D. W. BAIRD.

HARROW.

No. 187,447. Patented Feb. 13, 1877.

Fig. 1.

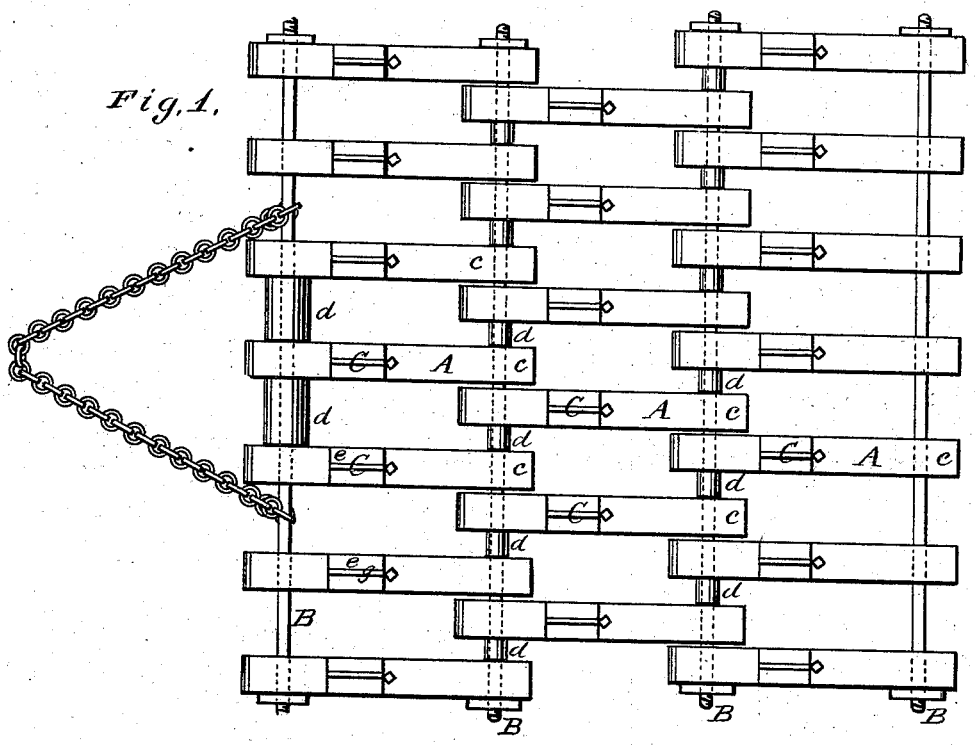


Fig 2

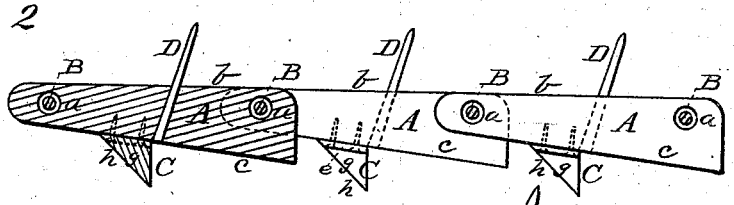


Fig. 3.

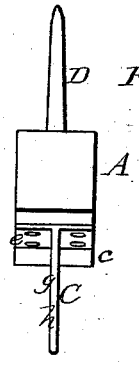
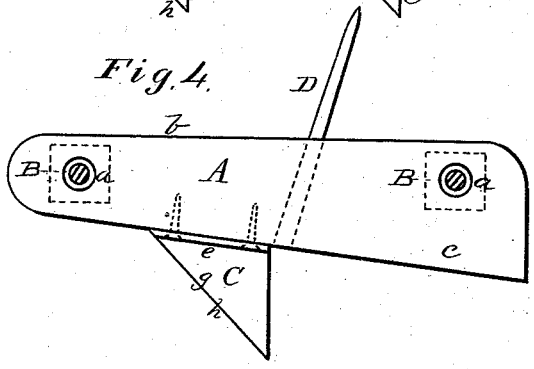


Fig. 4.



WITNESSES

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DANIEL W. BAIRD, OF LEBANON, TENNESSEE.

IMPROVEMENT IN HARROWS.

