

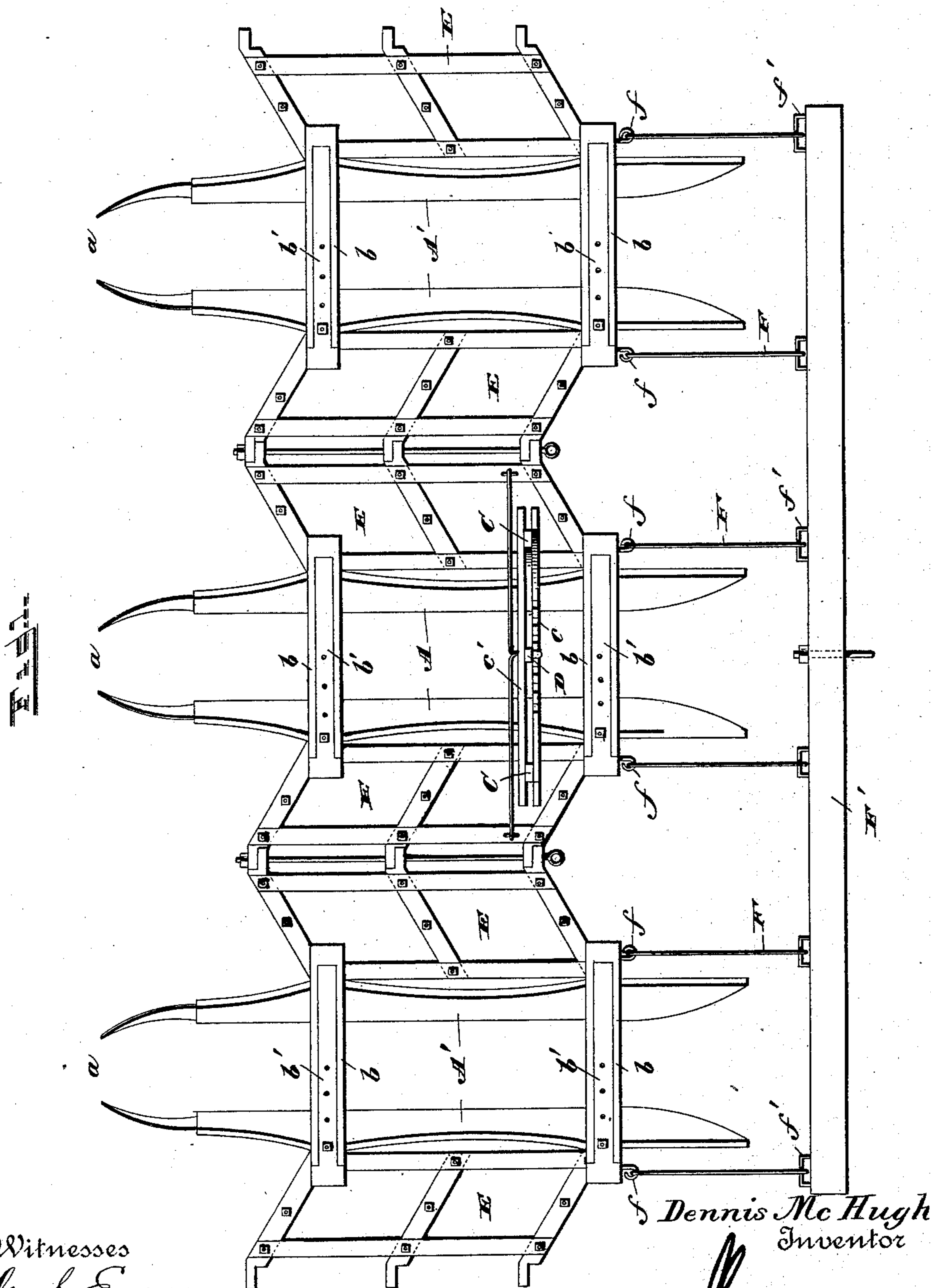
(No Model.)

