

No. 713,087.

Patented Nov. 11, 1902.

J. A. FRENIER.

SULKY PLOW.

(Application filed Mar. 29, 1902.)

(No Model.)

3 Sheets—Sheet 1.

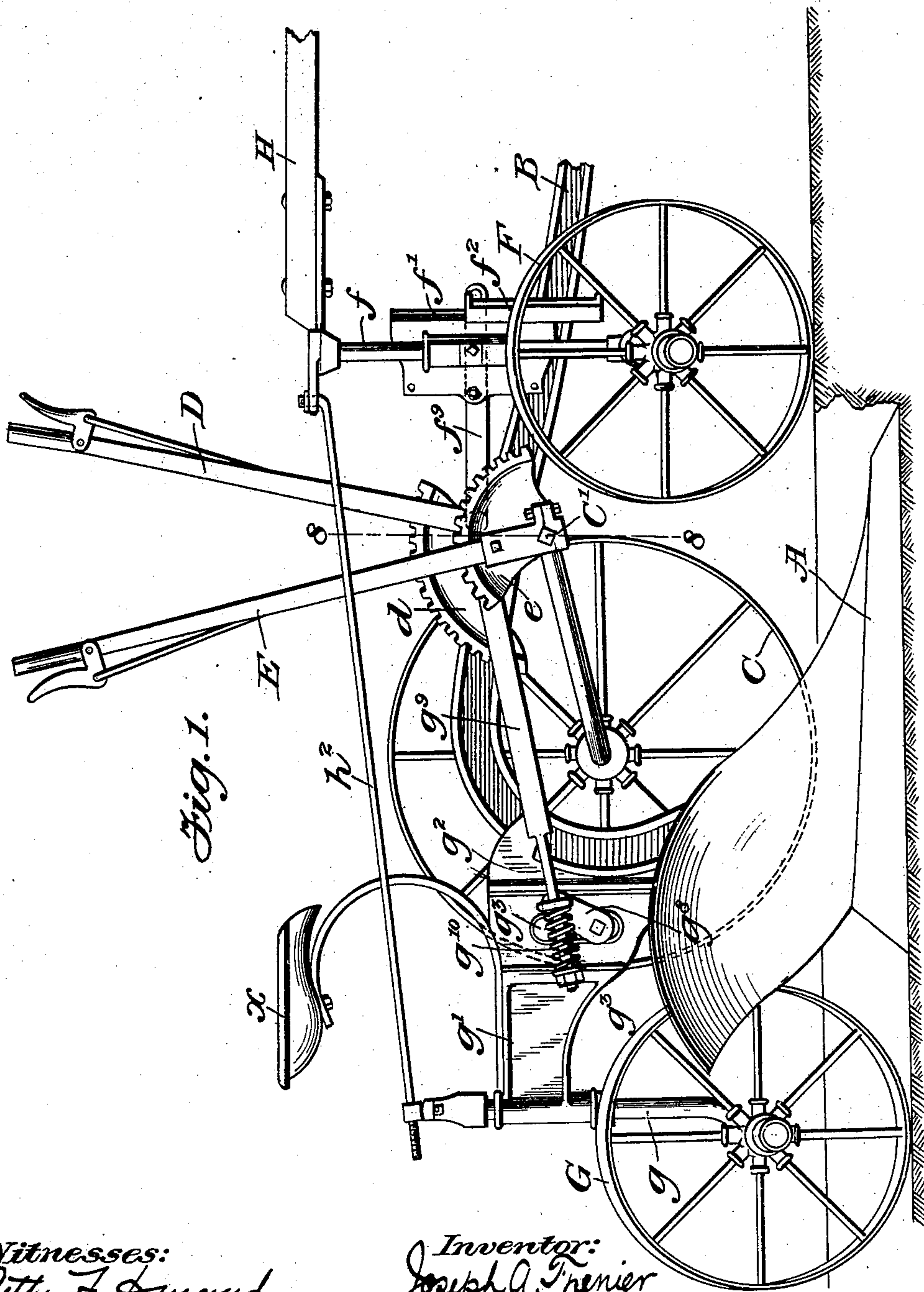


Fig. 1.

