

No. 617,338.

Patented Jan. 10, 1899.

E. M. HEYLMAN.

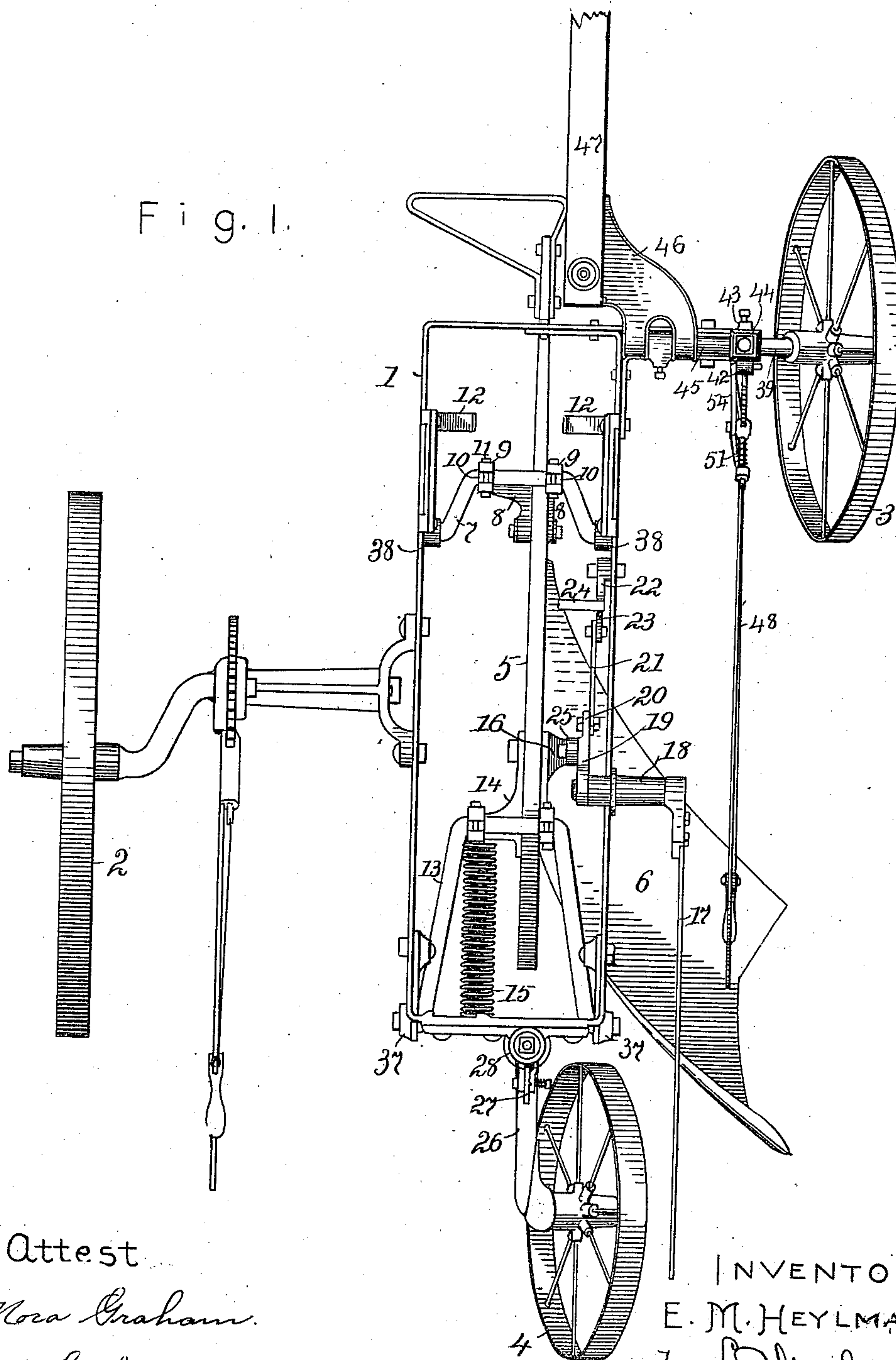
RIDING PLOW.

(Application filed July 28, 1898.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1.



