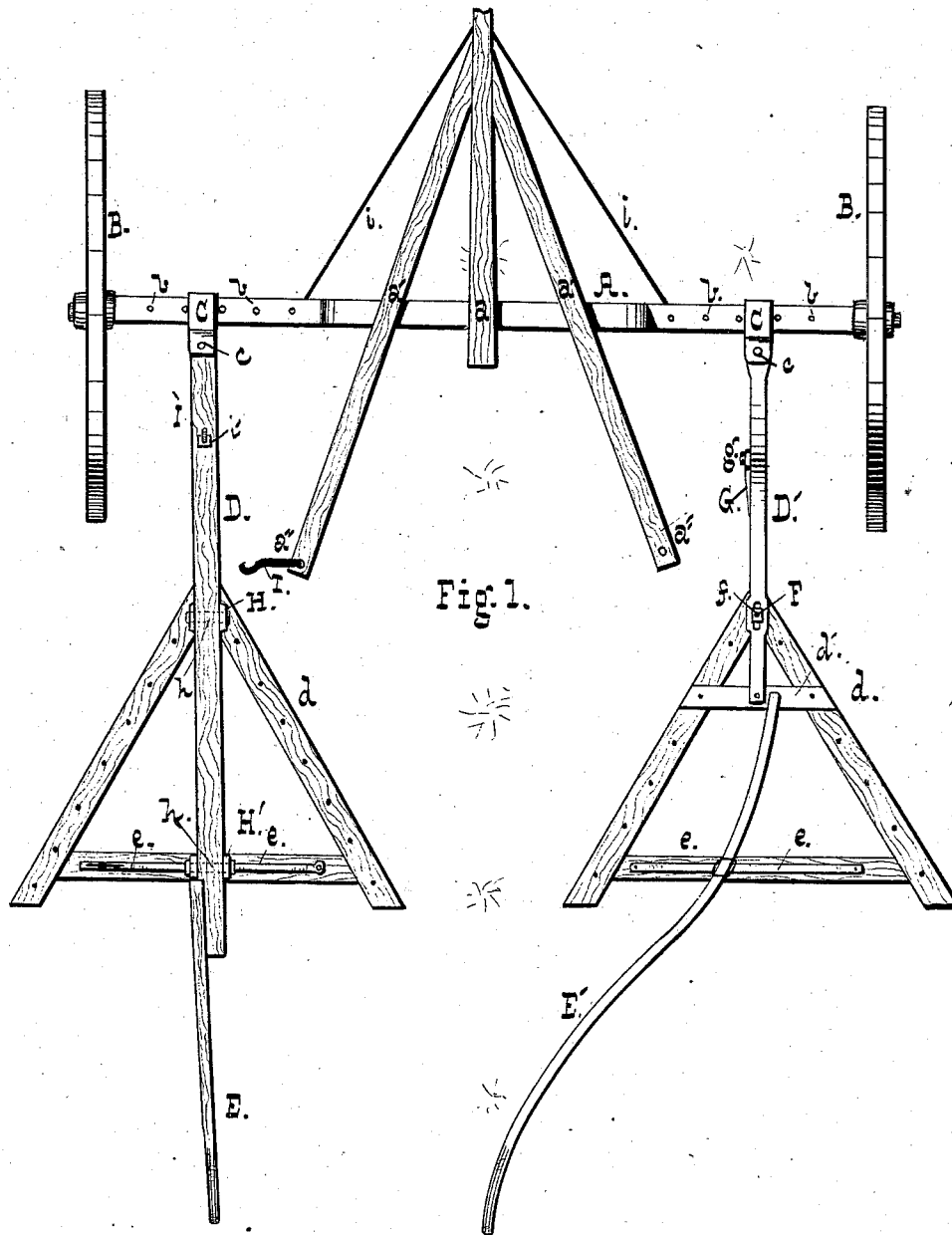


M. S. BLAIR.  
Harrow.

No. 216,933.

Patented July 1, 1879.



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Fig. 2.

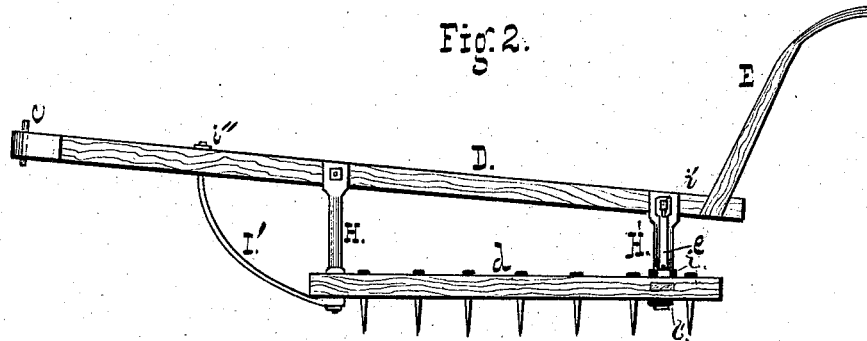
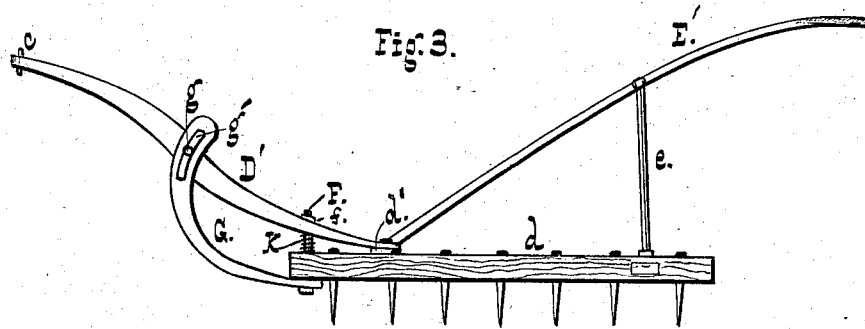


Fig. 3.