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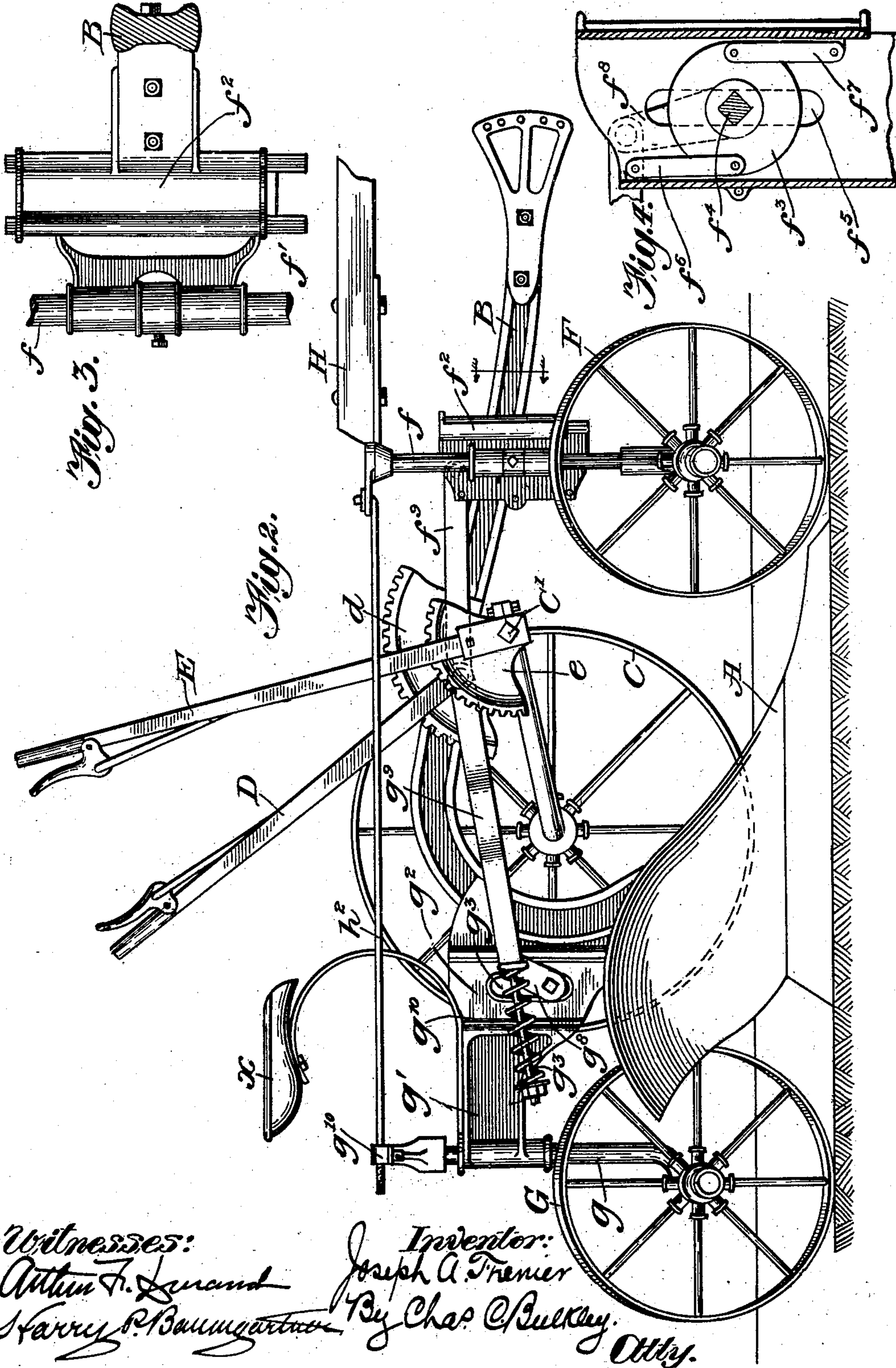
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3 Sheets—Sheet 2.



