

No. 759,754.

PATENTED MAY 10, 1904.

J. E. RUSSELL.
SULKY PLOW.

APPLICATION FILED FEB. 1, 1904.

NO MODEL.

5 SHEETS—SHEET 1.

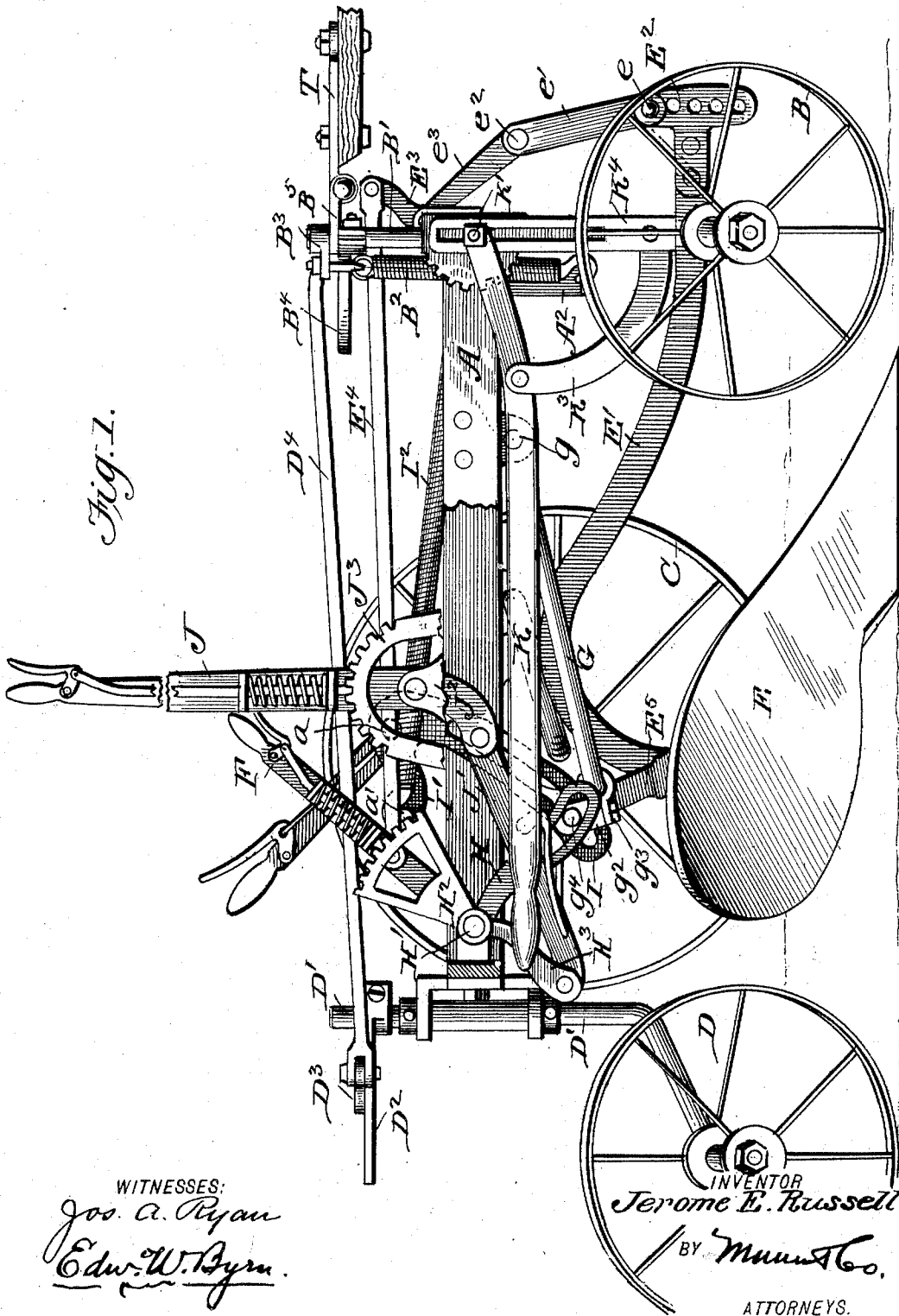


Fig. 1.

WITNESSES:
Jos. A. Ryan
Edw. W. Byrn

INVENTOR
Jerome E. Russell.
BY *Munn & Co.*
ATTORNEYS.

