

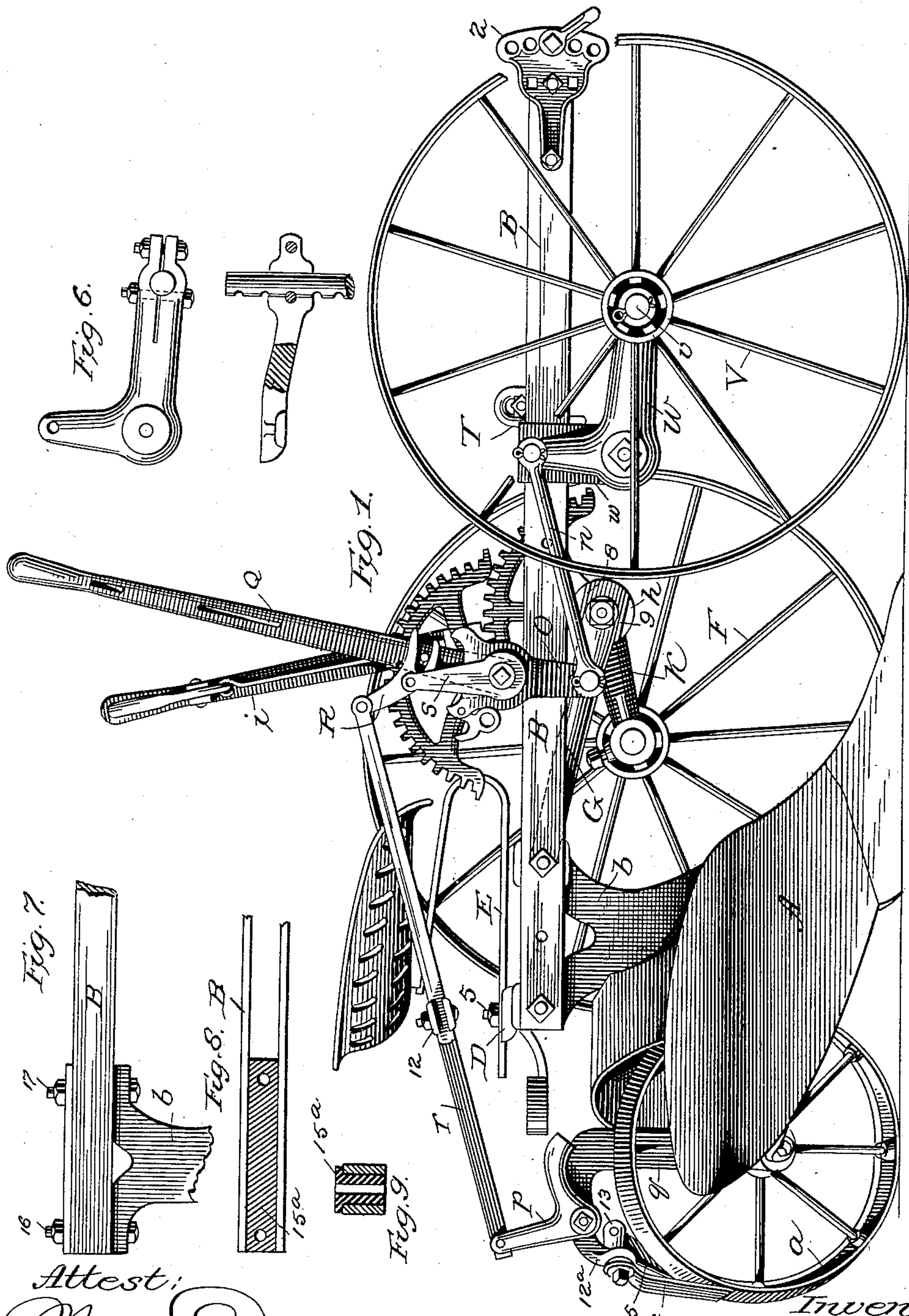
(No Model.)