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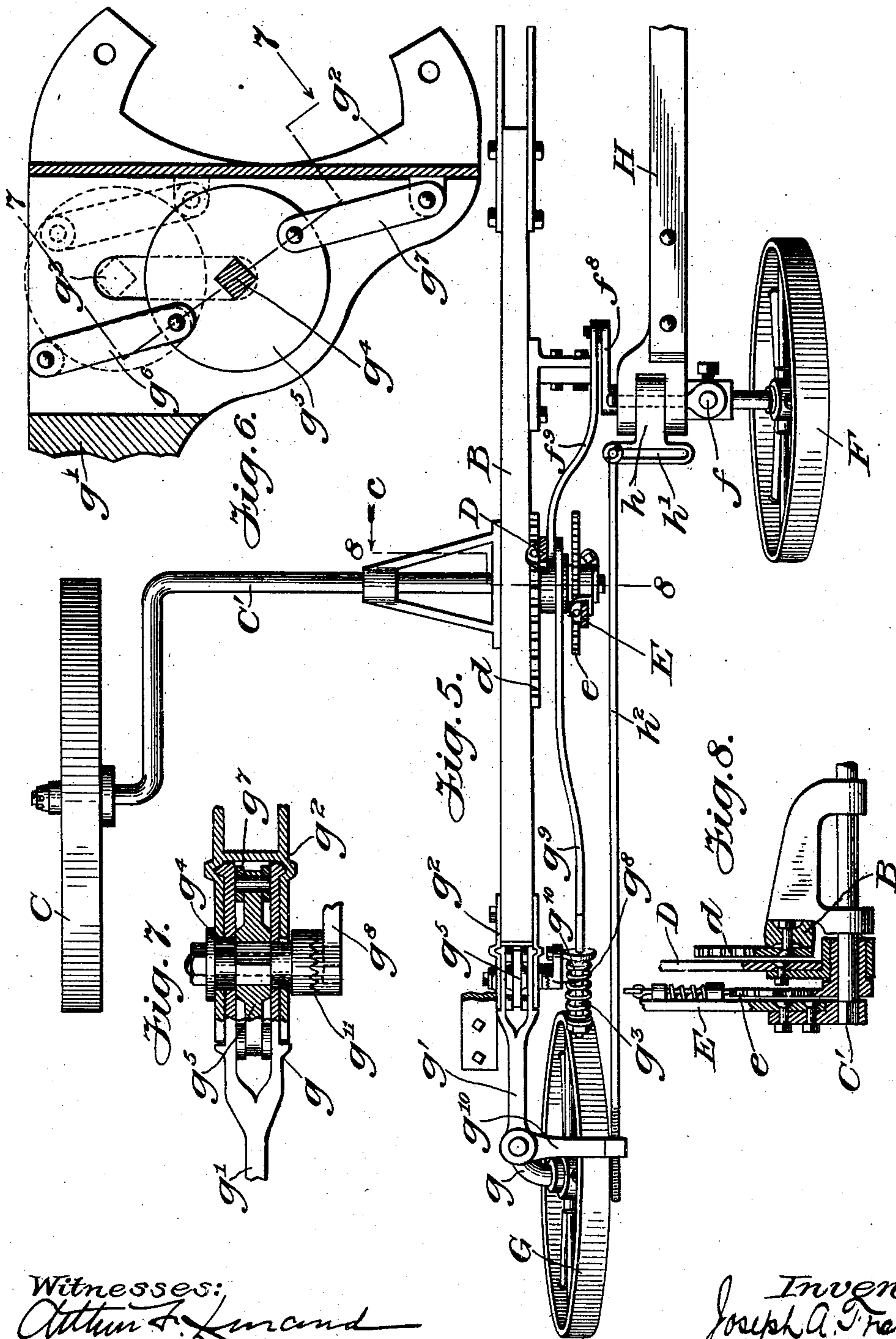
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

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SULKY-PLOW.

SPECIFICATION forming part of Letters Patent No. 713,087, dated November 11, 1902.

Application filed March 29, 1902. Serial No. 100,511. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH A. FRENIER, a citizen of the United States of America, and a resident of Davenport, Scott county, Iowa, have invented a certain new and useful Improvement in Sulky-Plows, of which the following is a specification.