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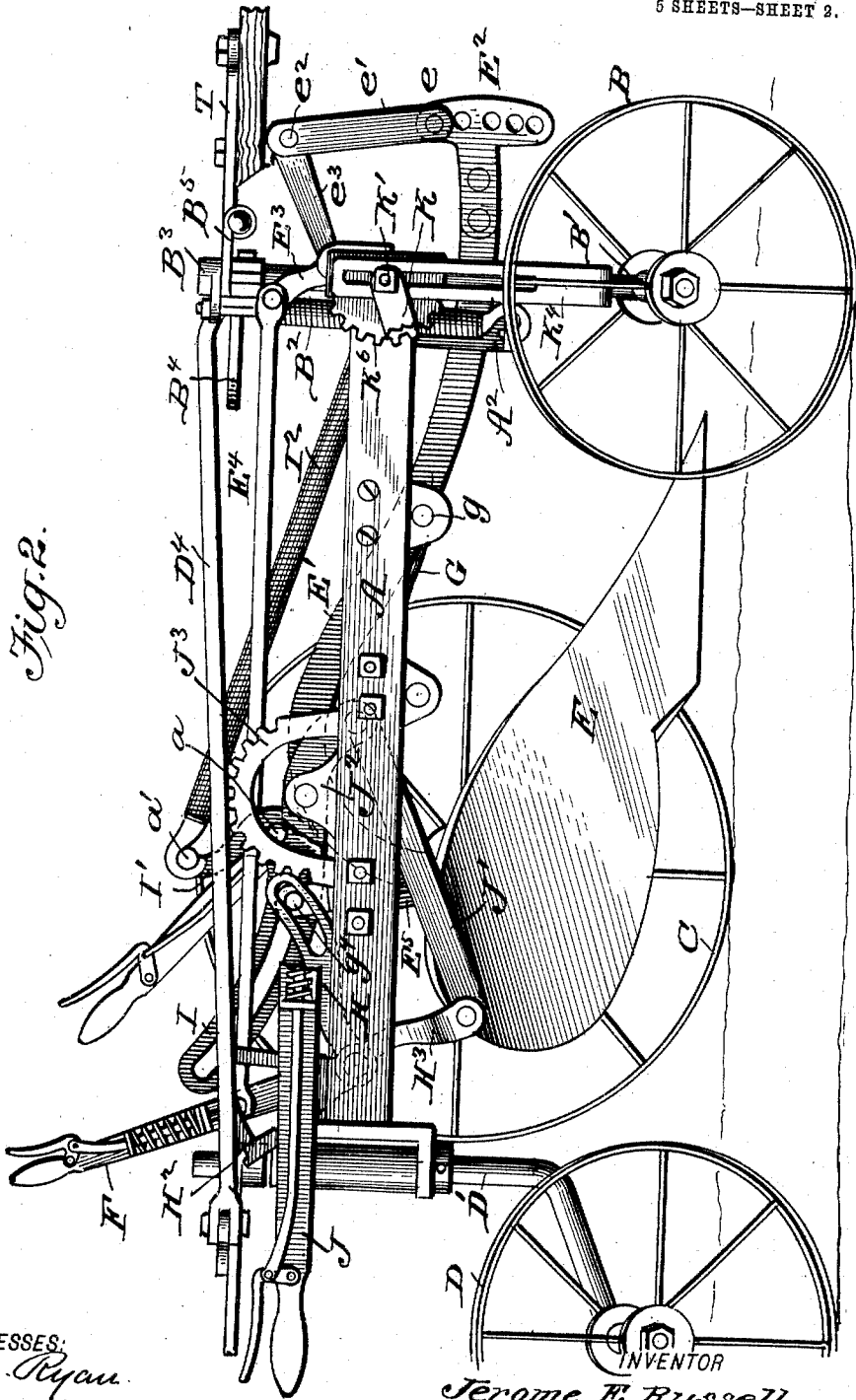


Fig. 2.

WITNESSES:
Jos. A. Ryan.
Edw. W. Ryan.

