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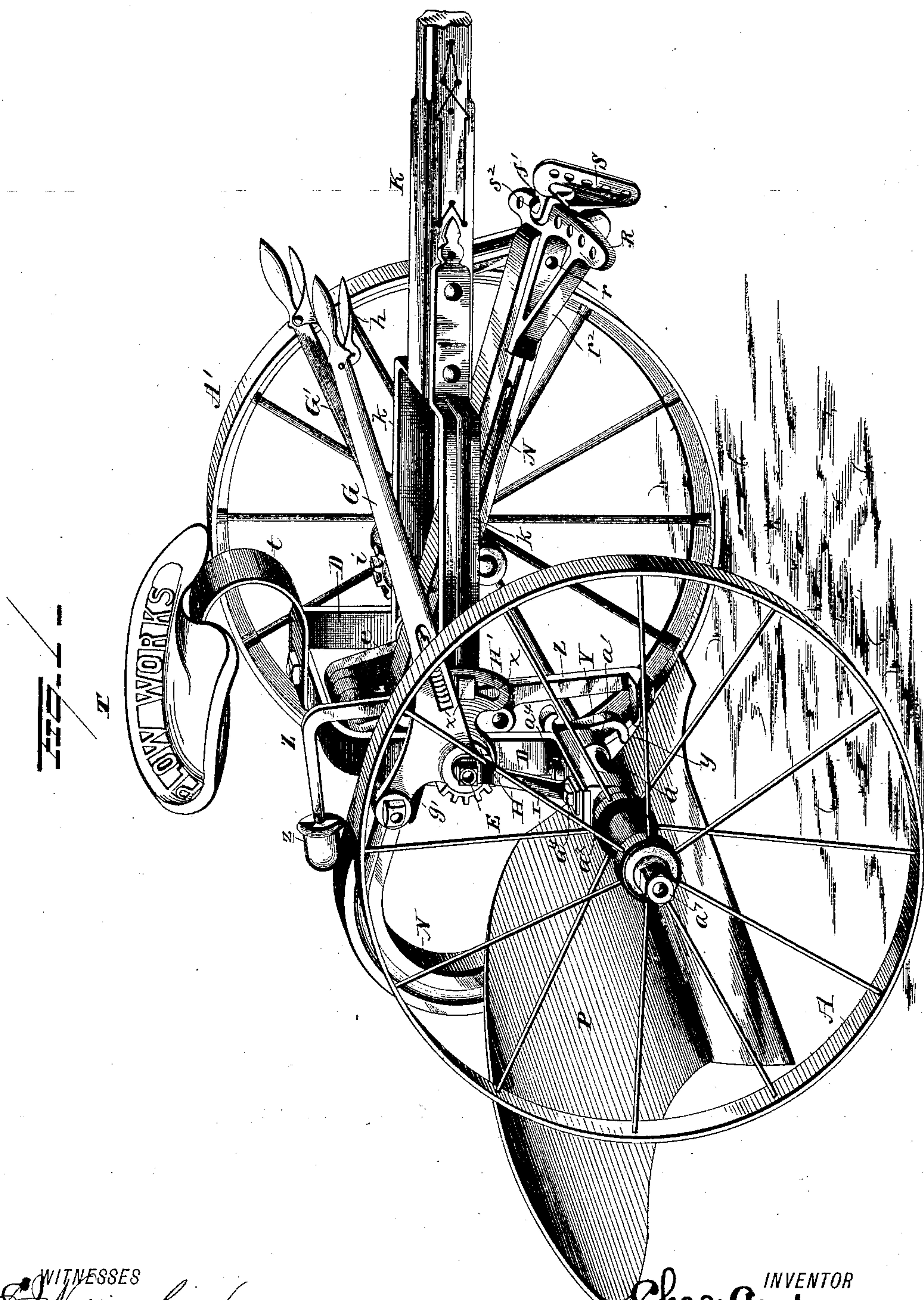
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C. ANDERSON.

SULKY PLOW.

No. 348,945.

Patented Sept. 14, 1886.



WITNESSES

WITNESSES  
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*Geo. F. Downing.*