3 Sheets—Sheet 1.

C. E. TOWER.  
SULKY PLOW.

No. 359,190.

Patented Mar. 8, 1887.



Attest:  
*Hall & Donaldson*  
Frank L. Middleton

Inventor  
Caleb E. Tower  
by *Ellis Spear*  
Atty.

(No Model.)

3 Sheets—Sheet 2.

C. E. TOWER.  
SULKY PLOW.

No. 359,190.

Patented Mar. 8, 1887.

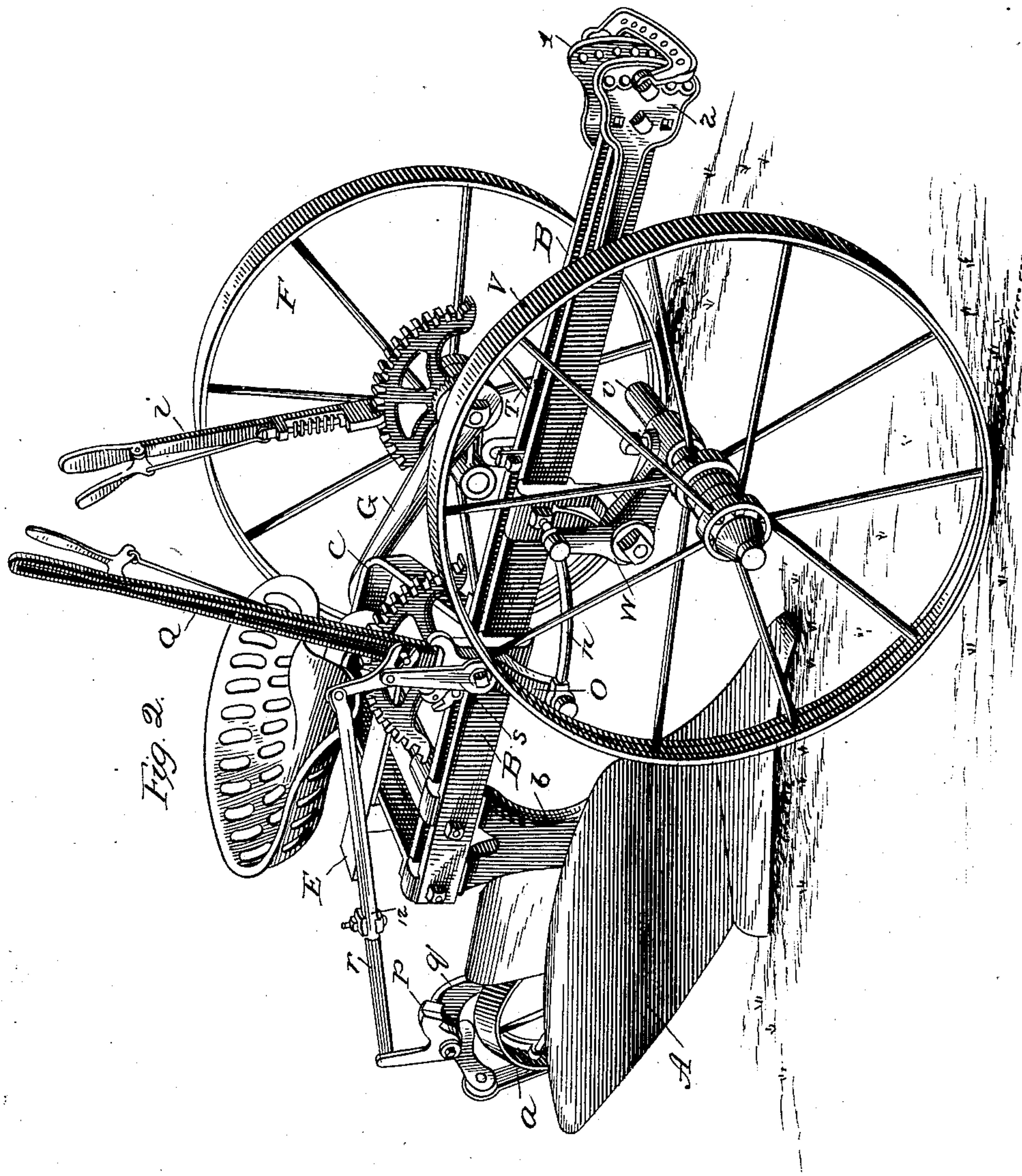
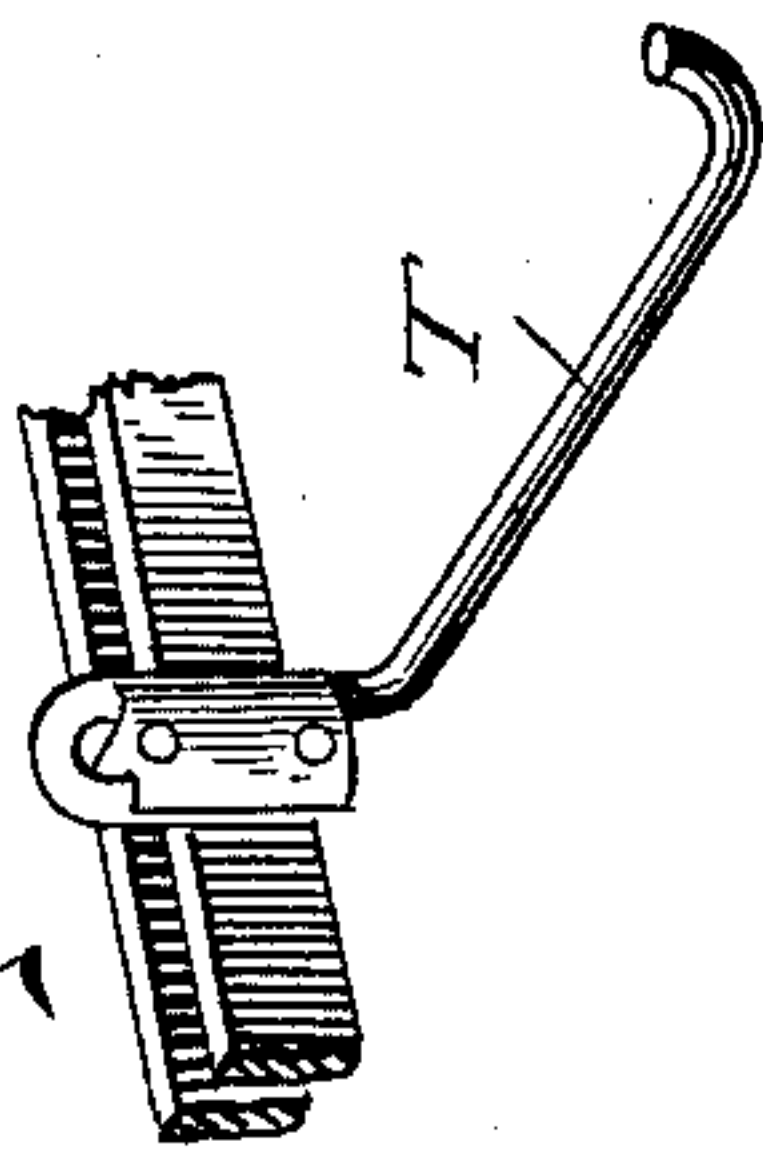