INVENTOR
Jerome E. Russell.
 BY *Munn & Co.*
 ATTORNEYS

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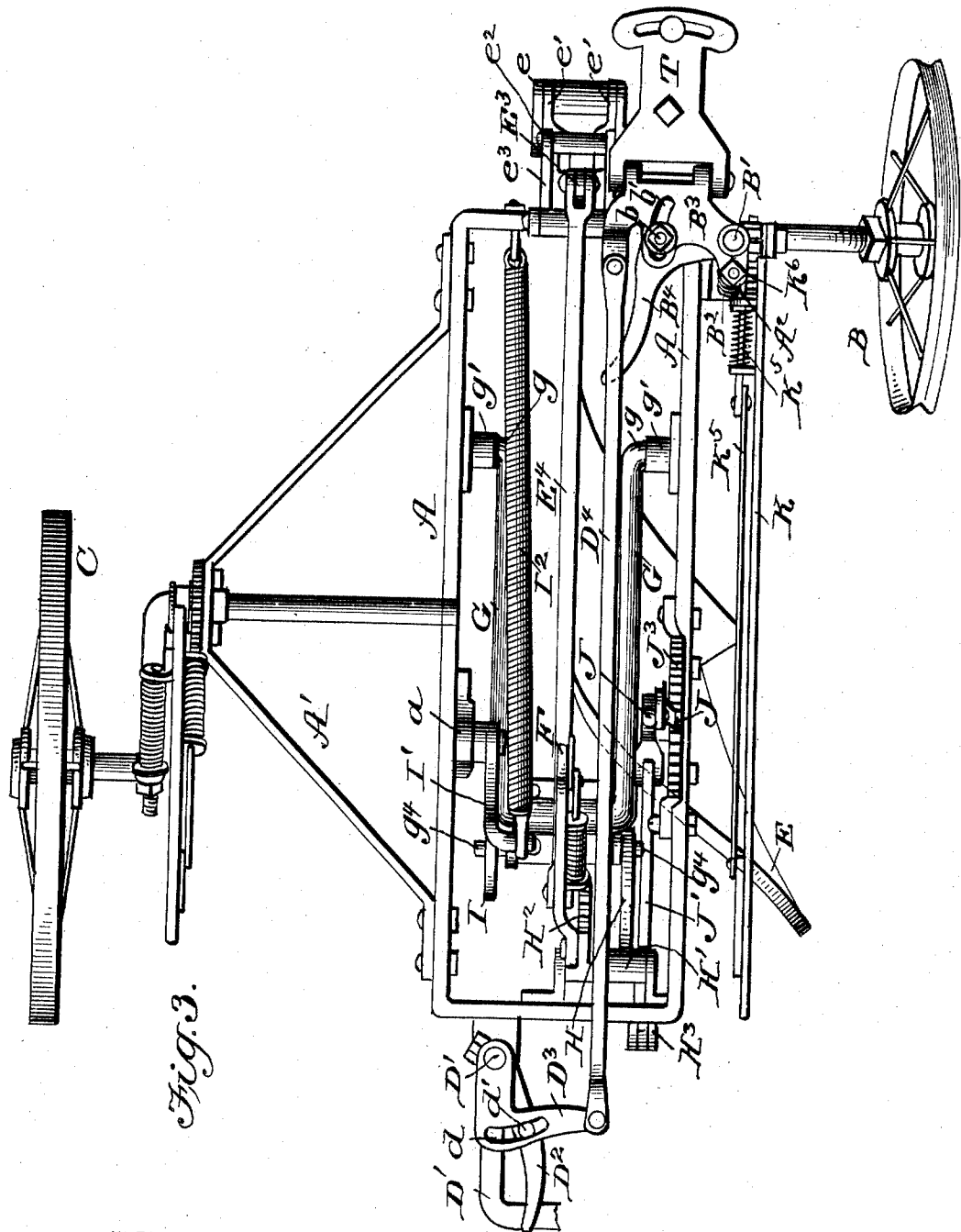


Fig. 3.

WITNESSES:

