(No Model.)

L. S. FLATAU.

HARROW.

No. 471,379. Patented Mar. 22, 1892.

Fig. 1.

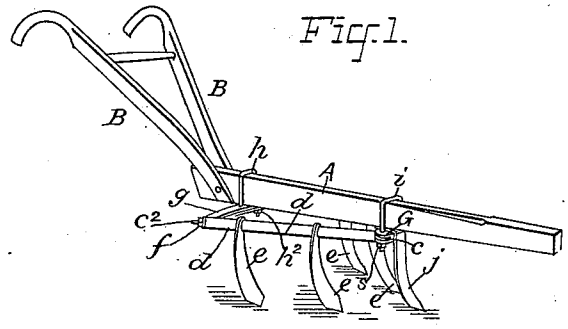


Fig. 2.

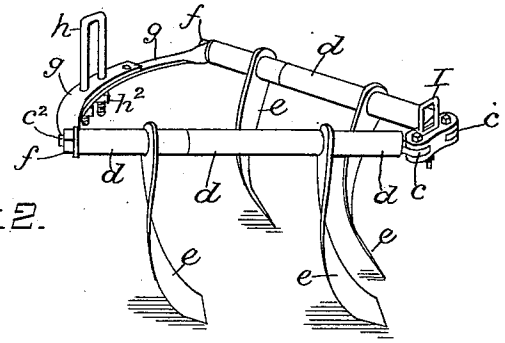


Fig. 3.

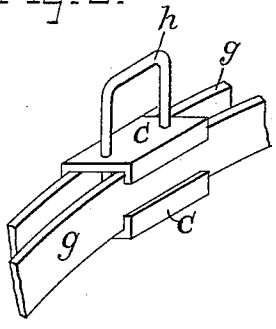
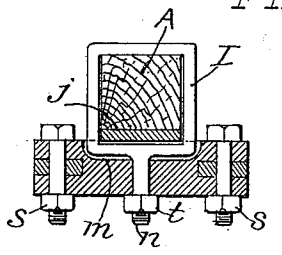


Fig. 4.



ATTEST:
J. A. Hundley
M. E. Foster

INVENTOR:
Louis S. Flatau
By
D. N. McIntire
Attorney

UNITED STATES PATENT OFFICE.

LOUIS S. FLATAU, OF PITTSBURG, TEXAS, ASSIGNOR TO B. F. AVERY & SONS, OF LOUISVILLE, KENTUCKY.

HARROW.

SPECIFICATION forming part of Letters Patent No. 471,379, dated March 22, 1892.

Application filed November 14, 1891. Serial No. 411,849. (No model.)

To all whom it may concern:

Be it known that I, LOUIS S. FLATAU, of Pittsburg, in the county of Camp and State of Texas, have invented certain new and useful Improvements in Harrows; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

In another application for Letters Patent by me now pending in the United States Patent Office, Serial No. 400,836, I have shown and described a novel construction of harrow the main or important features of which have reference to the devices and combinations of devices involved in the frame of the harrow; the means for the attachment of the teeth or blades of different kinds, and in the means for adjusting or spreading apart the lower ends of the arms composing the "A-frame" of the harrow, so to speak, and in said application I have shown and described the machine provided with a pair of handles especially adapted to the construction shown, and have shown and described a metallic head-block, to which the forward ends of the arms are pivotally attached, and which has cast integral with it not only a forwardly-projecting perforated arm for the attachment of the draft device, but also an upwardly and rearwardly projecting blade-like portion for the attachment of the lower ends of the handles of the implement.

My present invention or improvements relate to such changes in the structural features of my improved harrow as adapt it especially for use in connection with an ordinary plow-beam, more particularly such a one as is well known in the market as the "Georgia stock," so that any farmer who possesses a Georgia stock or ordinary plow-beam with its attached handles can purchase one of my improved harrows *per se* and without the exercise of any special mechanical knowledge or experience apply the harrow device or contrivance to the beam of such ordinary plow-stock.

To enable those skilled in the art to which my invention relates to make and use harrows embracing my present improvements, I will now proceed to more fully describe the latter, referring by letters to the accompanying drawings, which form part of this specification, and in which I have shown my invention carried into effect in that form or under the precise details of construction under which I have so far successfully practiced my invention.

In the drawings, Figure 1 is a perspective view of my improved harrow as applied to an ordinary Georgia stock, or with such ordinary plow-stock forming a part of the complete and operative implement. Fig. 2 is a perspective view showing the main portions of the harrow devices *per se* detached from the beam of the plow-stock, and illustrating, also, a slight modification in the construction of the metallic devices. Fig. 3 is a partial view in perspective, enlarged scale, of the parts seen at Fig. 2, but showing a modified form and arrangement of the spreader-bars and the means for clamping them in place. Fig. 4 is a detail view, same scale as Fig. 3, showing a modification of the means or devices by means of which the forward or leading end of the metallic harrow-frame may be secured to the wooden beam of the Georgia stock.

In the several figures the same parts will be found always designated by the same letter of reference.

A is the beam, and B B the handles, of an ordinary Georgia stock with which the harrow devices are combined, as best seen at Fig. 1 of the drawings.

