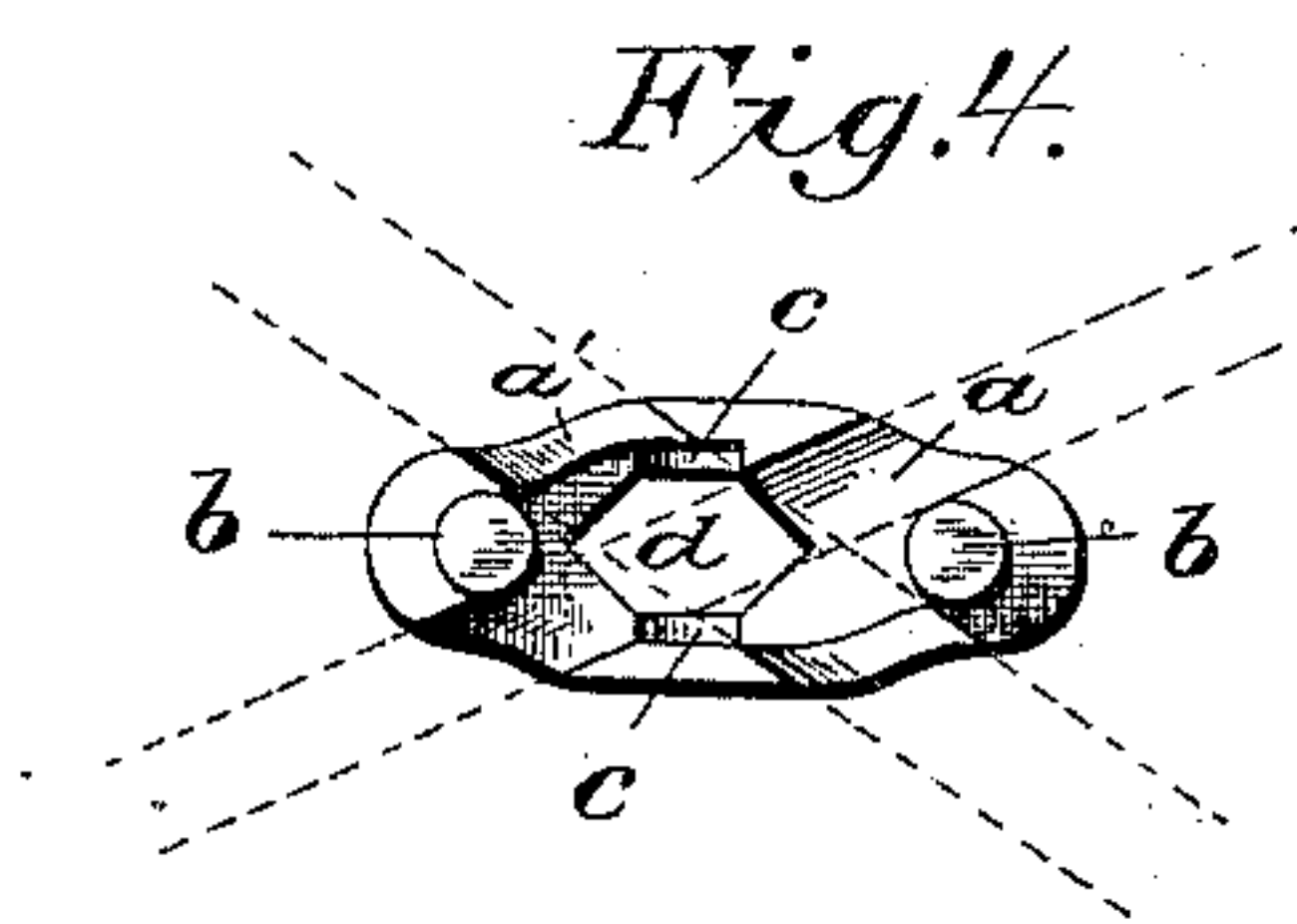
