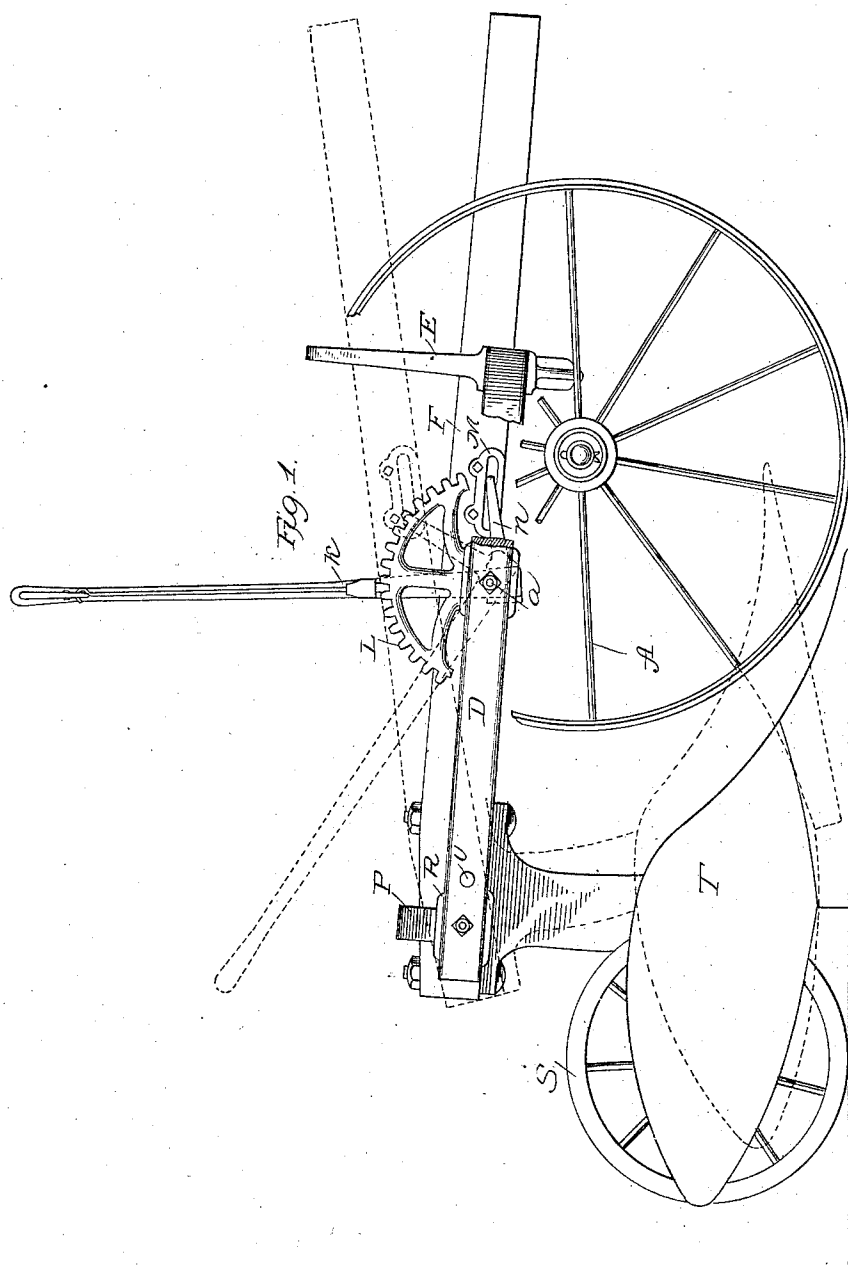




(No Model.)

