(No Model.)

J. H. BARLEY.

HARROW.

No. 256,619. Patented Apr. 18, 1882.

Fig. 1.

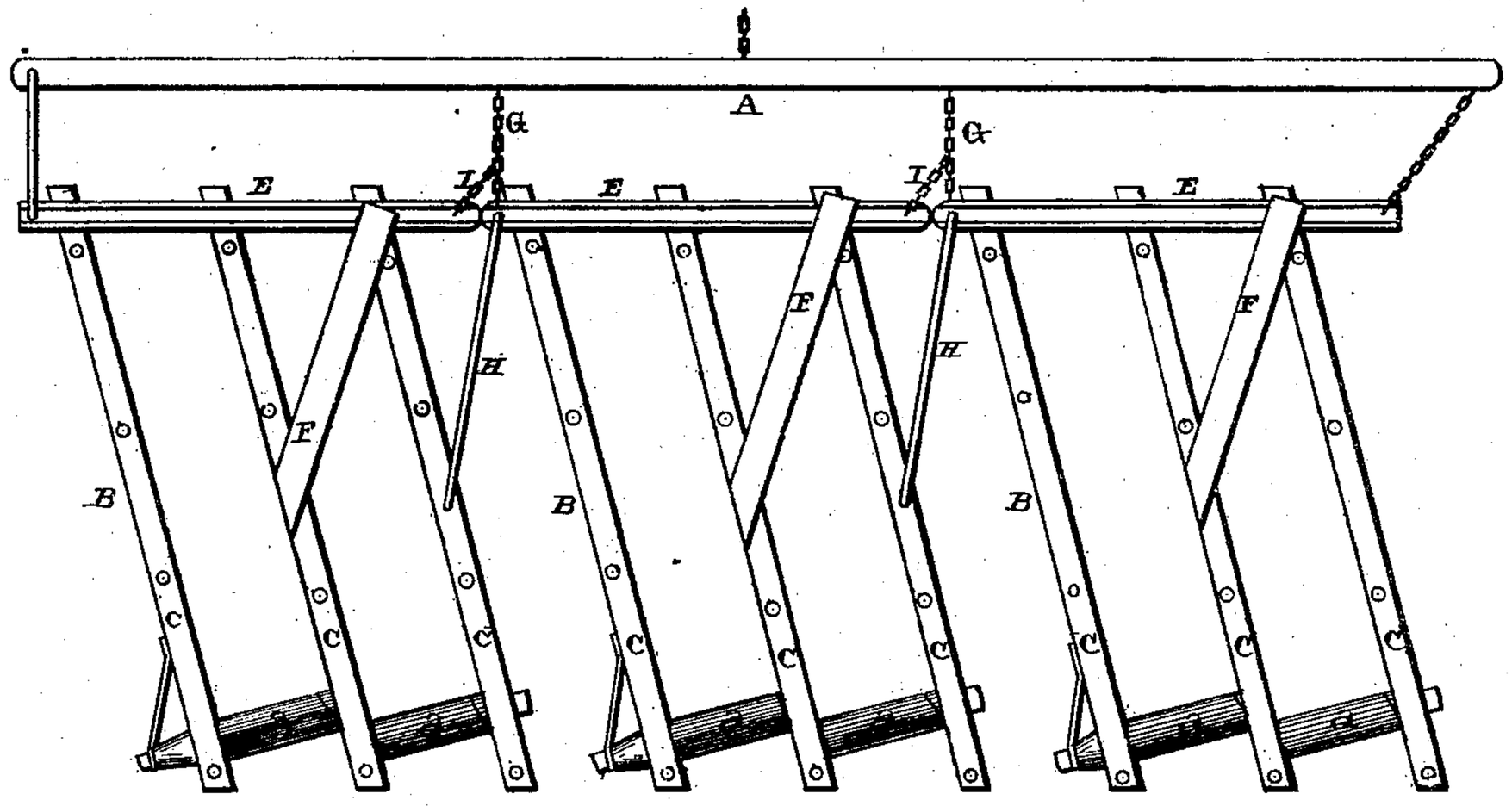


Fig. 2.