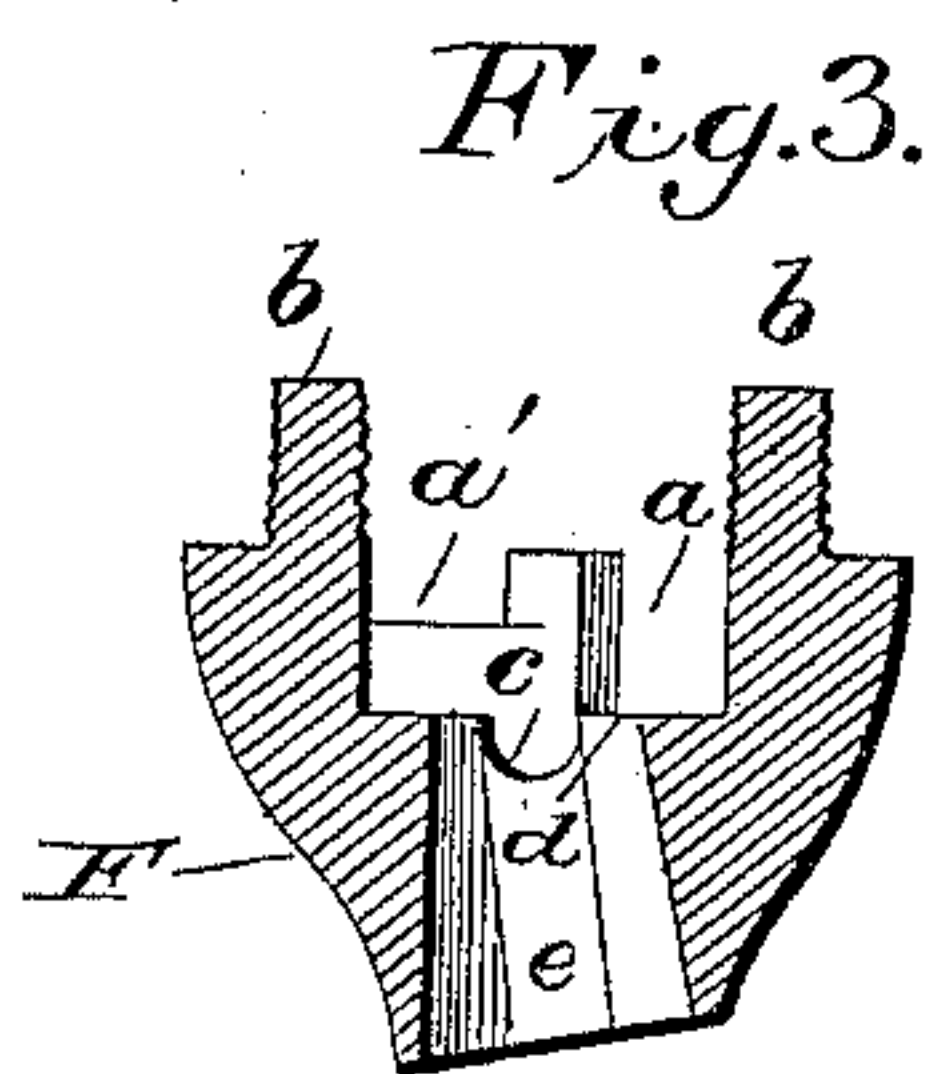
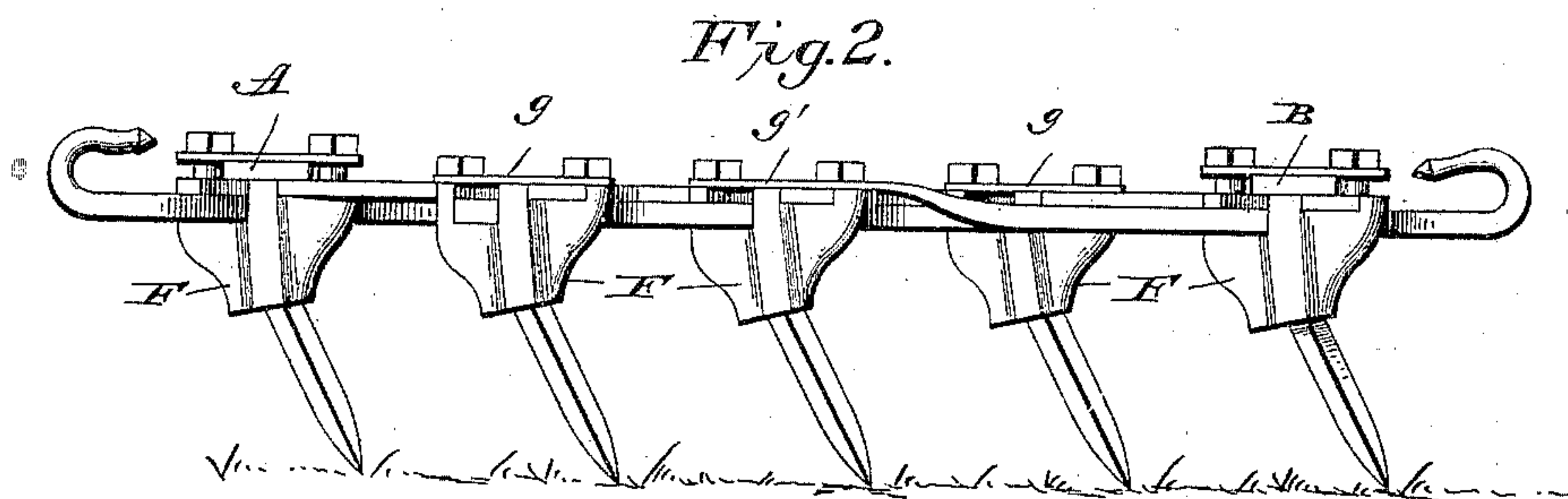
