

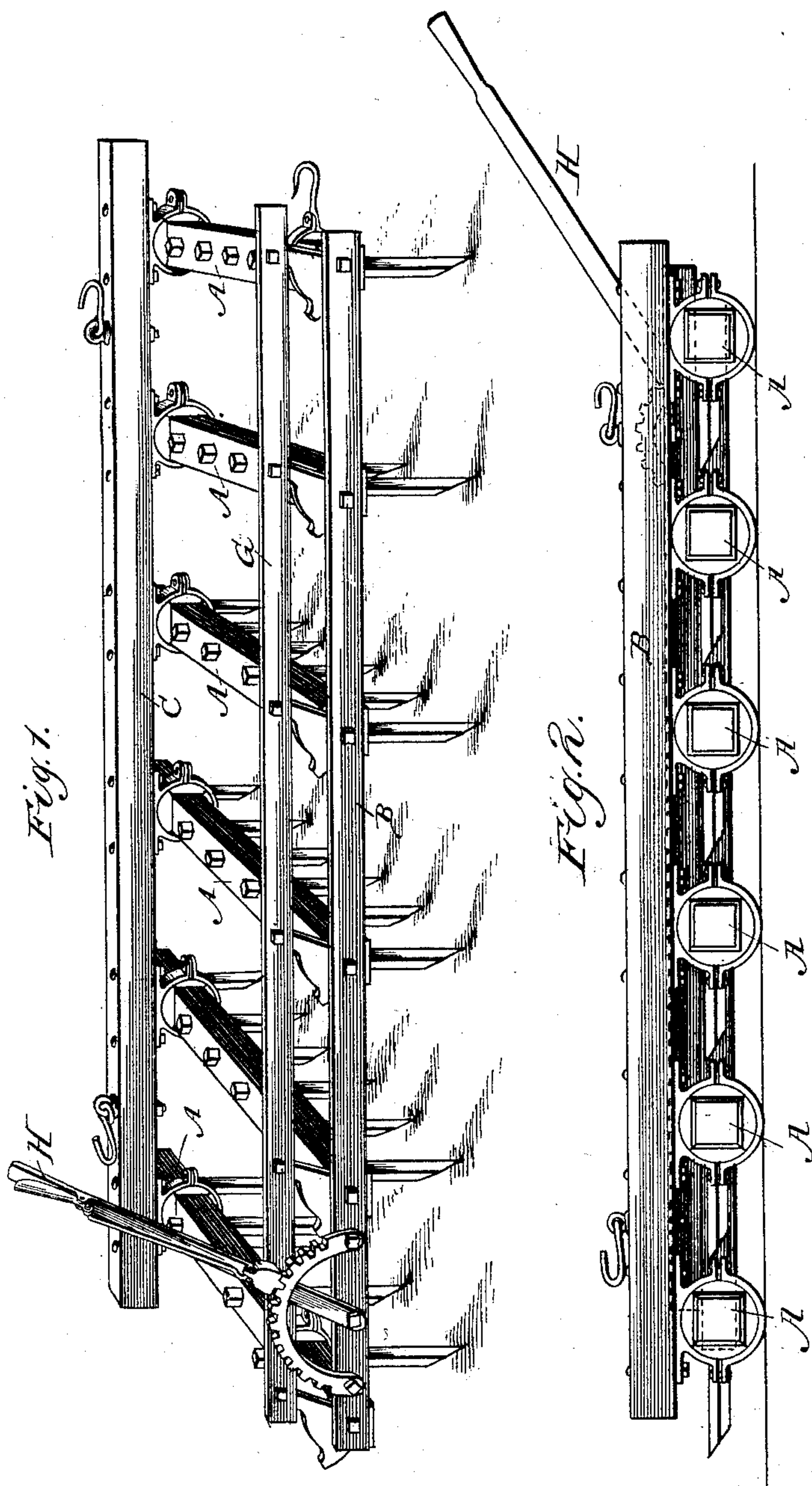
(No Model.)

