

(No Model.)

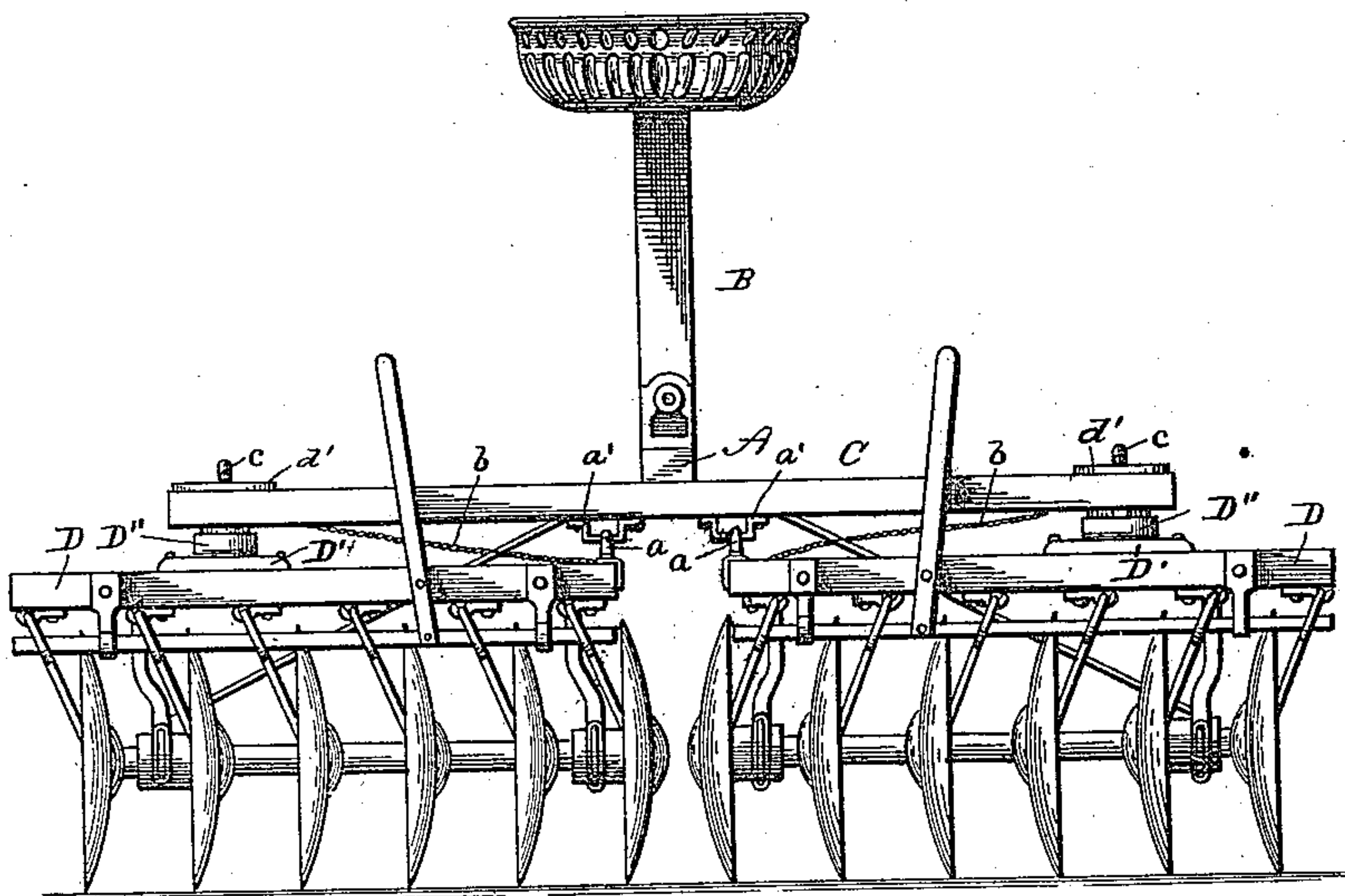
2 Sheets—Sheet 1.

