

(No Model.)

2 Sheets—Sheet 1.

H. WIARD & W. R. BULLOCK.
SULKY PLOW.

No. 286,517.

Patented Oct. 9, 1883.

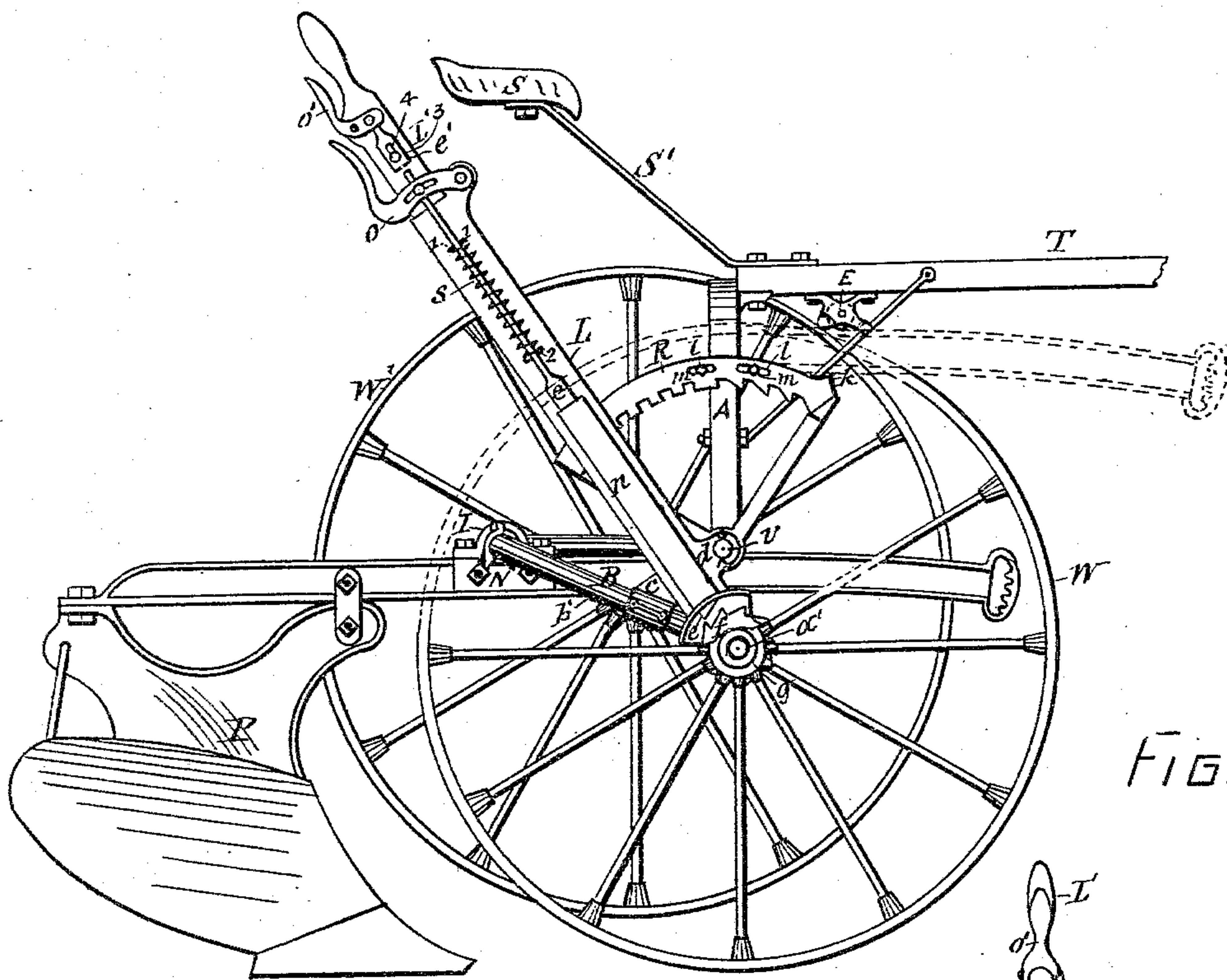


FIG. I

FIG. VII

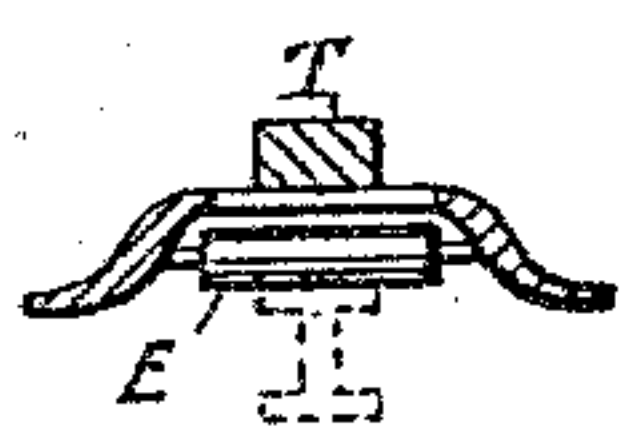
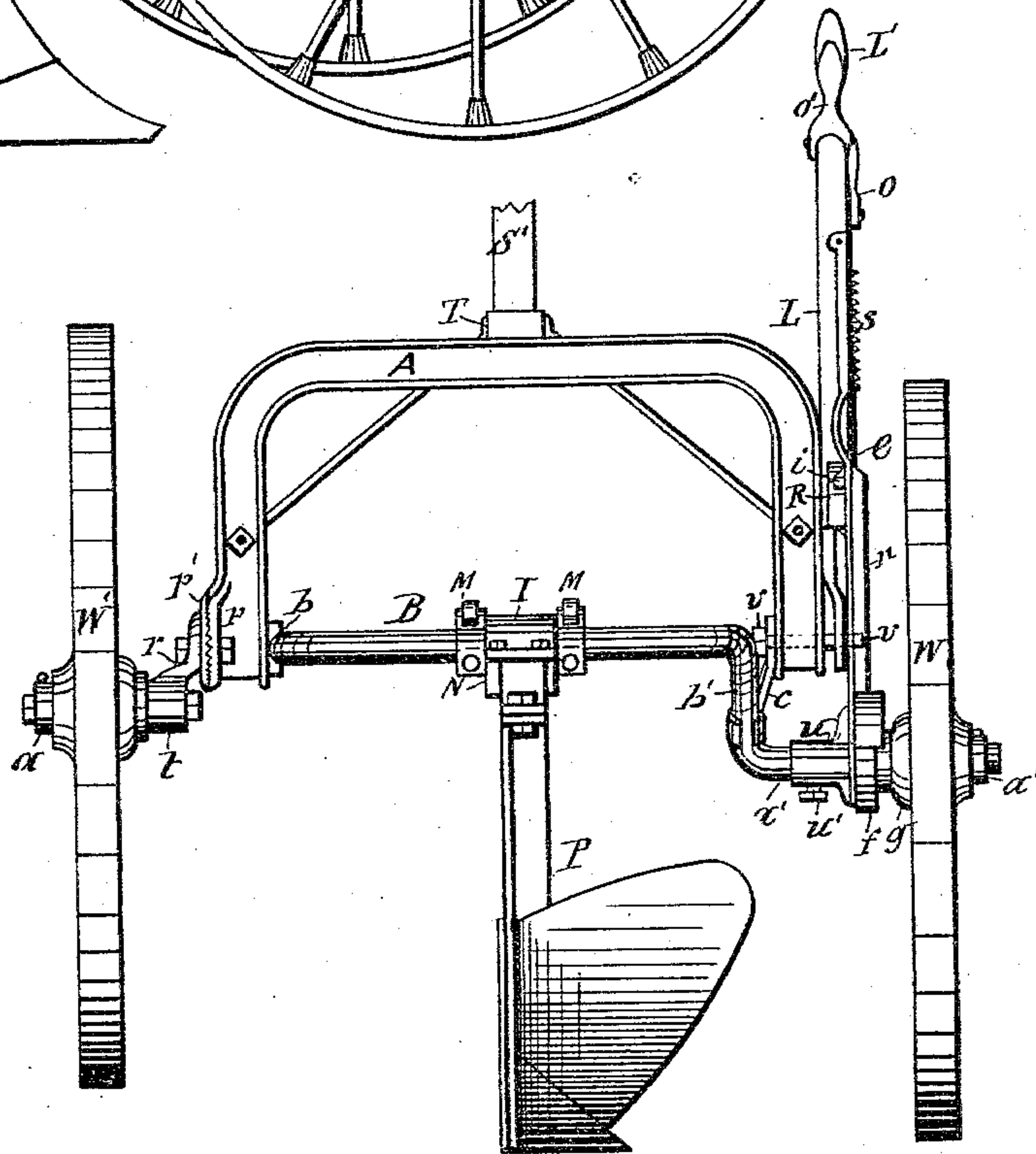


