W. McCRAY.

Combined Harrow and Cultivator.

No. 167,002. Patented Aug. 24, 1875.

Fig. 1.

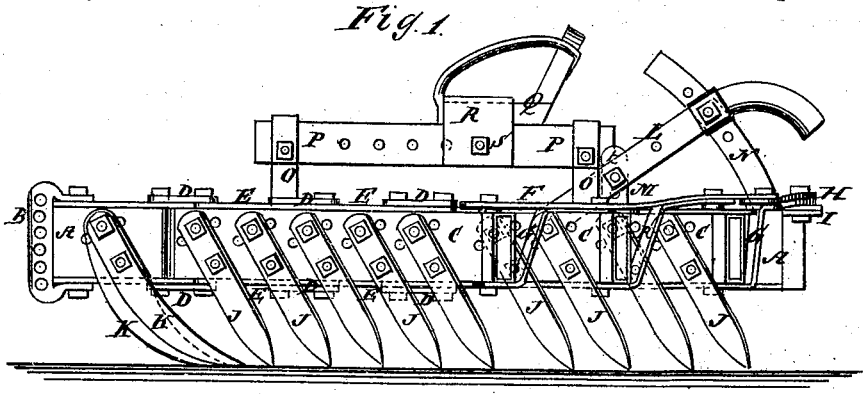


Fig. 2.

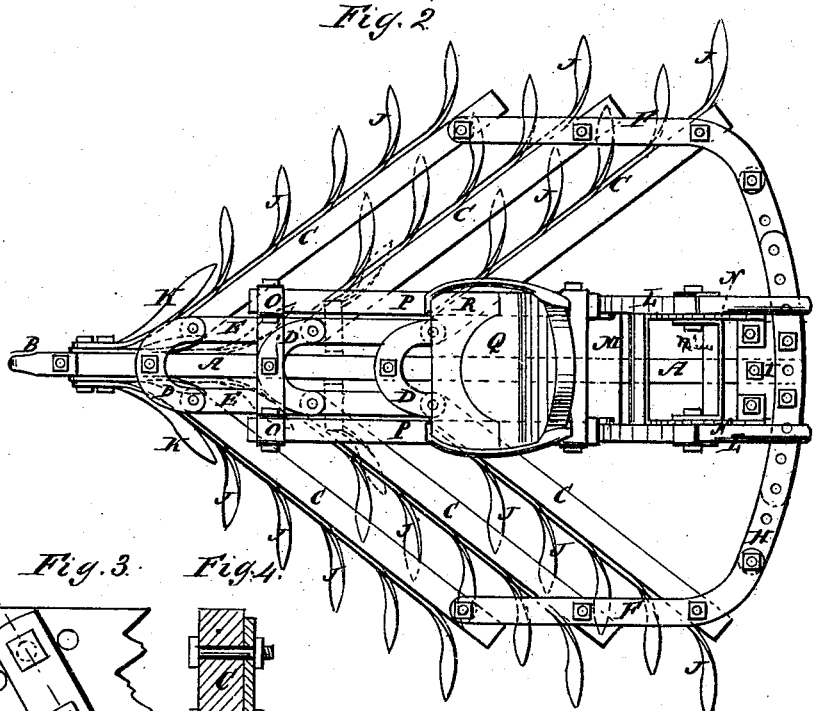


Fig. 3.

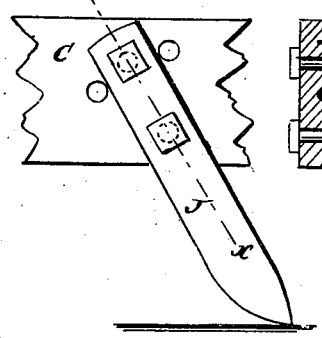


Fig. 4.

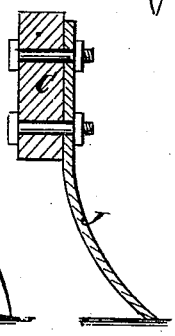
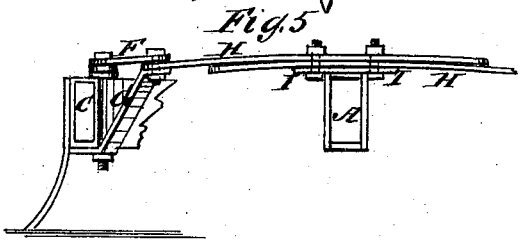


Fig. 5.



WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLIAM McCRAY, OF BLACK OAK, MISSOURI.

IMPROVEMENT IN COMBINED HARROWS AND CULTIVATORS.

