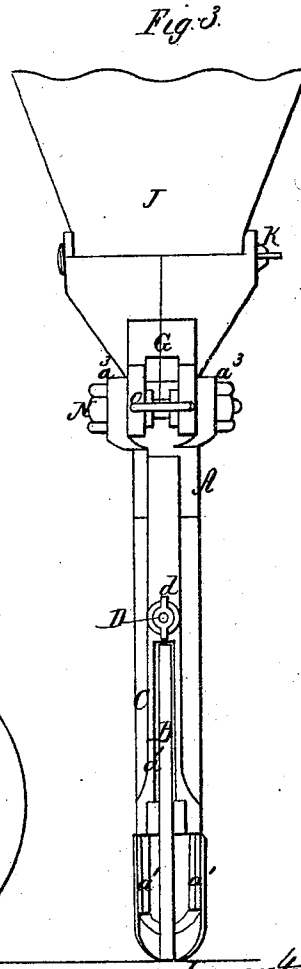
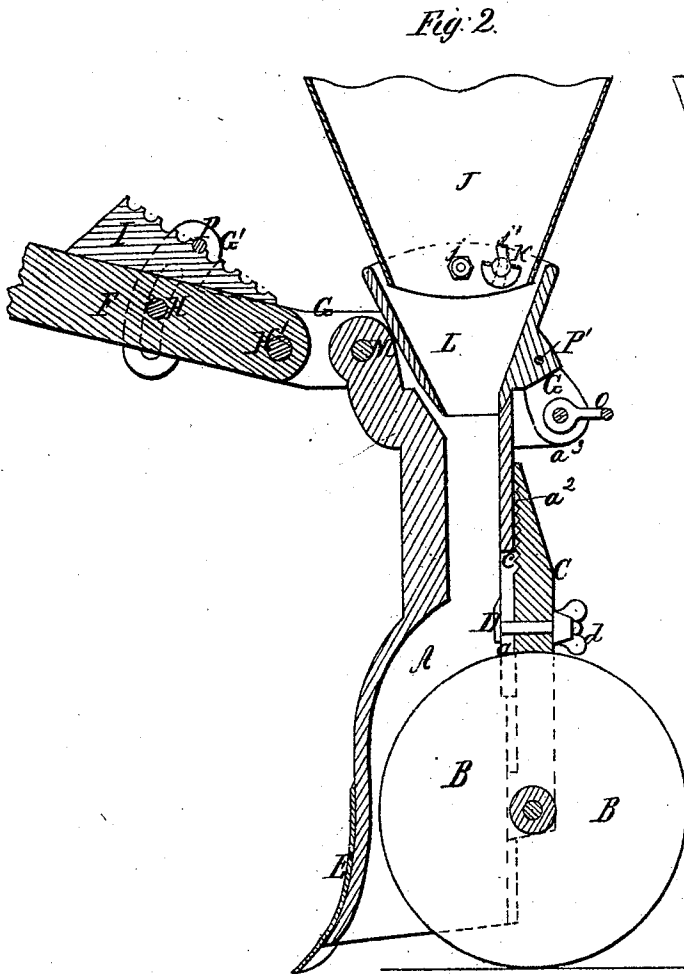
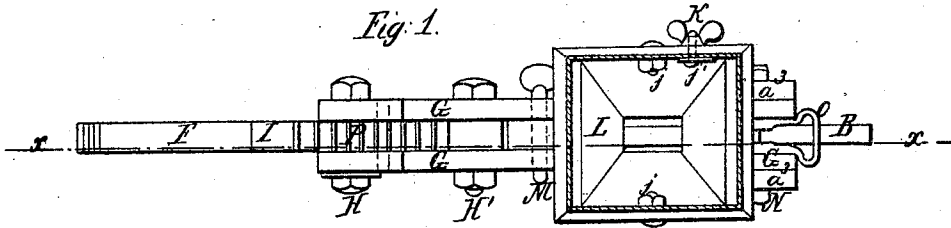


F. VILLARD.  
Grain-Drill Tooth.

No. 99,981.

Patented Feb. 15, 1870.



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# United States Patent Office.

FREDERICK VILLARD, OF MOUNT EATON, OHIO.

Letters Patent No. 99,981, dated February 15, 1870.

## IMPROVED GRAIN-DRILL TOOTH

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, FREDERICK VILLARD, of Mount Eaton, in the county of Wayne, and State of Ohio, have invented a new and useful Improved Grain-Drill Tooth; and that the following is a sufficiently full and exact description of the same to enable one skilled in the art to which my invention appertains to carry it into effect, reference being had to the accompanying drawings which form part of this specification.

My invention relates to a tooth for grain-drills relieved from liability to clogging and dragging, adapted to have all requisite adjustments conveniently and expeditiously made, and having its "hopper" so applied as to be always supported in a horizontal or nearly horizontal position.

The drawings represent a grain-drill tooth embodying the improvements by which I effect the above-named objects, as applied to a beam, a portion of which is shown, and in a working position—

Figure 1 being a plan view, partly in horizontal section;

Figure 2, a vertical longitudinal section on the line  $x x$ , fig. 1; and

Figure 3, a rear elevation.

The tooth proper or standard A is made hollow for the passage of the seed, is provided with a roller, B, working in a slot,  $a$ , in its back at its lower end, which serves to support the tooth and thus prevent dragging, and by its rotation by traction to keep clear the end of the seed passage, by forcing outward the earth, grass, and roots which might otherwise enter and clog it; said wheel or roller being mounted in vertically-adjustable bearings, to adapt its action to be regulated as desired.

