L. H. McGINNIS.

Harrow.

No. 168,762.

Patented Oct. 11, 1875.

Fig. 1

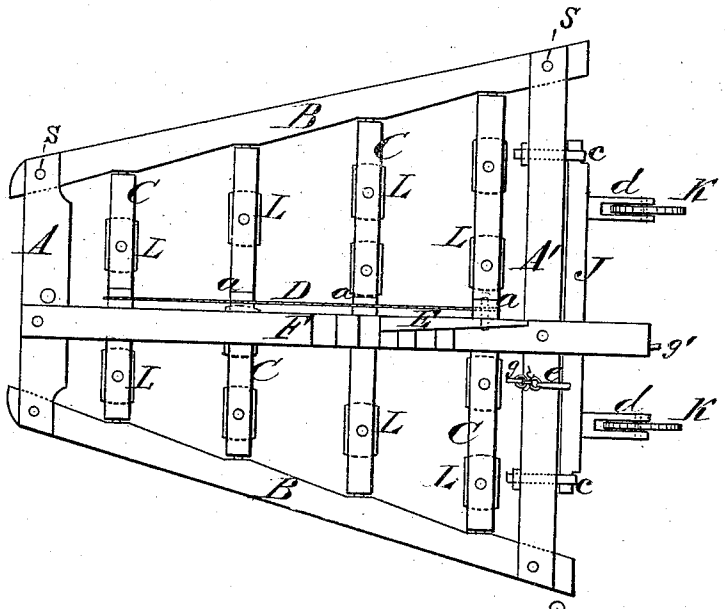


Fig. 4

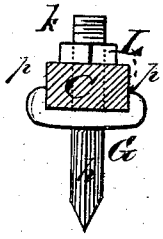


Fig. 2

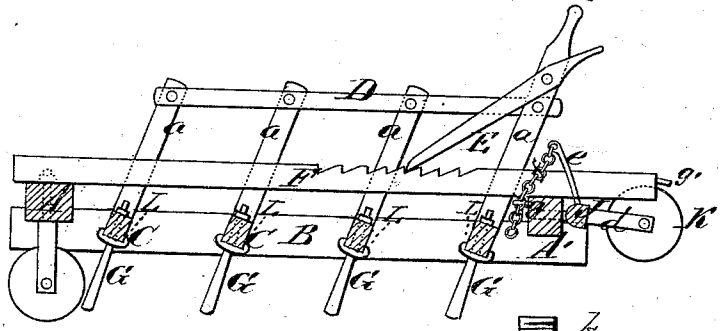


Fig. 5.

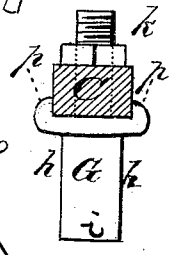
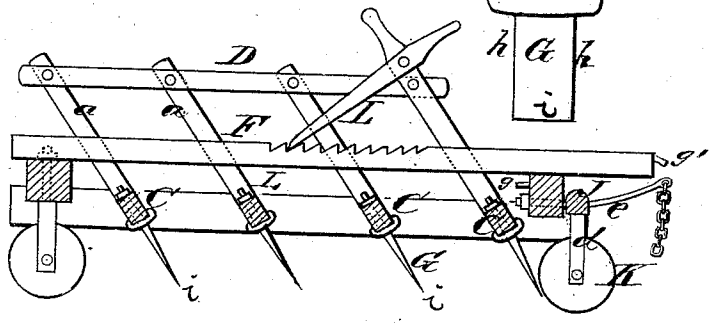


Fig. 3



WITNESSES

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UNITED STATES PATENT OFFICE.

LEONIDAS H. McGINNIS, OF WOODSTOCK, VIRGINIA.

IMPROVEMENT IN HARROWS.

Specification forming part of Letters Patent No. **168,762**, dated October 11, 1875; application filed June 19, 1875.

To all whom it may concern:

Be it known that I, LEONIDAS H. McGINNIS, of Woodstock, in the county of Shenandoah and State of Virginia, have invented a new and valuable Improvement in Harrows; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a plan view of my harrow, and Figs. 2 and 3 are longitudinal vertical sectional views of the same. Figs. 4 and 5 are sectional detail views thereof.