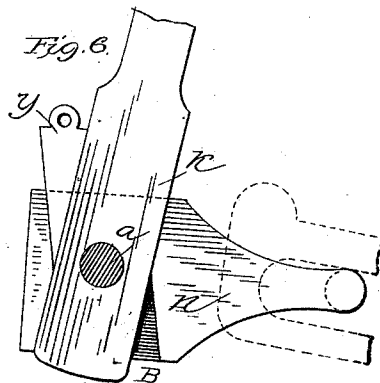
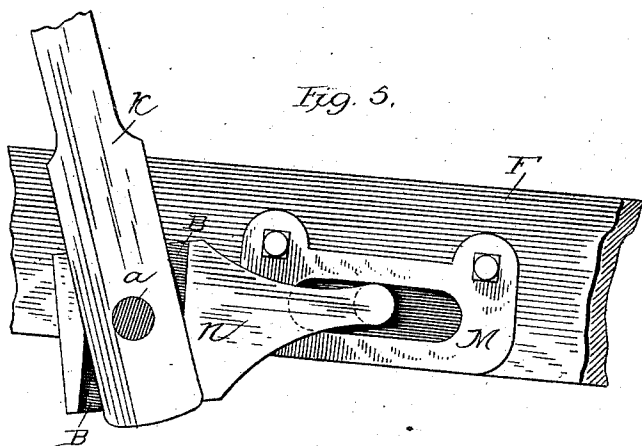
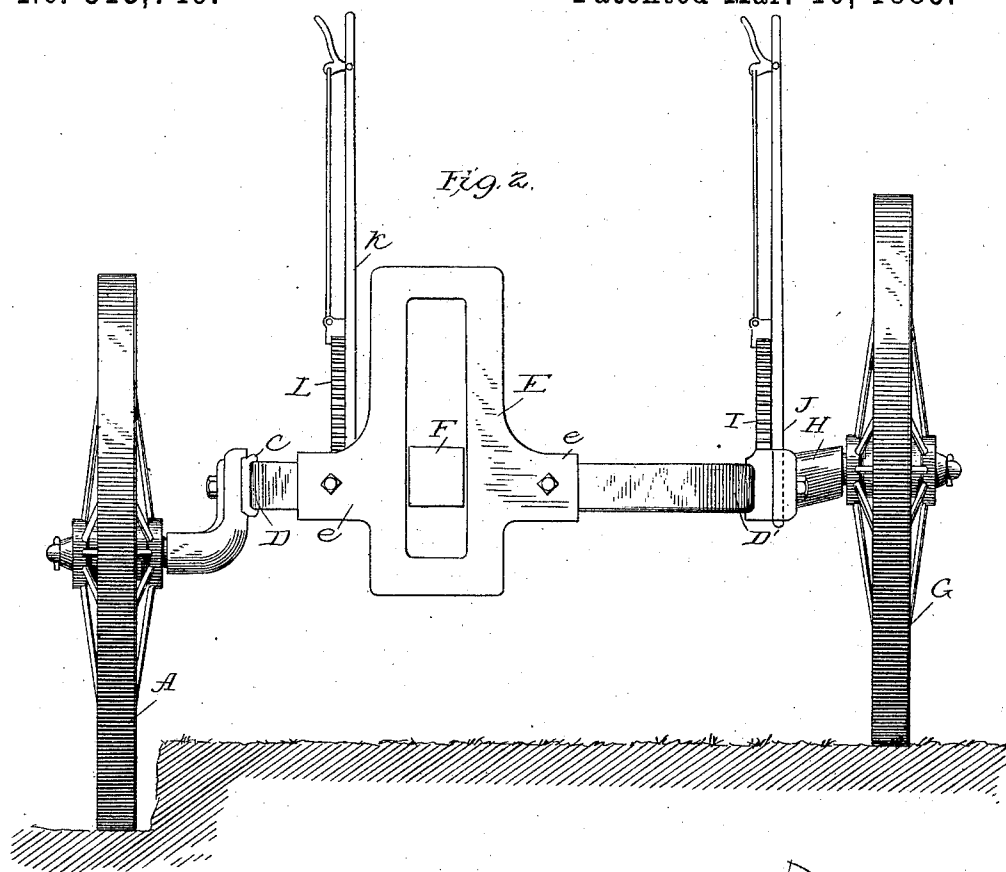
3 Sheets—Sheet 2.

E. D. MEAGHER & C. E. TOWER.

SULKY PLOW.

No. 313,749.

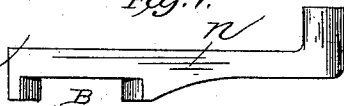
Patented Mar. 10, 1885.



