

(No Model.)

3 Sheets—Sheet 1.

N. S. BARGER.

SULKY PLOW.

No. 299,452.

Patented May 27, 1884.

Fig 1.

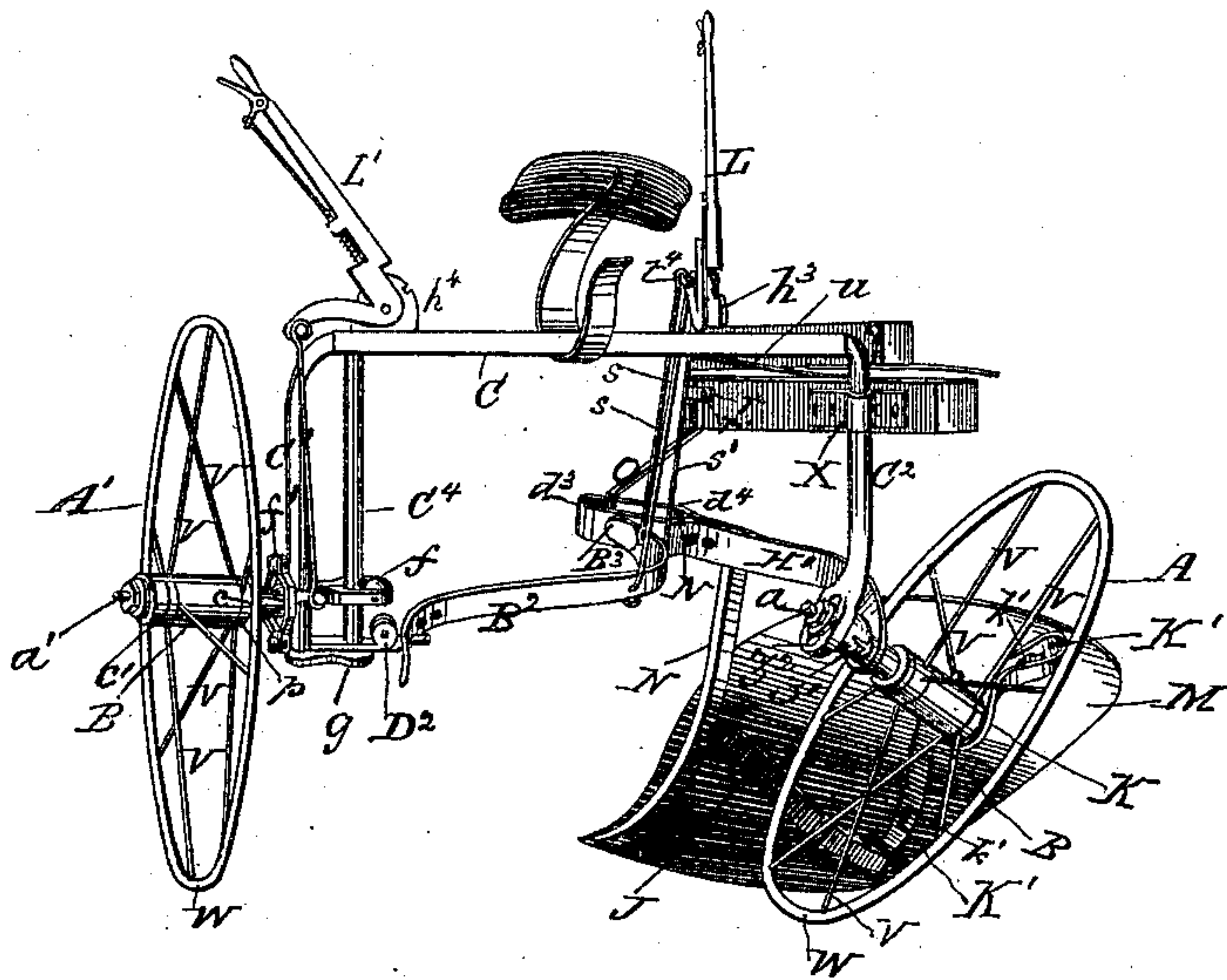
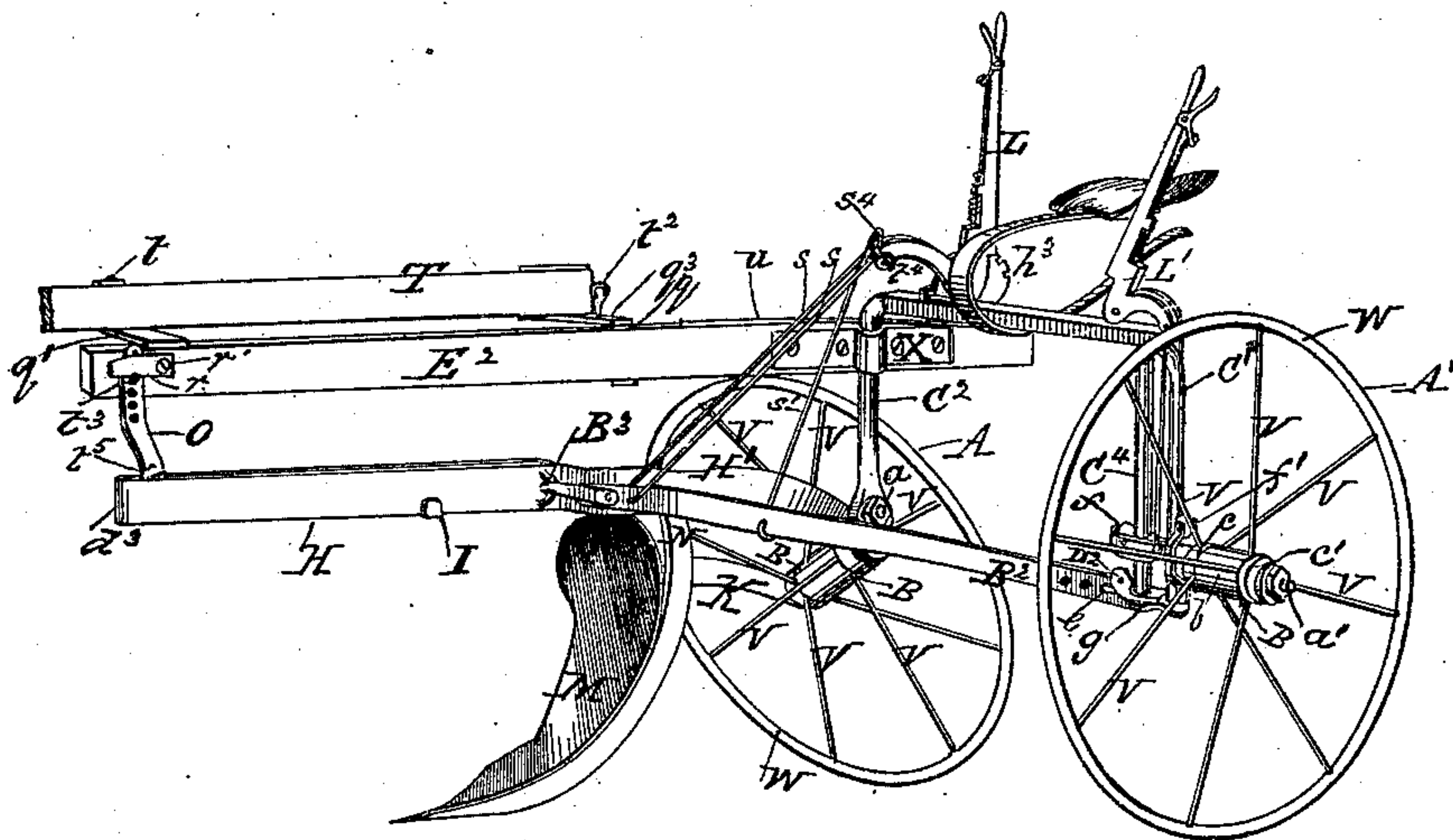