My invention relates to a wheeled or sulky plow, particularly those of the three-wheeled type, and especially to plows of this character in which all three wheels have a shifting connection with the plow-beam, so as to permit the plow to be raised and lowered. In a three-wheeled sulky-plow of this type the construction usually involves a land-side wheel and two furrow-wheels. It is usually the practice to locate one of said furrow-wheels behind the plow and to arrange the other at a point forward of the plow. It is also the practice to provide suitable connections whereby all three wheels can be controlled simultaneously, and also whereby one or more of said wheels can be controlled independently of the others.

Generally stated, it is the object of my invention to provide a simple, inexpensive, and highly-efficient wheeled or sulky plow of the foregoing type.

A special object is to provide an improved arrangement of levers and segmental racks for controlling the wheels.

Another object is to provide an improved shifting connection between the forward furrow wheel and the plow-beam.

A further object is to provide an improved shifting connection between the plow-beam and the rear furrow-wheel.

In addition to these it is also an object to provide certain details and features of improvement tending to increase the general efficiency and serviceability of a plow of this character.

In the accompanying drawings, Figure 1 is a side elevation of a wheeled plow embodying the principles of my invention. In this view the plow is shown in position relatively to the wheels to make the first furrow. In such case, it will be observed, the land-side and the forward furrow wheel travel on the surface of the ground. Fig. 2 is a view similar to Fig. 1, but showing the forward fur-

row-wheel adjusted down into position to travel in the previously-made furrow. Fig. 3 is a front elevation of the shifting connection between the plow-beam and the forward furrow-wheel. Fig. 4 is a side elevation of the connection between the forward furrow-wheel and the plow-beam, certain portions being shown in section for the purpose of showing the disk and links which constitute part of the means for causing the relative movement between the wheel and plow-beam. Fig. 5 is a plan of the plow shown in Figs. 1 and 2, certain portions being shown in section. Fig. 6 is a side elevation of the shifting connection between the rear furrow-wheel and the plow-beam, certain portions being shown in section for the purpose of exposing the disk and links which constitute part of the means for causing relative movement between the said wheel and plow-beam. Fig. 7 is a section on line 7 7 in Fig. 6. Fig. 8 is a section on line 8 8 in Fig. 6.

As thus illustrated, my improved sulky-plow comprises a suitable plow A, having the usual plow-beam B. As will be observed, all framework is dispensed with and the supporting-wheels are connected directly to the plow-beam. The land-side wheel C is preferably mounted upon a crank-axle C', which is in turn mounted in a suitable bearing on the plow-beam. This bearing preferably consists of a bracket c, secured in any suitable manner to the plow-beam. Upon this crank-axle and within reach of the driver or operator occupying the seat X are mounted a couple of levers D and E. Referring to Fig. 8, it will be seen that the lever E is rigid with the said shaft, while the lever D is rigid with a rack e, loosely mounted upon said shaft. The locking-bolt of the lever E is, it will be observed, preferably arranged to engage the said segmental rack e. The lever D can be provided with a like locking-bolt adapted to engage the segmental rack d, which is secured to the plow-beam.

The forward furrow-wheel F is preferably tilted or inclined outwardly and mounted upon the laterally-projecting lower portion of the standard or spindle f. A box-like casting f' is preferably mounted and arranged to provide a bearing for this said spindle or stand-

