

(No Model.)

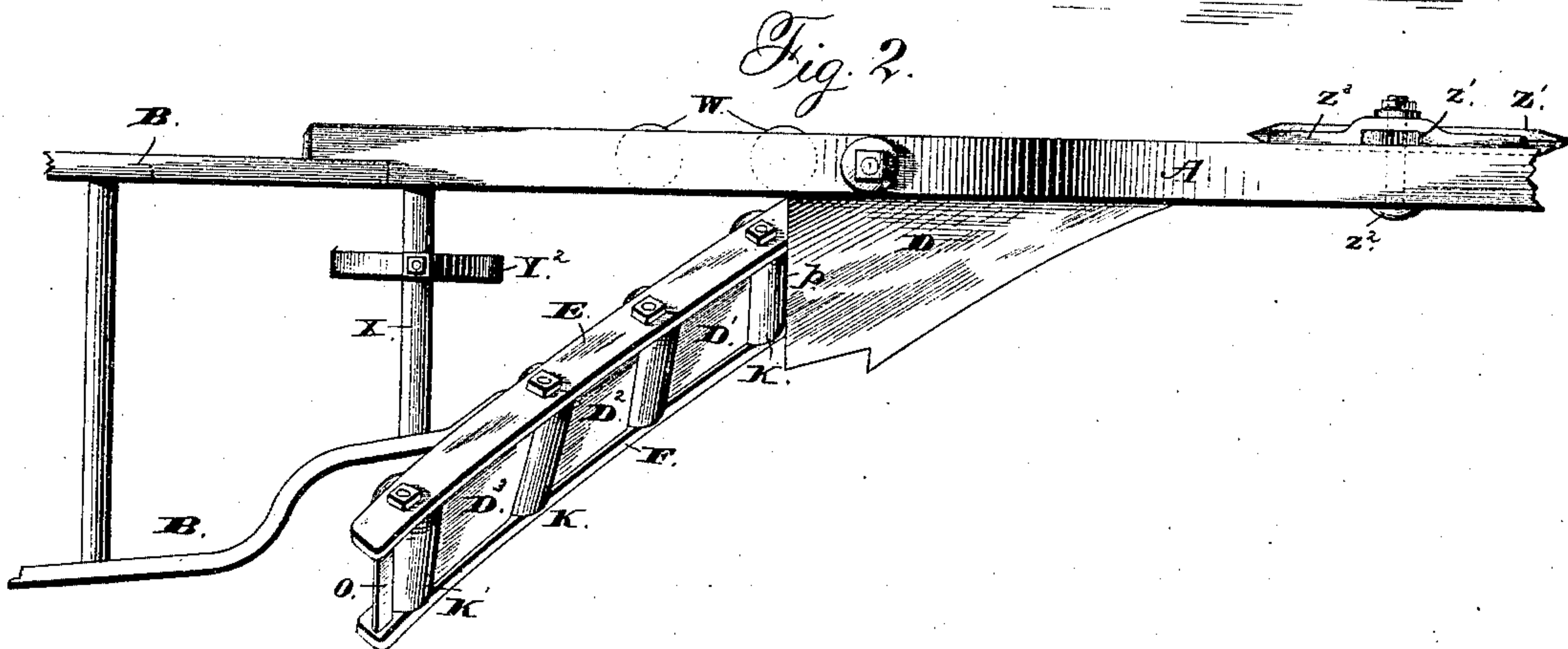
