

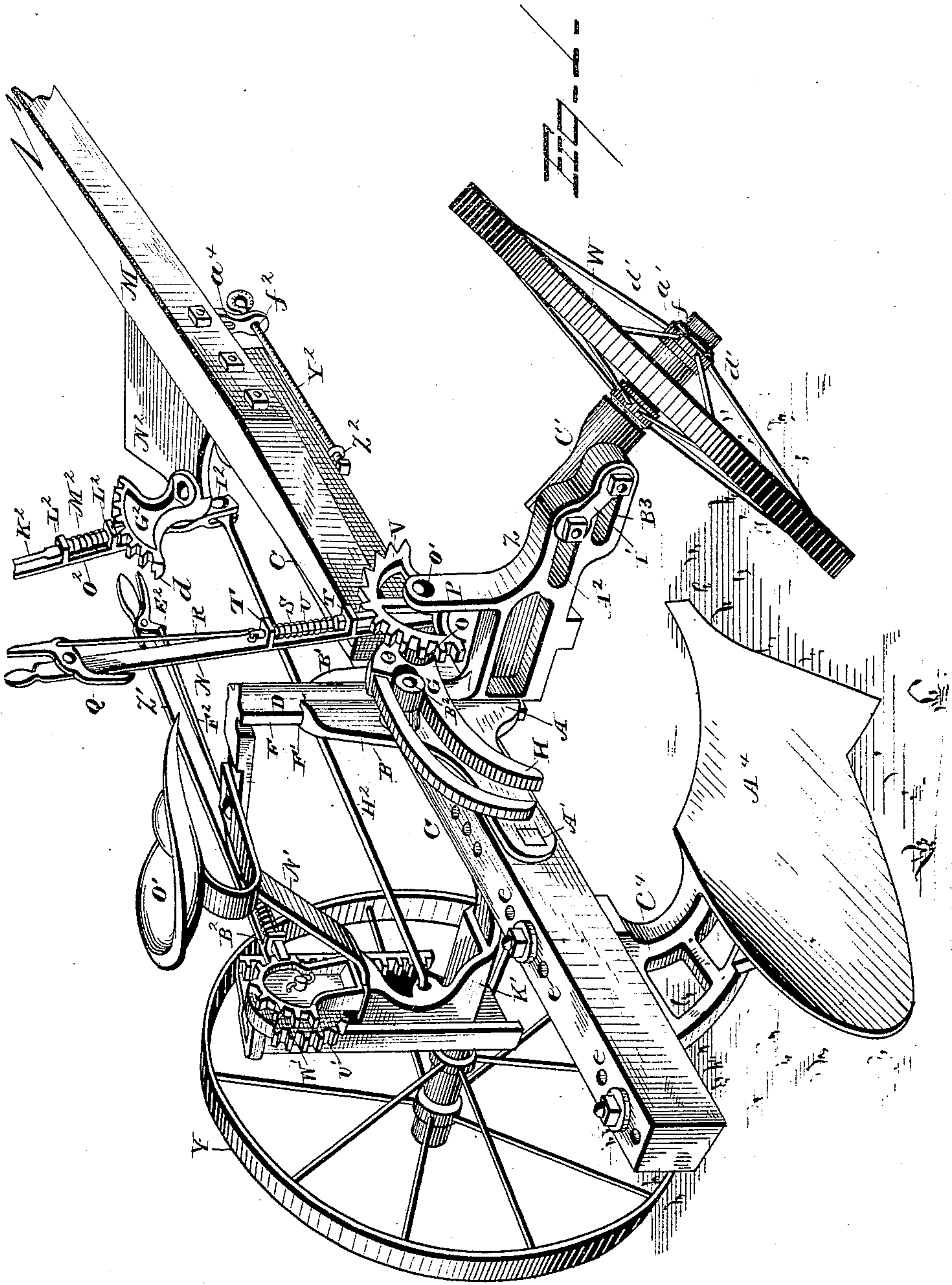
(Model.)

4 Sheets—Sheet 1.

W. L. CASADAY.  
SULKY PLOW.

No. 246,598.

Patented Sept. 6, 1881.