WITNESSES:

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Fig. 7.



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UNITED STATES PATENT OFFICE.

EDMUND D. MEAGHER AND CALEB E. TOWER, OF SOUTH BEND, ASSIGNORS
TO THE ECONOMIST PLOW COMPANY, OF ST. JOSEPH COUNTY, IND.

SULKY-PLOW.

SPECIFICATION forming part of Letters Patent No. 313,749, dated March 10, 1885.

Application filed September 26, 1884. (No model.)

To all whom it may concern:

Be it known that we, EDMUND D. MEAGHER and CALEB E. TOWER, of South Bend, in the county of St. Joseph and State of Indiana, have invented a new useful Improvement in Sulky-Plows; and we do declare that the following is a full, clear and exact description of the same.

Our invention relates to sulky-plows.

Our object is, first, to simplify the construction of the frame of the sulky and to increase its rigidity, whereby the plow may be more effectually held to its work in hard ground; and, further, our object is to provide means whereby the use of a tongue may be avoided.

In most sulky-plows as heretofore made the arches comprising part of the frame-work, or the frame-work in some part, has had more or less elasticity, and when the plow is worked in hard ground the spring of the frame renders impossible rigid and inflexible pressure on the plow; hence the plow cannot be forced into the ground to a proper depth, and poor plowing, and consequently poor crops, result from imperfection of this implement of cultivation.

In sulky-plows as heretofore made, so far as we are aware, a tongue has been ordinarily used. This tongue, thrown violently from side to side by the motion of the sulky, gives violent blows to the sides and necks of the horses. It also prevents working the land close to the fences, and is a hinderance when the plow is turning corners or working among stumps.

To overcome these objections and carry out the objects abovestated, our invention consists, first, of a vertically-rigid sulky-frame formed of side bars arranged in approximately-horizontal plane, but bent laterally to conform to the position of the plow and wheels, and provided with suitable rigid connections at front and rear.

It consists, secondly, of a sulky-frame composed of laterally-bent side bars connected at the rear ends by horizontal trunnions or pivots to the plow-beam.

It consists, thirdly, of a horizontal sulky-frame composed of laterally-bent side bars rigidly connected to each other at the rear by the horizontal trunnions or pivots of the plow-

beam and at the front by a vertical guide for the end of the plow-beam.

It consists, fourthly, in combining with a rigid frame and a plow-beam pivoted thereto at the rear end, a furrow-lever and connections between said lever and the plow-beam, adapted to force the plow into the ground and to lock it in position with limited vertical play, whereby the plow may be permitted to rise over a buried stone or like obstruction, or the land-wheel may drop into a hollow without throwing the weight of the frame on the point of the plow; and, lastly, our invention consists of details of construction, all as hereinafter more fully set forth.

In the accompanying drawings we have shown the preferred form in which we have embodied our invention.

In these drawings, Figure 1 represents a side elevation of our invention, with a part broken away; Fig. 2, a front elevation of the same; Fig. 3, a plan view; Fig. 4, a section on line *xx* of Fig. 3, looking to the rear. Figs. 5, 6, and 7 show the construction of furrow-lever and foot-piece for giving the required vertical play. Fig. 8 shows a modified form of receiver.

The side bars of the sulky-frame are shown at *D D'*, and are bent in the shape shown, or in any equivalent or suitable shape to conform to the parts hereinafter explained. The front ends of these bars are held together by a casting, *E*, in which is a loop or guide for the front end of the plow-beam. The ends of the bars are bolted to flanged ears *e e*, formed on the casting. The rear ends of the bars *D D'* are held together by a bent bar, *P*, between the ends of which and the bars *D D'* are flanged castings *R*, the parts being held together at each end of the bar *P* by a single bolt which passes through the casting, the ends of the bar *P*, and the bars *D D'*. The pieces *D*, *D'*, *E*, and *P* therefore constitute the entire frame of the sulky. The pieces *D D'* are preferably made of wrought iron or steel bars, arranged on edge, so as to give the greatest amount of vertical rigidity and ability to withstand the strain from the wheels, levers, and plow, so that the plow may be forced into the hardest ground by the action of the le-

