(Model.)

A. J. NELLIS.

Spring Tooth Harrow.

No. 241,402. Patented May 10, 1881.

Fig. 1.

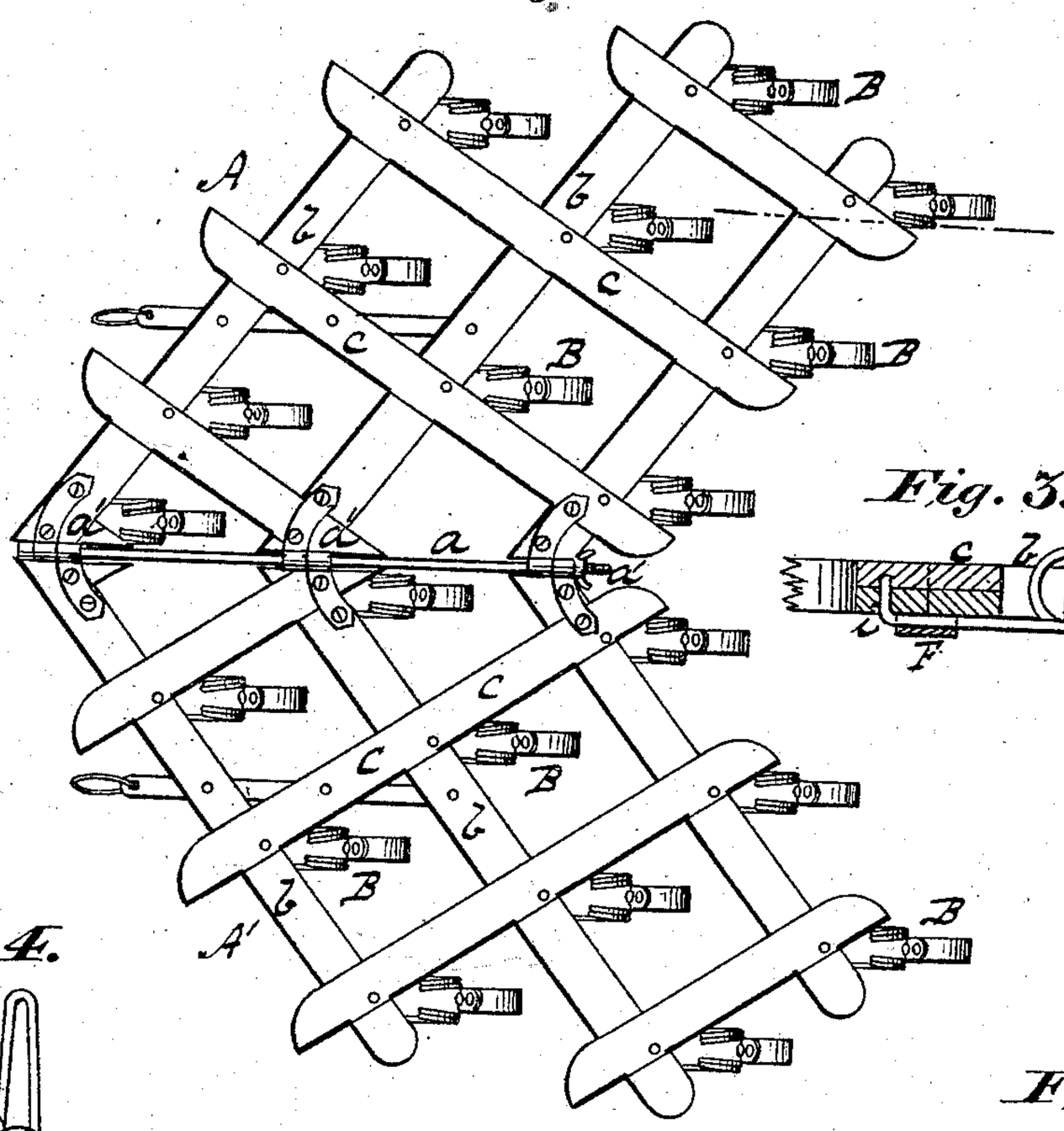


Fig. 3.

Fig. 4.

