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Patented Jan. 17, 1899.

W. L. BEALL.
CULTIVATOR TOOTH.

(Application filed Feb. 16, 1898.)

(No Model.)

2 Sheets—Sheet 1.

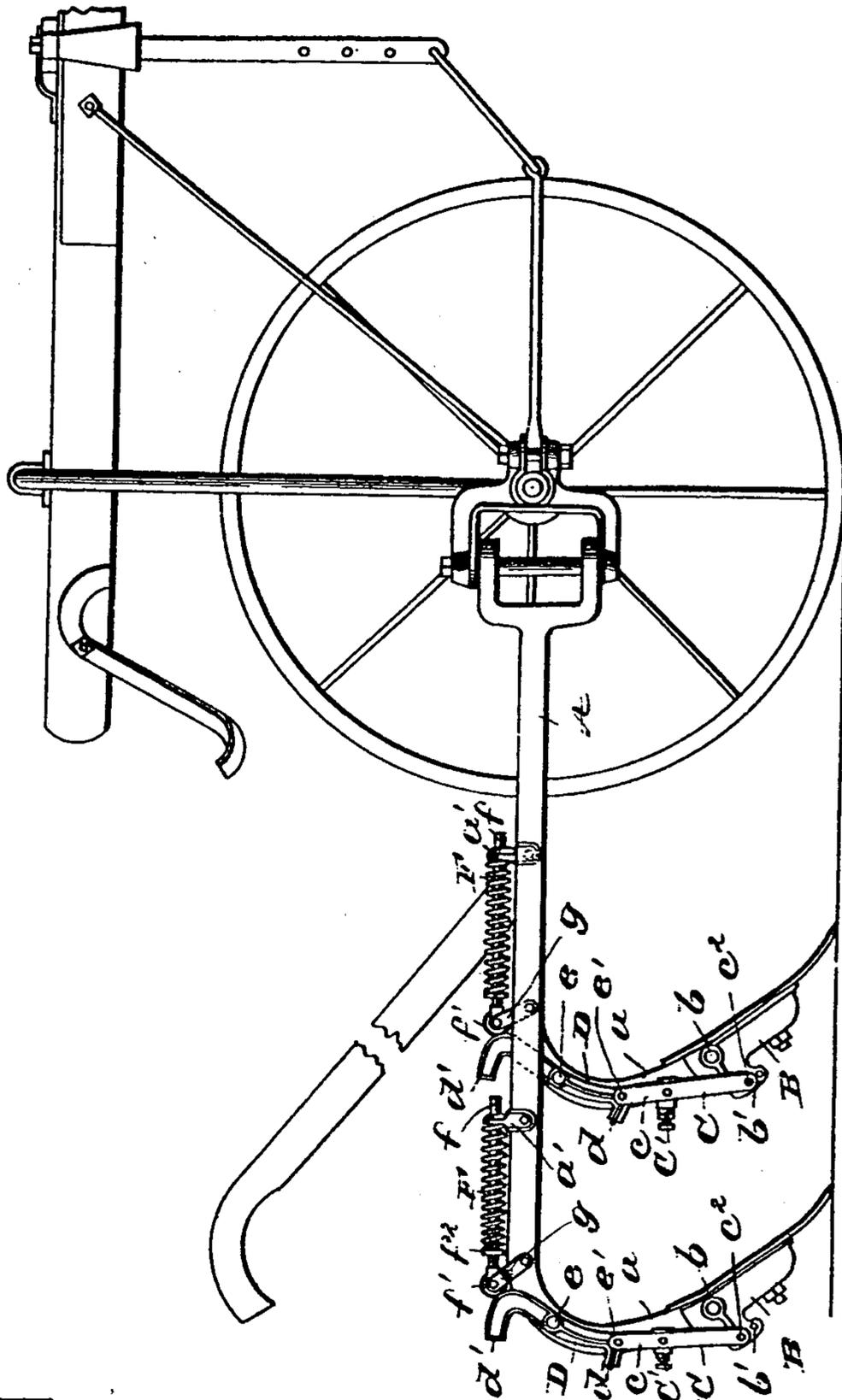


Fig. 2--

Witnesses—

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INVENTOR—

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UNITED STATES PATENT OFFICE.

WILLIAM L. BEALL, OF ALBION, MICHIGAN, ASSIGNOR TO THE GALE
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CULTIVATOR-TOOTH.

SPECIFICATION forming part of Letters Patent No. 617,711, dated January 17, 1899.

Application filed February 16, 1898. Serial No. 670,574. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. BEALL, a citizen of the United States, residing at Albion, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Cultivator-Teeth; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to cultivator-teeth, and more especially to such as are so supported in operative position that they will yield when brought into contact with a rigid obstruction.

The invention consists of certain new constructions and combinations of parts whereby improved results are secured and a better and more effective yielding cultivator-tooth produced.

In the accompanying drawings I have shown the best form in which I have contemplated embodying my invention, and said invention is disclosed in the following description and claims.

In the said drawings, Figure 1 is a side elevation of a cultivator with my improved teeth attached. Fig. 2 is an enlarged side elevation of the distinctive features of said tooth. Fig. 3 is a longitudinal vertical section of the construction shown in Fig. 2. Fig. 4 is a rear elevation, and Fig. 5 is a detail view.