FIG. II



WITNESSES
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FIG-IX

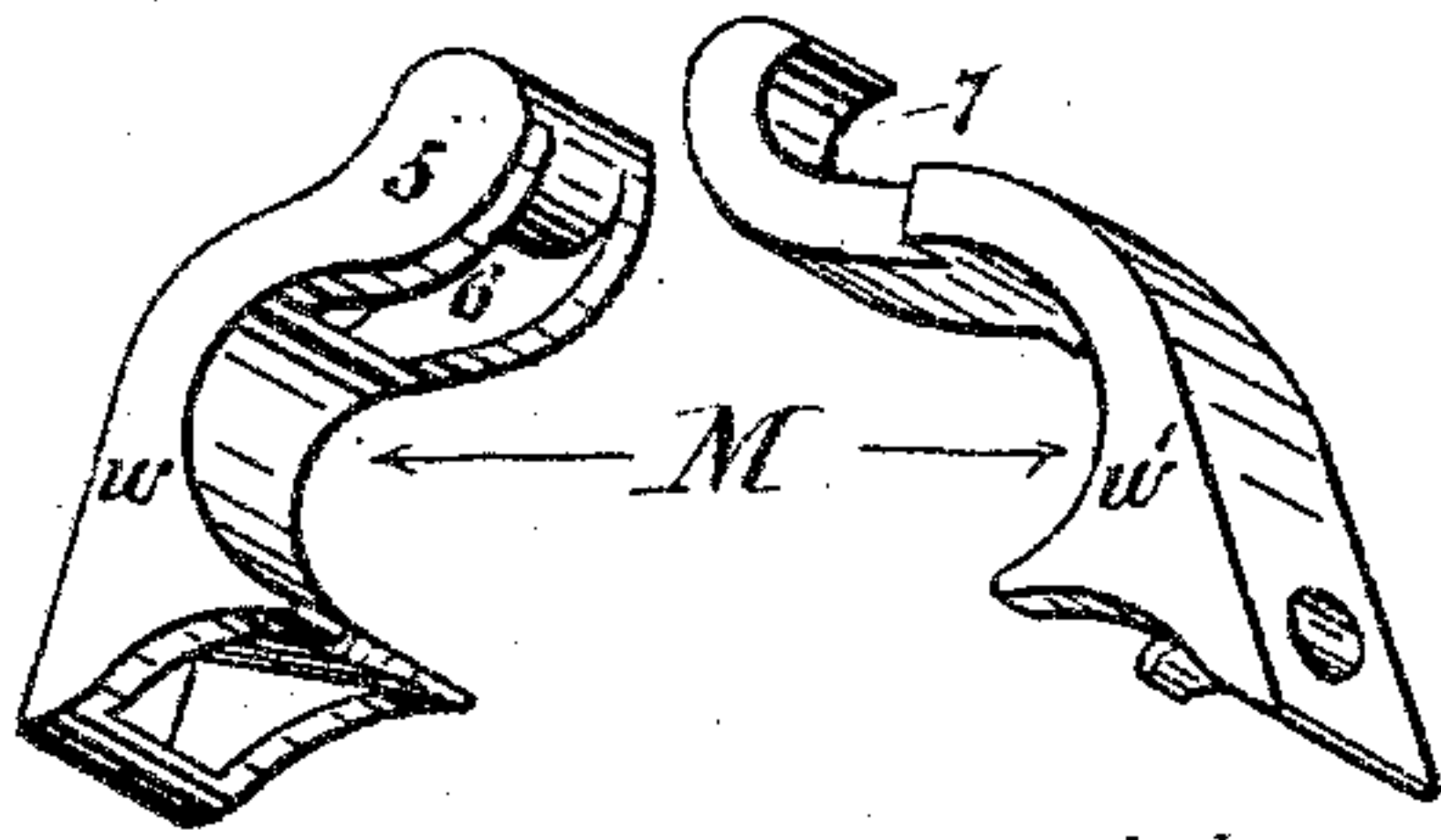


FIG-VIII

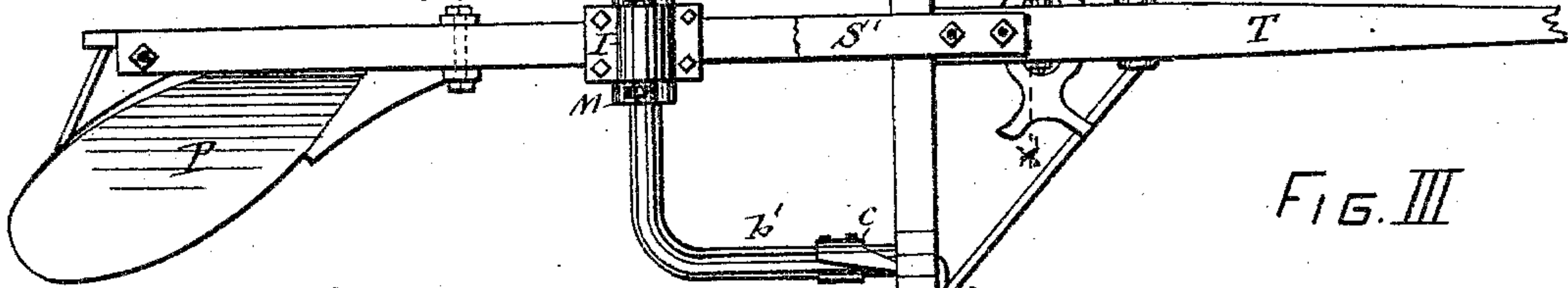
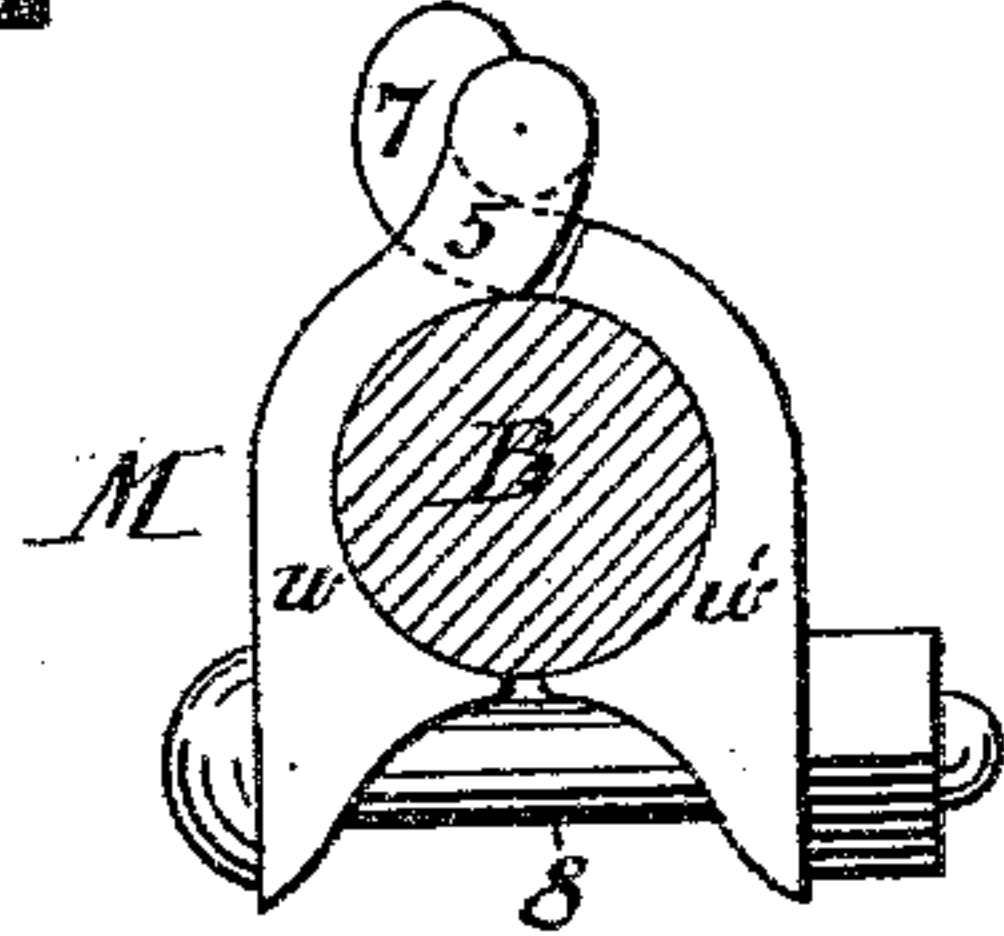