Fig. 2.

Fig. 2<sup>a</sup>



Attest:  
Walter Donaldson  
Frank L. Middleton

Inventor  
Caleb E. Tower  
by Eli Spear  
Atty.



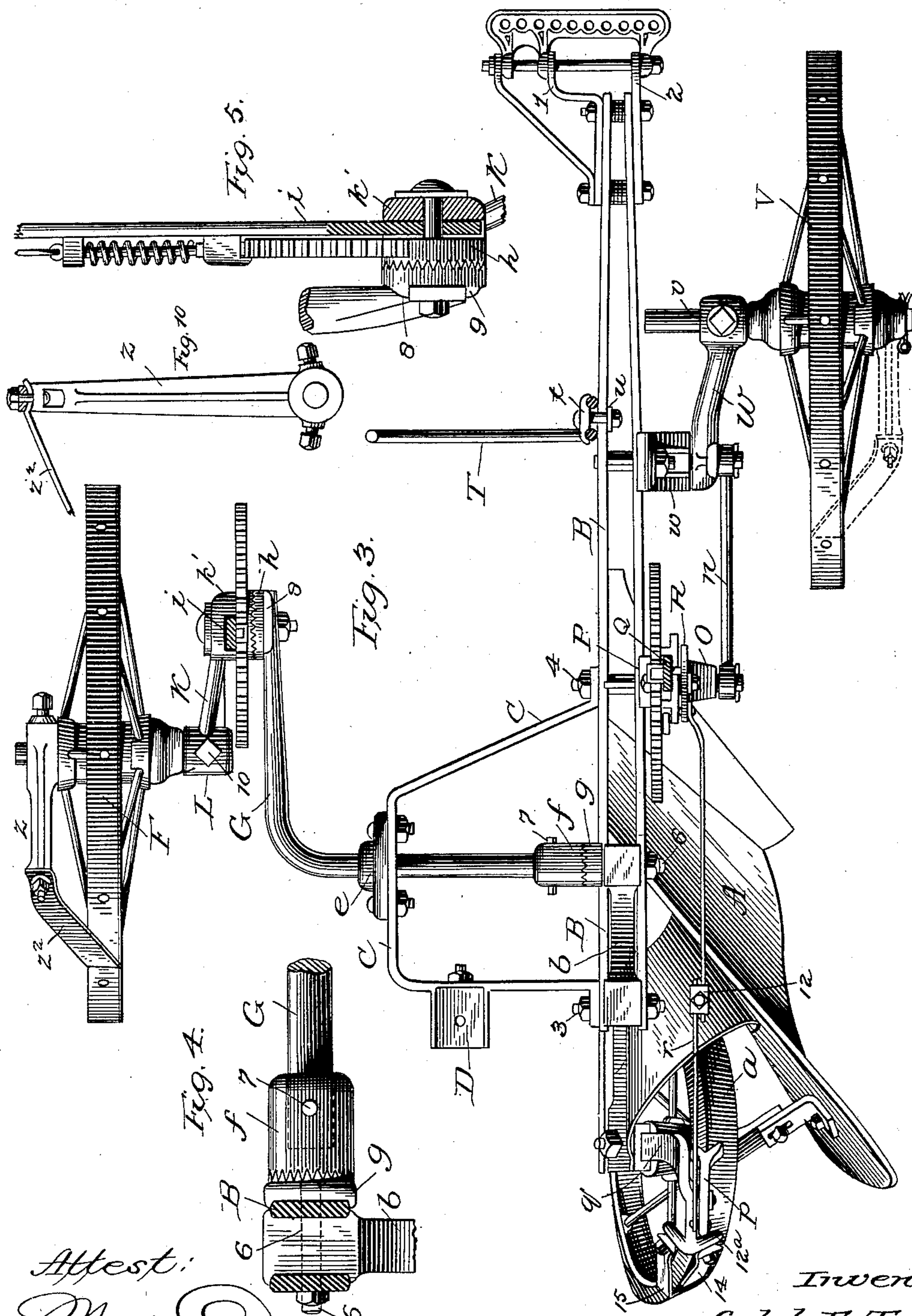
(No Model.)

3 Sheets—Sheet 3.

C. E. TOWER.  
SULKY PLOW.

No. 359,190.

Patented Mar. 8, 1887.



Attest:  
*Mallory Donaldson*  
Frank L. Middleton

Inventor  
Caleb E. Tower  
by *Eli Spen*  
Atty.



