

(No Model.)

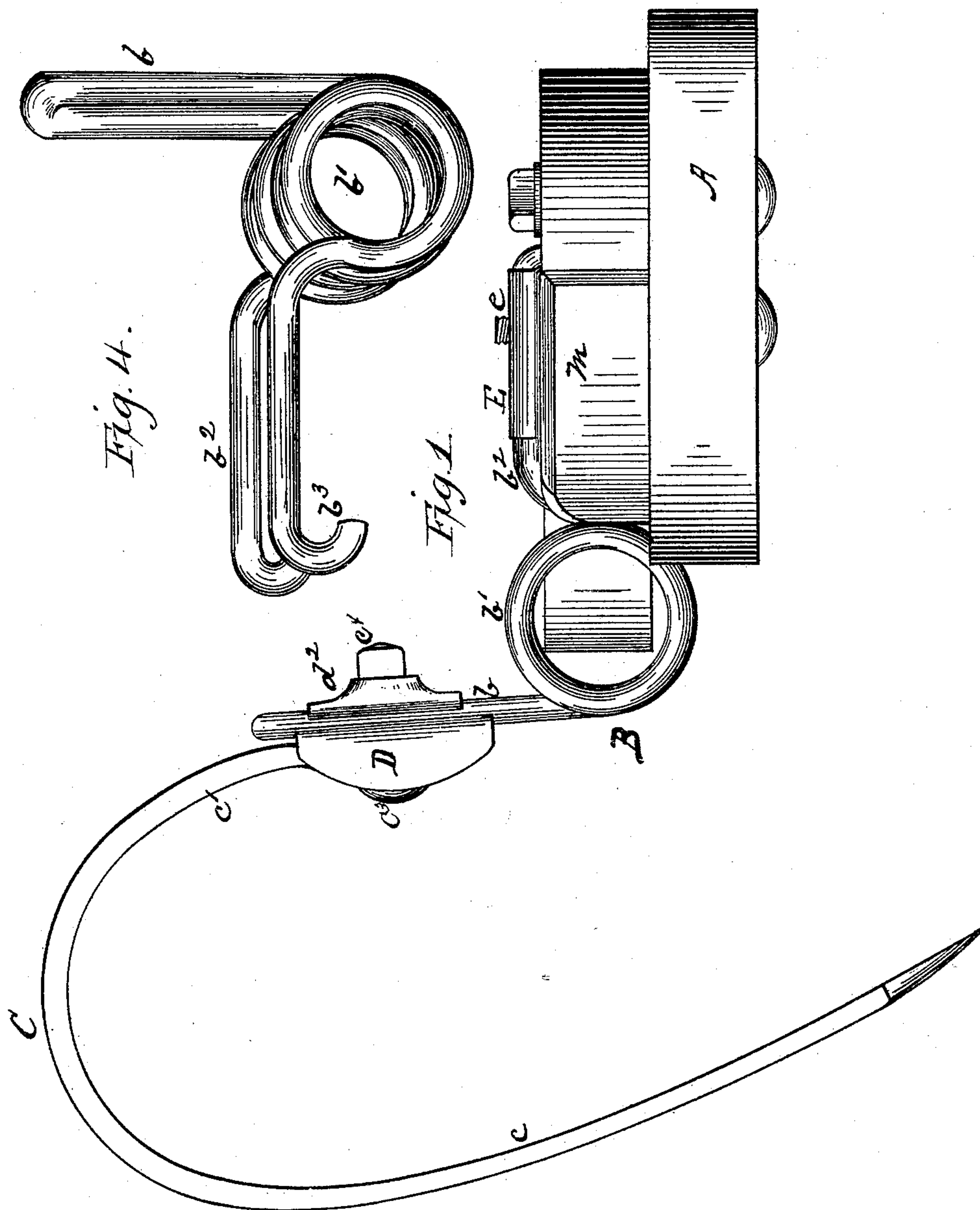
3. Sheets—Sheet 1.

A. J. NELLIS.

## HARROW AND CULTIVATOR TOOTH.

No. 257,237.

Patented May 2, 1882.