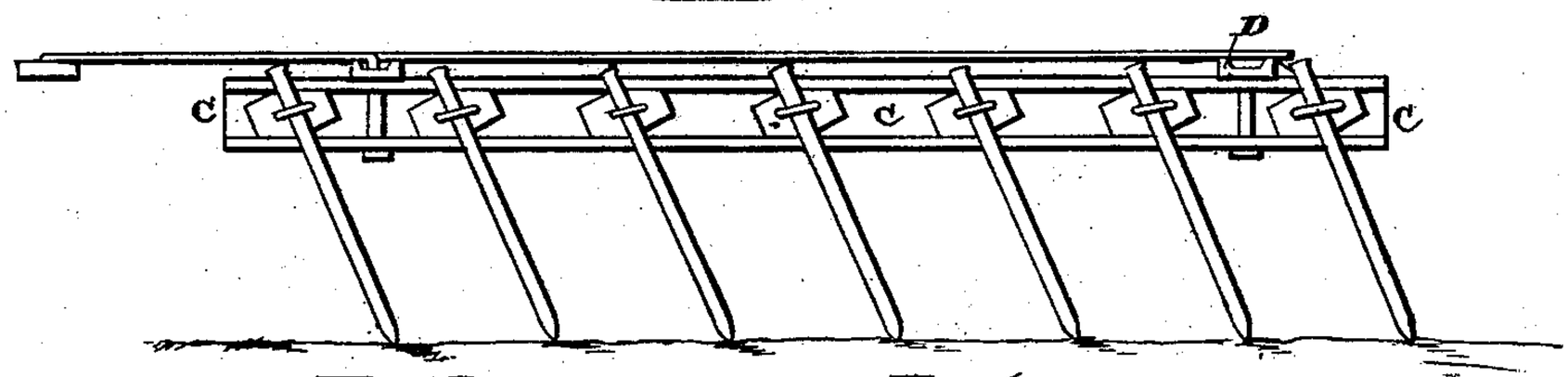


Fig. 3.

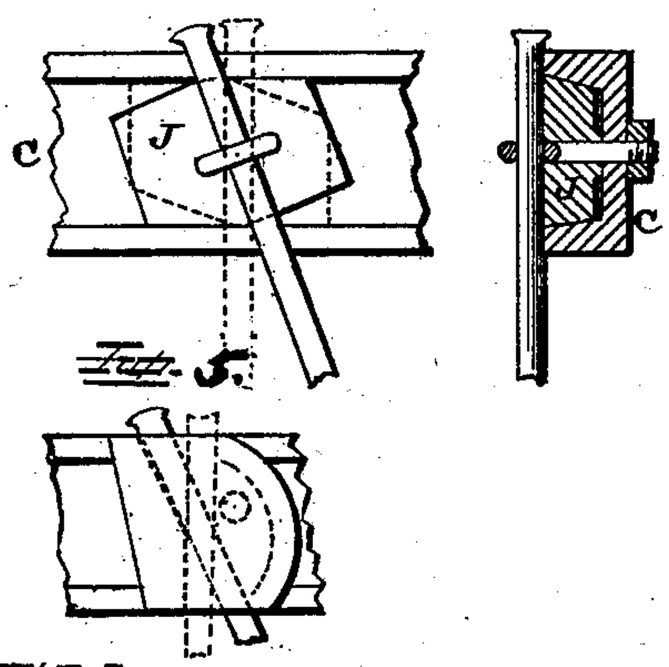
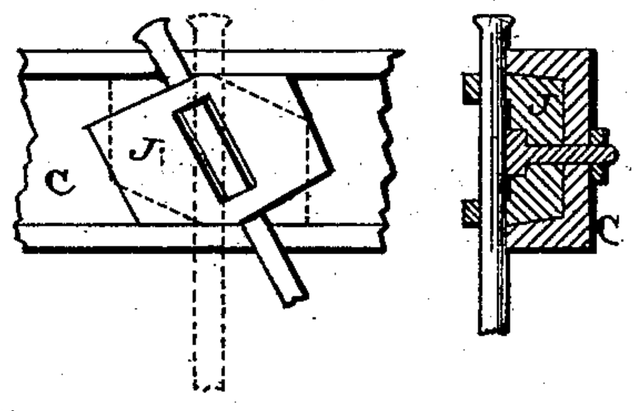


Fig. 4.



Witnesses.

Wm. H. Mortimer.

A. G. Kirkadden.

Fig. 6.