2 Sheets—Sheet 1.

D. McHUGH.
HARROW.

No. 410,004.

Patented Aug. 27, 1889.



Witnesses
G. S. Elliott.
E. M. Johnson

By his Attorneys

Dennis Mc Hugh
Inventor

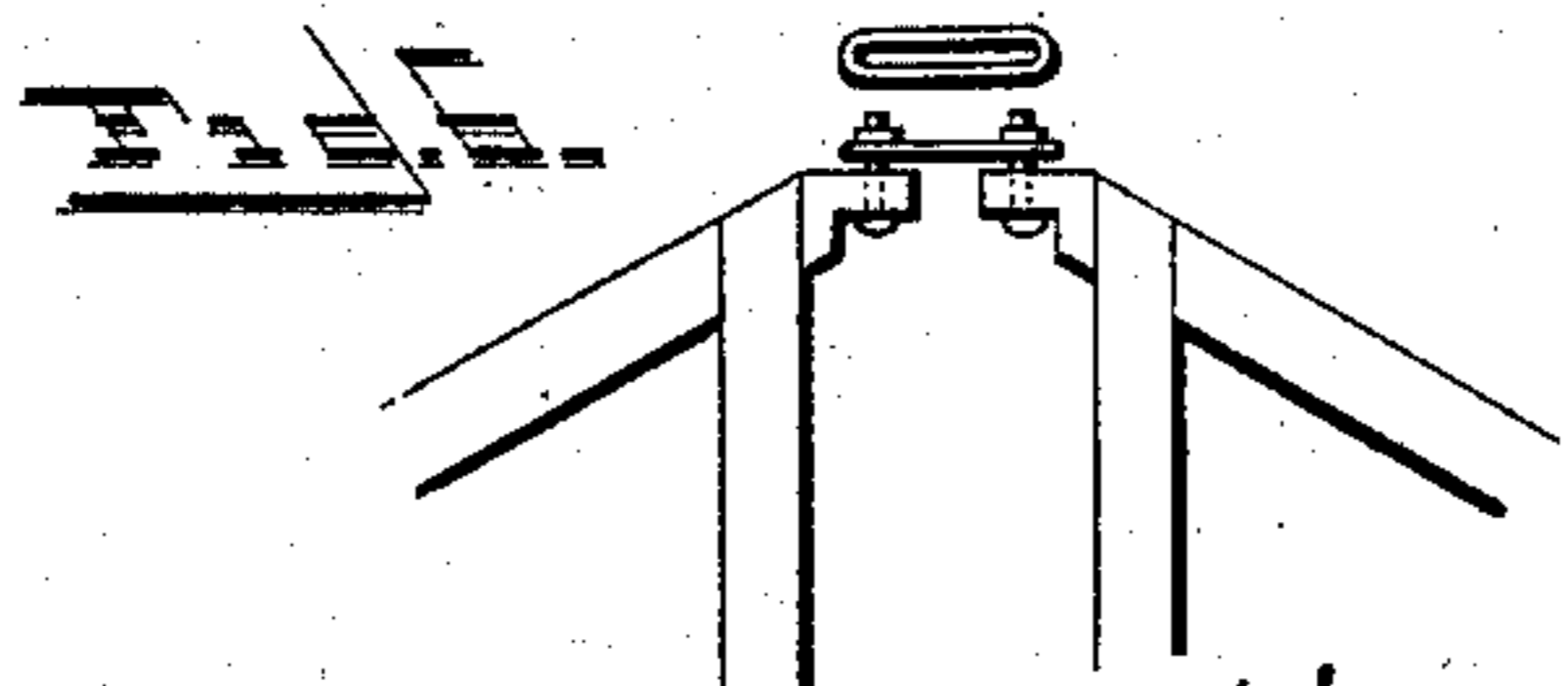
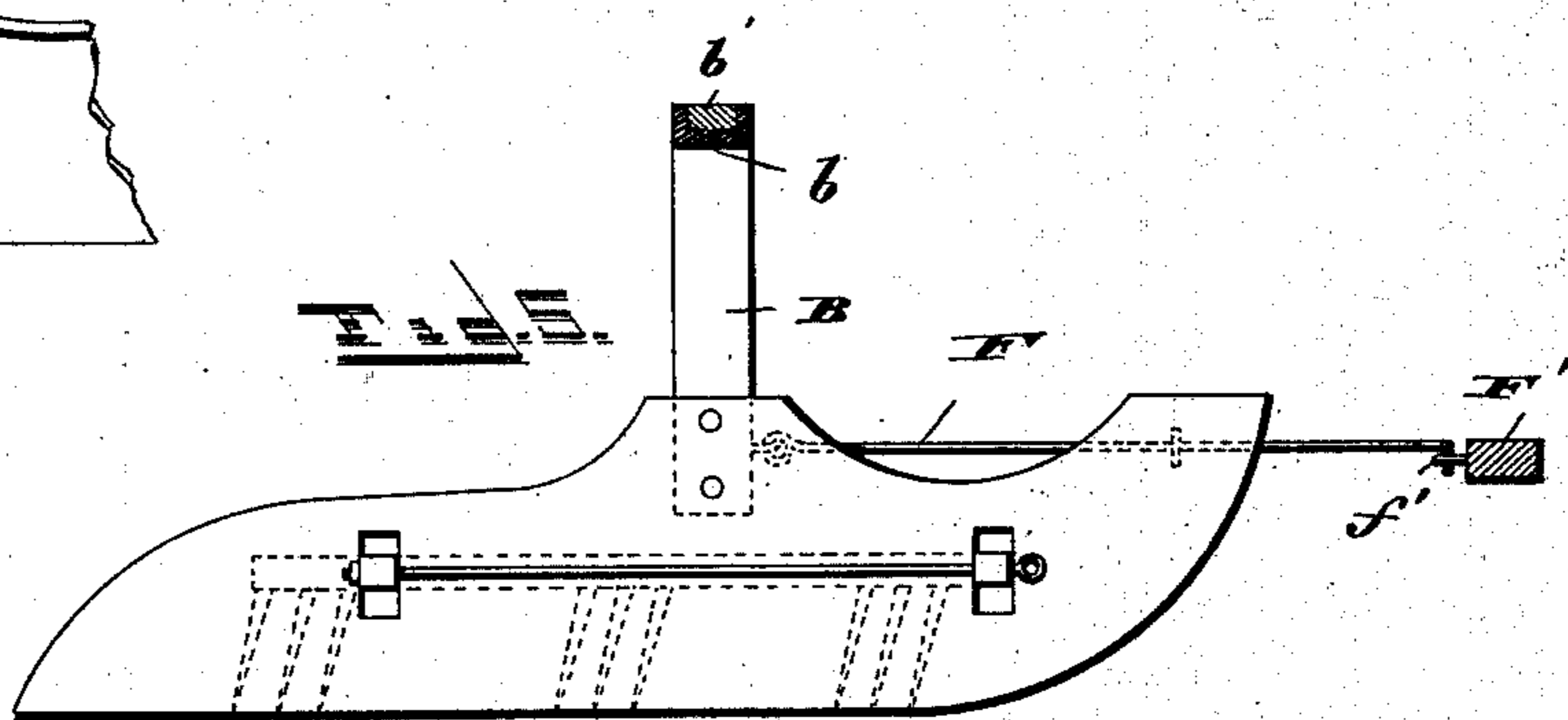