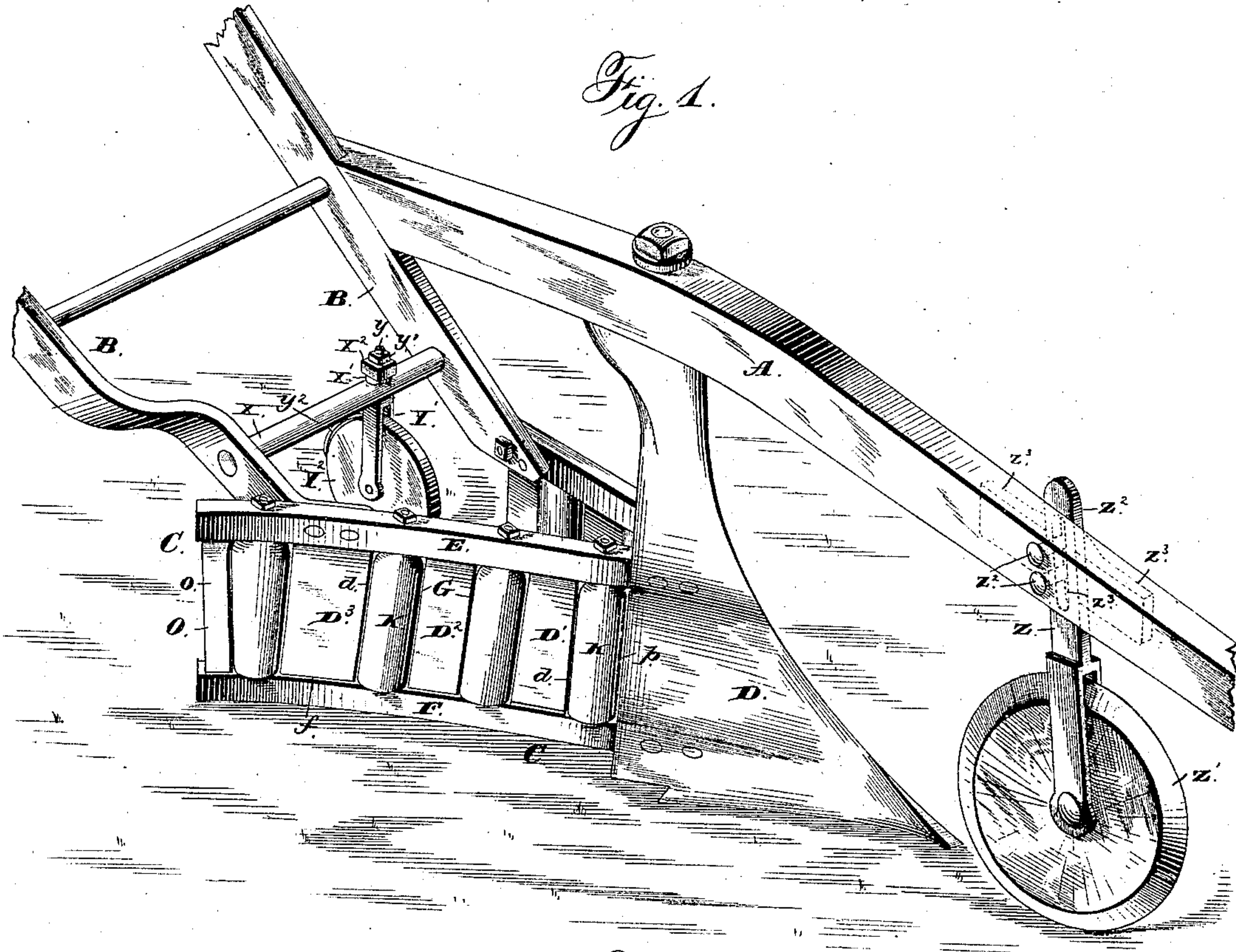
2 Sheets—Sheet 1.