Specification forming part of Letters Patent No. **167,002**, dated August 24, 1875; application filed June 5, 1875.

To all whom it may concern:

Be it known that I, WILLIAM McCRAY, of Black Oak, in the county of Caldwell and State of Missouri, have invented a new and useful Improvement in Combined Harrow and Cultivator, of which the following is a specification:

Figure 1 is a side view of my improved machine. Fig. 2 is a top view of the same. Fig. 3 is a detail side view of a part of one of the wings. Fig. 4 is a cross-section of the same, taken through the line *x x*, Fig. 3. Fig. 5 is a detail view of a part of the rear end of the machine.

Similar letters of reference indicate corresponding parts.

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

A is the main or central bar of the harrow, which is made wide and thin, is placed edgewise, and is faced upon its upper and lower edges to strengthen it and prevent wear. The forward ends of the facing-plates project a little, and are notched to receive the clevis B and hold it in place, the said clevis being secured by a vertical bolt passing through its ends and through the said bar A. Several holes are formed through the clevis-bar to receive the draft, so that the point of draft attachment may be adjusted higher or lower, as may be desired. C are the wings, two, three, or more of which are used upon each side of the central bar A. The forward ends of the bars or wings C are pivoted to and between the ends of the curved metallic straps D, which are secured to the upper and lower edges of the bar A by bolts. The forward ends of the bars or wings C are connected and held in proper relative position by bars E, to which they are secured by the same bolts that secure the said wings to the straps D. The rear ends of the bars or wings C are connected and held in proper relative position by bars F, secured to their upper sides. The connection between the ends of the wings C and the connecting-bars F is strengthened by the braces G, the lower ends of which are secured to the lower side of the ends of said wings by the bolts that secure the bars F. The braces G incline upward to the bars F, extend back along the under side of the said bars F, and are secured by the bolts that secure the said bars F to the next wing C. The rear ends of the bars F are curved inward, and are bolted to the upper ends of the rear braces G. To and between the rear ends of the bars F and the rear braces G are secured the outer ends of the two bars H, the inner ends of which overlap each other, and are bolted to a plate, I, bolted to the upper side of the rear end of the central bar A. Several holes are formed in the bars H to receive the bolts by which they are secured to the plate I, so that the wings C may be expanded or contracted to make a wider or narrower cut, as may be desired, the bars E F keeping the wings or bars C upon each side always parallel with each other. J are the wing-teeth, which are curved outward and rearward, and are made thin upon their forward edge. The upper parts or shanks of the teeth J have two holes formed through them to receive the bolts by which they are secured to the wings C. A single hole is formed in the wings C for each lower bolt, and two, three, or more holes for each upper bolt, said holes being formed upon the arc of a circle having its center in the axis of the lower bolt, so that the said teeth may be set erect, or may be inclined to the rearward more or less, as may be desired. To the forward part of the central bar A, between its forward end and the inner ends of the forward wings, are secured four teeth, K, two upon each side, by two bolts. The outer teeth K are curved outward more than the inner teeth K, so that the four teeth K may divide the space between the inner teeth of the wings C evenly.

When the machine is to be used for cultivating both sides of a row of plants, all the teeth attached to the bar A may be removed, or only the inner ones of said teeth, according to the width of the space desired to be left.

L are the handles, the forward ends of which are bolted to the turned-up ends of a plate, M, bolted to the bar A, or to short arms attached to said plate. The rear parts of the handles L are bolted to the U-bar N, the ends of which are bolted to the plate I attached to the rear end of the bar A. The U-bar N may be strengthened by a cross bar or brace, *n'*. Several holes are formed in the handles L, in

the lugs or arms of the plate M, and in the U-bar N, so that the said handles L may be adjusted as required. To the plate M, and to the forward part of the bar A, are bolted the bends of two U-bars, O, to the arms of which are bolted two longitudinal bars, P, to support the seat Q. To the seat Q is attached a U-plate, R, the arms of which project downward at the sides of the bars P, and are secured to said bars by a long bolt, S. Several holes are formed in the bars P to receive the seat-bolt, so that the said seat may be adjusted by moving the said bolt from one to the other of said holes.

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

1. The combination of the central bar A, the side bars or wings C, the pivoted connecting-bars D E F, and the adjustable connecting-bars H, with each other, to form the frame-work of the machine, substantially as herein shown and described.

2. The teeth J, constructed as described, and secured adjustably to the wings C, substantially as herein shown and set forth.

WILLIAM McCRAY.

Witnesses:

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LEWIS B. CLENING.