E. C. BOYER.  
DISK HARROW.

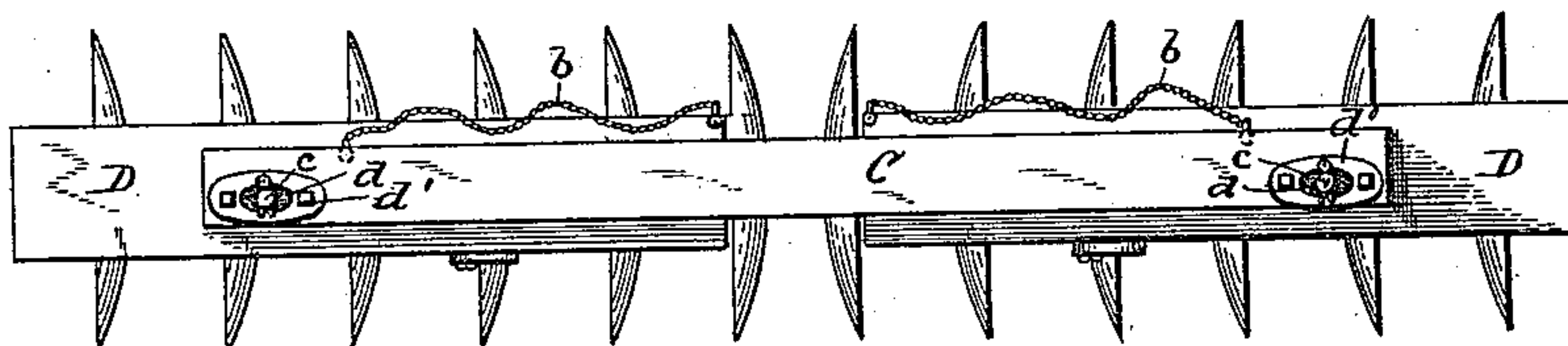
No. 441,054.

Patented Nov. 18, 1890.