2 Sheets—Sheet 1.

C. W. POST.
HARROW.

No. 363,762.

Patented May 24, 1887.



Witnesses:

Hill R. Onchundro.
W. W. Elliott

Inventor:

Charles W. Post
By, Jno. G. Elliott
Atty.

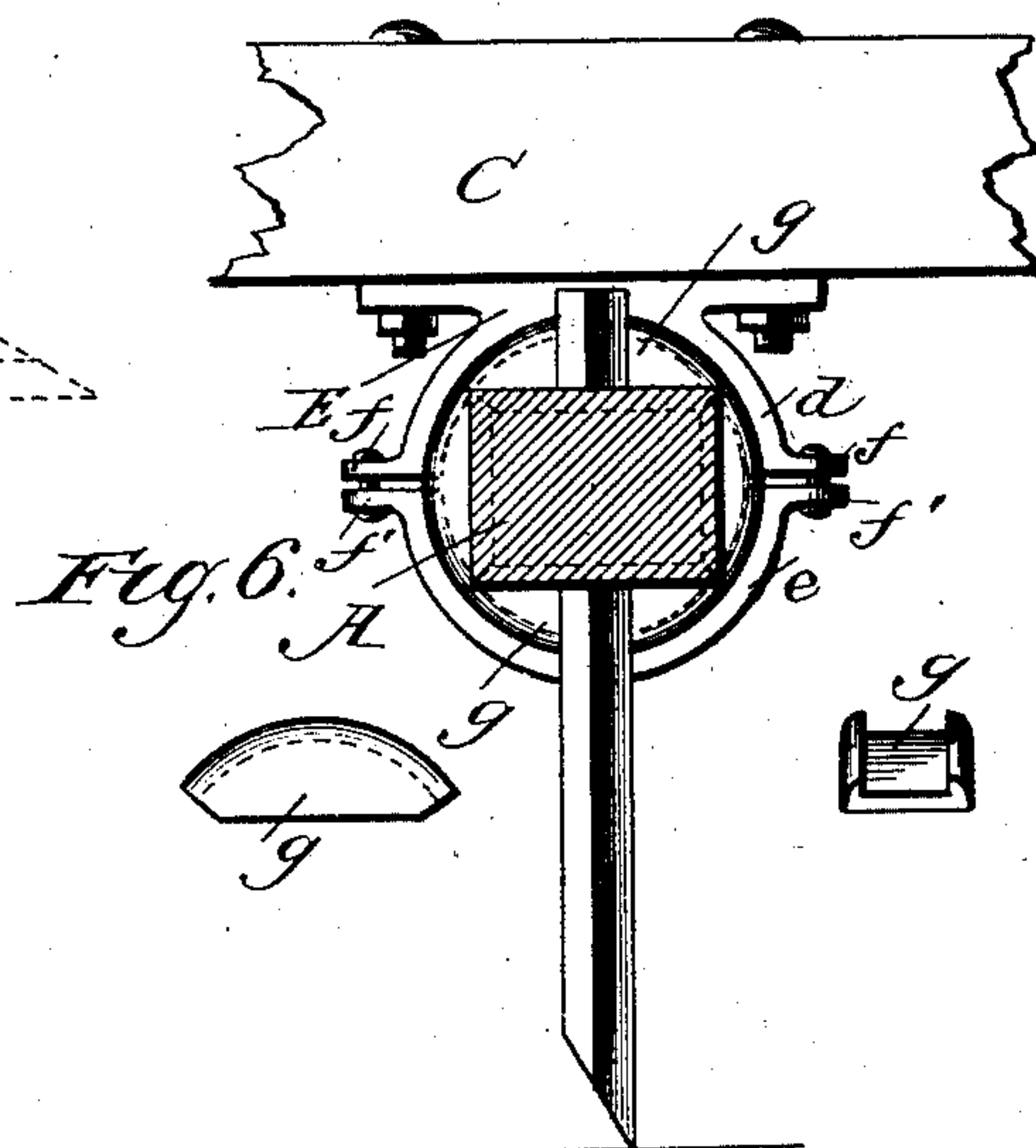
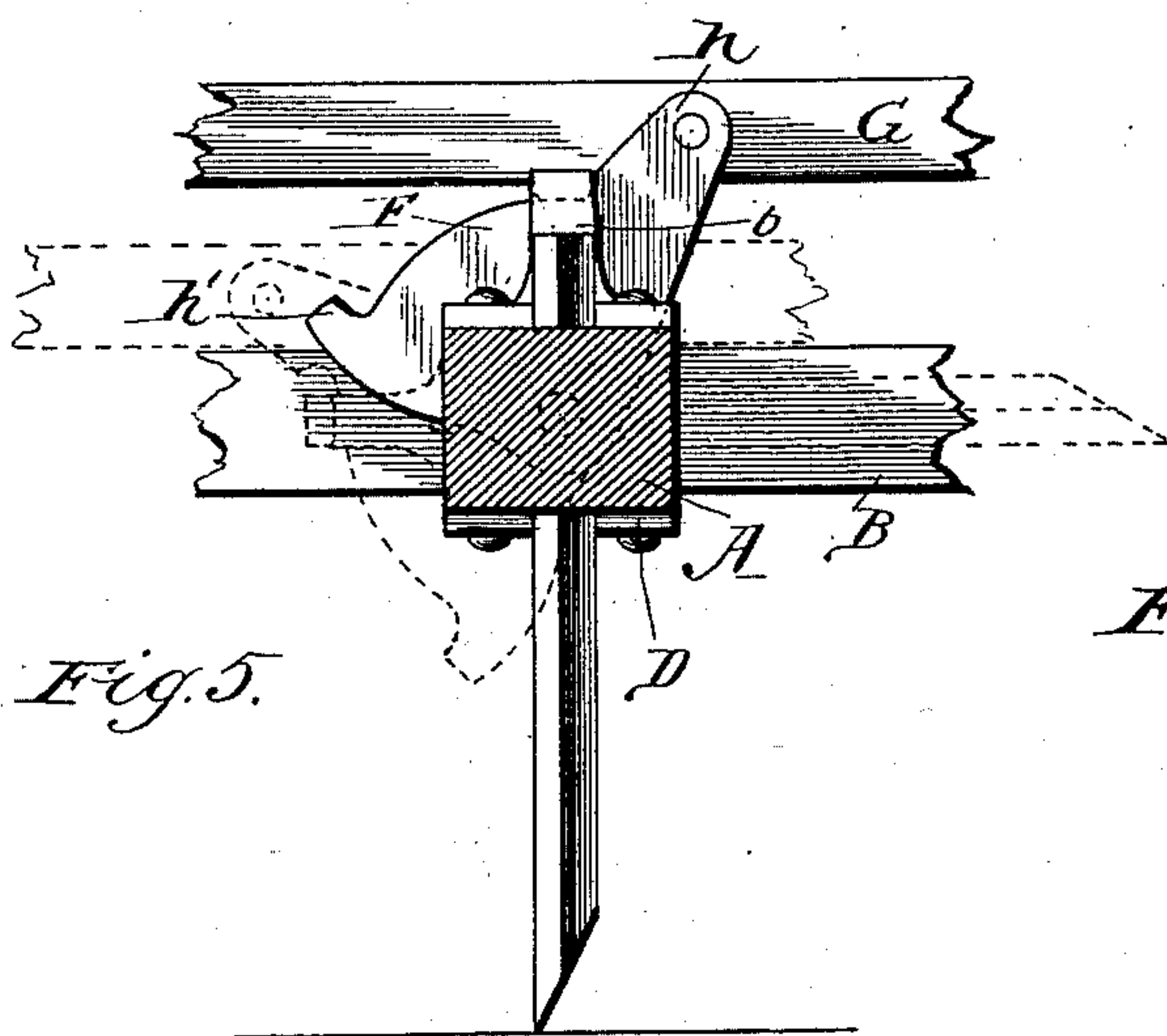