FIG. III

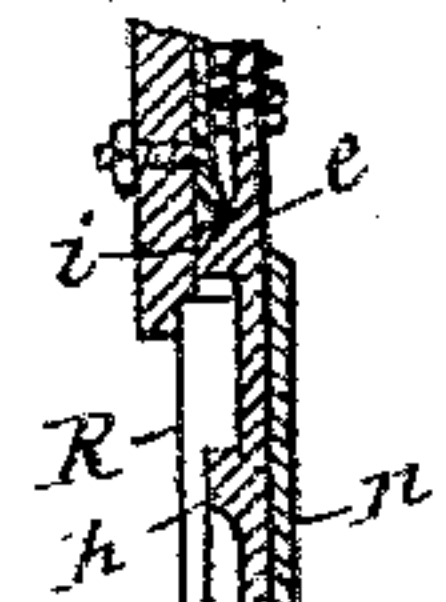
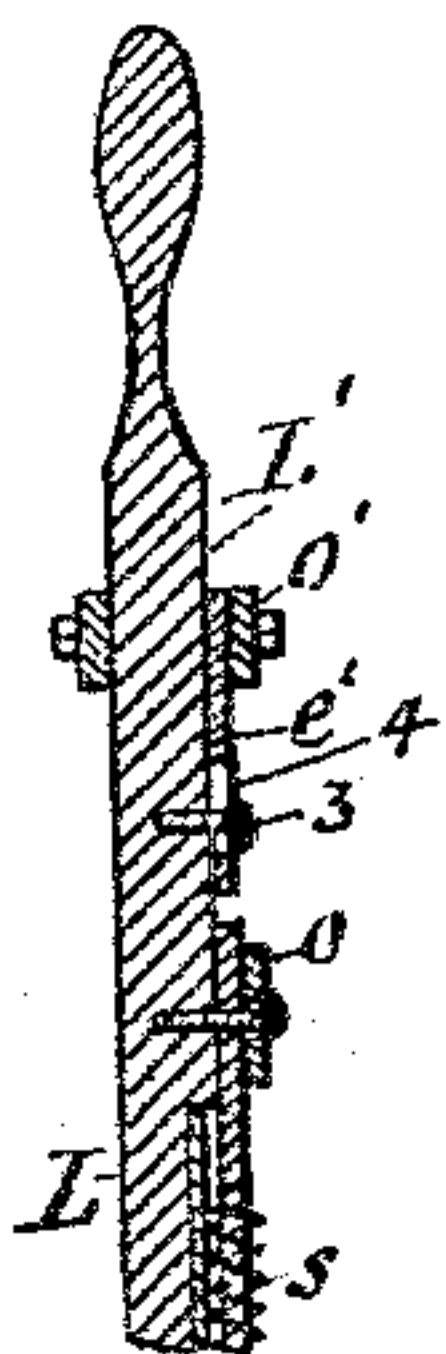
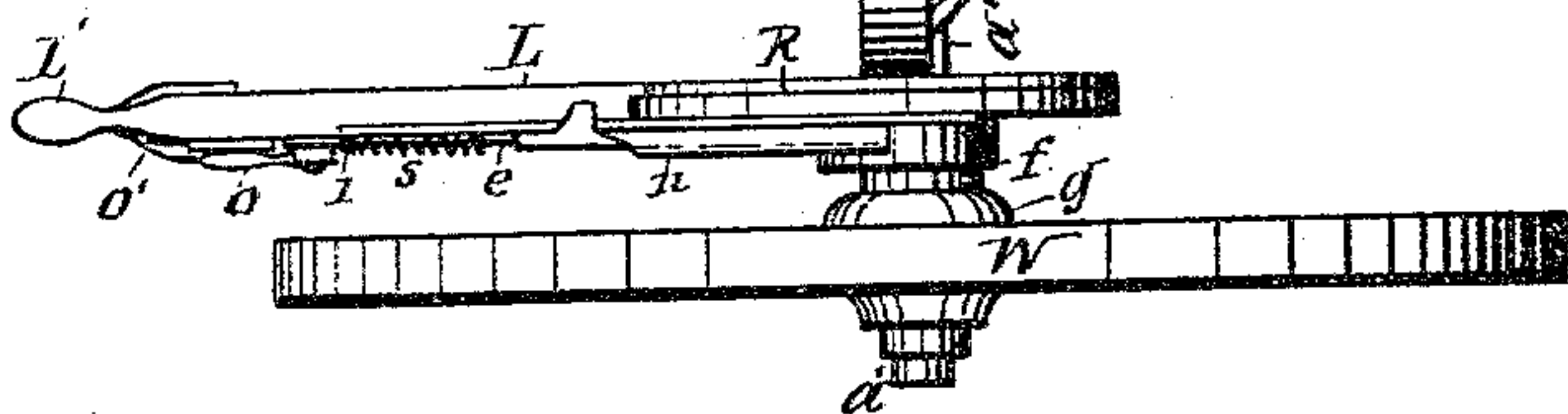


