

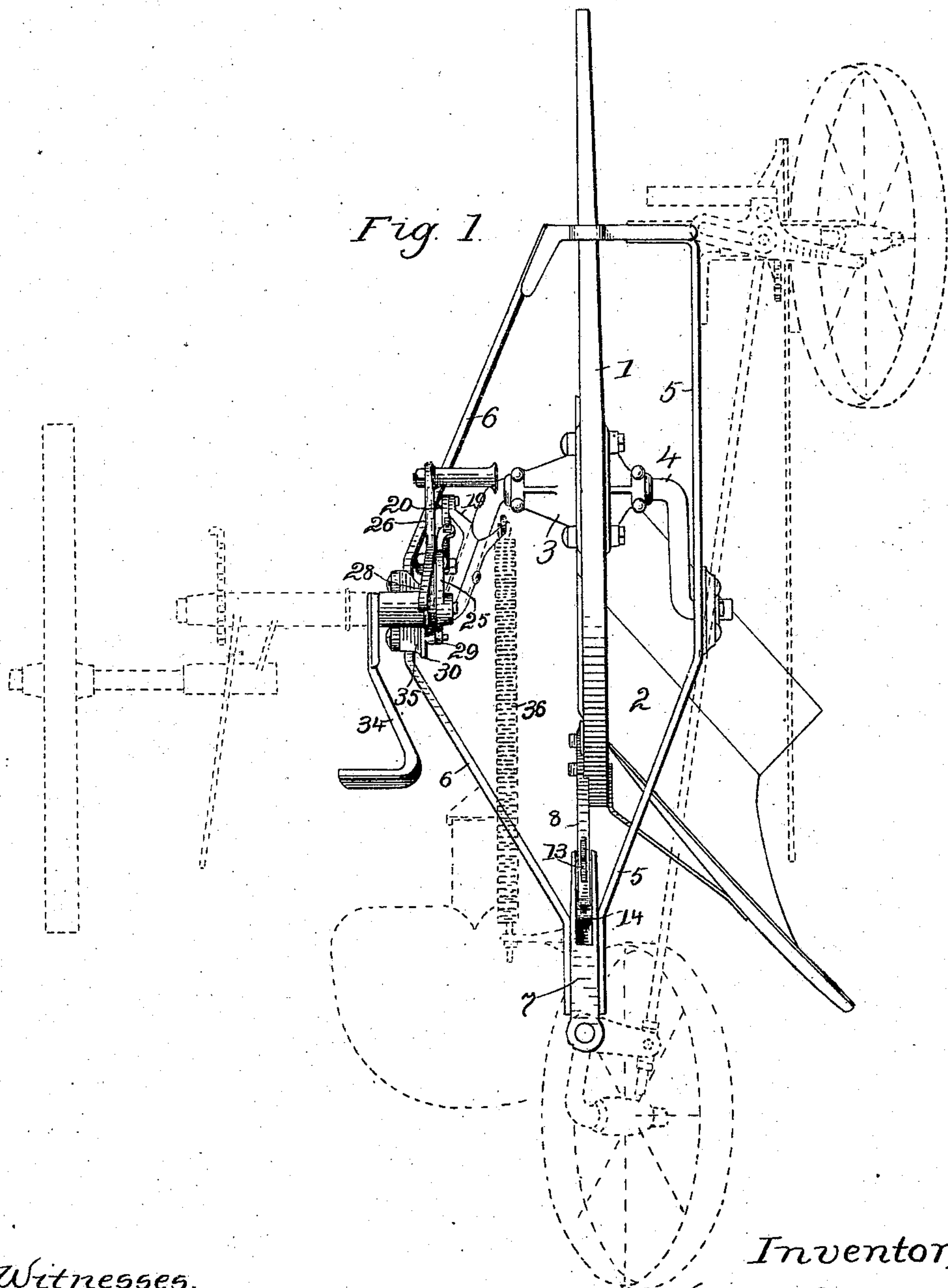
No. 854,821.

PATENTED MAY 28, 1907.

W. S. GRAHAM.
SULKY PLOW.

APPLICATION FILED JUNE 19, 1906.

