

(No Model.)

2 Sheets—Sheet 1.

C. A. ANDERSON & A. W. & F. D. ENGLAND.  
HARROW.

No. 483,317.

Patented Sept. 27, 1892.

Fig. 1.

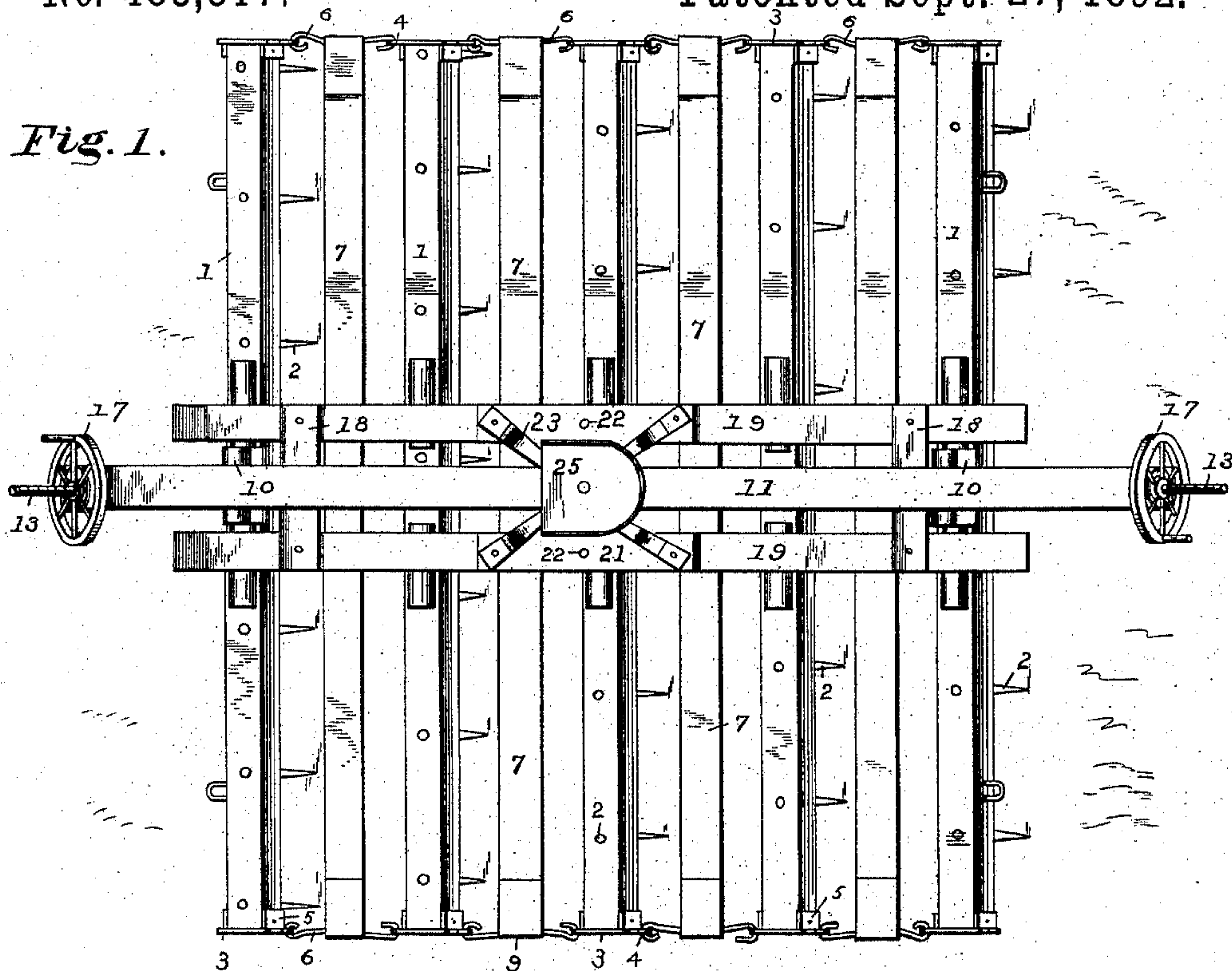


Fig. 2.