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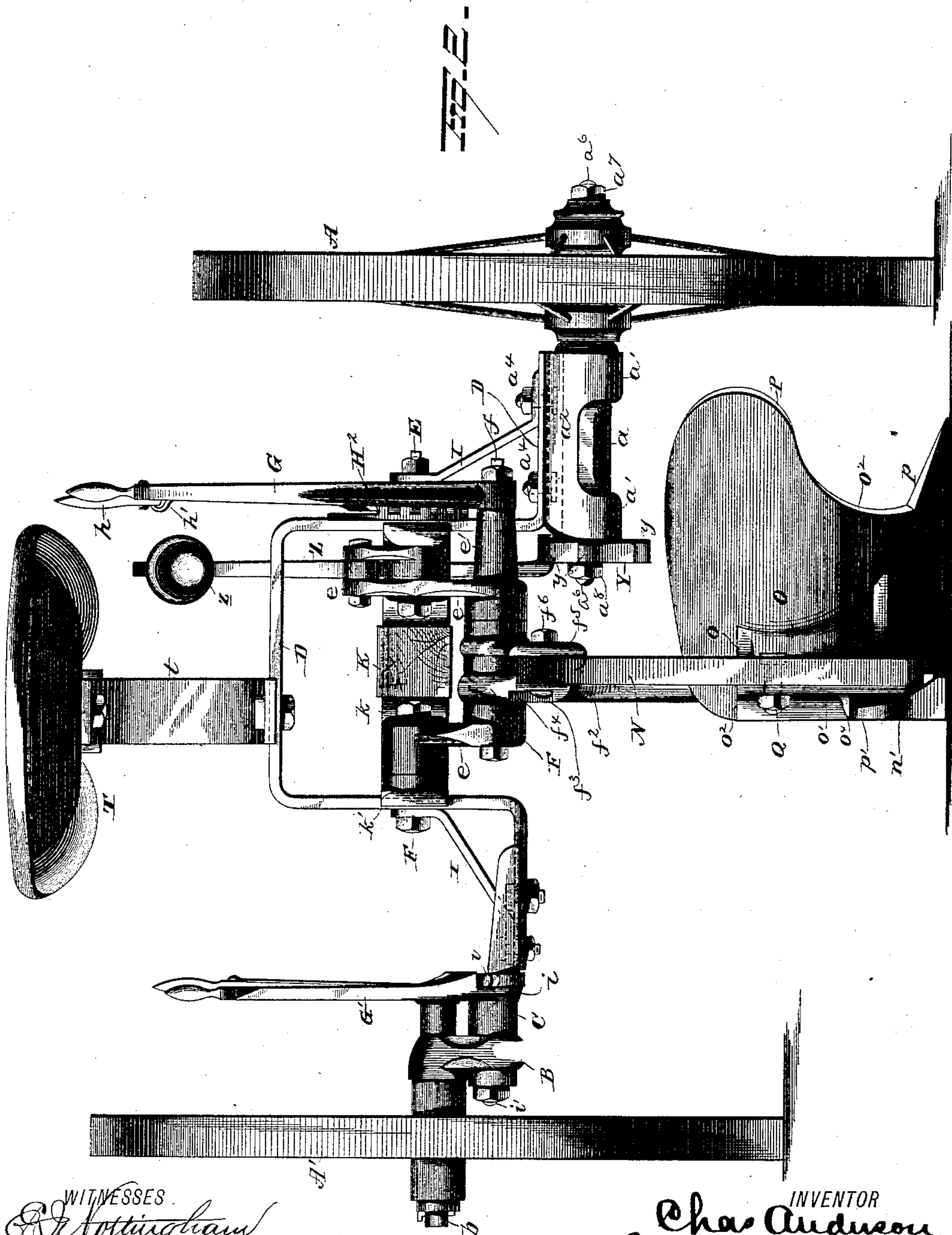
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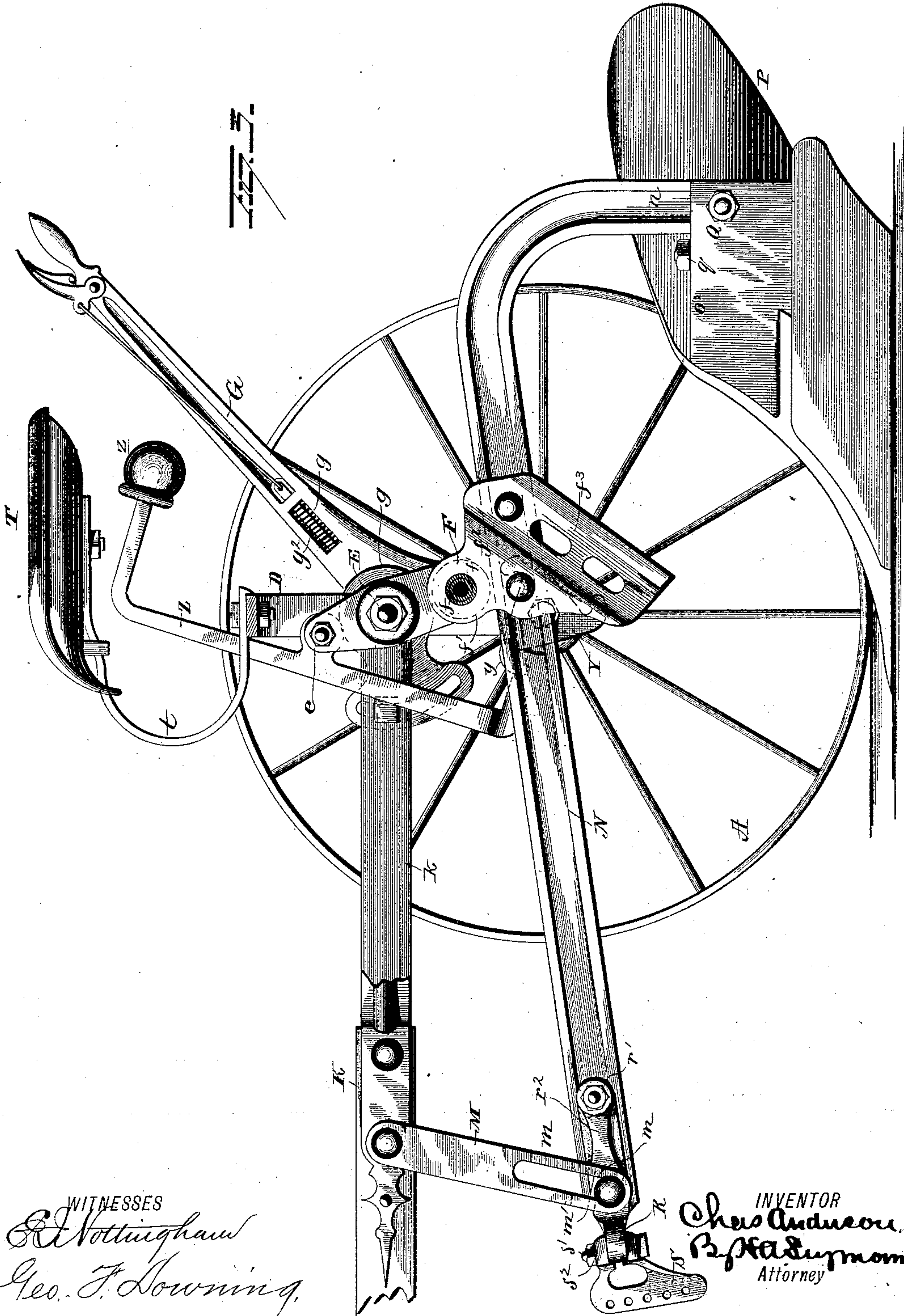