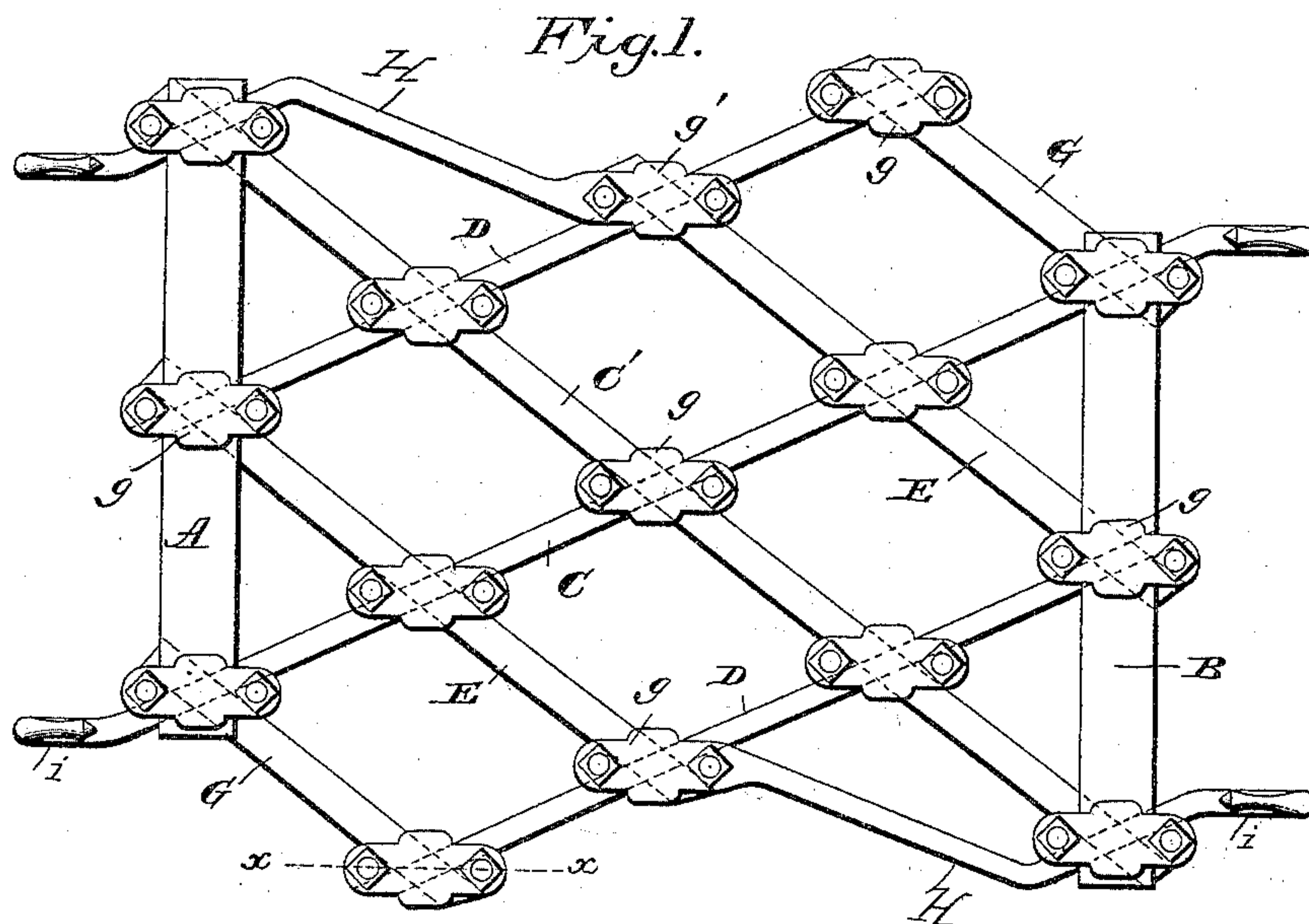