FIG IV

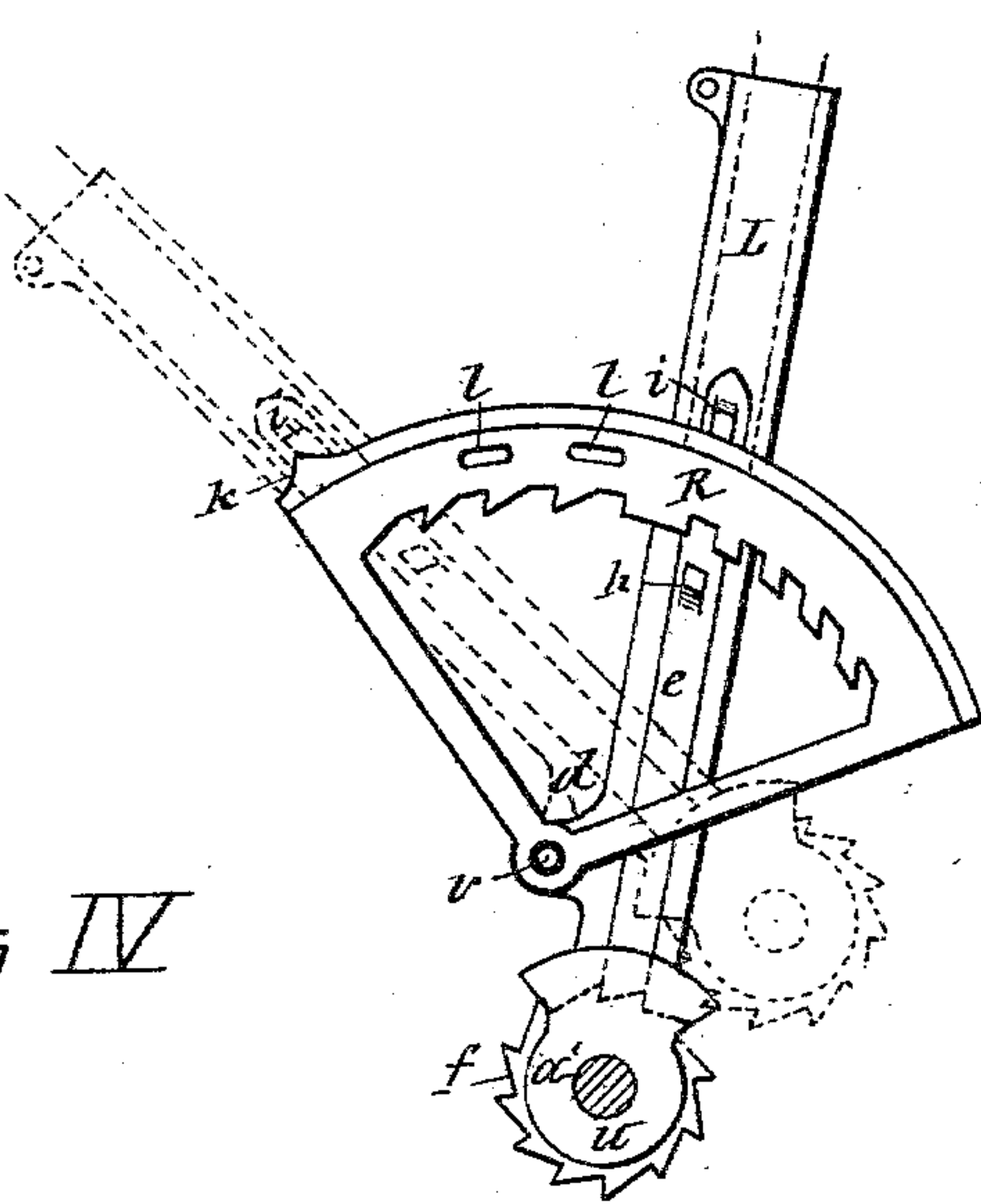
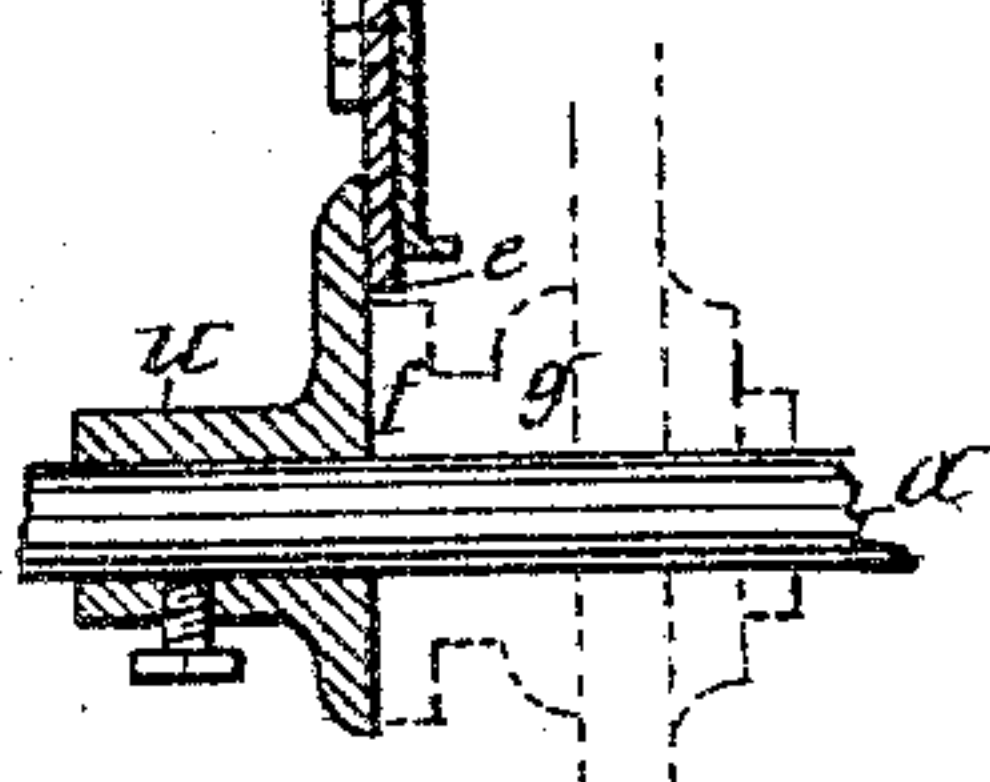


