

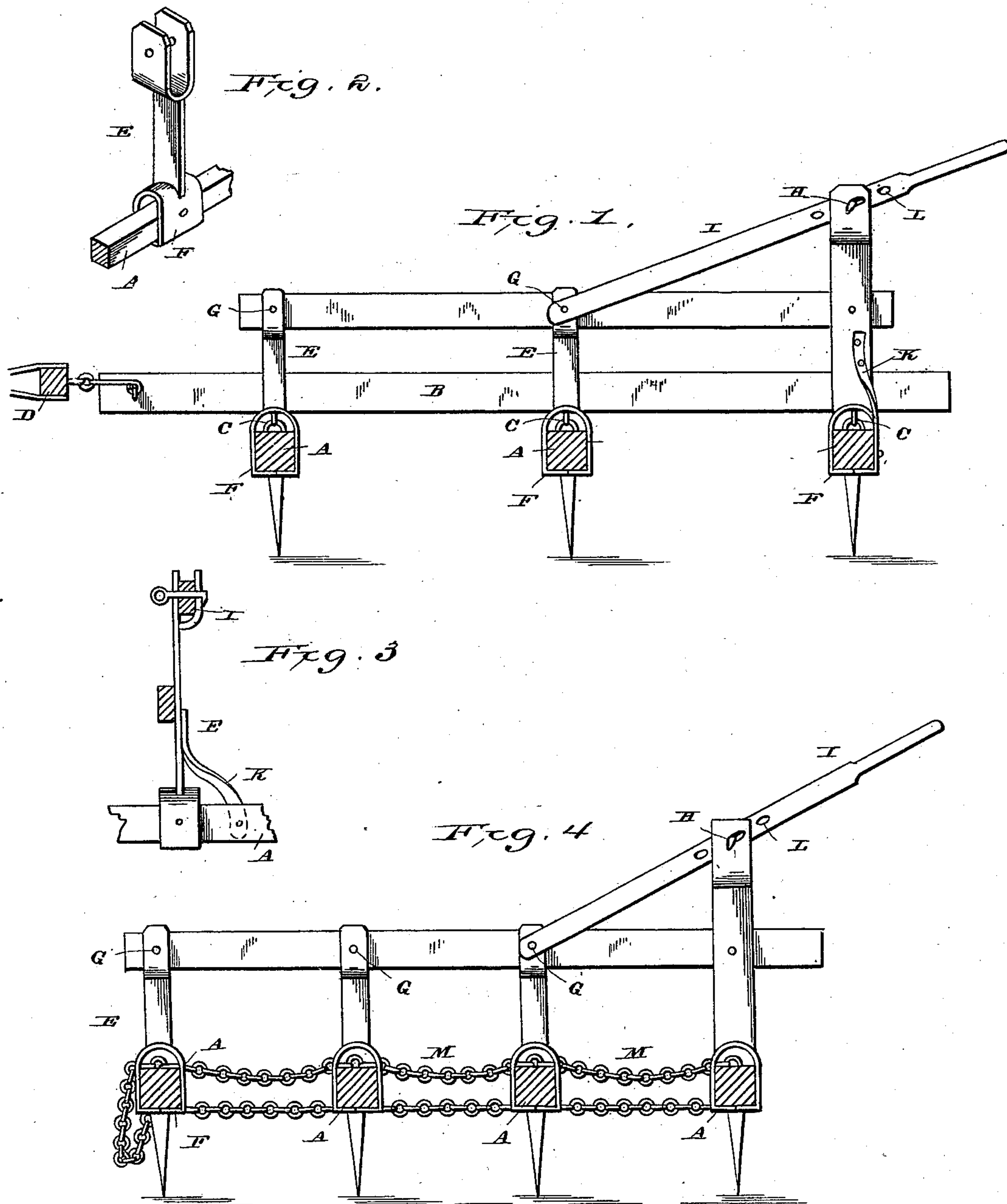
(No Model.)

H. S. HOWARD.

HARROW.

No. 273,535.

Patented Mar. 6, 1883.



Witnesses:  
Edmund L. Yerrice,  
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# UNITED STATES PATENT OFFICE.

HARLAN S. HOWARD, OF CHARLES CITY, IOWA.

## HARROW.

SPECIFICATION forming part of Letters Patent No. 273,535, dated March 6, 1883.

Application filed October 26, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, HARLAN S. HOWARD, of Charles City, in the county of Floyd, and in the State of Iowa, have invented certain new and useful Improvements in 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 has for its objects to provide certain improved means whereby the tooth-bars may be adjusted and held in any desired position, as more fully hereinafter specified. These objects I attain by the means illustrated in the accompanying drawings, in which—

Figure 1 represents a longitudinal vertical section of my improved harrow; Fig. 2, a detached view of one of the connections by means of which the tooth-bars are secured to the shifting-bar, by means of which the said tooth-bars may be adjusted. Fig. 3 represents a detached view, showing the rear tooth-bar connection and the means of applying the same; and Fig. 4 represents a longitudinal sectional view of a modification of my invention.

The letter A indicates the tooth-bars of the harrow, which are loosely connected to the cross-bars B, as shown in Fig. 1, by means of eyebolts C, or in any other convenient manner. The bars D, at their forward ends, are provided with hooks, by means of which they may be attached to the draft-bar.

The letter E indicates a series of metallic connections provided at their lower ends with stirrups or sleeves, F, through which the tooth-bars pass, and which are secured to the tooth-bars in any convenient manner. The upper ends of said connections are bifurcated, and between the branches is located a shifting-bar, which is pivoted to the connection by means of the pins G. The connection of the rear tooth-bar is extended above the shifting-bar, but is secured to it by means of a pin. The upper end is bifurcated, like the others, but has pivoted between its upper ends a lever, 1, one end of which is secured to the shifting-bar, the other terminating in a suitable handle at the rear. The lower part of the last-

mentioned connection is braced to the tooth-bar by means of a metallic arm, K. The lever is provided with a series of apertures, L, through which the pivot-pin H may be passed. When passed through the central aperture the shifting-bar is held in such position as to keep the teeth in a vertical position, and when passed through the apertures at either side of the central aperture it will hold the teeth at an angle, inclining forward or to the rear, as may be desired.

In the modification shown in Fig. 4 of the drawings the bars B are dispensed with and the chains M substituted for the same. The chains are particularly useful when an extremely flexible harrow is required to adapt the parts to yield properly in traveling over rough or stony ground.

I am aware that harrows have heretofore been constructed with teeth capable of being adjusted at varying angles to the ground, and that they have been provided with levers for effecting such adjustment and with devices for retaining the levers at different fixed points, and for this reason I do not lay broad claim to such features.

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

1. The combination, in a harrow, of the tooth and connecting bars or chains, the uprights having sleeves which embrace the tooth-bars, and bifurcations which receive the shifting-bar, with the rear upright and combined lever and handle, and the apertures and retaining-pin, substantially as shown and described.

2. In a harrow, the combination, with a rear tooth-bar, of the upright provided at its lower end with a sleeve which embraces said tooth-bar and a brace for imparting lateral rigidity, and at its upper end with a bifurcation and apertures for receiving and retaining the adjusting lever and handle, substantially as shown and described.

In testimony whereof I affix my signature, in presence of two witnesses, this 12th day of September, 1882.

HARLAN SMITH HOWARD.

Witnesses:

W. H. MERRIMAN,  
W. H. DAVIS.