ard. A second casting or inclosing member f^2 is secured rigidly to the plow-beam. The disk-like member f^3 is inclosed by these two relatively sliding castings or members and is provided with a shaft f^4 , arranged to extend through vertical slots f^5 , formed in the side walls of the casting f' . Thus, it will be observed, the two castings are capable of relative and vertical and sliding movement, and the two castings are connected and held against separation by their relative formation. The casting f' is preferably connected with the peripheral portion of said disk by one or more links f^6 . In a similar manner the casting f^2 is connected with the opposite side of said disk by one or more links f^7 . With this arrangement it will be seen that a rotation of this disk in one direction will cause it to move bodily upward, carrying the casting f^2 , and consequently the plow-beam, with it. A rotation of the disk in an opposite direction will cause it to move bodily downward, and to consequently lower the casting f^2 and the plow-beam. The means for thus rotating said disk consist, preferably, of a crank-arm f^8 on the shaft of the disk and of a link f^9 , arranged to connect this crank-arm with the lever D. With this arrangement the forward portion of the plow-beam can be raised and lowered upon the spindle or standard f by operating the lever D. The rear trailing or caster wheel G is also preferably tilted or inclined, so as to follow properly in the furrow being made by the plow, and is mounted upon the lower laterally-projecting portion of the stem or spindle g . This stem or spindle, it will be observed, is arranged to turn freely in the casting g' , which supports said seat. This casting g' has a vertical sliding or relative shifting movement with respect to the casting g^2 , which latter is secured rigidly to the rear portion of the plow-beam. This arrangement, it will be observed, is similar to the arrangement for adjusting the forward furrow-wheel. The side walls of the castings are provided with slots g^3 , adapted to receive the projecting end portions of the shaft g^4 . On this shaft g^4 a disk g^5 , similar to the one previously described, is mounted, and one side of this disk is connected with the casting g' by one or more links g^6 . At the opposite side the disk is connected with the casting g^2 by means of similar links g^7 . The projecting end portion of the shaft g^4 is provided with a crank-arm g^8 , and this crank-arm is connected by a link g^9 with the lever D. With this arrangement it will be seen that a relative shift or sliding movement between the two castings g' and g^2 can be caused by operating the lever D. This relative shift or sliding movement is of such character as to cause the rear portion of the plow to be raised or lowered, according to the direction in which the lever is swung. In other words, a shift of said lever in one direction will rotate the disk g^5 in such direction as to cause it to move bodily upward and lift the plow

and beam with it. Also the movement of the lever in an opposite direction will cause the disk g^5 to rotate and move bodily downward, thereby lowering the rear portion of the plow and beam. The arrangement, it will be seen, permits the rear caster-wheel to turn clear around and to swing freely below the rearwardly-projecting arm of the casting g' . As a means for holding the caster-wheel against turning while the machine is running straight ahead the upper end of the caster-wheel spindle g can be provided with a crank-arm g^{10} . This crank-arm can be connected in any suitable manner with the tongue H, which, it will be observed, is secured to the upper end of the spindle f . For example, the said tongue can be hinged to the casting h , and the latter can be provided with a transversely-extending slot h' . The rod h^2 can be arranged to connect the crank-arm g^{10} with the slotted portion of the casting h . Thus when the machine is running straight ahead the rear caster-wheel is held against turning; but when the tongue and forward furrow-wheel are swung to one side as in turning around, then the forward end of the rod h^2 becomes free to play in the slot h' . In this way, as soon as the tongue and forward furrow-wheel are swung to either side the connection between the caster-wheel and the tongue is practically released, so as to permit the caster-wheel spindle to turn freely in its bearing.

In operation the first furrow can be made by adjusting the plow and wheels relatively, as shown in Fig. 1. In this view it will be seen that the land-side and front furrow wheels travel along the unplowed surface of the ground, while the rear trailing or caster wheel follows in the furrow being made by the plow. Subsequently, as will be understood, the levers are adjusted so as to bring the front furrow-wheel down into the previous furrow, as shown in Fig. 2. In this case the rear trailing or caster wheel follows in the furrow being made, the land-side wheel travels above on the unplowed ground, while the front furrow-wheel travels in the previous furrow. By grasping the lever D and releasing its bolt from the rack d all three wheels can be simultaneously controlled, so as to bodily raise or lower the plow, according to the direction in which the lever is swung. The lever E can be employed to control the land-side wheel independently of the other wheels. With the form of shifting connection employed the rear furrow-wheel does not move toward and away from the plow when the latter is raised and lowered. In other words, the caster-wheel spindle and the plow-beam retain their distance apart at all points in the relative adjustment between the caster-wheel and the plow. Furthermore, these shifting connections, consisting of the rotary disks and links, are strong and simple and afford an efficient arrangement for securing the desired adjustments or movements of the plow. In addition these shifting connections,