Jos. A. Ryan
Edw. W. Byrn

INVENTOR

Jerome E. Russell

BY *Munn & Co.*

ATTORNEYS

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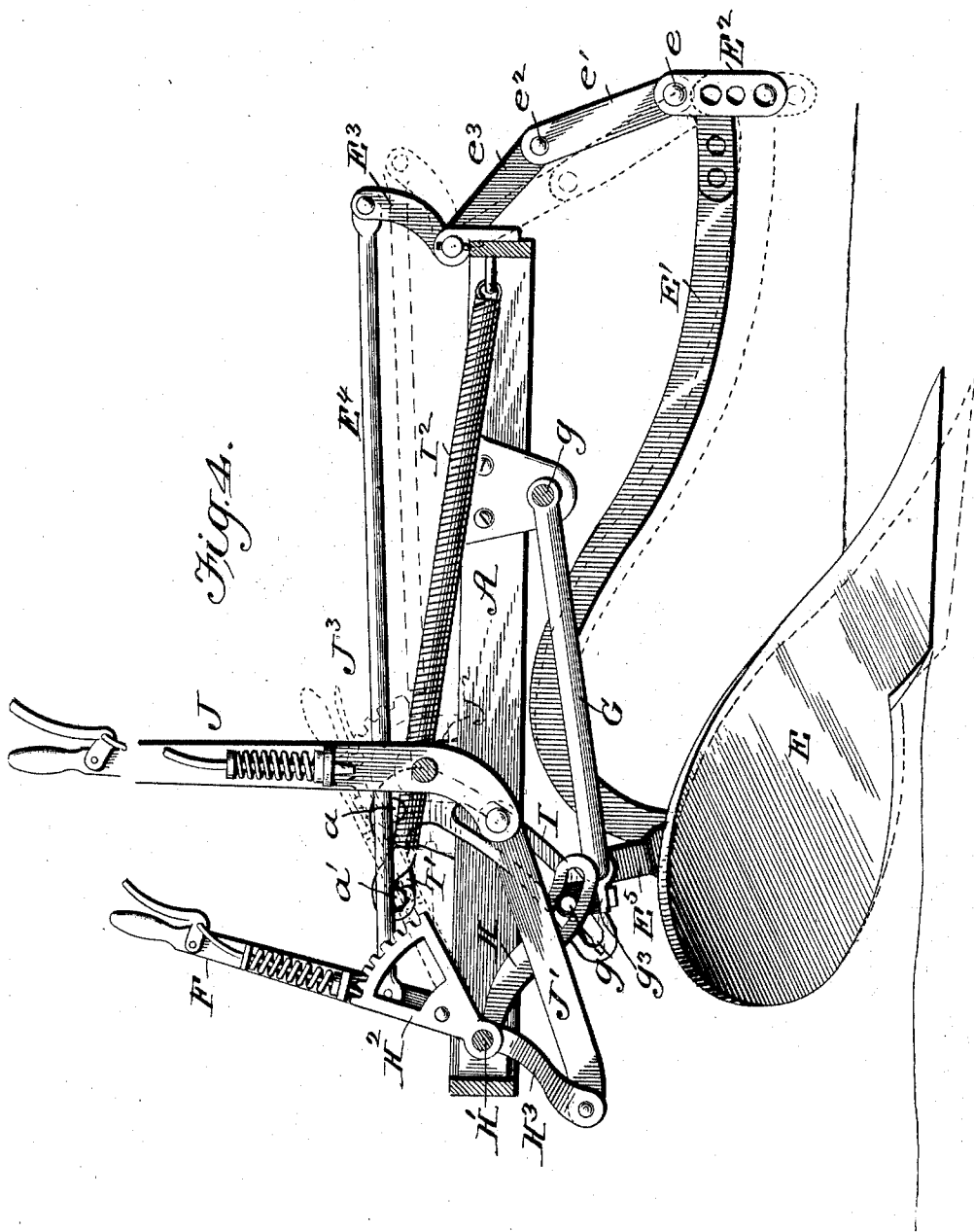


Fig. 4.

WITNESSES:
Jos. A. Ryan
Edw. W. Byrn.

INVENTOR
Jerome E. Russell
BY *Munn & Co.*

ATTORNEYS

No. 759,754.

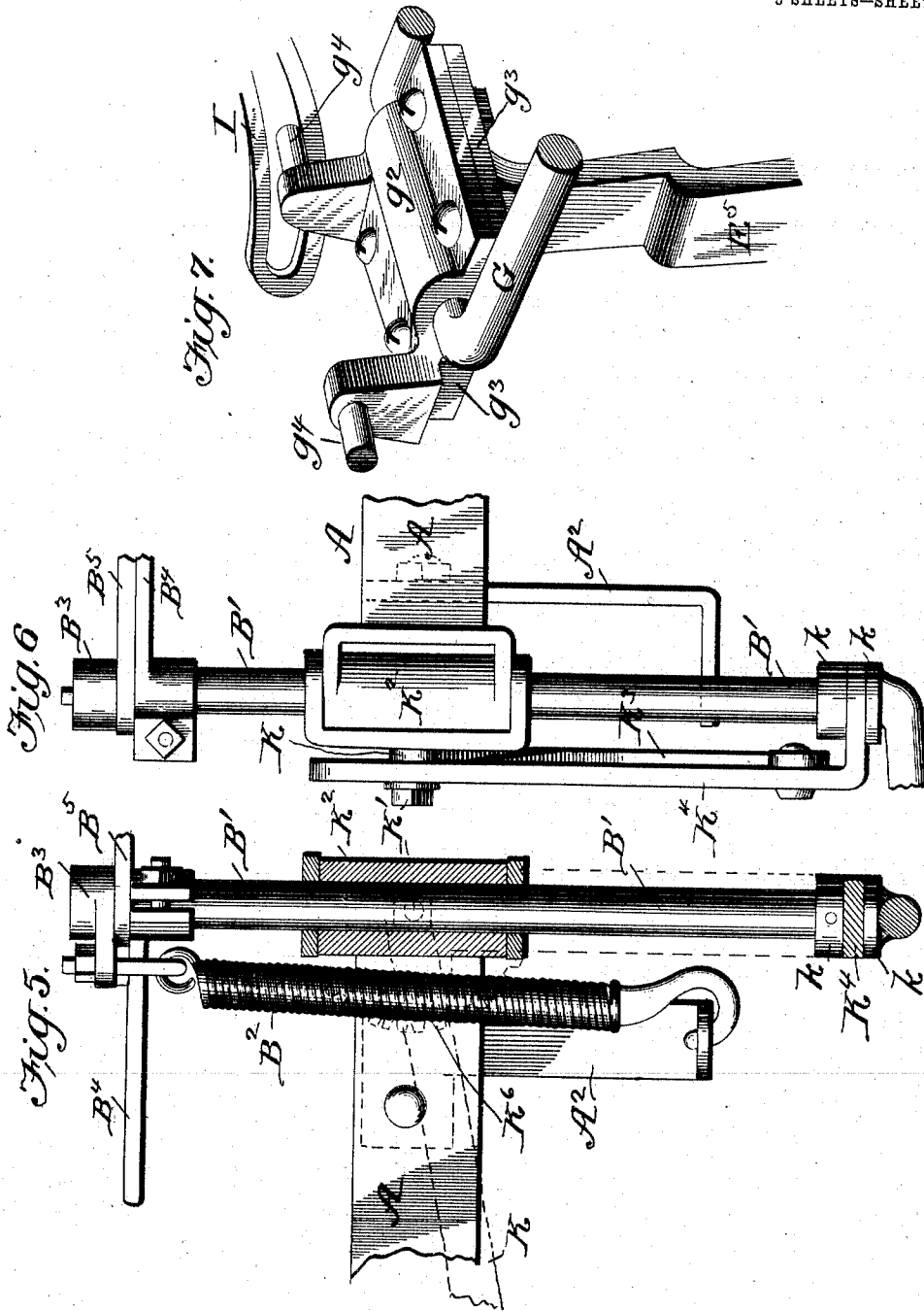
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5 SHEETS—SHEET 5.