# UNITED STATES PATENT OFFICE.

CALEB E. TOWER, OF SOUTH BEND, INDIANA, ASSIGNOR TO THE ECONOMIST  
PLOW COMPANY, OF SAME PLACE.

## SULKY-PLOW.

SPECIFICATION forming part of Letters Patent No. 359,190, dated March 8, 1887.

Application filed December 2, 1886. Serial No. 220,519. (No model.)

*To all whom it may concern:*

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

My invention relates, mainly, to sulky-plows, parts thereof being applicable to walking-plows.

It includes a tongueless sulky-plow having a beam fixed rigidly to the standard-neck of the plow with a landside or furrow wheel turning in fixed bearings in the rear, a vertically-adjustable land-wheel connected to the rear part of the beam, and a vertically-adjustable furrow-wheel connected to the front end of the beam.

It includes, also, a beam rigidly attached to the standard-neck of the plow, in connection with a frame rigidly attached to the beam forming the frame of the sulky, the said frame supporting the seat and the land-wheel.

It includes, also, important details of construction hereinafter fully explained, and pointed out in the claims.

In the accompanying drawings, Figure 1 represents a side elevation of the plow on the furrow side; Fig. 2, a perspective view on the furrow side. Fig. 2<sup>a</sup> shows a foot-rest; Fig. 3, a plan view with the seat omitted. Figs. 4 and 5 show details of construction. Fig. 6 shows a modification and section of the forward furrow-wheel arm. Fig. 7 shows a modified form of standard attachment. Figs. 8 and 9 are respectively horizontal and transverse sections of Fig. 7. Fig. 10 is a detail view of the scraper-supporting arm designed for the main supporting-wheels.

The plow A is substantially the same as that shown in Letters Patent of the United States granted to E. D. Meagher February 7, 1882, with a back supporting-wheel, *a*, forming a revolving landside. The beam B is composed of two flat straight bars of iron or steel set on edge and supported by trusses with connecting-bolts passing through from side to side. Between the rear ends of the beam is inserted the neck of the standard *b*, which is connected to the beam by bolts passing through the side

bars and the neck. The front ends of the bars which form the beam are brought nearly together, and to them are bolted the clevis-irons 1 2. To the landside of the beam, at its rear end, is bolted a frame, C. This I have shown as formed of a single bar bent twice and with its ends turned to fit the plow-beam, to which it is bolted by bolts 3 4. The rear bolt passes through one branch of the standard-neck and the front bolt passes through a truss. This single piece forms with the beam the entire frame. On the rear end of the frame is bolted a block, D, to which is attached the seat-spring E by means of a bolt, 5, inserted through any one of a series of holes in the said spring, whereby the seat may be adjusted forward or backward. The land-wheel F is supported upon an arm, G. This arm consists of a rod bent at right angles. The end attached to the frame passes through a re-enforcing casting, *e*, attached to the side of the frame, and is bolted in a socket, *f*, fixed to the beam. This socket (shown in Figs. 3 and 4) is provided with an axial bolt which passes through the beam and a part of the plow-neck, and through a plate interposed between the end of the socket and the side of the plow-beam. This interposed plate (marked *g*) has flanges projecting over and under the beam-bar to prevent it from turning, and an outer rosette-face corresponding to a rosette on the inner end of the socket, by which the socket is prevented from turning.

The bolt 6 is fixed in the bottom of the socket, and by means of the nut on the other end the socket is held firmly against the rosette. The wheel-arm is held to the socket by a bolt, 7, and the outer end of the arm can be set to any angle, according to the height desired for the outer end. The outer part of this arm is flattened and perforated and fits between the flanges 8 and 9 of a disk, *h*, which also has an outer rosetted face corresponding to the rosette-face on the hub of the segment G. This allows the segment to be set in any desired position to give proper adjustment to the wheel-lever *i*. This lever is fixed to the grooved face of the boss *k* on the end of the arm K. The other end of the arm K has a socket, L, which receives the spindle of the land-wheel, which spindle is held in the socket by a set-



