

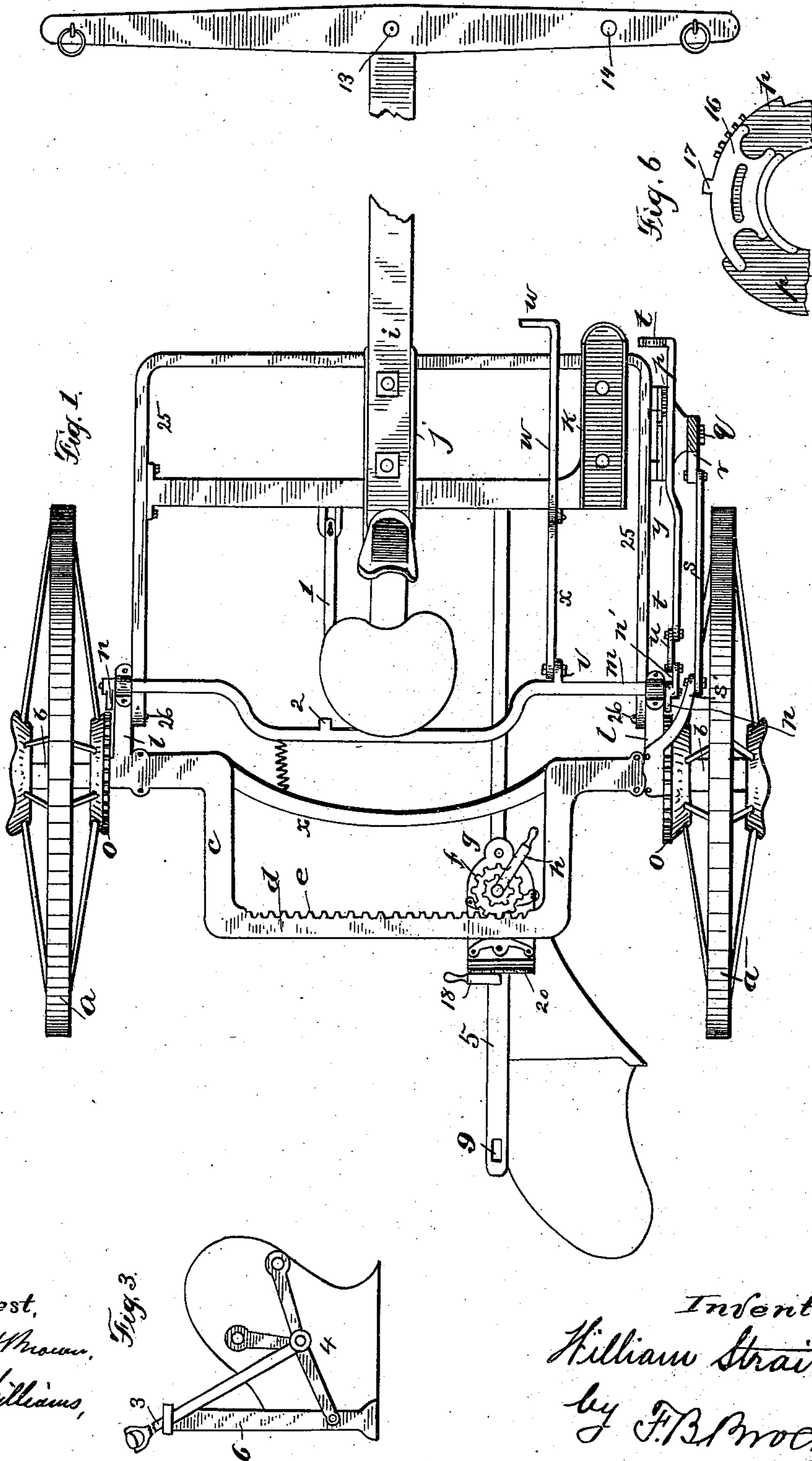
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3 Sheets—Sheet 1.