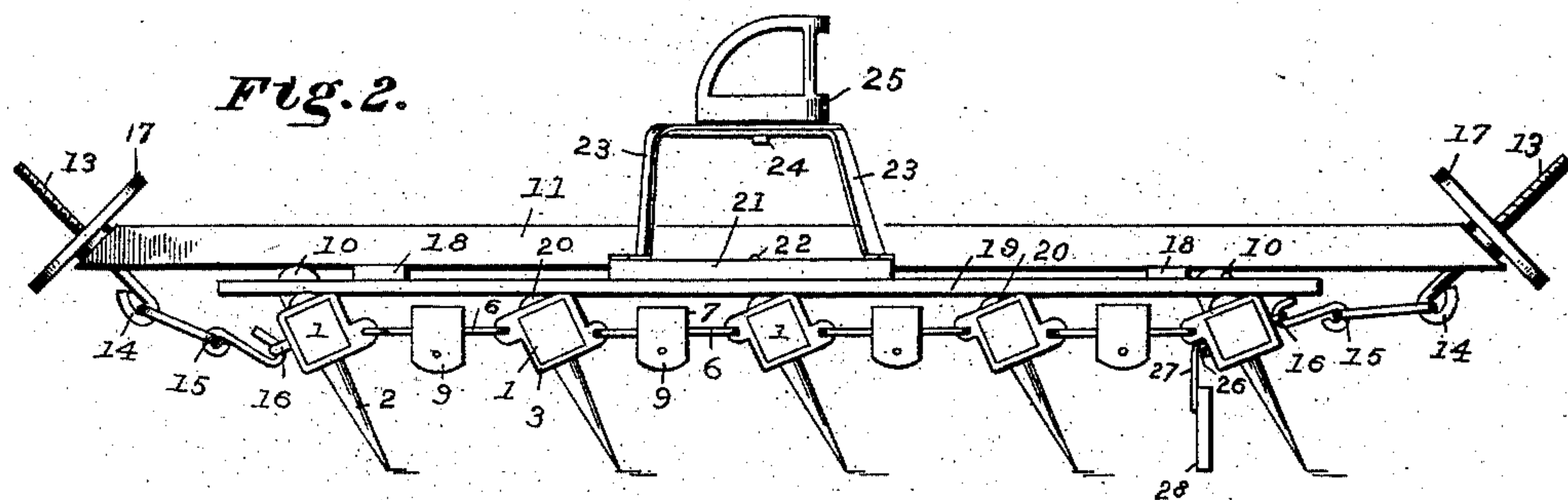
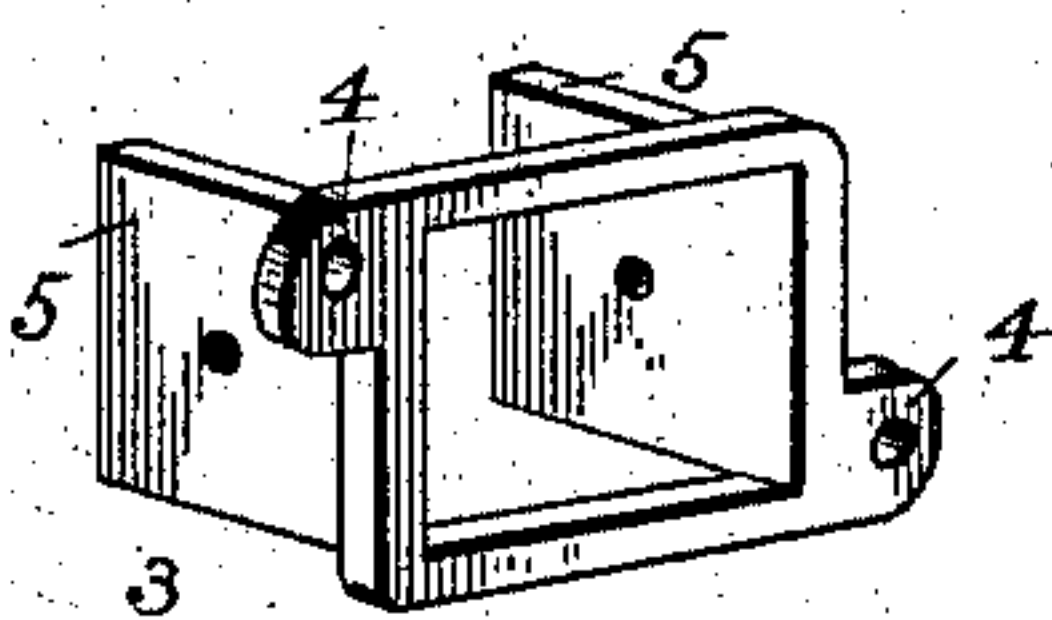


