

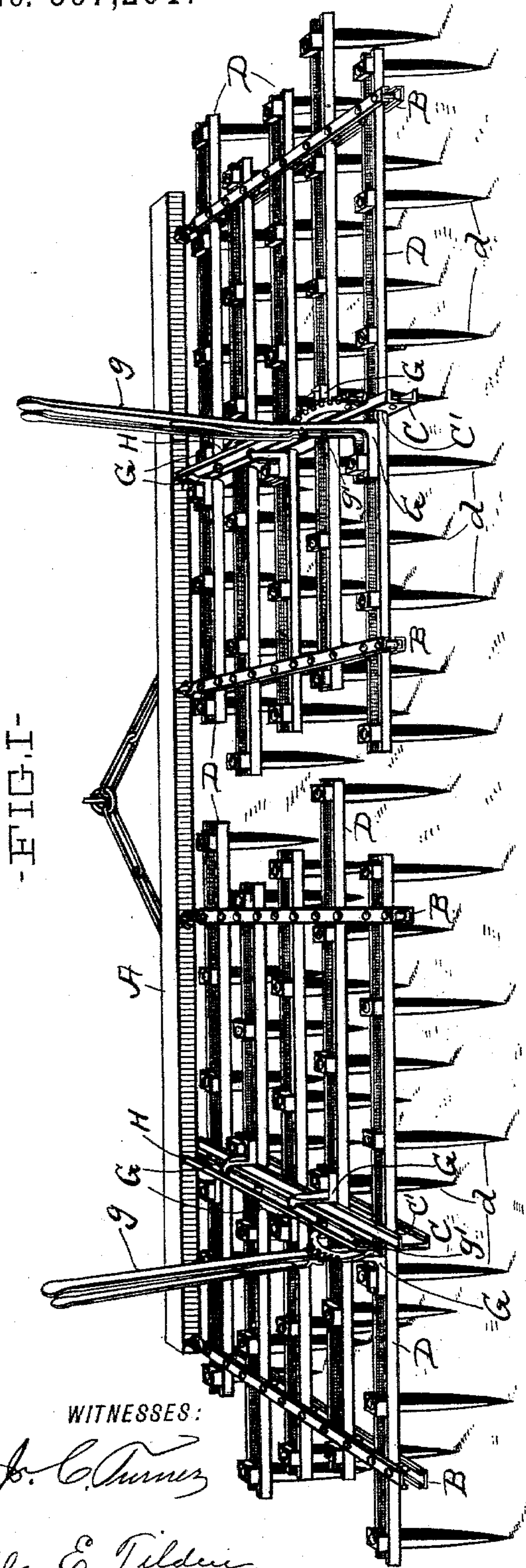
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3 Sheets—Sheet 1.

E. O. LEAN & E. S. FISHER.
HARROW.

No. 597,201.

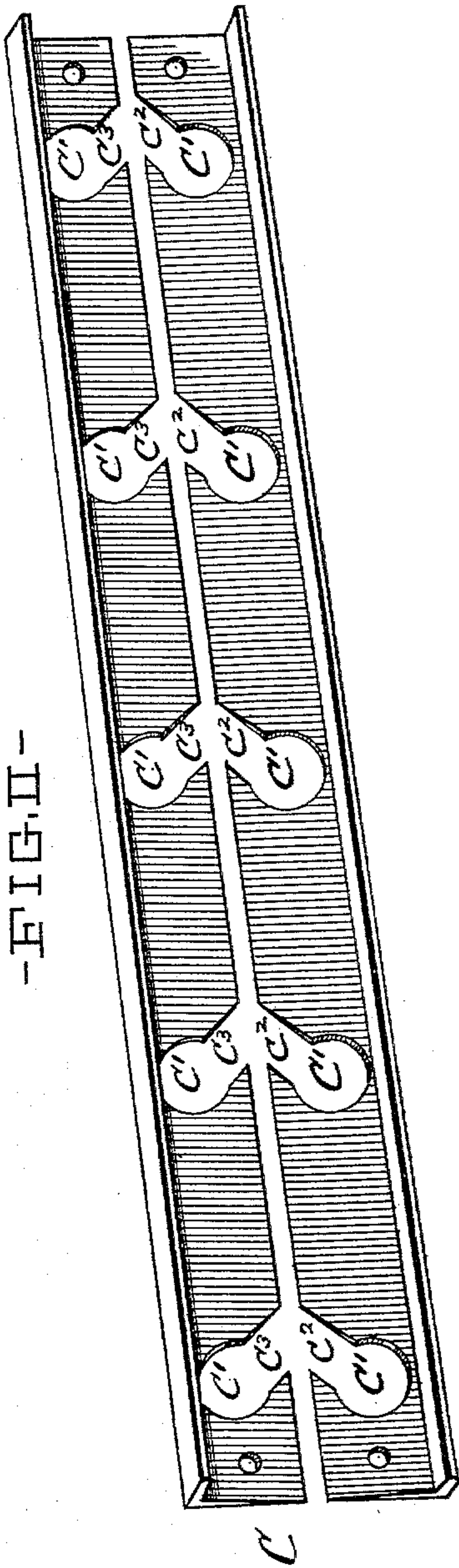
Patented Jan. 11, 1898.