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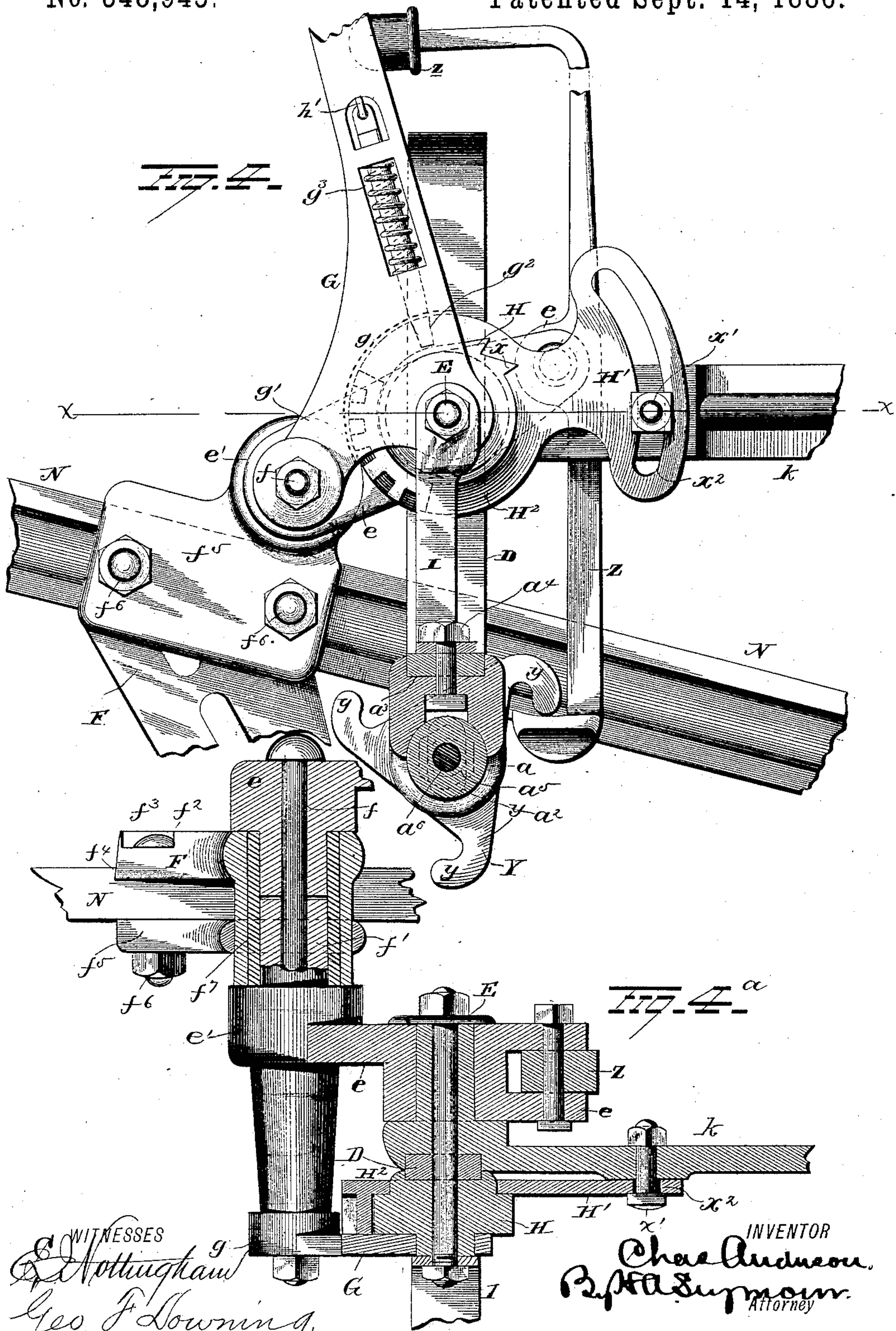
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