(No Model.)

D. EASTON.
HARROW.

No. 432,821.

Patented July 22, 1890.



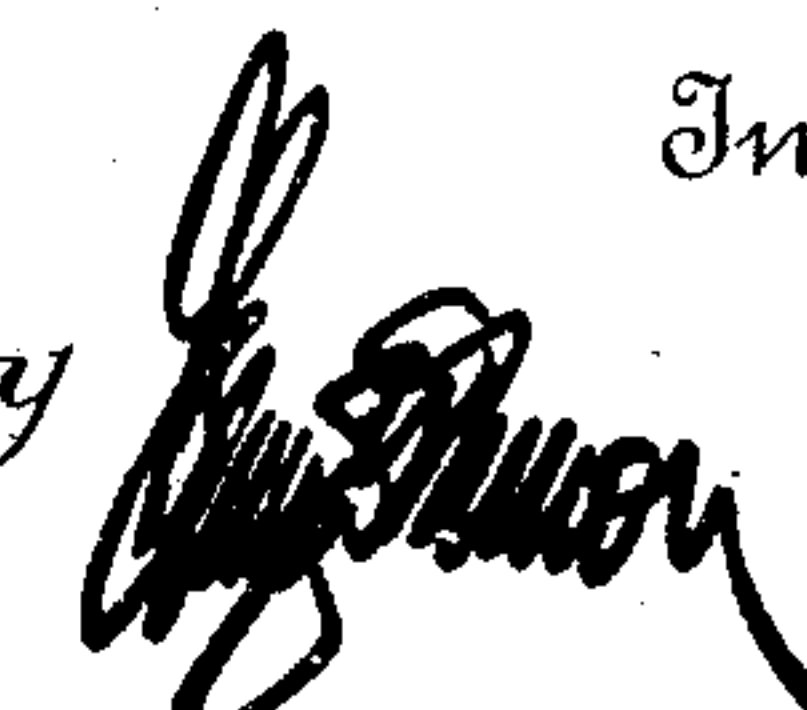
Witnesses
L. S. Elliott.
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Fig. 5.



Daniel Easton.

Inventor

by  Attorney

UNITED STATES PATENT OFFICE.

DANIEL EASTON, OF GRAFTON, NEBRASKA.

HARROW.

SPECIFICATION forming part of Letters Patent No. 432,821, dated July 22, 1890.

Application filed January 30, 1890. Serial No. 338,555. (No model.)

To all whom it may concern:

Be it known that I, DANIEL EASTON, a citizen of the United States of America, residing at Grafton, in the county of Fillmore and State of Nebraska, 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.

This invention relates to harrows; and it consists in the improved construction herein-after described and set forth, whereby a simple and efficient arrangement is provided wherein the harrow-teeth will adjust themselves either vertical or inclined, according to the direction of the movement of the harrow, and at the same time the bars and sockets will be rigidly and conveniently connected together.