WITNESSES:

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Ella E. Tilden



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BY

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Their ATTORNEYS.

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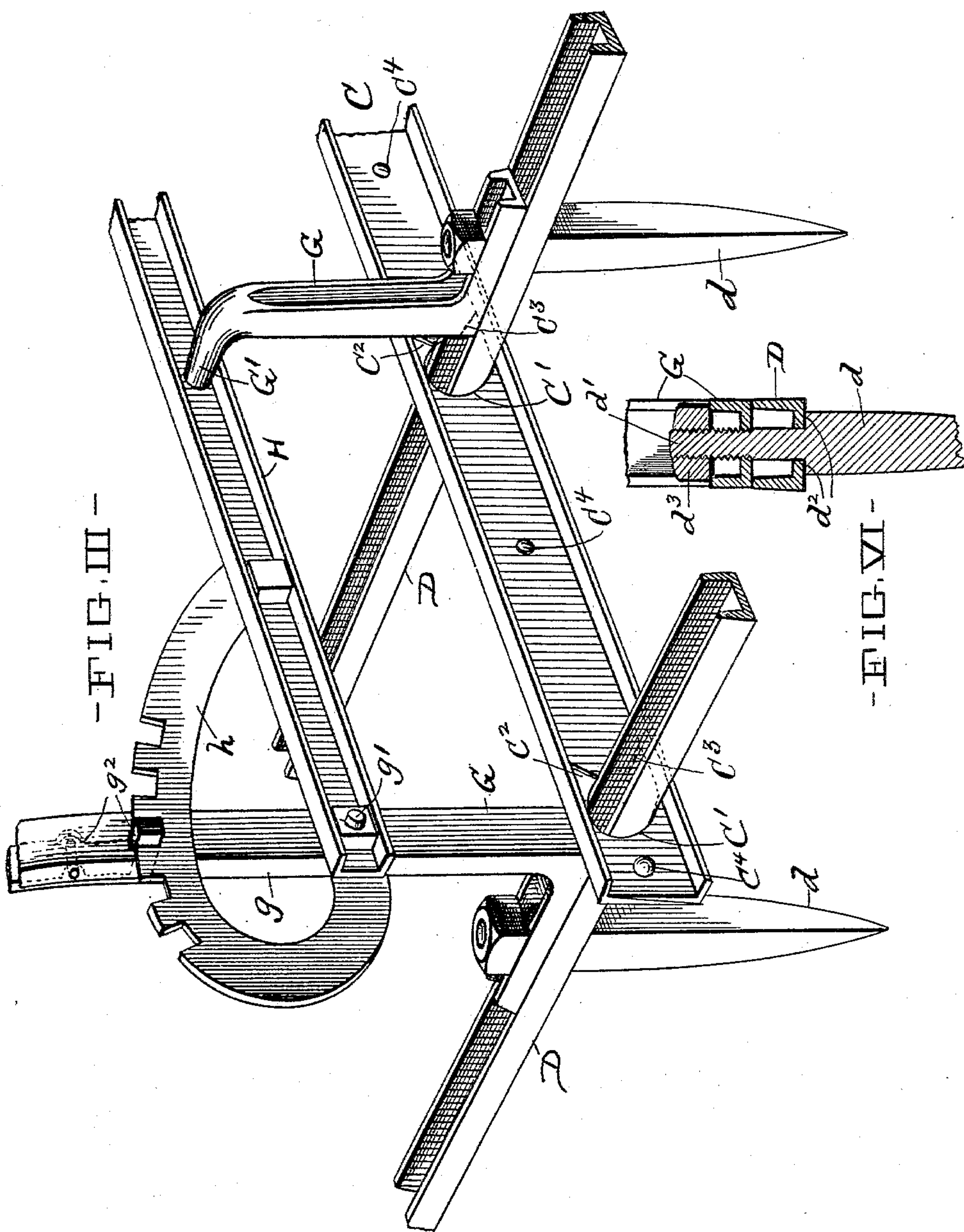
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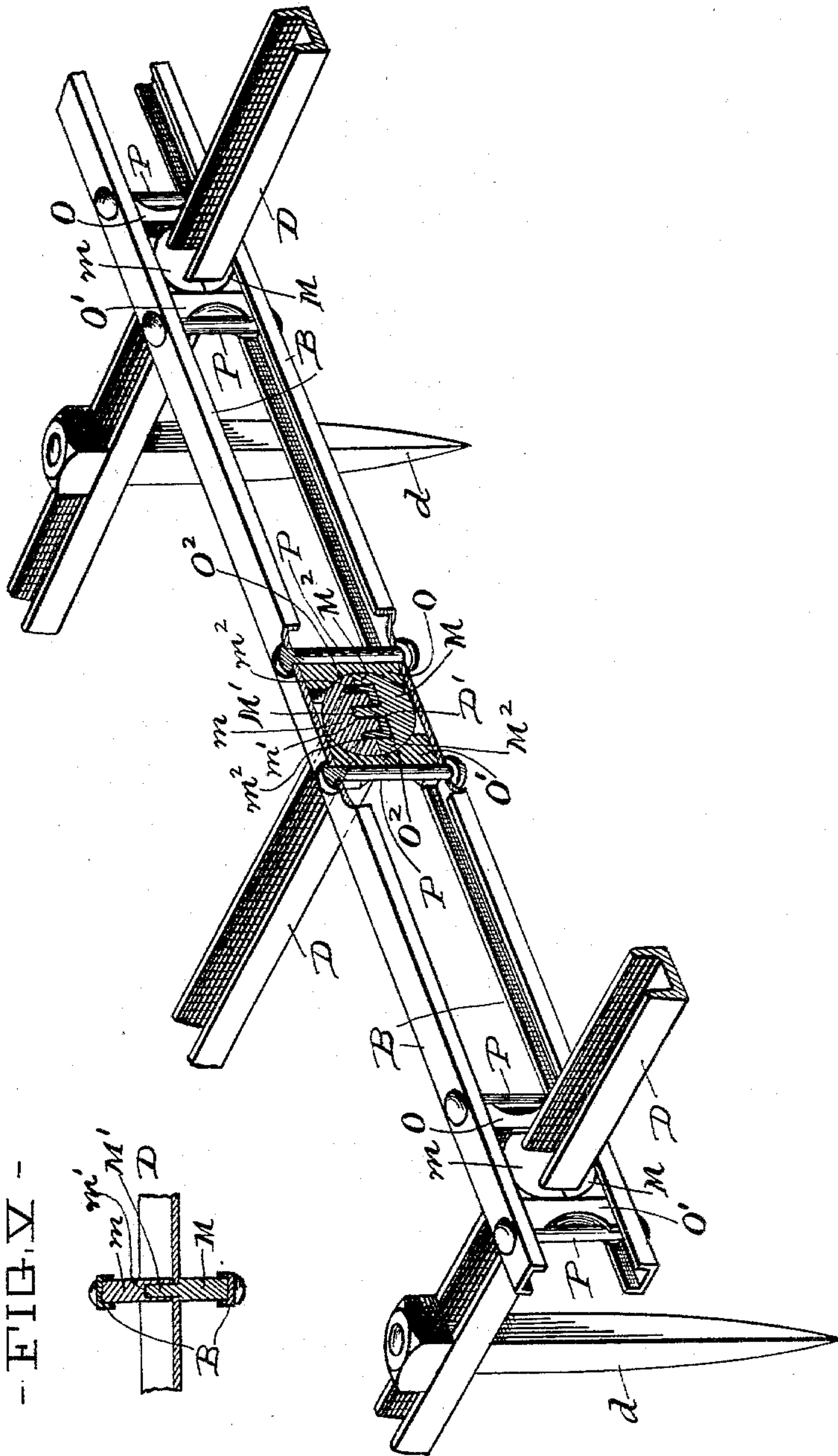
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-FIG. IV-