The harrow device proper consists, essentially, (as shown and described in my other application,) of two square bars or metallic arms c^2, the forward perforated ends c of which are hung on pivotal connections at the proper locality relatively to the beam A, and which are provided with suitable, removable, and adjustable depending teeth or blades e, that are held in proper relative positions by tubular devices d, the rear ends of said arms c^2 being secured by nuts f to the outer ends of the spreader-bars g, which spreader-bars are securely clamped or fastened to the under side of the rear portion of the beam A, all substantially as shown in the drawings.

j is the duck-bill tooth, which in the pres-

ent case is shown as arranged at the forward end of the harrow.

As shown in Fig. 1, the detail construction of the implement is such that the forward perforated ends *c* of the two arms of the harrow are mounted to turn freely round about the lower portions of the inverted-U-shaped clamping bar or clip *i*, which is yoked over or embraces the beam A, and the lower threaded ends of which are provided with nuts *s*, all in such manner that the metallic head-block G, through the perforated ends of which the legs of the clip *i* also pass, is securely clamped to the beam A, and the metallic and wooden parts of the implement at the forward portion of the harrow thus firmly secured in the proper relative positions, as shown.

When it may be desired to use the duck-bill tooth *j* at the forward end of the harrow, as illustrated at Fig. 1, the upper and rearwardly projecting horizontal portion or arm of the said duck-bill tooth is simply properly adjusted or placed between the under side of the beam and the upper surface of the metallic head-block G and there securely clamped in position, as shown at Fig. 1, and with the parts thus secured together at the forward portion of the harrow the rear ends of the divergent arms which carry the harrow-teeth may be adjusted nearer together or farther apart by sliding the spreader-bars *g* on each other in substantially the manner shown and described in my other application. As shown at Fig. 1, however, these spreader-bars *g* have their outer ends twisted or turned into vertical planes, (for the convenient securement to it of the lower end of one of the arms c^2,) while their main portions lie in horizontal planes and in contact with each other instead of being arranged in the manner shown in my said other application, and under this form or arrangement of the spreader-bars said bars are clamped together and are also securely fastened to the rear portion of the beam A by means of an inverted-U-shaped clip or clamping device *h*, the ends of which pass through suitable holes *p* in the bars *g* and are provided with nuts h^2, all as clearly shown at Fig. 1. By this means, each of the overlapped spreader-bars *g* being provided with a series of holes, the said spreader-bars may be adjusted to different positions relatively by removing the nuts h^2 and lifting out of the holes the ends of the clip *h*, then reinserting the ends of the clip in such other holes as may be desired and reapplying the nuts h^2 to reclamp the parts, all as clearly illustrated.

Whenever it may be desired to use the duck-bill tooth *j* at the middle rear portion of the harrow, it is only necessary to shift it from the position seen at Fig. 1 to the rearmost position, clamping its upper horizontal portion between the under surface of the lower portion of the beam A and the top surface of the upper one of the two spreader-bars *g*. In lieu, however, of the detail construction and arrangement of parts shown at the rear portion of the harrow in Figs. 1 and 2 the spreader-bars *g* may be arranged edgewise or vertically relatively to the under side of the beam A, and may be provided with clamping jaws or plates C, as shown at Fig. 3, and substantially as shown in my other case, under which variation of construction the lower ends of the U-shaped clamping device or clip *h* will of course pass through holes in the clamping-plates C, in order to clamp or firmly secure the spreader-bars and the said clamping-jaws and the beam A together.

In lieu of having the metallic head-block G made and arranged as shown at Fig. 1, where it is clamped to the lower side of the beam A by means of the inverted-U-shaped clip *i*, said head-block may be cast with a cored-out portion or depression, as shown at *m*, Fig. 4, in order that in place of the clip *i* a device such as shown at I, Fig. 4, may be employed for the purpose of clamping the head-block and its attachments to the beam A of the stock. As seen at Fig. 4, this device I is in the form of an inverted stirrup, through which the wooden beam A is slipped, and by means of which, through the medium of its lower threaded end *n* and a single nut *t*, the head-block *m* may be drawn home or securely clamped against the under surface of the beam A, all in a manner which will be easily understood by any one of ordinary mechanical intelligence.

Of course in the use of an implement such as herein shown and described the operation and effects are substantially the same as in the case of an implement such as shown in my other application, and the advantages with reference to simplicity of construction, durability of the working parts, and the convenience of assembling and relatively adjusting the metallic parts are all substantially the same as in the case of the machine shown in my other application. In the present case, however, it will be seen that by the use of one or the other of the modified forms of or interchangeable devices herein shown and described the harrow devices *per se* may be easily applied to and removed or detached from the wooden beam A of an ordinary plow-stock, so that the farmer possessing such stock need only purchase and keep for use the metallic appliances of the harrow device proper, which I have herein shown and described and combined with the beam of an ordinary Georgia stock.

Having now so fully explained the general construction and combined arrangement of the parts of my improved harrow, what I claim herein as new, and desire to secure by Letters Patent, is—

1. In a harrow of the type shown and described, the combination, with the beam A and the metallic head-block to which the forward ends of the adjustable arms of the har-

row device *per se* are pivotally connected, as specified, of the means herein shown and described by which said head-block is securely clamped to the under side of the said beam A, all in substantially the manner and for the purposes hereinbefore set forth.

2. In a harrow of the type shown and described, the combination, with the beam A and the spreader-bars *g*, of means such as herein shown and described operating to securely but adjustably clamp the said spreader-bars to the under surface of the beam A, all substantially in the manner and for the purposes hereinbefore set forth.

In witness whereof I have hereunto set my hand this 29th day of October, 1891.

LOUIS S. FLATAU.

In presence of—
E. T. KEIGHTLEY,
B. B. GATELEY.