FIG.V

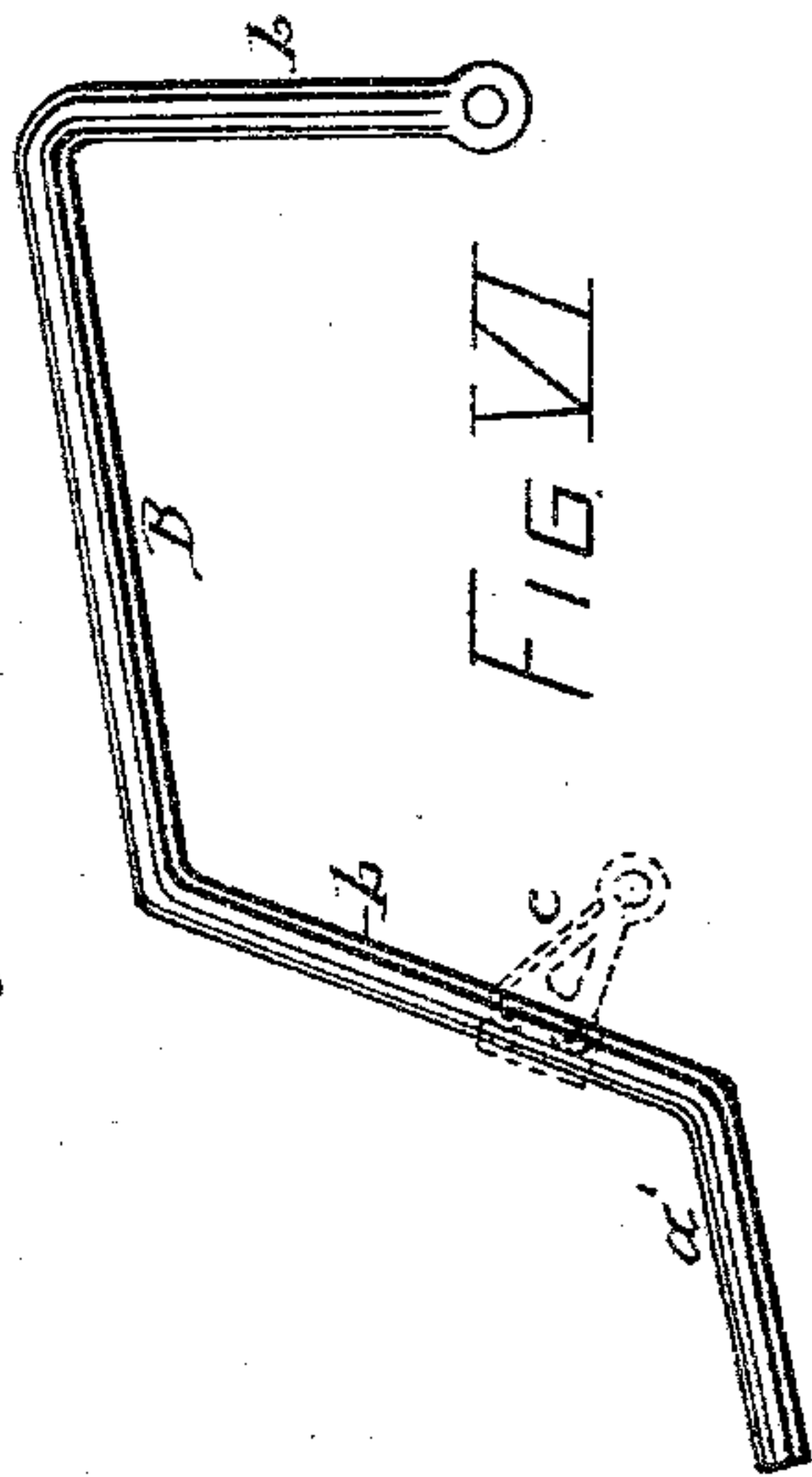


FIG VI

WITNESSES

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UNITED STATES PATENT OFFICE.

HARRY WIARD AND WILLIAM R. BULLOCK, OF SYRACUSE, NEW YORK.

SULKY-PLOW.

SPECIFICATION forming part of Letters Patent No. 286,517, dated October 9, 1883.

Application filed April 28, 1883. (No model.)

To all whom it may concern:

Be it known that we, HARRY WIARD and WILLIAM R. BULLOCK, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Sulky-Plows, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention consists in a novel construction and combination of a sulky and devices for adjustably suspending therefrom a plow in such a manner that by the manipulation of a single lever the sulky can be maintained in a horizontal position while the plow is in as well as out of the ground, and the adjustment of the sulky is facilitated by the weight of the driver seated thereon, and the lever is thus relieved of the greater portion of the strain, all as hereinafter more fully explained, and specifically set forth in the claims.

In the annexed drawings, Figure I is a side elevation of our improved sulky-plow. Fig. II is a rear end view of the same. Fig. III is a plan view with the seat broken away to better illustrate the more essential features of the invention. Fig. IV is an enlarged longitudinal section of the shifting-lever and its connection with the crank-axle and ratchets. Fig. V is rear face view of the same, illustrating the operation of the guard for automatically throwing the dog out of its engagement with the ratchet of the carrying-wheel. Fig. VI is a detached view of the crank-axle. Fig. VII is a transverse section on line *xx* in Fig. III, showing the arrangement of the friction-roller which forms the bearing for the plow-beam when the plow is carried in an elevated position under the sulky. Fig. VIII is an enlarged side view of one of the collars by means of which the plow is confined laterally in its position on the sulky, and Fig. IX is an isometric detail view of said collar.

Similar letters of reference indicate corresponding parts.

A denotes the main frame of the sulky, made arching or in the form of the three sides of a rectangle, supported in an upright position by the tongue T, firmly attached thereto. The driver's seat S is supported on the usual standard, S', which is secured to the tongue at its junction with the frame A, and extends rearward therefrom, so that the entire weight of

the driver comes onto the sulky. The extremity of the frame A, on the land-wheel side of the sulky, has integral with it a rearward projecting serrated collar or disk, *p*, to which is fitted a correspondingly-serrated collar, *p'*, which is cast in one piece with an arm, *r*, the opposite end of which is provided with a sleeve, *t*, through which the inner end of the axle *a* of the land-wheel passes. A nut applied to said axle at the inner end of the sleeve firmly connects said parts. The two collars *p p'* are adjustably clamped together by means of a bolt inserted through the center thereof, as shown.

The before-described connection of the axial support of the land-wheel with the main frame A is very rigid, and yet allows the coupling or supporting arm *r* to be turned, so as to carry the land-wheel higher or lower in relation to the furrow-wheel, the position of which latter is controlled by a single lever, in the manner hereinafter described.