Witnesses:  
 Edith  
 Wm. D. Brown

Inventor:  
Aaron J. Nellis  
by ~~W. H. P. H. P.~~ atty

(No Model.)

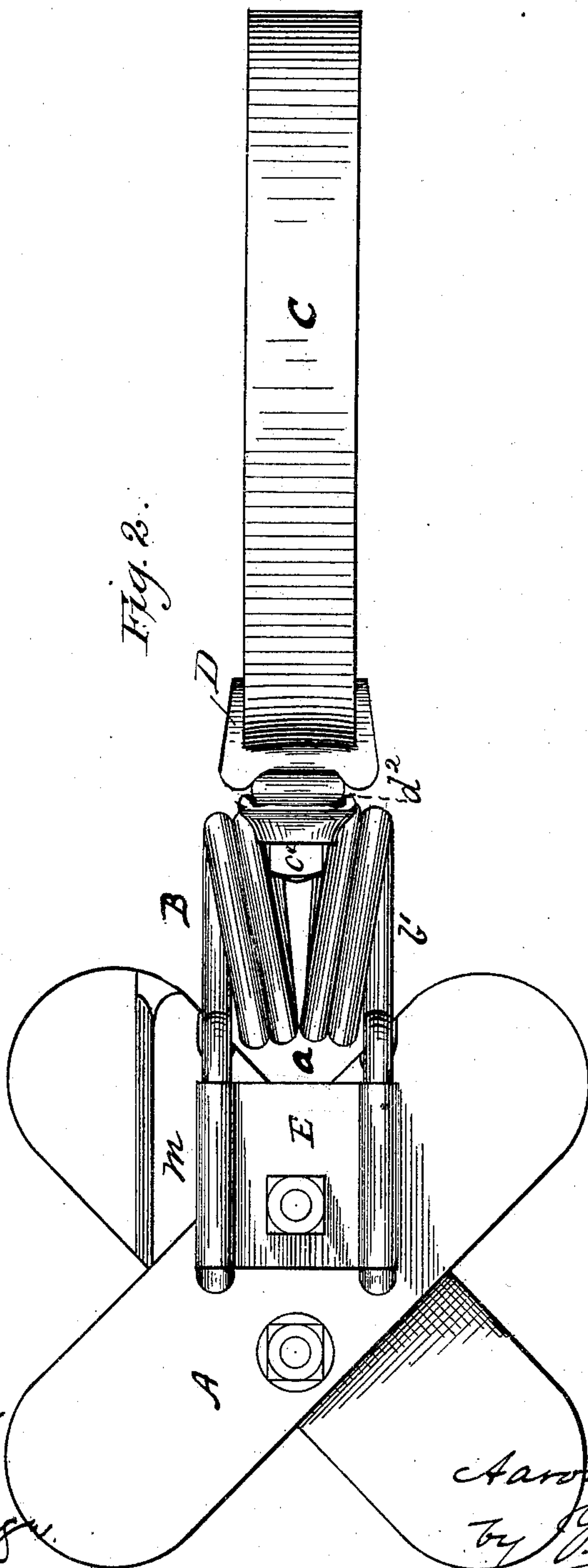
3 Sheets—Sheet 2.

A. J. NELLIS.

HARROW AND CULTIVATOR TOOTH.

No. 257,237.

Patented May 2, 1882.



Witnesses:  
C. S. Hyer  
Wm. L. Bragg.

Inventor:  
Aaron J. Nellis  
by J. W. Ritter  
att'y

(No Model.)