WITNESSES

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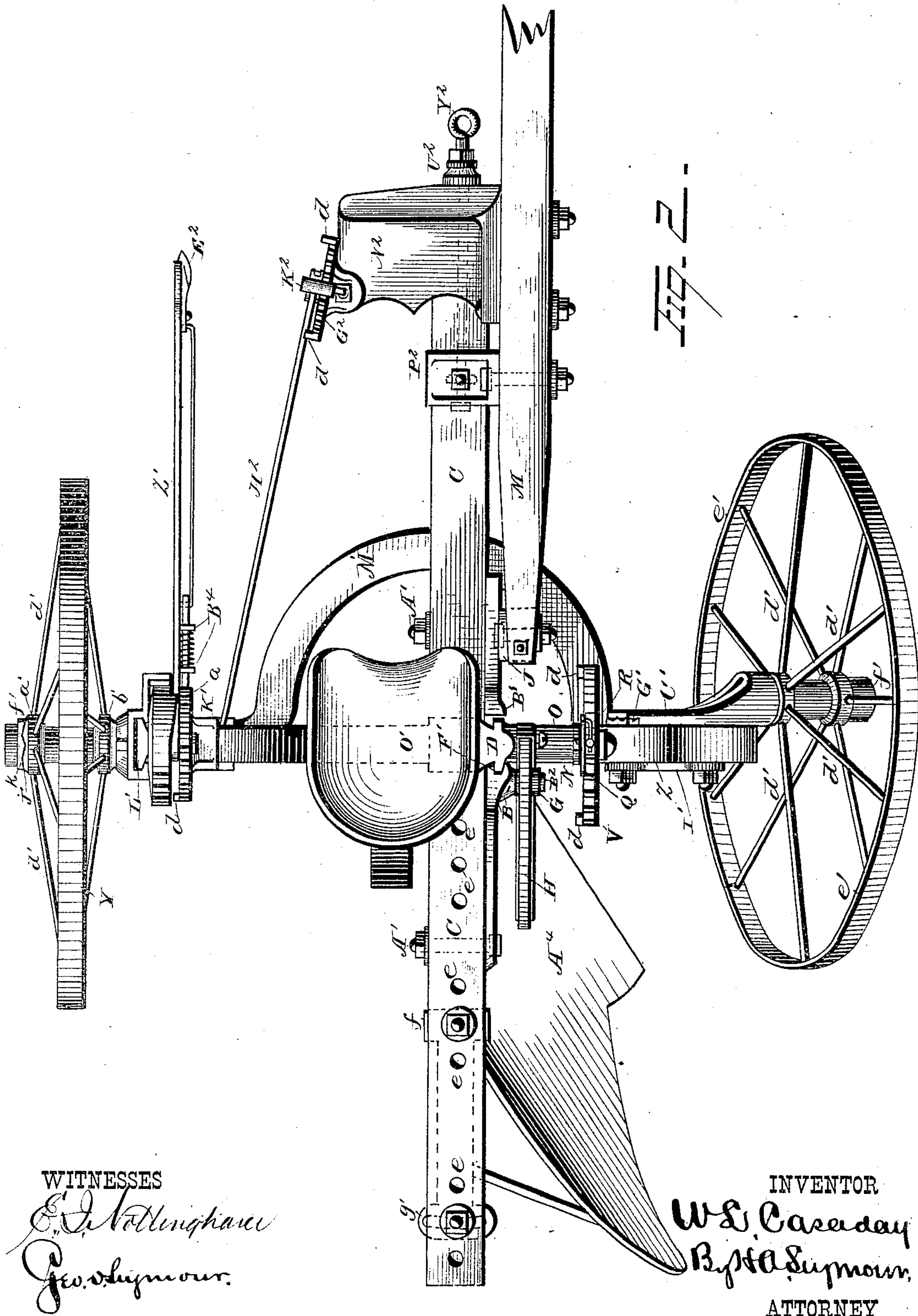
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4 Sheets—Sheet 2.

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SULKY PLOW.

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Patented Sept. 6, 1881.