although easily and readily operated, are of such character as to insure against loose joints, and consequently as to insure against lateral yielding or play. In this way a thoroughly rigid and efficient construction is obtained without the necessity of employing any supplemental framework. Furthermore, although strong and rigid and characterized by all of the necessary adjustments, the machine is practically of minimum weight and number of parts. By grasping both levers, so as to release their bolts from the rack, and by holding the lever E stationary the lever D can be employed for controlling the front and rear furrow-wheels independently of the land-side wheel, and, furthermore, for a certain portion of its travel this lever D causes a relative movement of the front wheel independently of the others. For example, in Fig. 2 the front wheel is down in the furrow, the rear wheel is following in the furrow being made, while the land-side wheel is traveling on the surface of the ground. In Fig. 1, however, the lever D has been thrown forward to an extent to lower the plow below the front wheel without disturbing the position of the rear wheel relatively to the plow. When the plow is lowered to the level of the front and rear furrow-wheels, as shown in Fig. 2, the disk g^5 is practically at the limit of its downward movement, and consequently a forward movement of the lever D from the position shown in Fig. 2 will, owing to the provision of the spring g^{10} , lower the plow relatively to the front wheel only. In other words, an adjustment of the lever D forward from the position shown in Fig. 2 compresses the spring g^{10} , as shown in Fig. 1, allowing the relation between the rear furrow-wheel and the plow to remain the same. It will be seen, however, that this extreme forward adjustment of the said lever lowers the plow-beam on the spindle f , or, in other words, practically lifts the front furrow-wheel relatively to the plow, so as to allow the latter to assume the position necessary for making the first furrow, as shown in Fig. 1. In this way it will be seen that the lever D is connected and arranged for simultaneously adjusting both furrow-wheels up to a certain point in its swing and that beyond such point the relative movement is confined to the forward furrow-wheel. As stated, the raising and lowering of the plow causes no change in the distance between the plow and the rear furrow-wheel. Consequently the plow can be raised and lowered without any tendency on the part of the rod h^2 to push or move the rear furrow-wheel around. The crank-arms for rotating the two disks can be adjustably connected with the studs or short shafts upon which the latter are mounted. For example, as shown in Fig. 7, the crank-arm g^8 is connected with the shaft g^4 by means of a toothed formation, such as is shown at g^{11} , so as to permit the crank-arm to be adjusted to the proper angle relatively to the disk and links. With

this arrangement the connections between the two rotary disks and the lever D can be adjusted nicely, so as to secure the proper relative movements.

What I claim as my invention is—

1. In a wheeled or sulky plow, the combination of a suitable plow and plow-beam, a plurality of supporting-wheels including a rear caster-wheel, two relatively sliding members serving as medium of connection between the caster-wheel and plow-beam, a rotary member arranged for vertical bodily shift between the two relatively shifting members, and links for connecting said rotary member with said relatively shifting members.

2. In a wheeled plow, the combination of a suitable plow and plow-beam, a plurality of supporting-wheels including a rear caster-wheel, a rotary member and a plurality of links serving as medium of connection between the caster-wheel and plow-beam, and a lever and suitable connections for rotating said rotary member, so as to cause the latter to have a bodily vertical shift.

3. In a wheeled or sulky plow, the combination of a suitable plow and plow-beam, a plurality of supporting-wheels including a rear caster-wheel, a casting in which the spindle of the caster-wheel is free to turn, a second casting secured to the rear portion of the plow-beam, a rotary member arranged between the two castings and having a shaft extending through vertical slots in the side walls of said castings, links connecting the rotary member with the two castings, and a lever suitably connected and arranged for rotating said rotary member.

4. In a wheeled or sulky plow, the combination of a suitable plow and plow-beam, a plurality of supporting-wheels including a forward furrow-wheel, two relatively sliding members serving as medium of connection between the said front furrow-wheel and plow-beam, a rotary member arranged between the said relatively sliding members, and links for connecting the said relatively sliding members with the said rotary member.

5. In a wheeled or sulky plow, the combination of a suitable plow and plow-beam, a plurality of supporting-wheels including a forward furrow-wheel, a bodily-shifting and rotary member, together with a plurality of links serving as medium of connection between the said front furrow-wheel and plow-beam, and a lever connected and arranged for rotating said rotary member.

