(No Model.)

J. L. LAUGHLIN.

HARROW.

No. 294,393. Patented Mar. 4, 1884.

Fig. 1.

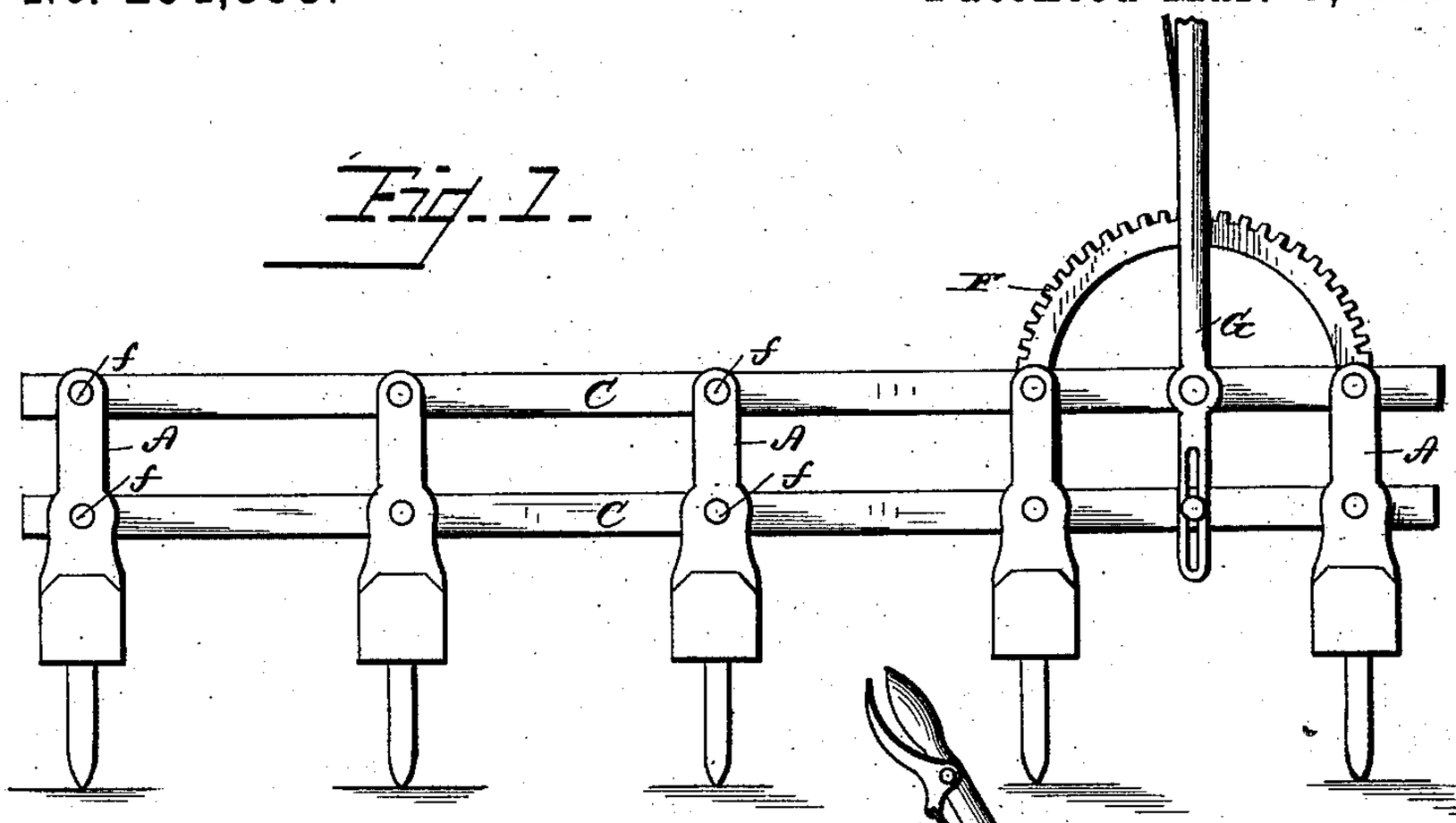


Fig. 2.

