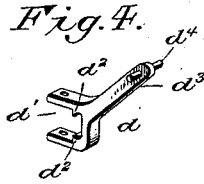


(No Model.)

H. L. MACK.  
HARROW.

No. 421,739.

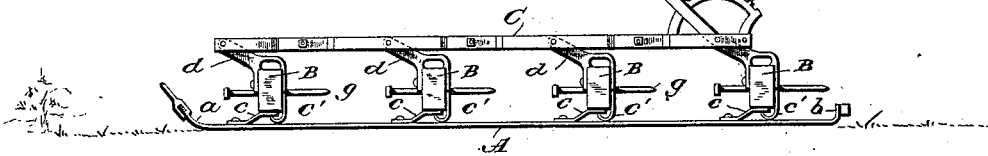
Patented Feb. 18, 1890.



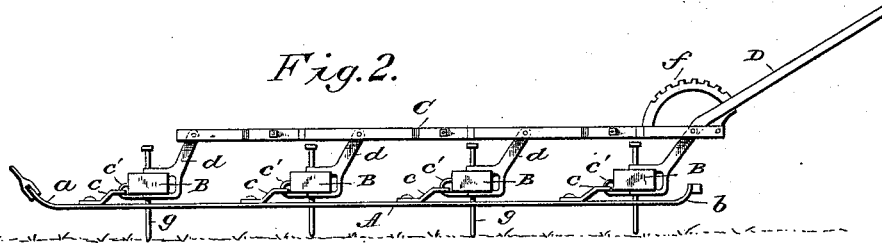
*Fig. 5.*



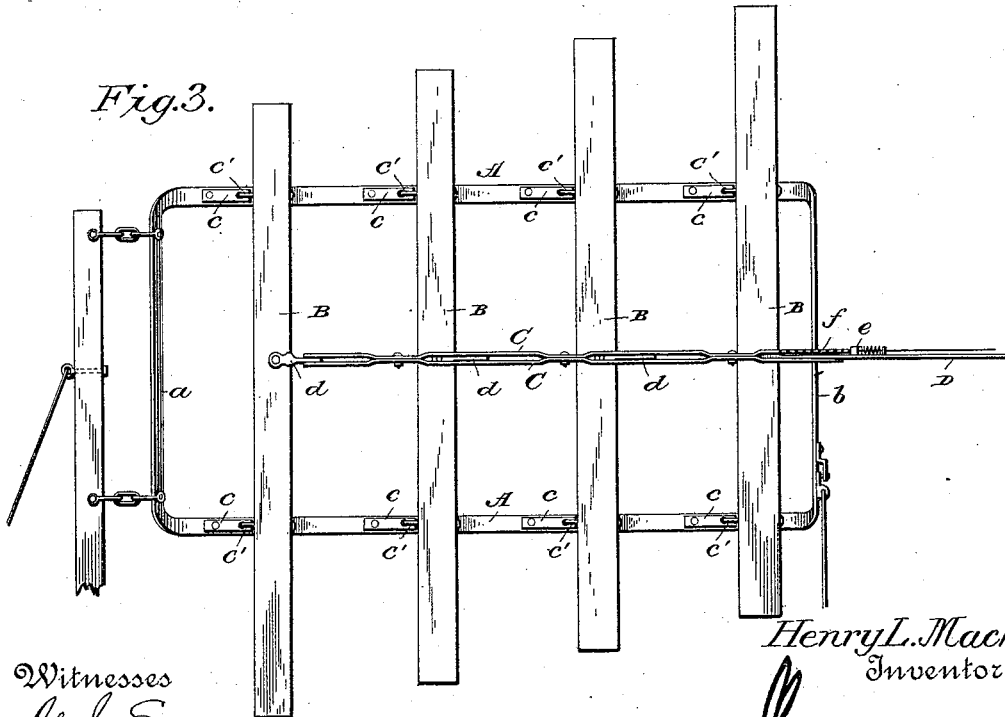
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



Witnesses

*G. S. Elliott,*  
*W. Johnson*

*Henry L. Mack.*  
Inventor

By his Attorney

# UNITED STATES PATENT OFFICE.

HENRY L. MACK, OF ELLENSBURG, WASHINGTON.