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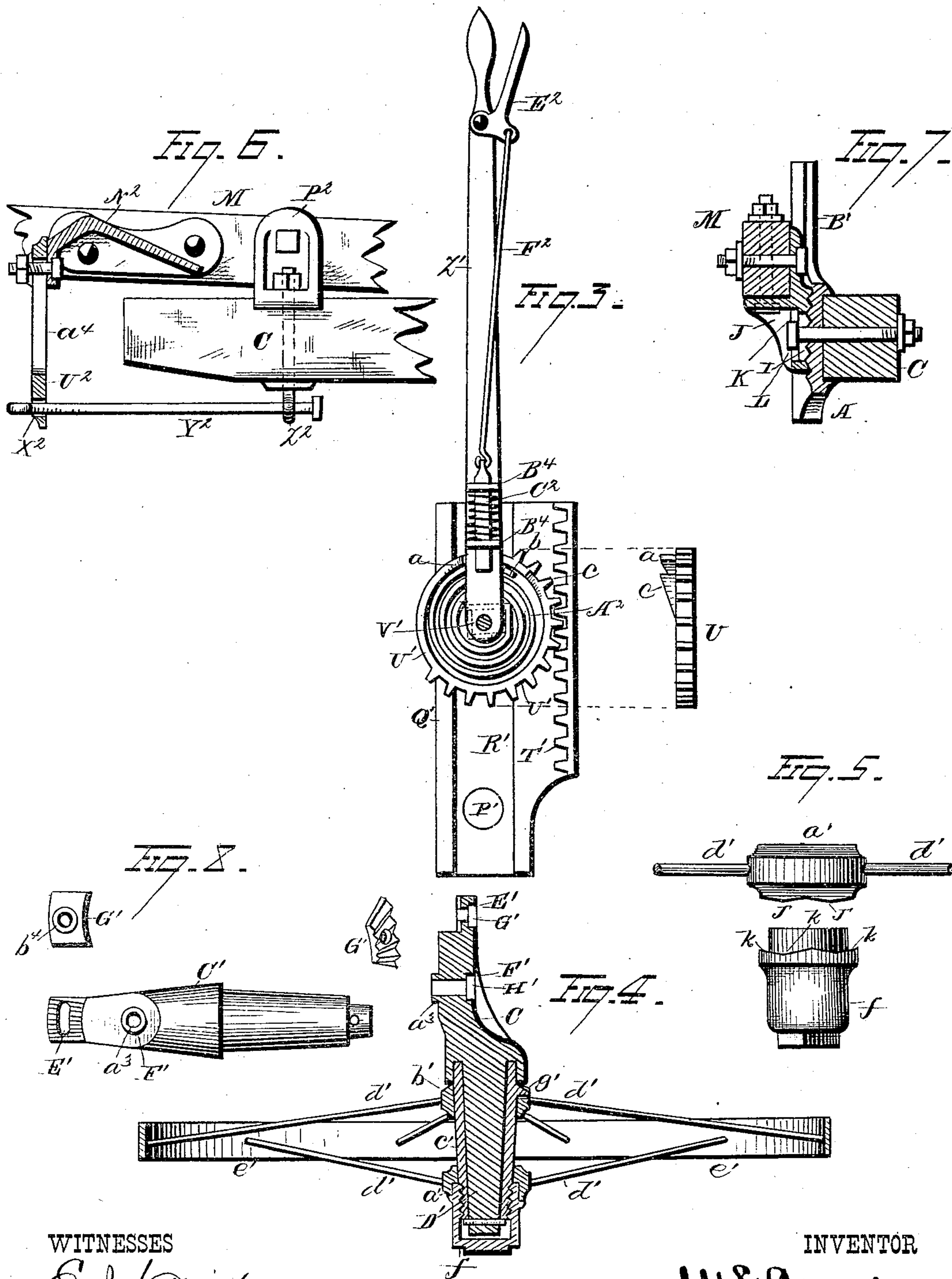
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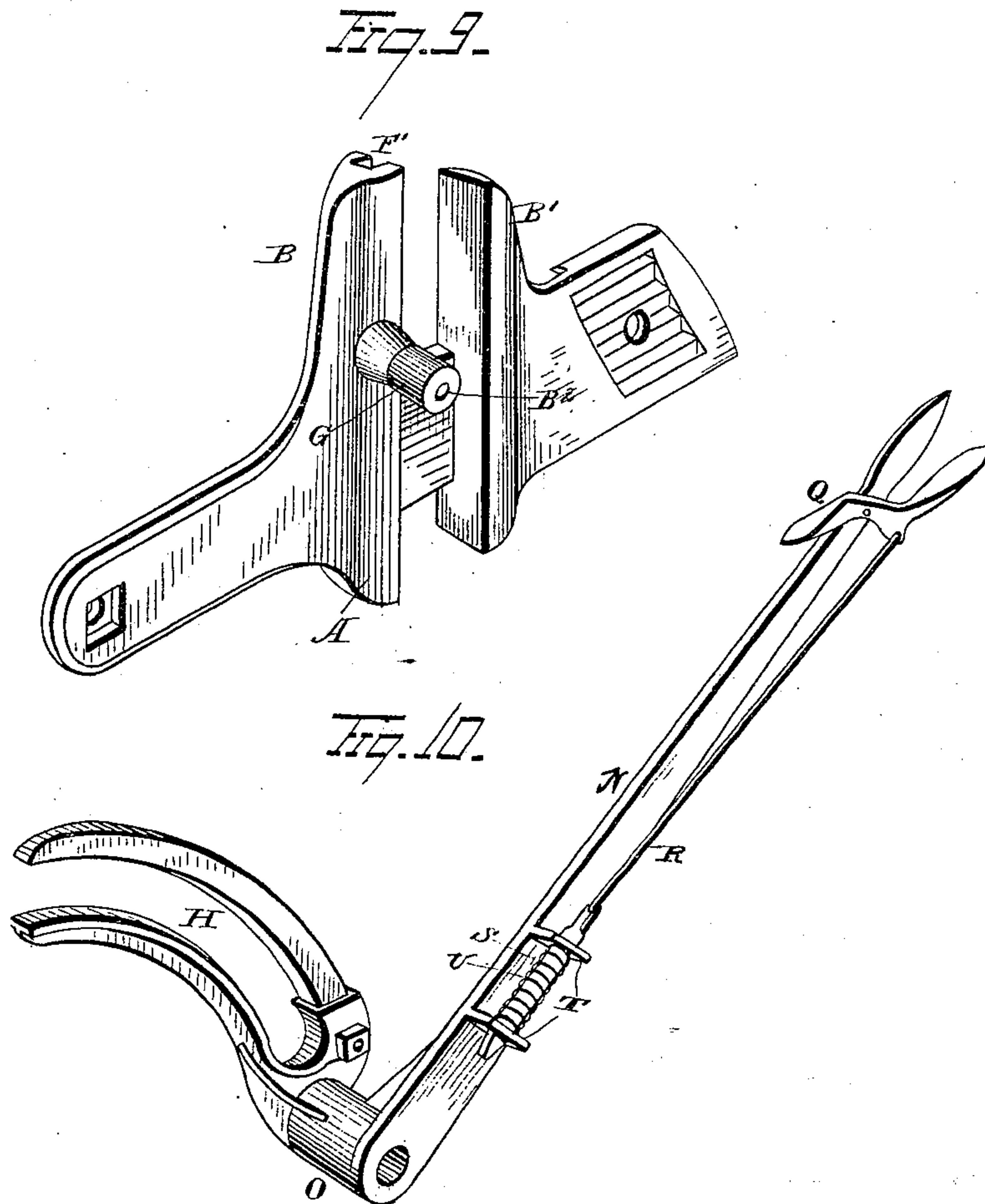
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# UNITED STATES PATENT OFFICE.