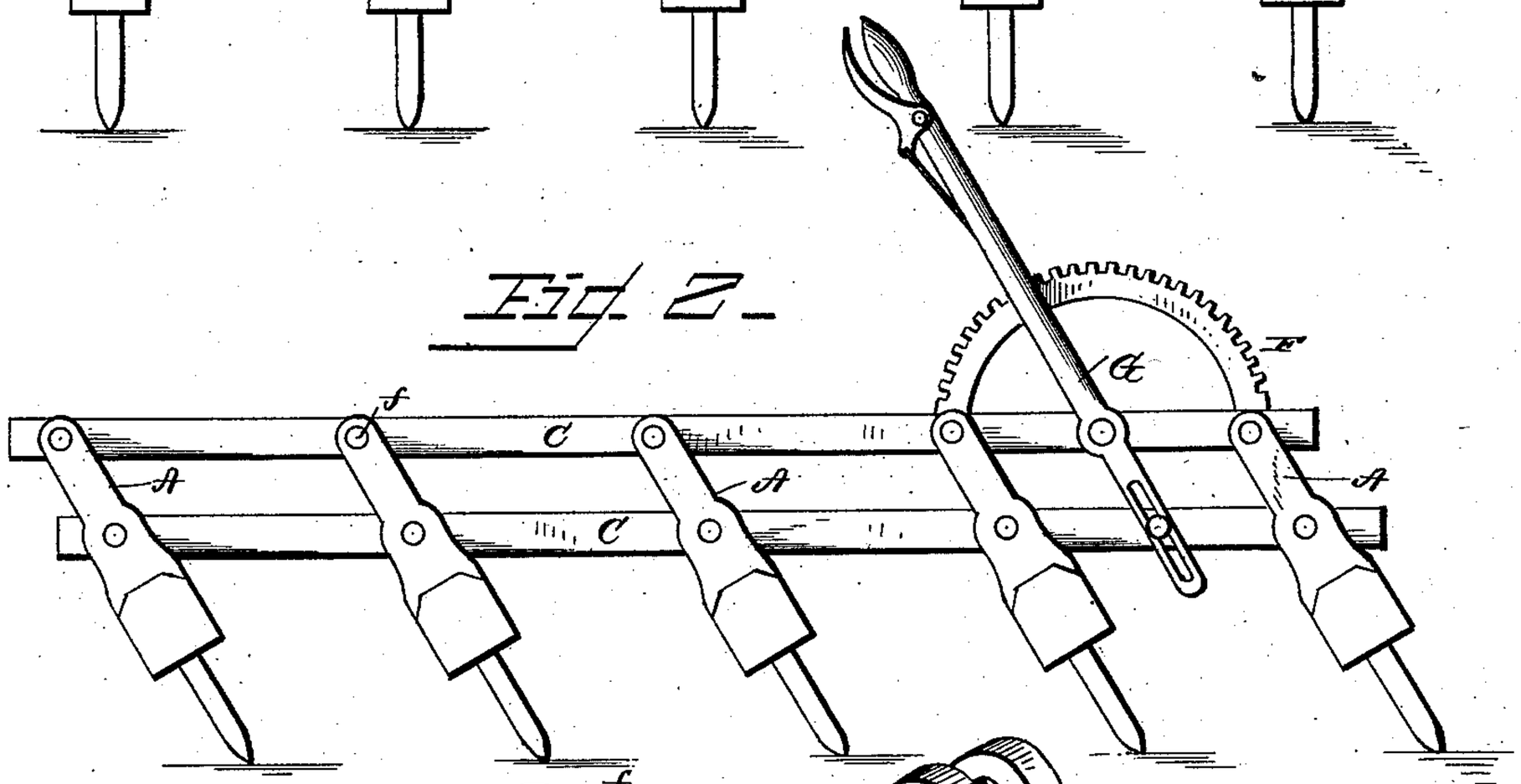


Fig. 3.

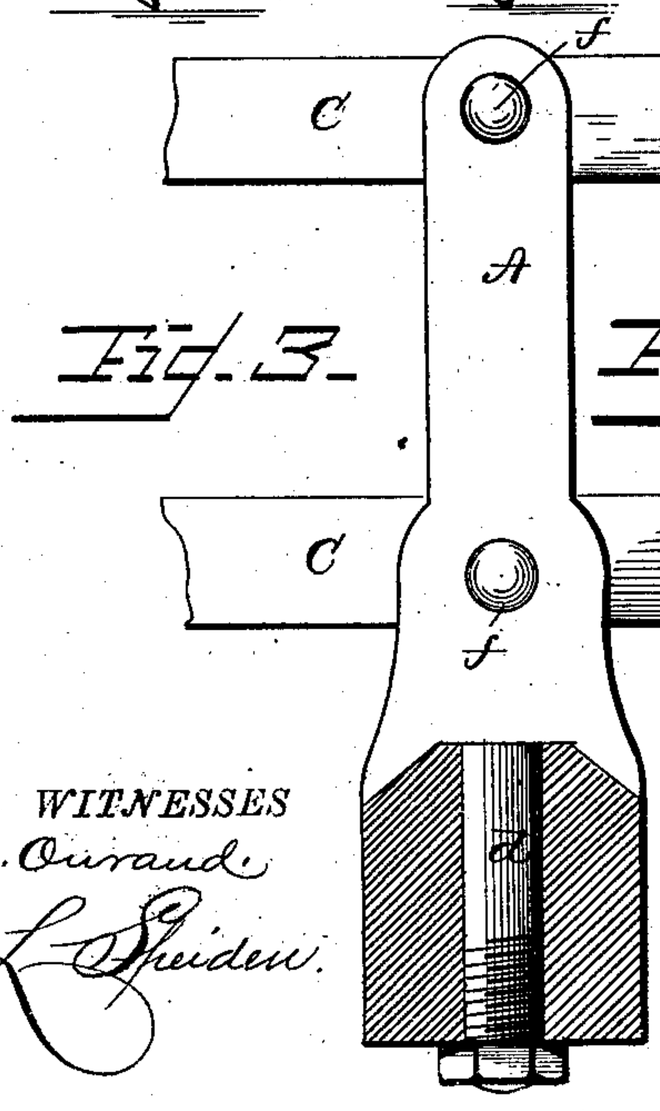
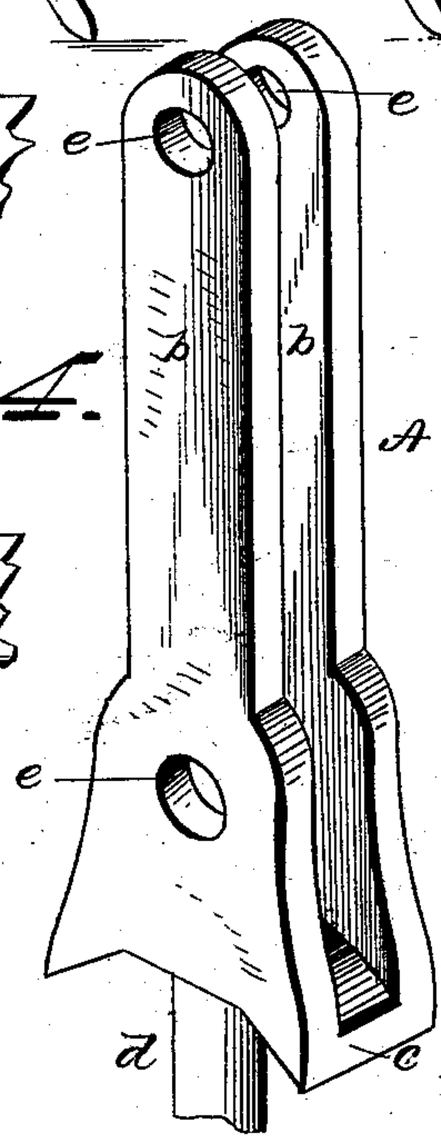