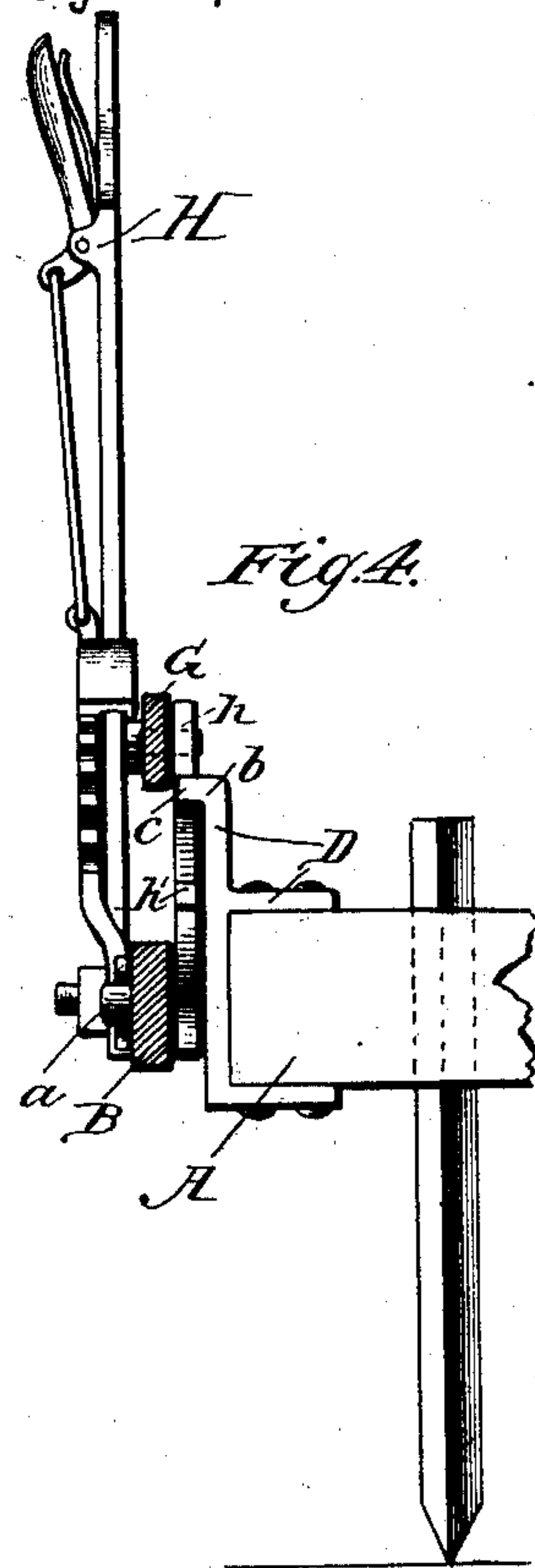
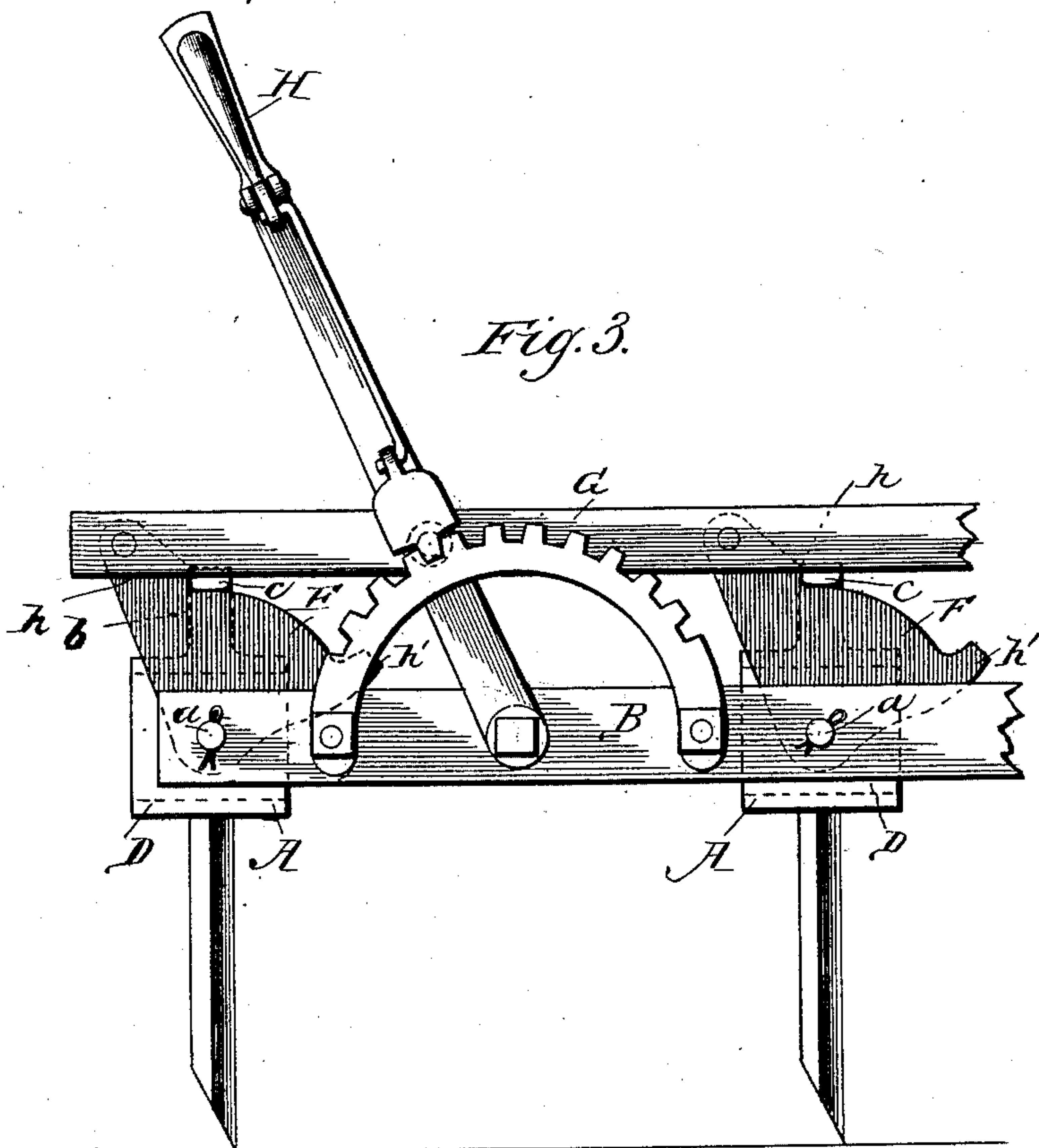
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2 Sheets—Sheet 2.