WILLIAM L. CASADAY, OF NEW CARLISLE, INDIANA.

## SULKY-PLOW.

SPECIFICATION forming part of Letters Patent No. 246,598, dated September 6, 1881.

Application filed May 18, 1881. (Model.)

*To all whom it may concern:*

Be it known that I, WILLIAM L. CASADAY, of New Carlisle, in the county of St. Joseph and State of Indiana, have invented certain new and useful Improvements in Sulky-Plows; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in sulky-plows, the object being to provide an article of the character indicated which will combine lightness, strength, and ease of operation with an adaptability to a wide range of adjustment, as circumstances may necessitate.

With these ends in view, my invention consists in certain details of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view, in perspective, of my improvement from the furrow side of the plow. Fig. 2 is a plan view thereof. Fig. 3 is a detail view of the raising and compensating device of the land-side wheel. Fig. 4 is a view, in horizontal cross-section, of the furrow-side-wheel axle and spindle. Fig. 5 is a detail view, showing the ratchet engagement between the outer wheel band and nut. Fig. 6 is a side view, partly in elevation and partly in section, of devices to change the relative adjustment of the beam and tongue. Fig. 7 is a section view taken near the inner end of the tongue and beam; and Fig. 8 shows front and rear views of the plate G' and a rear view of the axle and spindle of the land-side wheel. Fig. 9 is a detached plan view of the guide-plate which is attached to the plow-beam. Fig. 10 is a detached view of the operating lever and sleeve.