screw, 10. The lever *k* is provided with the ordinary pawl engaging with the teeth of the segment. The land-wheel spindle may, however, be held in other ways, as hereinafter explained, and I do not limit myself to this mode of holding the spindle. The land-wheel has, therefore, two adjustments—one of the arms *g*, which is a permanent adjustment, and the other a working adjustment controlled by the driver through the working-lever. The forward furrow-wheel, *V*, is journaled on the spindle *v*, which has an adjustment in or out in the socket of the bell-crank lever *W*, being held therein by a set-screw; or it may be held to the bell-crank lever by a construction as hereinafter described. The bell-crank lever is pivoted upon an arm, *w*, bolted to the beam. The arm of this bell-crank lever is connected to the loose foot of the furrow-wheel lever by a rod, *n*. The loose foot *O* is constructed upon the same principle as that shown in the patent granted to Meagher and Tower, March 10, 1885, No. 313,749, the construction being varied to adapt it to special situation. The segment is cast with a standard, *P*, which is bolted directly to the plow-beam, the bolt passing through the two bars and an intermediate truss. The furrow-wheel lever *Q* and the loose foot are pivoted upon the same bolt, *11*, passing through the segment-standard. The loose foot *O* is formed with an interior recess, in depth adapted to admit of the thickness of the furrow-wheel lever with free play, and of such relative width as to allow the lever limited movement within the recess, back and forth, without moving the loose foot. The purpose of the loose foot is explained in my said patent. It is here adapted to the improved arrangement by which the lever operating the furrow-wheel is brought back toward the driver's seat, so that it may be within convenient reach, while the wheel occupies a position which adapts it to control the height of the forward end of the plow-beam.

It will be observed from the foregoing description that the plow is supported on three wheels. Of these only one, and that the land-side wheel, (which may be changed for any rear supporting-wheel without material change in result in controlling the plow,) is in fixed bearings. The other two wheels are the main supporting-wheels, and both regulate the depth of the furrow. Further, the furrow-wheel, mounted on a spindle adjustable outward and inward, as explained, is adjustable to varied widths of furrow or different kinds and sizes of plows.

The plow being tongueless, and being adapted to ride upon the wheels freely and out of the ground, is liable to run upon the team in going down hill. It is therefore desirable to apply a brake to one of the wheels to prevent too rapid movement on descending ground. I use the brake shown in an application filed by me on the 10th day of June, 1886, No. 204,878, but connect it with a land-wheel lever, so that it may be operated by further rear-

ward movement of the lever, the effect of which is to give additional elevation to the plow, and at the same time to apply the brake. The brake *p* is pivoted on top of a standard, *q*, which is fixed to the arm on the landside, which supports the rear furrow-wheel. The brake is in the form of a bell-crank lever, the lower arm of which is formed to fit the periphery of the plow. The upper arm is connected by an extensible rod or bar, *r*, to a forked lever, *R*, pivoted upon an arm, *s*, fixed upon the outer end of the bolt upon which the loose foot is pivoted. The prongs of the lever hereon pivoted embrace a pin fixed in the furrow-wheel lever extending outward, being adapted to have some play between the prongs. The extensible bar is pivoted to the upper end of the pronged lever, and when the furrow-wheel lever is thrown forward the brake is off. When the furrow-wheel lever is thrown backward, as it is in drawing out the plow or lifting the plow from the ground, the upper end of the pronged lever is thrown forward. The parts are so adjusted that the plow may be lifted so as to ride clear of the ground without putting on the brake, but also so that the further rearward movement of the said lever will apply the brake, the pin having a wedge movement on one prong of the pronged lever. This adjustment is effected by means of a clamp, *12*, connecting the lapped ends of the two parts of the extensible lever. The same standard which supports the bell-crank brake is extended to the rearward and provided with two branches, *12 13*, to which are attached outwardly-extending scrapers *14 15*, that serve to keep the rear furrow-wheel clean.