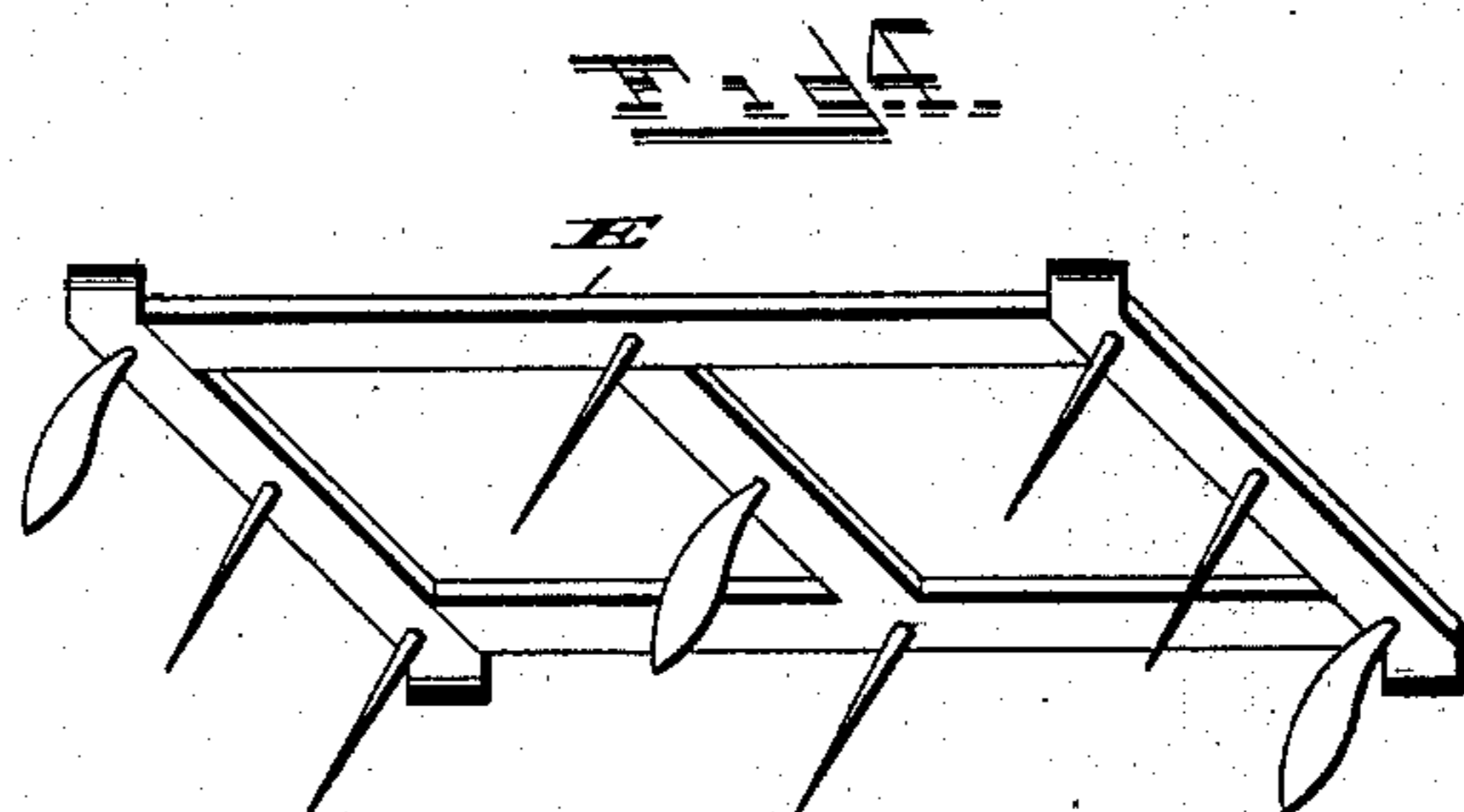