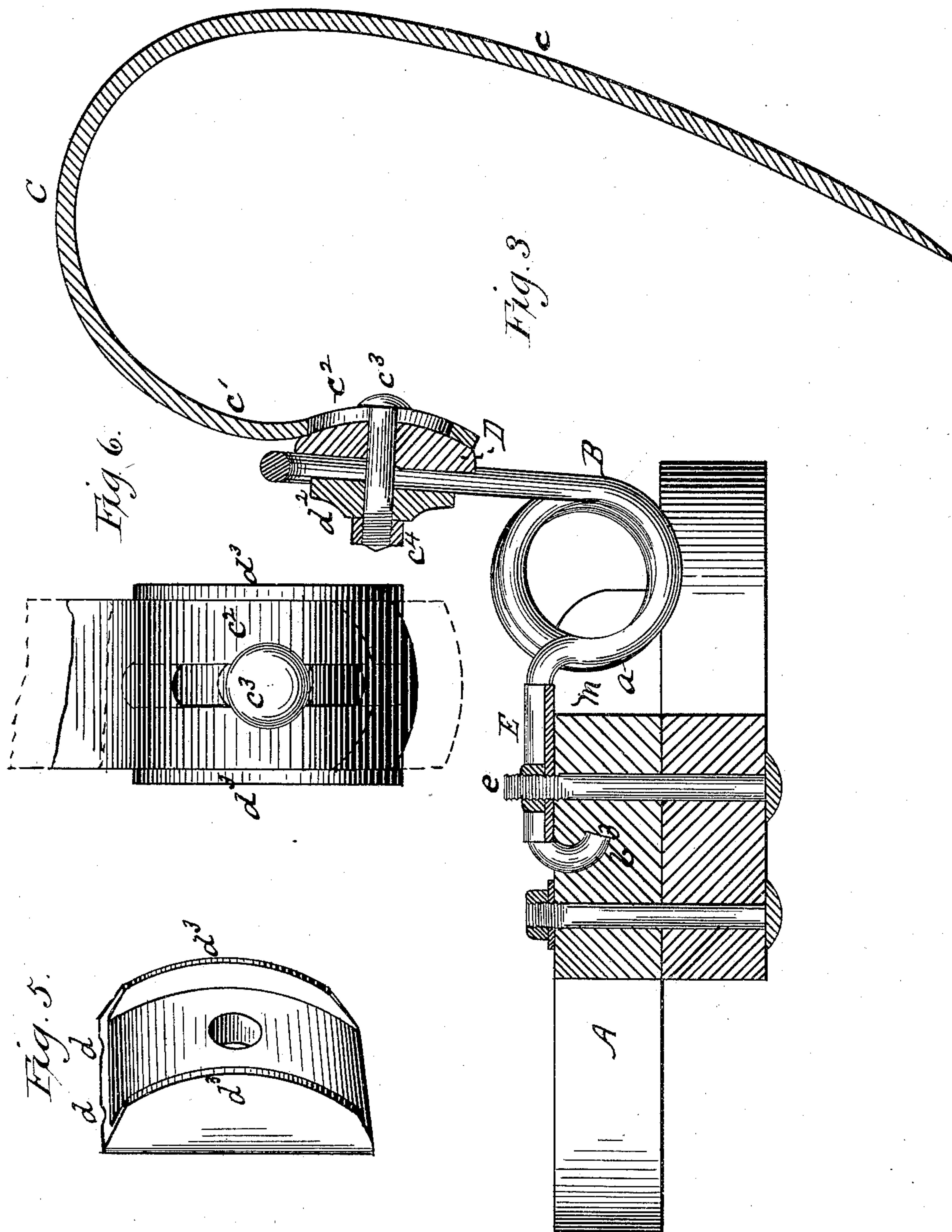
3 Sheets—Sheet 3.

A. J. NELLIS.

HARROW AND CULTIVATOR TOOTH.

No. 257,237.

Patented May 2, 1882.



Witnesses:  
C. S. Hyer  
Wm. E. Riege.

Inventor:  
Aaron J. Nellis  
by J. M. Ratter  
att'y



# UNITED STATES PATENT OFFICE.

AARON J. NELLIS, OF PITTSBURG, PENNSYLVANIA.

## HARROW OR CULTIVATOR TOOTH.

SPECIFICATION forming part of Letters Patent No. 257,237, dated May 2, 1882.

