

(No Model.)

2 Sheets—Sheet 1.

H. D. BABCOCK & DE VALOIS ST. JOHN.
HARROW.

No. 561,643.

Patented June 9, 1896.

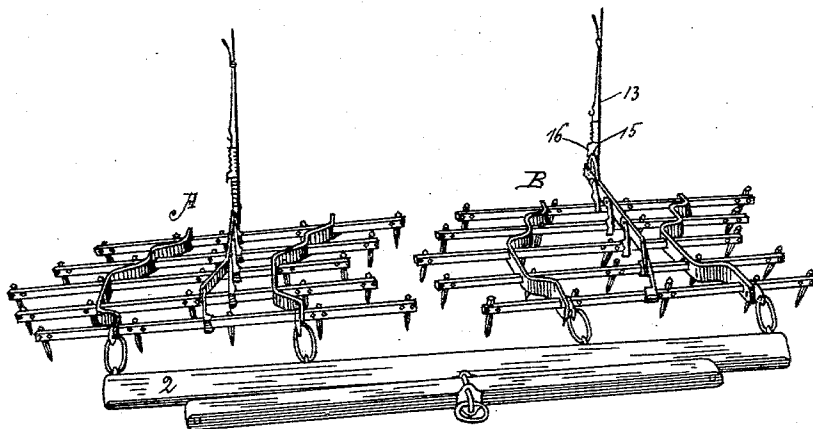
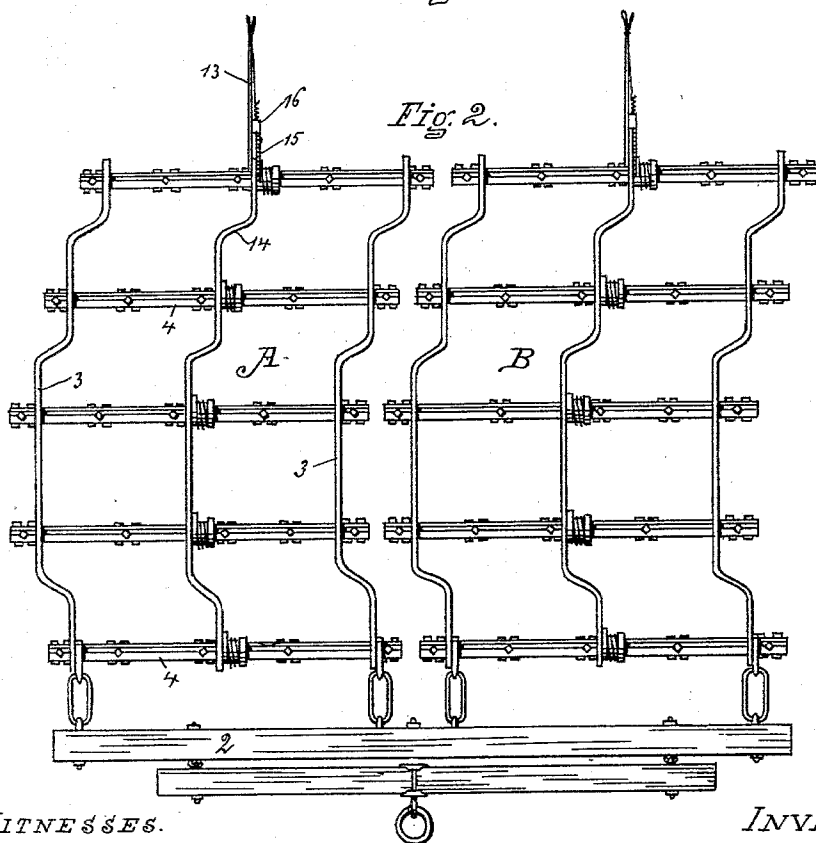


Fig. 1.



