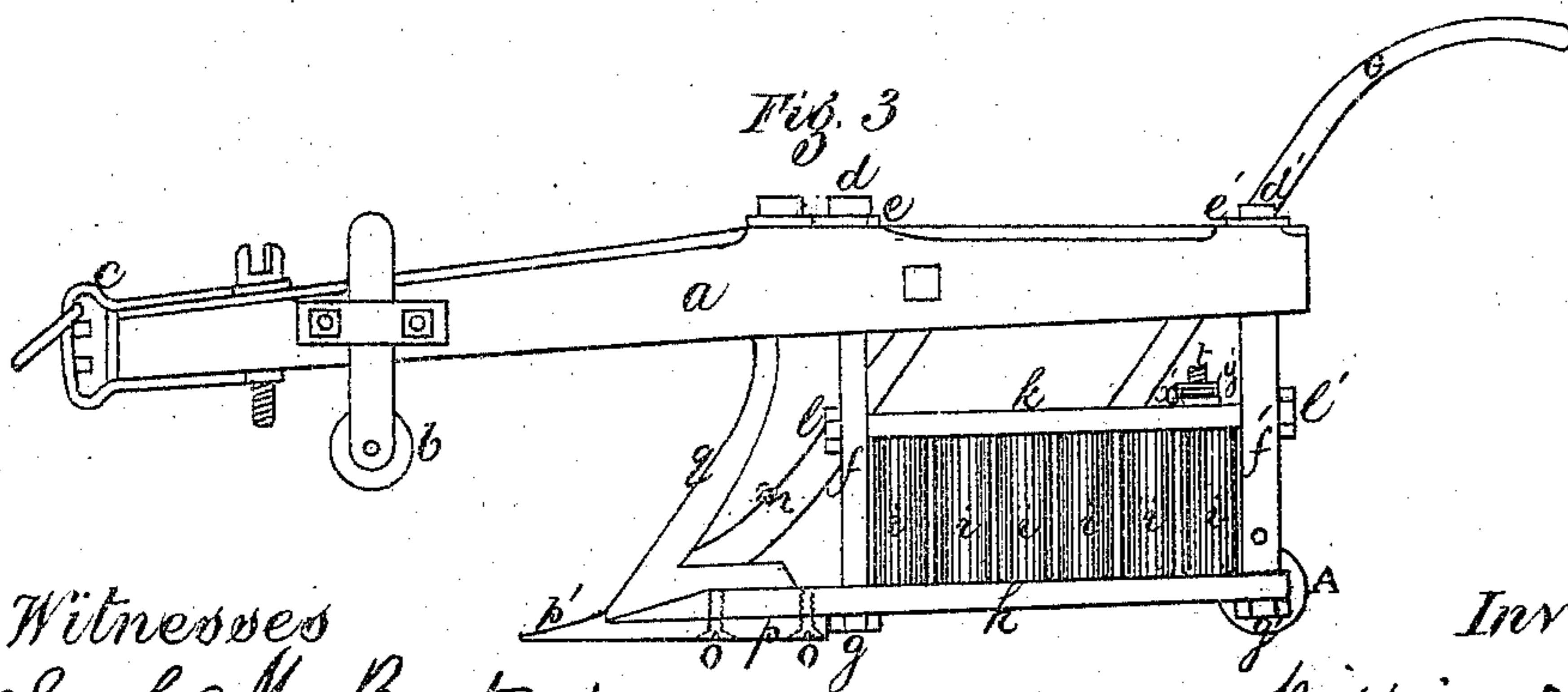
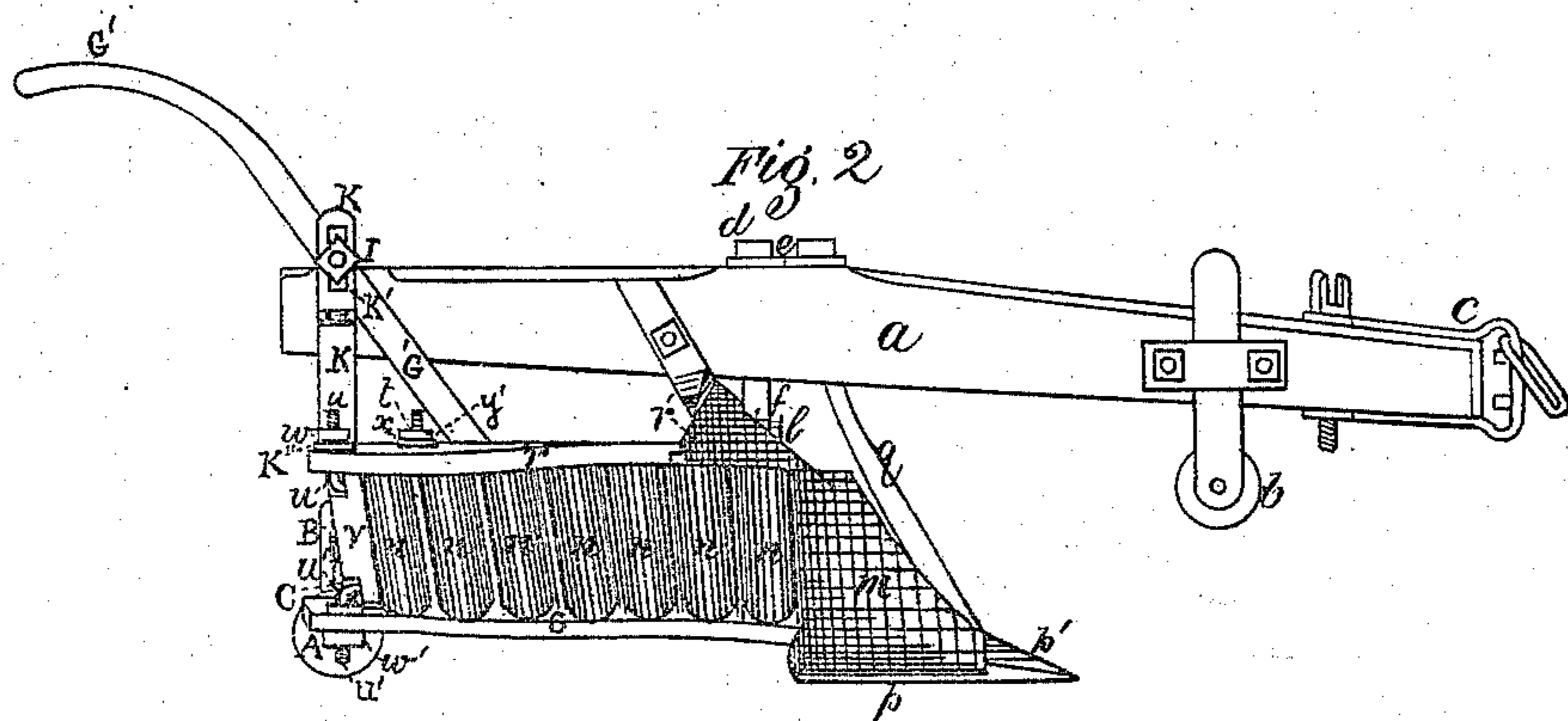