The adjustable wheel-spindle on the forward furrow-wheel, made to set in or out, as wide or narrow furrows may be required, and to suit the size of plow used or work to be done, has been described as held by a set-screw in a socket. This is a simple and convenient form; but I have shown in Fig. 6 a modification in some respects more desirable. In this the arm that holds the forward furrow-spindle is made of malleable cast-iron, and is split in a plane running through the axis of the spindle-socket. It is provided with a bolt above and below the socket, with nuts which may be turned up to spring the parts together to clamp the spindle and cause all the interior surface to bear upon the surface of the spindle and hold it more firmly.

For the purpose of keeping the land and furrow wheels free from the accumulation of earth when working in heavy or moist soil, I employ the scrapers shown in Figs. 3 and 10. The supporting-arms *z* are formed of cast metal, and at their lower ends are provided with sockets adapted to receive the end of the wheel-spindles. Set-screws serve to connect the two parts—arm and spindle—rigidly together. The arms extend outwardly parallel with the diameter of the wheel and slightly beyond the periphery of the same. The extreme outer ends are formed on a curve, and



at a slight distance therefrom openings are provided. The end of the scraper-blade  $z^2$  is curved to correspond to the curved end of the arm, upon which it is seated and held by means of a suitable bolt, as shown. By this combination of elements I utilize the wheel-spindle as the support for the scraper-arm, thus reducing the idea to practical form in the simplest possible manner. The spindle and wheel being adjustable, as before described, it is essential that the said adjustment also move the scraper-arm, so that the relation between the scraper-blade and wheel will always remain the same. This is effected by securing the scraper directly to the adjustable spindle.

The foot-rest T is formed of a rod of iron having an open loop at right angles to the rest, formed by bending the bar, and this is held to one side of the plow-beam by clamping-plates *t u* and bolts passing through them and through the loop.

It will be observed that the construction of the parts, as heretofore described, is such that the frame with the land-wheel and all its attachments, may be shifted to the opposite side of the beam and may there be attached in the same manner without any change of parts, as above explained; also, that the forward furrow-wheel may be shifted to the opposite side and attached in the same way. The foot-rest and the clevis irons may also be reversed, so that the beam, frame, and wheels and all the beam attachments may be used either for a right or left hand plow, and thus the amount of stock necessary to keep on hand may be reduced, as all the parts may be put together either for a right or left hand plow.

Instead of the neck of the plow-standard extending between the bars of the beam, the plow-standard may be bolted to the block 15 by vertical bolts 16 17, this block being held between the rear end of the bars which form the plow-beam by the transverse bolts, as heretofore shown. This modification is shown in Figs. 7, 8, and 9.

I am aware that plow-beams made up of bars of iron bolted and trussed together are not new, and my invention on this point is limited to the combination of the described beam, with the neck of the standard extending between them at the rear end, and connected rigidly by transverse bolts, which forms a very simple and strong structure.

I do not limit myself in the general combination of the loose foot on the lower end of the hand-lever of the front furrow-wheel. This loose foot practically forms the lower end or shorter arm of this lever, and, so far as the general combination is concerned, may be rigid with the lever.

I am aware that it is not new to form a plow-beam of iron or steel bars set on edge; but I am not aware that such plow-beams have ever been combined with the standard rigidly by bolts, the standard or the block to which the standard is attached between the bars which form the beam.

I am aware that it is not new to attach a scraper-arm to an adjustable wheel-spindle in such a manner as to move with said spindle when being adjusted and thereby maintain a fixed relation of the scraper to the wheel; hence I claim only my special devices.

I claim as my invention—

1. In combination, a plow and beam, a frame on the landside rigidly attached to the beam at the rear end thereof, a horizontally-bent land-wheel arm fixed adjustably to the beam and the said frame, a toothed segment fixed on the bent end of the land-wheel arm, a spindle-crank pivoted thereto, and a lever engaging with the segment, all substantially as described.