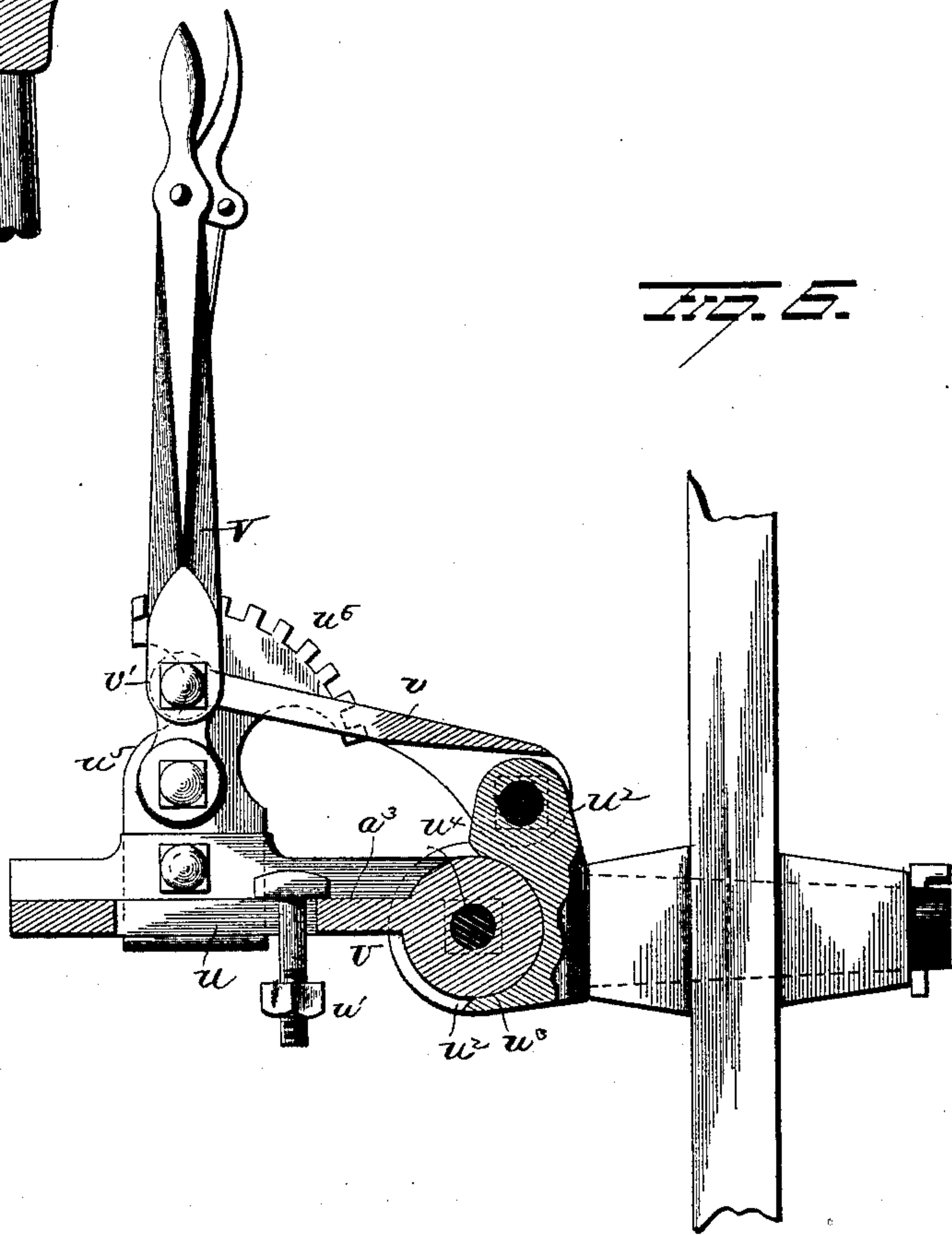
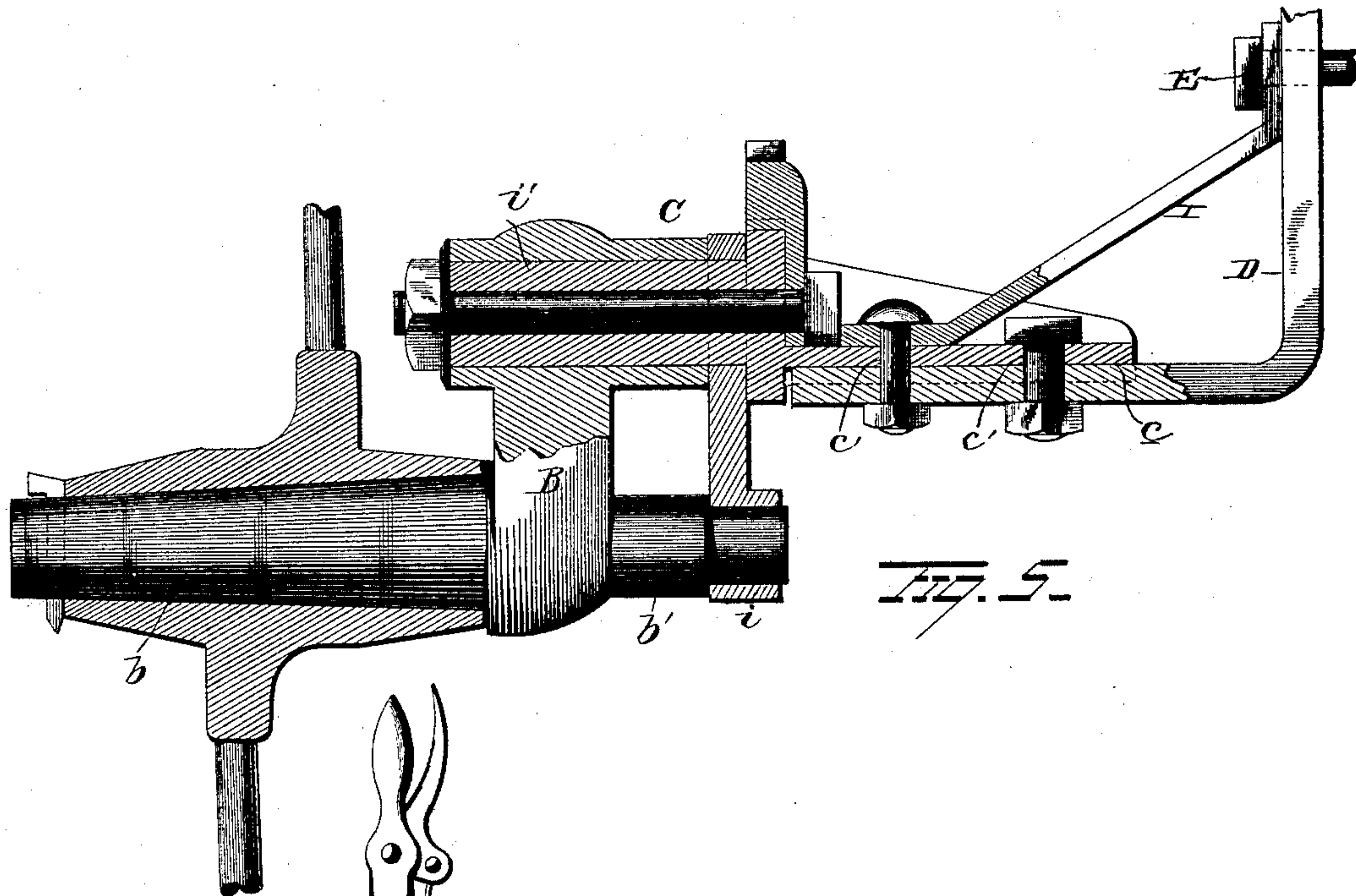
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# UNITED STATES PATENT OFFICE.