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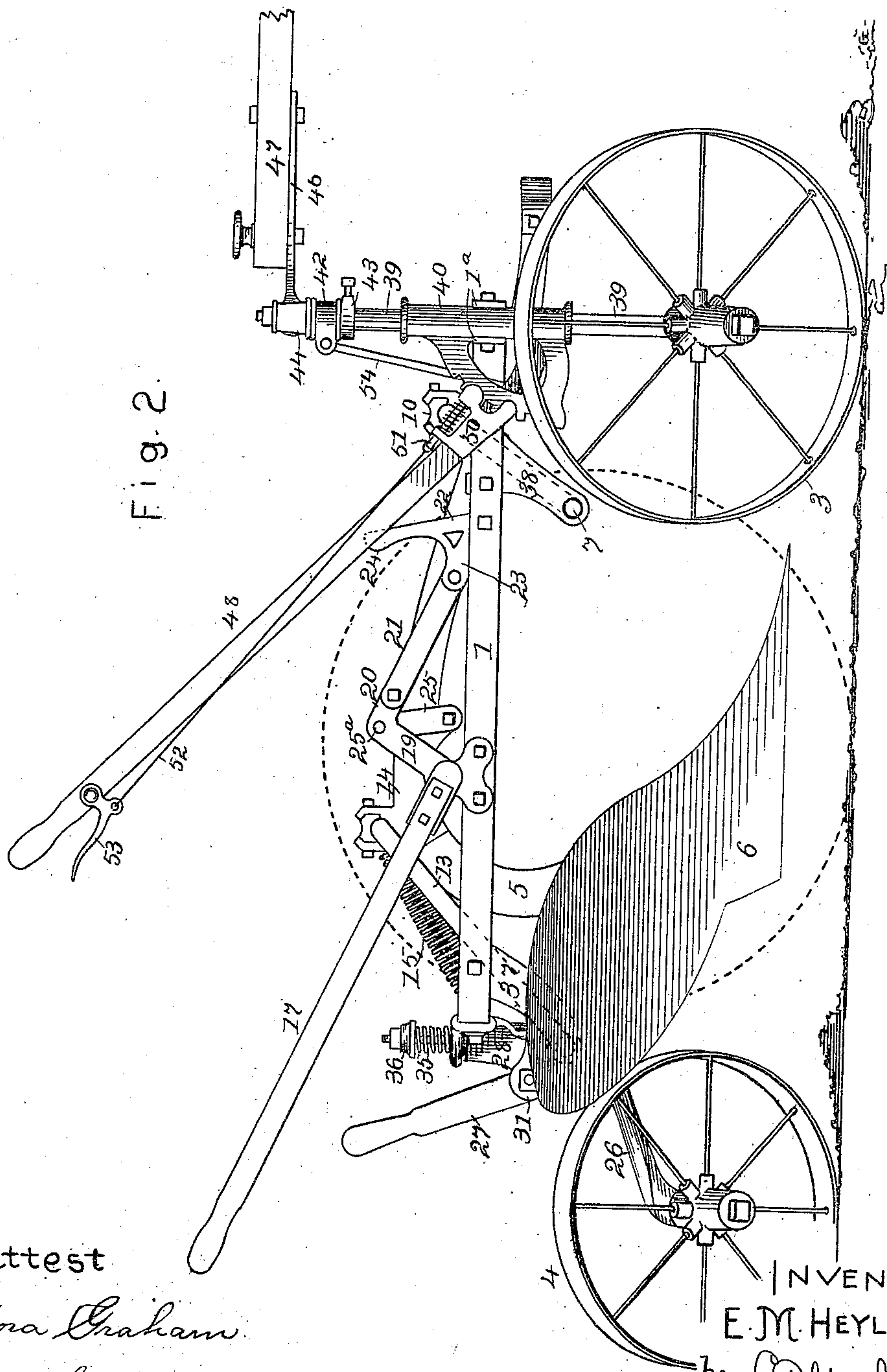
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Fig. 3.