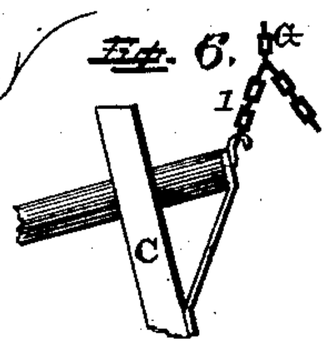
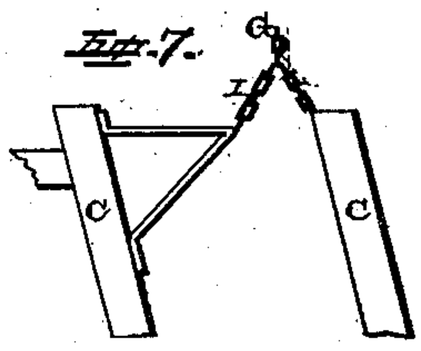


Fig. 7.



Inventor.

J. H. Barley

per

F. A. Lehmann

Atty.

UNITED STATES PATENT OFFICE.

JAMES H. BARLEY, OF SEDALIA, MISSOURI.

HARROW.

SPECIFICATION forming part of Letters Patent No. 256,619, dated April 18, 1882.

Application filed January 31, 1881. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. BARLEY, of Sedalia, in the county of Pettis and State of Missouri, 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in harrows; and it consists—

First, in attaching the sections of the harrow to a single draft rod or bar by means of chains, which have their rear ends fastened to the corners of each section, which sections are connected together by means of diagonal brace-rods or chains, and by short chains, which are fastened to the overlapping ends of the rods which connect the front ends of the beams together, and which chains are fastened to the chains which are fastened to the draft rods or bars, as will be more fully described hereinafter. The object of this part of my invention is to connect the sections of the harrow together by means of a draft attachment which renders the harrow-sections more easily turned at the corners without cramping, and which effectually prevents their rear ends from swinging and closing in upon each other when an obstacle or rough ground is encountered.

Second, in making each beam of the sections of the harrow out of double-flanged iron, and securing the harrow-teeth against the sides or edges of these beams in such a manner that they can be adjusted to stand vertically to the side of the beam, or at any desired inclination thereto, according to the direction in which the harrow is drawn. The object of this part of my invention is to devise a means for making the harrow-teeth adjustable against the sides or edges of the double-flanged beams, instead of having the teeth pass vertically up through both of the flanges, as has heretofore been the case, and thus enable the teeth to be used in two or more positions, instead of only one.

Figure 1 is a plan view of my invention complete. Fig. 2 is an edge view of the same. Fig. 3 shows a side and a vertical section of one method of securing the teeth to the beams by means of an eyebolt and a block which is placed in between the two flanges. Fig. 4 shows similar views, with the difference that the tooth passes down through the block itself, instead of through the eye made in the clamping-bolt. Fig. 5 shows the clamping-blocks secured rigidly in position between the two flanges of the beam and the teeth allowed to move back and forth in the block. Figs. 6 and 7 are detail views of the extension on the front end of the harrow.

A represents a single continuous draft rod or bar, to which the sections B of the harrow are secured. Each one of the sections of the harrow is formed of three or more double-flanged beams, C, which are united together at their rear ends by means of a cross-bar, D, or by a number of clamping-bolts, on which are placed the spools *a*, for keeping the ends of the beams the same distance apart. The front ends of the beams are secured together by means of the bars E, which overlap the sections but slightly at one corner, but do overlap considerably at the other. Across the top of each section is secured a brace, F, which has its front end fastened to the overlapping right-hand end of the connecting-rod E. These two cross connecting-rods and the brace may be made of double-flanged iron similar to the beams, or of flat rods, as may be desired.

Each section of the harrow is connected at its left-hand corner to the draft-rod A, by means of a chain, G, which has its rear end fastened to the overlapping end of the cross-rod E, and then the sections are connected together by means of the diagonal rods, braces, or chains H, which have their rear ends fastened at or near the center of one section and their front ends fastened in the overlapping end of the cross-rod E.

Instead of the chains G, a rod having its end divided into two prongs may be used.

All of the sections except the right-hand one are connected at their right-hand corners by a chain, I, with the chains which are fastened directly to the draft-rod. By means of this construction each section of the harrow is so connected to the adjoining one that they cannot possibly close upon each other at their rear ends when an obstruction or rough ground is reached, as they otherwise would do, unless some special provision is made to prevent them.