CHARLES ANDERSON, OF SOUTH BEND, INDIANA, ASSIGNOR TO THE SOUTH BEND IRON WORKS, OF SAME PLACE.

## SULKY-PLOW.

SPECIFICATION forming part of Letters Patent No. 348,945, dated September 14, 1886.

Application filed June 5, 1886. Serial No. 204,223. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES ANDERSON, of South Bend, 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 appertains to make and use the same.

My invention relates to an improvement in sulky-plows.

The object is to provide a sulky-plow, which shall be light, simple, inexpensive, and durable, and which shall at the same time possess all the more important advantages of the heavier and more complicated and expensive forms of plows.

With these ends in view my invention consists in certain features 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 of the plow in perspective, with parts in the position which they would assume when going to or from the field. Fig. 2 is a rear view, partly in section, with parts in the position which they assume when the plow is at work. Fig. 3 is a vertical longitudinal section through the plow-beam; and Figs. 4, 4<sup>a</sup>, 5, and 6 are detached views of parts.

A represents the furrow-wheel, and A' the land-wheel. The furrow-wheel A is secured on a short axle, *a*, loosely mounted in bearings *a'*, formed in the ends of a hanger, *a''*. In the upper side of the hanger *a''* is formed a channel, *a'''*, in which one end of the yoke or arch-section of the axle is secured by bolts *a'*. The axle *a* is preferably provided with a central bore, through which a rod, *a''*, extends, provided with threaded ends adapted to receive a nut, *a'*, at the outer end of the hub, and a nut, *a''*, for securing a lifting-wheel to the inner end of the axle, as will hereinafter appear. The wheel A' is mounted on a spindle, *b*, which is in effect the wrist-pin of a crank, B, the latter being mounted on the end of a stub-axle, C. The under side of the stub-axle C, for a considerable distance from the inner end of the same, is provided with a channel, *c*, to receive the land end of the arch-section of the axle, and the upper side is correspondingly grooved, to re-

ceive the end of a diagonal brace. The grooved portion of the stub-axle C is provided with perforations *c'*, to receive securing-bolts. The stub-axes are firmly united by an arched axle-section, D, the ends of which have extended bearings in the channels *a'''* and *c*, formed in the upper side of *a''* and under side of C, respectively. At points about the middle of the sides of the arched axle-section D are a pair of pivotal bolts, E, set firmly in the sides of the section D, and having their axes in the same line. On the portions of the bolts E which extend within the arch of the section D are loosely mounted a pair of arms, *e*, between the free ends of which is loosely secured the hanger F, for the attachment of the plow. One end of the arm *e*, on the the furrow side, is provided with an outwardly-extending sleeve, *e'*, the end of which is about flush with the outer face of the side of the arch D, and the opposite end of said arm *e* projects beyond the bolt E, for a purpose which will hereinafter appear. The free ends of the arms *e* are secured together, with the plow-hanger between them, by a bolt, *f*, which extends through them and through the sleeve-projection *e'*. An operating-lever, G, for swinging the arms *e*, and hence elevating or depressing the plow-hanger and plow attached thereto, is loosely mounted on the end of the bolt E, projecting on the furrow side of the arch D. Between the lever G and the side of the arch D a disk, H, is firmly secured, and provided with teeth or notches *x* on a portion of its periphery. A sector-bar, H', adapted to conform to the periphery of the disk H, is secured to a plate, H<sup>2</sup>, mounted on the bolt E, between the disk H and the arch, and extending forwardly alongside of one of the branches of the tongue, to which it is secured in rocking adjustment by a draw-bolt, *x'*, which extends through a branch of the tongue and a curved slot, *x''*, in the plate. The end of the lever G is hollowed out to conform to the periphery of the sector-bar, as shown at *g*. A branch, *g'*, at the lower end of the lever G, extends rearwardly, and loosely embraces the bolt *f* at the end of the sleeve projection *e'*. A spring-actuated dog, *g''*, is allowed a longitudinally-sliding motion in bearings formed across a channel, *g'''*, in the lower portion of the lever G, and is adapted