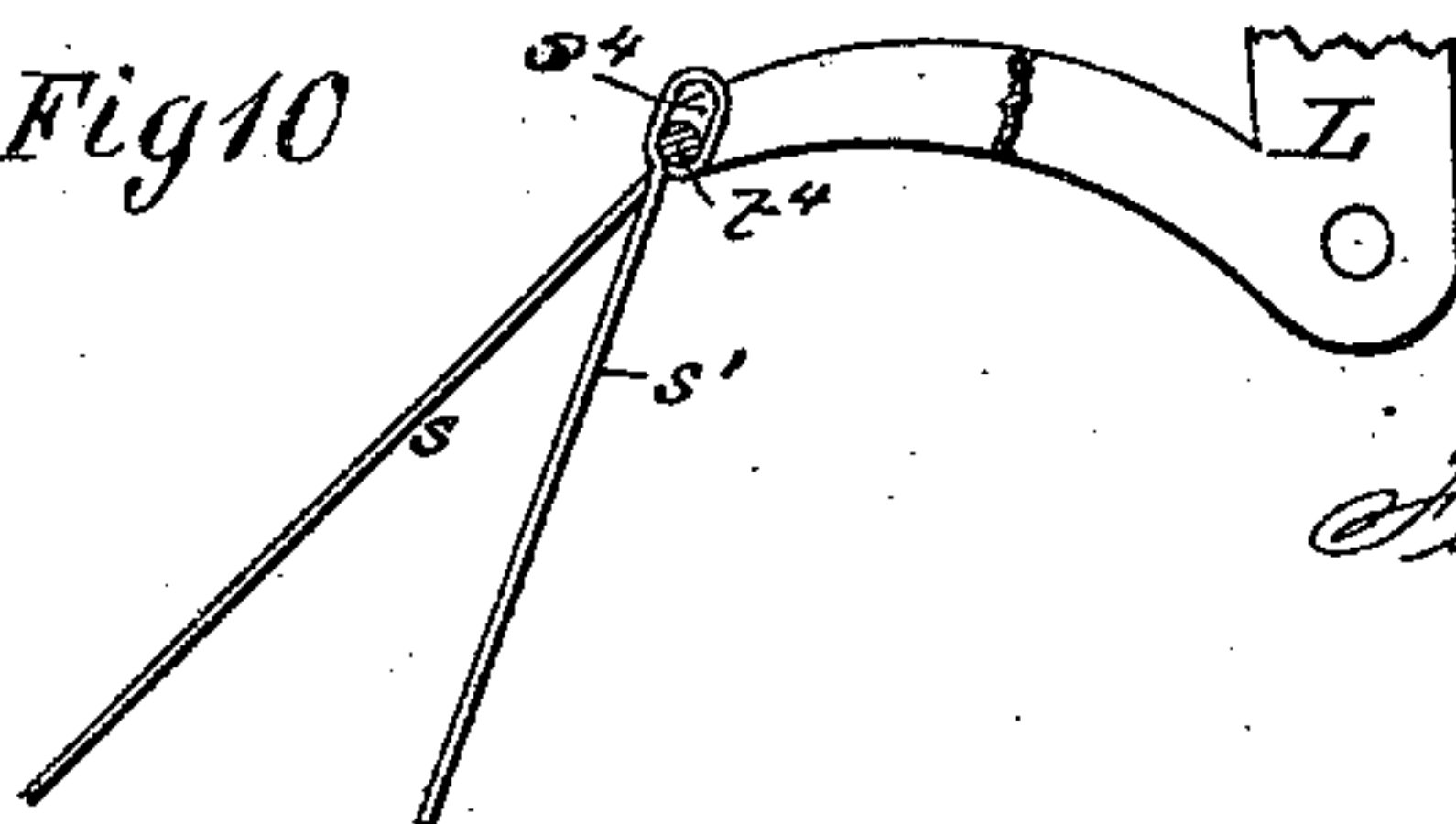
Fig 2.



Witnesses:

B. Fenwick.  
J. P. Theo. Lang.

Fig 10



Inventor:

Nathaniel S. Barger  
by his attys  
Fenwick & Lawrence

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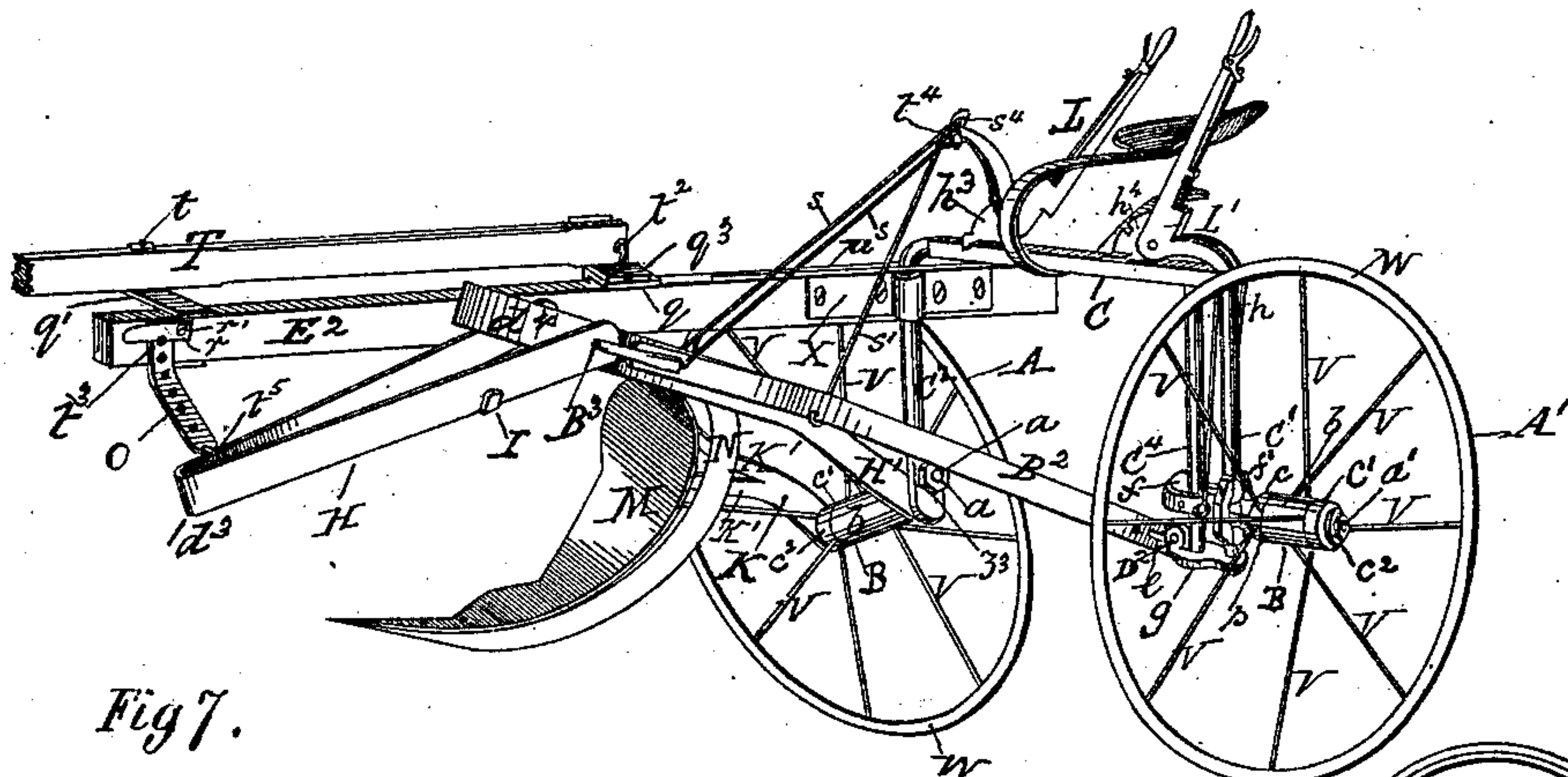
N. S. BARGER.

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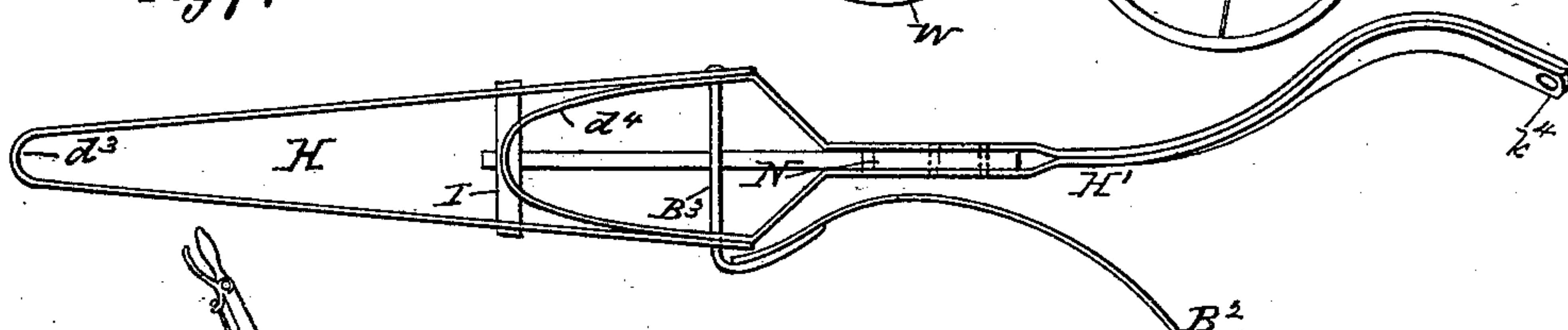
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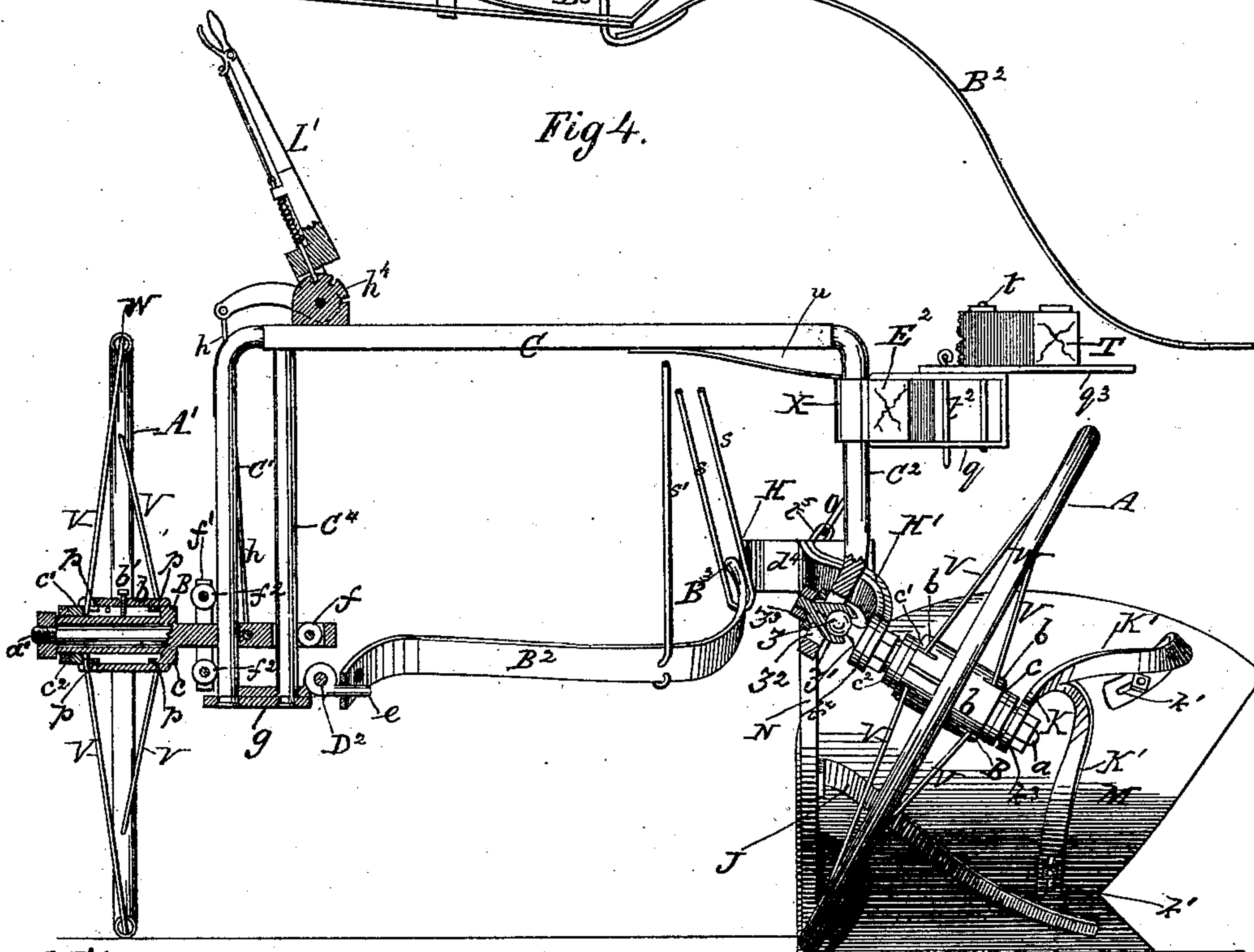
*Fig 3.*