W. A. ESTES.

PLOW.

No. 312,559.

Patented Feb. 17, 1885.



Witnesses:  
Jas. E. Hutchinson.  
Henry C. Hazard.

Inventor.  
W. A. Estes, by  
Chandler & Russell, his Attys.

(No Model.)

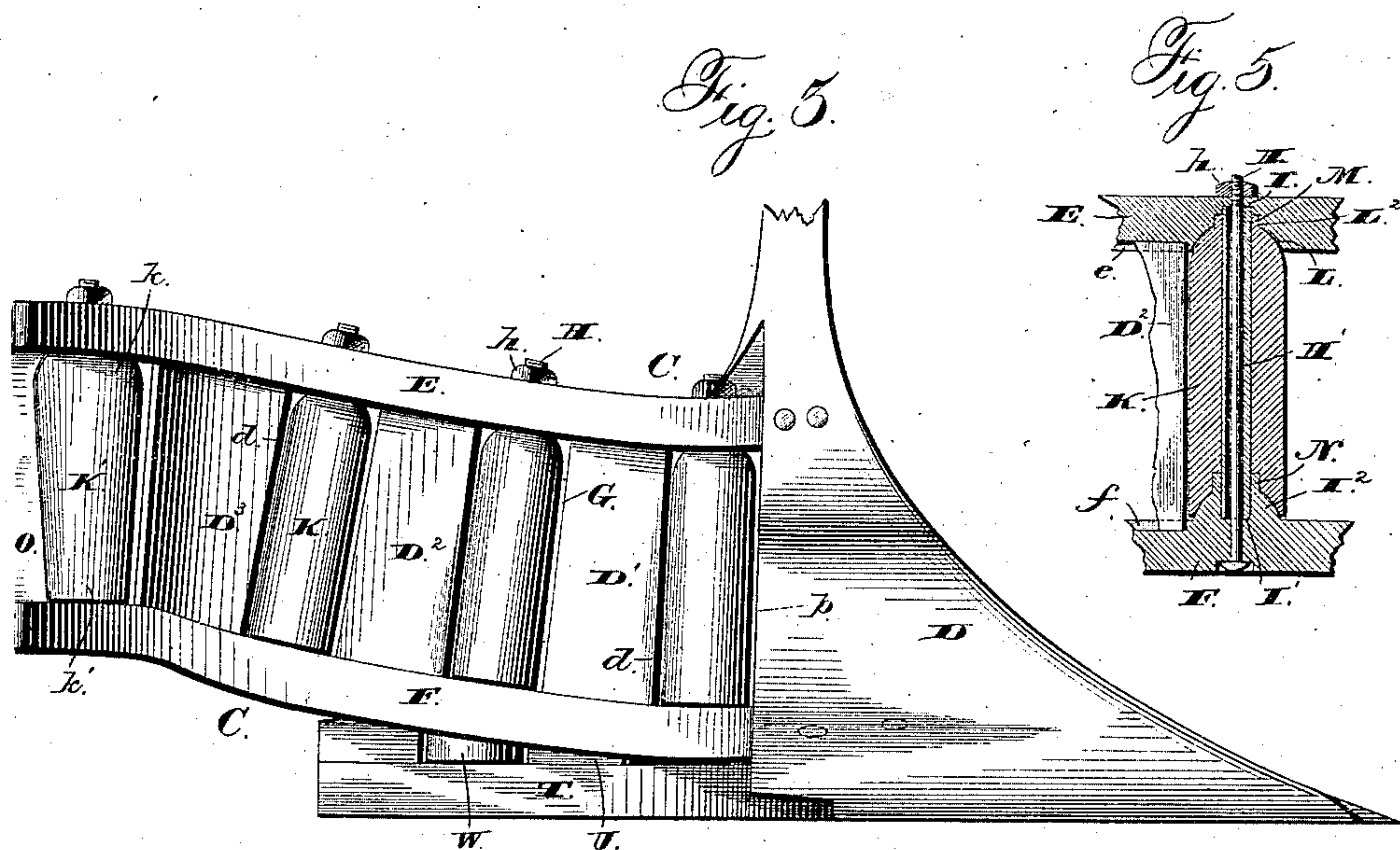
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W. A. ESTES.