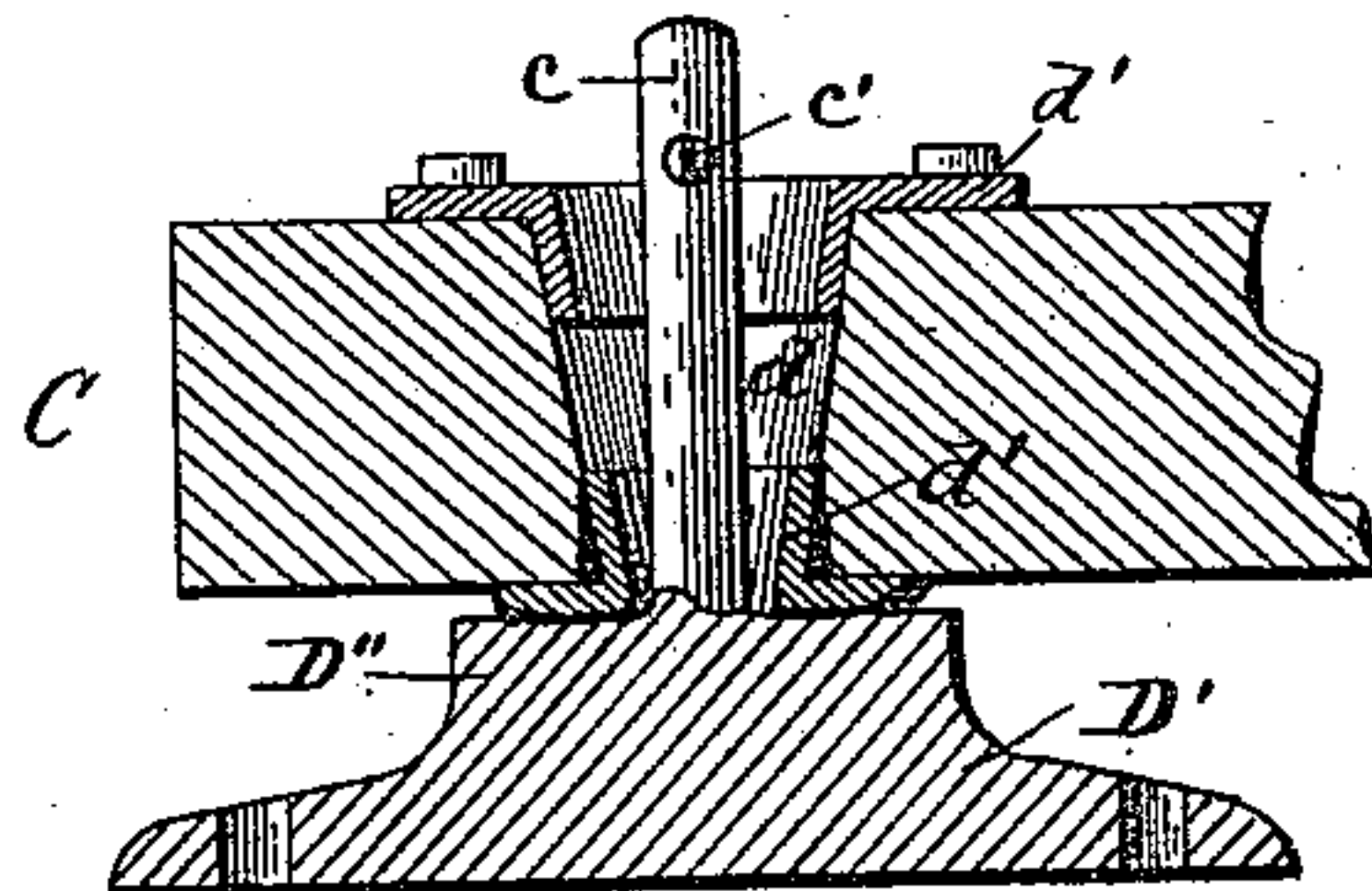
*Fig. 1.*



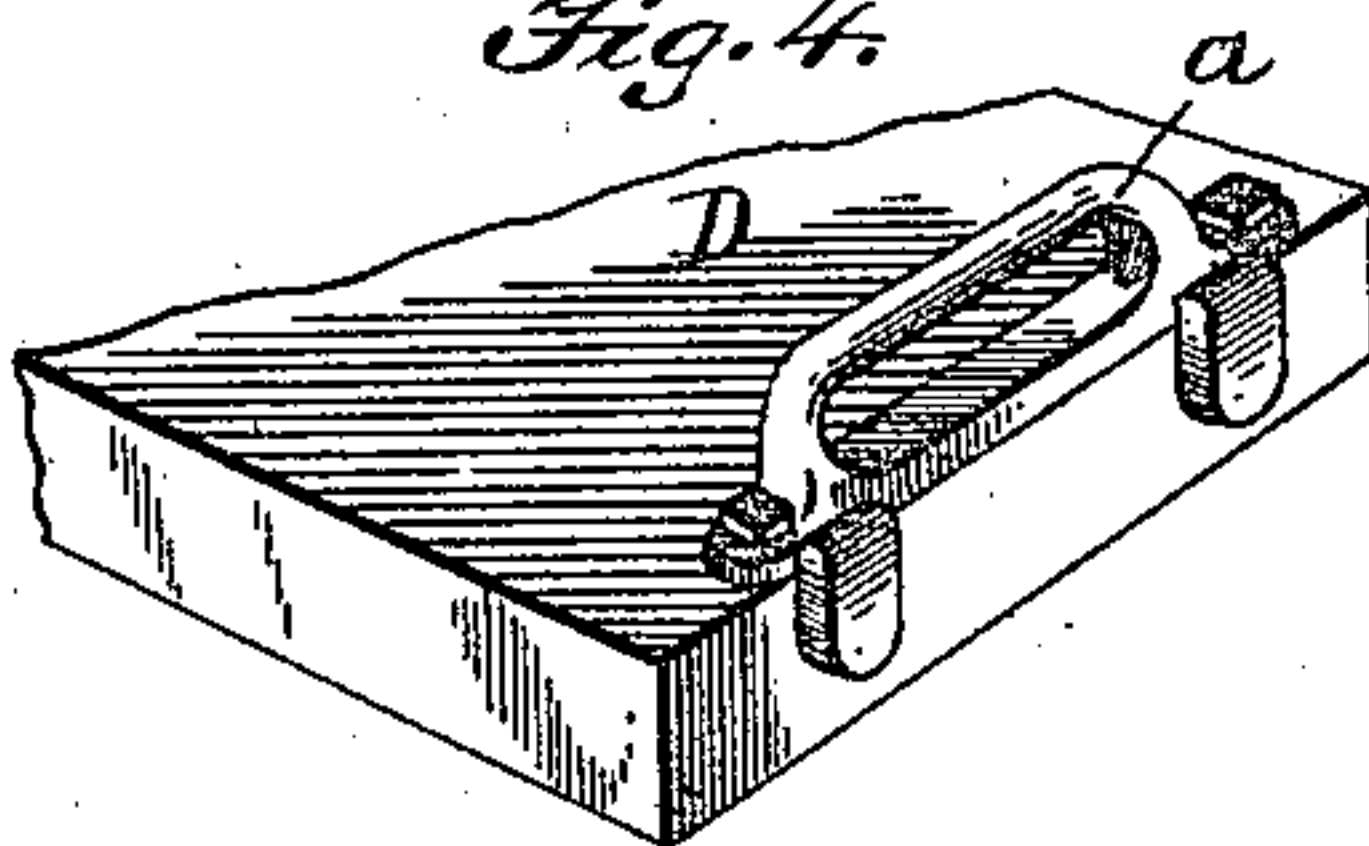
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



WITNESSES:

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C. D. Davis

INVENTOR:

E. C. Boyer  
BY C. M. Alexander

ATTORNEY.

