(No Model.)

C. L. POWELL.

HARROW.

No. 409,233. Patented Aug. 20, 1889.

Fig. 1.

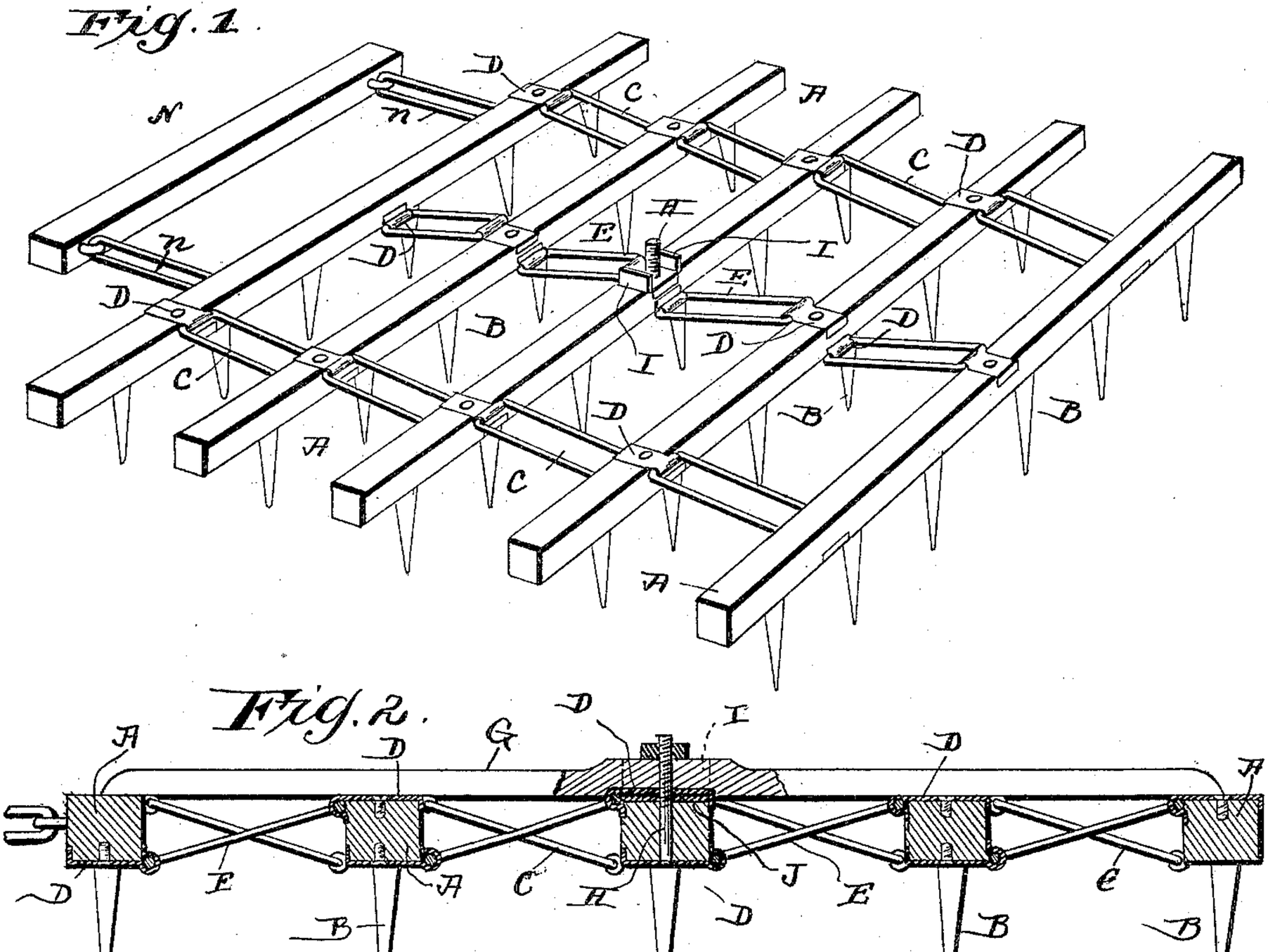


Fig. 2.

Fig. 3.

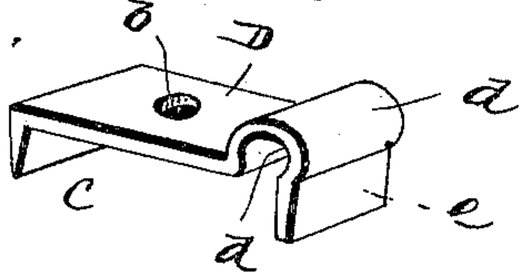
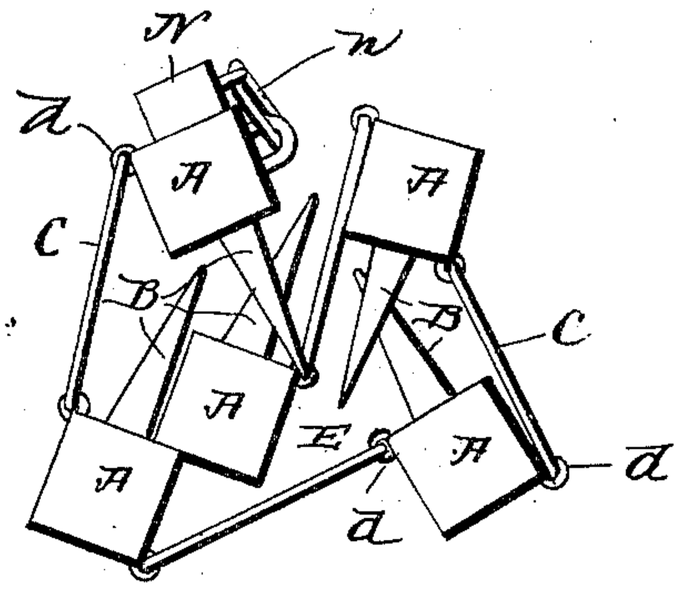


Fig. 4.