*Fig 7.*



*Fig 4.*



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SULKY PLOW.

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Fig 5.

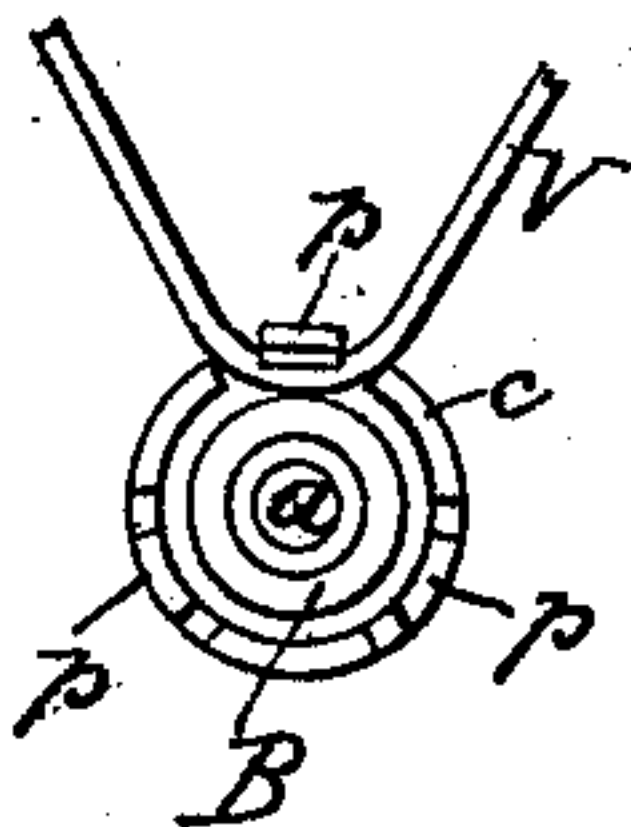
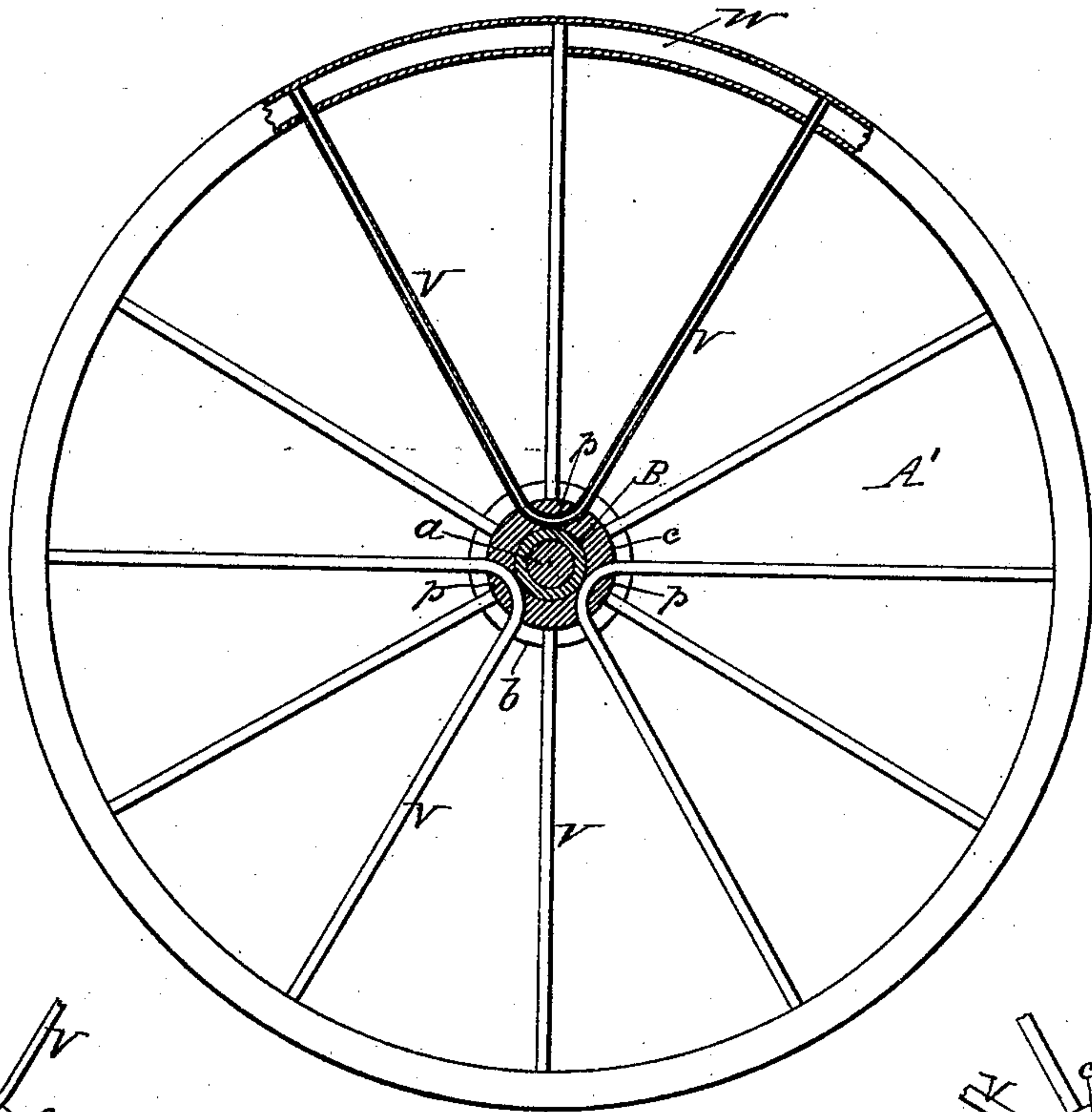


Fig 8.

