No. 621,954. Patented Mar. 28, 1899.

J. H. YOUNG.

SPRING TOOTH HARROW.

(Application filed Sept. 8, 1898.)

(No Model.)

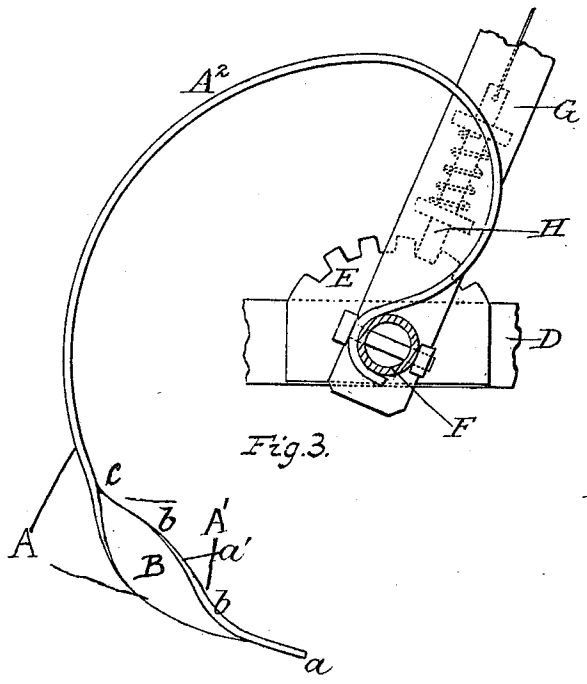


Fig. 3.

Fig. 1.

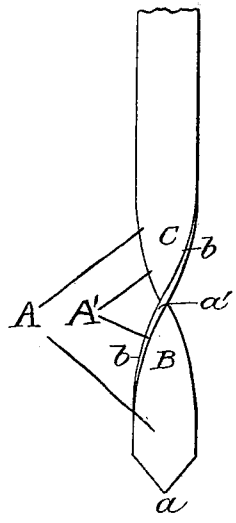
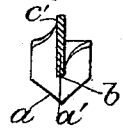


Fig. 2.



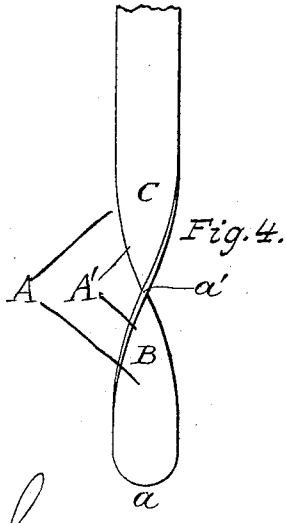


Fig. 4.

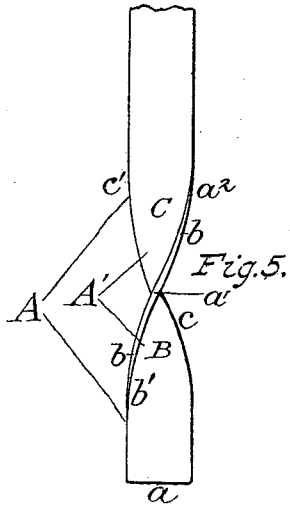


Fig. 5.

Witnesses.

Charles Perkins.

A. Perkins Jr.

John H. Young,

Inventor.

by Alex. Selkirk

Attorney.

UNITED STATES PATENT OFFICE.

JOHN H. YOUNG, OF BERNERVILLE, NEW YORK.

SPRING-TOOTH HARROW.

SPECIFICATION forming part of Letters Patent No. 621,954, dated March 28, 1899.

Application filed September 8, 1898. Serial No. 690,497. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. YOUNG, a citizen of the United States, residing at Bernerville, in the county of Schoharie and State of New York, have invented new and useful Improvements in Spring-Tooth Harrows, of which the following is a specification.

My invention relates to improvements in spring-tooth harrows and cultivators; and it consists of the combination, with a spring-tooth, of the elements hereinafter described, arranged therein as set forth, and also the combination and arrangement, with a frame, a tilting or oscillating shaft supported in the frame, a lever, and a ratchet-wheel and dog, of a spring-tooth having combined and arranged in it a half-twist in the body of its digging-end portion, as hereinafter described and set forth.

The objects of my invention are to provide in a tooth of a spring-tooth harrow or cultivator an angularly-arranged half-twist form of moldboard which is adapted to carry the soil loosened by the digging end of the tooth upwardly toward the surface of the ground, while the upper portion of the tooth may be adapted to carry portions of the surface soil downwardly; also, to provide a combination and arrangement, with well-known parts of a harrow or cultivator, of a spring-tooth having a half-twist form of moldboard between its digging end and the body of the tooth, which connects with a rock-shaft or tilting shaft, so as to adapt the said moldboard portion of the tooth to be set at any preferred angle in relation to the surface of the soil operated on.

Other objects and advantages of the invention will be fully understood from the following description and claims when taken in connection with the annexed drawings, in which—

Figure 1 is an elevation of a portion of a digging-tooth embodying my improvements in the same. Fig. 2 is a section. Fig. 3 is an elevation of a portion of a harrow-frame and a digging-tooth embodying my improvements therein and mechanism for adjusting said tooth to any preferred angle in relation to the surface of the soil to be operated on. Fig. 4 is a plan view of a digging-tooth having a modified form of digging end, and Fig. 5 is a plan showing another modification of the digging end of the tooth containing my improvements.