ver, as hereinafter explained. It is obvious, however, that many changes may be made in the construction of this frame without impairing its stiffness. For example, the frame may be made of one continuous piece, the bars D D' being extended, and welded at the meeting-points of its ends. In this way the pieces E P and R may be omitted, or the pieces P and R may be omitted by bending the bar which constitutes the body of the frame around the back end of the beam of the plow. In like manner the loop E may be omitted by continuing the side bars, D D', until they meet under the beam of the plow. In this case a guiding-pin may be set on the bar D, working through a hole in the beam or through a hole in a casting or forging attached to the side of the beam, the pin in this case taking the place of the loop E, and forming a guide for the front end of the beam, permitting it to rise or fall in relation to the frame, but preventing any lateral movement. We do not confine ourselves, moreover, to the precise form of the lateral bends in the bars D D'. These may be varied as may be found convenient without impairing the stiffness of the frame.

The plow-beam F is made of wood or other suitable material, and may be of ordinary construction. Its front end passes through the loop E, and has only enough lateral play therein to insure easy vertical movement. The rear end of the beam is held in position on the frame by two trunnions, U, one of which is bolted to each side of the beam, as shown in Fig. 3. The ends of these trunnions pass through corresponding holes in the ends of the bars D D', and act as pivots to permit the front end of the beam to be moved up and down without allowing lateral movement or twisting of the back end of the beam.

Instead of the trunnions U a casting or forging may be used, shaped to pass over or under the beam F, with ears turned up or down to meet the face of the bars D D', and adapted to be bolted thereto, the bolts acting as pivots instead of the trunnions, the beam being bolted to this casting or forging. The wheel-spindles are attached directly to the side bars of the frame. The wheel that runs in the furrow is shown at A, and supports one side of the sulky-frame at the front end thereof. This spindle is bolted to the side bar, D, with one bolt, and between the spindle B of this wheel and the bar D is a sliding block, C, having a slotted hole for the spindle-bolt to pass through. The slotted hole permits a forward and back adjustment for the purpose of changing the position of the wheel, and to control its run. By moving the block forward the front of the wheel is thrown in and in this position it will run towards the vertical furrow-bank, its tendency in that direction being regulated by the amount of inclination given to the wheel. By moving the block C backward the front of the wheel is thrown out and

the tendency of its run will be from the furrow-bank. This adjustment is necessary to guide the plow in the desired direction, and, in connection with the usual clevis attached to the front of the beam F, controls the width of the furrows to be plowed. The land-side wheel is shown at G. It is attached to the bar D' by one bolt which passes through the spindle H of the said wheel. Between the spindle-face and the bar D' is located the sector I, which has ribs on its side to fit the upper and lower edges of the bar D'. The spindle is an ordinary crank-spindle, as shown in Fig. 3, and the lower end of the operating-lever J fits into a recess in the end of the spindle, so that a single bolt secures the lever, the sector, and the spindle all to the bar D'. Obviously, by moving the lever forward the wheel is moved upward and backward, and by moving the lever backward the wheel is moved forward and downward. The lever is held in position by the plunger of the lever engaging into the teeth of the sector, and by this leveling of the sulky-frame the plow is kept in proper position for work. The furrow-lever is shown at K. It is located upon the side bar, D, in that part which lies near to the beam. A foot-piece, N, formed with flanges to fit over the edges of the lower end of the lever K, is bolted thereto, and forms therewith a bell-crank lever. At the end of the foot-piece is a pin fitting into the slot of a receiving-casting, M, bolted to the side of the plow-beam F. A sector, L, is provided for the lever K, and it has flanges on the outside fitting over the top and bottom edges of the bar D. The lever K is placed against the smooth inner surface of the sector, and one bolt secures the sector, the lever, and the foot-piece, passing through them all and through the bar D. By pulling the lever K backward the front of the plow-beam is raised within the loop E, and the plow T, being bolted to the back end of the beam, has its point raised at the same time to lift it out of the furrow. By pushing the lever K forward the front end of the plow-beam is pressed down and the plow forced into the ground. It is held at any desired depth, being locked by the plunger of lever K engaging with the teeth of the sector L. As the rear end of the plow-beam is pivoted to the rear end of the frame, and allowed at any time only vertical swinging movement upon the rear pivots, the locking of the lever K holds, with limitations hereinafter explained, the plow absolutely rigid with the frame of the sulky, and the weight of the driver is transmitted through inflexible connections to the plow. At the same time the sulky is carried along by the plow as a part of the same structure, and does not require to be guided by a tongue, as ordinary sulky-plows are guided. The guide E, or the equivalent thereof, holds the plow-beam in fixed relation to the wheels of the sulky, so that they guide the plow constantly, and together with the rear wheel, S, which is the same as that shown