(No Model.)

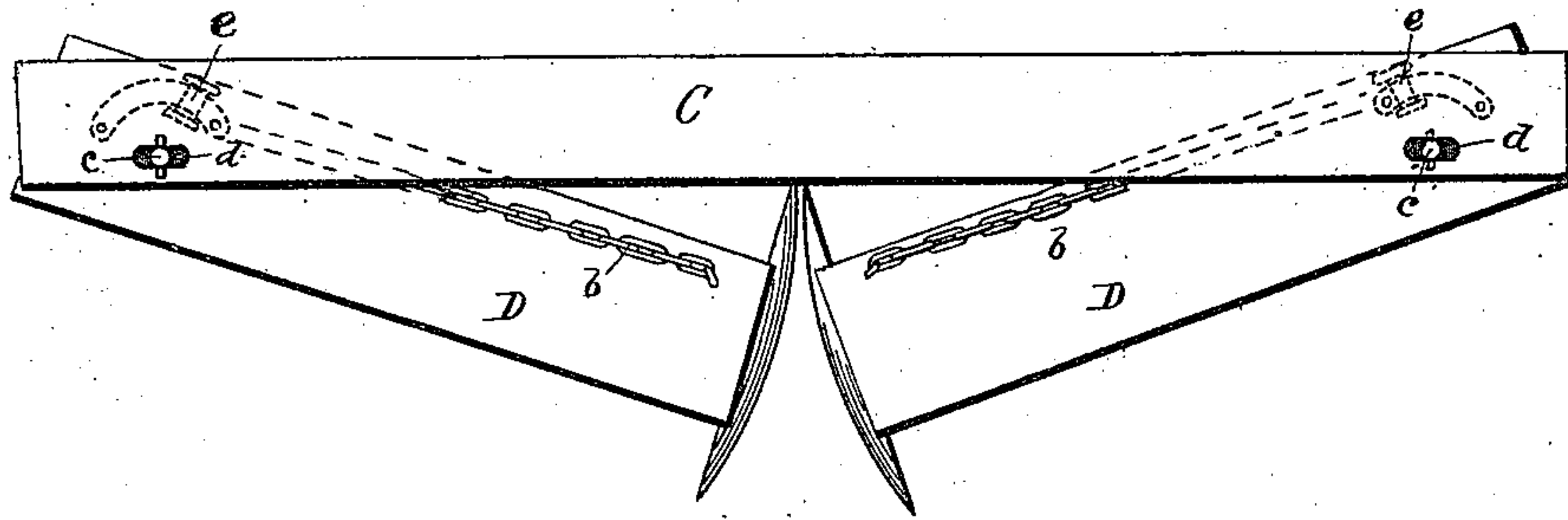
2 Sheets—Sheet 2.