W. STRAIT.  
SULKY PLOW.

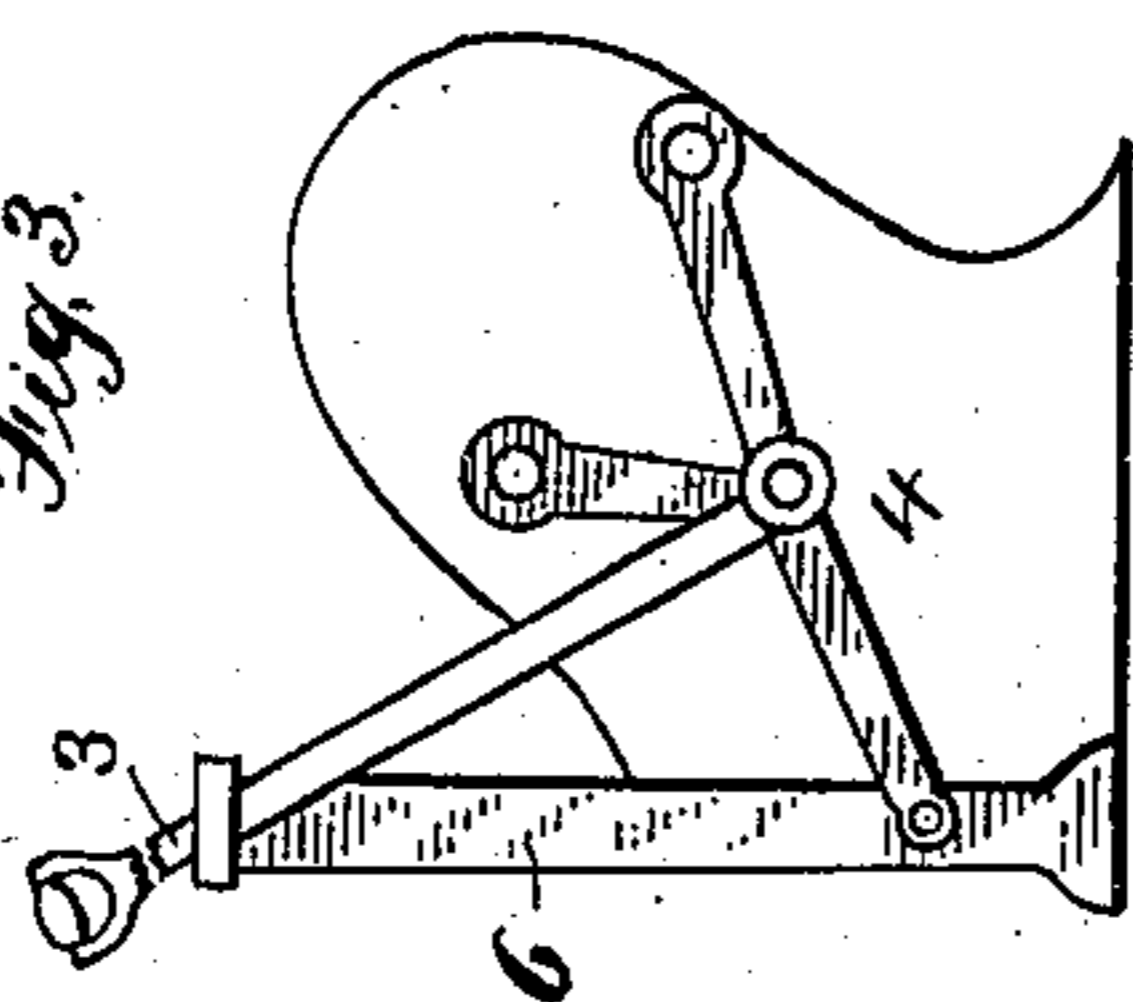
No. 376,788.

Patented Jan. 24, 1888.



Attest,  
C. W. H. Mower,  
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Fig. 3.