To the left corner of the left section, instead of a chain being used to connect it with the draft-rod, a single rigid link is used, so as to hold this section more firmly and rigidly in po-

sition, and thus prevent it from swinging around toward the draft-rod, as it would do, having nothing to counterbalance it on its outer side. The sections of the harrow being thus connected together and to the draft-rod, no one of them can be moved laterally without affecting the others to an equal degree.

The overlapping extensions of the bar E can be made, when preferred, by passing a rod of iron through holes formed through the sides of the beams, and through spools or blocks which go between said beams to hold them the desired distance apart.

On the right-hand front side of each end of each section a short block can be placed on the outside end of the clamping cross-rod, thus forming the projection the same as when the cross-bar is bolted across the top of the beams of each section.

I am aware that heretofore wide channel or U-shaped metal beams, similar to what are shown, have been used in harrows; but the teeth have always been passed up through both flanges, and thus held rigidly in position, so that they are capable of use in but a single position only. One of the special features of my invention is to so connect these teeth to the sides of the beams that they can be used in two or more different positions.

In Fig. 3 is shown a block, J, having two of its diagonally-opposite corners cut away, and then it and the tooth are clamped to the side of the beam in between the two flanges, as shown. As the two diagonally-opposite corners of the block are cut away, the block and teeth turn upon the bolt, and the flanges act as stops so as to limit the movement of the blocks, and thus the angle at which the teeth shall be inclined. The angle at which the teeth shall be inclined to the side of the beam is regulated by the amount which is cut from the corners of the blocks. In Fig. 4 is shown a similar block with this exception, that the bolt passes simply through the block and the beam, and the block is provided with openings through its outer edges, down through which the tooth is passed. In both of the above cases the clamping-bolt acts as a pivot upon which the block and the tooth move, and the tooth will stand vertically to the side of the beam or be inclined backward, according to which end of the harrow is first drawn forward.

In Fig. 6 a block, Y, is clamped rigidly to the side of the beam in between the flanges, and which has an opening made through it sufficiently large for the tooth to play back and forth, as shown. The inner side of this block is made thickest at its center, so as to bear against the tooth at this point only, and thus serve as the pivot upon which the tooth moves. The opening through the block is of such a shape that the tooth will be held vertically to the side of the beam when one end of the harrow is drawn forward, and will be inclined to the side of the beam when the draft is applied to the other end.

The beams of each section of the harrow may be united together at their rear ends by a number of separate and distinct clamping-bolts, upon which are placed spools or cylinders, as shown, for the purpose of keeping the beams apart. These spools and bolts may be used for connecting together both ends of the beams, or there may be an iron cross-bar used at the front end, and the spools used at the rear end only. Where the spools are used the extension beyond the front end of the harrow may be formed by making the bolt considerably longer than is necessary to reach through the two beams, and on this outer projecting end will be placed a short section of a spool, as shown in Fig. 8. This same projection may also be formed by an angular iron casting, which is secured to the side of the harrow, as shown in Fig. 9.

I am well aware that metal plates have been bolted to the sides of solid beams, and that these plates are provided with flanges around their edges, as shown in the patent to J. H. and T. K. Barley, July 2, 1878, and here lay no claim to any such devices. This invention differs from such construction in dispensing with such devices, and making the beams control the movements of the teeth.

Having thus described my invention, I claim—

1. In a harrow, the combination of a draft rod or bar with the sections of the harrow, the chains G, which unite the sections to the draft-rod, and the chain I, which unites the corner of the adjacent section to the chain G, substantially as shown.

2. In a harrow, the combination of the draft-rod, the chains G I, and the diagonal brace or chain, which unites the two sections of the harrow together, substantially as described.

3. In a harrow, the extensions E, made to project beyond the two edges of the sections of the harrow, with the chains G, which are connected to said extensions and unite the sections of the harrow to the draft-bar, substantially as set forth.

4. In a harrow, the combination, with the double-flanged beam, C, of the polygonal stop-blocks J, and the harrow-tooth clamped thereto and against the edges of the flanges, which act as stops to the movement of the blocks, substantially as specified.

5. In a harrow, the combination of a tooth-holder with the double-flanged beam, the plate being clamped thereto and inserted between the flanges of the beam which holds the plate and tooth in position, substantially as and for the purpose shown and described.

In testimony that I claim the foregoing I have hereunto set my hand this 4th day of January, 1881.

JAMES HANLEY BARLEY.

Witnesses:
A. P. MOREY,
H. W. KERR.