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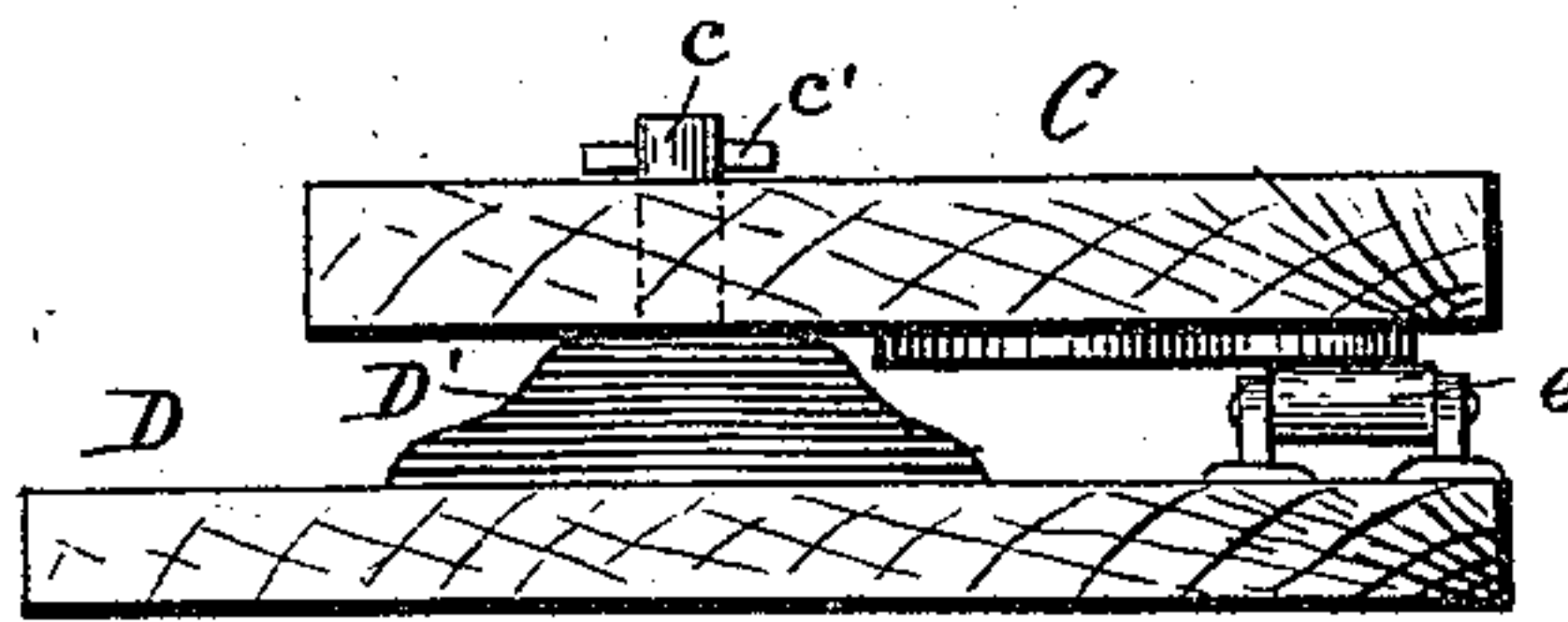
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*Fig. 5.*



*Fig. 6.*



Witnesses

*F. C. Gibson*

*C. D. Davis*

Inventor

*E. C. Boyer*

By *his* Attorney

*C. M. Alexander*



# UNITED STATES PATENT OFFICE.

EDWARD C. BOYER, OF DAYTON, OHIO.

## DISK HARROW.

SPECIFICATION forming part of Letters Patent No. 441,054, dated November 18, 1890.

Application filed July 10, 1890. Serial No. 358,284. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD C. BOYER, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Disk Harrows; and I do 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 the letters of reference marked thereon, which form a part of this specification.

In the accompanying drawings, Figure 1 represents a rear elevation of a disk harrow provided with my improvements; Fig. 2, a plan view thereof, the tongue, seat, and draft-rods being omitted; Fig. 3, a vertical longitudinal sectional view of the connection between the cross-beams and the gang-beams; Fig. 4, a detail perspective view of one of the gang-beams at its inner end; Fig. 5, a plan view showing more clearly the operation of the chains, and Fig. 6 an end view of cross-beam and one gang-beam.

The invention relates to that class of disk harrows in which are employed a pair of disk gangs arranged on either side of the tongue and journaled in bearings carried by suitable gang-beams, which gang-beams are capable of being simultaneously shifted with respect to their angles to the tongue, and have also an oscillating motion in order that the gangs may conform to the unevenness of the soil, as will fully hereinafter appear.

The present invention has certain important objects in view, which will appear in the course of this specification; and it consists in certain novel features of construction, that will be fully hereinafter described, and particularly pointed out in the claims appended.

Referring to the drawings by letter, A designates the tongue, B the seat and standard, and C the cross-beam secured rigidly to the rear end of the tongue.

Bolted on the top of the gang-beams D D near their outer ends are the metallic castings D' D', which have formed integral with them the pedestals or projections D'' D'', from the center of each of which rises a vertical pin c. These pins c pass up through holes d d, formed in the cross-beam near its

ends, pins c' c' being inserted through holes in the upper projecting ends of the pins to prevent their withdrawal. The holes or slots d d, formed in the bridle-plank or cross-beam, are gradually enlarged laterally toward their upper ends, and they have inserted in their upper and lower ends flanged thimbles or linings d' d', which are securely bolted in place and are adapted to receive the wear of the pins and prevent their contact with the wooden cross-beam. The lower thimbles loosely fit the pins at their lower ends, and the upper ones are approximately elliptical shaped in cross-section to conform to the laterally-enlarged holes. The lower thimbles rest in the tops of the pedestals D'' D'', as shown.