WITNESSES:
Jos. A. Ryan
Edw. W. Ryan.

INVENTOR
Jerome E. Russell
 BY *Munn & Co.*
 ATTORNEYS

UNITED STATES PATENT OFFICE.

JEROME E. RUSSELL, OF TITONKA, IOWA.

SULKY-PLOW.

SPECIFICATION forming part of Letters Patent No. 759,754, dated May 10, 1904.

Application filed February 1, 1904. Serial No. 191,526. (No model.)

To all whom it may concern:

Be it known that I, JEROME E. RUSSELL, a citizen of the United States, residing at Titonka, in the county of Kossuth and State of Iowa, have invented a new and useful Improvement in Sulky-Plows, of which the following is a specification.

My invention relates to certain improvements in sulky-plows; and it has for its objects, first, to be able to change the inclination of the plow to the ground in such a manner that the tilting of the point down to make it run deeper does not involve the raising of the heel of the plow, and vice versa, but when the point of the plow is tilted down the whole lay of the plow is tilted down about a center in rear of the beam.

A second object is to be able to raise and lower the entire plow without changing the inclination.

A third object is to provide means for holding the plow in the ground or maintaining it in an elevated position.

A fourth object is to render the vertical adjustment of the front furrow-wheel easy and free from gripping and binding.

A fifth object is to so connect the front and rear furrow-wheels as to render the one adjustable independently of the other.

My invention consists in certain novel constructions and arrangements of parts for securing the above-named objects and for obtaining other desirable results, which will be hereinafter fully described with reference to the drawings, in which—

Figure 1 is a vertical side elevation, partly broken away, showing the plow in its position in the ground. Fig. 2 is a similar view showing the plow raised for transportation. Fig. 3 is a top plan view. Fig. 4 is a vertical longitudinal section showing the means for tilting the plow-point. Fig. 5 is a sectional side view, and Fig. 6 a front view, of the means for adjusting vertically the front furrow-wheel; and Fig. 7 is a detail in perspective of the plow-supporting device.

In the drawings, A represents an elongated rectangular frame having a laterally-projecting bracket-shaped extension A', (see Fig. 3,) which parts together form the frame of the

sulky-plow. The frame is supported in the usual manner upon three wheels B, C, and D. The front wheel B runs in the previous furrow, the middle wheel C runs on the high unplowed land, and the rear wheel D runs in the furrow just being turned by the plow, and E is the plow, which is suspended beneath the sulky-frame and is made vertically adjustable, so as to be lowered to contact with the ground in plowing or be elevated above the same for transportation. All the wheels are mounted upon crank-axes connected to the framework, and the front and middle wheels are made vertically adjustable to suit the depth of plowing.

As so far described the sulky-plow is of the common and well-known form, and I will now describe my features of improvement.

E' is the plow-beam, which is made longer than usual. It extends from a position behind the point of the plow rearwardly and upwardly over the moldboard and then forwardly to a position in front of the forward end of the rectangular supporting-frame. At the front end the beam is provided with flanged and perforated jaws E², forming a clevis attachment, and these jaws are connected by a bolt e and links e' with a bolt e². This bolt e² is carried by the twin arms e³ of a rocking elbow-lever E³, which is journaled in bearings on the front end of the framework. The upper arm of this rocking lever is connected to a horizontal rod E⁴, which runs longitudinally to the rear, and is jointed to a hand-lever F, which I term a "tilting-lever," since its function is to tilt the plow to a different inclination to the ground, as hereinafter described.