6 SHEETS—SHEET 1.



Witnesses.

W. S. Graham
W. S. Scherer

Inventor,
William S. Graham.
by *L. P. Graham*
his attorney.

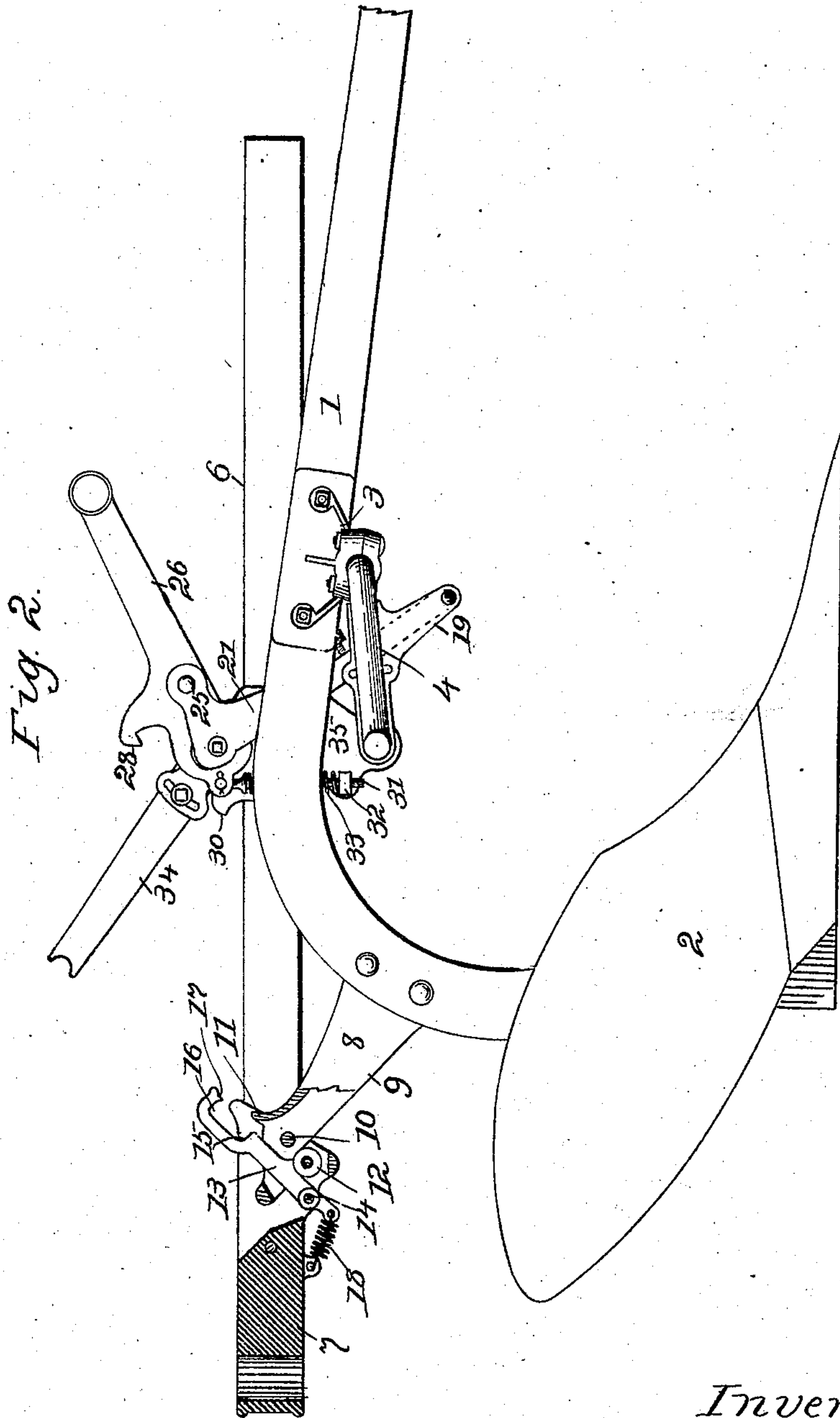
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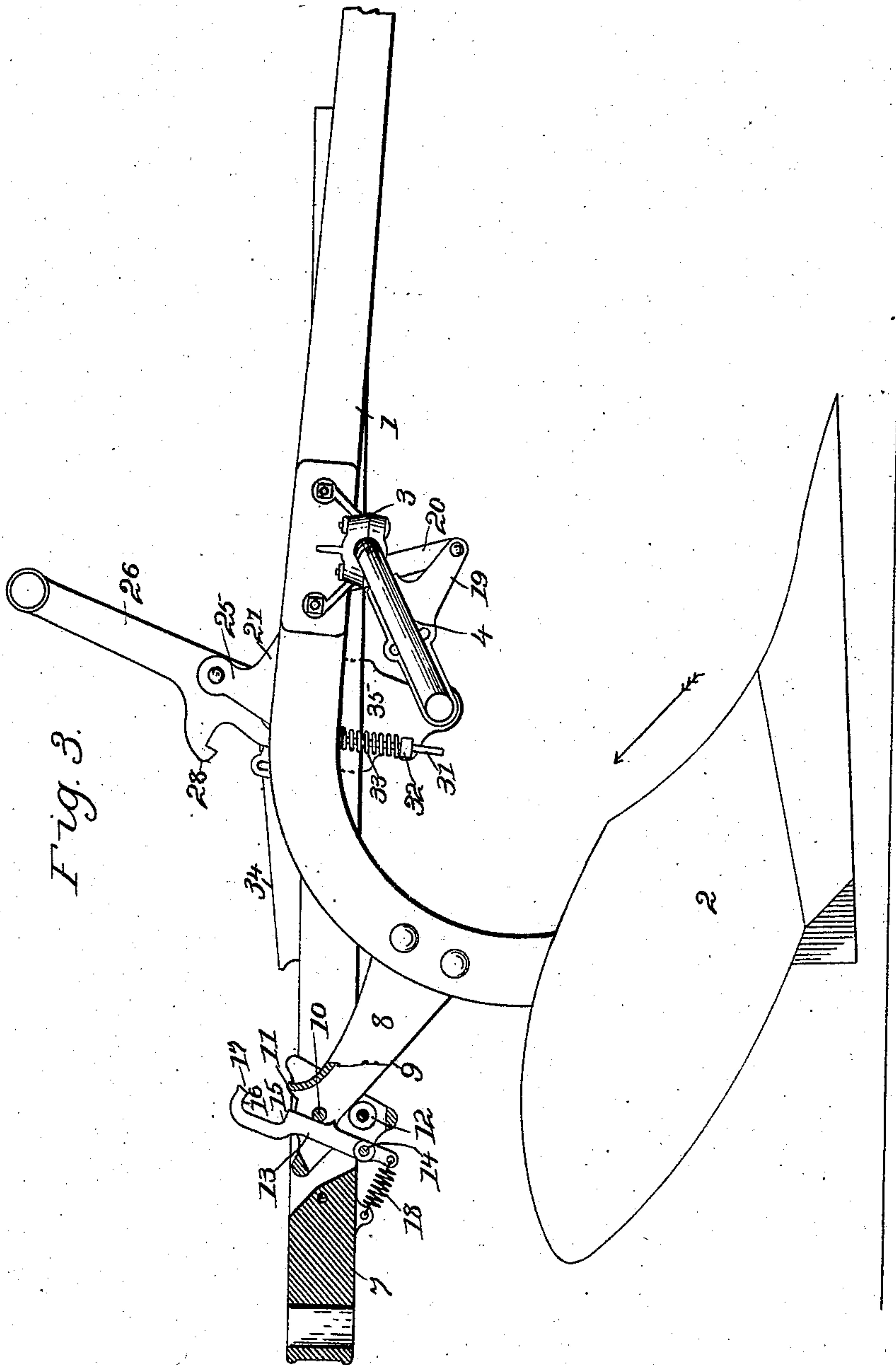