C. W. POST.
HARROW.

No. 363,762.

Patented May 24, 1887.



Witnesses.

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UNITED STATES PATENT OFFICE.

CHARLES W. POST, OF SPRINGFIELD, ILLINOIS.

HARROW.

SPECIFICATION forming part of Letters Patent No. 363,762, dated May 24, 1887.

Application filed April 23, 1886. Serial No. 199,881. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. POST, a citizen of the United States, residing in Springfield, county of Sangamon, and State of Illinois, have invented certain new and useful Improvements in Harrows, of which the following is a specification.

This invention relates to improvements in that class of harrows in which the teeth are made adjustable to various angles relative to the surface of the ground.

Prior to my invention harrows have been constructed in which the teeth were adjustable by means of a hand-lever, which also served to maintain the teeth rigid in their adjusted position as against the strain in either a forward or backward direction, and hence in dragging such harrows from place to place, when they are not designed to operate on the ground, the lever must necessarily be actuated in such case, in order to incline the teeth rearwardly, so that they may pass more freely over the ground. In addition to this, in none of the prior constructions can the teeth be folded up within the compass of their supporting-frame when the harrow is prepared for shipment, and in practice it is well known that the cost of transporting such harrows is greatly increased by the liability of their projecting teeth cutting, scratching, and otherwise injuring other articles in transportation therewith, so much so that railroads charge double first-class freight in cases where the teeth project. The objection is chiefly due to the rigid connection between the tooth-bars and the adjusting side bar actuated by the lever.