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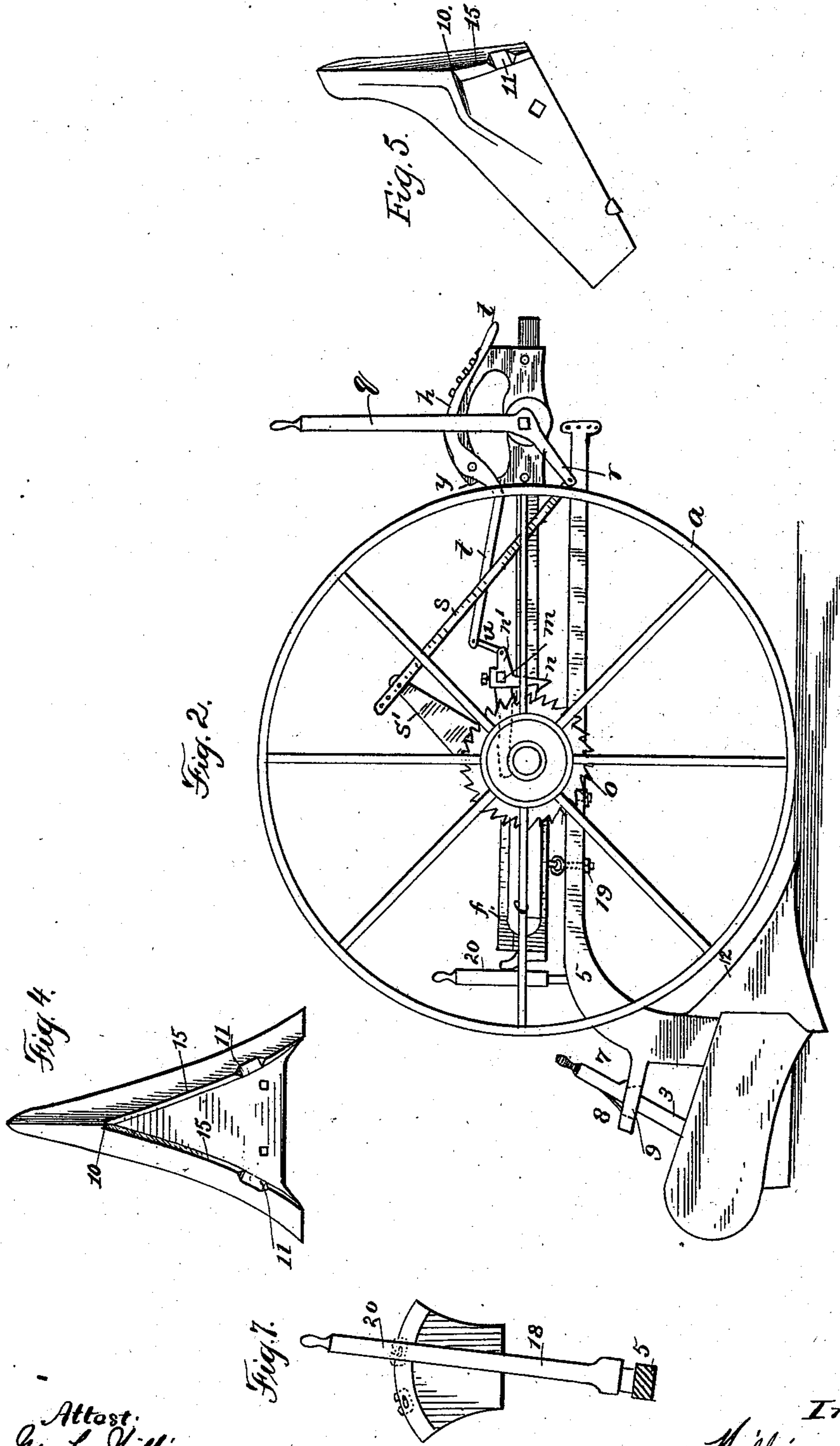
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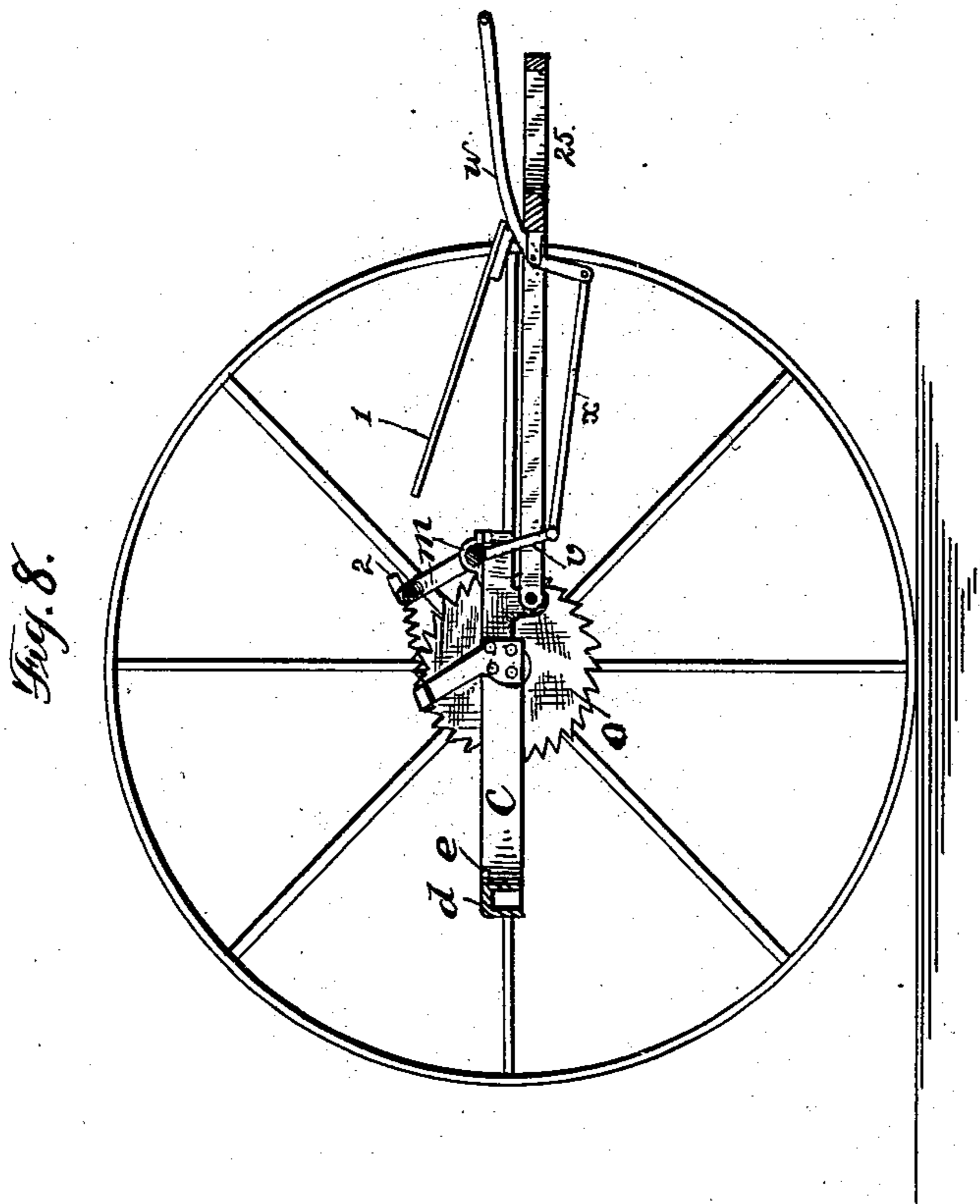
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3 Sheets—Sheet 3.