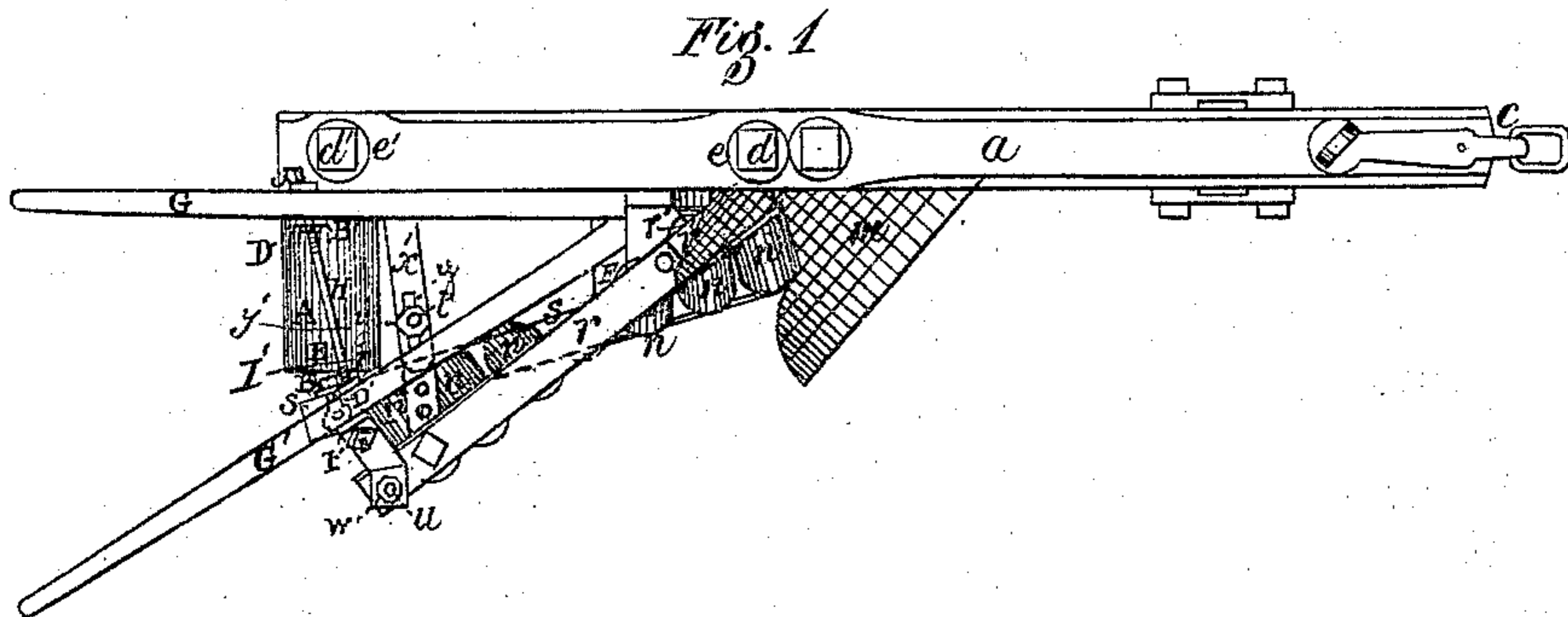


