricted to the particu-

lar form and arrangement of parts described, as these may be varied without departing from the invention. Thus, as shown in Figs. 4 and 5, representing modifications, the cam-block F, instead of being rigidly fastened to the draw-bar, may be made to slide longitudinally thereon, and the arm *e* of the drill-tooth may be made to act directly or through the intervention of a friction-roller on the cam-arm *f'* of said block, thus causing the tooth, when it meets an obstruction, to slide the block on the draw-bar against the tension of spring H as the tooth is tripped or rocked backward.

The form of the clutches and the arrangement of gears for enabling the driver at will to trip the teeth may also be varied; but these, with other modifications, will be obvious to the skilled mechanic.

Parts of the machine not particularly described may be constructed in any usual or preferred way.

What I claim as new, and desire to secure by Letters Patent, is—

1. The cam-block F, applied to the draw-bar, and operating in combination with the separately-pivoted hoe or tooth, substantially as and for the purpose described.

2. The combination, with the draw-bar and the drill-tooth or hoe pivoted thereto, of the cam-block F, sliding bar I, and spring H, substantially as and for the purpose set forth.

3. The sliding rod or bar I, provided with the friction-rollers *i i'*, in combination with the cam-block F and pivoted hoe or tooth E, substantially as and for the purpose described.

4. The pivoted drill teeth or hoes, locked or held in working relation to the draw-bars by springs, in combination with devices controlled by the attendant on the machine, for tripping said hoes or teeth at will, for adapting them to pass over obstructions, or for freeing them from clogging matter, substantially as described.

5. Devices for holding the pivoted hoes in working position, substantially as described, in combination with the connecting-rods *n* and means for operating the same, controlled by the attendant, whereby the hoes can be tripped at will, as described.

6. The sliding rods or bars I, or their equivalent, for locking the hoes or teeth in working position, in combination with the connecting-rods *n* and the collars *l l*^{1}, or a roller on a shaft, K, or their equivalent, adapting said hoes to be tripped by the tractive power of the machine, as described.

7. The shaft K, provided with the clutch hub or hubs K', and sliding collars or roller for tripping the drill-teeth, in combination with the spurs *l*^{2} and cams *o*, or their equivalent, for releasing the collars or roller, as described.

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