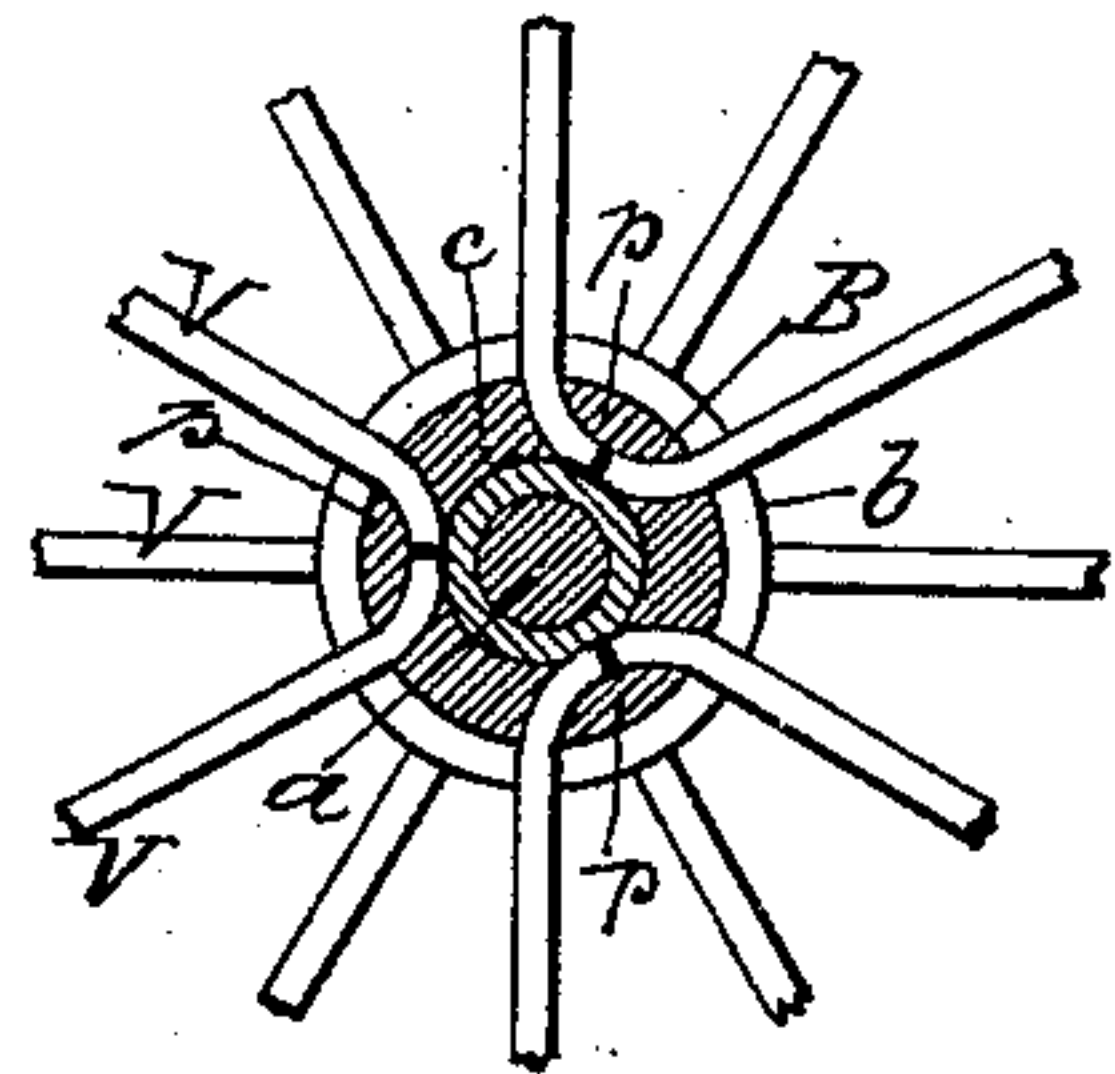
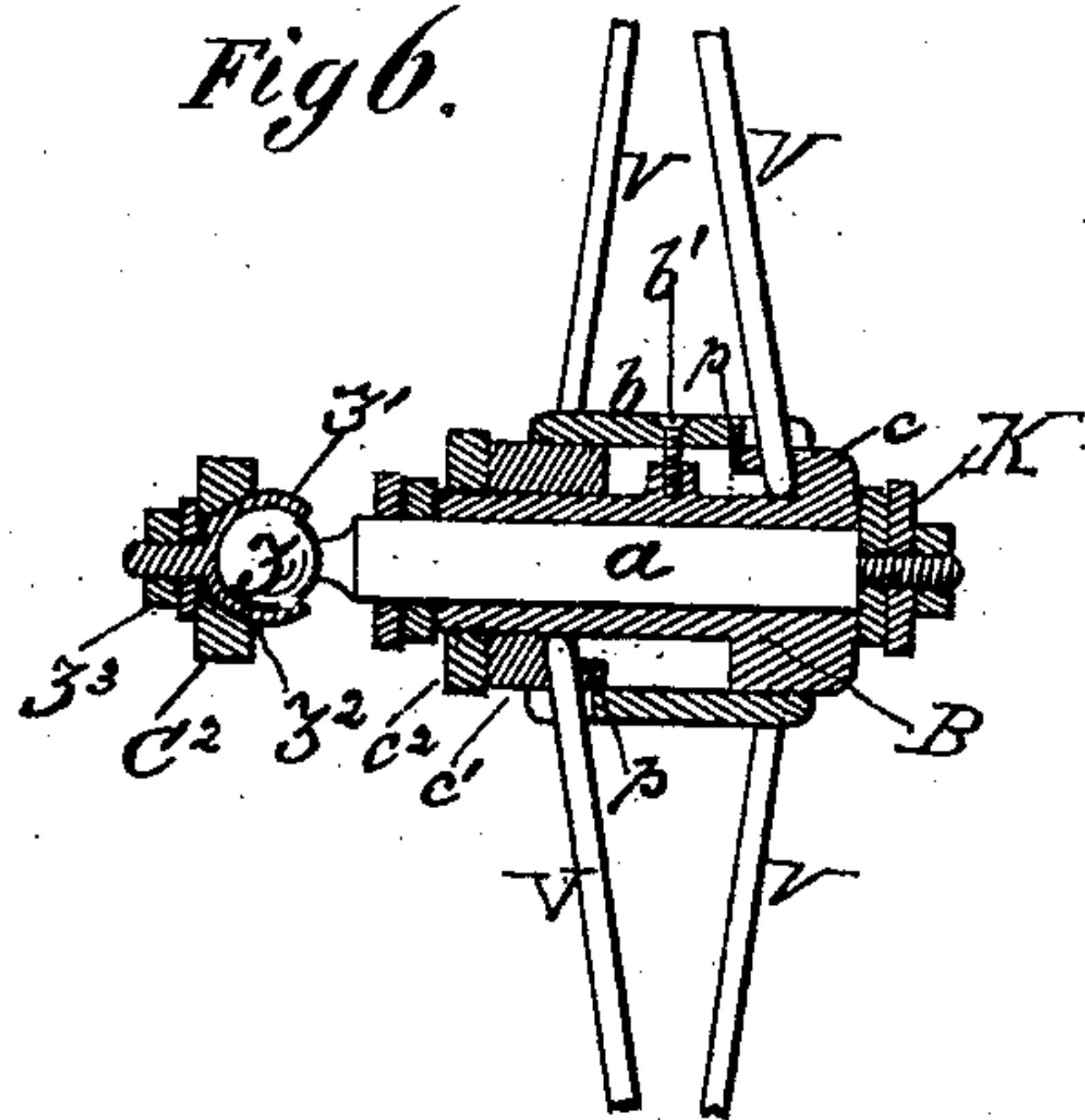