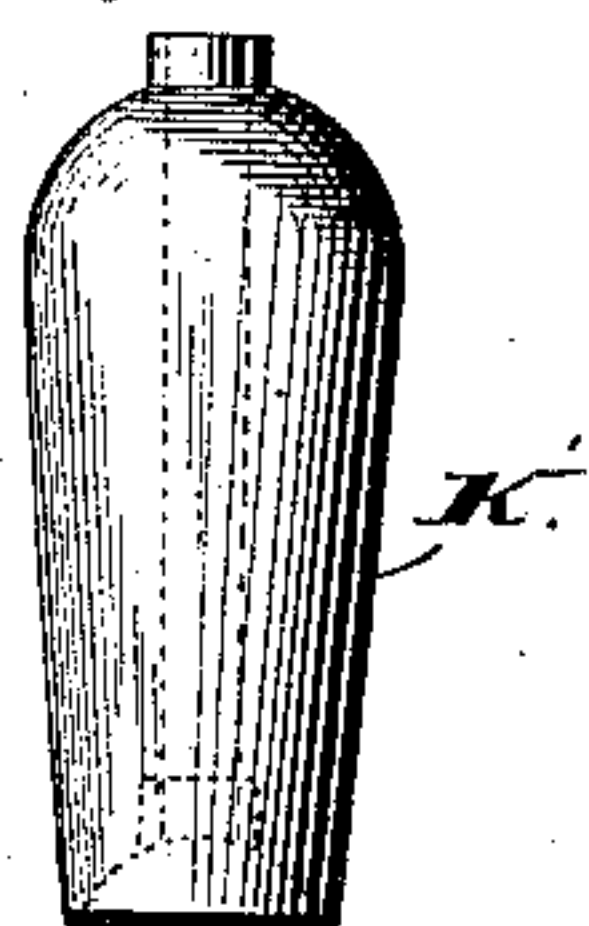
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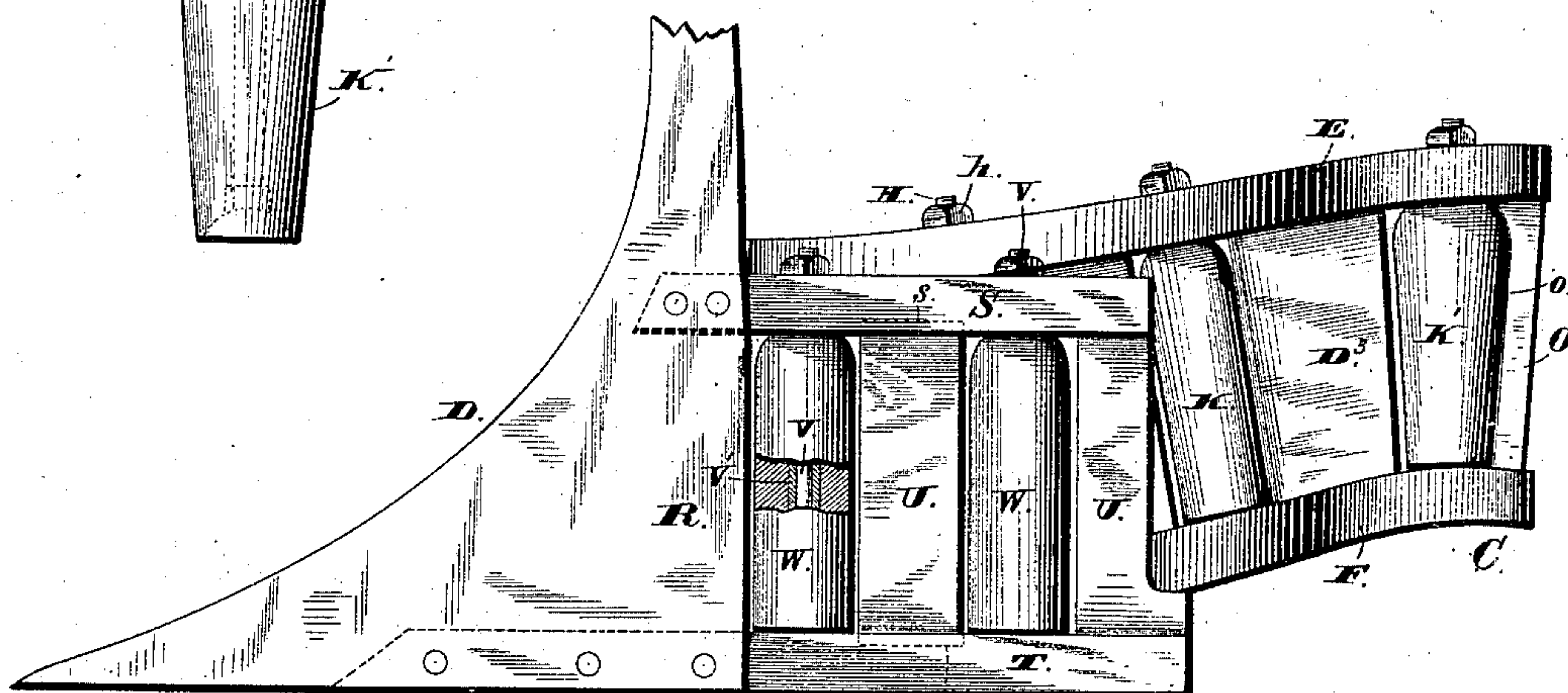