-FIG. V-

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UNITED STATES PATENT OFFICE.

EMERSON O. LEAN AND EDWARD S. FISHER, OF MANSFIELD, OHIO.

HARROW.

SPECIFICATION forming part of Letters Patent No. 597,201, dated January 11, 1898.

Application filed September 9, 1896. Serial No. 605,255. (No model.)

To all whom it may concern:

Be it known that we, EMERSON O. LEAN and EDWARD S. FISHER, of Mansfield, Richland county, Ohio, have invented certain new and useful Improvements in Harrows; and we 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 pertains to make and use the same.

Our invention relates to improvements in harrows; and it consists in certain features of construction and combinations of parts hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in perspective of a two-sectioned harrow embodying our invention. Fig. 2 is a perspective view of the two pieces composing the center bar of the harrow-section. Fig. 3 is a view in perspective showing a portion of the center bar of one of the harrow-sections and the mechanism employed for simultaneously adjusting the position of the teeth to an angle forwardly or backwardly. Fig. 4 is a view in perspective, partly in section, showing a portion of one of the side bars of a harrow-section and the manner of supporting the toothed bars from the side frames. Fig. 5 is a transverse vertical section taken centrally through one of the tooth-bar-bearing collars. Fig. 6, on sheet containing Fig. 3, is a transverse vertical section of a collar *M* and the connected tooth-bar and side frame.

A in Fig. 1 of the drawings represents the draw-bar, to which the harrow-sections are detachably hooked or secured in any approved manner. Each harrow-section comprises two forwardly and rearwardly extending side frames *B B*, arranged a suitable distance apart and at opposite sides, respectively, of the harrow-section, and each harrow-section comprises, furthermore, a forwardly and rearwardly extending center bar *C*, arranged parallel or approximately parallel with and centrally between the side frames.

Each harrow-section comprises any suitable number of parallel tooth-bars *D*, arranged equidistant apart and transversely of the side frames and center bar. Each tooth-bar is preferably formed from a channel-bar having its flanged side facing upwardly and

and has its teeth *d* secured in place in any approved manner. The tooth-bars extend through and are capable of oscillation within circular holes *C'* (see Fig. 3) in the center bar. A standard *G* is secured to each tooth-bar adjacent to the center bar, and the standards of the different tooth-bars are arranged alternately at opposite sides of the center bar. A shifting bar *H* is operatively connected in any approved manner with the different standards and is arranged a suitable distance above and preferably parallel with the center bar. A notched segment *h* is formed upon the forward end of the shifting bar, and a forwardly and rearwardly tilting hand-lever *g*, that is fulcrumed at *g'* (see Fig. 3) to the rear end of the shifting bar and rigid with the rearmost standard *G*, is provided with a dog *g²* for engaging any one of said notches. By this construction the hand-lever upon disengaging its dog from the notched segment can be tilted forwardly and rearwardly, and consequently the tooth-bars, through the medium of the standards and the shifting bar connecting said standards with the lever, are oscillated rearwardly or forwardly according as the lever is tilted rearwardly or forwardly, and hence the position of the teeth of the tooth-bars is controlled by said lever and may be adjusted to any angle forwardly or backwardly as best suited to the condition of the soil upon which the harrow is employed. The engagement of the round *G'*, that is formed upon the upper end of each standard located rearward of lever *g*, with a corresponding hole formed in the shifting bar (see Fig. 3) forms a simple and durable operative connection between said bar and standard. The center bar holds the tooth-bars extending therethrough in proper position.