Fig 9.

Fig 6.



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# UNITED STATES PATENT OFFICE.

NATHANIEL S. BARGER, OF HAMPTON, IOWA, ASSIGNOR OF ONE-HALF TO  
T. B. TAYLOR AND W. D. EVANS, BOTH OF SAME PLACE.

## SULKY-PLOW.

SPECIFICATION forming part of Letters Patent No. 299,452, dated May 27, 1884.

Application filed December 31, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, NATHANIEL S. BARGER, a citizen of the United States, residing at Hampton, in the county of Franklin and State of Iowa, have invented a new and useful Improvement in Sulky-Plows, of which the following, in connection with the annexed drawings and letters of reference marked thereon, is a specification.

My invention relates to sulky-plows, and the same will be fully understood from the following specification and claims, in connection with the accompanying drawings, in which latter—

Figure 1 is a perspective rear view of my plow, the plow proper being lowered. Fig. 2 is a perspective side view of the same, showing the plow lowered. Fig. 3 is a perspective side view showing the plow raised. Fig. 4 is a rear view, partly in section and partly in elevation. Fig. 5 is a part side view and part section of one of the wheels, illustrating the construction of the hollow metallic rim, spokes, and hub. Fig. 6 is a central longitudinal section through the hub of the landside-wheel and the attachment of the axle. Fig. 7 is a detail top view of the hinged plow-beam bail and plow-standard. Fig. 8 is an end view of one of the wheel-hubs, the sleeve, nut, and wooden boxing being removed. Fig. 9 is a transverse section of a wheel-hub with spokes, showing a slightly modified construction of the spokes and lips of the hubs; and Fig. 10 is a detail view of the lifting-rods of the bail and lever.

A A' are the traction-wheels of the sulky, the wheel A serving also as a wheel-landside. These wheels are both of the same size, having respectively a hollow rim, W, made of gas-pipe, and six double spokes, V V, also made of gas-pipe. By "double" spokes I mean a spoke having two divergent branches, or bent into V-shape, as shown in Fig. 6. Three of these spokes extend from the outer end of the hub and three from the inner end of the same, those extending from the outer end of the hub, as well as those from the inner end, inclining inwardly as they approach the rim W, as shown. The holes for the reception of the

outer end of the spokes are drilled or cut through the inner surface of the rim only, and the ends of the spokes rest against the inside of the outer surface of the rim.

The hub B of the vertical wheel is made of iron, having on its end nearest the arched support or axle-tree C C' C<sup>2</sup> a shoulder, c, cast or made solid with the hub, said shoulder having three lips, p, which are formed by cutting away the metal on each side of the respective lips, and leaving the lips raised sufficiently to provide room between them and the hub for the inner curved coupling end of the double spokes V V to pass underneath the lips. On the outer end of the hub a sleeve, c', with similar lips, is provided, made separate from the hub. To apply these double spokes V to the hub and rim of the wheel, their outer ends are all inserted into the holes or sockets of the rim, and the inner curved coupling ends of three of them passed under the lips p of the shoulder c, while the inner ends of the other three spokes are passed under the lips of the sleeve c', whereupon the sleeve c' is forced toward shoulder c and tightened up by a nut or burr, c<sup>2</sup>, on the outer end of the hub until the spokes are made firm between the hub and rim. With this construction of the hub the wheel can be tightened up whenever the spokes become loose.

The wheel-landside A is constructed in substantially the same manner as the vertical wheel A', the sleeve c', shoulder c, and lips p, except that the lips are longer and extend over the spokes to a greater extent, and the nut or burr c<sup>2</sup>, the shoulder c, and the sleeve c' are so arranged that the spokes are tightened up at the end of the hub nearest the arched frame or axle-tree C C' C<sup>2</sup>, as shown in Fig. 6; or, in other words, the shoulder c, if made solid with the hub of the wheel-landside, is on the outer end, or the end farthest away from the arched support or axle-tree, while the sleeve c', made separate from the hub, is on the end nearest the said arched support or axle-tree.

The spokes V, if desired, can be cut in two at the curve, (see Fig. 9,) thereby making twelve single spokes, and the lips on the shoulder or sleeve can be shaped as loops, and thus



constructed the curved ends of the spokes can be passed under the loops and the wheel tightened by the nut or burr  $c^2$ , as before described.

The metal hubs described may each have a wooden boxing,  $b$ , confined in position by a set-screw,  $b'$ , as shown in Fig. 6, and thus it will be seen that I have an exceedingly light and cheap wheel, while at the same time it can always be kept solid and firm.