The prime object of this invention is to provide a harrow in which, when folded for shipment, the teeth will fold within the compass of the harrow's frame, whereby injury to the teeth during transportation may be avoided.

Another object is to provide such a connection between the tooth-bars and the adjusting side bar that the teeth, while in a working position, will be rigid against strain in one direction only.

Further objects are to provide such a connection between the tooth-bars and the adjusting-bar that when the latter has reached the limit of its adjustment the tooth-bar is

free to have a further rotation on its own axis independent of said adjusting-bar, whereby when the harrow is folded for shipment the teeth thereof may fold and lie within the compass of the harrow-frame, and to provide certain details of construction essential to the proper carrying out of my invention, hereinafter fully described, and illustrated in the accompanying drawings, in which—

Figure 1 represents a perspective view of a harrow embodying my invention, with the parts in position ready for use; Fig. 2, a similar view showing the harrow folded for shipment or transportation; Fig. 3, an enlarged detail side elevation of a portion thereof, more clearly showing the actuating-lever, the adjusting side bar, and the connection between said bar and the tooth-bars; Fig. 4, a detail section thereof on the line *x x* of said figure; Fig. 5, another detail section on line *y y* of Fig. 4, showing an inside view of the connection between the adjusting and tooth bars; Fig. 6, detail views of the pivoting-connection between the tooth and strengthening side bars.

Similar letters of reference indicate the same parts in the several figures of the drawings.

Referring by letter to the accompanying drawings, A indicates the usual tooth-bars of a harrow, in which are secured in any suitable manner and in any desired number and form the usual teeth, which tooth bars or beams are pivoted at either end thereof to the side bars, B and C, the former one of which is preferably composed of iron perforated at suitable intervals to receive the stud-journals *a*, provided on a suitable casting, D, bolted or otherwise rigidly secured to the ends of the beams, which casting also has an upwardly-projecting arm, *b*, on the end of which is also provided a lug or projection, *c*, for the purpose of limiting the oscillatory movement of the said beams on their journals, for the purpose hereinafter described.

The side bar, C, to which the opposite ends of the tooth beams or bars are secured, is preferably composed of wood, to the under side of which beam are secured a series of brackets or hangers, E, corresponding in number to and through which the beams project and are suitably journaled. These brackets may be

of any suitable form or construction that will permit a rotation of the tooth-beams therein without permitting an endwise or lateral movement; but I prefer to construct this bracket in the manner shown in Fig. 6, in which the bracket is shown as composed of two parts, the part *d* of which being bolted to the side bar, C, and having the bearing portion or journal part thereof formed in the shape of a semicircle, while the other part, *e*, thereof is also formed in the shape of a semicircle, and constitutes a cap for the other part, to which it is secured by the bolts passing through the lugs *f f'* on either side thereof, so that when placed together the two parts will form a circular bearing or journal of a slightly greater diameter than the tooth-beams, which are preferably square in cross-section.

Suitably countersunk in the beams, to prevent a lateral shifting thereof, are a series of segments, *g g*, the inner sides of which are flat to conform to the squared surface of the beam, but the outer sides of which are on the arc of a circle consisting of a quadrant thereof, so that when four of them are placed one on each face of the beam they form an exact circle and of a diameter slightly greater than that of the bracket E, which seats in a suitable groove formed on the curved face of these segments, which construction, while it permits a rotation of the beams within the hangers or brackets, at the same time prevents any lateral movement between these parts. In addition to this, such a connection between the side bar and tooth-beams serves to strengthen the harrow against any strain due to the lagging of one side thereof during the practical operation of the harrow.