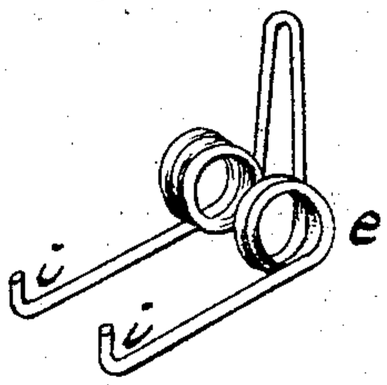


Fig. 5.

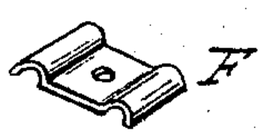
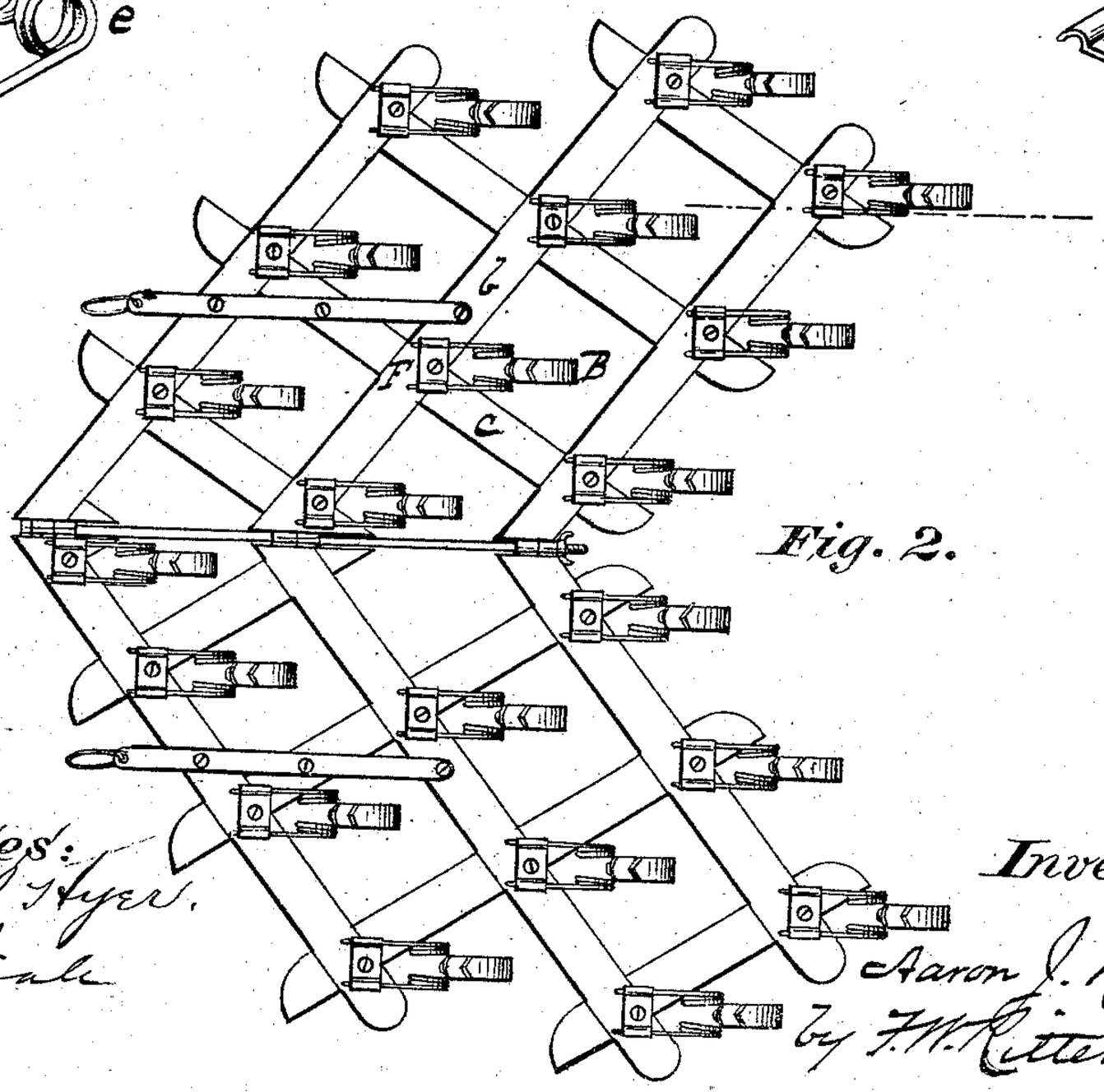


Fig. 2.