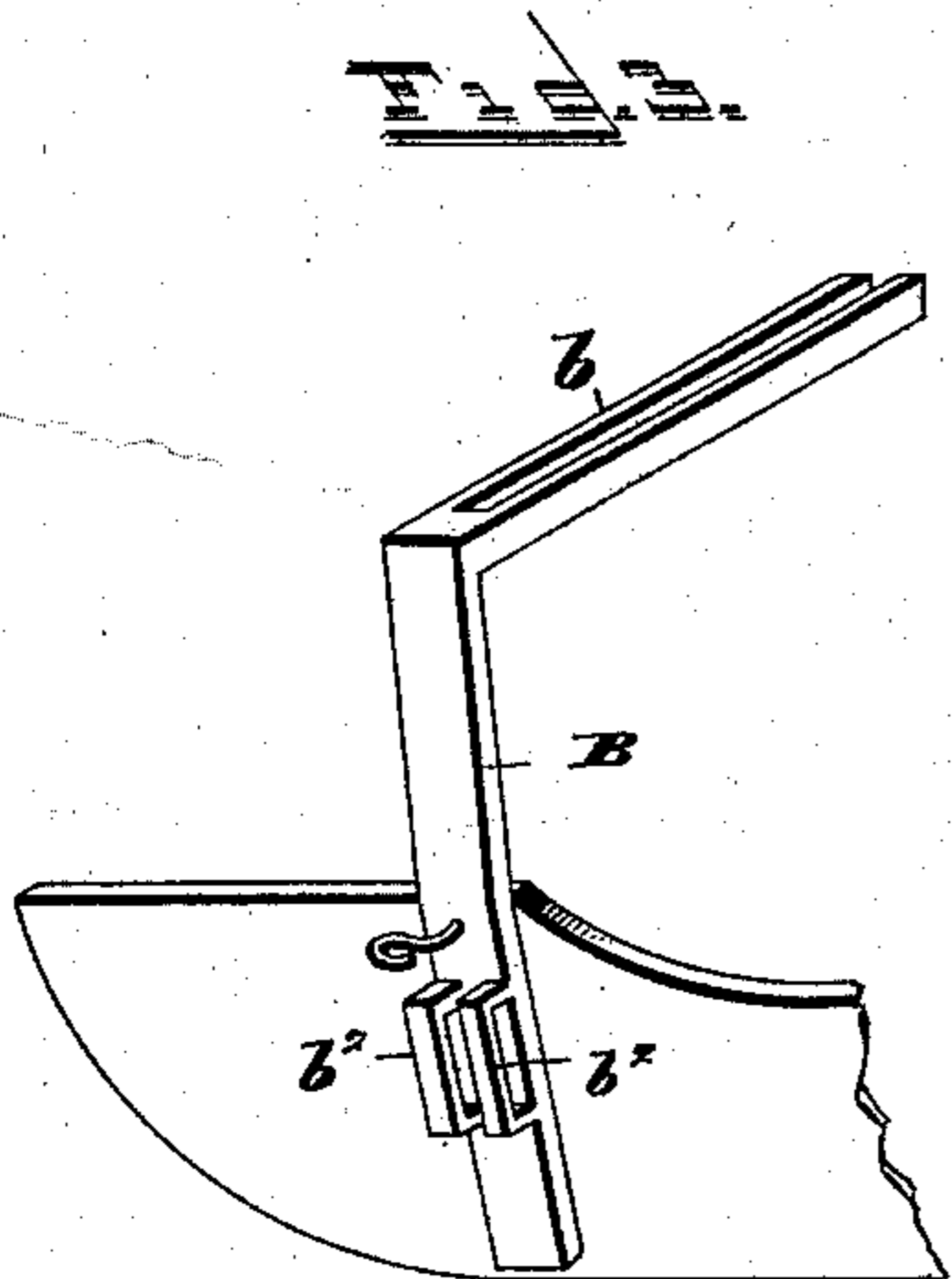
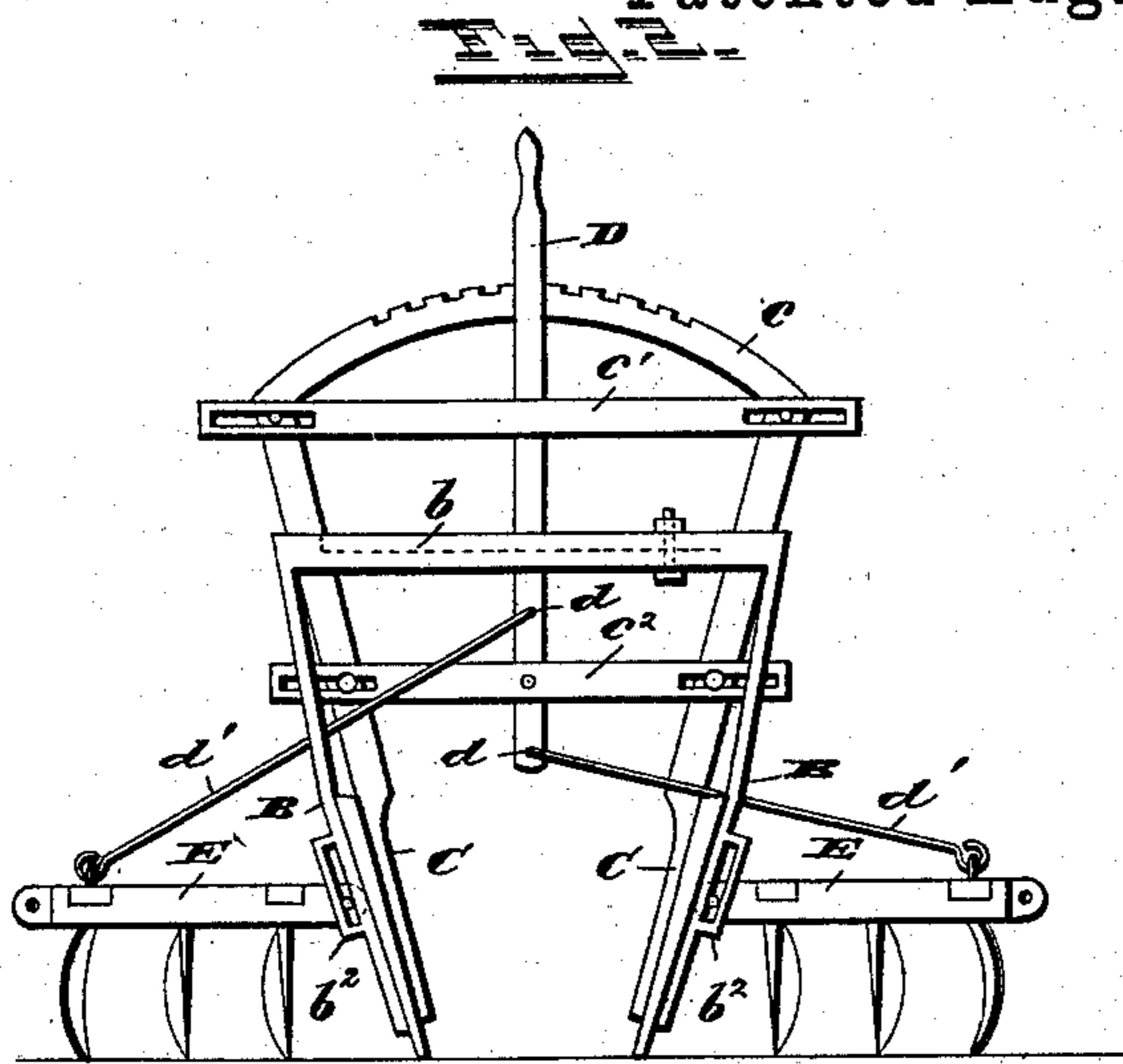
(No Model.)