Application filed January 14, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, AARON J. NELLIS, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Harrow and Cultivator Teeth, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of the same, in which—

Figure 1 is a side elevation of a tooth embodying my invention, and a portion of a harrow-frame, showing the manner of attaching the tooth. Fig. 2 is a plan or top view. Fig. 3 is a sectional view, showing the manner of adjusting the angle of the tooth. Figs. 4, 5, and 6 are detail views of the spring-section, the adjusting or saddle block, and the heel of the cutting-section of the tooth.

Like letters refer to like parts wherever they occur.

My invention relates to the manner of constructing and means for attaching and adjusting the spring-teeth of harrows, cultivators, and like implements, and has for its object, first, to protect the spring-section of the tooth, as far as possible, from undue wear, which shall tend to weaken and destroy the same.

In a patent, No. 241,402, previously granted to me I protected the spring of the tooth against side twists and strains by arranging the spring in the angles formed by the convergence of the cross-bars of the frame; but in such instance the spring was attached to the under surface of the harrow-frame, so that it was subject to wear from contact with stones, rubbish, &c. In the present instance I go a step farther and form the coils of the spring below the free ends; or ends by which it is attached to the frame, and secure the free ends to the upper surface of the frame, so that the coil shall be kept out of contact with stones, rubbish, &c., which accumulate under the harrow-frame, and thus while all the advantages of the former construction are retained the additional advantage of protecting the spring from undue wear is secured.

The second object of my invention is to obtain such a connection between the cutting and spring sections of the tooth that the angle of the tooth may be changed at will, so as to adapt it to either mellow or hard soil, and this

I accomplish by forming the short arm or heel of the tooth on the arc of a circle and connecting it to the spring by an interposed adjusting or saddle block having a curved face adapted to form a seat for the curved heel of the tooth-section, all as will hereinafter more fully appear.

I will now proceed to describe my invention more specifically, so that others skilled in the art to which it appertains may apply the same.

In the drawings, A indicates a portion of a harrow or cultivator frame, and B the spring-section of a harrow or cultivator tooth, which is arranged within the angle  $\alpha$ , formed by the converging cross-bars of the frame, so that the spring shall be sustained and braced against lateral twist or strain.

C indicates the cutting-section of the tooth, and D the interposed adjusting or saddle block by which the cutting portion C and the spring portion B are connected. The spring portion B is preferably formed from a rod of suitable diameter by folding the same to form the loop  $b$  for the attachment of the short arm of the cutting-section, then coiling the rod to form a spiral,  $b'$ , the spring of which is in reverse direction to the spring of the cutting-section C, and finally bending the free ends  $b^2$  at substantially right angles to the section  $b$  and on a line above the center of the coil  $b'$ . The essentials, therefore, of this spring-section are that the arm for the attachment of the hook or cutting section C shall stand so as to bring the coil opposite the curved face of the tooth, and the frame section or arms  $b^2$  shall be above the center of the coil, so as to suspend the coil in the angle of the frame and above the under surface thereof.

E indicates a clamp, and  $e$  a bolt by means of which the spring-section B is secured to the frame A.

C indicates the hooked or cutting section of the tooth, having the long arm or tooth proper,  $c$ , and the short arm or heel section  $c'$ , by means of which it is so connected to the spring-section B as that the coil  $b'$  shall be opposite the concavity of the portion  $c$ . The short arm or heel-section  $c'$  is curved in the arc of a circle, as at  $c^2$ , and said curved portion has a longitudinal slot to permit the adjustment of the tooth and the passage of the bolt  $c^3$ , by which the section C is secured to spring-section B.

D indicates the saddle-block, by means of



which the section C is adjustably connected to the spring-section B. This saddle-block is preferably formed with parallel longitudinal grooves  $d$  upon one face for the reception of the arms of loop  $b$  of the spring-section B, the parts being held together by a clamping-plate,  $d^2$ , through which passes the bolt  $c^3$ . The opposite face of the saddle-block D is convex and properly shaped to form a seat for the curved section  $c^2$ , having by preference lateral flanges  $d^3$  to prevent the rotation of the section C on the bolt  $c^3$ .