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SULKY PLOW.

No. 376,788.

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# UNITED STATES PATENT OFFICE.

WILLIAM STRAIT, OF ELMIRA, NEW YORK.

## SULKY-PLOW.

SPECIFICATION forming part of Letters Patent No. 376,788, dated January 24, 1888.

Application filed December 18, 1886. Serial No. 221,978. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM STRAIT, a citizen of the United States, residing at Elmira, in the county of Chemung and State of New York, have invented certain new and useful Improvements in Sulky-Plows; and I do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

Figure 1 is a plan view of a sulky having my improvements applied thereto. Fig. 2 is a side elevation of the same. Fig. 3 is a rear elevation of the reversible plow shown in Fig. 1. Fig. 4 is a bottom view showing a plow-point having my improvements. Fig. 5 is a bottom view of a modified form of plow-point, showing my device adapted to other kinds of plows. Fig. 6 is a detail elevation of a segment-piece, hereinafter referred to. Fig. 7 is a detail view of the lever mechanism for adjusting the plow vertically. Fig. 8 is a side elevation of the sulky, partially in section.

My present improvements relate to plows.

The object of my invention is to provide a sulky-plow adapted for use on either level or hillside lands; also, to provide a power-lift for the purpose of raising the plows out of the ground, releasing the same, or regulating their depth of cut, all of which is independent of the hand mechanism for the same purpose.

The object of my invention is also to provide for the weight of the driver, assisting in balancing the plows; also, means for shifting the reversible plow, jointing the plow-point to the plow, and other improved details, all of which will be first fully described, and the points of novelty then set forth in the claims.

