

(No Model.)

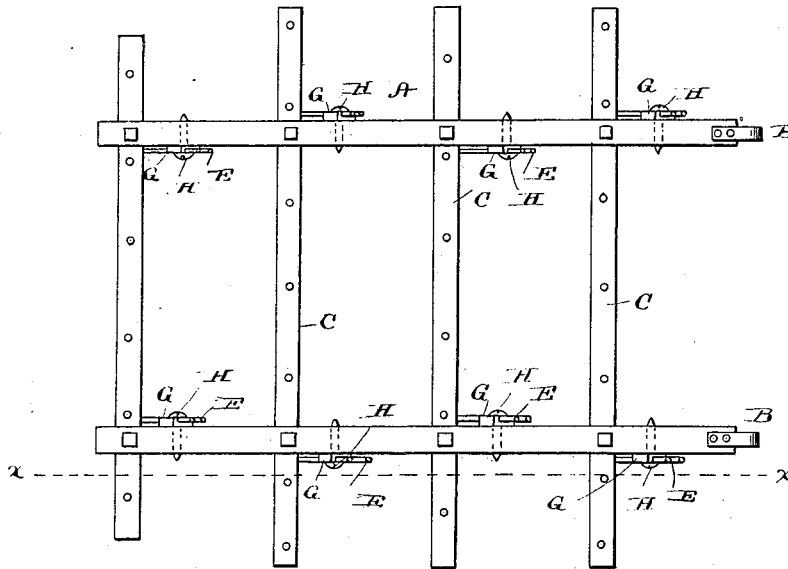
H. S. HOWARD.

HARROW.

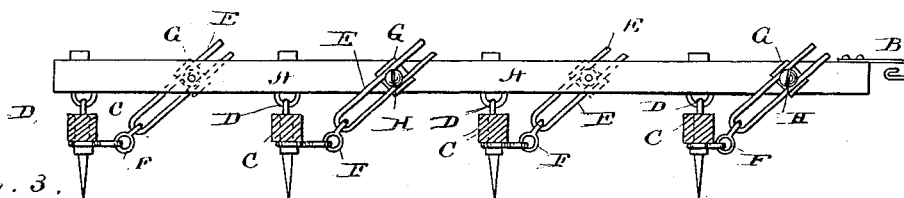
No. 263,520.

Patented Aug. 29, 1882.

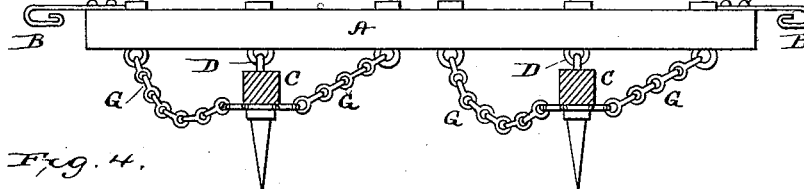
*Fig. 1.*



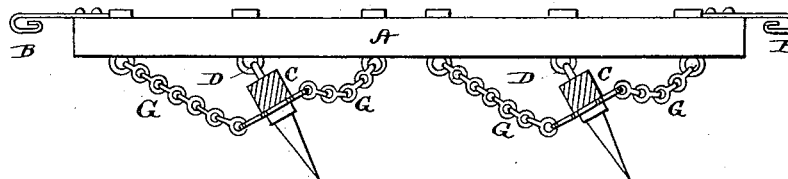
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



Witnesses,

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# UNITED STATES PATENT OFFICE.

HARLAN S. HOWARD, OF CHARLES CITY, IOWA.

## HARROW.

SPECIFICATION forming part of Letters Patent No. 263,520, dated August 29, 1882.

Application filed May 4, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, HARLAN SMITH HOWARD, of Charles City, in the county of Floyd, and in the State of Iowa, have invented certain new and useful Improvements in Adjustable Harrows; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

This invention relates to certain improvements in harrows, and it is designed to render the tooth-bars adjustable in one or both directions at any angle to the draw-bars, so as to present the teeth more or less obliquely to the surface of the field, as more fully hereinafter specified. These objects I attain by the apparatus and devices illustrated in the accompanying drawings, in which—

Figure 1 represents a top view of my improved harrow; Fig. 2, a longitudinal vertical section of the same, and Figs. 3 and 4 longitudinal sectional views of modifications of my invention.

The letter A indicates the draw-bars, which are provided at their ends with hooks B, by means of which the harrow may be attached to the harness of the draft-animal.

The letter C indicates the tooth-bars, which are connected to the draw-bars by means of eyebolts D or other loose connections, so that the tooth-bars may swing freely on the draw-bars. As shown in Figs. 1 and 2 of the drawings, the tooth-bars are also connected to the draw-bars by means of the inclined links E and short chains, the links being adjustably secured to the draw-bars by means of the

guides G and screws H, by means of which the bars may be retained at any angle with respect to the draw-bars. The links and their adjustable connections may be all arranged on one side of each draw-bar, but are preferably arranged alternately on opposite sides, as represented, by which the parts are more firmly held together and to their proper positions.

In the modifications shown in Figs. 3 and 4 of the drawings, the links E are dispensed with and the tooth-bars are connected to the draw-bars by means of chains G, the harrow being provided at each end with hooks B, so arranged that the teeth will assume any desired angle automatically when drawn forward or reversed.

As thus constructed, it is evident that the tooth-bars may be arranged so that they may be presented at any desired angle to the draw-bars in either direction with little inconvenience or delay.

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

The combination, with the draw-heads A, of the tooth-bars C, loosely attached thereto, and the open links E and clamping devices G, whereby the tooth-bars may be adjusted substantially as specified.

In testimony whereof I affix my signature, in presence of two witnesses, this 21st day of March, 1882.

HARLAN SMITH HOWARD.

Witnesses:

RACHEL ARAMINTA HOWARD,  
WASHINGTON PERRY HOWARD.