to automatically engage the toothed sector-bar H and lock the lever G, and hence the plow in the desired elevated adjustment. The spring-actuated dog  $g^2$  is operated by a hand-lever,  $h$ , secured to the handle of the lever G, and connected with the dog by a rod,  $h'$ , located in a prolongation of the channel  $g^3$ . A pair of diagonal braces, I, are secured on the ends of the bolts E, and lead from thence to the end of the arch-section D on the furrow side and to the channel in the upper side of the stub-axle C on the land side, respectively, their lower ends being secured by the bolts which secure the arched section D to the stub-axes. To the stub-axle C, at the end of the channel portion, is secured a sector-bar, H', and on the said stub axle, between the sector-bar and the crank B, is loosely mounted an operating-lever, G', quite similar in its construction to the lever G, above described, its projecting foot or its branch  $i$  being adapted to loosely embrace the inner end of the spindle  $b$ , which projects through a sleeve,  $b'$ , on the free end of the crank B. The crank B, sector-bar H', and operating-lever G' are secured to the stub-axle C by a single bolt,  $i'$ , which extends from the channeled portion through to its outer end, as shown. The rotation of the lever G' on its axis thus rotates the crank B and elevates or depresses the land-wheel A', as may be desired, while the spring-actuated dog attached to the lever serves to lock the lever, and hence the wheel, in the desired adjustment.

K is the tongue. It terminates rearwardly in two branches,  $k$ , which are firmly secured to the sides of the arched portion of the axle by means of the bolts E and the lips  $k'$ , which engage the edges of the axle. A second hanger, M, is secured to the side of the tongue in swinging adjustment, and is provided with an elongated loop,  $m$ , at its lower end, which is adapted to embrace a stud or bolt which extends through the plow-beam.

A series of perforations,  $m'$ , through the sides of the loop  $m$  are adapted to receive a pin for adjusting the plow-beam at different elevations in the hanger.

The hanger F consists of a sleeve portion,  $f'$ , loosely mounted on the bolt  $f$ , from one end of which sleeve portion depends a jaw,  $f^2$ , having a channel,  $f^3$ , formed in its outer face for the attachment of a jointer, and on its inner face provided with a recess,  $f^4$ , for the reception of the plow-beam. A second jaw,  $f^5$ , conveniently secured loosely on the sleeve  $f'$ , is provided on its inner face with a recess similar to the recess  $f^4$  on the opposite jaw, and a pair of bolts,  $f^6$ , adapted to extend through the jaws and plow-beam, serve to clamp the beam securely thereto. The sleeve  $f'$  of this hanger is further provided with a loose box-bearing,  $f^7$ , of hard metal, which may be replaced at slight expense when worn and save the cost of an entirely new hanger. The effect of the hanger M in connection with the main hanger F is to hold the plow-beam in

such a position relatively to the draft that the point of the plow will have the same, or nearly the same, pitch whether the plow is running shallow or deep, and thus preventing the tendency to creep to the surface when a hard soil is struck or to bury itself in softer soil.

The driver's seat T is secured to the top of the arch D by a band-spring,  $t$ .

The driver, by manipulating the operating-levers G G', may elevate and depress the plow and land-wheel at his pleasure, and the spring-dogs attached to the levers will lock the parts in the desired adjustment. It is, however, found desirable to be able to throw the burden of elevating the plow upon the power which is drawing it. This I have accomplished in a very simple manner, as follows: A lifting-wheel, Y, above referred to, which consists, essentially, of a rotary plate or piece of any convenient thickness or shape, provided with one or more (in the present instance three) projecting arms or teeth,  $y$ , is secured to the axle  $a$  in such a manner as to turn positively with it. I find it convenient to provide the wheel with an oblong recess,  $y'$ , adapted to receive the reduced end of the axle  $a$ , on which it is secured by the nut  $a^8$ . A lever or lift operating dog, Z, is pivotally secured in the forwardly-extended end of the arm  $e$ , which is preferably bifurcated to receive it, and is provided with a counter-weight,  $z$ , at its upper rearwardly-bent end, which tends to hold its lower end normally out of engagement with the lift-wheel Y. When, however, it is desired to have the draft lift the plow, the operator swings the upper end of the lever forwardly, throwing the lower end into engagement with one of the arms or teeth  $y$ , which, as it advances, draws down on the lever or dog Z, and hence elevates the hanger F and plow secured thereto. The rocking of the arm  $e$  also swings the lever G forwardly, the locking-dog attached thereto moving over the periphery of the disk H, and when the tooth  $y$  in the course of its travel disengages itself from the lever or dog Z the plow will be locked in elevated adjustment by the dog  $g^2$  in engagement with one of the teeth  $x$ . The plow may then be lowered by the operator at pleasure by reaching forwardly and releasing the dog  $g^2$  as he grasps the operating-lever G.