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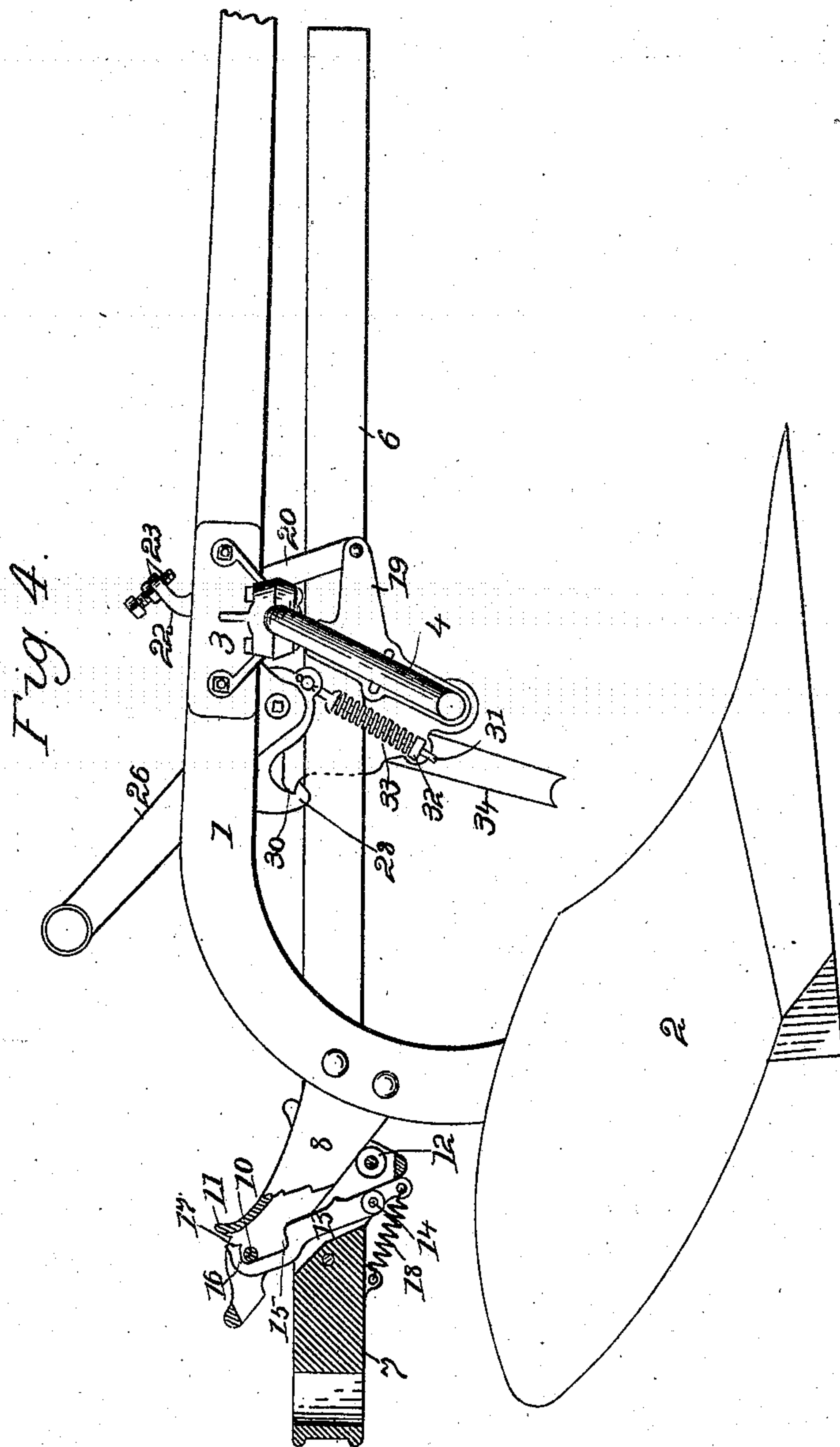
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