6. In a wheeled or sulky plow, the combination of a suitable plow and plow-beam, supporting-wheels whereof one is a front furrow-wheel, a casting mounted to slide up and down upon the spindle of said front furrow-wheel, a second casting secured to said plow and beam, a rotary member arranged between the two castings and having a shaft projecting through vertical slots in the side walls of said castings, links connecting said rotary member with said castings, and a lever

connected and arranged for rotating said rotary member.

7. In a wheeled or sulky plow, the combination of a suitable plow and plow-beam, a plurality of supporting-wheels including a land-side wheel, a crank-axle upon which said land-side wheel is mounted, a rack secured to the plow-beam, a rack loosely mounted upon said crank-shaft, a lever rigid with said loosely-mounted rack and provided with a locking-bolt adapted to engage the rack secured to the plow-beam, and a lever rigid with said crank-shaft and provided with a locking-bolt adapted to engage said loosely-mounted rack, whereby said first-mentioned lever is adapted for adjusting the land-side wheel independently of the other wheels, and whereby said last-mentioned lever is adapted for simultaneously adjusting all of said wheels.

8. In a wheeled plow, the combination of a suitable plow and plow-beam, a rear trailing or caster wheel having shifting connection with the plow-beam, a front furrow-wheel having shifting connection with the plow-beam, a transversely-disposed crank-axle, a land-side wheel mounted on said crank-axle, a rack secured to the plow-beam, a rack loosely mounted upon said crank-shaft, a lever rigid with said loosely-mounted rack and provided with a locking-bolt adapted to engage the rack secured to the plow-beam, a lever rigid with said crank-axle and provided with a locking-bolt adapted to engage said loosely-mounted rack, a link serving as medium of connection between the loosely-mounted lever and the shifting connection between the front furrow-wheel and plow-beam, and a link serving as medium of connection between the caster-wheel and plow-beam and said loosely-mounted lever.

9. In a machine for tilling the soil, the combination of a suitable furrow-making device, a plurality of supporting-wheels whereof one is a rear caster-wheel, and a rotary and bodily-shifting member and a plurality of links serving as medium of shifting connection between said caster-wheel and said furrow-making device.

10. In a machine for tilling the soil, the combination of a suitable furrow-making device, a supporting-wheel, two relatively sliding members serving as medium of connection between the wheel and furrow-making device, a rotary member interposed between the two relatively sliding members, and links connecting the rotary member with the said relatively sliding members.

11. In a wheeled plow, the combination of a suitable plow and plow-beam, a plurality of supporting-wheels including a rear furrow-wheel, a sliding connection between said rear furrow-wheel and the plow-beam, a rotary member and links for causing a sliding movement on the part of said connection, a crank-arm adjustably connected with said rotary member, a lever, and a link connecting said lever with said crank-arm.

12. In a wheeled plow, the combination of a suitable plow and plow-beam, a plurality of supporting-wheels including a front furrow-wheel, two relatively sliding members connecting the front furrow-wheel with the plow-beam, a rotary member interposed between said sliding members, links for connecting said rotary member with said sliding members, a crank-arm adjustably connected with said sliding member and lever, and a link connecting said lever with said crank-arm.

13. In a wheeled plow, the combination of a suitable plow and plow-beam, a plurality of wheels including front and rear furrow-wheels, two relatively sliding members connecting the rear furrow-wheel with the plow-beam, two similar relatively sliding members connecting the front furrow-wheel with the plow-beam, a rotary member interposed between each pair of sliding members, links for connecting the rotary members with the sliding members, crank-arms carried by said rotary members, a lever suitably connected with both of said crank-arms, and a spring serving as a yielding portion of the connection between the said lever and the crank-arm on the rear rotary member.

14. In a wheeled plow, the combination of a suitable plow and plow-beam, a plurality of supporting-wheels including front and rear furrow-wheels, a disk and links serving as medium of connection between the rear furrow-wheel and the plow-beam, a crank-arm carried by said disk, a swinging lever, a link connecting said lever with said crank-arm, a spring interposed between said crank-arm and a shoulder on said link, shifting connection between the front furrow-wheel and the plow-beam, and suitable connections whereby said lever also controls said front furrow-wheel.

Signed by me at Davenport, Scott county, Iowa, this 17th day of March, 1902.

JOSEPH A. FRENIER.

Witnesses:

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