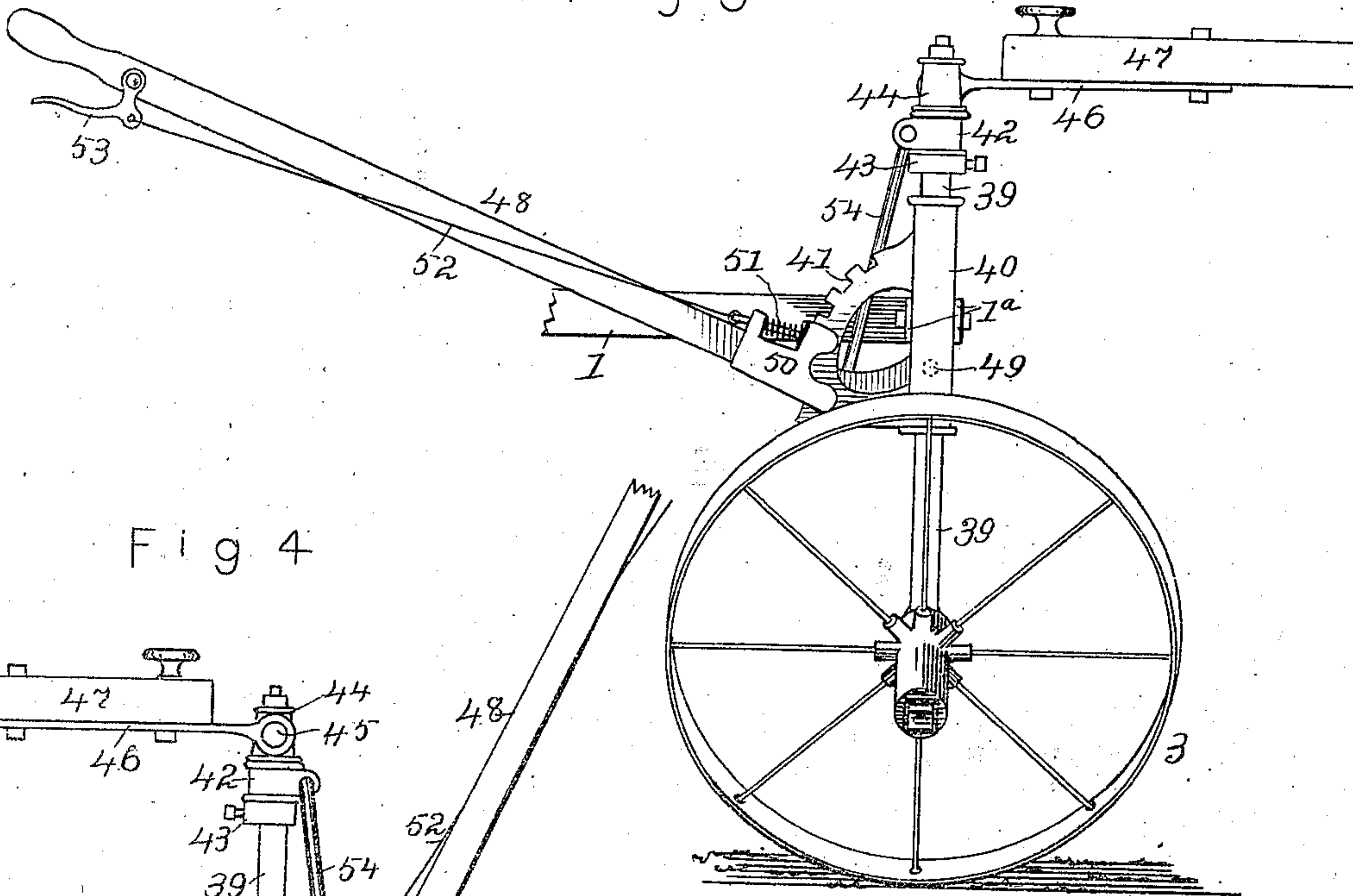


Fig. 4.

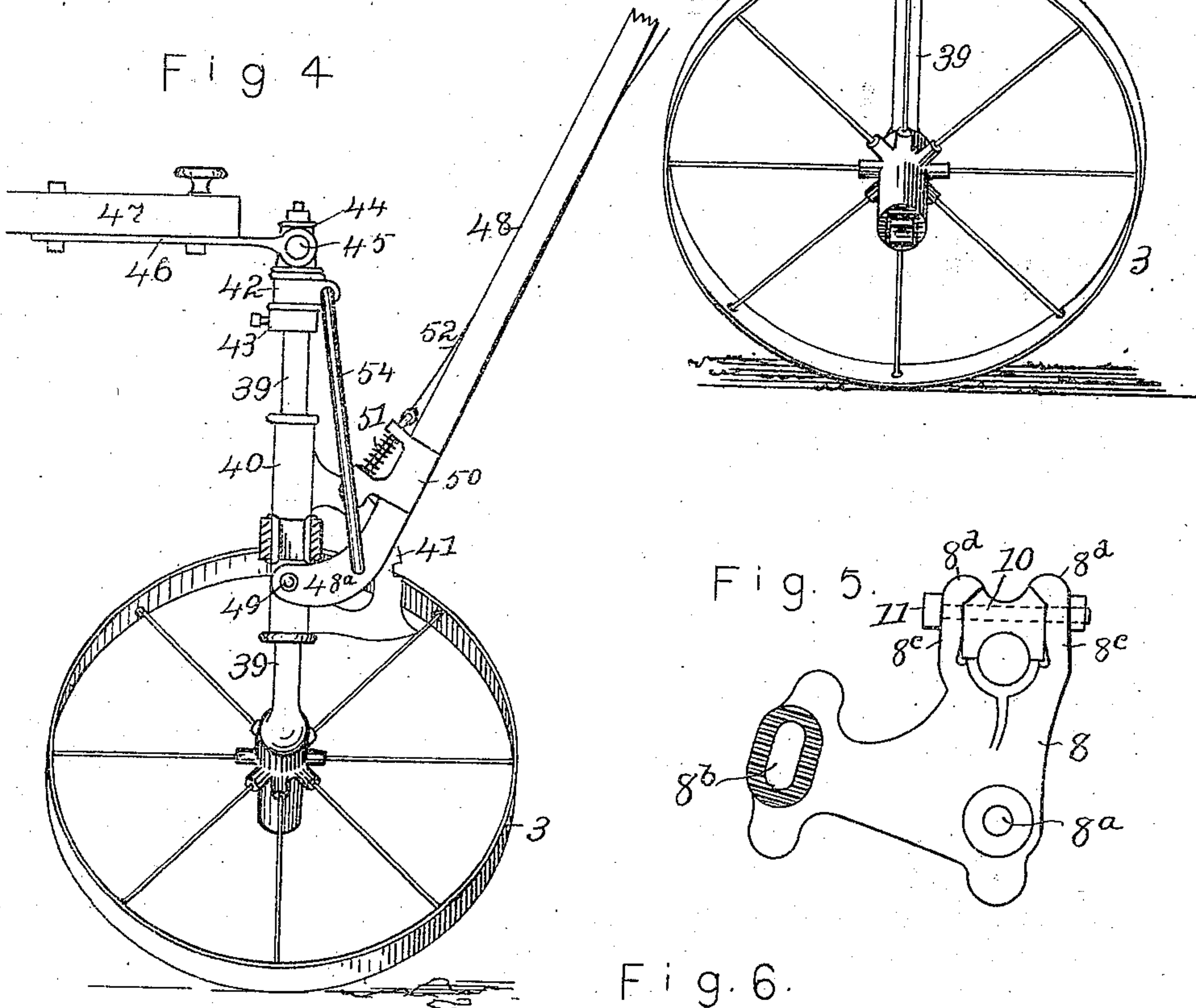


Fig. 5.