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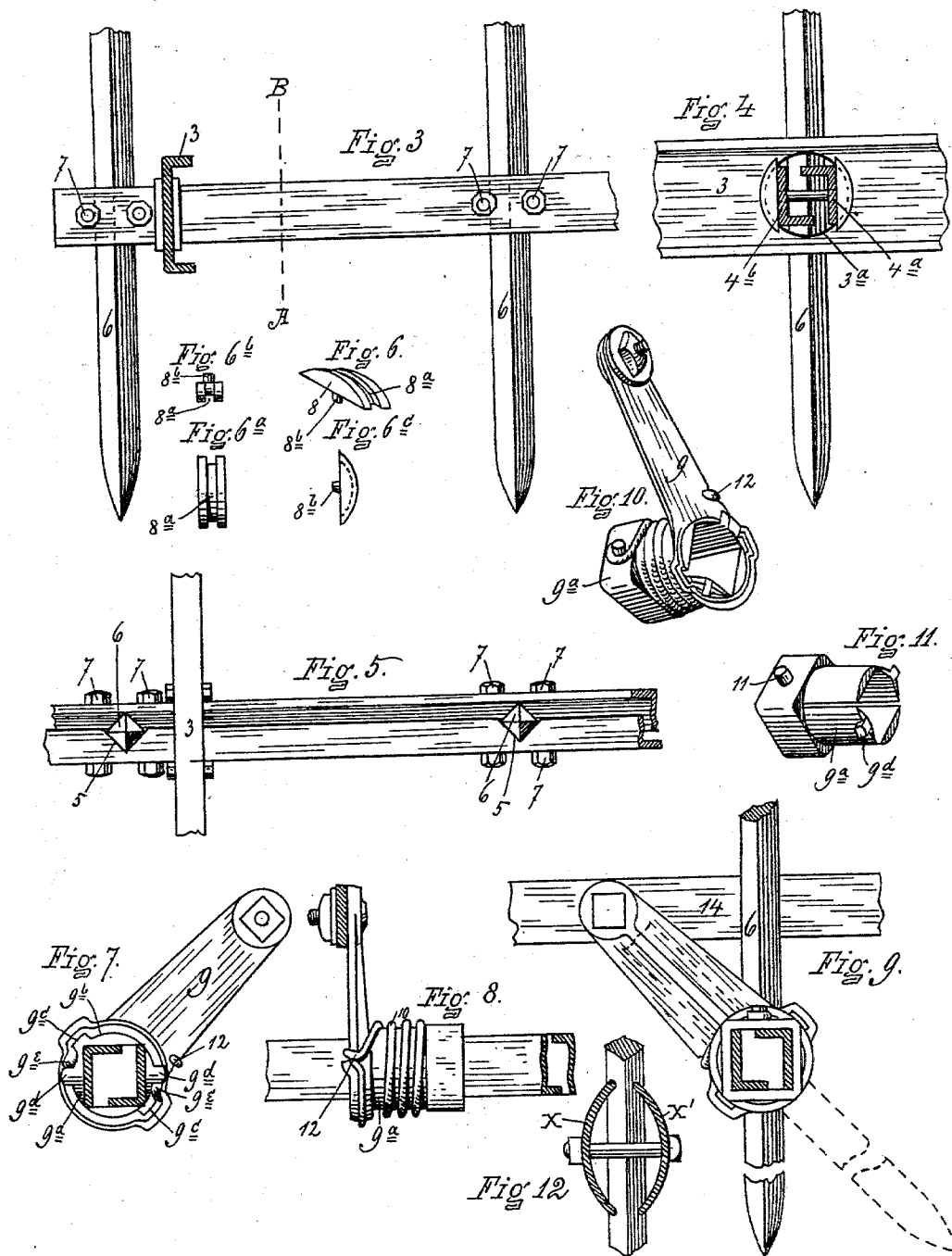
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UNITED STATES PATENT OFFICE.

HENRY D. BABCOCK AND DE VALOIS ST. JOHN, OF LEONARDSVILLE, NEW YORK, ASSIGNORS TO THE STANDARD HARROW COMPANY, OF UTICA, NEW YORK.

HARROW.

SPECIFICATION forming part of Letters Patent No. 561,643, dated June 9, 1896.

Application filed December 6, 1894. Serial No. 531,070. (No model.)

To all whom it may concern:

Be it known that we, HENRY D. BABCOCK and DE VALOIS ST. JOHN, of Leonardsville, in the county of Madison and State of New York, have invented certain new and useful Improvements in Harrows; and we do hereby declare that the following is a full, clear, and exact description of the invention, which 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 and figures of reference marked thereon, which form part of this specification.

Our invention relates to an improvement in harrows.

In the drawings which accompany and form a part of this specification, and in which similar letters and figures of reference refer to corresponding parts in the several views, Figure 1 shows a perspective view of our improved harrow. Fig. 2 shows a plan view of a slightly-modified form of construction. Fig. 3 shows a portion of one of the cross-bars in connection with a cross-section of one of the draft-bars. Fig. 4 shows a portion of the draft-bar and the cross-bar on a cross-section, together with the bearings of the cross-bar. Fig. 5 shows a plan view of the parts shown in Fig. 3. Figs. 6, 6^a, 6^b, and 6^c show details of a bearing-piece used in the harrow. Fig. 7 shows a tooth-adjusting lever from the side, in connection with the cross-section of the cross-bars. Fig. 8 shows an edge view of the same. Fig. 9 shows details relating to the teeth-adjusting mechanism. Fig. 10 shows a perspective view of the adjusting-levers shown in Figs. 7 and 8. Fig. 11 shows one of the parts of the adjusting-lever mechanism disconnected from the other parts. Fig. 12 shows a modified form of construction of cross-bars.