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# UNITED STATES PATENT OFFICE.

MILTON S. BLAIR, OF WARSAW, IOWA.

## IMPROVEMENT IN HARROWS.

Specification forming part of Letters Patent No. **216,933**, dated July 1, 1879; application filed April 8, 1879.

*To all whom it may concern:*

Be it known that I, MILTON S. BLAIR, of Warsaw, Wayne county, State of Iowa, have invented certain new and useful Improvements in Harrows; and I hereby declare the same to be fully, clearly, and exactly described as follows, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of the device complete, and Figs. 2 and 3 side elevations of the harrows.

My invention relates, in particular, to corn-harrows; and consists in the combination of a pair of small harrows adapted to pass between the rows of corn with an ordinary cultivator-frame, and in certain details of construction and combinations of parts, as hereinafter described.

In the accompanying drawings, A represents the ordinary bowed axle of a cultivator, having tongue *a*, lateral braces *a'* and *i*, and wheels B.

The axles at either side are perforated at intervals, and provided with pins *b b*, in order to effect a lateral adjustment of the harrows to suit varying widths of the rows.

C C are clips embracing the axle, to which the draft-beams of the harrows are secured by pins *c*.

The harrows *d* are triangular in shape, and are provided with handles EE', similar to those of a plow, except that one of them is bent around toward the other, in order to enable the driver to guide both harrows while walking in the path of one of them.

The harrows are readily directed by bearing up or down upon the handle, as the side receiving the pressure, being inclined to the line of draft, operates precisely after the manner of a rudder.

The beams *a'* are extended behind the axle, and are perforated at *a''* for the attachment of hooks I, upon which the harrows are hung clear of the ground when not in use.

The harrows are attached to the frame or axle A by means of draft-beams D, and as the height of the axles of cultivators varies, it is necessary to construct this beam in such manner as to admit of its forward end being vertically adjusted. Two means of accomplishing this are shown in Figs. 2 and 3. In the

former, H H' are a pair of standards, secured, respectively, upon the forward end of the harrow and upon its cross-timber, terminating above in jaws, (see Fig. 1,) which embrace the beam, and in which it is secured by bolts, as shown.

The rear standard is vertically adjustable upon the cross-timber by reason of its being threaded at the part passing through the timber, and being provided with nuts *i i'* above and below the same.

To raise the forward end of the beam, it is only necessary to run the upper nut up on the standard the required distance and screw up the lower one until the other jams against the top of the cross-timber. Lateral braces *e e* are provided to relieve the standard of lateral strain.

I' is a brace extending from the front of the harrow up through the beam D, where it is secured by a nut, *i''*, the object being to prevent undue strain upon the standards H H' as the harrow is drawn over the ground.

The construction shown in Fig. 3 is the mechanical equivalent for that just described in many respects.

The handle E' is provided with lateral braces *e e*, but is not vertically adjustable. The draft-beam D', preferably metallic, is attached to a cross-beam, *d'*, a short distance behind the harrow-point. Through the latter, and through a slot in the beam D', passes a pin, F, having a nut, *f*, above the beam. Below it a spring, K, embraces the pin and sustains the beam.

From the under side of the harrow extends a strong brace, G, having a slot, *g'*, through which passes a pin, *g*, secured to the beam. The slot *g'* is formed in the arc of a circle described about the point of attachment of the beam as a center, and the pin *g* is furnished with a clamping-nut for securing the brace to the beam.

To raise or lower the end of the beam, it is only necessary to loosen this nut and turn the nut *f* up or down on the pin F.

Such is, in general terms, a description of the construction of the device. Its mode of operation will have been made evident therefrom.

The harrows are drawn between the rows, being guided by the driver, who directs their

course by bearing up or down upon the handles.

In passing through a narrow row or narrow part of a row the harrow therein may be hung up on the hook I.

The harrows may be attached to the ordinary cultivator-axle, their feature of vertically-adjustable draft-beams adapting them for all ordinary variations in the height of the axle.

Instead of using a nut, *i*', for tightening the rod I', a swivel-link of the usual construction, threaded onto one or both parts of the rod, may be used.

What I claim is—

1. In combination with the axle of a wheel-cultivator, the harrow *d*, having handle, as described, and provided with the draft-beam D, spring K, and slotted brace G, substantially as set forth.

2. The harrow *d*, having pin F, nut *f*, and spring K, in combination with the draft-beam D' and slotted brace G, substantially as set forth.

MILTON S. BLAIR.

Witnesses:

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