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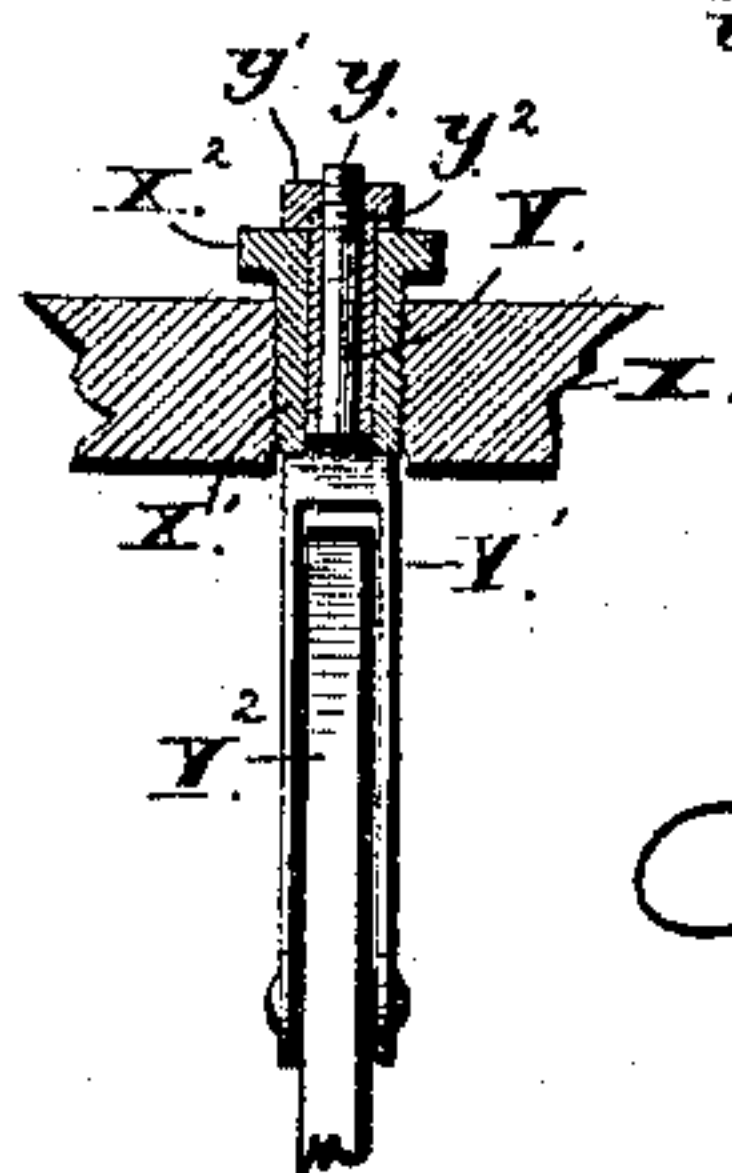
*Fig. 6.*