Fig. 6.



Witnesses

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Inventors  
C. A. Anderson,  
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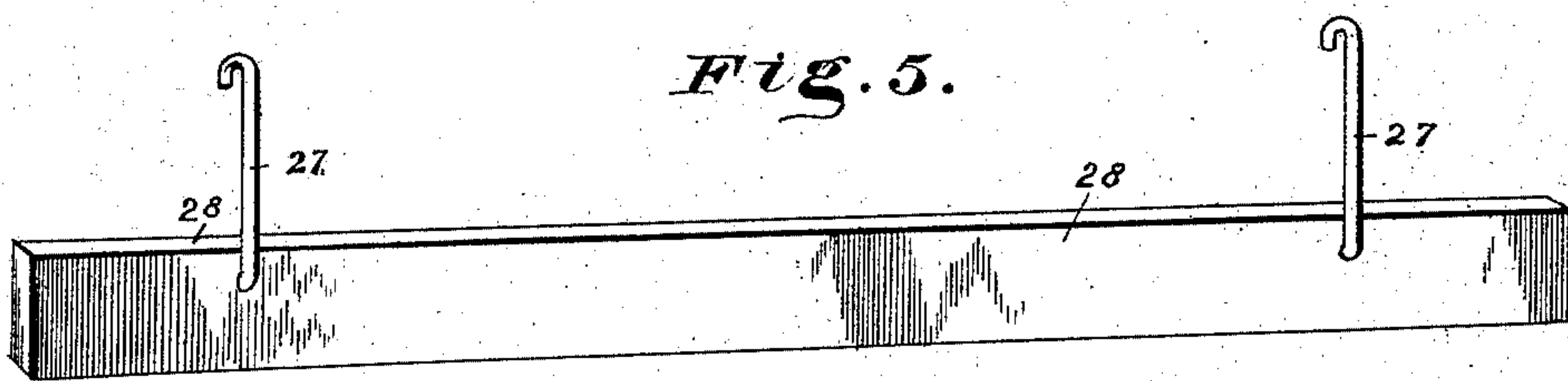