A represents a plate, which is secured to the side of the plow-beam C by suitable bolts, A'. Plate A is provided with two vertical jaws or guides, B B', between which is interposed the vertically-adjustable guide-bar D, which latter is provided on one edge with a rib, F, that fits in a groove, F', formed on the inner edge of the guide B. Upon a stud, B<sup>2</sup>, projecting outwardly from the jaw or guide B, is journaled a roller, G, upon the opposite side of which the curved arms of the crow-bill H bear as the

guide-bar D is raised and lowered. The inner edge of the guide B' is constructed with a plain, flat face, against which bears the plain, flat face on the adjacent edge of the guide-bar D. This construction of parts is employed in order that the plow-beam may have a limited swinging adjustment, as will hereinafter be described; and to provide for such movement the rear edge of the guide-bar, in connection with its jaw or guide, constitutes a pivotal or hinged bearing to allow of the swinging adjustment of the plow-beam in a horizontal plane. The forward portion of the plate A is provided with a serrated face, I, which engages the serrated inner face of the bracket J, supporting the inner end of the tongue M. Bracket J is constructed with an elongated slot, K, through which passes the bolt L. By this construction and arrangement of parts the tongue may be raised and lowered by loosening the nut on the bolt L, and when said tongue is in proper adjustment the nut is tightened, thereby securing the serrated face of the bracket J in snug contact with the correspondingly-serrated face on the plate A.

A lifting-lever, N, and the crow-bill H, before mentioned, are made integral or rigidly secured to a sleeve or hub, O, which is journaled on a rod or bearing, O', supported at one end by the guide-bar D and at its opposite end in a post, P. The said lever N is provided at its upper extremity with a hand-lever, Q, connected by a wire, R, or other suitable connection, to a dog, S, journaled in two lugs, T, projecting from the outer face of the lifting-lever, and encircled by a spring, U, interposed between the said lugs, and exerting a constant effort to keep the dog S in engagement with one of the teeth formed on the peripheral edge of a sector, V, made integral with or attached to post P. The right-hand half of the sector V is provided with inclined teeth, adapted by their configuration to raise the dog S without manipulating the hand-lever Q, and enabling the operator to lift the plow through a distance represented by half of the sector by simply pushing the lever N forward. However, in returning it to lower the plow the dog S must be elevated. The left-hand half of the said sector V is provided with vertical cog-teeth, and to effect any oscillatory movement of the lever over this section of the sector the dog S



must be elevated out of engagement with the cog-teeth by the hand-lever Q.

As before described, the crow-bill H is attached to the sleeve O, and is adapted to partake of every motion imparted thereto by the oscillation of the lifting-lever N.

The roller G, attached, as aforesaid, to the guide or jaws B, and located between the curved arms forming the bill, will be forced to take, as the said bill is oscillated from right to left and from left to right, a prescribed path, and accordingly either elevate or depress the plow-beam and attachments relative to the plow frame and wheels.

The construction of the crow-bill and connecting parts is particularly adapted to raising the plow-beam with the least effort, inasmuch as when the operation of lifting begins the roller G is very near the fulcrum of the lifting-lever, and therefore a large per cent. of the force exerted will be secured. It is to be observed that at the time when the lifting begins, as aforesaid, the plow is in the furrow and covered in whole or in part with earth, which must be lifted with it. As the plow is lifted and the earth is unloaded the roller moves out in the curved track formed between the two arms constituting the bill, increasing the distance from the fulcrum and gaining in speed as the weight on the plow is reduced. The upper arm of the bill, which assists in forcing the plow into the ground in starting a furrow, is made detachable at pleasure, so that in plowing stony land the plow-beam and plow can be raised when it meets an obstruction without lifting the frame and driver.

The furrow-side wheel, W, is adapted to revolve in a plane at an angle with the plane in which the land-side wheel, Y, revolves, and is further adapted to lateral and angular adjustment, the construction and arrangement of parts being such that the inclined wheel will travel on the bottom of the preceding furrow and bear against the vertical wall of the unplowed ground, and thus relieve the land-side edges of the plow of undue friction and wear.

Bearing Z of the plow-frame is provided with two independent slots, A<sup>2</sup> B<sup>3</sup>, located in parallel horizontal planes, but diagonally opposite each other.