In the drawings, A is the cultivator-beam, having the downwardly bent or extending portion *a*. To the lower end of *a* the tooth-shank B is pivoted at *b*. This is preferably made in two parts, but in every case provided with a slot or recess to receive the lower end of the beam. The tooth-shank has a rearwardly-extending part *b'* of segmental form, which is in this instance provided with a number of apertures to receive a bolt securing the lower member C of the toggle-lever. This lower member is composed of two links *c c'*, and these links are pivoted to the tooth-shank B at *c*. D, the upper member of the toggle-lever, is composed of a single casting having its two ends bent rearwardly. This member of the lever is provided with a slot extending entirely through the same or trans-

versely and nearly from end to end, the two outer walls only being united at the ends *dd'*. The closed end *d* forms a permanent stop which limits the movement of the toggle-lever, so that it can never pass quite to a right-line position. This member of the lever is pivoted to the beam at *e*, and the links forming the lower member are pivoted to D at *e'* by short rivets or bolts, one on each side of the beam A.

Between the links *c c'* is the inverted-U-shaped yoke C', which has its legs riveted or otherwise secured to the links *c c'*. A screw or bolt *c³* is passed through the middle of the yoke, fitting a threaded aperture in the same, and has upon it a jam or clamping nut *c⁴*. The end of this screw or bolt normally rests against the rear edge of the part *a* of the beam, and by turning this bolt or screw inward or outward the position of the toggle-lever is adjusted. The jam-nut serves to lock the bolt against accidental displacement.

The spring-pressure which serves to normally maintain the toggle-lever in place to hold the tooth-shank and its attached tooth in the desired position for work is applied to the casting D above the pivot *e*. This pressure is effected by the coiled spring F. A roof extends through the spring and engages the bracket or abutment *a'*, secured to the beam. The opposite end of the rod *f* is bifurcated and provided with the friction-roll *f'*. Two links *g g* are pivoted to the axis of the roll *f'* and have their opposite ends pivoted to the beam A. The friction-roll is provided with a central portion of such a width as to engage the slot in the upper part of the lever D and on each side a shoulder to engage the sides or the outer faces of the walls of the slot, so that the roll is kept from moving laterally out of engagement with the lever. The face of the upper end of the arm D, engaged by the roll *f'*, is not of an even curvature. From the normal point of engagement by the roll to the point *x* it is of such form as to act quite strongly to compress the spring, but from that point to the end of the lever it is but slightly out of a true circle drawn from the pivot *e* as a center. The rod *f* is provided with a screw-thread adjacent the roll *f'*, upon

which is a nut f^2 , by means of which the force of the spring can be adjusted.

The operation of this construction will be easily understood by those familiar with this class of devices. The force of the spring normally holds the toggle C D as nearly in a straight line as the adjustment of the screw c^2 will permit. In case the cultivator-tooth should come in contact with a rigid obstacle the tooth-shank B will turn or swing backward, flexing the toggle. At the same time as the upper end of the lever D moves inward its curved upper face acts as a cam against the roll f' to compress the spring F. As soon as the roll reaches the point x nearly the full compression of the spring has been effected. A further movement of the lever in the same direction but slightly increases the pressure of the spring. The links $g g'$ lying normally at an acute angle to the main body of the beam, one of the first effects of moving the roll forward is to cause them to swing the roll outward, increasing the leverage of the spring. The series of openings in the segmental portion b' of the tooth-shank enables the latter to be set in the position desired. The links $g g'$ by their action in raising roll f' and increasing the leverage of the spring render it unnecessary that the spring should be as much compressed as in other constructions in which the leverage remains constant.

It will be noted that the curved face of the arm D acts as a cam to compress the spring and that the compression is less than it would be were there a direct connection between them.

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

1. In a cultivator-tooth, the combination with the toggle-lever for holding the tooth-shank in position, of a spring for preventing the flexing or bending of the lever, the attachment of the spring including means for increasing its leverage as the lever is flexed or bent, substantially as described.

2. In a cultivator-tooth, the combination with the toggle for holding the tooth-shank in position, of a coiled spring engaging one part of said lever to prevent the flexing or bending of the lever, and means whereby the flexing of the lever will move the point engaged by the spring farther from the pivot of the engaged part, substantially as described.

3. In a cultivator, the combination with the toggle-lever for holding the tooth-shank in normal position, of a spring engaging one part of the lever for preventing the bending of the lever, the connection between the two including a cam construction for compressing the spring, whereby the compression of the spring is more easily effected, substantially as described.

4. In a cultivator-tooth, the combination with the toggle-lever for holding the tooth-shank in position, one part of said lever provided with a curved or cam surface, of a spring bearing upon said cam-surface and the links connecting the spring to the beam, substantially as described.

5. In a cultivator-tooth, the combination with the toggle-lever for holding the tooth-shank in position, of a friction-roll bearing against one of the members of said lever a spring forcing the roll against said lever and the links pivoted to said roll, substantially as described.

6. In a cultivator-tooth, the combination with the toggle-lever for holding the tooth-shank in position, a spring for preventing the flexing of the lever, the part of the lever receiving the force of the spring being provided with a curved or cam face compressing the spring, the said cam being substantially as described whereby the initial bending of the lever compresses the spring but the further movement thereof has but little effect upon the spring, substantially as set forth.

7. In a cultivator-tooth, the combination with the beam and the toggle-lever for holding the tooth-shank, of the stop consisting of the inverted-U-shaped-yoke and the adjusting-screw, substantially as described.

8. In a cultivator the combination with the beam and tooth-shank of a toggle-lever having for one member the slotted member D embracing the beam and spring-pressure devices tending to maintain the lever in a right-line position, one end of said slotted member serving as a stop, substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

WILLIAM L. BEALL.

Witnesses:

F. T. LAWLER,
W. D. BALL.