2. In combination, a plow-beam and plow, a frame secured to the rear of the beam, a land-wheel arm rigidly supported by the frame and beam, having its outer end bent toward the front, a pivoted connection between the land-wheel and the end of the arm, suitable operating devices for said wheel, and a suitable support for the forward end of the plow-beam, all substantially as described.

3. In combination, a plow-beam formed of two flat bars of iron or steel, a plow having its standard rigidly secured between the bars of the beam, a frame for supporting the seat, a land-wheel arm secured at its rear end to the beam by the same bolts which hold the plow-standard in place, a support for the forward end of the beam, a segment and lever for operating it, the said segment, with the forward end of the frame, being secured to the beam by the same bolt, substantially as described.

4. The combination, in a plow, of the beam and the plow, and a suitable support for the landside of the beam, with an independently vertically-adjustable furrow-wheel carried upon a bell-crank lever near the forward end of the plow-beam, with connections to a pivoted lever for raising and lowering the said furrow-wheel, the parts being constructed and combined substantially as described.

5. In combination, a plow-beam and plow, suitable rear supporting-wheels, and a front supporting-wheel having its spindle journaled directly in one end of a bell-crank lever pivoted to a bracket on the beam, and a link connecting the other arm of the bell-crank lever to the lower end of a hand-lever, also supported upon the beam in reach of the driver, substantially as described.

6. In a sulky-plow and in combination, a plow-beam and plow, a frame rigidly attached to the beam, carrying a vertically-adjustable land-wheel, all adapted to be shifted without change in construction from one side of the plow-beam to the other, whereby it is adapted either to right or left hand plows, substantially as described.

7. In combination with the beam of a sulky-plow, a bracket carrying the bell-crank lever on which the forward furrow-wheel is journaled, said bracket being bolted to the side of the plow-beam, and a standard carrying a seg-



ment and the lever which controls the furrow-wheel, all adapted to be shifted from one side to the other without change in construction, substantially as described.

5 8. In combination with a lever and its connections with the forward vertically-adjustable furrow-wheel, a rear furrow-wheel, and the brake for the rear furrow-wheel connected to the lever which raises and lowers the forward  
10 furrow-wheel, whereby when the forward furrow-wheel is raised the brake may be applied, substantially as described.

9. In combination with the rear supporting furrow-wheel and the brake, the pronged lever pivoted upon a standard, a pin upon the  
15 lever which operates the forward furrow-wheel, extending between the prongs of the pronged lever, and a connecting rod or bar between the pronged lever and the brake-arm,  
20 substantially as described.

10. In combination with the bent arm G and the frame and beam of the plow-socket to which the bent arm is fixed, formed with a rosette-face and provided with a bolt and a  
25 flanged interposed plate between the socket and the beam, substantially as described.

11. In combination with a sulky-plow frame, a bent supporting-arm adjustably fixed to the frame, whereby it may be turned to raise or  
30 lower its outer end, combined with a land-wheel and intermediate mechanism connected to the end of the bent arm, substantially as described.

12. In combination, a plow, a beam, a frame rigidly attached to the beam, a bent arm carrying the land-wheel on its outer end, passing  
35 through the outside of the frame and adapted to turn therein, and adjustable mechanism connecting the inner end to the plow-beam, whereby the land-wheel may be vertically ad-  
40 justed in relation to the beam and frame, substantially as described.

13. In combination, a plow, a beam, a bent land-wheel supporting-arm adjustably fixed to the beam, a lever and wheel-arm pivoted  
45 to the said bent arm, said lever having a suitable pawl, and a segment adjustably secured to the bent arm, all substantially as described.

14. In combination with the main carrying and supporting wheels, the spindles for the same adapted to be adjusted laterally, the arms  
50  $\approx \approx$ , connected to the outer ends of the spindles and extending parallel with the wheels in fixed relation thereto, and the scraper-blades secured to said arms and extending therefrom to  
55 the periphery of the wheels, substantially as described.

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

CALEB E. TOWER.

Witnesses:

LEIGHTON PINE,

WILLIS A. BUGBEE.