2 Sheets—Sheet 2.

D. McHUGH.
HARROW.

No. 410,004.

Patented Aug. 27, 1889.



Witnesses

G. S. Elliott.

E. M. Johnson

Dennis McHugh.
Inventor

By his Attorneys

[Signature]

UNITED STATES PATENT OFFICE.

DENNIS MCHUGH, OF MALVERN, IOWA.

HARROW.

SPECIFICATION forming part of Letters Patent No. 410,004, dated August 27, 1889.

Application filed March 28, 1889. Serial No. 305,071. (No model.)

To all whom it may concern:

Be it known that I, DENNIS MCHUGH, a citizen of the United States of America, residing at Malvern, in the county of Mills and State of Iowa, 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 or figures of reference marked thereon, which form a part of this specification.

My invention relates to certain new and useful improvements in harrows.

The object of my invention is to provide a harrow for cultivating listed corn, and is made up of a series of V-shaped harrow-frames, each section thereof being attached to runners, the sections being connected to the runners and to each other, so that the runners can be inclined and separated to increase the space between the same, whereby the harrow is better adapted for cultivating between rows, as will be hereinafter fully set forth.

Figure 1 is a plan view of a harrow constructed in accordance with my invention. Fig. 2 is a rear elevation of the central runner-frame, which may be used independent when desired. Fig. 3 is a perspective detail of one of the runners and of one of the harrow-sections detached. Fig. 4 is a detail view of one of the harrow-sections. Fig. 5 is a sectional view of a modification of my invention, showing but one arch attached to the runners. Fig. 6 is a view illustrating a modification.

A A refer to the runners of the central section, and A' to the runners of the side sections. These runners consist of boards the front ends of which are rounded, while at their rear ends they are provided with horizontally-disposed cultivating-blades *a a*, the rear ends of which converge to throw the earth between the runners. These blades *a a* may be adjustably secured to the runners, so that their lower edges will extend below the lower edges of the runners, so that said blades will enter the ground while the runners pass over the surface.

To the runners A and A' are rigidly bolted

upwardly-projecting standards B and B', which are provided at their upper ends with horizontal extensions *b* and *b'*, provided with perforations, through which a bolt or other suitable means for connecting the parts may pass. One of these extensions, preferably *b*, is provided with a recess, in which the extension *b'* will lie to permit lateral adjustment of the parts, and at the same time by providing the socket within which the adjacent extension will lie movement of the parts will be prevented when they are secured to each other.

The standards B and B' are attached to the outer sides of the runners, and upon these standards are formed loops *b²*, through which pins or bolts pass for securing the harrow-sections thereto, so that the harrow-sections are not only permitted a pivotal movement, but by means of the loops *b²* a free vertical movement is allowed. The central runners A A have also attached thereto standards C C, the upper ends of which are connected by two cross-bars *c* and *c'*, both of which are provided with slots to permit the upper ends of the standards C being adjusted or spread, as may be desired. One of these cross-bars, preferably the upper one, is either notched or provided with perforations in which a catch attached to a pivoted lever may engage, said lever passing between the cross-bars. The lever is pivoted near its lower end to the cross-bar *c²*, the ends of which are slotted, and through the slots pass bolts for securing the same to the standards C. By this construction, when combined with the standards B and their parts, as hereinbefore described, the runners may be adjusted to different angles, the upper part of the runners being separated, while the lower edges retain their normal distance, thereby permitting the runners to be near the roots of the plants, while ample space is provided for the upper part of the plants to pass between the runners and beneath the arches.

The lever D, which is pivoted to the center of the cross-piece *c²*, is provided with perforations *d d*, one above and the other below the cross-bar, and through these perforations the ends of the bars *d'* pass, the opposite ends thereof being formed into eyes to engage eye-

bolts or staples attached to the outer rail of the harrow-section E. The harrow-sections E E are made up of a suitable number of beams extending parallel with the runners, and are connected by diagonal bars, the outer ends of which are cut away and perforated for the passage of a bolt for connecting the sections to each other. The inner ends of the end bars are similarly cut away and perforated for attaching the same to the standards B.

The arches carrying the runners A' are constructed substantially the same as the central arches, though the frame for supporting the lever D is dispensed with, as it is only necessary to provide the same for the central sections.

If desired, as shown in Fig. 5, but a single frame or arch B may be used, and when this is the case there is a slight modification of the draft attachment, the rods to which the draft-bar is secured passing through eyes or staples attached to the forward end of the runners, thus giving additional rigidity to the runners.