The present invention is an improvement on that granted me December 15, 1885, No. 332,302, whereby the operator may bring a power-lift into operation for the purpose of raising the plows out of the ground, which lift is thrown into and out of engagement by the foot, leaving both hands of the driver free to manage the team.

Two or three horses are used in drawing this sulky-plow. It will be seen from the draw-

ings of the pole and neck-yoke that two horses travel as wide apart, or nearly so, as when three are used. In the latter case the pole is moved to the side pole-seat and to the side hole, 14, of the neck-yoke. The two outside horses carry the neck-yoke. In using three horses I find it expedient to arrange the wheels at such a distance apart that each wheel may run in the furrow when the plow is reversed. I also prefer to adjust the plow from one side to the other in order to bring the plow in position to plow left and right hand furrows. In other words, the relative position of the horses hitched to each end of the neck-yoke is the same, whether those two horses alone are used or whether a third or middle horse is employed. No change in the position of the two outer horses takes place with respect to their position before the plow when the third horse is harnessed in. The only change is the shifting of the draft-pole so that it will be pivoted in the side hole, 14, of the neck-yoke instead of the central hole, 13, as is the case when but two horses are drawing the plow. This shifting of the pole is necessary in order to provide a space equidistant between the two outer horses for the middle horse to travel in. By means of this arrangement the off horse will travel in the furrow when a right-hand furrow is turned and the nigh horse in the furrow when a left-hand furrow is cut, no matter whether a middle or third horse is in the team or not. In order to effect this result when employing a single reversible plow, it is desirable to shift the plow-beam laterally in cutting a right-hand furrow, so that the off horse may travel in the adjacent furrow previously cut; and in cutting a left-hand furrow the mold-board is reversed and the beam shifted to the other side of the machine, and in such position that the nigh horse travels in the adjacent furrow previously cut. To effect this result properly where the outer horses of the team travel such a distance apart, whether a middle horse be used or not, the wheels should be spread apart, so that either may track the furrow behind the outer horse in cutting both right and left hand furrows.

In the drawings, *a* represents the wheels of a sulky-plow.

*b* are short axles secured in the main axle or

arch *c* of the sulky. The portion *d* of the arch forms a bearing provided with a rack-bar, *e*, along its length.

*f* is a journal-box, which carries the plow and is adapted to be moved laterally along the bearing *d* from one side to the other for the purpose of giving lateral adjustment to the plow.

The side motion of the plow along the arch-bearing *d* may be affected in various ways. I have shown a method of providing a lateral adjustment by means of a pinion, *g*, located on the journal-box *f*. This pinion meshes with the rack-bar *e*, and is provided with a crank-arm, *h*, secured to the same shaft that pinion *g* is fastened to. The turning of the crank-arm *h* causes the plow attached to the journal-box *f* to travel the length of the arch-bearing *d*, according to the degree and direction of rotation of the crank-arm.

*x* is an arch or light frame attached to the axle, and to which is secured the spring which holds the rock-shaft *m* in its normal position and the pawls *n* out of engagement.

*l l* are two projecting arms, formed on the axle at either side and adjacent to the wheels *a*. These arms project forwardly and upwardly from the axle, and their outer ends form boxes or bearings for the reception of a crank-shaft, *m*, extending, preferably, across the frame of the machine. On this tilting crank-shaft (preferably at both ends) are dogs or pawls *n*, which under certain conditions are adapted to be thrown into engagement with toothed or ratchet wheels *o*, formed on the inner side of the hubs of both of the wheels *a*.

25 is the forward frame of the machine. This frame, which carries the operating-levers, the seat, and the draft-connections, is jointed or hinged to the crank-axle by pivots 26 in the projecting arms *l* on the crank-axle. The weight of the forward frame, 25, added to that of the driver on the seat, has a constant tendency to oscillate the crank-axle and to lift and counterbalance the weight of the plow. At the side of the frame, near the forward end, is secured the segment-rack *p*.

*q* is a hand-lever, provided with the usual spring-dog for engaging the segment-rack for the purpose of adjusting the depth of cut of the plow or for throwing the plow entirely out of the ground.

*r* is an arm formed on the lower end of lever *q* below the pivotal point thereof.