My invention relates to harrows and cultivators; and consists in a harrow-frame having converging detachable side pieces and central brace, in combination with reversible tooth-bars; also, in a rock-shaft applied to the rear end of the harrow-frame, provided with wheels for adjusting while at work, and transporting the harrow to and from the field, which wheels may be operated independently of the harrow-teeth; also, in a novel combination of a flanged washer with each tooth and the beam. These washers embrace the shank of the tooth under the beam, and the flanges clasp the lower edges of the beam, binding them together, and adding the strength of the washers to the weak parts of the beam and teeth; also, in a novel shape of the harrow-teeth, whereby they are strengthened on the line of the draft, and are enabled to cut the soil with great facility and the least resistance, all of which will be understood from the following description and accompanying drawings.

The frame of my improved harrow and cultivator consists of two parallel cross-bars, A A′, rigidly secured by bolts with screw-taps to the conveying side bars B B and central brace-bar F. C C designate tooth-carrying bars free to oscillate in their bearings in the side beams B B. These bearings are round, passing nearly through the side beams, of equal size and the same shape, so they may be removed and changed end for end when the beams are worn by friction in front, or the teeth become dulled on their front edges. From each bar C rises a lever-arm, *a*, and on the upper end of the lever-arm of the rearmost bar C a handle is formed for leverage in adjusting the teeth. The lever-arms *a* are connected together by a strip, D, which is pivoted to them by detachable bolts, so that all the bars C are oscillated in adjusting the position of the teeth at the same time to the same angle. E designates a pawl, which is pivoted to the lever-arm of the rearmost bar C, which engages with the rack-bar F, which is rigidly secured to the front and rear beams A A. When the pawl E is engaged with the rack-bar F the teeth G are prevented from being thrown back while in operation. By these means the teeth are adjusted and held at any desired angle. The bar F not only serves as a rack for pawl E, but also for strengthening the draft-bar and the frame in the line of draft. Each washer L is constructed with flanges *p p*, which embrace the lower edges for the teeth-carrying bars at the entrance of each tooth, and with a hole in the center, adapted to the shape of the shank of the tooth which passes through it, thus adding its own strength to the tooth and the bar at their weakest parts, preventing the former from breaking, and the latter from splitting. Each tooth G has two cutting-edges, *h h*, and its lower end is double-beveled, so as to form a broad, sharp end, *i*. The shanks of these teeth pass up through the washers L and bars C, held in place by nuts *k* on screw-threads. A slight inclination of the teeth forward facilitates the entering of hard clay soils by a "draw-cut." When inclined backward by a slanting cut, their peculiar shape severs sods and clods, and packs and smooths the soil with the least friction possible.

For cultivating by running over the plants "broadcast," I prefer the common round teeth. It is in the use of those, especially when driven in tightly to hold without screw-threads and taps, that my combination for reversing the tooth-beams is most economical, when the teeth are worn in front instead of drawing out the teeth, which enlarges the holes, and inserting anew with wedges to tighten in the worn holes.

For cultivating between the rows, or for preparing the soil for planting, I prefer my

improved oval teeth. The beams are reversed by removing two bolts, S S, from one side of the frame, taking off one side bar when all the tooth-beams are free to reverse, and adjusting the pawl E and strip D, which are likewise secured by removable bolts and taps.

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

1. The harrow-frame having the converging detachable side pieces B and central brace F, in combination with the reversible tooth-bars C, substantially as described, and for the purpose set forth.

2. The flanged washers L, combined with bars C and teeth G, substantially as described, and for the purpose set forth.

3. The harrow-tooth G, the lower end of which is broad and beveled on both sides, and double-beveled from its vertical axis to its vertical sides, so as to form parallel cutting-edges, substantially as described.

4. In a harrow, the combination, with the pivoted tooth-beams C, of transporting-wheels K K, rocking bar J, lever-arm *e*, chain *f*, and hitching-studs *g g'*, whereby the wheels and the tooth-beams may be operated independently or together, substantially as described.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

LEONIDAS H. McGINNIS.

Witnesses:

ROBT. A. BRUBECK,

H. FOUNTAIN.