The axle C' of the spindle D' is provided with two perforations, E' F', adapted to receive bolts G' H', which pass through the slots A<sup>2</sup> B<sup>3</sup>, respectively, and through a perforated plate, I', located on the rear face of the bearing Z. Nuts screwed onto those ends of the bolts which project through the perforations in the plate I' establish a firm union between the parts. A boss, a<sup>3</sup>, formed on the under face of the axle in position to be received in the lower of the diagonal slots in the bearings, aids in giving security to the adjustment between the axle and bearing Z. By loosening the said nuts the axle and its attachments may be moved toward or from the opposite wheel a distance proportional to the length of the slots.

The slot E', which is the outer of the two slots E' F' formed in the axle C', is elongated, thereby permitting the wheel by pivotal movement of the axle on the bolt H' to assume positions of different angularity with the earth. To insure permanency of the different adjustments which the wheel may take by reason of this elongated slot the under face of the outer end of the axle is serrated and adapted to engage with a perforated serrated plate, G', interposed between the end of the axle and the bearing Z. A boss, b<sup>4</sup>, formed on the under face of the said plate G', and adapted to be received in the upper slot, locks it in position. The object of thus arranging the furrow-side wheel to run at an angle with the ground is to vary the width of the furrow and to resist the tendency of the plow to deviate from the line of draft caused by the resistance of the furrow which it upturns and the absence of the land-side, which in plows of ordinary construction operates to overcome in great measure this deviatory tendency, as aforesaid.

The wheel Y, revolving in a vertical plane, is itself adapted to be raised and lowered with reference to the plow-frame by means of a hand-operated lever, and also adapted by means of a spring to automatically compensate for irregularities in the surface of the earth over which it passes.

The axle-bearing is connected with the frame K', the front face of which constitutes a guide, L', by a semicircular plate, M', while a curved beam, N', supporting the driver's seat O', connects the upper end of guide-bar D with the upper face of the said frame K'.

The spindle P' of the land-side wheel is provided with a frame, Q', on the inner face of which is formed a guideway, R', in which the guide L' reciprocates. The spindle-frame Q' is also furnished with a rack, T', adapted to engage with a cog, U', mounted on an arbor, V', interposed between a sector, W', and the upper end of the guide L'. The said cog-wheel U' is adapted to be turned to the right or left, and thereby, through its engagement with the rack T', lower or raise the spindle-frame Q' and its attached parts by means of a lifting-lever, Z', pivotally mounted on the arbor V' and interposed between a lug, a, formed on the inner peripheral edge of the cog-wheel, and the projecting end b of a spring, A<sup>2</sup>, contained within a recess therein. Two lugs, B<sup>2</sup>, projecting from the rear face of the said lever provide bearing for a dog, C<sup>2</sup>, which is normally held in engagement with the cog-teeth of the sector W' by a coiled spring interposed between said lugs and encircling the dog.

A hand-lever, E<sup>2</sup>, pivoted to the upper end of the lifting-lever, and connected with the dog C<sup>2</sup> by a wire or cord, F<sup>2</sup>, enables the operator to release the engagement between the dog and any one of the sector cog-teeth with which it may be engaged and oscillate the lifting-lever forward or backward to lower or raise the spindle and wheel, as may be desired.

A coiled spring, A<sup>2</sup>, contained within a re-



cess in the cog-wheel  $U'$ , is arranged to compensate in great measure for the inequalities in the surface of the earth over which it passes, and, performing the functions of a cushion, to modify the effects of violent shocks and universal strains to which the plow may be subjected. The inner end of the said spring is rigidly secured to some point at or near the center of the wheel. In the drawings the wheel is shown as provided with a squared post, with which the inner end of the spring is bent to conform. The outer end of the spring is provided with a projecting end,  $b$ , which is interposed between two lugs  $a$  and  $c$ , formed on the inner peripheral edge of the cog-wheel, the lifting-lever  $Z'$  being, as before described, interposed between the lug  $a$  and the end  $b$  of the spring.

The arrangement of the spring, as described, causes it to exert a constant tendency to force the axle-frame to its lowest position of engagement with the cog-wheel; but any weight imposed on the plow-frame will operate to coil the spring on itself and permit the cog-wheel to turn in backward motion, and thus allow a depression of the frame proportional in degree to the weight imposed upon it and the torsional force of the spring. When, for instance, the plow is being operated the weight of the driver will operate to partially coil the spring, and also when the land-side wheel meets obstructions the spring will be coiled still tighter, and the spindle-frame will be raised. Again, when the wheel meets depressions in the surface over which it passes the spring will instantly uncoil, and the spindle-frame will be lowered, carrying with it the wheel. The spring thus causes the wheel to automatically compensate for irregularities in the soil, and thus prevent careening of the plow. The spring is prevented from being coiled too tightly by the lug  $c$ , before described, which impinges against the projecting end  $b$  of the spring, and arrests the motion of the cog-wheel.