*s* is a link, pivoted at one end to the arm *r* of lever *q* and at the other to the arm *s'*, which projects from the main axle of the sulky.

When the hand-lever *q* is thrown back and forth, it rocks the axle and raises and lowers the plow or plows, according to the movement of the lever *q*.

*t* is a foot-lever pivoted to the segment-rack *p*. This lever has an arc-shaped or circular surface corresponding to the shape of the segment-rack, and is arranged to lie under the

path of the spring-dog on the hand-lever *q*. To the other end of the rocking foot lever *t* is pivoted a link, *u*, which in turn is pivoted to one end of the pawl *n* on the rock or crank shaft *m*, the purpose of all of which will be explained further on.

*v* is an arm formed on the rock-shaft *m*, and *w* is a foot-lever pivoted to the forward frame of the machine. These two arms and levers *v* and *w* are pivoted and form a power-lever catch for the purpose of raising the plow or plows out of the ground.

The power lift is intended as a substitute for the hand-lever *q*, and either may be used at the pleasure of the operator.

When it is desired to raise the plows by the power-lift, the driver presses on the foot-lever *w*, which, by means of the link *x* and arm *v*, causes the rock-shaft *m* to rotate. The said rock-shaft being connected to the lever *t* by means of an arm, *n'*, on the pawl or dog *n* and a link, *u*, the arc-shaped bearing of said lever is caused to move upwardly against the dog on the hand-lever *q* and raises said dog out of the notches in the segment-rack. Just as the dog on the lever *q* is thrown out of engagement the dogs or pawls *n n* on the ends of the rock-shaft *m* engage with the ratchets *o* on the wheels *a*. Now the forward motion of the sulky and the wheels raises the plows and carry the hand-lever *q* backward freely over the segment-rack *p* until the dog drops into a notch, *y*, on the segmental piece *p*, thereby holding the plows up. At the same time that the dog on the hand-lever drops over the notch or lug *y* for the purpose of holding the plows out of the ground a trip-piece or projection, 1, which is bolted to the frame, strikes against the rock-shaft *m* at the point 2 and throws the dogs *n* out of engagement with the ratchet-wheels. The trip 1 is adjustable in the line of its length by a slotted bolt connection or other known means.

In the construction of my plow it will be seen that the weight of the driver assists in raising the plows. The frame of the sulky, to which the seat is attached, is in front of the pivotal line of the axle and the plows are in the rear of the axle.

When the driver steps upon the frame or is in the seat, his weights helps to raise or balance the plows. In my Patents Nos. 332,301 and 332,302, for sulky-plows, the driver had to be in the seat to have his weight balance the plows, and in those cases when the hand-lever was used the weight was more or less taken from the seat. In my present invention the weight of the driver balances the plows, whether upon the seat or upon the frame.

The plow, which in the present instance I have shown attached to the sulky, is a single reversible-mold-board plow; in which said mold-board is swung from right to left, and vice versa, as it is desirable to reverse the furrow side of the plow in hillside plowing. For the purpose of effecting the reversal of the mold-

board I arrange a lever, 3, within reach of the driver on the machine. This lever is pivoted at its lower end to the brace 4, which connects the mold-board to the plow-beam 5. The brace 4 is pivoted at its lower end to the lower part of the plow-standard 6. Lever 3 has a catch, 7, near the upper end of the lever, and the spring 8 opposite thereto, as shown in Fig. 2. The lever 3 passes through a slot, 9, in the plow standard or beam, which is flared or cut away to allow of the lever's having sufficient lateral motion to enable the plow to reverse itself.

When the mold-board is over to the one side or the other in its proper place, the hook 7 on the lever 3 has passed up through the slot 9 and the spring 8 has thrown the catch 7 into engagement with the upper side of the standard and locked the mold-board in position. When it is desired to reverse the mold-board, the lever 3 is pushed backwardly against the spring 8, when the catch 7 will fall through the slot 9 and the weight of the mold-board will swing itself upon the pivoted brace 4 downwardly and pass the center of the swinging motion. At that point of the rotation a slight pull on the hand-lever 3 will swing the board into its place on the opposite side of the standard.