G is a U-shaped bail which carries the main portion of the weight of the plow by being connected to the plow at the middle bend of the bail, while its two side arms extend forwardly and at their ends are turned outwardly at right angles and form trunnions g g, that rock in reinforced and elongated bearings g' g', (see Fig. 3,) secured to the lower edge of the rectangular frame. The rear end or loop portion of this bail swings about the front trunnions and raises and lowers the plow. In making connection between the loop of the bail and the plow-beam (see Fig. 7) a boxing g² g³ is clamped about the loop of the bail and

the upper portion g^2 of the boxing is formed with rearwardly-projecting and offsetting trunnions g^4 . One of these trunnions rests in and plays along the slot of a curved arm H on one side, (see Fig. 1,) and the other trunnion rests in and plays along the slot of a curved arm I, Figs. 1, 3, 7, on the other side. The arm H when the plow is in action extends forwardly and downwardly, while the arm I extends rearwardly and downwardly.

The lower portion g^3 of the plow-supporting box is mounted upon or formed with a rearwardly-projecting standard E^5 , which is bolted to the plow-beam behind the moldboard and which carries the trunnions g^4 to a point in rear of the plow. The importance of this will be more fully explained hereinafter.

The curved and slotted arm H, Figs. 3 and 4, is rigid with a hub which is journaled upon an axial bolt H' , carried by the framework. This hub has also rigidly attached to it or formed with it an upwardly-projecting and notched segment H^2 , which is adapted to be adjustably locked to the tilting-lever F by a spring-bolt, and said hub has also a rigid arm H^3 , projecting downwardly and connecting by a rod or bar J' with the lower end of the lifting-lever J. This lifting-lever is for the purpose of raising bodily the whole plow and for lowering the same, and for this purpose it is pivoted to a reinforced lug J^2 on the framework and has a spring-bolt adapted to engage with the notches of an arch-bar J^3 for holding the lifting-lever to its adjustment.

The slotted and curved arm I (see Figs. 2 and 3) is formed with a rearwardly-projecting arm I' at its upper end and is fulcrumed at a to a lug rising from the main frame. I^2 is a long helical spring, which at one end is hitched to an offset at the end of the arm I' , and at the other end the spring is hitched to the front end of the main frame.

The two points of connection with the plow serve to raise the plow bodily by a practically parallel motion, the lifting strain being applied at the bolt e at the extreme front end of the beam and at the trunnions g^4 in the rear of the plow-beam. This lifting power is applied by swinging the lifting-lever J to the rear. This action pulls the connecting-rod J' forward, and with it the arm H^3 , rocking the hub on axial bolt H' and lifting the slotted arm H, which in turn raises the trunnion g^4 and the plow. As this hub is rocked to the rear the segment H^2 and engaged lever F are thrown to the rear, pulling back rod E^4 . This rocks the elbow-lever E^3 e^3 and lifts the links e' and the front end of the plow. As the lever J passes from a vertical to a horizontal position the various parts pass from the position shown in Fig. 1 to that shown in Fig. 2.

In the movement just described the trunnions g^4 ride in the slots of the two arms H and I, moving toward the centers of each arm, which arms cross each other at the axial line

of the trunnions, as seen in Fig. 1. When the plow is in its elevated position, as in Fig. 2, the tension of spring I^2 at the attaching-point a' of arm I' is above the center a of the elbow $I I'$, and consequently the tension of the spring I^2 holds up the curved arm I and helps to lift and sustain the plow in elevated position, making this operation easy. When the plow is in its lowest position at work in the ground, the attaching-point a' of the spring I^2 is somewhat below the center a of the elbow $I I'$, as seen in Fig. 1, and consequently the tension of the spring aids in holding the plow down to its work in the ground.

The U-shaped bail G is made with unusually long side arms, and the angle which these arms occupy when the plow is in the ground, as in Fig. 1, is such that the draft strain applied to the front of the plow-beam causes a downward thrust of the plow into the ground and an upward lifting strain on the front of the sulky-frame, making the sulky run easier and causing the plow to do better work.

In sulky-plows it is desirable to be able to tilt the point down at different inclinations to suit different soils. Heretofore this has been done; but in tilting the point down the heel is raised, and this so changes the relation of the rear part of the plow to the furrow being turned as to cause it to turn the furrow improperly and let the plow run out of the ground. To overcome these difficulties, I locate the pivotal center about which the plow-point is tilted at a distance in rear of the beam and at the back end of the plow. This point is the center of the trunnions g^4 , which are mounted on the rearwardly-extending standard E^5 , whose value will now be explained.