## HARROW.

SPECIFICATION forming part of Letters Patent No. 421,739, dated February 18, 1890.

Application filed November 14, 1889. Serial No. 330,301. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY L. MACK, a citizen of the United States of America, residing at Ellensburg, in the county of Kittitas and State of Washington, have invented certain new and useful Improvements in Harrows; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention has reference to harrows; and it consists in the improved construction hereinafter described and set forth, whereby the general character of the harrow is simplified and its teeth so adjusted that their operating parts may be readily moved to completely throw the tooth-bars into an inoperative position.

In the accompanying drawings, forming part of this specification, Figure 1 is a side view of a harrow-section, showing the parts adjusted to maintain the teeth in an inoperative position. Fig. 2 is a like view showing the teeth in an operative position. Fig. 3 is a plan view of said improved harrow, and Figs. 4 and 5 are detail views.

As represented, the harrow consists of two similar sections connected and operating together, as will be well understood. Each section has a main or supporting frame A, consisting of a metallic bar bent in substantially rectangular form, as shown in Fig. 3. The front and rear portions *a b* of this frame are curved upward, so that the side portions will approximate runners. Each of the side portions has secured upon its upper side and at equidistant points brackets *c*, consisting of a casting bent to form a horizontal portion bolted to the frame and a second horizontal portion in a different plane perforated for the passage of the eye *c'* of a casting having a bent body to enable it to be secured to a transverse horizontal tooth-bar B near one end thereof. There are of course a number of the tooth-bars B arranged in transverse series, and each bar has centrally secured

thereto a casting *d*, of the peculiar shape shown in Fig. 4, and consisting of a bifurcated portion *d'*, of two parallel parts adapted to embrace the beam, as shown most clearly in Fig. 1, to which they are bolted, the inner face of each part being provided with a spur *d''*, which rests upon the corners of the beam and serves to more effectually hold it in engagement with the casting. The remaining portion of the casting consists of an extension *d'''*, provided with laterally-projecting pins *d''''* on each side to pivotally engage perforations therefor in parallel flat metallic bars C C, which are separated and bear against each other at intervals, as shown in Fig. 3, in order that they may receive the ends of the castings and at the same time be bolted to each other.

A lever D is connected to the rear end of the bars C C and has a spring-pawl *e*, adapted to engage one of a series of notches in a segment *f*, secured to the bars adjacent to the front end thereof. A series of harrow-teeth *g* pass through the bars B.

In practice, when the teeth are to be thrown to an inoperative position, the lever is thrown forward, as represented in Fig. 1, which movement will cause it to rearwardly move the bars C C and, through the medium of their connections with the bars B B, turn them one-quarter, so that the teeth are changed from a vertical to a horizontal position and be above the horizontal plane of the supporting-frame. When in such position, the supporting-frame rests entirely upon the ground, and will by reason of its configuration serve as a runner for the harrow.

An important distinction of my improvement on other forms of bars B consists in the fact that the bars, while being connected and operated in series, have a limited play or movement, so that they are not strained, as might be the case were they to turn in rigid end bearings or sockets.

I claim—

1. The combination, in a harrow, of a main frame having projections on its upper side, bars pivotally engaging said projections and provided with harrow-teeth, together with a connecting medium consisting of parallel

bars alternately spread and bolted together,  
as described, an operating-lever, locking pawl  
and ratchet, and castings *d*, having extensions  
pivottally secured between the spread portions  
5 of the connecting medium, substantially as set  
forth.

2. The combination, in a harrow, of a sup-  
porting-frame and pivoted bars thereon, and  
castings *d*, having bifurcated portionsspurred,

as described, and connecting-bars and lever, 10  
substantially as set forth.

In testimony whereof I affix my signature in  
presence of two witnesses.

HENRY L. MACK.

Witnesses:

GEO. J. SMITH,

W. R. NEWLAND.