The devices employed to turn or clamp the wheels consist of a brace,  $H^2$ , having one end secured to the guide-frame on the land side of the wheel, and the other end to the short arm  $I^2$  of a lever, the long arm  $K^2$  of which is provided with projecting lugs  $L^2$ , in which a dog,  $M^2$ , is journaled and held in normal engagement with the teeth of a sector,  $G^2$ , secured to the outer edge of a foot-rest,  $N^2$ , bolted to the tongue  $M$  by a spring,  $O^2$ , interposed between said lugs and encircling the dog. When the lever-arm  $K^2$  is carried forward the wheels will be turned leftward, and when it is drawn toward the driver they will be turned to the right.

The object in adapting the wheels to be turned to the right and left by the driver without stopping the team or leaving his seat is in order that he may keep, if desired, the wheel moving forward in a line parallel with that through which the draft is exerted. Again, to insure parallelism between all of the furrows it may be often necessary to change the

direction of the wheels, particularly in hilly and uneven land.

The three sectors  $V W' G^2$  employed in this device are each provided with lugs  $d$  at their outer edges, to limit the oscillatory motion of the several lifting-levers. The tongue  $M$  is pivotally mounted on a bracket,  $P^2$ , secured to the plow-beam, and is thus adapted to be raised or lowered to regulate the suction of the plow and to adapt it to horses of different heights.

The devices for locking the rear end of the said tongue in different adjustments have already been explained. Those located forward of its pivotal point consist in a slotted tongue-iron,  $U^2$ , depending from the front face of the foot-rest  $N^2$ . This tongue-iron is adapted to be vertically adjusted to vary its engagement with the foot-rest to the extent of the length of its slot  $a^4$ , and consequently to vary the relative positions of the plow beam and tongue. The extreme lower end of the plate is perforated at  $X^2$  to receive a draft-iron rod,  $Y^2$ , the inner end of which is inserted in a staple,  $Z^2$ , depending from the under face of the plow-beam. The plow-beam is itself provided with a number of vertical perforations,  $e$ , by means of which the plow  $A^4$  may be longitudinally adjusted.

The plow-standard  $C^4$  is provided with two perforated bearings,  $f$  and  $g$ , through which are passed the bolts securing the plow to the plow-beam. The bearing  $g$  aforesaid is provided with an elongated slot, adapting the plow to be turned to the right or left, as desired.

The wheels  $W$  and  $Y$  consist each in two metallic bands,  $a' b'$ , mounted upon skeins  $c'$ , and having the inner ends of the wheel-spokes  $d'$  secured in their peripheries. The outer ends of the spokes of the two bands are secured in alternating succession in rims  $e'$  of appropriate construction.

The skeins  $c'$  consist in cylindrical metallic tubes, slightly tapering from their rear to their forward extremities, where they are exteriorly screw-threaded to receive in screw-thread adjustment the interiorly screw-threaded nuts or caps  $f'$ . The rear end of the said skeins are provided with shoulders  $q'$ , adapted to be received in slots in the outer faces of the rear bands,  $b'$ , to lock the wheel-structures to the skeins upon which they are mounted.

The outer or front faces of the bands  $a'$ , which are located, when in correct adjustment, near the screw-threaded end of the skeins, are provided with face ratchet-teeth  $j$ , which are adapted to engage with face ratchet-teeth  $k$ , formed on the inner face of a flange which encircles the inner end of the nuts  $f'$ . When the nuts are screwed on the forward ends of the skeins the face-teeth  $k$  will impinge against and engage with the face-teeth  $j$ , formed at the front face of the band  $a'$ , and force the said bands toward the central portion of the skeins a slight distance, thereby tightening the adjustment of the whole wheels. This ratchet engagement between the outer bands and nuts serves the twofold function of allowing the



wheels to be tightened by easy stages, and also of retaining the cap in a fixed adjustment, subject only to be changed by the key or wrench which is adapted to engage with and turn it.

5 I would have it understood that I do not limit myself to the exact construction shown and described, but hold myself at liberty to make such slight changes of construction and combinations of parts as fairly fall within the  
10 spirit and scope of my invention.