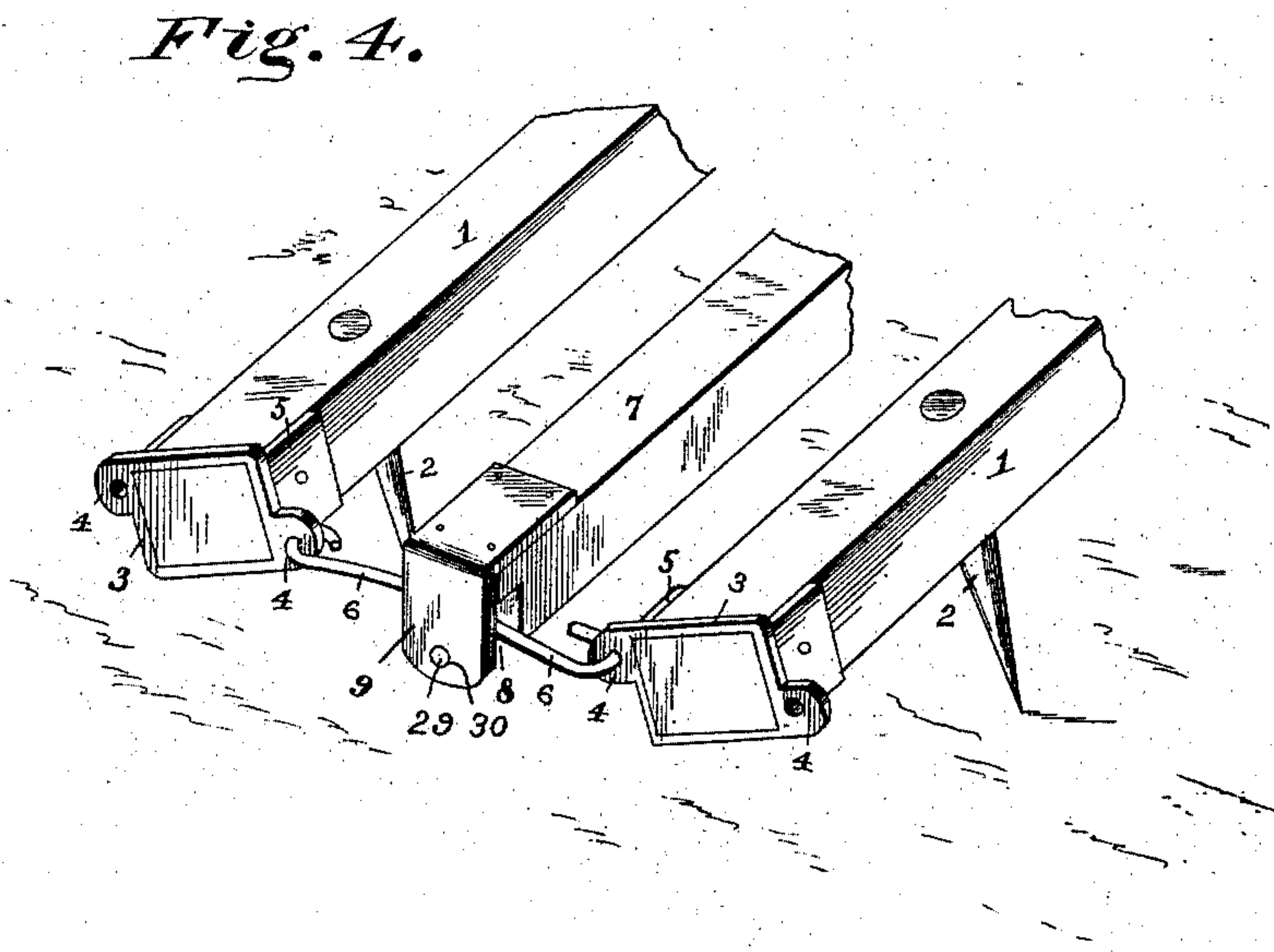
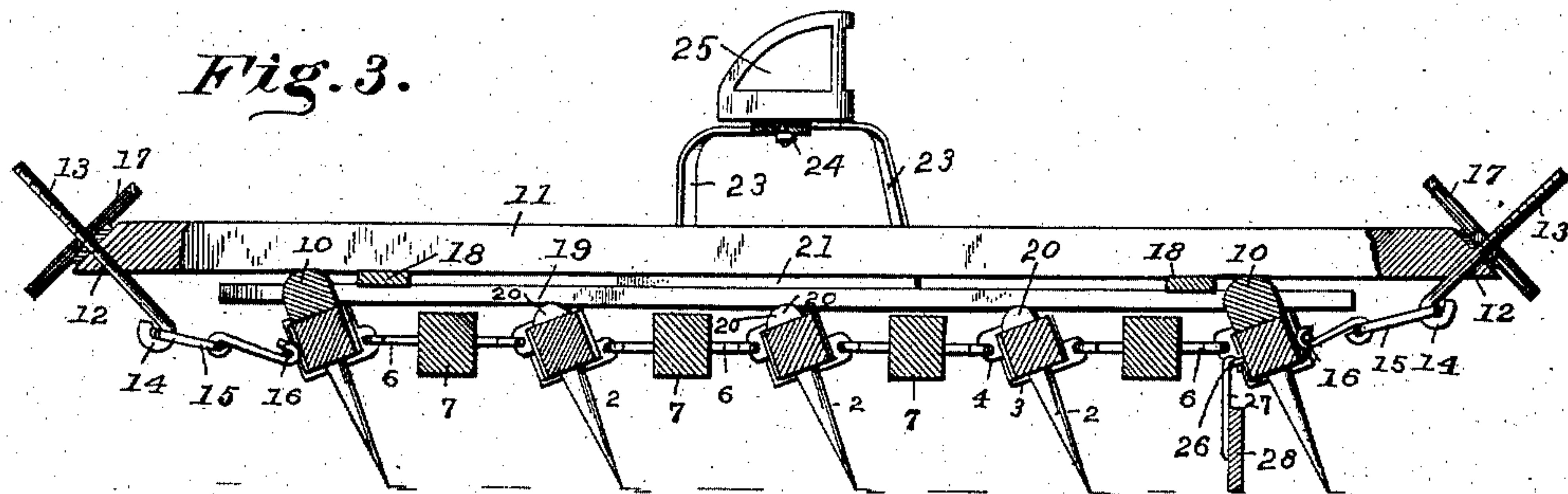
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2 Sheets—Sheet 2.