By referring to Fig. 4 it will be seen that by taking the trunnions g^4 as a center and running a straight line to the point of the plow as a radius of adjustment if the plow-point is lowered about the center g^4 all of the plow will be lowered, as indicated in dotted lines, but the point will be lowered more than the heel by reason of its greater distance from the center, and thus the plow will be made to dig deeper into the soil without raising the heel of the plow or falsifying the position of the moldboard, but the latter will scour and turn a perfect furrow in all adjustments. This result is attained by locating the pivotal center g^4 , about which the plow is adjusted, in rear of the plow-beam and at practically the rear end of the moldboard. This explains the value of the rearwardly-offsetting standard E^5 .

I will now explain the mechanism for giving the tilting adjustment to the point of the plow. When the plow is lifted bodily without changing its inclination, it is lifted by the trunnions g^4 and also by the bolt e at the front end of the beam, as heretofore explained, both these points moving upwardly at the same time.

To alter the inclination of the plow E or tilt its point, the trunnion g^4 remains stationary and only the front end of the beam is adjusted vertically. This is accomplished by throwing the tilting-lever F forwardly over the notched segment H², as shown in dotted lines in Fig. 4, which pushes forward the rod E⁴, rocks the elbow E³, and drops the link e' , which sustain the front end of the plow-beam. This causes the angle of the plow to the horizontal to be changed, so as to run deeper, and as this movement is made about the trunnion g^4 as a stationary center in rear of the plow-beam and moldboard it will be seen that the entire plow moves down slightly—that is to say, the heel of the plow is not thrown up by a depression of the point, which avoids the objections heretofore referred to. This tilting down of the plow-point is very necessary to hold the plow into certain kinds of stiff or mucky soils.

The front furrow-wheel B is journaled on the bent arm at the lower end of the vertical spindle-rod B'. The upper end of this rod is attached to the upper end of a helical spring B², which at its lower end is hooked into a hanger-bar A², depending from the main frame A. By means of this spring the front end of the sulky is supported in an elastic manner upon the front furrow-wheel, so that the vertical adjustment of the front furrow-wheel may be easily accomplished, since the spring aids the adjusting devices. These adjusting devices consist of a long lever K, Figs. 1, 5, and 6, fulcrumed upon a fixed bolt K' in a vertical box K², attached firmly to the framework A. A hooked arm K³ connects the lever K with a vertical slotted bar K⁴, which at its lower end is bent in and perforated and embraces the lower end of the spindle between two collars k, k . The upper portion of the bar is guided by its slot, which embraces the pivot-bolt K'. A locking spring-bolt K⁵ on the lever K (see Fig. 3) engages a notched segment K⁶ on the vertical box K² to hold the lever to its different adjustments. When the lever K is turned to raise or lower the front furrow-wheel, the vertical spindle slides through the boxing K² and is guided against cramping by the slotted bar K⁴, and the movement is rendered easy by the balancing effect of the spring B².

The rear furrow-wheel D is carried upon the lower bent arm of a vertical spindle D', turning about a vertical axis in bearings mounted on the main frame A. The arm of the rear furrow-wheel is made longer than the arm of the front furrow-wheel, so as to get the rear furrow-wheel farther to the rear of the plow, which enables it to better resist the side thrust of the plow. The spindles of the front furrow-wheel and rear furrow-wheels are connected, so that they turn together about their vertical axis, as has been done heretofore; but I make this connection

an adjustable one, as follows, reference being had to Fig. 3: On top of the rear spindle D' is a rigid arm D², having a screw-stem d' , passing through a slot d in a horizontal plate D³, pivoted on the upper end of the spindle D' and pivoted also to the rear end of a long rod D⁴, which runs to the front of the main frame. A clamp-nut on the screw-stem d' adjustably connects the plate D³ and the arm D². A similar adjustment at the front end connects the rod D⁴ to the vertical spindle B' of the front furrow-wheel—that is to say, a horizontal plate B³ is pivoted on the spindle B' and also to the rod D⁴ and at an intermediate point is connected to a rigid arm B⁴ on the spindle by a slot and screw-stem b', b . These connections while coupling the front and rear wheels together for a similar movement when in action also give the desirable result of permitting each furrow-wheel to be adjusted independently of the other. The tongue-plate T is hinged about a horizontal bolt to the plate B³ and is provided with a transverse slot at its front end for the adjustment of the tongue.

As both the front and rear furrow-wheels are coupled together for simultaneous movement about their vertical axes, it will be seen that the rear furrow-wheel arm, being the longer, is less affected by variations in the position of the front furrow-wheel arm and consequently is better able to resist the side thrust of the plow.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A sulky-plow having the plow proper supported at two points, one point being in rear of the beam and the other point at the front portion of the beam, and means for adjusting the front support up and down independently of the rear support, whereby the plow-point may be tilted down without raising the rear or heel portion of the plow substantially as and for the purpose described.