The harrow, as shown, consists of two sections A and B, although the number of sections may be increased or diminished at pleasure. The sections are connected by links or other suitable means to an evener-bar 2. Each section of the harrow consists of draft-bars 3 and rocking cross-bars 4. The cross-bars are composed of two bars or parts 4^a and 4^b, locked or lapped together, as shown. The horizontal flanges or webs of each bar are notched at 5 substantially up to the line of the

inner face of the vertical web portion of each part of the bar. In the notches are placed spiked teeth 6, which are securely clamped together and to the parts of the bar by bolts 7. The cross-bars pass through openings 3^a in the deep vertical webs of the draft-bars. There is also located in each opening on each side of the cross-bar a bearing-piece 8, having a groove 8^a, adapted to receive the web of the draft-bar. The pieces 8 are secured to the cross-bar by being provided with a projecting teat 8^b on the flat back side, which engages in a suitable hole or indentation of the cross-bar.

In setting up the harrow the parts of the cross-bars are slipped through the openings in the draft-bars, and a piece 8 is slipped in on either side, as shown in Fig. 4, when the bars are spread or separated as far as the size of the opening in the draft-bar will permit and the teeth are inserted between the parts of the cross-bar, holding them separated sufficiently to maintain all the parts in their respective places.

On each of the several cross-bars are provided adjusting arms or levers 9 in the following manner: Immediately on the cross-bar is provided a sleeve 9^a, having a substantially square opening to receive the bar and prevent the same being rotated therein. Means may also be provided for preventing the sleeve 9^a from sliding laterally on the bar. The base end of the arm 9 is provided with a large opening, as shown at 9^b, for the reception of the end of the sleeve 9^a, and is also provided with slotted openings in the nature of key-seats, as shown at 9^c, which permit the eye to be placed on or removed from the end of the sleeve when the key-seat groove 9^c registers with the projections 9^d on the end of the sleeve.

For limiting the swinging movement of the arm 9 on the sleeve 9^a in one direction is provided, on the end of the sleeve, a pair of lugs or projections 9^d, against which the projections 9^c on the arm are adapted to engage. Coiled about the sleeve 9^a is provided a spring 10, secured at one end to a pin 11 on one end of the sleeve 9^a and at the other hooked onto the arm 9, as shown at 12. This spring is tensioned to hold the lugs or projections 9^d

in contact with or against the projections 9^a on the arm, and adapted to allow the tooth 6 to yield when it should strike an obstruction from the position shown in full lines in Fig. 5 9 to that shown in dotted lines in the same figure. The arm on the rear rocking cross-bar is extended to form an operating lever-handle 13, and this lever-handle is connected with the several levers 9 on each of the rock- 10 ing cross-bars by connecting-rod 14. On the rear end of the connecting-rod is provided a semicircular rack 15, in which engages a catch 16 on the lever-handle 13, securing the connecting-rod, together with the several parts, 15 in any of its positions of adjustment.

In the modified form of construction shown in Fig. 12 crescent-shaped bars *x* and *x'* are substituted for the angle-iron bars shown in the previous figures, and the edges of the cres- 20 cent shapes are notched to partially receive the tooth, as shown. In this construction the elasticity or spring of the frame-bar on its cross-section line is taken advantage of in clamping the teeth.

25 The operation of this class of spike-tooth harrow is too well understood to warrant extended description. It is sufficient to note that by the provision of the spring 10 on each of the rocking cross-bars, with the set of teeth 30 located on each, they are independently movable, whereby they can free themselves when

caught on such obstructions as would otherwise injure the harrow in case the tooth failed to become released, and the independent operation of the bars obviates any jumping or 35 springing of the harrow, which would take place where all the teeth of each section moved together, as well as reducing the amount of power required to free the harrow from a fixed obstruction. All the remaining teeth 40 of the harrow except those located on the bar of the tooth, which may become caught, remain at work, as usual, in any of their positions of adjustment within the range of the adjusting mechanism provided. 45

What we claim as new, and desire to secure by Letters Patent, is—

The combination in a harrow of a rocking tooth-bar, a sleeve mounted on the bar, an ad- 50 justing-arm pivoted on the sleeve, a stop for limiting the swinging movement of the arm in one direction, and a spring coiled around the sleeve and attached to the sleeve at one end and to the arm at the other for yieldingly holding the bar, substantially as set forth. 55

In witness whereof we have affixed our signatures in presence of two witnesses.

HENRY D. BABCOCK.
DE VALOIS ST. JOHN.

Witnesses:

E. WILLARD JONES,
GEORGE C. CARTER.