Fig. 4.



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HARROW.

SPECIFICATION forming part of Letters Patent No. 294,393, dated March 4, 1884.

Application filed November 14, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN L. LAUGHLIN, a citizen of the United States of America, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in 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.

This improvement is designed for that class of harrows—especially that shown and described in my Patent No. 274,125, dated March 20, 1883—in which means are provided for adjusting the teeth at different angles, as circumstances may require.

The main object of my improvement is to construct a connecting-link in one piece, made of malleable iron or other suitable metal, for the attachment of the tooth-bar and the shifting bars. Another object, also, is to manufacture the links, made in one piece of metal, and the parts composing the harrow at a small cost.

Figure 1 is a side view of a harrow of the adjustable class in a normal condition with my improvement applied. Fig. 2 is a similar view, showing the harrow in an adjusted position. Fig. 3 is a side view of one of the connecting-links, with portions of a tooth-bar and shifting bars; and Fig. 4 is a perspective view of the improved connecting-link.

In the annexed drawings, A represents the connecting-link, preferably made of malleable iron. This link consists of the parallel side arms, *b*, united at their base to the web *c*, and the centrally-arranged bolt *d*, of proper length. The under side of the web *c* is formed with the three sides of a geometrical octagon, so as to fit the upper surface and the beveled ends of the tooth-bar. These octagonal sides, fitting closely the two angle-surfaces of the tooth-bar, relieve the strain upon the bolt in the shifting of the tooth-bar to either the right or left. The bolt *d* is provided at its lower end with screw-threads to receive a nut. The bolt, with its screw-threads, may be of wrought-iron, and placed in the mold, and the cast-iron for forming the upper portion of the link run into the mold to make the union of the parts. The space between the parallel side arms is sufficient to readily receive the parallel bars C, and in the casting of the link the oppositely-arranged holes *e* in the side arms are made by sand-prints or other means. In some cases one of the side arms of the link may be omitted and the other arm made heavier to produce substantially the same result. The wooden bars of the harrow being prepared to a given size and the holes for the several bolts bored, the bolt portions of the connecting-links are driven or passed into vertical holes of the tooth-bars and secured in position on the under side by the nuts. The parallel bars C C are passed between the vertical side arms and pivotally connected by the short bolts *f*, as shown.

Attached to the parallel bar C is a lever, G, arranged to lock, by means of a spring-pawl or other suitable device, to a quadrant, F, secured to the upper bar, C, which lever G, for shifting the parallel bars in opposite directions simultaneously, imparts a reciprocating oscillating motion to the tooth-bars, thereby enabling the teeth to be inclined to clear them of trash, or set and held at any angle.

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

1. As an improved article of manufacture, the described connecting-link, consisting of the perforated parallel side arms, the web with the octagonal sides on the under side thereof, and the screw-threaded bolt, all united together, substantially as described.

2. In a harrow, the combination of a plurality of tooth-bars, with the connecting-links constructed as described, each link having the parallel arms to receive and connect pivotally the parallel adjusting-bars, a web with octagonal sides to fit the angle-surfaces of the tooth-bar, and the screw-threaded bolt passed vertically through the tooth-bar, substantially as described.

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

JOHN L. LAUGHLIN.

Witnesses:

W. H. COEN,

JOHN KELSALL.