Specification forming part of Letters Patent No. **187,447**, dated February 13, 1877; application filed September 16, 1876.

To all whom it may concern:

Be it known that I, DANIEL W. BAIRD, of Lebanon, in the county of Wilson and State of Tennessee, 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 bottom view of this invention. Fig. 2 is a longitudinal section of the same. Fig. 3 is a front view, and Fig. 4 a side view, of one of the block-sections.

The object of this invention is to provide a strong and durable flexible harrow, which will also serve as an efficient clod-crusher; and it consists mainly in the construction and novel arrangement of the tapering block-sections, and in connection therewith of the cutting-teeth and tearing-teeth respectively projecting from opposite edges of said blocks, as hereinafter fully shown and described.

In the accompanying drawings, the letter A designates the block-sections, which form, when connected together, the body of the harrow. These sections or blocks are made of hard and durable wood, and, as I usually construct them, are about nineteen inches long. The forward end of each block may be about three inches wide and deep, while the rear end, although of the same width, is deeper, being for this length of block, about five inches deep. Near each end, holes *a*, about two and a quarter inches in diameter, are bored through from side to side, having their centers in a line parallel with the upper surface or edge *b* of the block, so that when the sections are connected together by the iron rods B passing through the holes *a* in said sections, the extra depth *c* of the rear end of each section will project downward, forming a sloping crusher, which will drag over the ground at the proper angle to crush and grind the clods after they have been divided by the cutting-teeth C. These teeth are formed of tough cast-iron, having each a base, *e*, two inches wide and six inches long, from the central line of which the cutter *g* projects, having its forward edge *h* sloping backward. The cutting-tooth is secured to the under side of each section by means of screws at the front end of said section, the rear of the cutter reaching nearly to the middle of the block. The form of the cutting-blade is that of an angular vertical plate, having the point downward and the sloping edge forward.

A little in rear of the middle of each block I design to secure a tearing-tooth, D. This tooth may be of the ordinary form as used in rigid harrows, but should be shorter. It may be driven through the block from the under side, or be otherwise secured thereto, and it should slant backward at an angle of fifteen or twenty degrees, or the harrow will not run steadily and will fail to clean itself.

To form the harrow the block-sections are connected together by means of iron rods of about one inch in diameter. These rods are sufficiently smaller than the holes *a* of the blocks to allow easy play. The rods are about five feet long, and the sections are placed thereon at any required distance apart, being separated by means of sleeves or washers *d* of either wood or metal, which should be so arranged that no two teeth shall follow the same line. In order to prevent the sections from slipping off the rods a nut or key-pin should be connected therewith at each end. The sections are arranged in three rows usually, those of each row being arranged alternately with those of the next row, as indicated in the drawings. In this manner a five-foot harrow may be readily constructed, which will be heavy enough for ordinary soil. If more weight is required, the dimensions of the blocks may be increased, or more of them may be added.

I do not desire to be confined to the exact dimensions of parts, or the precise construction herein stated. The cutting-teeth are turned down when the harrow is employed as a clod-crusher, and when it is used as a tearing-harrow the spike-teeth are turned down, the sections being reversed, and having their level sides *b* downward. Sometimes it may be advisable to turn the sections of one row with the tearing-teeth downward, leaving the other row or rows with the cutting-teeth downward, thus forming a composite crush-

ing and tearing harrow. Between the chain branches in the first row the block-sections may be separated by long washers to prevent jamming in turning.

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

1. A flexible harrow, consisting of the block-sections A, having their under sides sloping downward from front to rear, the connecting-rods B on the same level, the washers *d*, and the front cutting-teeth C, substantially as specified.

2. The tapering block-sections A for a flexible harrow, having the front angular cutter-tooth C and the drooping rear extension *c*, substantially as specified.

3. The combination, with connecting-rods and separating washers, of the section-blocks A, level on one side and sloping on the other, and carrying the tearing-teeth on the level side, and the cutting-teeth on the sloping side, forming a reversible duplex clod-crusher or tearing-harrow, substantially as specified.

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

DANIEL WEBSTER BAIRD.

Witnesses:
J. C. COOK,
J. C. TAYLOR.