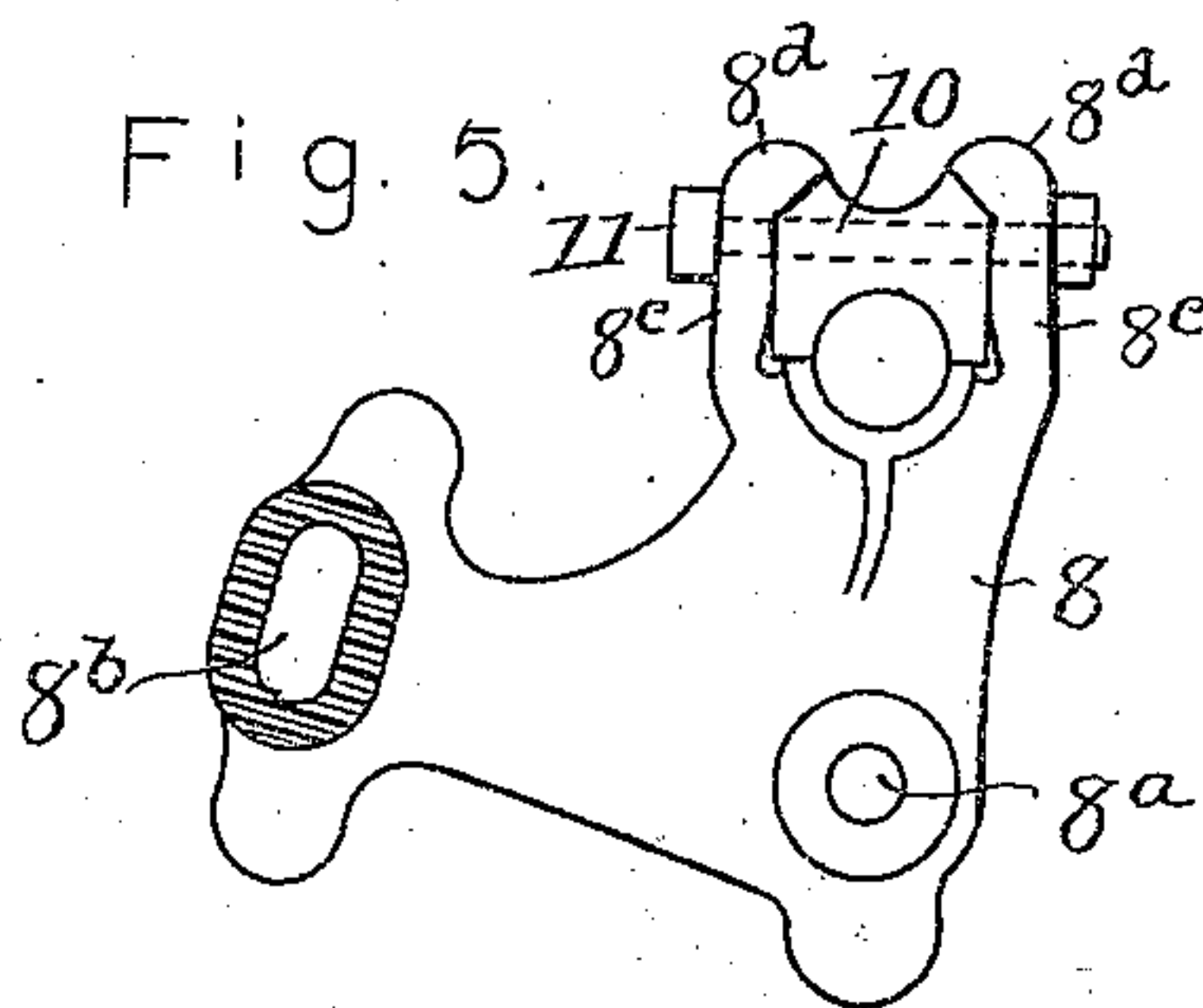
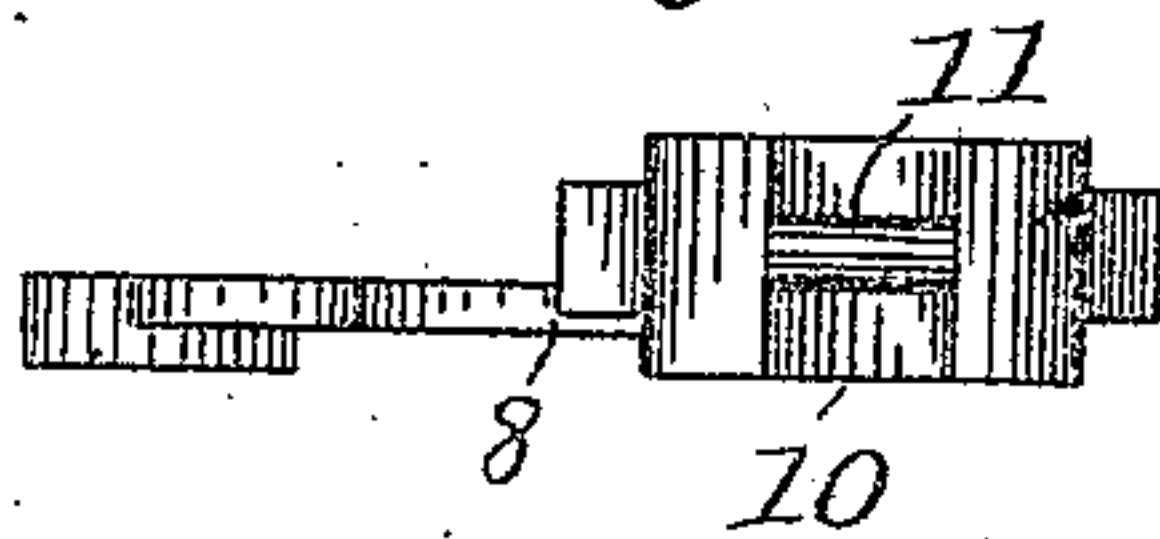