Ordinarily the front arches B B are provided with eyes or bent bars terminating in eyes, as shown at *f*, with which draft-rods F engage. These draft-rods at their front ends also engage with loops *f'*, attached to the rear edge of the draft-bar F', which draft-bar is of sufficient length to extend across the whole series of harrows.

The draft-bar may be provided with any suitable evener device, or the horses may be hitched directly thereto. The loops *f'* permit the draft-bar to swing laterally without affecting to any great extent the movement of the harrow.

The harrow-sections are preferably provided with rearwardly-inclined teeth; but they may carry cultivator-blades when desired.

Instead of providing the lower ends of the standards B with the loops *b*², these lower ends may be enlarged and provided with a vertical slot, so as to form sockets in which the inner ends of the harrow-sections may play; or, as when a single frame is provided to connect the runners, the runners in front and rear of the arch may be provided with openings through which the ends of the harrow-sections can pass and be secured by means of a bolt.

In operation, after the runners have been adjusted to give them the desired pitch or angle with respect to each other, and also the desired distance between the runners, the harrow-sections are adjusted at the proper inclination by means of the lever D, which adjusts all but the extreme outer sections, as it will elevate the central portion of the harrow-frames to give them the proper inclination for cultivating corn or other plants that have been planted with a lister, and are consequently growing in the middle of a rather

deep furrow, the injury to the plants being obviated by the runners which are located on each side of the rows. As the outer harrow-sections will be some distance from the plants not protected by the runners, it is not necessary to raise them, as upon the next trip across the field the ground will be again partly harrowed.

In practice the rear ends of the runners converge, and by the construction shown the parts are so connected that they will be capable of adjustment to suit any width of row.

This harrow may be used by disconnecting the several sections to cultivate either one, two, or three rows, and, if desired, the different harrow-sections may be disconnected from the runners and connected to each other to provide an ordinary harrow with six sections or less, as may be desired.

In Fig. 6 I have shown a modification by which I connect the sections of the harrow-frame by means of a link, which allows a slight vibration of the parts.

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

1. The combination, in a harrow for cultivating listed corn, of runners connected adj-justably to each other by arches, a frame carrying a pivoted lever, harrow-sections pivotally connected to the runners, so that said pivots may move vertically, and rods connecting the outer ends of the harrow-sections to the lever, whereby said harrow-sections may be raised, substantially as shown, and for the purpose set forth.

2. The combination, in a harrow for cultivating listed corn, of runners provided at their rear ends with cultivating-blades, harrow-sections pivoted to said runners, and rods connecting the outer ends of the harrow-sections with a lever carried by a frame attached to the runners, the runner-connecting arches and lever-carrying frame being laterally adjustable, substantially as shown, and for the purpose set forth.

3. The combination, in a harrow, of two or more runner-carrying arches, harrow-sections pivotally connected to said runners, so as to be capable of a vertical movement at their points of connection, the harrow-sections being connected to each other, and means, substantially as shown, for elevating the sides of the harrow-sections where they are pivoted to each other, substantially as shown, and for the purpose set forth.

4. The combination, in a harrow, of the runners connected to each other by laterally-adjustable arches, the upper portion of said arches interlocking with each other and provided with a bolt for securing the parts, harrow-sections pivoted to the lower ends of the arches, draft-eyes *f*, and rods F, adapted to engage therewith and with loops attached to the draft-bar F', substantially as shown, and for the purpose set forth.

5 The combination, in a harrow, of harrow-sections consisting of two or more parallel bars connected to each other by lateral bars, said harrow-sections having at their corners perforated projections at right angles with the parallel bars, and means for connecting the harrow-sections to each other, so that said sections may be used as an ordinary harrow, and also be capable of attachment to

the arches carrying runners, substantially as is set forth.

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

DENNIS MCHUGH.

Witnesses:

O. H. SNYDER,
F. A. MARSH.