Witnesses

Wm. Bagger

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UNITED STATES PATENT OFFICE.

COLUMBUS LAFAYETTE POWELL, OF CENTRE TOWN, MISSOURI.

HARROW.

SPECIFICATION forming part of Letters Patent No. 409,233, dated August 20, 1889.

Application filed March 8, 1889. Serial No. 302,472. (No model.)

To all whom it may concern:

Be it known that I, COLUMBUS LAFAYETTE POWELL, a citizen of the United States, residing at Centre Town, in the county of Cole and State of Missouri, have invented new and useful Improvements in Harrows, of which the following is a specification.

This invention relates to harrows; and it has for its object to provide a device of this class in which the teeth may be kept either in a straight vertical or in an inclined or tilted position, and in which the toothed bars may be allowed to oscillate or vibrate freely, or may be so connected as to form a stiff and rigid frame.

The invention consists in the improved construction and arrangement of parts, which will be hereinafter fully described with reference to the drawings, in which—

Figure 1 is a perspective view of my improved harrow. Fig. 2 is a longitudinal sectional view showing the stiffening-bar attached thereto. Fig. 3 is a detail view of one of the plates by which the connecting-links are attached to the toothed bars. Fig. 4 is a view showing the harrow rolled up for transportation.

The same letters refer to the same parts in all the figures.

The frame of my improved harrow is composed of a series of bars A A, to which the teeth B B are attached in any suitable manner. The upper side of each of the bars A is provided near its ends with links C C, hinged thereto by means of plates D, which will be presently more fully described, said links extending rearwardly and connected by means of similar plates D to the lower front edge of the next succeeding bar A. Centrally to the upper front edge of each bar A is similarly hinged a link E, which extends forwardly to the lower rear edge of the bar A next in front, where it is attached by means of one of the hinge-plates D. The said hinge-plates consists each of a flat plate or casting *a*, having a central perforation *b* to receive a bolt, by means of which it may be attached to the bar. At one end the said plate is provided with a flange *c*, and at the opposite end it has formed a bearing *d*, into which one of the connecting-links may easily be slipped, and the edge of which is provided with a flange *e*. The flanges *c* and *e* are adapted to fit over the sides of the bars A, which latter are approximately squared in cross-section, and they serve to retain the plate or link fastening device securely in position when the said plates are attached to the bars A by means of suitable fastening-bolts. It will be seen that by this method of connecting the bars of the harrow-frame the said bars will be permitted to vibrate or oscillate freely, while at the same time the teeth are maintained in an approximately-vertical position. When it shall be desired to convert the harrow-frame into a stiff or rigid one, this may be accomplished by attaching to the central bar of the harrow-frame a longitudinal stiffening-bar G. The central harrow-bar A is provided for this purpose with an upwardly-extending bolt H, at the sides of which are a pair of flanges I J, formed upon a plate J, placed upon the bolt H, which latter may also be used for securing the link-fastening plates D D at this point. The longitudinal stiffening-bar, which is provided with a bolt hole or perforation K, is adjusted upon the bolt H between the flanges I I, and secured in position by means of a notch L, thus serving to prevent the harrow-bars from vibrating or from yielding in an upward direction. When it is desired to convert the harrow-frame from a rigid into a yielding one, this may be accomplished in a moment's time by removing the stiffening-bar.

The draft is attached to a draft-bar N, which is connected to the front bar A of the harrow-frame by means of links N N, or the harrow may be used as a diamond harrow by attaching the draft to one of the corners thereof.

The operation and advantages of this improved harrow will be readily understood from the foregoing description, taken in connection with the annexed drawings.

When used without the stiffening-bar, it will vibrate or adjust itself to suit all parts of the ground; it will never get clogged or choked, inasmuch as the teeth will always tilt or vibrate, so as to clear themselves of any obstructions; it may be changed in a moment's time from a flexible into a stiff harrow by adjusting the longitudinal stiffening-

bar; the teeth will not hang on ruts or other obstructions, but will readily tilt so as to pass over the same; it will harrow young corn without tearing it up by the roots, leaving it standing upright and in good condition, and it may be easily rolled up for transportation, as shown in Fig. 5 of the drawings, with the points of all the teeth turned inward, so that it may be easily and conveniently handled. The plates forming the hinges, whereby the connecting-links are attached to the frame-bars, are simple in construction and add materially to the strength and durability of the harrow.

Having thus described my invention, I claim—

The combination, with a harrow-frame composed of a series of flexibly-connected toothed bars, of a bolt secured centrally to and extending upwardly from one of the bars, a flanged plate mounted upon the said bolt, and a longitudinal stiffening-bar adapted to be secured detachably thereto, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

COLUMBUS LAFAYETTE POWELL.

Witnesses:
WM. F. POWELL,
JOHN POPE.