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Witnesses

*J. Ulke, Jr.*  
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# UNITED STATES PATENT OFFICE.

CHARLES ALBERT ANDERSON, ALEXANDER WILSHER ENGLAND, AND FRANK DAVID ENGLAND, OF PEMBROKE, KENTUCKY.

## HARROW.

SPECIFICATION forming part of Letters Patent No. 483,317, dated September 27, 1892.

Application filed January 16, 1892. Serial No. 418,325. (No model.)

*To all whom it may concern:*

Be it known that we, CHARLES ALBERT ANDERSON, ALEXANDER WILSHER ENGLAND, and FRANK DAVID ENGLAND, citizens of the United States, residing at Pembroke, in the county of Christian and State of Kentucky, have invented a new and useful Harrow, of which the following is a specification.

Our invention relates to improvements in harrows; and the objects in view are to provide a harrow of that class comprising a series of toothed harrow-bars loosely connected and to so arrange the same as to thoroughly pulverize the soil, to provide a cheap and convenient means for connecting the harrow-bars, for weighting the same, to provide means for regulating the tension of the harrow as a whole, and a convenient seat arrangement for supporting the operator or driver.

Other objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a plan of a harrow constructed in accordance with our invention. Fig. 2 is a side elevation. Fig. 3 is a central section. Fig. 4 is a detail in perspective of the ends of two adjacent harrow-bars. Fig. 5 is a detail of the drag-bar. Fig. 6 is a detail of one of the end castings detached.

Like numerals of reference indicate like parts in all the figures of the drawings.

In practicing our invention we employ a series of harrow-bars 1, which in cross-section are rectangular or square, and each bar is provided with a series of depending harrow-teeth 2, those of each bar alternating with regard to those of the adjacent bars, so that all portions of the surface over which the harrow is dragged are thoroughly pulverized. Over each end of each bar 1 there is fitted a cast-metal rectangular frame 3, two of the diagonally-opposite corners of which are provided with perforated lugs 4. Two of the edges of the frame have flanges 5, which are inwardly disposed and embrace and are bolted to the opposite sides or faces of the harrow-bars. Short chain-sections 6 serve to connect the adjacent perforated lugs of each pair of castings, so

that by this means a harrow-section perfectly flexible is formed.

