(No Model.)

P. E. LITTLE.

HARROW.

No. 418,199. Patented Dec. 31, 1889.

Fig. 2.

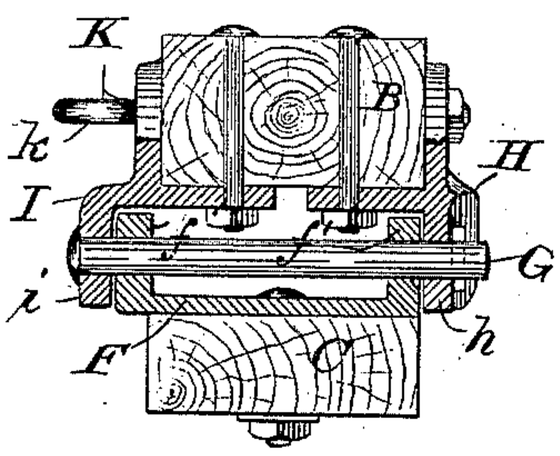

Fig. 3.

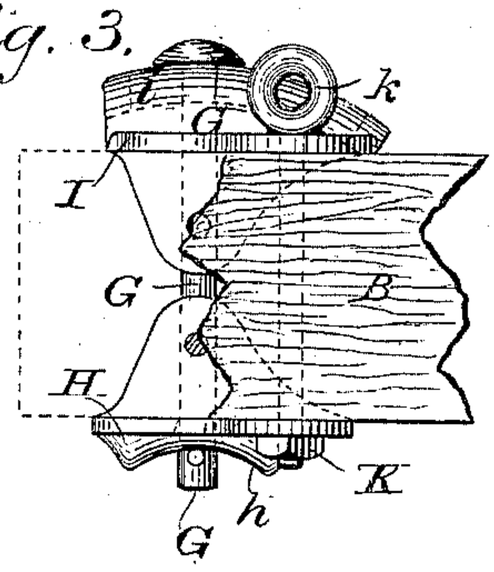

Fig. 1.

Fig. 4.

Fig. 5.

Witnesses

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HARROW.

SPECIFICATION forming part of Letters Patent No. 418,199, dated December 31, 1889.

Application filed April 5, 1889. Serial No. 306,128. (No model.)

To all whom it may concern:

Be it known that I, PETER E. LITTLE, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Harrows, of which the following is a specification.

My improvement relates to that class of harrows having gang-beams armed with disks and hinged to an overhead frame-bar in such manner as to be set at different angles to the line of draft and to rise and fall upon their hinges, so as to follow the undulations of the ground; and it consists in a peculiar construction of the hinge which connects the gang-beam to the frame-bar, whereby the uniting-bolt serves both as the pivot for the vertical play of the gang-beam and for its angular adjustment, all as will be hereinafter described.

In the drawings, Figure 1 is a top plan view of a harrow embodying my invention, one end of the draft-beam being broken away to more clearly expose the mechanism beneath; Figs. 2, 3, and 4, enlarged details, in vertical transverse section, top plan view, and front elevation, of one form of the hinged joint between the draft-beam and the outer ends of the gang-beams. Fig. 5 is an enlarged detail, in top plan view, of that member of the hinge-joint which in the present instance is secured to the gang-beam, showing also the pivot-bolt.

A is the draft-tongue, having at its rear end the inclined standard A′, bearing an appropriate seat, and beneath said standard having the rigidly-affixed transverse frame-bar or draft-beam B, which extends to nearly the entire width of the harrow, equidistant upon each side. To this draft-beam, beneath its outer ends, are pivoted at a point near their own outer ends the two gang or harrow beams C, extending from the pivotal points inward until they nearly meet, being allowed to rise and fall vertically and swing back and forth upon their pivotal connection with the draft-beam, but at no time to rock thereupon. Each of these gang-beams supports a gang of disks D, which revolve upon a shaft, rod, or journal D′, carried in bearings at the lower end of hangers E, depending from the gang-beams near each end thereof, and the inner brackets, or else the inner ends of the beams, are connected by links *e* with the lower end of a lever E′, pivoted to and latching into a segment-rack E^2 upon the draft-tongue.