In the accompanying drawings, Figure 1 is a plan view of a harrow-section embodying my improvements. Fig. 2 is a side view of the same. Fig. 3 is a detail sectional view taken on the line xx of Fig. 1. Fig. 4 is a plan view of the casting. Fig. 5 is a perspective view of one of the teeth.

The transverse end bars $A B$ and main diagonal bars $C C'$ constitute the salient parts of the harrow. On either side of the diagonal bars and parallel therewith are bars $D D$ and $E E$. The several series of bars $C D E$ cross each other in different horizontal planes and are connected at each of said intersections by casting F . Each casting F is tapered downward and has diagonal slots a and a' in its upper side, while threaded vertical lugs b are located at each end at the intersection of the slots a and a' . The walls of said casting are provided with vertical angular recesses c , as shown in Figs. 3 and 4, and the lower portion of the casting has centrally therein a vertical perforation d , which communicates with a chamber e in the lower tapered portion of said casting; the chamber being substantially of a lozenge shape, and having one end vertical and the other inclined.

The bars $C D D$ in the lower plane are narrower than the bars $C' E E$, and are substan-

tially square in cross-section, so that they will bear snugly in the slot a of the castings, while the upper bars $C' E E$ are not only thinner, but wider, and rest diagonally in the other slot a' of the castings on the bars $C D D$ snugly between the portions f , so as to be retained in place thereon. When the several bars $C C' D E$ have been adjusted in the castings, plates g , having perforations, are dropped over the threaded lugs and nuts applied to securely lock the bars to the castings. The front bars $A B$ of course are clamped upon the upper bar by the tri-plates. Before, however, the parts are so arranged the harrow-teeth are adjusted in the castings, each harrow-tooth being lozenge-shaped in cross-section, and having at its upper end lateral ears h , which are adapted to register with the vertical recesses in the side walls of the casting to descend to the bottom of the slot and secure a bearing thereat. The lower recess in the slot, by means of its inclined and vertical walls, enables the teeth to be vertically rigid when the harrow is moved in one direction and inclined when moved in the other.

In order to brace the parts in the line of draft, supplemental bars $G G$ are included and connected similar to the other upper bars. At the other corners the bars $H H$ are employed, the inner ends of which carry integrally the locking-plates g' . The ends of the bar C project beyond the bars $A B$ at a different angle from the rest of the bar and are formed into hooks i , a second hook i' being presented by the corresponding portion formed by the projecting ends of the supplemental bars $H H$.

It will be comprehended that the harrow-section previously described is strong and simple, and that several similar sections may be used in a gang.

I claim—

1. The combination, in a harrow, of the diagonal upper and lower bars $C C'$, extending the full length of the harrow and forming the main cross-bars thereof, parallel bars $D E$, castings each made in a single piece and comprising end lugs having shouldered bases and side projections $f f$, and intermediate cross-recesses between the same in different planes to receive said bars, the inner sides of the casting adjacent to the projections $f f$

having vertical recesses terminating in concaved seats at their lower ends, detachable harrow-teeth having lateral lugs to bear in said concaved seats, together with locking-plates and end bars, substantially as set forth.

2. The combination, with the casting described, comprising shouldered end lugs, side projections *ff*, and intermediate cross-recesses between the same in different planes, the inner sides of the casting adjacent to the projections *ff* having vertical recesses terminating in concaved seats at their lower ends, of a detachable harrow-tooth having lateral lugs to bear in said concaved seats, together with a locking-plate through which the lugs pass, substantially as set forth.

3. The combination, with the upper and lower diagonal main and parallel bars located in different planes, as described, the main bars extending the entire length of the harrow, castings for receiving and clamping

said bars at their intersections, and castings each made in a single piece and comprising end lugs having shouldered bases and side projections *ff*, and intermediate cross-recesses between the same in different planes to receive said bars, the inner sides of the castings adjacent to the projections *ff* having vertical recesses terminating in concaved seats at their lower ends, of detachable harrow-teeth having lateral lugs to bear in said concaved seats, locking-plates, together with supplemental bars *H H*, located at diagonal corners of the harrow, having integral clamp-plates at their inner ends and hooked at their outer ends, substantially as set forth.

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

DANIEL EASTON.

Witnesses:

JOHN R. PATTERSON,
B. TOBEY.