The construction of the several parts being substantially as before specified, the tooth-section C will be secured to spring-section B by fitting the curved portion  $c^2$  of the short arm  $c'$  upon the saddle-block D, between the flanges  $d^3$  thereof, arranging the saddle-block on the arms of loop-section  $b$  of the spring, applying the clamping-plate  $d^2$ , and finally passing the bolt  $c^3$  through the several parts and securing the same by the nut  $c^4$ , or equivalent means. When the depth of draft of the tooth is to be changed the nut  $c^4$  is loosened and the saddle D slipped up or down on the loop-section  $b$  of spring-section B, while if it is desired to change the angle at which the cutting-section of the tooth C is to operate to meet the requirements of hard or mellow soil the same can be done by sliding the curved surface  $c^2$  of the short arm over the convex surface of saddle D. When the draft and angle desired have been secured the parts are again rigidly secured by turning home the nut  $c^4$ .

In securing the spring-tooth BC to the frame A the free ends  $b^2$  (which, if desired, may be bent as at  $b^3$ ) are placed upon the upper surface of frame A at the meeting points of the cross-bars, and are clamped thereto by means of clamping-plate E and bolt  $e$ , a leveling-block,  $m$ , being employed, if required. The coil  $b'$ , which is pendent from the section  $b^2$ , will rest within the angle  $a$ , formed by the cross-bars of the frame, so as to be braced thereby against lateral twists or strains, but will not descend below the frame in such manner as to come in contact and be worn or injured by stones, &c., over which the harrow may pass.

The advantages of my invention are the protection afforded the spring-section of the tooth against undue wear and the perfect adjustability, both as to angle and depth of draft, of the cutting-section of the tooth.

I am aware that a tooth has heretofore been provided with a rotating hub whereon it was adjustable, so that the tooth might be adjusted vertically and also set at different angles by rotating the hub, and do not herein claim the same, for the reason, first, that the rotation of the hub is not the equivalent in its effect on the tooth to the adjustment of the tooth in the arc of a circle, as herein described, and, secondly, because such a construction cannot be applied to spring-teeth of the class specified.

I am also aware that a spring-tooth has heretofore been adjusted in the arc of a circle upon a curved saddle-block rigidly attached to the harrow-frame, and do not herein claim such a construction, for the reason that in such cases the adjustment is made at the point of vibration or point of greatest strain, and is consequently liable to derangement.

Having thus described the nature and advantages of my invention, what I claim, and desire to secure by Letters Patent, is—

1. The herein-described spring-tooth for harrows, cultivators, and like implements, composed of a cutting or tooth section proper and a coiled spring-section, the coil of the spring-section arranged opposite the face of the tooth-section, and the center of the coil-section below the suspension-arms by which the tooth is attached to the frame, substantially as and for the purpose specified.

2. In a harrow, cultivator, or like implement, the combination, with the frame, of a spring-tooth composed of a cutting or tooth section proper and a coiled spring-section secured thereto opposite the face of the cutting-section, the suspension-arms of the spring-section being arranged above the center of the coil and attached to the upper surface of the harrow-frame, substantially as and for the purpose specified.

3. In a spring-tooth for harrows, cultivators, and like implements, the combination of a spring-section having the vertical loop or arm, a cutting-section or tooth proper having the curved heel, and the interposed saddle having the curved face, the cutting-section adjustable on the spring-section in the arc of a circle, and also vertically, whereby both the draft and cutting-angle of the tooth can be changed, substantially as and for the purpose specified.

4. In a tooth for harrows, cultivators, and like implements, the combination of the cutting-section having the curved heel, the coiled spring-section having the vertical loop or arm, and the interposed saddle having the curved face to receive the heel of the cutting-section, substantially as and for the purpose specified.

5. In a spring-tooth for harrows, cultivators, and like implements, the combination of a hooked section or tooth proper, and the coiled spring-section having the vertical arm or loop for the attachment of the hook-section, and the suspension-arms which project at a right angle to the loop-section and in a plane above the center of the coil, substantially as and for the purpose specified.

In testimony whereof I affix my signature, in presence of two witnesses, this 9th day of January, 1882.

AARON J. NELLIS.

Witnesses:

C. E. CORNELIUS,  
H. H. SALLADE.