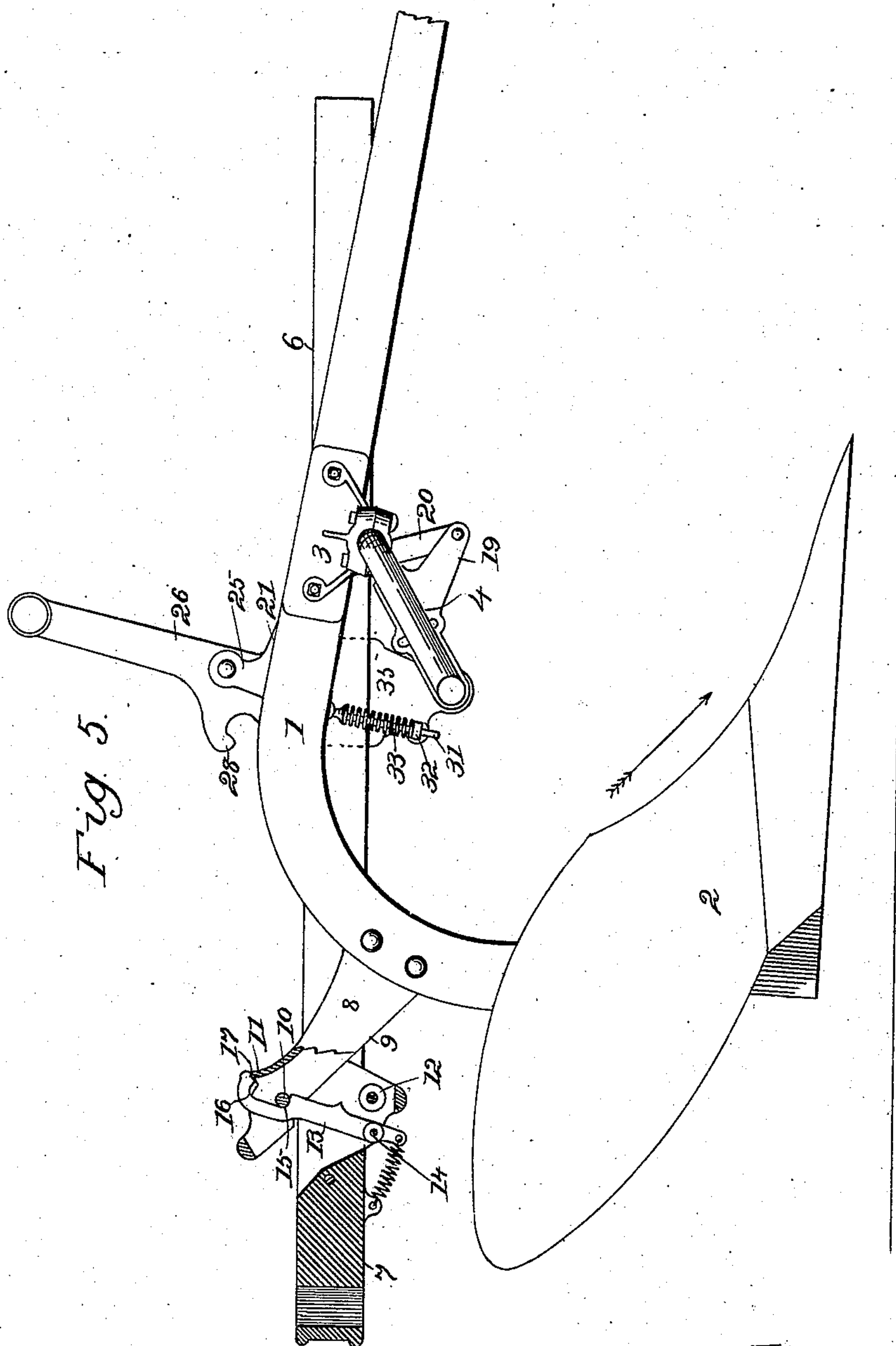
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6 SHEETS—SHEET 5.