Fig. 6.



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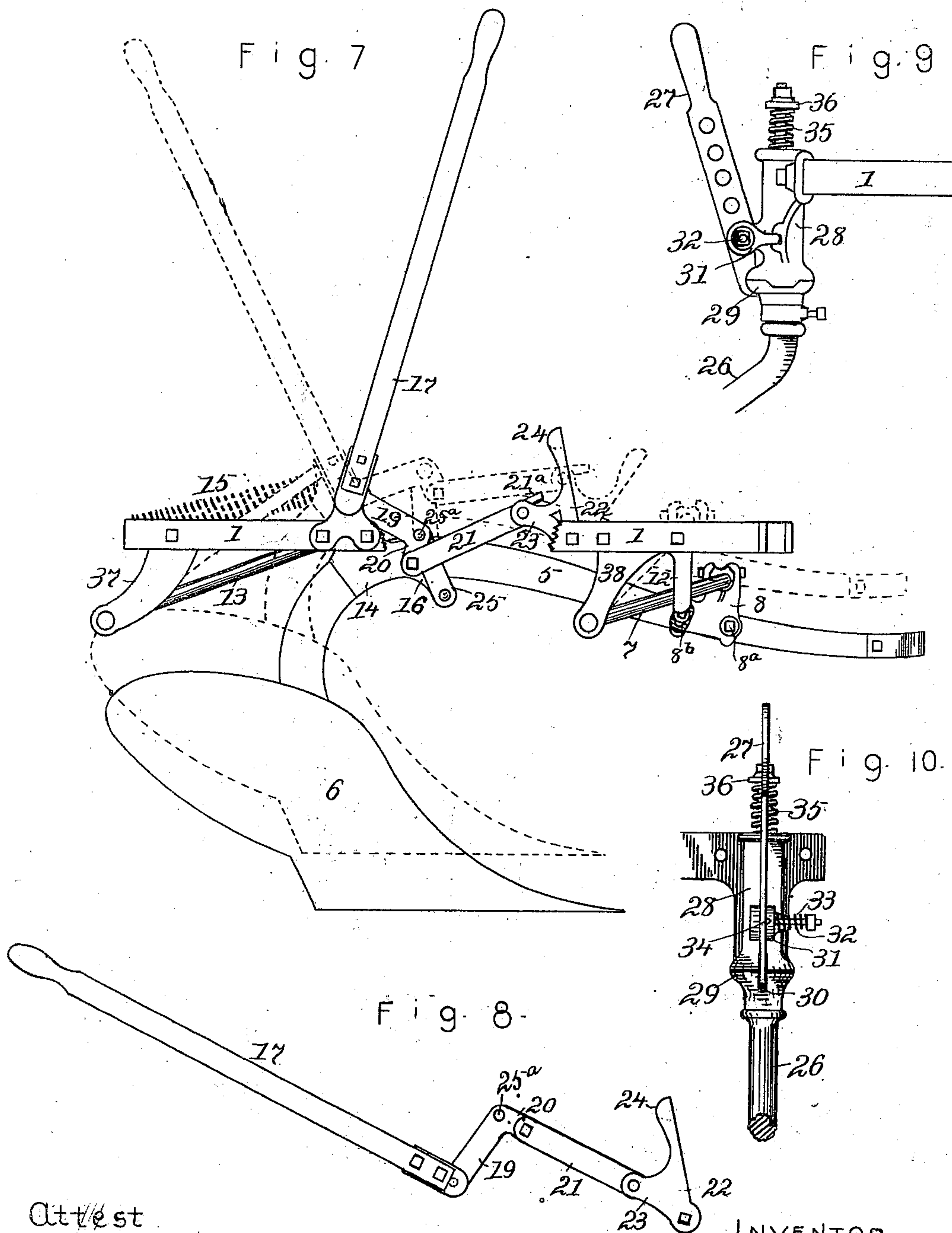
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UNITED STATES PATENT OFFICE.

EDWARD M. HEYLMAN, OF CANTON, ILLINOIS, ASSIGNOR TO THE PARLIN & ORENDORFF COMPANY, OF SAME PLACE.

RIDING-PLOW.

SPECIFICATION forming part of Letters Patent No. 617,338, dated January 10, 1899.

Application filed July 28, 1898. Serial No. 687,151. (No model.)