In order to adjust the teeth to any desired position or angle relative to the ground, I have provided a series of sector-plates, F, (more clearly shown in Fig. 3,) pivoted on the stud-bolts or journals *a* of the castings D, between the said castings and the side bar, B, the said sector being of any desired length and having the ends thereof turned up, as shown at *h* and *h'*, to limit the movement of the lug or projection *c* on said casting, which projects at right angles over the concentric portion of the said sector-plate and into the path of the said ends *h h'*. To the former one of these ends is pivotally secured an adjusting-bar, G, extending the entire length of the harrow parallel with and in the plane a little above the pivoting side bar, B. This adjusting-bar is actuated by a hand-lever, H, common to this class of harrows, the spring-pawl of which engages the segment rack or gear I, for the purpose of maintaining the said lever and bar in any adjusted position, which said segment-rack is rigidly secured at either end thereof to the pivoting side bar, B, to which also is pivotally secured a hand-lever, H.

The ends or shoulders *h* of the sector-plates are preferably forward of the lug or projection *c* in the line of travel of the harrow, and hence,

as the resistance to the pivoted tooth is at the bottom or ground end thereof, this lug or projection *c* on the casting secured to the tooth-beam would at all times when the tooth is under strain press closely against the said shoulder *h*. Hence it is only necessary to change the position of the shoulder by actuating the adjusting-bar in order to give the tooth any desired angle or inclination.

It will also be observed that the pivots of the sector-plates and the hand-lever are coincident, so that as the adjusting-bar is actuated it rises and falls or approaches and recedes from the pivoting side bar, to which it is pivotally connected by this series of traveling parallel pivots; but while the tooth is held rigid and adjustable as against any strain in the forward direction, if the draft were changed to the rear end of the harrow, the teeth, without the necessity of altering the position of the hand-lever, would incline sufficiently to the rear not to engage or draw into the ground, in which position the teeth are sometimes set to work—for instance, in running over young corn.

A still more important result of the connection just described is that by reason of the independent rotation of the tooth-beams, or, rather, the rotation they are capable of in addition to that imparted to them by the extreme adjustment of the adjusting-bar, the said teeth are capable of being folded into a horizontal position, and in such manner that their points will come entirely within the compass of the tooth-beams and harrow-frame, so that when the harrow is packed for shipment the points of the teeth will be effectually protected and removed from danger of injury or fracture thereof, or of their injuring other articles in transportation with them by cutting, scratching, or otherwise, which latter is the prime objection to the prior constructions, in which such a disposition of the teeth cannot be effected, owing to the adjustment of the teeth being limited to the extreme adjustment of the adjusting-bar.

I may here add that the side bar, while forming a connection between and maintaining the tooth-bars in their relative positions, also holds the teeth to their work and prevents their rising over and shirking in hard ground.

The general operation of these adjustable harrows is now so well known that I do not deem it necessary to enter into details further than has been done in order to set forth the advantages of the construction and operation of my improvements.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a harrow, the tooth-bars, the pivoting side bar thereof, the adjusting-bar, and a sector-plate between said tooth and adjusting bars and pivoted on the axis of the former, in combination with a stud or shoulder on the

tooth-bar, projecting over and engaging shoulders on said sector-plate, substantially as described.

2. In a harrow, the tooth-bars A, the side
5 bar, B, the castings D, the stud-journals *a* on said castings, the arm *b* thereof, and the projection *c*, in combination with the adjusting-bar G, the sector-plates F, and the shoulders *h h'* thereon, substantially as described.

10 3. In a harrow, the tooth-bars A A', the quadrant-plates *g g*, countersunk therein, and when united forming a circle, and pro-

vided with grooves on the circular or working faces thereof, in combination with the side bar, C, and a series of brackets or hangers, E, 15 secured thereto, corresponding in number with and adapted to work in the groove on the faces of said quadrant-plates when in position on the tooth-beams, substantially as described.

CHARLES W. POST.

Witnesses:

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W. W. ELLIOTT.