B represents a crank-axle, one arm, *b*, of which terminates at and has its extremity pivoted to that of the frame A, adjacent to the land-wheel W'. The other arm, *b'*, of the crank-axle is of greater length than the arm *b*, and inclined rearward, and terminates in a horizontal extension forming the axle *a'* for the furrow-wheel W. The arm *b* is connected with the main frame A by an arm, *c*, rigidly attached to the arm *b*, and pivoted to the extremity of the frame A nearest the furrow-wheel W, the two pivotal connections of the crank-axle on the main frame A being directly opposite and in line with each other. The plow P is connected to the crank-axle by a shoe, N, clamped onto the plow-beam, and provided above said beam with a suitable bearing for the crank-axle B. A cap, I, placed across said axle and bolted to the shoe N, perfects the attachment of the plow. Said attachment, however, is adapted to slide longitudinally on the crank-axle B, and thus shift the plow bodily laterally, said shifting allowing the plow to be adjusted so as to take more or less land or cut a furrow of greater or less width, and at the same time maintaining the plow parallel to the line of draft, thereby obviating the cramping of the sulky incident to a deflection of the tongue, which latter means of adjusting the plow has heretofore been resorted to. We secure the plow in the required position by

means of collars M M, clamped on the crank-axle at opposite sides of the shoe N. Said collars we construct as illustrated in Figs. VIII and IX of the drawings, for the purpose of reducing the cost of their manufacture, facilitating their application and removal when required, and rendering them more effective in their operation, each of said collars being composed of two parts, *w* and *w'*, which do not quite reach around the axle B. The part *w* is provided above the axle with an upward projection, 5, and with an eye, 6, in said projection. The part *w'* is formed with an upward-projecting hook or curved tongue, 7, which is adapted to pass through the eye 6 and interlock with the solid portion above said eye. The lower extremities of the aforesaid two parts are extended below the axle, and are provided with holes for the reception of the bolt 8, by which the two parts are drawn together and clamped on the axle B. It will be observed that the described construction of the collar M saves the expense of drilling holes for the hinge-pin of the two component parts, and allows the latter to be easily molded and cast and readily put together and applied to the axle, and since the free ends of the two parts do not quite meet, they can be drawn together sufficiently to obtain a firm hold on the axle.

L denotes the shifting-lever, provided at its lower end with an eye, *u*, through which the furrow-wheel axle *a'* is extended. A set-screw, *u'*, passing through the eye *u* and engaging the axle *a'*, rigidly secures the lever on said axle. The lever has projecting from its front edge an arm, *d*, which is pivoted on the outer end of the pin or bolt *v*, which couples the long arm *b'* of the crank-axle with the frame A, said pivot serving as a fulcrum for the lever L.

It will be observed that by the described arrangement of the long arm *b'* of the crank-axle and the lever L, lying back of the fulcrum *v*, which latter is in line with the pivot of the opposite end of the crank-axle, the furrow-wheel axle *a'* is nearly directly under the fulcrum *v* when the lever is thrown into its extreme rearward position and the crank-axle lowered to throw the plow into the ground, thus throwing the axle *a'* into its greatest distance beneath the fulcrum when the plow is in operation and the furrow-wheel travels in the furrow, and thereby maintaining the sulky in a horizontal position. The forward thrust of the lever L swings the axle *a'* rearward, and simultaneously raises the main or central portion of the crank-axle. The latter raises the plow out of the ground and draws it forward or toward the sulky, while the former throws the furrow-wheel backward and lowers the sulky so as to bring it into a horizontal position when the plow and wheel leave their respective furrows; hence one and the same lever accomplishes the adjustment of the sulky, and this adjustment is facilitated and the lever relieved of the greater portion of the strain by the comparative slight travel of the axle

a' past the fulcrum and by the weight of the driver coming directly on the fulcrum.

R denotes a quadrant or segmental rack, having its teeth or notches on the under side, for the purpose hereinafter explained. This quadrant we pivot on the fulcrum-pin *v*, so as to maintain it concentric therewith. The segment or rim of the quadrant we provide with slots *l l*, through which pass the bolts *m m*, by which the quadrant is fastened to a fixed bearing on the frame A. Said slots allow the quadrant to be turned on its pivot and clamped in such a position as to allow the lever L a greater or less thrust in either direction past its fulcrum, and thus regulate the action of the cranked axle, so as to carry the plow a greater or less depth into the ground and the furrow-wheel a greater or less distance beneath the fulcrum, as well as back and forward thereof. The aforesaid adjustment of the quadrant carries with it the guard *k*, hereinafter described, and thus simultaneously adjusts the action of the dog *e* in conjunction with the ratchet *f*, which compels the furrow-wheel to lift the plow.

f is a ratchet-wheel which is integral with or rigidly attached to the hub *g* of the furrow-wheel.

In a longitudinal guide or way, *n*, on the lever L slides rectilinearly a duplex dog, *e*, in the form of a bar, having its lower extremities adapted to engage with the teeth of the ratchet-wheel *f*.

From the back of the dog *e* projects a tooth, *h*, which is in such relative position that it can engage with the teeth of the quadrant R, and become liberated therefrom without throwing the extremity of the dog into engagement with the ratchet *f*, before described. The dog *e* is held normally in engagement with the quadrant by means of a spiral spring, *s*, surrounding the upper end portion of the dog, which is shaped to accommodate said spring, the spring resting with its lower end against lugs *l l*, cast on the lever L, and exerting an expansive force against a collar or pin, 2, on the dog. A small hand-lever, *o*, is pivoted to the main lever L and connected to the dog *e* near the upper end thereof. By pressing down said lever *o*, the dog *e* can be pushed far enough to cause it to engage with the ratchet *f* on the hub of the furrow-wheel, and thereby compel said wheel to swing the lever L forward and the crank-axle upward, and thus throw the plow out of the ground and the furrow-wheel rearward to level the sulky. This action by the furrow-wheel, however, is not always desirable. In order to give the operator full control of the aforesaid action, we provide the lever L with an extension, *L'*, preferably formed of wood and bolted to the iron lever L. On this extension we hinge another small lever, *o'*, which is provided with a push-bar, *e'*, the movement of which is limited by a pin, 3, projecting from the handle-extension *L'* and through a slot, 4, in the push-rod. Said slot is of sufficient length that while allowing the

push-bar *e'* to force the dog out of engagement with the quadrant R it at the same time prevents the engagement of the lower end of the dog with the ratchet *f*. This arrangement
5 allows the operator to swing the crank-axle in the manner hereinbefore described without bringing into action the ratchet *f*, fixed to the hub of the furrow-wheel.