To all whom it may concern:

Be it known that I, EDWARD M. HEYLMAN, of Canton, in the county of Fulton and State of Illinois, have invented certain new and useful Improvements in Riding-Plows, of which the following is a specification.

The improvements are embodied in means for raising and lowering the plow in the carrying-frame, in means for adjusting the tongue-controlled wheel, in means for controlling the rear caster-wheel, in bearings for the bails on which the plow-beam is swung, and in means for regulating the pitch of the plow. It is exemplified in the structure hereinafter described and it is defined in the appended claims.

In the drawings forming part of this specification, Figure 1 is a plan of so much of a plow as is needed to describe my improvements. Fig. 2 is a side elevation of the structure shown in Fig. 1. Fig. 3 is a side elevation of the mechanism employed to raise and lower the tongue-controlled wheel. Fig. 4 is an elevation of the opposite side of the mechanism shown in Fig. 3. Fig. 5 is a side elevation of a bracket and boxing used to provide for varying the pitch of the plow and improving the connection between the plow-beam and the front bail. Fig. 6 is a plan of the bracket and boxing. Fig. 7 is a side elevation illustrative of the operation of the plow raising and lowering mechanism. Fig. 8 is a detail of the plow raising and lowering mechanism. Fig. 9 is a side elevation of the means used to control the rear caster-wheel. Fig. 10 is a rear elevation of the mechanism shown in Fig. 9.

In this instance the frame of the plow is made of a metal bar bent to form a rectangle, as shown at 1. A carrying-wheel 2 is connected with one side of the frame, near the center thereof, a tongue-controlled wheel 3 is connected with the front end of the frame on the side opposite wheel 2, and a caster-wheel 4 is connected with the rear end of the frame. Downward-extending brackets 38 are fastened to the front portion of the frame on opposite sides thereof, and an upward and forward extended bail 7 is pivoted at its ends in the brackets 38. Upward and forward extending bail 13 is pivoted at its ends in down-

ward-extending brackets 37, which are fastened to the rear end of the frame, and the beam 5 of the plow 6 is swung from the bails in a manner to be hereinafter set forth. The bails connect the plow-beam with the frame in a manner to permit rise and fall of the plow with relation to the frame, and the means by which the raising and lowering is effected constitutes one feature of the invention. To construct this feature, I provide a pivot-bearing, as 18, on a side of the frame and extend a pivot-pin through it. On one end of the pivot-pin I fix a handle 17. On the other end I fix a crank-arm 19, and I connect the crank-arm with a bracket 16 on the plow-beam by means of a downward-extending link 25. The crank-arm 19 extends upward and forward when the plow is raised, and it has an extension 20, turning downward and forward at an abrupt angle with the body of the arm. A bell-crank lever 22 is pivoted to the frame in front of the pivot of arm 19. One of its members, 23, extends rearward and its other member, 24, extends upward and is turned sidewise to form a foot-bearing. A link 21 connects member 23 of the bell-crank lever with extension 20 of the crank-arm in such manner that when the plow is raised the pivot of the bell-crank lever and the two connections of link 21 fall on a right line, or approximately so, and form a dead-center lock to hold the plow raised. When the plow is raised, the handle 17 extends backward, the crank-arm extends upward and forward, the member 23 of bell-crank lever 22 extends toward the swinging end of the crank-arm, and the foot-bearing member 24 of the bell-crank lever extends upward and rearward. This condition is illustrated in Figs. 2 and 8, and the result is that a dead-center lock is made by simply moving the parts into their shown positions and the plow is held raised without any manipulation beyond the act of raising and without any lock device apart from the raising mechanism. To lower the plow, the foot-lever 22 must be moved sufficiently to break the dead-center lock, which is done by pushing the foot-bearing forward and raising the pivot of the link with member 23 above the two other aligned pivots, after which the plow will fall of its own weight,

forcing the foot-lever to the position shown in dotted lines in Fig. 7 and then carrying it back to its original position, as shown in solid lines in the same figure. The arc described by the pivot of link 21 with member 20 of the crank-arm is half above and half below a right line drawn from the pivot of the crank-arm to the normal position of the pivot of the link with the foot-lever, and so the foot-lever is carried from its normal or rearward position as the crank-arm rises or falls and assumes the same position when the plow is entirely lowered that it maintains when it is entirely raised. At the half-throw of the crank-arm in either direction the foot-lever is carried back to the position shown in dotted lines in Fig. 7, and at the termination of a full throw up or down the foot-lever assumes the position shown in solid lines in Figs. 2, 7, and 8. This peculiarity of construction gives the foot-lever utility as a lifter, as well as a lock, and when the plow is to be raised the operator has a choice of modes of procedure. He may grasp lever 17 with his hand and draw it backward in the customary manner, he may use the hand-lever and the foot-lever conjointly, or he may give the foot-lever quick pressure and release and raise the plow without touching the hand-lever. The operation last described is made feasible by the introduction of a balancing-spring 15, which exerts upward stress on the plow to an extent to nearly equal the plow's weight, and so when upward motion is given to the plow by forward pressure on the foot-lever the momentum so developed, aided by the tension of the spring, carries the plow to its highest position, where it is automatically locked by the raising mechanism. It is to facilitate the plow-raising action of the foot-lever, while giving the link 25 sufficient rise, that the extension 20 of arm 19 is turned downward from the pivot 25^a of the link. This gives the link increased upward pull on the crank-arm in act of raising the plow, as it throws the pivot of the link, with the crank-arm, downward below the pivot of the crank-arm. It is desirable that the foot-lever shall have a stop to limit its forward throw, and such provision is made in this instance by extending a portion 21^a of link 21 beyond the pivot of the link with the foot-lever and forming a stop projection on the foot-lever in position to engage the extension when the plow is raised.