*Fig. 4.*



*Fig. 7.*



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# UNITED STATES PATENT OFFICE.

WILLIAM A. ESTES, OF VASSALBOROUGH, MAINE.

## PLOW.

SPECIFICATION forming part of Letters Patent No. 312,559, dated February 17, 1885.

Application filed March 28, 1884. Renewed January 7, 1885. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM A. ESTES, of Vassalborough, in the county of Kennebec, and in the State of Maine, have invented certain new and useful Improvements in Plows; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 shows a perspective view of my improved plow; Fig. 2, a plan view of the same; Fig. 3, a detail view in side elevation of the mold-board; Fig. 4, a similar view of the landside; Fig. 5, a sectional detail view of one of the rollers and a portion of each bar in which its ends are journaled; Fig. 6, a detail view of the roller at the rear of the mold-board; Fig. 7, a sectional view of supporting-wheel and its adjusting devices.

Letters of like name and kind refer to like parts in each of the figures.

The object of my invention is to provide an improved plow; and to this end it consists in the construction, arrangement, and combination of parts, as hereinafter described and set forth.

In the drawings, A designates the plow-beam, which is of the ordinary form. The handles B B are also of the ordinary construction, and attached to the beam and braced in the usual way. The mold-board C, I make separate from the plow point or share D. This board, instead of being made in one piece or plate of suitable curvature, as heretofore, is formed of the upper and lower bars, E F, and the panels D' D<sup>2</sup> D<sup>3</sup>, whose upper and lower edges are received and held in grooves *e* and *f* in the lower side of bar E and the upper side of bar F, respectively. These panels are, as shown, set some distance apart to leave the spaces G G between them. The grooves *e* and *f* are, as shown, near the outer or bearing side of the bars E F. The panels, which are preferably formed of steel well tempered, to prevent sticking or loading, are then set well out toward the bearing side of the board, near the outsides of the bars. These bars are drawn toward each other and firmly held, so as to clamp and hold the panels between them, by means of bolt-rods H H, which pass down

through both bars, and are provided either with screw-nuts on each end beyond and bearing against the bars, or with a head on the lower end, below bar F, and a nut on the other, above bar E. These bolt-rods are within or behind the plane of the panels, as shown in the drawings. Three of them are opposite the spaces between the panels, and the fourth one is situated to the rear of the rear edge of the last panel. Surrounding these rods, between the bars E and F, are the tubes or tubular bushings H' H', which form distance-pieces, to keep the bars a fixed distance apart and prevent their being sprung inward as the bolt-rods H H are tightened up by screwing up the nuts *h h*. The upper end of each of these tubular distance-pieces fits in and abuts against the upper end of the recess I in the bar E, surrounding the bolt-rod H. Their lower ends fit into and abut against the bottoms of recesses I' in the centers of the convex upwardly-projecting portions I<sup>2</sup> on the bar F.

The tubular distance-pieces H' H' can be made of gas-pipe or other tubing, as desired.

With the construction shown in the drawings and just described, when the bolt-rods are tightened up, the panels will be clamped firmly in place by the bars, and a strong and rigid mold-board will be formed with slots or spaces extending through its face between the panels.

Upon all of the tubular distance-pieces and bushings H' except the rear one are journaled the rollers K K K, of a sufficient diameter to nearly fill the spaces G G and project beyond the plane of the board face. The rear roller, K', journaled on the brace-rod in rear of the edge of the last panel, D<sup>3</sup>, is of a peculiar form, to be hereinafter described. The upper end of each roller is made convex at L, to fit a concave recess, L', in the under side of bar E, and is provided with a central cylindrical neck, M, surrounding the bushing H', upon which the roller is journaled, and fitting into a cylindrical recess, L<sup>2</sup>, in the bar E, forming an enlargement of the recess I, already described, and extending nearly to the upper end thereof, as shown. The upper end of this enlargement of recess I is shown as squared or made at right angles to the walls of the recess. If desired, it can be made in-



clined inward and downward toward its center, as shown in dotted lines in the drawings. The upper end of the cylindrical neck M will then be correspondingly shaped to fit the recess enlargement L<sup>2</sup>. The convex projections I<sup>2</sup> on the upper face of bar F are provided with the central cylindrical portions, N, surrounding the tubular bushing or distance-pieces H'. The lower ends of the rollers are concaved and recessed to fit the projections I<sup>2</sup> and the cylindrical projections N. The front edges, *d d*, of the panels, which are situated just behind the rollers, are situated so close to the peripheries of the rollers as to act as scrapers, to remove any earth adhering to them.