A number of important advantages are derived from this manner of connecting the gangs to the cross-beam. The cross-beam is supported at a fixed position relative to the gang-beams by a firm and broad bearing-surface, while at the same time the gangs have a free pivotal or swinging movement on the pins c c, enabling them to be readily adjusted with respect to the line of draft. The essential advantage derived from these connections is that they permit the gangs to have a free rocking or oscillating motion transversely to the line of draft, thereby enabling them to conform to irregular and undulating soil and thoroughly pulverize and cultivate the same, these connections at the same time preventing all backward and forward rocking of the gangs, as is evident. It is evident that the two thimbles d' d' in each hole may be formed in one without departing from the invention in the least.

Chains b b connect the inner ends of the gangs to the cross-beam, these chains extending outwardly and being connected to the cross-beam at a point near its connection with the gang-beams. The object of these chains is to limit the rearward movement of the inner ends of the gangs and prevent the inner disks coming in direct contact with each other, and also for the purpose of relieving the strain of the inward end-thrust of the gangs, which end-thrust is considerable when the concave disks are working in the soil.

Loops a a may be secured to the inner ends of the gang-beams and adapted to engage loops a' a', secured on the bottom of the cross-



beam, as fully set forth in my former patent No. 418,106, dated December 24, 1889.

A roller *e* is journaled in suitable bearings on the upper side of each gang-beam in front of the casings *D'*, which rollers bear upon a suitable segmental bearing-plate secured to the adjacent side of the cross-beam. As the beams are shifted, these rollers roll back and forth upon the bearing-plates and serve not only to reduce the wear and friction, and thereby enable the parts to be adjusted with ease and facility, but also to more evenly distribute the weight of the parts and prevent the front edge of the gang-beams rising, as is evident. It is evident that the rollers may be mounted upon the cross-beam and the wearing-plates on the gang-beams, if desired, without departing from the invention.

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

1. In a disk harrow, the combination, with the tongue and the cross-beam carried thereby and provided at or near each of its ends with a vertical hole, the upper portions of the said holes being enlarged longitudinally of the cross-beam or transversely to the line of draft, of a pair of gangs provided with pins projecting up through the said enlarged holes and working freely therein, whereby the said gangs may oscillate freely transversely to the line of draft and at the same time be prevented from rocking forward and backward, substantially as described.

2. The combination of a tongue, a cross-beam thereon provided with vertical holes at its opposite ends, these holes being enlarged transversely to the line of draft at their upper ends and provided with metallic thimbles or linings, and a pair of gangs provided with pedestals having projecting from their upper surfaces vertical pins which pass up through the holes in the ends of the cross-

beam whereby the gangs may oscillate transversely of the line of draft, but will be prevented from rocking forward and backward, substantially as described.

3. The combination of the cross-beam, the gangs pivotally connected thereto, and chains connecting the gangs to the cross-beam, the chains extending from the inner ends of the gangs to near the outer ends of cross-beam, substantially as described.

4. In a disk harrow, the combination of a tongue provided at its rear end with a transverse beam, this transverse beam having formed in its ends vertical holes enlarged transversely to the line of draft at their upper ends and provided with metallic thimbles, a pair of gang-beams below the cross-beam provided with pedestals having vertical pins extending up through the holes in the ends of the cross-beam, means for preventing the withdrawal of these pins, means for connecting the inner ends of the gangs to the cross-beam, and chains connecting the gang-beams to the cross-beam, substantially as and for the purposes described.

5. The combination, in a disk harrow, of a cross-beam, gangs pivotally connected to the said cross-beam near its outer ends, loops connecting the inner ends of the gangs to the cross-beam, and chains connecting the gangs to the cross-beam, the chains extending from the inner ends of the respective gang-beams outwardly in opposite directions to near the pivotal points of the gang-beams, whereby the inward end-thrust of the gangs will be relieved and the rearward movement of their inner ends limited, substantially as described.

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

EDWARD C. BOYER.

Witnesses:

JOHN L. H. FRANK,  
ELWOOD L. BOYER.