The plow is swung from the bails by means of brackets 8 and 14, which are preferably made each of two parts adapted to fit against opposite sides of the plow-beam, and the brackets have pivot-bearings particularly adapted to economize material and judiciously utilize the strength thereof. The details of the bearings are shown in Figs. 5 and 6. The lower half of the bearing is formed in the bracket, clamp extensions 8^c extend upward in front and behind the bearing and project toward each other at their upper ends,

a bearing-block is held between the extensions 8^c, forming the upper half of the bearing, and a bolt 11 binds the clamp extensions against the block and holds the block from lateral displacement. The internal surfaces of the projections 8^d of the clamp extensions form angles with the extensions approximating forty-five degrees, and the block has corresponding angles, so that when the extensions are clamped onto the block the block is forced downward by inclined-plane action in close contact with the lower half of the bearing and the bail therein. A pair of bearings having the described peculiarities is provided for each bail, and the results attained are that the bail may be readily detached from the brackets. The stress of the bail is on the bearing itself, and the securing-bolt is applied in a manner to accomplish the double effect of holding the block against lateral movement and clamping it against the other half of the bearing.

The downward swing of the front bail is limited by stop-arms 12, and the swing of the rear bail is controlled by the distance between its bearing on the beam and the bearing of the front bail. The greater the distance between the bearings of the bails the more nearly horizontal will be the swing of the rear bail and the smaller its rise and fall. This enables the extent of vertical swing of the plow and the pitch thereof to be modified slightly by shifting the bearings of the bails, and this is provided for by pivoting one of the brackets—in this instance the front one—so that its bearings may be swung backward or forward as occasion demands. The pivot is located at 8^a below the bearing, and a rearward extension has a slot 8^b concentric with the pivot-bolt. The surface adjacent to the slot is preferably corrugated or roughened, and a bolt extends through the slot and provides means for binding the rearward extension of the bracket firmly against the plow-beam. The pivot-bolt engages the plow-beam, and the bearing of the bracket may be thrown forward or backward to increase or diminish the vertical movement of the plow by loosening the bolts, swinging the bracket on the pivot-bolt, and retightening the bolts.

The tongue-controlled wheel 3 requires to be raised and lowered with relation to the plow-frame in order to meet differing conditions, and one feature of my invention is designed to provide simplified means for accomplishing this result, as follows: A vertical sleeve 40 is fixed in a lateral extension 1^a of the plow-frame, and it is provided with a rearward-extending arc-formed rack 41. The vertical portion of shaft 39 of wheel 3 extends through the sleeve and journals therein. A cap 44 is fixed onto the upper end of the shaft and provided with a laterally-extending shaft. A bracket 46 is journaled on shaft 45, and the tongue 47 is fastened to the bracket. Immediately below cap 44 a

collar 42 is mounted loosely on shaft 39, and below the loose collar is a fixed collar 43, which joins with the cap in holding the loose collar against motion lengthwise of the shaft.

5 A lever 48 is fulcrumed below the frame at 49 on sleeve 40 and extended obliquely rearward to the part of the plow on which the driver sits. The lever is deflected downward near its fulcrum, as shown at 48^a in Fig. 4,
10 and from the lowest portion of the bend a rod 54 extends upward and engages collar 42. A casting 50 on lever 48 forms a housing for a lock-bolt 51, which engages the toothed rack 41, and the housing is so constructed
15 that the bolt moves toward and from the fulcrum of the lever in engaging and disengaging the teeth. The bolt is spring-actuated in one direction, and a grip-lever 53 and connecting-rod 52 provide means for moving
20 the bolt in the contrary direction. The downward deflection of the lever enables the connection of rod 54 with the lever to swing equal distances above and below a line drawn from the fulcrum at right angles with the
25 sleeve, thus economizing the force applied to raising or lowering the wheel, and it also provides clearance to avoid the frame extension, as shown in Fig. 4. The peculiar construction of the housing 50 with relation
30 to the deflected lever gives the lock-bolt proper mechanical action, and the result of the entire contrivance is to provide for raising and lowering the wheel by direct action of a single lever. The driver sitting in
35 position may grasp the lever 48 and carry it from its lowest position (shown in Fig. 3) to its highest position (shown in Fig. 4) without any inconvenience, and the wheel will be correspondingly shifted by force applied to
40 the collar 42 through rod 54.

The rear-caster-wheel should be held against ordinary side pressure, so that it will properly track the furrow and control the plow while plowing. It should yield to severe side
45 pressure in turning around, and provision should be made to hold it entirely rigid in backing and possibly in other unusual circumstances. To provide for these different requirements, I extend the vertical portion of
50 shaft 26 of the caster-wheel through and above the bearing-sleeve 28, which is fixed to the plow-frame, put a nut 36 on the upper end of the shaft, and place a spring 35 between the nut and the upper end of the
55 sleeve. On the lower end of the sleeve I form a downward extension having beveled edges and on the shaft immediately below the sleeve I fix a collar 29, which has a recess to fit the extension on the sleeve when the
60 wheel is in operative position.