The bars E and F can obviously be bent so as to give any desired curvature to the mold-board, the steel panels being also bent, if desired or found necessary. The rear roller, K', is journaled on the rear tubular distance-piece or bushing, as were the other rollers on the other bushings, and its ends are formed like those of the rollers above described, and at each end fit the bars E and F in the same way. This roller is, however, not cylindrical, like the others, but is made tapering or cone-shaped, its upper end, *k*, being larger than its lower end, *k'*, as shown in the drawings. The lower end is of the size of the other rollers, preferably about two inches and a half, while its top is one-third larger. With the rear roller so constructed, as the plow passes along through the furrow, the outwardly-flaring upper portion of the roller K' will, with the least possible friction, cause the furrow-slice to be turned well over. If desired, one or more of the other rollers can be made of a shape like roller K', as just described. Where they are so constructed I contemplate making each successive roller going toward the rear of the board larger at its upper end than the one preceding it, so that the turning of the furrow-slice shall be commenced by one of the forward rollers and finished by the rear one, the operation of turning being performed by the combined action of the rollers.

Behind the rear roller, K', is attached to the bars E and F the plate O, whose forward edge, *o*, scrapes the roller K' and clears its periphery of adhering earth.

My mold-board, as constructed, can be attached at its forward end to the plow point or share D in any desired way.

As shown in the drawings, the forward ends of the bars are bolted to the inner side of the rear portion of the point D. The first of the rollers K K of the mold-board is so situated as to come close to the rear edge, *p*, of the share or point.

The landside R of my plow is constructed in the same way as the mold-board, being formed of bars S T, steel panels U U, whose upper and lower edges fit into and are held by grooves *s* and *t* in such bars, respectively, bolt-rods V, tubular distance-pieces V' around such rods and between the bars S and T, and rollers W W, formed at their ends like rollers

K and K' on the mold-board, so as to fit suitably-shaped portions of the bars S and T, all as shown in the drawings.

The landside, as is the mold-board, is fastened in any desired way to the inner face of the side of the plow point or share.

The rear edges of the mold-board side and landside of the plow-point can be beveled outward, as shown in the drawings at *v v*, the front wall of bars E F and S T being correspondingly beveled to bring the faces of the mold-board and landside as nearly flush with the side faces of the plow-point as possible. If desired, the front ends of these bars can be formed with a rabbet or offset, instead of being beveled to receive the rear edges of the point or share sides.

I do not limit myself herein to any means of attaching the mold-board and landside to the point, or of bracing or fastening the rear ends of such board and landside.

As shown in the drawings, the landside and mold-board are at their rear ends attached to the lower portions of the handles B B in the ordinary and well-known way. A cross-bar, X, extends from handle to handle, as shown in the drawings. Into this is screwed the hollow screw X', provided with an angular head, X<sup>2</sup>, to enable it to be screwed down or up, as desired. The head can be otherwise formed for this purpose. Within this screw is a hollow bushing, X<sup>3</sup>. This, as shown, extends above the head of the screw and below to a point within and not to the lower end of the screw. Up through the screw and bushing extends the swivel-shank Y of the fork Y', in which is journaled the supporting-wheel Y<sup>2</sup>. The end of the screw X' does not extend down through the bar X, but nearly so. The squared upper end of the fork portion Y' extends up in the bar into contact with the lower end of the screw. A reduced cylindrical portion, *y*, on the fork extends up into the screw, and upon the top of this portion rests the lower end of bushing X<sup>3</sup>. The upper end of the spindle or shank Y is screw-threaded, and upon this is screwed the nut *y'*, having in its lower face a recess, *y''*, adapted to receive the upper end of bushing X<sup>3</sup>, so that the nut will inclose and cover the same. A scraper, *y''*, is attached to the fork Y', so as to remove adhering dirt from the peripheral surface thereof.

With the construction as just set forth the fork and wheel journaled therein can obviously be adjusted up and down by turning the screw X' and the bushing, within which the spindle Y is well inclosed, so as to prevent the access of dirt and dust thereto.

To the beam A, in front of the plow-point D, is adjustably attached the standard or frame Z, carrying the rotary colter or cutter-wheel Z', journaled in its lower end.