The wheel-landside A is attached to an oblique axle,  $a$ , said oblique axle  $a$  at its lower end passing through a bearing-orifice in the V-shaped arm K, bolted to the mold-board or plow proper, M, and forming a support for one end of said axle and the wheel-landside A. The axle  $a$  at its upper end passes through another bearing-orifice in the extension H' of the beam H, (which beam and extension will be hereinafter described,) and is, with the wheel-landside A, supported at said end. The axle  $a$  is extended inwardly and provided with a ball,  $z$ , on its end, by which it is attached to the arched support, said ball fitting in a socket-bearing,  $z'$ , which passes loosely through a slot,  $z^2$ , in the lower part of the right leg C' of said arched support or axle-tree, and is fastened by a nut,  $z^3$ , on the inside of said leg. The ball-and-socket joint formed by the ball  $z$  and socket-bearing  $z'$  permits the angle of the axle  $a$  and wheel A to be changed as may be needed to properly receive the pressure of the mold-board, and also the oblique wheel A to be raised to a vertical position by the bail B<sup>2</sup> and lever L when the plow proper is being transported on its wheels A A' from one field to another or on the road. The land or left-hand wheel A' is attached to an axle-arm,  $a'$ , which moves up and down on the vertical left leg C' of the arched support or axle-tree and guide and stay rod C', and both wheels A A' revolve freely on their axle-arms  $a a'$ .

From the horizontal part of the arched support or axle-tree the guide and stay rod C' is extended down parallel with the left leg of said support, and is fastened in the plate  $g$ , and to this rod and the leg C' of the support the axle-arm  $a'$  is fitted by means of vertically-formed passages in it, one of which contains a friction-roller,  $f$ , for the guide-rod C' to slide against in moving up and down. The axle-arm  $a'$  has a vertical slotted or notched bar,  $f'$ , which is on the front side of the left leg C' of the arched support, and in the same friction-rollers  $f^2$ —one at each end of the bar—are applied. By means of the roller  $f f^2$  the axle is stayed and guided truly up and down. To this axle-arm  $a'$  two connecting-bars,  $h$ , are secured by a pivot-pin, and the upper ends of these bars are connected by another pivot-pin to a lever, L', which is pivoted to a notched sector-plate,  $h^1$ , fastened on top of the horizontal part of arched support. With this construction and mode of operating the land or left-hand wheel liability to bind is obviated, and a strong and durable support for the land-wheel is secured.

The V-shaped arm K, forming the lower and outer support for the wheel-landside H, has its braces  $k k'$  so bent as to fit the mold-board, and the ends of these braces  $k k'$  are slotted at  $k k$ , and are bolted through said slots to the mold-board. These slots  $k k$ , in conjunction with the ball-joint at  $z z'$ , permit the arm K to be raised or lowered, thus raising or lowering the outer end of the axle  $a$ , and so changing the inclination of the wheel-landside A to properly receive the pressure from the mold-board.

The plow-beam consists of two parts, H H', formed respectively of flat bar metal or plates, bent as shown, and set up edgewise, and the two parts H H' are connected together almost directly over the junction of the lay and mold-board of the plow by means of the round end or transverse horizontal pivot part B<sup>3</sup> of the bail B<sup>2</sup>. The portion H' of the beam is bent into a loop,  $d^1$ , at the middle of the length of the metal plate of which it is formed, and extends some distance forward of the pivot B<sup>3</sup>, between the branches of the part H, and rests down upon a transverse horizontal bar, I, extending across the under side of said part H, and by this means the part H' is made to form with part H a rigid beam with respect to any downward pressure upon the joint at B<sup>3</sup> when the beam is horizontal on top, and a flexible or upwardly-bending beam with respect to any pressure that may be brought against said joint. The part H is also bent into a bow or circle,  $d^3$ , at the middle, said bowed portion forming the front end of the beam, from which rear branches diverge in opposite directions, extending close along the outside of the front end of the portion H'. The rear ends of the portion H' are made to converge toward each other as they extend back of pivot B<sup>3</sup>, coming almost together shortly in the rear of pivot B<sup>3</sup>, running thence parallel a sufficient distance to receive the upper end of the standard N, which standard is securely bolted through both branches of the portion H', and from the standard both of said branches further converge, coming closely together near the rear of the standard N, and thence running together to the rear end of the beam-extension, being united either by welding or rivets. The part H' of the beam in rear of the standard N is bent or curved outwardly and downward at a sufficiently oblique angle toward the wheel-landside A to properly receive the axle  $a$ , and thus, in connection with leg C', form a support or bearing therefor. The other end of the axle  $a$  is supported in the bearing-bracket K, extending back from the under side of the mold-board, as shown.

The bracket or arm which forms the bearing  $k^3$  is set lower than the extension-beam bearing  $k^1$ , and the axle  $a$  of the wheel-landside may, by means of the bearing  $k^3$ , lie so inclined as to bring the periphery of the wheel at any necessary angle with the furrow-angle so as to properly receive the pressure on the



mold-board, thus making the plow run evenly and truly, and this angle can be nicely secured by the slots  $k' k'$  in the bracket-arms, through which the fastening-bolts pass into the mold-board.

The bail  $B^2$  is a flat bar or plate set up edgewise, and bent or curved somewhat like the letter S, and to its forward end is riveted or welded the transverse horizontal round pivot  $B^3$ , forming the pivot of the joint in the beam  $H H'$ . The rear part of the bail  $B^2$  is provided with several holes, into any one of which a pivot,  $e$ , forming part of the plate  $g$ , passes, and joined to it by the hinge  $D^2$ .

By means of the holes in the bail the bail can be lengthened or shortened to set the plow to run truly or properly with the sulky.

The lever  $L$ , pivoted to the notched sector  $h^3$ , is attached to the bail  $B^2$  by means of the doubled connecting rod or bar  $s s$ , attached to the bail near the forward end, and the single rod  $s'$ , attached at first bend or curve in the bail, as shown.

The rod or bar  $s'$  is provided with a loop,  $s^4$ , at its upper end, by which it is attached to the pivot-pin  $t^4$  in the end of the lever  $L$ . When the lever  $L$  is down, the pivot-pin  $t^4$  rests in the lower end of the slot  $s^4$ , and when the bail  $B^2$  is raised by the lever  $L$  and rods  $s s$  for the purpose of throwing the point of the plow out of the ground, the pivot-pin  $t^4$  simply passes up to the upper end of slot  $s^4$ , and no strain is put upon the rod or bar  $s'$ ; but when it is desired to raise the wheel-landside  $A$  from an oblique to a vertical position, then the lever  $L$  is still further raised, putting the strain on rod  $s'$ , together with doubled rod  $s s$ , the rod  $s'$  giving the crank motion to the bail  $B^2$ , which cants the beam  $H H'$  toward the land-wheel, also depresses the front portion,  $H$ , and raises the portion  $H'$  of the same, and adjusts or changes the wheel  $A$  from an oblique to a vertical position. The bail  $B^2$ , by reason of its double curve, its motion on pivot  $e$ , the motion at the hinge  $D^2$ , the location of the points of attachment of the rods  $s s s'$ , and the slot  $s^4$  in rod  $s'$ , has a compound or double motion or a rising crank motion imparted to it when it is raised by the lever  $L$ , first raising the plow directly out of the ground at the point, and then when the plow is out of the ground by further raising it with the lever  $L$ , rods  $s s'$ , and bail  $B^2$  the beam  $H H'$  is caused to cant and the wheel  $A$  is raised by this means from an oblique to a vertical position.