The center bar, for the purpose of accommodating its application after the assemblage of the tooth-bar and side frames, is formed of two sections or halves, wedge-shaped in end elevation and suitably joined together side-wise to form one bar. Said sections have lateral circular perforations arranged at equal intervals, as shown in Fig. 2, and the circular openings in the one section register with the circular holes in the other section when the sections are assembled and form the cir-

cular tooth-bar-receiving holes C' of the center bar. One of said wedge-shaped sections of the center bar has open-ended slots C^2 extending and inclining upwardly from its tooth-bar-receiving holes C' , and its companion section has open-ended slots C^3 extending and inclining downwardly from its holes C' , and said slots C^2 and C^3 are large enough to accommodate the slipping of said sections over the tooth-bars from one side of the bars. One of said center-bar sections is slipped over the tooth-bars from above, and the other section is slipped over the tooth-bars from below, and when they have both been slipped into the position required they are secured together by rivets or suitable securing devices C^4 to form one rigid bar.

Of course it follows from the construction hereinbefore described that the tooth-bars have to be tilted in the one direction to accommodate the application of one of the center-bar sections and have to be tilted in the opposite direction in applying the other center-bar section.

Each side frame of a harrow-section is formed of two parallel channel-bars arranged a suitable distance apart vertically and above and below the tooth-bars, respectively, as shown more clearly in Figs. 4 and 5. The two channel-bars are furthermore arranged with their flanged sides facing each other. Each tooth-bar between the two bars of each side frame is provided centrally with a vertical hole D' for the reception of an upwardly-projecting dowel or tenon M' , formed upon the upper side of the lower section M of a collar that embraces said bar and fits the grooves or channels formed between the flanges of the said frame's channel-bars—that is, each tooth-bar between the two bars of each side frame is supported from a collar engaging the channels formed between the flanges in said bars and capable of oscillation or rotation. Said collar is made in halves or sections arranged at the bottom and top, respectively, of the tooth-bar. One of said collar-sections, the lower section in the case illustrated, has the dowel or tenon M' formed centrally of its top and projecting upwardly through the hole D' , formed in the central part of the flanged or channel tooth-bar, into a recess or hole m' , formed centrally of the lower portion of the upper section m of the collar. The lower collar-section M at its ends overlaps at M^2 M^2 the forward and rear sides of the tooth-bar. The upper collar-section is slotted at the forward and rear sides of its centrally-bored portion, as at m^2 , so as to fit over the flanges of the tooth-bar and overlap the forward and rear sides of the tooth-bar. The engagement of the dowel or tenon formed upon one of the collar-sections with a hole in the tooth-bar effectually prevents endwise displacement of the tooth-bar.

By the construction hereinbefore described it is obvious that the tooth-bars are free to rotate or oscillate in the one direction or the

other, and it will also be observed that said bars cannot be displaced rearwardly or forwardly upon providing means for preventing displacement of the tooth-bar-bearing collars longitudinally of the side frames. We therefore provide two blocks O and O' at the forward side and rear side, respectively, of each tooth-bar-bearing collar and fitting at their upper and lower ends the grooves or channels formed between the side frames' channel-bars. Each of said blocks easily embraces the adjacent portion of the collar, and to this end is provided upon its collar-facing side with a concavity O^2 , engaged by said portion of the collar and having a segmental wall arranged to afford bearing for the collar during the rotation or oscillation of said collar.

Rivets or bolts P , secured to the channel-bars in engagement with the outer sides of the aforesaid blocks, prevent displacement of the blocks longitudinally of the side frames in addition to their function of tying together the bars of the respective side frame.