The cutter-frame Z consists of the slotted bar Z<sup>2</sup>, forked at its lower end, and having the cutter Z' properly journaled in the lower ends of the forks *z z*.



Upon the side of the beam A is a plate, Z<sup>3</sup>, which has the upright groove z' on its outer side, adapted to receive the upper end of the cutter frame or standard Z. Two bolts or screws, z<sup>2</sup> z<sup>2</sup>, with suitable washers thereon, pass through the slot z<sup>3</sup> in the cutter-frame Z and into the plate Z<sup>3</sup>. These can be screwed up so that the frame and cutter will be firmly held at any adjustment.

10 The bars EF and ST can be made of wrought-iron or other desired metal, and can be made of any shape or form.

The rollers are preferably made of iron, and can be hollow or solid, as is deemed best. The peculiar manner in which they are journaled, and the form of their ends, insures protection of the journal-bearings from dust and dirt.

With my construction of mold-board and landside, as shown and described, lightness and strength are obtained, and, the bearing-surfaces being made of tempered steel plates, loading and sticking are prevented. The bolt-rods, which serve to hold the top and bottom bars in place, also carry the bushings, upon which are journaled the anti-friction rollers. Thus economy in material and space is secured. The inverted cone-shaped rear roller completes the turning of the furrow-slice most perfectly, and with a minimum of friction.

30 I am aware that it is not new to place standards and teeth in a hollow screw or socket, and to provide by such screw vertical adjustment, and I therefore do not claim such a construction, broadly.

35 Having thus described my invention, what I claim is—

1. In a plow landside or mold-board, a series of upright separate detachable plates held at their upper and lower ends in a suitable frame, substantially as shown and described.

45 2. A plow having its landside and mold-board formed of detachable steel plates held in suitable frames with spaces between them, and rollers journaled in the frame and projecting between and beyond the plates, substantially as shown and described.

3. In combination with the steel plates forming the bearing-surface of the landside or mold-board of a plow, the bars provided with grooves to receive the upper and lower edges of the plates, and means for drawing the bars toward each other to clamp the plates between them, substantially as shown and described.

55 4. In combination with the plates forming the bearing-surface of a mold-board or landside, the bars provided with grooves for

receiving and holding the upper and lower edges of the plates, bolt-rods passing through and connecting the bars, and tubular distance-pieces surrounding such rods between the bars, substantially as and for the purpose described.

5. In combination with the series of steel plates forming the bearing-surface of the mold-board or landside of a plow, bars provided with grooves to receive the upper and lower edges of the plates, bolt-rods passing through the bars, tubular distance-pieces on the rods between the bars, and rollers journaled on such pieces and extending between and beyond the faces of the plates, substantially as shown and described.

6. In combination with the upper and lower bars and bolt-rod connecting the same, a tubular distance-piece or bushing around the rod, an anti-friction roller journaled on the bushing, and provided on its upper end with a projection extending up into a recess in the upper bar around the bushing, and at its lower end with a recess, into which fits a projection on the lower bar surrounding the lower end of the bushing, substantially as shown and described.

7. In combination with a roller, at one end made convex and provided with an axial cylindrical projection, and at the other made concave and provided with an axial cylindrical recess, a tubular bushing upon which the roller is journaled, extending through the roller and beyond its end, frame-bars recessed to receive the ends of the bushing, one of which has a concave and recess to receive one end of the roller, and the other a convex portion with a projection to fit the other end thereof, and a bolt-rod passing through the bars and bushing, substantially as and for the purpose described.

8. The supporting wheel-carrying fork, squared at its upper end and provided with a cylindrical shank, in combination with a hollow screw working in a fixed portion of the frame, a bushing within the screw, and a nut upon the upper end of the shank, which fits over the upper end of the bushing and bears upon the upper end of the screw, substantially as and for the purpose described.

In testimony that I claim the foregoing I have hereunto set my hand this 14th day of March, A. D. 1884.

WILLIAM A. ESTES.

Witnesses:

JAS. P. RYON,  
HENRY C. HAZARD.