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UNITED STATES PATENT OFFICE.

AARON J. NELLIS, OF PITTSBURG, PENNSYLVANIA.

SPRING-TOOTH HARROW.

SPECIFICATION forming part of Letters Patent No. 241,402, dated May 10, 1881.

Application filed March 24, 1881. (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 Spring-Tooth Harrows; 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, reference being had to the accompanying drawings, and to the letters or figures of reference marked thereon, which form a part of this specification.

In the drawings, Figure 1 is a top view of a harrow embodying my invention. Fig. 2 is a bottom view of the same. Fig. 3 is a side elevation, and Fig. 4 is a detail view, of the spring. Fig. 5 is a detached view of the clamp for securing the tooth to the frame.

Like letters refer to like parts wherever they occur.

My invention relates to the construction of spring-tooth harrows, and has for its object, first, to obtain such a construction of the spring or vibrating tooth that it shall readily relieve itself of dirt, trash, &c., and promptly yield to and pass over obstructions such as stones, roots, &c., without causing the lifting of the harrow-frame; and to this end it consists in so combining a coiled or spiral spring with a hooked spring-tooth, as will hereinafter appear, that the spring or yield of the tooth shall be in reverse direction to the coil of the spiral, so that the tooth can rise and fall vertically as well as vibrate.

The second object to be obtained is to support the coil of the spring-tooth against lateral strain or side twists; and to this end the second part of my invention consists in arranging the spring-tooth with its coil in the forks formed by the cross-bars of the frame, so that as the spring is compressed laterally it will be supported against side strain by the converging bars of the harrow-frame.

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

For the purposes of illustration, a butterfly-harrow is shown in the drawings, the wings A A′ of which are connected by the usual rod *a* and joints *a′*.

b c indicate the bars composing the frame, said bars arranged to cross each other at suitable angles, and the whole secured in the ordinary or any approved manner of constructing this class of harrow-frames.

B B indicate the spring-teeth devised by me. These teeth consist of a hook-shaped or double-curved section, *d*, preferably of spring-steel, so as to yield readily. Said section *d* is connected by its short arm to the ends of spiral springs *e*, the opposite ends of the spiral springs being adapted to be made fast to a harrow-frame. The coils of the spiral springs *e* are arranged opposite the concave face of the hooked section *d*, and in reverse to the spring thereof, so that the spiral will coil and uncoil to permit the vertical rise and fall of the section *d* when the point of the tooth meets an obstruction. In constructing the harrow these teeth are arranged on the frame at the crossings of the bars *b c* with the coiled or spiral springs *e* in the forks formed by the converging bars, and are preferably secured by means of a clamp, F, which binds the ends of the spirals to the frame. If desired the ends of the spirals may be bent up, as at *i*, and inserted in holes in the frame in order to secure a firmer attachment between the tooth and frame.

The equalizing-bars, &c, will be attached to the harrow in the usual manner.

The construction being substantially as specified, the devices will operate as follows: As the harrow is drawn forward the spring-tooth, in addition to its vibratory motion, will have a vertical motion, which will prevent the lodgment of dirt, &c., against the face of the tooth, and in case the tooth meets an obstruction it will not cause the whole frame of the harrow to rise, as in the case of the ordinary construction, but the point of the tooth will move backward and upward, the tooth pivoting on the spiral spring, which coils up, permitting the tooth to yield vertically and thus pass over the obstruction. As soon as the tooth has passed the obstruction the uncoiling of the spiral spring will bring the tooth down. If the strain put upon the tooth is lateral rather than in a right line, that portion of the spiral against

which the strain is brought will be crowded against and supported by the converging cross-bar *b* or *c*, as the case may be, and the spring-tooth will be less likely to be broken or twisted.

The advantages of my invention are the independent action possessed by each tooth and the effective manner in which the teeth are supported and protected.

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

1. The herein-described spring-tooth for harrows or cultivators, in combination with the coiled spring arranged opposite to the face of the tooth and attached to the short arm thereof, substantially as and for the purpose specified.

2. In a harrow or similar implement, the combination, with a cross-barred frame, of a spring-tooth or spring-teeth, composed of a tooth-section proper and a coiled spring secured thereto, the coiled spring of the tooth arranged in the fork formed by the convergence of the cross-bars, so as to be supported against lateral strain, substantially as and for the purpose specified.

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

AARON J. NELLIS.

Witnesses:
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