By the construction hereinbefore described it is obvious that the tooth-bars are capable of rotation or oscillation freely and are effectually prevented from displacement in any direction. The construction is both simple and durable.

We would also remark that each standard G is secured to its supporting tooth-bar by the same means that secures a tooth of said bar, as shown in Fig. 3 and more clearly in Fig. 6, wherein said tooth at its upper end terminates in a stud d' , extending upwardly through the tooth-bar and base of the standard. A shoulder d^2 , formed upon the tooth at the lower end of the stud, engages the underside of the tooth-bar. A nut d^3 is mounted upon said stud at the upper side of the standard's base, and by tightening the nut said base and the tooth-bar are clamped between the nut and the aforesaid shoulder d^2 .

What we claim is—

1. In a harrow-section, the center bar provided at suitable intervals with holes to accommodate the extension therethrough of the tooth-bars, and composed of two sections or pieces secured together side by side and having open-ended slots extending and inclining from the tooth-bar-receiving holes, substantially as shown, for the purpose specified.

2. The two sections for forming the center bar of a harrow-section, suitably perforated at equal intervals longitudinally to form circular holes in the bar, and one of said sections having open-ended slots extending and inclining upwardly from its circular perforations, and the companion section having open-ended slots extending and inclining downwardly from its circular perforations, substantially as and for the purpose set forth.

3. In a harrow-section, the combination with the tooth-bars and the side frames comprising, respectively, two channel-bars arranged at the upper side and lower side, respectively, and transversely of the tooth-

bars; of collars arranged between and extending into the channels in the bars of the side frames, suitably-supported blocks affording bearing for the rear and forward portions of said collars and grooved or concaved to embrace the adjacent portions of the collars, substantially as set forth.

4. In a harrow-section, the combination with the tooth-bars, and the side frames comprising, respectively, two channel-bars arranged at the upper side and lower side, respectively, and transversely of the tooth-bars, collars capable of rotation or oscillation between the channels in the bars of the side frames, suitably-supported blocks affording bearing for the rear and forward portions of said collars and engaging the channels in said bars, and rivets or devices for tying together the bars of the side frames and arranged to engage the aforesaid blocks and prevent their displacement from the collars, substantially as and for the purpose set forth.

5. In a harrow-section, the combination with the horizontally-arranged and parallel tooth-bars having their body portion composed, respectively, of a horizontally-arranged channel-bar, and the side frames comprising, respectively, two channel-bars arranged horizontally above and below the tooth-bars, respectively, of collars supporting the tooth-bars and capable of rotation or oscillation and arranged between and extending into the channels of the side-frame bars, and each of said collars being made in two sections, arranged at the top and bottom, respectively, of the respective tooth-bar, the upper collar-section being slotted and fitted over the flanges of the tooth-bar, and having its central portion extending into the channel of the tooth-bar, and the lower collar-section

tion having a dowel or tenon extending centrally through the tooth-bar into the aforesaid central portion of the upper collar-section, substantially as shown, for the purpose specified.

6. In a harrow-section, the combination with the horizontally-arranged and parallel tooth-bars having their body portion composed, respectively, of a horizontally-arranged channel-bar and the side frames comprising, respectively, two channel-bars arranged horizontally above and below the tooth-bars, respectively; of collars supporting the tooth-bars and capable of rotation or oscillation and arranged between and extending into the channels of the side-frame bars, and each of said collars being made in two sections, arranged at the top and bottom, respectively, of the respective tooth-bar, the upper collar-section being slotted and fitted over the flanges of the tooth-bar, and having its central portion extending into the channel of the tooth-bar, and the lower collar-section having members abutting the rear and forward sides of the tooth-bar and having a dowel or tenon extending centrally through the tooth-bar into the aforesaid central portion of the upper collar-section, and blocks held against and affording bearing for the forward and rearward extremities of the collars, substantially as shown, for the purpose specified.

In testimony whereof we sign this specification, in the presence of two witnesses, this 26th day of August, 1896.

EMERSON O. LEAN.

EDWARD S. FISHER.

Witnesses:

JAMES E. GIBSON, Jr.,

MAGGIE SCHAUWEKER.