The wheel or roller B is mounted in the lower end of a slide or bracket, C, suitably constructed to receive it, and supported, first, by vertical guides  $a^1$  formed on the back of the tooth or standard, as shown; second, a clamp-bolt, D, passing through an extension of the slot  $a$ , provided in the back of the tooth or standard for the wheel or roller B, and through a perforation in it, and provided on its outer end with a thumb-nut,  $d$ , or its equivalent; and third, a V-shaped projection,  $a^2$ , on the back of the tooth or standard above said slot, and a vertical series of corresponding depressions,  $c$ , in its face; the former provision serving to support it laterally and the latter vertically at any desired point; its attachment by means of the clamp-bolt D  $d$  passing through a vertical slot in the tooth or standard, adapting it to be readily loosened and adjusted vertically to any desired extent, and then by tightening said screw and pressing one or another of the depressions  $c$  over the projection  $a^2$ , to hold it.

The shovel or shoe E may be of any desired form, and attached in any suitable manner.

The tooth proper constructed as above described is attached to the beam F through the medium of a frame or double link, G, attached to the end of the beam by two horizontal bolts, H H', one situated at its front extremity, and the other at an intermediate point; the latter constituting a pivot, and the other, in connection with a segmental slot,  $g$ , in said link for its reception, forming a means for adjustment. Said link at this point is also made to form a yoke, G'; and a notched wedge, I, is provided, by the introduction of which, to a greater or lesser extent thereunder, the forward projection of the tooth may be increased or diminished as desired, being secured in the desired position by tightening the adjusting bolt H aforesaid.

To prevent the adjustment of the angle of the tooth injuriously affecting the position of the "hopper" J, it (the hopper) is attached to its support by horizontal pivots  $j j$ , parallel with that of the link, and adapted to be adjusted by means of a parallel bolt, K, passing through a segmental slot,  $j'$ , therein, by which means its horizontality is adapted to be preserved.

The tooth is provided with the usual "wooden-pin provision," to adapt it by the breakage of said pin to give way on coming in contact with any solid obstacle; and to prevent this effecting the hopper when employed, or requiring its dispensement, the base L of said hopper is made separate from the remainder of the tooth, and forms a part of or is attached separately to the link G, thus receiving only the movement of said link and beam; the lower end of said base L and the top of the tooth or standard being so constructed as to form the necessary tight joint to prevent the escape of seed, as shown in fig. 2.

The tooth for the application of the wooden pin M is hinged to the rear extremity of the link or frame on its under side by means of lugs  $a^3 a^3$  embracing the rear end of said link and a pintle, M, passing there-through, or in other suitable manner, and is provided in front with an upwardly-projecting lug,  $a^4$ , provided with a transverse perforation corresponding with similar ones in the sides of said link or frame, through which the wooden pin M is passed.

The staple or clevis O for the attachment of the elevating chain may be secured between the rear ends of the double link or frame G by means of the pintle N of the hinge of the tooth, as shown.

The link or frame G and the hopper base L may be cast in two equal longitudinal parts, and united by means of two or more screws, P P, the front of which may form the top of the yoke for the reception of the adjusting wedge I, as shown.

The principal difficulties with drill-teeth now in use are, that if the ground is damp or contains grass, fibres, or roots to any great extent, the teeth fill up and consequently do not sow evenly, and the liability of the

teeth to catch in the roots and similar obstructions and drag; both of which are seriously detrimental to the working of the machine, and render necessary the constant care of the operator. Both of these difficulties are effectually obviated by the provision of the ground-wheel or roller at the sole of the tooth, as described; the tooth being thereby supported and adapted to pass over ordinary obstructions without difficulty, and at the same time the seed-passage of the tooth is kept perfectly clear, and thus a uniform and regular discharge of seed from the tooth always obtained.

The mode of mounting and adjusting the hopper adapts it to be readily used in connection with a folding-tooth, as described, and to receive the seed with equal facility at any angle of the tooth.

The means for adjustment are simple and effective; and the tooth as a whole is strong, neat, and compact, and adapted to be readily and cheaply manufactured.

Having thus described my invention,

I claim and desire to secure by Letters Patent—

1. The combination, with a grain-drill tooth, of a wheel or roller, B, arranged at its lower end, and adapted to be supported rigidly at such projection as to prevent the tooth dragging, as set forth.

2. The wheel or roller B, employed and operating substantially as specified, and mounted in vertically-

adjustable bearings, substantially as shown and described, for the purpose set forth.

3. In combination with the pivoted link or frame G forming the attachment of the tooth to the beam, the segmental slot *g*, bolts H H', yoke G', and notched wedge I, arranged and operating substantially as described, for the purpose set forth.

4. The hopper J, attached by transverse pivotal bolts *j j*, and adapted to be adjusted to retain its horizontality, as described, for the purpose set forth.

5. The hopper base L, constructed separate from the tooth proper, as described, for the purpose set forth.

6. The combination of the link or frame G pivoted to the beam and adapted to be adjusted as desired, the tooth proper A E attached to said link or frame by means of a hinge-joint, *a<sup>2</sup> a<sup>3</sup> N*, and wooden pin M, the wheel or roller B arranged in the lower end of the tooth and adapted to be adjusted vertically as desired, the hopper base L arranged on the link or frame G separate from the tooth proper, and the hopper J mounted on the base L and adapted to be adjusted as desired, substantially as represented and described, for the purpose set forth.

Witnesses:

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