in Letters Patent bearing date February 7, 1882, to E. D. Meagher, form supporting-wheels for the whole structure.

It is obvious that the position of the lever, sector, and other parts may be changed without changing their functions. For example, the lever and sector can be secured to the beam, and the casting M can be secured to the side of the bar D, and in this changed position they will operate to raise or lower the plow-beam in the same manner.

The structure as thus far explained would be sufficient for soil having no buried rocks or other like obstructions and no inequalities upon its surface, but these obstructions and inequalities so commonly occur that provision must be made for them. The point of the plow must be permitted to rise when it meets a buried stone without hinderance from the frame, and the wheel must be permitted to drop when it meets a hollow in the ground without throwing the weight on the plow-point. At the same time it is desirable to carry the point of the plow so that it will not cut any deeper than a certain defined depth; also, it is necessary at the same time to have control over the furrow-lever, so that it can be used to face the plow in speedily at the ends by throwing the weight of the frame on the point of the plow, or to force the plow in deeper than it would be inclined to run in crossing spots in the field much harder than the average of the work. It is also necessary that a third action should be had in the lever, so that in certain kinds of work the frame and plow can be locked rigidly together vertically, so the plow can neither run deeper or shallower than the lever will permit without carrying the frame with it.

Figs. 5, 6, and 7 show in plan the construction of lever and foot-piece adapted to accomplish the purpose above specified. Fig. 7 represents an edge view of the foot.

The lever K is set loosely into the recess B B in the lever-foot N, being pivoted as heretofore explained. The recess cut in the face of the lever-foot N is narrowest in the middle and flares to each end, so that the lever has a limited play on the foot, but brings up rigidly against the sides at the limit of its movement. When the lever is drawn backward, as shown in Fig. 5, the upper jaw of the slot in receiver M rests on the spur of the lever-foot N. In this position the front of the beam is held up by the lever-foot, and it cannot drop below the point at which it is held by the lever; but if the plow strikes a buried stone the point can glance over it without lifting the wheels and frame. The receiver M coming up with the beam lifts the lever-foot N, which turns on the bolt *a a* until the shoulder of the mortise strikes the front edges of lever K, thus freeing the point, and obviating the danger of breaking plow or frame. The same action takes place when the land-wheel drops into a hollow. The land-side of the frame in drop-

ping down simply takes up the slack motion between the front edge of the lever and jaw of the recess B B without forcing the beam, and with it the point of the plow, below the proper depth. When lever K is pushed forward, as shown in Fig. 6, lever-foot N is forced down on lower jaw of open slot in receiver M, and in this position the point of the plow cannot rise above the position desired without lifting the frame and wheels, but can drop below its regular depth until the jaw of the recess C C strikes against the front edge of the lever.

When desired to lock the lever rigidly and hold the plow in a fixed relation to the frame, a wedge, Y, can be inserted between lever and face of recess or mortise. The same results can be attained by making the mortise or recess in lever-foot N with parallel instead of flaring faces, with sufficient space between lever edges and jaws of recess to allow the necessary movement forward and back and bear only on the corners of the recess. The locking of the lever in a fixed position can be done in this case by inserting a second bolt above or below the bolt *a*, by the use of which second bolt the lever can be rigidly secured to the lever-foot, when desired, instead of using the wedge Y.

