

A. FRIEDEMANN.  
HARROW.

No. 111,445.

Patented Jan. 31, 1871.

Fig. 1.

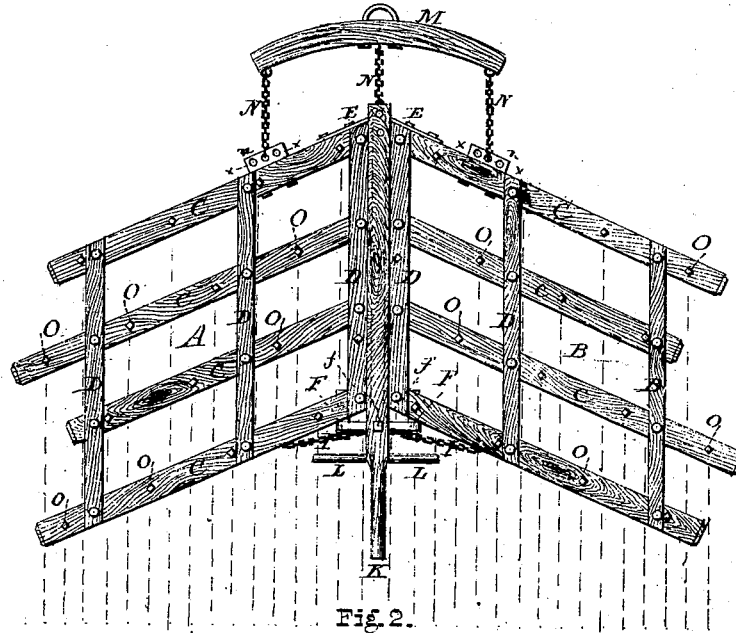


Fig. 2.

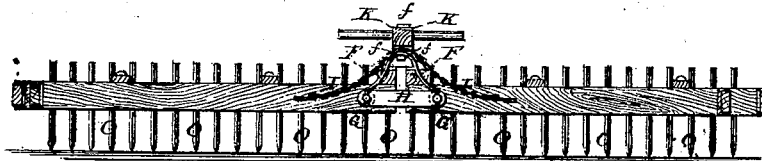


Fig. 3.

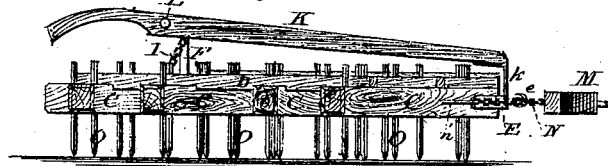
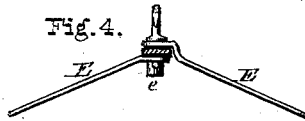


Fig. 4.



Witnesses.

*Richard M. ...*  
*Chas. ...*

A. E. L.

Inventor.

*August Friedemann*  
*by ...*  
Atty.

# United States Patent Office.

AUGUST FRIEDEMANN OF WAVERLY, IOWA.

Letters Patent No. 111,445, dated January 31, 1871.

## IMPROVEMENT IN HARROWS.

The Schedule referred to in these Letters Patent and making part of the same.

*To all whom it may concern:*

Be it known that I, AUGUST FRIEDEMANN, of Waverly, in the county of Bremer and in the State of Iowa, have invented certain new and useful Improvements in Harrows; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 is a plan view of the upper side of my harrow; and

Figures 2 and 3 are a rear and side elevation, respectively, of the same.

Letters of like name and kind refer to like parts in each of the figures.

My invention is an improvement upon a similar device for which Letters Patent No. 106,046 were granted to me on the 2d day of August, 1870; and

It consists principally in the employment of a lever for lifting the rear end of the harrow or of either section, as may be desired, substantially as is hereinafter shown.

It further consists in the construction of the sections and the arrangement therein of the teeth, substantially as is hereinafter shown, and for the purpose set forth.

In the annexed drawing—

A and B represent the sections of the harrow, each composed of four bars, C, arranged parallel with and equidistant from each other, and secured together by means of three cross-bars, D, placed near the center and at the ends of said bars C, and having a relative angle therewith of about thirty degrees.

As seen in fig. 1, the bars C of each section have different lengths, and while arranged so that their inner ends are in a line with each other their outer ends project unequally, both with relation to each other and to the corresponding bars of the opposite section.

The front ends of the sections are connected together by means of an ordinary strap-hinge, one leaf of which, E, being attached to the forward face of the front bar C of each section, while the rear ends of said section are connected by means of an arched strap, F, pivoted at its ends to or upon two studs, G, which are secured to and project rearward from the inner ends of the rear bars C.

A second strap, H, having a straight form, is placed over the studs G outside of the strap F, and the whole secured in place by means of suitable pins passing downward through the ends of said studs.

The strap F has the form of a pointed arch, to or within the apex of which is secured a stud, f, having attached thereto two short chains, I, that from thence extend outward in either direction, and have their opposite ends connected to the rear bar C of each section, the length of said chains being such as to permit the arched clamp to move to either side only so far as may be necessary in order to enable the harrow to conform to the undulations of the ground.

Attached to the upper end of the stud f is a lever, K, the front end of which is pivoted upon the pin e, of the hinge E, by means of a metal plate, k, attached to and extending vertically downward from the end of said lever, while the opposite end of said lever projects beyond the rear end of the harrow, and forms a handle, by means of which the rear end of said harrow may be readily raised in order to clear it from obstructions.

A cross-bar, L, passing horizontally through and at a right angle with the lever, furnishes a means whereby the outer end of either section may be raised at will in order to enable it to pass over or to clear it from obstructions.

The front end of the harrow is attached to a draw-bar, M, by means of three chains, N, one of which extends from the hinge E to the center of said bar, while the others are connected to its outer ends and to two plates, n, secured to and projecting forward from the front bars C, and each provided with a series of holes, x, for receiving the hooks upon the ends of said chains, said devices being constructed and arranged substantially the same as in my former patent, with the exception of the draw-bar, which, instead of being straight, is curved to the rear, as seen in fig. 1.

The advantage of the curved form of the draw-bar is that it prevents the double-tree from striking against the same, and thereby renders the movement of the horses and harrow more independent and easy.

It will be seen that the teeth O are so arranged within the bars as to divide the space equally between the outer sides of the harrow, while at the same time said teeth do not come in a line with each other, either transversely or in a line with the draft. The especial advantage of this arrangement arises from the fact that the contiguous teeth are placed at a greater distance apart transversely than in ordinary harrows, and, consequently, afford less obstruction to the passage of stones or sticks.

Having thus fully set forth the nature and merits of my invention,

What I claim as new is—

1. The levers K and L, when pivoted to or upon the harrow, substantially as and for the purpose shown.

2. The sections A and B, composed of the alternately long and short bars C, containing the teeth O, and connected together by means of the cross-bars D, all arranged substantially as and for the purpose specified.

In testimony that I claim the foregoing I have hereunto set my hand this 28th day of October, 1870.

AUGUST FRIEDEMANN.

Witnesses:

H. S. BURR,

H. S. HOOVER.