As thus far briefly described, the machine in its general features does not differ materially from others heretofore in use. Coming now, however, to the hinge-joint between the draft-beam and the respective harrow-beams at that side of the draft-tongue, it should be such as to be quickly removed in assembling and dismantling the machine, should practically prohibit any rocking or oscillation of the gang-beam around its longitudinal axis, and at the same time should permit it to swing back and forth freely upon this joint, and also to rise and fall in a vertical plane that it may adapt itself to all inequalities of the ground, to hold the disks up to their work steadily, and also to permit the angling adjustments or oblique adjustments which are required by the nature of the work to be performed or the field to be operated upon. I have therefore so constructed the hinge-joint that the pivot-pin itself is the bolt which unites the gang-beam to the overhead frame-bar or draft-beam, and while it permits the vertical hinging of the harrow it is so confined to a fixed point at one end and guided horizontally at the other end in a radial movement from said fixed point that it is carried with and becomes an agency in the horizontal swinging movement of said beam. This joint I will now proceed to describe.

F is a plate bolted to the upper side of the gang or harrow beam near its outer end and having upstanding ears *f f′*, the first at the front edge of said beam and the other at the rear edge, in which is received the pivot-bolt G, and so connected with it that it shall have no lateral play therein. Bolted to the draft-beam immediately above this plate and at the rear edge thereof is a bracket H, having a depending lug *h*, provided with an eye, into which the pivot-bolt takes in such manner that it may have a considerable vibration from this eye as a pivot-bearing. To the front of the draft-beam is bolted a second bracket I, having a flange *i* depending therefrom in front of the lug from the plate on the harrow-beam, and a horizontal slot *i′* through this flange is level with the bearing of the

pivot-bolt and of such diameter as to snugly embrace said bolt. These two brackets, which may be readily cast as one, but, to accommodate varying widths of the draft-beam and changes incidental to weather, are made separate, have each a horizontal web under the draft-beam and a vertical web embracing its rear and front sides, respectively, and are secured by vertical bolts passing through the beam and the horizontal subtending webs and by one long through-bolt K, extending horizontally through the beam and through the vertical webs, and at its front end provided with an eye *k*, to which the rear end of the hound *k'* is connected; but of course this eye-bolt for the hound may be attached at any other suitable place along the draft-beam, and an ordinary bolt may be employed to secure the brackets in place. It is more convenient, though, and saves extra bolts and extra weight in the machine to place a double function upon the hound-bolt.

It will be readily understood that in assembling the parts the lug-plate is first permanently secured to the harrow-beam and the brackets to the draft-beam. Then the draft-beam is placed in position over the harrow-beam, the pivot-bolt passed through the horizontal slot in the front bracket, the two lugs in the plate and the eye in the rear bracket, and then plugged with its key or cotter, so as to prevent escape, thus finishing the joint, when the harrow-beam can rise and fall vertically upon the bolt as a pivot, but in swinging horizontally will carry the bolt with it about the pivotal point indicated by the center of the eye in the rear bracket, being restrained, however, from rocking axially in this or any movement by the guide-slot in the front bracket, which confines the bolt to a horizontal play.

In order that the inner ends of the harrow-beams may be kept at a suitable distance from the draft-beam when swung forward parallel with or past it and may not rise vertically so far as to strike against and abrade it, their upper sides are armed with wear-plates *l*, and the under sides of the draft-beam opposite these plates are provided with metal runners L, extending transversely thereacross and of such length that they will come above the harrow-beams or part thereof at any reasonable range of adjustment, so as to stop their vertical movement, and in the back-and-forth adjustments run upon the wear-plates and ease the friction. Such, however, form no part of the present invention.

I claim—

1. The combination, substantially as hereinbefore set forth, with the double-jointed hinge, one member of which has an eye at one side and guide-slot at the other, and the other member of which carries ears, of the removable pin or bolt passing through said guide-slot, ears, and eyes to unite the members together and serve as a pivot-pin.

2. The combination, substantially as hereinbefore set forth, of the plate F, having ears, the lug *h*, provided with an eye, the flange *i*, provided with a horizontal guide-slot, and the removable pin or bolt G, passing through said guide-slot, ears, and eye.

3. The combination, substantially as hereinbefore set forth, of the draft-tongue, the draft-beam, the gang-beams, the double-jointed hinge connecting said gang-beams with the draft-beams, the horizontal eyebolt connecting the upper members of said hinge to the draft-beam, and the tongue-hound extending from the draft-beam to said eyebolt.

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Witnesses:
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