W. A. ESTES.
Plows.

No. 143,279.

Patented September 30, 1873.



Witnesses
Sam^l. M. Barton
Chas. J. Hogan

Inventor
William A. Estes
by his atty-
caneel D. Wright.

UNITED STATES PATENT OFFICE.

WILLIAM A. ESTES, OF CHINA, MAINE.

IMPROVEMENT IN PLOWS.

Specification forming part of Letters Patent No. 143,279, dated September 30, 1873; application filed April 28, 1873.

To all whom it may concern:

Be it known that I, WILLIAM A. ESTES, of China, in the county of Kennebec and State of Maine, have invented certain Improvements in Plows, of which the following is a specification:

Figure 1 of the accompanying drawings is a top view, and Figs. 2 and 3 are side views, of my improved plow.

The present invention relates to certain new and useful improvements in plows, having for their principal objects the lessening of the friction and reduction of the draft, the adjusting of the furrow side to suit the holder on sideling ground, and allowing the turning of furrows up hill, thereby obviating the use of a side-hill plow. My invention consists mainly in the peculiar construction of the plow-frame and the combination of parts, which I will now proceed to describe.

In the drawings, *a* represents the beam of a plow, provided on the forward part with a truck-wheel, *b*, and chain-clevis *c*. Extending through the beam *a* are the tops of vertical bars *f f'*, held by screw-nuts *d d'* and washers *e e'*, bearing on the top of the beam *a*. The bottom of the bars *f f'* connect with and hold, by means of screw-nuts *g g'*, a bottom plate or bar, *h*, which forms a seat for a series of vertical rollers, *i i*, &c., turning on vertical stems or axles connected with the bottom bar or plate *h* and a top bar or plate, *k*, which extends longitudinally between the bars *f f'*, to which it is held by screw-nuts *l l'* turning on the screw-ends of the bar *k*, which ends extend through the bars *f f'*. The bottom bar *h* extends some distance forward of the front bar *f*, and is beveled downward at the front to receive the bottom of a colter, *q*, and the toe of the share *m*, and has attached, by screws *o*, a steel bar, *p*, having countersunk screw-holes to receive the screws *o*, and formed on the forward part with a point, *p'*, sloping laterally and upward from the point to the heel, where it is notched to receive the toe of the share *m*, which is formed in the usual curved shape, and suitably attached to the beam *a* and to the bar *h*, and also to a top angle arm or bar, *r'*, and bottom angle bar *s*, on the mold-board side of the plow. Hinged or pivoted to the bar or arm *r*, which is con-