When the draft-lift is in use, the sector-bar H' may be swung around on the periphery of the disk H at a proper distance from the teeth  $x$  to be out of the way by elevating the end of the plate H' at the side of the tongue branch; but when it is desired to employ the sector-bar H' either alone or in connection with the draft-lift, it may be swung forwardly toward the teeth  $x$  on the disk, and the plow may then be locked at any desired elevation by the dog  $g^2$  in engagement with the said sector-bar.

To make the sulky as above described more general in its application, I further provide an attachment which will enable the operator to adjust the furrow-wheel at any desired in-



elination to the axle and at a greater or lesser distance from the line of the plow. This attachment consists of a stub-axle, U, adapted to take the place of the axle  $a$  and hanger  $a^2$ , as above described. The stub-axle U has a channel,  $a^3$ , in its upper side adapted to receive the end of the arch-section of the axle, and is provided with an elongated slot,  $u$ , through which the securing-bolt  $u'$  extends, which admits of the stub-axle being slid outwardly or inwardly and locked to the arch-section, so as to cause the plow to take a wider or narrower furrow, as desired. The spindle  $u^2$  has an enlarged head on its inner end, in which is formed a socket,  $u^3$ , adapted to receive a cylindrical bearing on the end of the main section, which is secured in the socket by a pintle-bolt,  $u^4$ . By this construction the spindle  $u^2$  is allowed a limited rocking motion in a vertical plane at right angles to the line of draft, and the hinge-joint is of such construction that there is no liability of the wheel becoming loosened at the joint and having an irregular advance movement.

To the front side of the stub-axle U is firmly secured an upright plate,  $u^5$ , terminating at the top in a toothed sector-bar,  $u^6$ . An operating-lever, V, is pivotally secured at its lower end to the inside of the plate  $u^5$ , and at a point a short distance above its end it is connected to a lug on the head of the pintle  $u^2$  by an arm,  $v$ . The end of the arm  $v$  adjacent to the lever is loosely secured between the lever-body and a branch,  $v'$ , and the end adjacent to the pintle-head is provided with a recess adapted to partially embrace the lug to which it is pivoted. A spring-actuated dog,  $v^2$ , is attached to the lever V and adapted to engage the toothed sector-bar  $u^6$  and lock the lever thereto, and hence the spindle and wheel, in the desired adjustment. The operator from his position in his seat can tilt the furrow-wheel to suit the circumstances by throwing the lever V outwardly or inwardly while the plow is at work or at rest. The matter of replacing the hanger  $a^2$  by the jointed stub-axle is simple and requires but a few moments, thereby adapting the plow to the varied conditions of soil and shapes of surfaces. The plow-beam N is of the channel type, and at its rear end, where it forms the plow-standard  $n$ , it is formed nearly or quite straight, extending downwardly to the foot of the plow and there bending forwardly with a sharp turn, as shown at  $n'$ .

For securing the mold-board, landside, and point to the standard a peculiar-shaped casting, O, is provided, as follows: The side  $o$  of the casting is shaped to conform to the curve of the mold-board P and furnishes an extended seat for the same. It also extends low enough to form an extended bearing for the plow-point and wing  $p$ . The side  $o'$  of the casting extends rearwardly at the same angle with the side  $o$  as the landside  $p'$  makes with the mold-board and forms an extended seat for the landside. The sides  $o$  and  $o'$  of the cast-

ing are firmly united by a horizontal web,  $o^2$ , a short distance above the foot and by the increased thickness of metal at the upper end,  $o^3$ . The lower end of the plow-beam N or standard  $n$  fits snugly beneath the web  $o^2$  and a rib,  $o^4$ , at the rear edge of the side  $o'$  of the casting, is adapted to fit snugly in the groove in the side of the beam or standard. The beam is locked in its adjustment by means of one or more bolts, Q, (one is sufficient,) which extends transversely through the beam and the side  $o'$  of the casting, and by a long bolt,  $q$ , which extends upwardly through the foot of the standard  $n$ , web  $o^2$ , and re-enforced top  $o^3$  of the casting. This latter-named bolt is not, however, absolutely necessary to secure the beam to the plow; but it tends to materially strengthen the attachment and prevent any possible play between beam or standard and plow. The distance of the web  $o^2$  above the foot of the plow is naturally determined by the depth of the end of the standard  $n$ , the object being to allow the latter sufficient room to keep it above the foot-bearing of the plow and yet not reduce its depth enough to weaken it.

The attachment on the front end of the plow-beam for applying the draft at different points to the right and left of the beam center consists of a transverse perforated bar, R, projecting farther on the furrow side than on the land side of the beam, to the rear edge of which are secured a pair of rearwardly-extending jaws or branches,  $r$ , adapted to embrace the opposite sides of the plow-beam, to which they are secured by bolts  $r'$ , extending through the jaws or branches and the beam. A strengthening-brace,  $r^2$ , extends from the furrow end of the bar R to the jaw or branch  $r$  near its rear end.

