A. H. BALLAGH.

Harrows.

No. 199,012. Patented Jan. 8, 1878.

Fig. 1

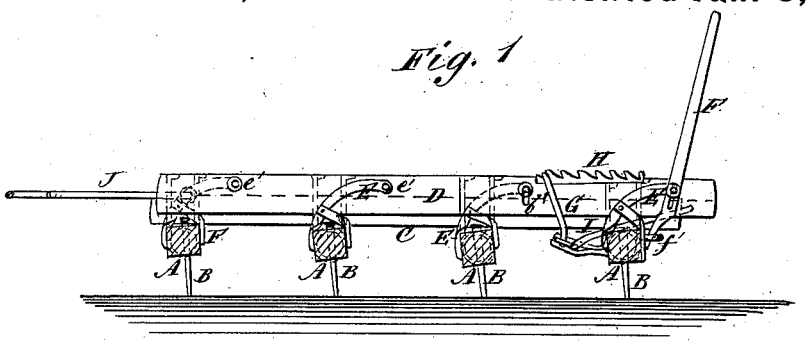


Fig. 2

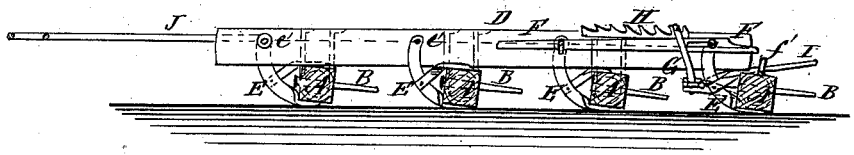
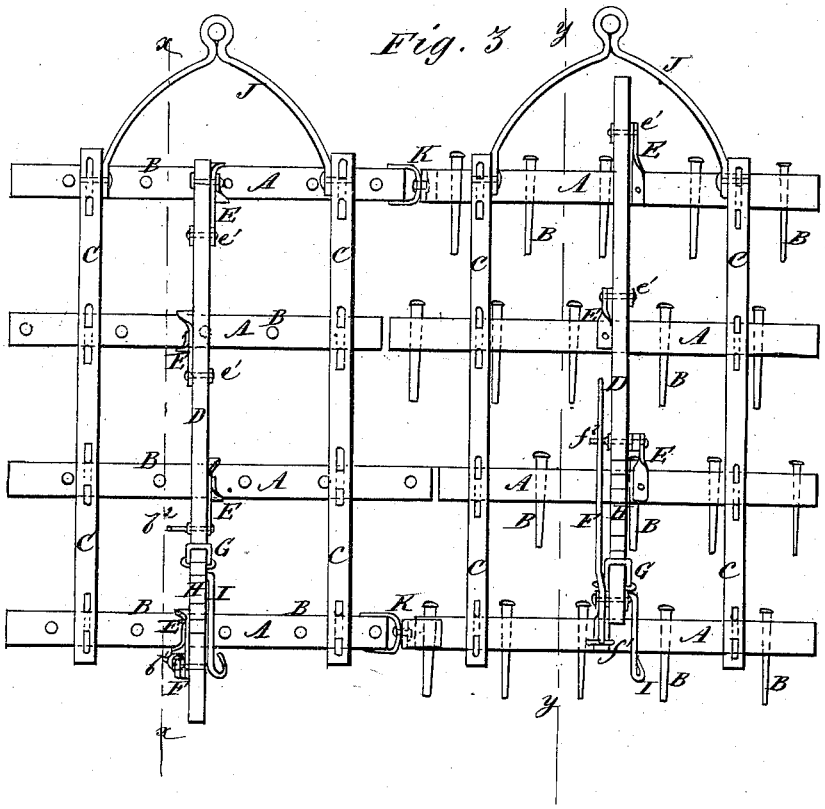


Fig. 3



WITNESSES:

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UNITED STATES PATENT OFFICE.

ANDREW H. BALLAGH, OF MACON CITY, MISSOURI.

IMPROVEMENT IN HARROWS.

Specification forming part of Letters Patent No. **199,012**, dated January 8, 1878; application filed May 21, 1877.

To all whom it may concern:

Be it known that I, ANDREW H. BALLAGH, of Macon City, in the county of Macon and State of Missouri, have invented a new and useful Improvement in Harrows, of which the following is a specification:

Figure 1 is a vertical longitudinal section of my improved harrow, taken through the line *x x*, Fig. 3, showing the teeth in a vertical position. Fig. 2 is a vertical longitudinal section of the same, taken through the line *y y*, Fig. 3, showing the teeth in a horizontal position. Fig. 3 is a top view of the same.

Similar letters of reference indicate corresponding parts.

The object of this invention is to furnish an improved harrow which may be readily adjusted to hold the teeth in any desired position from vertical to horizontal when at work, and which shall be simple in construction and convenient in use.

The invention will first be described in connection with the drawing, and then pointed out in the claim.

A are the cross-bars, to which the teeth B are attached, and which are placed parallel with each other, and work in staples or other bearings attached to the side longitudinal bars C. D is the central longitudinal bar, which is placed about midway between the bars C, and is connected with the tooth-bars A by the arms E. The lower ends of the arms E are forked, and are securely bolted to the tooth-bars A. The upper ends of the arms E are pivoted to the bar D by a detachable bolt, *e'*. By this construction, by moving the bar D forward and back, the bars A may be turned to hold the teeth B in any desired position from vertical to horizontal, all the said bars A being moved at the same time.

The bar D is moved by a lever, F, which is pivoted to the rear bolt *e'*, and its lower end is inserted in a socket, f^1, attached to the rear tooth-bar A. The lever F is slotted to receive the bolt *e'*, so that it may be withdrawn from the socket f^1, and laid in a horizontal position upon the hook f^2, attached to the side of the bar D, when desired.

The bar D is held in any position into which it may be adjusted by the U-pawl G, which is pivoted to the rear tooth-bar A, and engages with the ratchet-bar H, attached to the upper side of the rear part of the said bar D. To the pawl G is attached a rod, I, for convenience in raising the pawl G when it is desired to move the bar D forward to incline the teeth B to the rearward. When the bar D is moved in the other direction, the pawl G will slide over the teeth of the bar H without being raised.

To the ends of the bars C are attached the ends of the bail J, which has an eye formed in its center for the attachment of the draft.

The harrow may be formed of one, two, or more sections, such as hereinbefore described, as may be desired.

When two or more sections are used, the adjacent ends of two or more of the tooth-bars A have clevises K attached to them, which clevises are swiveled to each other at their bends, which serve as hinges to connect the sections, and at the same time allow the tooth-bars A of either section to be adjusted independently of the others.

In case it be desired to use less of a harrow, the bolts *e'* of the arms E of one or more of the tooth-bars A are detached, and the said tooth-bar is tied with its teeth in a horizontal position, leaving the other bars to do the work.

This construction allows the bars A to be turned to bring the teeth B into a horizontal position, and adapt the machine to be used as a clod-crusher.

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

The combination of two harrows having reciprocating bars D, bifurcated arms E, bars C C, and pivoted tooth-bars A, two or more of the latter being connected by two clevises, K, pivoted at their ends, and swiveled together at the middle, as and for the purpose specified.

ANDREW H. BALLAGH.

Witnesses:

HUMPHREY WATERMAN,
WILLIAM MCCULLOUGH.