The same letters of reference refer to the corresponding parts throughout the several views.

In the drawings, A represents the digging portion of a tooth of a harrow or cultivator, which digging portion is made of a broad flat thin piece of steel having in its body the half-twist portion A′, the middle of length of which twist is about six inches, more or less, from its digging end *a*, as shown. This twist A′ of the digging portion of the tooth is made to begin at a suitable distance from the digging end *a* and gradually increases to a full half-twist of the piece at *a′*, so as to adapt the double curved edge *b b* to serve as the front cutting edge of the tooth. This cutting edge *b b* starts from one side of the piece forming the tooth and runs progressively in curving lines forwardly and upwardly to and past the point *a′* at the middle of the length of the tooth and thence to the point of termination of the twist, as at a^2, at the opposite edge of the tooth, as shown in Figs. 1, 4, and 5. The portion B of this half-twist A′, located between points *b′* and *a′*, is in the form of a concave curve in cross direction, running from the cutting edge *b* to the rear side edge *c*, and serves as a moldboard between the digging end *a* of the tooth and the point *a′* at the middle of length of the twisted portion A′ and adapts said portion B to operate as a soil-lifting moldboard for advancing the soil loosened by the digging end of the tooth upwardly in an inclined direction while the tooth is being pulled forward through the soil. The portion C of said half-twist portion A′, located between the points *a′* and a^2, is also in concave-curved surface running from cutting edge *b b* to the rear side edge portion *c′* and adapts said portion C to operate reversely to twist portion B, so as to carry portions of the surface soil downwardly below the plane of the general surface of the soil being operated on by this tooth A, and thereby thoroughly mixing the soil to the full depth cut by the tooth.

Although a single tooth is shown in the drawings, yet it will be readily understood that in a harrow or cultivator it is intended to employ two or more rows of two or more

digging-teeth embodying the above-described elements and set these teeth so that those of the preceding rows may be in position to dodge those of the next succeeding row, as is the practice in harrows and cultivators, and when so arranged in rows and staggering the soil will be worked upwardly from the digging-point of each tooth, and to a considerable extent both downwardly and laterally by each tooth, so as to give to the soil a more loosened condition than has been given it by harrows or cultivators having teeth of old constructions, and at the same time these teeth, by reason of the twisted or concave-curved surface of their upper portion C, work the seed and fertilizer cast on the surface of the soil into the surface portions of the same, that both the seed and fertilizers may be covered.

In Fig. 2 the digging end *a* of the tooth is shown to be provided with an angular-formed point. In Fig. 4 the digging end *a* is shown to be made with a convex form, while in Fig. 5 it is shown to be made with a straight line in direction from side edge to side edge.

In Fig. 3, D is a side bar of the frame of a harrow or cultivator having secured to it the segmental-formed rack E. F is a rock-shaft or tilting-bar which is supported in a suitable manner from the framework of the implement, so as to be adapted to be freely oscillated in either direction at will. G is a suitable lever secured by its lower end to the said shaft or bar F for service as a means for oscillating the latter in either direction. H is an elastic dog carried by the lever G and provided with any well-known mechanism (not shown) for enabling the operator while he is grasping said lever to operate both it and said dog, as is generally practiced by the trade.

The entire construction and details of parts and the several well-known mechanical devices employed in harrows and cultivators are omitted, because in their several well-known modifications they are so well known as not to require any particular description.

Although this digging-tooth A may be made separate and independent of the body A^2 and be secured thereto by means of bolts or rivets, (not shown,) such construction being well known, yet I at present prefer to make said digging-tooth A integral with the body portion A^2, as shown in Fig. 3, and secure the outer end of this body to the shaft or bar F in a strong and rigid manner by means of bolts or rivets or other well-known means which need not here be described, so that thereby and by coöperation of lever G, secured to said shaft or bar and rack E and dog H, the operator may from his seat (not shown) readily operate said shaft or bar for adjusting the depth of the cut of the teeth secured to said shaft or bar, and thereby move the digging-tooth (or a series of the same) lengthwise in either direction in relation to the soil, so as to cause it to penetrate the latter to any preferred distance.

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

1. In a harrow or cultivator, a digging-tooth of broad flat thin steel, having, in its length, a half-twist A′ and comprising, with its digging-end portion *a*, the double curved cutting edge *b b*, the curved concave portion B for operation in the soil as an inclined moldboard and the curved concave portion C above said portion B and adapted for operating, as a reversed moldboard, with the surface portion of the soil, substantially as and for the purposes set forth.

2. In a harrow or cultivator, the combination with a digging-tooth of broad flat thin steel and having, in its length, a half-twist A′ and comprising a digging-end portion *a* double curved cutting edge *b b*, the curved concave portion B, the curved concave portion C above said portion B, with its curved concave running reversely to that of the latter, of the shaft or bar F adapted to be oscillated in either direction, rack E, dog H, operating-lever G, and a suitable body A^2 connecting the said digging-tooth with the said shaft or bar F, substantially as and for the purposes set forth.

JOHN H. YOUNG.

Witnesses:
A. SELKIRK, Jr.,
CHARLES SELKIRK.