The clevis S consists of an upright perforated bar terminating rearwardly in a pair of jaws,  $s$ , which snugly fit the upper and lower sides of the bar R and lap over the front of said bar, as shown at  $s'$ . By sliding the clevis along the bar R and locking it in different positions thereon by a draw-bolt,  $s^2$ , the plow may be made to take more or less land, as desired, and may be held up to its work in side-hill plowing, where the tendency is to constantly work away from the land.

The aim has been to provide a light, strong, simple, and effective plow to be employed in connection with the improved sulky hereinbefore described; but as the novel features of the plow used in connection with the sulky are quite as important in many respects when the plow is used as a hand-plow, I desire to have it understood that such features of the plow as are not confined in their scope to its use as sulky-plow are reserved as the subject-matter of a separate application.

The sulky-plow as thus constructed is light, the number of bolts required to connect the parts is reduced to a minimum, and the plow is capable of a variety of adjustments which render it effective under all conditions of soil.

It is evident that slight changes might be



resorted to in the form and arrangement of the several parts described without departing from the spirit and scope of my invention; hence I do not wish to limit myself strictly to the construction herein set forth; but,

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 a pair of ground-wheels, an arch-axle section, and two stub-axes, of a pair of crank-arms pivotally secured to the arch-axle section, a plow-supporting hanger loosely secured between the free ends of the crank-arms and a plow secured to said hanger, substantially as set forth.

2. In a sulky-plow, a plow-supporting hanger provided with depending jaws or branches, one of the said jaws or branches being provided with a jointer-bearing, substantially as set forth.

3. In a sulky-plow, the combination, with an arch-axle section, a plow-hanger, and a plow suspended from said hanger, of a stub-axle on one end of the arch-axle section provided with the plow-lifting wheel Y, and a lever pivoted to the plow-hanger and having a rearwardly-projecting end adapted to be engaged by the lifting-wheel.

4. In a sulky-plow, the combination, with an arch-axle, a plow-hanger pivoted thereto, and a stub-axle provided with a plow-lifting wheel, of a weighted lever pivoted to the plow-hanger and adapted to be engaged by the plow-lifting wheel, substantially as set forth.

5. In a sulky-plow, the combination, with a plow suspended from the free end of a crank secured in swinging adjustment to the side of an arch-axle section, of an operating-lever secured in rocking adjustment to the side of the arch and provided with a rigid extension integral with the lever adapted to engage the free end of the crank, substantially as set forth.

6. In a sulky-plow, the combination, with a plow suspended from the free end of a crank, of an operating-lever mounted concentric with or having the same axis of rotation as the crank, and provided with a rigid extension engaging the free end of the crank for elevating the latter, substantially as set forth.

7. In a sulky-plow, the combination, with a plow-supporting crank-arm provided with a sleeve projection attached to its free end and extending parallel with its axis of rotation, of an operating-lever having the same axis of rotation as the crank-arm and adapted to embrace a bolt or rod, substantially as described, projecting through the said sleeve projection, substantially as set forth.

8. In a sulky-plow, the combination, with a plow-supporting crank suspended from a bolt or its equivalent set in the side of the arch-axle section, of a sector-bar rigidly secured in rotary adjustment on the bolt, and an operating-lever loosely secured on the bolt,

the lever being recessed to conform to the periphery of the sector-bar, substantially as set forth.

9. In a sulky-plow, an operating-lever recessed at its foot to conform to the curve of a sector-bar, and provided with a channel across which are formed bearings for a sliding dog, and in which the dog-operating rod is housed, substantially as set forth.

10. In a sulky-plow, the combination, with a lever pivotally secured to the axle and adapted to support a plow from one of its ends, of an operating dog or lever pivotally secured to its opposite end and adapted to engage a lifting device operated by the ground-wheel, substantially as set forth.

11. In a sulky-plow, the combination, with a lever pivotally secured to the axle, and a plow suspended from one end of the lever, of an operating dog or lever hinged to the opposite end of the lever and adapted to engage a rotary lift secured to an axle, substantially as set forth.

12. In a sulky-plow, the combination, with a plow-supporting lever pivotally secured to one side of an arch-axle section, and an operating-lever secured in rocking adjustment on the same axis, and connected with the plow-supporting end of the first-mentioned lever, of a lifting-dog secured to the opposite end of the plow-supporting lever, and a disk provided with one or more retaining-teeth adapted to engage a dog attached to the said operating-lever as the latter is rocked by the lift, substantially as set forth.

13. The combination, with the stationary disk adapted to lock the operating-lever in a position to suspend the plow, of the sector-bar adapted to be moved along the periphery of the disk, and adjusted to suit the convenience of the operator, for the purpose substantially as set forth.

14. The combination, with the land-wheel, the crank on which it is mounted, its operating-lever, and the sector-bar for determining its adjustment, of the single bolt adapted to extend longitudinally through the spindle and lock the several above-mentioned parts to the axle, substantially as set forth.

15. In a sulky-plow attachment adapted to replace the furrow-wheel axle and hanger, the combination, with the channel-faced stub-axle, and the spindle hinged to its end, of the sector-bar standard, the operating-lever, the arm connecting the operating-lever and hinged spindle, and the dog attached to the operating-lever adapted to engage the sector-bar and thereby lock the wheel in tilted adjustment, substantially as set forth.

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

CHARLES ANDERSON.

Witnesses:

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M. M. MATTHEWS.