2. A sulky-plow comprising a main frame, a plow and its beam, a U-shaped bail pivotally connected at its front end to the frame, a boxing embracing the middle of the bail and provided with trunnions, a standard supporting the boxing and projecting rearwardly from the plow, two slotted arms arranged to cross each other, one embracing the trunnion on one side and the other the trunnion on the other side, a lifting-lever with means for connecting it to one of said slotted arms and a lifting connection for the front end of the plow-beam connected to and operated by the lifting-lever substantially as described.

3. A sulky-plow comprising a main frame, a plow and its beam, a U-shaped bail pivotally connected at its front ends to the frame, a boxing embracing the middle of the bail and provided with trunnions, a standard supporting the boxing and projecting rearwardly from the plow, a slotted and rocking arm

projecting forwardly from its axis and embracing one of the trunnions, a lifting-lever and means for connecting the same to the slotted arm for lifting the same and the plow, and a second slotted and rocking arm extending rearwardly from its axis and embracing the other trunnion and a tension-spring attached to this latter slotted arm and arranged to pass from one side of its axis to the other substantially as and for the purpose described.

4. In a sulky-plow, a lifting mechanism for the plow proper comprising two slotted arms arranged to cross each other, the one extending forwardly from its axis and the other rearwardly, lifting devices applied to one of said slotted arms and a spring tension device applied to the other slotted arm substantially as described.

5. A sulky-plow having its plow supported at two points, one at the front and the other at the rear of the beam, lifting devices connecting with these two points, mechanism connecting the lifting devices of the front of the plow with the lifting device for the rear of the plow, and a tilting-lever with locking adjustments for raising or lowering the front support independently of the rear support to tilt the plow substantially as shown and described.

6. In a sulky-plow, the combination with the frame, the plow and its beam; of a trunnion located at the rear of the beam, a rocking hub having a slotted arm extending forwardly and embracing the trunnion, and another rigid arm projecting from said hub, a connecting-rod attached to the end of this arm, and a lifting-lever fulcrumed to the main frame and connected at its lower end to the connecting-rod and having an adjustable locking device substantially as and for the purpose described.

7. In a sulky-plow, the combination with the main frame, the plow, its beam and a U-shaped bail; of lifting devices for the plow and an elbow-lever having downwardly and rearwardly extending slotted arm I connected to the plow and rearwardly-extending arm I', and a spring I² connected to the rear end of arm I' and adapted to pass above and below the fulcrum of said arm and arranged to hold the plow to both its highest and lowest positions substantially as described.

8. In a sulky-plow, the combination of the main frame, the plow having a supporting-trunnion at its rear, a rocking hub with slotted arm H, locking-plate H² and operating-arm H³, all rigidly connected together, lifting-lever J, rod J' connecting the lever to arm H³, tilting-lever F adjustable over plate

H², connecting-rod E⁴ extending to the front of the frame, elbow-lever E³ attached thereto, and links e' connecting the elbow-lever to the front of the plow-beam substantially as shown and described.

9. In a sulky-plow, the combination with front and rear furrow-wheels having vertical spindles with horizontal crank-arms D² B⁴ at the top, horizontal slotted plates D³ B³ adjustably connected to the crank-arms and pivoted on the upper ends of the spindles, and a bar connecting these plates, crank-arms and spindles for a simultaneous rocking about their vertical axes and permitting the furrow-wheels to be operated together but be adjusted independently of each other substantially as described.

10. In a sulky-plow, the combination with the furrow-wheel and the main frame supported thereon; of means for adjusting the two vertically in relation to each other and a spring connecting the spindle of the furrow-wheel to the frame, said spring being arranged to sustain the weight of the frame and to aid by its tension in the vertical adjustment substantially as described.

11. In a sulky-plow, the combination with the frame having boxing K²; of the lever K fulcrumed to the boxing and having arm K³, slotted bar K⁴ attached thereto and having bent perforated lower end and its upper end embracing the fulcrum-bolt of the lever, the furrow-wheel spindle B' having collars k k swiveling above and below the lower bent end of the slotted bar K⁴, the furrow-wheel spindle passing through the boxing and connected to and supporting the main frame, and adjustable locking mechanism for the lever substantially as described.

12. In a sulky-plow, the combination with the frame having boxing K² and hanger A²; of the lever K fulcrumed to the boxing and having locking devices and arm K³, slotted bar K⁴ attached thereto and having bent and perforated lower end and its upper end embracing the fulcrum-bolt of the lever, the furrow-wheel spindle B having collars k k swiveling above and below the lower bent end of the slotted bar K⁴, the furrow-wheel spindle passing through the boxing and the spring B² connecting the upper end of the furrow-wheel spindle to the hanger A² of the frame to elastically support the frame and smoothly guide the same in its vertical adjustment substantially as described.

JEROME E. RUSSELL.

Witnesses:

T. P. REIBSAMEN,
GEO. R. WESTLAKE.