The first two movements described—holding the point of the plow so that it cannot sink below the desired depth, as in Fig. 5, or so that it cannot rise above the desired height, as in Fig. 6—can be accomplished by using a lever with a fixed lever-foot, and widening the jaws of the receiver M, in which the spur of the lever-foot N works, so as to allow the beam to play up or down until the spur strikes the upper or lower jaw. The first and third movements can be accomplished also by the use of a fixed lever and foot, and a lever-receiver made in two parts, as shown in Fig. 8, the lower half, *x*, of the receiver being inserted whenever it is necessary to lock the lever rigidly.

The action of the plow in ordinary work is as follows: The plow is put in the ground by pushing the lever forward, as shown in Fig. 6, and when the necessary depth is attained the lever is pulled back into position. (Shown in Fig. 5.) The point of the plow is now carried on the spur of the lever-foot. If the plow will not run as deep as desired, the plowman raises the hitch on his clevis until he finds the elevation which will hold the desired depth in the hardest place in the field. In going through softer spots the plow cannot sink any lower, and when a buried stone is struck the point of the plow can glance over it without lifting the frame. So, also, the land-wheel can drop into hollows and rise out without bearing the point of the plow down. In this position the plow will do its work with the greatest regularity and the lightest draft; but when unusual force is required to hold the plow or colter down the wedge Y can be inserted, or the le-

ver forced forward temporarily when the plow is passing through an unusually hard strip of ground, and then drawn back to its place when this spot is passed.

5 What we claim as our invention is—

1. A horizontal sulky-frame composed of laterally-bent side bars rigidly connected to each other at front and rear, combined with suitable supporting-wheels connected directly to
10 the said bars, and with a plow-beam connected to said bars by horizontal pivots or trunnions at the rear end thereof, substantially as described.

2. A horizontal sulky-frame composed of laterally-bent side bars rigidly connected to each other at the rear by the horizontal trunnions or pivots of the plow-beam and at the front by a vertical guide for the end of the plow-beam, substantially as described.

3. A vertically-rigid frame composed of side bars having connections at its rear end, with a plow-beam adapted to permit vertical movement only of the front end of the plow in relation to the frame, and suitable guide for the
25 front end of the beam, connecting it with the frame, and adapted to the vertical movement, suitable supporting-wheels for the frame, and means for holding the front end of the beam at any desired height, all substantially as described.
30

4. In combination, the bent side bars, D D', the supporting-wheels, and the casting E on said bars, connected to the plow-beam by horizontal trunnions or pivots, as set forth.

5. A sulky-frame composed of the laterally-bent side bars, D D', and rigid connections between these bars in front and rear, in combination with a vertically-adjustable supporting-wheel, G, and a laterally-adjustable supporting-wheel, A, substantially as described.
40

6. In combination with a side bar, D, of the sulky-frame, the spindle B, the curved and slotted block C, and the connecting-bolt, as described.

7. In combination with the side bar, D, of the sulky-frame, the flanged sector L, lever K, foot-piece N, plow-beam F, having a slotted casting, and a connecting-bolt, as described.

8. In combination with the side bars, D D', of a sulky-frame, the bent bar P, flanged castings R, and connecting-bolt, as described. 50

9. In a sulky-plow, and in combination, a rigid frame, a plow pivoted to the rear end of said frame, a front vertical guide for the plow-beam, and a loosely-connected furrow-lever, whereby the beam may be held rigidly up or down, all substantially as described. 55

10. In a sulky-plow, and in combination, a rigid frame, a plow pivoted to the rear end of said frame, a front vertical guide for the plow-beam, a furrow-lever, and a recessed lever-foot connecting frame and plow-beam and loosely pivoted to the lever, as and for the purpose set forth. 60

11. In a sulky-plow, and in combination, a rigid frame, a plow pivoted to the rear end of said frame, a front vertical guide for the plow-beam, a furrow-lever, and a recessed lever-foot connecting the beam and frame and loosely pivoted to the lever, and means for rendering the loose connection rigid, all substantially as described. 65

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

EDMUND D. MEAGHER.
CALEB E. TOWER.

Witnesses:

LEIGHTON PINE,
PIERRE MEAGHER.