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

1. In a sulky-plow, the combination, with an  
15 axle bearing or frame provided with two elongated slots located one above the other, of an axle and bolts extending through the axles and said elongated slots, thereby securing the axle to its bearing or frame at an angle of in-  
20 clination thereto, substantially as set forth.

2. In a sulky-plow, the combination, with an axle bearing or frame provided with two elongated slots located one above the other, of an axle, a perforated plate, and bolts extending  
25 through the axle, elongated slots, and perforated plate, substantially as set forth.

3. In a sulky-plow, the combination, with an axle bearing or frame provided with two elongated slots located one above the other, of an  
30 axle provided with an elongated slot in its inner end and bolts extending through the axle and elongated slots in the bearing or frame, the parts being constructed and arranged to allow the axle to be adjusted both laterally and ver-  
35 tically, substantially as set forth.

4. In a sulky-plow, the combination, with an axle bearing or frame provided with two elongated slots located one above the other, of an axle provided with an elongated slot and ser-  
40 rated face at its inner end, a plate interposed between the axle and its bearing or frame, said plate provided with a boss that fits in one of the elongated slots in the axle-frame, and con-  
45 structed with a serrated face that engages the serrated face on the axle, and bolts extending through the axle and the two elongated slots, substantially as set forth.

5. In a sulky-plow, the combination, with a roller journaled on a plate attached to the plow-  
50 beam, of a toothed sector formed integral with a post on the axle-frame, a sleeve journaled between said sector and a vertically-adjustable guide-bar, and a lifting-lever and crow-bill con-  
55 nected to said sleeve, substantially as set forth.

6. In a sulky-plow, the combination, with a roller journaled on a plate attached to the plow-  
60 beam, of a vertically-adjustable guide-bar, and a crow-bill consisting of two curved arms, one rigidly secured to a sleeve and the other removably secured thereto, substantially as set forth.

7. In a sulky-plow, the combination, with a vertically-adjustable guide-bar, having a plain flat face on one edge and a rib located on its opposite edge, of a plate attached to the plow-

beam, said plate provided with two vertical  
65 guides or jaws, one of said jaws having a plain flat face and the other provided with a groove in which is received the rib on the guide-bar, substantially as set forth.

8. In a sulky-plow, the combination, with a  
70 plate attached to the plow-beam, said plate being provided with vertical jaws or guides, of a vertically-adjustable guide-bar, having an inclined axle connected with its lowest end, and a bar supporting the driver's seat with its upper  
75 end, substantially as set forth.

9. In a sulky-plow, the combination, with a plate attached to the plow-beam, said plate be-  
80 ing provided with two vertical jaws or guides, and a guide-bar provided with a rib adapted to be received within a groove in one of the ver-  
85 tical jaws or guides, of a roller journaled on a stud attached to one of the jaws or guides, and a crow-bill adapted to engage with said roller and to be moved to the right or left and raise  
90 and lower the plow-beam, substantially as set forth.

10. The combination, with a guide and a spin-  
95 dle-frame provided with a guideway and a rack, of a recessed cog-wheel adapted to engage with the rack, and a coiled spring located in the recess of the cog-wheel and having its inner end fixed and its outer end engaged with a lifting-  
100 lever the movements of which control those of the cog-wheel.

11. In a sulky-plow, the combination, with a guide having a spindle connected therewith and a guide-bar, of a cog-wheel meshing with  
105 a rack on the guide, and a spring one end of which is fixed and its outer end connected with the lifting-lever, substantially as set forth.

12. The combination, with a guide and a spin-  
110 dle-frame provided with a guideway and a rack, of a recessed cog-wheel, and a coiled spring located in the recess of the wheel and having its  
115 inner end fixed and its outer end interposed between two lugs on the face of the wheel, sufficient space being left between the said lugs and spring to allow it to coil and uncoil to a limited degree independent of the motion of the lifting-  
120 lever.

13. In a sulky-plow, the combination, with a lever adapted to be retained in desired adjust-  
125 ment by engagement with a sector secured to the foot-rest, of a brace connecting said lever and the land-side-wheel bearing; and a guide-  
130 plate and a bearing-plate secured, respectively, to the wheel-frame and the plow-frame, and adapted to have pivotal movement upon each other when the lever aforesaid is oscillated.

In testimony that I claim the foregoing I have hereunto set my hand this 3d day of May, 1881.

WILLIAM LEWIS CASADAY.

Witnesses:

E. D. MEAGHER,  
C. R. STICKNEY.