7 designates a weight-bar, of which there is a series, the weight-bars alternating with the harrow-bars. Each weight-bar is provided at its end with a recess 8 and with an L-shaped metal clip 9, the outer end of which extends down over the end of the bar. The recesses thus formed engage the short chain-sections 6 between the harrow-bars. These weight-bars are plain or untoothed and are simply to give weight to the structure. The front and rear bars 1 are provided at their centers with upwardly-projecting convexed or rounded bearing-blocks 10, which extend some distance above the series of intermediate harrow-bars. These blocks support a superimposed tension-bar 11, considerably longer than the harrow as a whole, and therefore having its ends extending in front and in rear of the harrow. The ends of the tension-bar are beveled or chamfered, as shown, and an inclined perforation 12 is formed in each beveled end, the perforations being oppositely inclined with relation to each other. In each perforation an inclined threaded bolt 13 is seated, the lower ends of the bolts terminating in eyes 14. Short chains 15 connect the eye of each bolt with a staple 16, projecting from the front face of the adjacent end harrow-bar 1. Upon the upper or threaded ends of the bolts hand-wheels 17 are threaded, so that, as will be obvious, the bolts may be adjusted in the perforations of the tension-bar, and thus the entire series of loosely-connected harrow-bars may have their tension increased or diminished, as may be found desirable. The cross-cleats 18 are pivoted at their ends to opposite parallel longitudinally-disposed beams 19, such cross-cleats being located adjacent to and at the inner sides of the convexed bearing-blocks 10 and under the tension-bar 11. The beams 19 rest upon a series of small convexed bearing-blocks 20, with which each harrow-bar 1 is provided at each side of its center. Short seat-bars 21 are pivoted, as at 22, to the centers of the beams 19, and from the ends of the said seat-bars rise seat-standards 23, which at their intersection have pivoted thereto, as at 24, a driver-seat 25. At the inner sides of the rear bar 1 eyes 26 are located,



and these eyes are for the accommodation of and removable engagement with a pair of hooks 27, which extend from the upper edge of a drag-bar 28, designed to drag after the harrow, and thus smooth to a nicety the soil which the teeth of the harrow have pulverized.

From the foregoing description, in connection with the accompanying drawings, it will be seen that we have provided a harrow of great simplicity, strength, and durability, one in which the several bars may be readily adjusted so as to place the same under greater or less tension, have provided means for adjusting the weight of the harrow in accordance with the soil and the desired depth of penetration, and finally have provided an improved seat-support whereby the switchings or lateral movements of the harrow are not communicated to the seat, but the latter permitted to maintain its alignment with the draft.

The weight-bars, as before stated, are removable from the harrow, and when in position may be temporarily secured by means of pins 29, passed through perforations 30, formed in the clips and ends of the bars.

Having described our invention, what we claim is—

1. In a harrow of the class described, the combination, with the toothed harrow-bars and the intermediate series of chains connecting the same, of the series of weight-bars having their ends recessed and provided with the L-shaped metal clips having perforations, and the pins passing through the perforations and into the ends of the weight-bars, substantially as specified.

2. In a harrow, the combination, with the series of harrow-bars flexibly connected, of the tension-bar extending beyond the front and rear ends of the harrow and provided with openings, screw-eyes mounted in the openings, hand-wheels mounted on the screws, and short chains connecting the eyes with

the front and rear bars of the harrow, substantially as specified.

3. In a harrow, the combination, with the series of transverse harrow-bars flexibly connected, the end bars being provided with convexed bearing-blocks, of the tension-bar projecting beyond the front and rear harrow-bars and having its ends provided with inclined perforations, threaded eyebolts located in the perforations, hand-wheels mounted on the eyebolts, and short chains connecting the lower ends of the eyebolts with the front and rear harrow-bars, substantially as specified.

4. In a harrow of the class described, the combination, with the series of harrow-bars flexibly connected, the front and rear bars being provided with the central blocks and each bar being provided at each side of its center with a convexed bearing-block, of the longitudinal parallel beams, located upon the blocks and at each side of the central blocks, the cleats, pivotally connecting the beams, the seat-bars pivoted on the beams, the standards secured to the ends of the seat-bars, and the seat mounted upon the standard, substantially as specified.

5. In a harrow of the class described, the combination, with the series of harrow-bars, of the series of metal frames embracing the ends of the bars, each frame being provided with inwardly-disposed bar-embracing flanges bolted to position and provided at opposite sides with perforated ears, and short chains connecting each adjacent pair of ears, substantially as specified.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

CHARLES ALBERT ANDERSON.  
ALEXANDER WILSHER ENGLAND.  
FRANK DAVID ENGLAND.

Witnesses:

W. H. JERNIGAN,  
W. W. GARNETT.