On a lug extending rearward from the sleeve I pivot a lock-lever 27, and in the rear side of collar 29 I form a square notch 30 in Fig. 10, in which the lower end of the lever 27 may
65 rest. The pivot-bolt 32 of lever 27 extends beyond the lever on one side. A stop-collar

31 is placed on the bolt and against the lever, and a spring 33 is made to press the collar against the lever and hold it in any position in which it may be swung. To aid the
70 spring, the collar has a recess or recesses to receive a beveled rib 34 on the lever.

The spring 35 tends to hold the inclined extension of the sleeve in the recess of collar 29, thereby keeping the wheel yielding in
75 operative position, and when it is desired to make the wheel unyielding in its operative position the lever on the sleeve is made to engage the notch in collar 29. When the lever 27 is swung out of contact with collar 29,
80 the caster-wheel shaft may swing under extreme stress, and in whatever position the lever is placed the spring 33 and the collar 31 will hold it against unintended motion.

What I claim is—

1. In a plow, the combination of a wheel-carried frame, a plow-beam therein, a crank-arm pivoted on the frame and connected with the plow, a bell-crank lever pivoted to the frame in front of the crank-arm with one
90 member extending rearward and the other member extending upward, and a link connecting the rearward-extending member of the bell-crank lever with the swinging end of the crank-arm and forming with such member
95 a dead-center lock for the crank-arm when the plow is raised.

2. In a plow, the combination of a wheel-carried frame, a plow-beam swung on bails in the frame, a crank-arm pivoted on the
100 frame and connected with the plow-beam, a hand-lever fastened to the crank-arm, a bell-crank lever pivoted to the frame in front of the crank-arm with one member extending rearward and the other member extending
105 upward, and a link connecting the rearward-extending member of the bell-crank lever with the swinging end of the crank-arm and forming with such member a dead-center lock for the crank-arm when the plow is raised. 110

3. In a plow, the combination of a wheel-carried frame, a plow-beam therein, a bell-crank lever pivoted to the frame with one member extended rearward and the other member extended upward, a crank-arm pivoted on the frame in the rear of the bell-crank lever and swinging approximately equal distances above and below the rear end of the rearward-extended member, a connection between the crank-arm and the plow-beam and
120 a link between the swinging end of the crank-arm and the rearward-extended member of the bell-crank lever whereby the bell-crank lever rocks forward and back as the plow is raised or lowered, substantially as set forth. 125

4. In a plow, the combination of a wheel-carried frame, a plow therein, a spring exerting tension against downward motion of the plow, a crank-arm connected with the plow-beam, a bell-crank foot-lever and a link connecting the foot-lever with the crank-arm,
130 substantially as described, whereby pressure

applied to the foot-lever will raise the plow, the plow in rising will rock the bell-crank lever forward and back and the bell-crank lever will form a dead-center lock to hold the plow raised.

5 5. In a plow, the combination of a wheel-carried frame, a plow therein, a forward-projected crank-arm pivoted on the frame and having a downward extension, a bell-crank
10 lever pivoted on the frame in front of the crank-arm, a link connecting the bell-crank lever with the downward extension of the crank-arm and a link connecting the plow
15 with the crank-arm at the highest point thereof, substantially as set forth.

6. The combination in a plow in which the beam is swung on a bail or bails, of a bracket fastened to the plow-beam and forming the
20 lower half of the bail-bearing, upward extensions of the bracket on opposite sides of the bail, such extensions being inclined toward each other at their terminations, a block
25 filling the space between the extensions and forming the upper half of the bail-bearing and a bolt clamping the extensions against the block and holding the block against lateral displacement.

7. In a plow the beam of which is swung on bails, a bracket having a pivot-hole, a lateral
30 extension slotted concentric with the pivot-hole, and an upward-extended bearing for a bail, together with bolts extending through the hole and the slot, respectively and bind-

ing the bracket to the plow-beam, substantially as set forth.

8. In a plow, the combination of a frame a
35 vertical sleeve fixed in the frame at the front end thereof, an arc-formed rack on the rear surface of the sleeve, a wheel-shaft the vertical portion of which extends through the
40 sleeve, a downward-curved lever pivoted on the sleeve below the frame and extended rearward therefrom, a link connecting the downward-deflected portion of the lever with
45 the shaft above the sleeve and a bolt on the lever having motion toward and from the pivot of the lever and adapted to engage the rack.

9. In a plow, the combination of vertical
50 sleeve 28 fixed on the rear end of the plow-frame, shaft 26 extending through and above the sleeve, spring 35 exerting upward stress on the shaft, the beveled downward extensions on lower end of the sleeve collar 29
55 having recesses adapted to receive the extensions of the sleeve and also having the notch 30 and the lever 27 pivoted on the sleeve and adapted to engage notch 30 of the collar, substantially as set forth.

In testimony whereof I sign my name in
60 the presence of two subscribing witnesses.

EDWARD M. HEYLMAN.

Witnesses:

J. S. TENDICK,

U. G. ORENDORFF.