Heretofore the connection between the lever and the ratchet on the wheel has generally been made by a separate and distinct pawl pivoted to the lower end of the lever and operated by an extra rod connected with said pawl and with a supplemental lever pivoted
10 to the upper end of the main lever; but it is obvious that such devices have more joints, that are liable to wear and work loose and rattle, and are neither so compact, stable, and durable, nor so positive and reliable in their
15 operation, as our improved connection between the lever and the wheel and quadrant.

In order to guard against accidents from neglect to throw the dog in due time out of engagement with the ratchet-wheel *f*, we provide the forward end of the quadrant with a sloping upward projection, *k*, and fix to the back of the dog *e* a lug, *i*, the encounter of which with the projection *k* compels the dog
20 *e* to rise and clear the ratchet *f*.

E represents a roller pivoted horizontally and at right angles to the line of draft on the foot-rest F or other suitable support underneath the tongue T, said roller forming an anti-friction bearing for the plow-beam when
25 the plow is raised out of the ground and carried in an elevated position underneath the sulky.

Having described our invention, what we claim is—

40 1. In a sulky-plow, the combination, with the sulky-frame, of a crank-axle having its two arms pivoted on said frame at points directly opposite and in line with each other, one of said arms being extended rearward and below its pivot and formed with the furrow-wheel axle, and the land-wheel axle attached to the sulky-frame separate and independent of the crank-axle, substantially as shown.

2. In combination with a plow, a main frame supporting the driver's seat, and provided with a stationary axle for the land-wheel, a crank-axle pivoted on said frame, and having fixed to it the furrow-wheel axle eccentrically in relation to the land-wheel axle, and a lever fixed to the crank-axle and fulcrumed on the main frame in such relative position as to swing the furrow-wheel axle forward and backward underneath the fulcrum of the lever, substantially as set forth.

3. In combination with a plow, an arched main frame provided with a stationary land-wheel axle, the driver's seat supported on said frame, a crank-axle pivoted at its arms on the main frame, and having one of said arms extended below its pivotal support and terminating with an axle for the furrow-wheel, and a lever fixed to the furrow-wheel axle and ful-
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crumed on the main frame above said axle, substantially as set forth.

4. In combination with the sulky-frame, the crank-axle terminating at the end of one of the crank-arms with a pivotal connection on the frame, and having the other crank-arm of greater length and inclined rearward, and terminating with the furrow-wheel axle, and supported by an arm pivoted on the main frame, and the land-wheel axle attached to said frame separate and independent of the crank-axle, substantially as shown and set forth.

5. In combination with the main frame A, provided with the stationary axle *a*, the crank-axle B, pivoted at the end of the arm *b*, and having the longer arm, *b'*, extended rearward and formed with the furrow-wheel axle *a'*, the arm *c*, connected to the arm *b'* and pivoted on the frame above the axle *a'*, the lever L, fixed to the furrow-wheel axle, and having the arm *d* hinged to the pivotal pin of the arm *c*, and provided with the dog *e*, and the ratchet *f*, fixed to the wheel-hub *g*, substantially as shown and set forth.

6. In combination with the frame A, supporting the driver's seat, and provided with the stationary axle *a*, the crank-axle B, hinged on the frame A, and having the arm *b'* inclined rearward and extended below its support on the frame, and provided at its extremity with the furrow-wheel axle *a'*, the lever L, fixed to the furrow-wheel axle, and having the arm *d* hinged on the pivotal pin of the arm *c*, and provided with the dog *e*, and the segmental rack R, secured concentric with said pivotal pin, substantially as described and shown.

7. In combination with the ratchet on the wheel-hub and the quadrant on the frame, the duplex dog, consisting of a single bar having its lower end adapted to engage the ratchet, and provided at the quadrant with a tooth adapted to engage therewith, substantially as described and shown.

8. In combination with the ratchet on the wheel-hub and the quadrant having teeth or notches on its under side, the lever provided with a longitudinal way, the rectilineal reciprocating duplex dog having its lower extremity adapted to engage the ratchet, and provided at the under side of the quadrant with a tooth or lug, and a spring arranged to normally sustain the dog in its elevated position, substantially in the manner set forth and shown.

9. In combination with the ratchet on the wheel-hub, the quadrant provided on its under side with a series of notches and on top of its forward end with an upward-projecting guard, the rectilineal reciprocating duplex dog, having its lower end adapted to engage the ratchet, and provided with lugs *h* and *i*, respectively, below and above the quadrant, substantially in the manner and for the purpose specified and shown.

10. In combination with the frame A, the crank-axle B and lever L, fixed to said axle and fulcrumed on the frame, the quadrant R, pivoted on the fulcrum of the lever and pro-
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vided with slots *l l*, and the clamping-bolts *m*, fastening the quadrant on the frame, substantially as described and shown.

11. In combination with the frame A, having integral with it the serrated collar *p*, the arm *r*, formed in one piece with the serrated collar *p*, clamped on the collar *p*, and provided at the opposite end with the sleeve *t*, and the axle *a*, passing through said sleeve and secured thereto, substantially as described and shown.

12. The collar M, composed of two parts, *w* and *w'*, one of said parts being provided with a lower extension, an upper projection, 5, and an eye, 6, in the latter, and the other part be-

ing formed with a lower extension and with an upward-projecting hook, 7, in combination with a bolt or clamp applied to the lower end of said parts, substantially as described and shown.

In testimony whereof we have hereunto signed our names and affixed our seals, in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 18th day of April, 1883.

HARRY WIARD. [L. S.]

WILLIAM R. BULLOCK. [L. S.]

Witnesses:

WILLIAM C. RAYMOND,

FREDERICK H. GIBBS.