The tongue-extension  $E^2$  is attached to the arched support by means of a strap,  $X$ , around the right leg,  $C^2$ , of said support and stayed by means of the diagonal brace  $u$  from the tongue to the top of arched support. This tongue-extension is provided with two supports,  $q q'$ , for the tongue.

The tongue  $T$  is fastened to the tongue-support  $q'$  by means of the pivot  $t$ , and at its rear end is supported by a metal sector,  $q^3$ , the end of which toward the tongue-extension being

perforated, so that by means of the pin  $t^2$  and holes in sector the rear end of the tongue can be moved in or out to regulate the amount of land taken by the plow. By entirely removing the pin  $t^2$  the tongue can be swung toward the sulky at right angles to the tongue-extension, thus permitting the plow and team to be turned in the shortest possible space.

$O$  is a strap or bar attached to the end of the beam  $H$  by a link,  $t^5$ , and to side of tongue-extension  $E^2$ , near its end, by a pin,  $t^3$ . The strap  $O$  is held on pin  $t^3$  by a notched latch,  $r$ , pivoted to tongue-extension  $E^2$  by a screw-pivot,  $r'$ . This strap  $O$  serves for holding the front end of the beam  $H$  down in its place when said beam is raised, and also for preventing said end of beam dropping below its proper position.

The standard  $N$  of the plow is widened or spread out at the point under the lay and mold-board, in order to afford the necessary support to the lay and mold-board, and a brace,  $J$ , is bolted to the standard  $N$  near the top of the mold-board, and extended obliquely across the under side of the mold-board and lay for further supporting the mold-board and lay.

From the foregoing description it will be seen that my sulky-frame, comprising mainly an arched support, a vertical land-wheel, and an oblique wheel-landside, is placed in the rear of the plow proper, thus affording the rider or plowman every opportunity to see the work he is doing while plowing, and while this is so the best possible support for the wheel-landside is obtained, and that the combination of the bail and ball-and-socket joint enables me to make a sulky with a furrow-side wheel which answers as a wheel-landside while plowing, then as a vertical fellow sulky-wheel to the landside-wheel while the sulky-plow is being transported on the road or off the field. Further, it will be seen that by the herein-described construction of the sulky-plow wheels I am enabled to make a sulky-plow much lighter, stronger, and firmer than those constructed in the usual manner, and which wheels can be kept tight and solid; and, also, that by the construction and combination of the beam, bail, and connected parts in the manner described the plow can conveniently and perfectly be thrown into and out of the ground at the most natural place—viz., the point—without affecting the landside-wheel; and it will also be seen that a very stable means for supporting, guiding, and adjusting the land-wheel are secured; and, finally, that by the whole construction of parts is produced a sulky-plow very simple in construction, and which will operate in any direction, either while plowing or turning around, with very little friction or draft.

I do not claim anything in the plow shown in Letters Patent No. 264,846, except so far as the constructions, parts, and combinations of parts therein shown are employed in different relations and combinations, and for per-



forming functions in such new relations and combinations not accomplished in said patented plow.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A plow-sulky having an arched support or axle-tree with a horizontal axle,  $a'$ , carrying vertical land-wheel  $A'$ , an oblique axle,  $a$ , carrying an oblique wheel-landside,  $A$ , and a ball-and-socket-joint connection, whereby the axle  $a$  is adjustable to a horizontal position and the oblique wheel-landside  $A$  to a vertical position, both of said wheels at all times serving as the sulky-wheels and being in the rear of the plow proper, substantially as and for the purpose described.

2. The combination, with a plow, of an oblique wheel-landside having a periphery which is in cross-section curved, and is formed of a tube, substantially as and for the purpose described.

3. The bail  $B^2$ , with its pivot  $B^3$ , and hinge and pivot connection  $D$   $e$ , in combination with the jointed beam and the arched support or frame, substantially as and for the purpose described.

4. The bail, in combination with the pivot  $e$  and hinge  $D$ , rods or bars  $s$   $s'$ , and lever  $L$ , substantially as and for the purpose described.

5. A plow-beam,  $H$ , provided with a joint between its ends, which is flexible in an upward direction and rigid in a downward direction, in combination with the arched support, wheels  $A$   $A'$ , and the bail  $B^2$  and its lifting devices, substantially as and for the purpose described.

6. The combination, with the plow proper,  $M$ , of the oblique wheel-landside  $A$ , the two-part plow-beam  $H$   $H'$ , having a vertical joint

at  $B^3$ , and the arm  $K$ , with braces  $K'$ , bolted to the mold-board and forming, with the rear part of plow-beam, bearing for the wheel-landside, substantially as and for the purpose described.

7. The three rollers  $f'$   $f^2$   $f^3$ , all attached to the movable axle or spindle  $a'$ , one being inside on the inner vertical leg,  $C'$ , and two outside on the outer leg,  $C'$ , of the arch-support, and the inside one being on a plane between the outer rollers, in combination with the arched support, its vertical legs  $C'$   $C'$ , plate  $g$ , movable axle arm or spindle  $a'$ , the connecting rods or bars  $h$ , and lever  $L'$ , whereby either the upward or downward strains are caused to fall upon the rollers and binding avoided, substantially as described.

8. The combination, with a frame of a sulky-plow provided with wheels  $A$   $A'$  in the rear of the plow proper, of a plow-beam having a joint,  $B^3$ , between its ends, and the bail  $B^2$ , provided with pivot  $e$  and hinge  $D$ , the rods or bars  $s$   $s'$ , and lever  $L$ , substantially as and for the purpose described.

9. The tongue-extension  $E^2$ , in combination with its strap  $X$ , brace  $u$ , and beam-strap  $O$ , latch  $v$ , and tongue-supports  $q$   $q'$ , substantially as and for the purpose described.

10. The combination of the arched support, the two wheels, one having a ball-and-socket-joint connection, the plow proper, the jointed beam, the bail having a pivot and hinge, and means for raising and lowering the plow proper, as well as adjusting the wheel-landside, substantially as and for the purpose described.

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Witnesses:

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