nected with the upper part of the share *m*, is a slightly curved or twisted angle-bar, *r*, that extends outward toward the rear, where it is connected with the bottom angle-bar *s* by hooked rods *u u'* affixed to the ends of a vertical bar, *v*, and formed with vertical screw-ends that extend through the bars *s* and *r*, which are held by screw-nuts *w w'*, turning on the said ends of the rods *u u'*. The bottom bar *s* is of a slightly curved or twisted form, and extends outward toward the rear, forming a seat for a series of vertical rollers, *n n*, &c., turning on stems or axles connected with the top and bottom bars *r r'*. The upper bar is, when extended, of a more obtuse angle than the lower bar *s*, which it crosses and extends laterally at the rear a little beyond it, and gives an oblique direction to the rollers *n*, which thus are made to slope laterally at different angles, a portion of the rollers *n* at the rear inclining outward, and the remaining portion at front inclining inward at the top, the series forming an angular twisted curve to properly direct the earth in forming the furrow. Screwed down or otherwise attached to the top bars *k* and *r*, near the rear end of the plow, are transverse plates or straps *x x'*, the former or under one of which is formed with a series of apertures to receive the stem of a screw, *t*, which extends through a slot, *y*, formed in the upper plate or strap *x'*, and receives a screw-nut, *y'*, which bears upon the plate *x'*, and, together with the head of the screw *t*, holds the plates *x x'* together; or, by its release, allows of the extension or contraction of the top bar *r*. At the bottom of the rear end of the plow is located a transverse roller, *A*, the ends of whose axle are supported by and turn in the lower portion of vertical plates *B B'*, extending upward and formed with slots *C*, which receive the screw-stem of a screw, *D*, that screws into the bar *f'*, and whose head bears against, so as to hold in any desired position, the plate *B'*, and the screw-stem of a plate, *D'*, connected with the bar *s* or rod *u*, the plate *B* being held in any desired position by means of a nut, *E*, meshing on the screw-stem of the plate *D'*, and bearing against the plate *B*. Attached to the bottom plates *k* and *s*, near the center of the plow, is a cross-bar, *F*, arranged to receive and hold the bottom

ends of the plow-handles $G\ G'$, formed as usual, and connected near the top by a cross-rod, H , having screw-ends that extend through the handles, and receive on both sides of the handles nuts $I\ I'\ J\ J'$. Connected with the rod H , so as to have an up and down play thereon, and held or released by the nut I , is a vertical arm, K , formed with a slot, K' , in the shorter and upper portion, which is hinged to the longer and lower portion, the bottom of which is formed with an outward lateral projection, K'' , that receives the screw-end of rod u' , and is held to the top of the bar r by the nut w , which bears on the top of the bottom extension of the plate K , this arrangement of the slotted hinged arm K being for the support of the plate r , and to allow of its lateral movement. The vertical bar v is notched at top and bottom, and hung on the hooked ends of the rods $u\ u'$, so as to turn and allow of the lateral adjustment of the plate r by which the mold-board side of the plow is altered to the different work required.

By the above description, reference being had to the drawings, it will readily be seen that, by the rotation of the rollers $i\ i$, &c., and $n\ n$, &c., the friction of the plow when drawn through the earth is much lessened, and consequently less power is required in its operation; and that the rear roller A , rotating in its bearings, greatly aids in the propulsion of the plow by lessening the friction, and, by the adjustable plates $B\ B'$ and screws $D\ D'$, arranged as described, is raised or lowered and held in any desired situation, so as to regulate the angle or bearing of the plow in the earth, and to accommodate it to furrows of different depths.

It will also be observed that, by means of the pivoted top-bar r , adjusting-straps $x\ x'$, and hinged adjustable arm K , arranged as described, the mold-board side of the plow

may be extended or contracted laterally at the top, so as to enlarge its angle and change its shape, as desired, for the kind of work to be performed.

By forming the bar-point p' of steel, and of a separate piece from the share, and arranging it so as to be readily attached or removed, it can, when worn or injured, be sharpened or repaired and readily be replaced; or, if damaged beyond repair, a new point-bar may be easily attached at a very small cost.

I am aware that plows having friction-rollers have been before known, and I do not therefore desire to claim their use broadly.

Having thus fully described my improvement, what I claim as my invention, and desire to have secured to me by Letters Patent, is—

1. A plow having its mold-board adjustable laterally, so as to cause its rear end to incline outward from the bottom at any desired angle, and adapt it to turning furrows up hill, substantially as described.

2. The plow-frame, composed of the rigid bars $f\ f'$, h , k , and s , and hinged bars $r\ v$, provided on each side with the friction-rollers $n\ n\ i\ i$, and adapted to admit of the lateral extension or contraction of the plow at its rear end, substantially as described.

3. The combination of the hinged bar r with the arm r' , connecting it to the mold-board, the slotted plates $x\ x'$ connecting it to the bar k , and the hinged slotted arm K connecting it to the handle, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM A. ESTES.

Witnesses:

ZENAS PERCIVAL,
OREN A. HASKELL.