Figs. 4 and 5 show an improved means of securing the plow-point to the saddle or standard. It is adapted for use for either hillside or reversible level-land plows. 10 is a projection or lug at the joint of the points, and 11 are recesses in the landside side of the point of corresponding shape to a lug on the saddle or seat on the standard. 15 is a rib or ribs, Figs. 4 and 5, formed on the landside side or sides of the plow-point, within which the recesses 11 are cut or formed. The advantages of this construction are that when the point is placed upon its seat it makes a firmer joint with the mold-board than is obtainable by the usual mode of securing the point, and, further, if the bolts which hold the point to its seat work loose there is no danger of the plow-point moving, as often is the case when the bolts simply are used to hold the point to its place. In such constructions, also, the bolts often become worn, so that a firm joint cannot be made between the plow-point and the mold-board.

When, either by means of the power-lift or the hand-lever lift, the plow has been raised up out of the ground, and it is desired to lower the plow again without having to employ the hands or the hand-lever, it may be done by pressing the foot upon the rock-lever *t*, which lever presses upon the dog of the hand-lever and raises it from the notch or lug *y*, when the weight of the plow will cause it to descend and the hand-lever *q* to swing forward to its normal position.

The pole *i* may be shifted or thrown to one side in any known way to admit of the middle horse being harnessed in. The means shown in the drawings consist of two pole-seats, in which the pole is interchangeable.

16 is a segment-piece having a lug, 17. It

is adjustable in the line of its length, and is bolted to the segment-rack *p*. The segment-bearing of this piece is flush with or slightly above the teeth of segment *p*, so that the dog of lever *q* may slide freely along it. The stop or lug 17 is set adjustably, so as to allow the plow to cut a predetermined depth of furrow, and at the same time to admit of the plow freely rising automatically when striking an obstruction.

18 is a lever-and-rack mechanism which admits of the plow being adjusted vertically when one wheel is down in the furrow or when the machine is working on hillside land. The plow-beam is fastened to the journal-box *f* by means of eyebolts 19, so that the plow may rock laterally to provide for this movement. 20 is a segment-rack on box *f*, in the notches of which the lever 18 is adjustably set by a dog on the lever falling into them.

I claim—

1. In a wheeled plow, a crank-axle carrying a plow, forwardly-projecting arms rigid thereto, and supporting-wheels, in combination with a frame jointed to the axle-arms in front of the axle and a driver's seat located upon the jointed frame, substantially as shown and described.

2. In a wheel-plow, the combination of a crank-axle having a plow journaled thereto and arms projecting forwardly therefrom, with a forward frame and a rock-shaft pivoted to the projecting arms, a dog carried by the shaft, and a wheel and ratchet.

3. A reversible plow-point provided with an interiorly-projecting lug at or near the apex of the point and oppositely-arranged recesses at the sides, substantially as described.

4. A plow-point having a depression or seat upon its share and provided with a rib or thickened projection extending along its landside edge or side, said rib having a recess adapted to lock with a corresponding lug upon the plow saddle or seat, substantially as set forth.

5. In combination with a sector-plate and a lever for raising and lowering a sulky-plow, an adjustable segmental piece having a lug or notch.

6. In a wheeled plow, the combination of a crank-axle, a reversible-mold-board plow having a suspension-bearing on the frame, and means for moving the plow laterally on the frame.

7. A wheeled plow provided with a laterally-adjustable pole or shafts and a reversible plow or plows, in combination with a shifting mechanism for setting said plow or plows to one side or the other of the frame, whereby the off horse of the two or three horse team may walk in the furrow when the machine is set for plowing right-hand furrows, and the nigh horse may walk in the furrow when the machine is set for left-hand furrows.

8. In a wheeled plow, the combination of a crank-axle having a plow journaled thereto

and arms projecting forwardly therefrom, with  
a forward frame and a rock-shaft pivoted to  
the projecting arms and extending across the  
frame, a dog carried at each end of the shaft,  
5 and a ratchet on each wheel.

9. In a reversible-mold-board plow, a plow-  
standard, a mold-board, a link connecting the  
two, a lever pivoted to the mold-board and  
passing up through or by the standard, a catch

upon the lever, and a spring for engaging the 10  
lever and standard, all combined as set forth.

In testimony whereof I affix my signature in  
presence of two witnesses.

WILLIAM STRAIT.

Witnesses:

JULIUS SOLGER,

F. B. BROCK.