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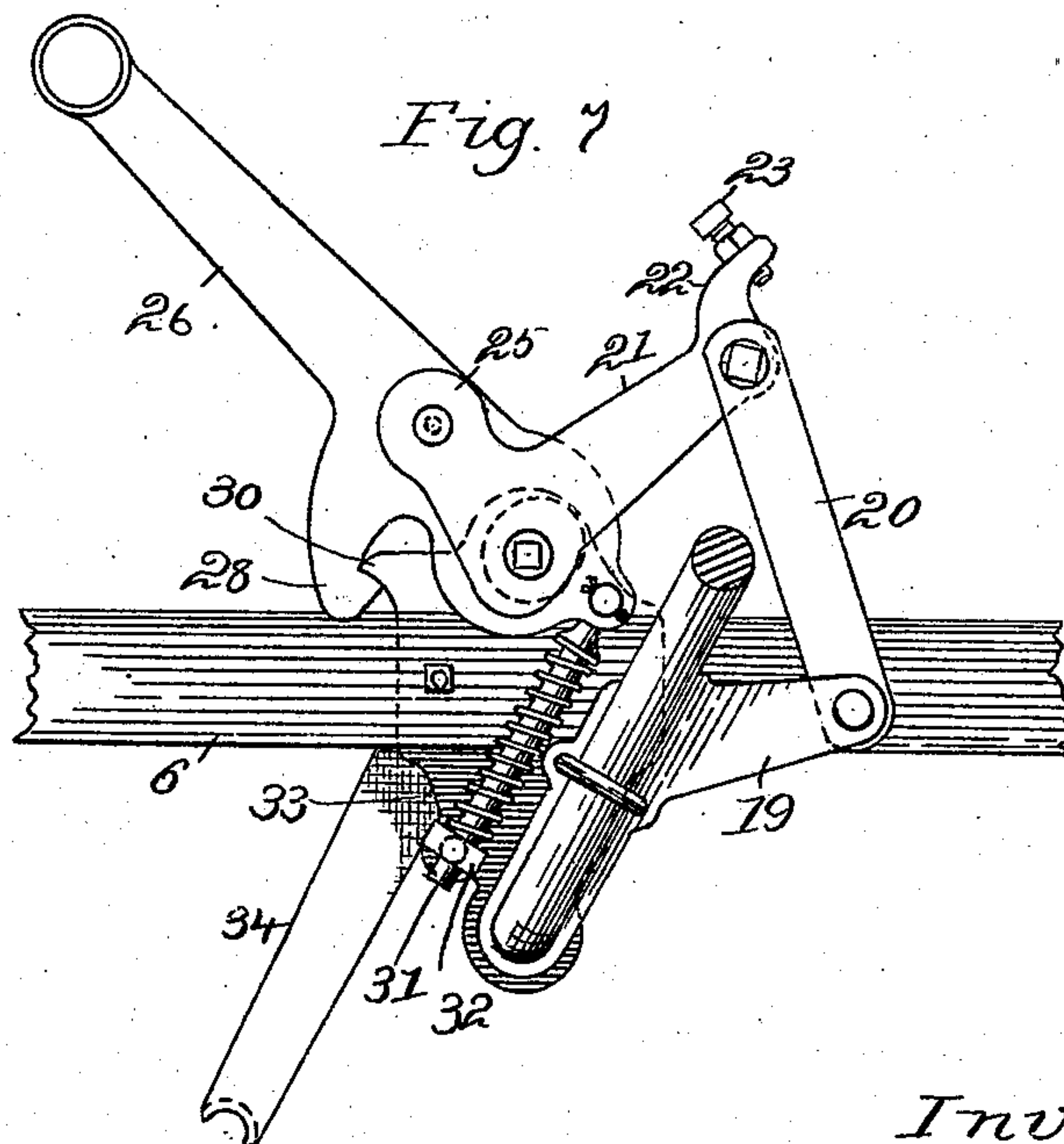
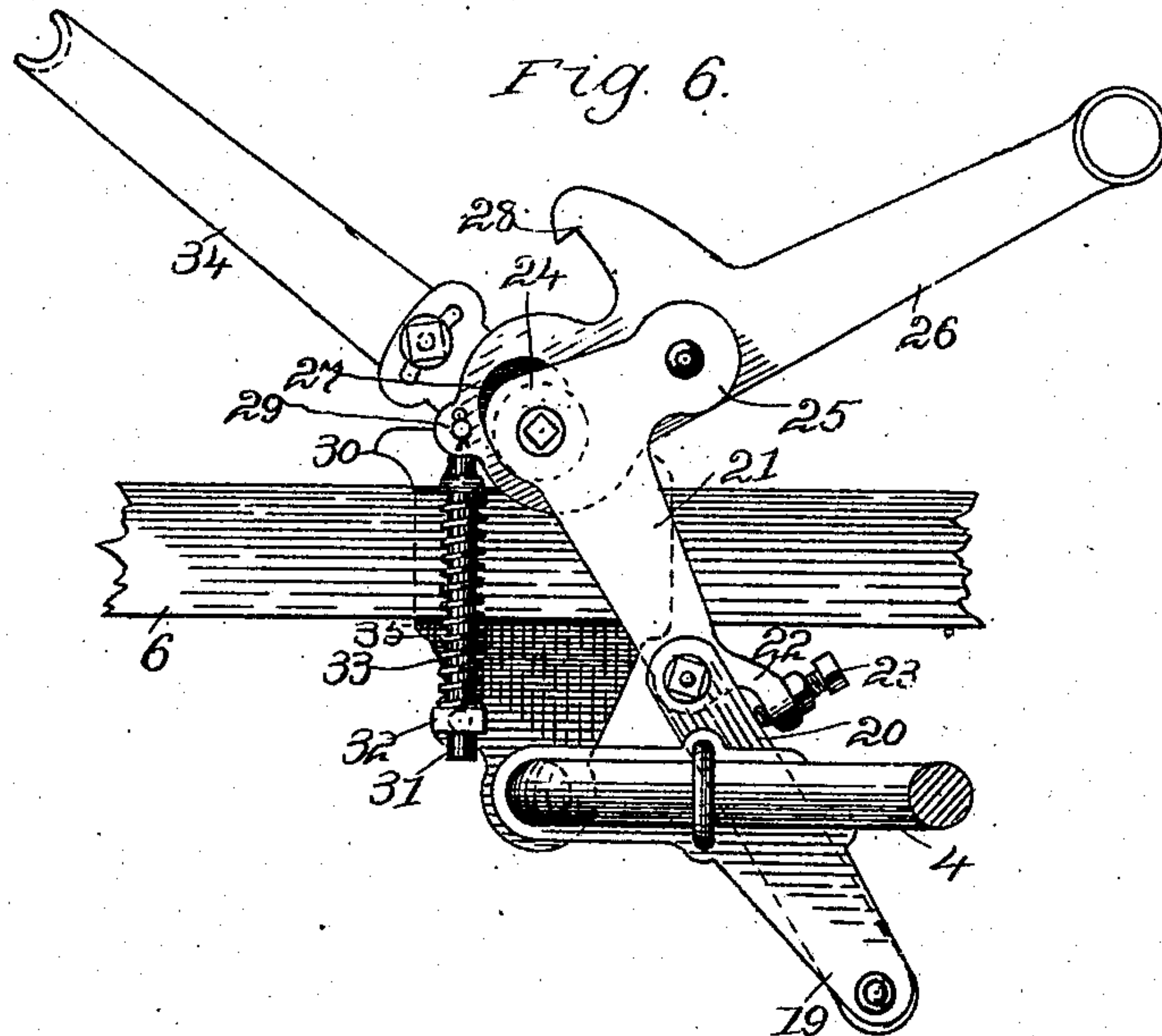
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6 SHEETS—SHEET 6.



Witnesses.
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Jvy Scherer

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his attorney

UNITED STATES PATENT OFFICE.

WILLIAM S. GRAHAM, OF CANTON, ILLINOIS.

SULKY-PLOW.

No. 854,821.

Specification of Letters Patent.

Patented May 28, 1907.

Application filed June 19, 1906. Serial No. 322,489.

To all whom it may concern:

Be it known that I, WILLIAM S. GRAHAM, a resident of the city of Canton, county of Fulton, and State of Illinois, have invented certain new and useful Improvements in Sulky-Plows, of which the following is a specification.

The principal object of this invention is to provide improved and simplified means for tilting the plow beam in raising and lowering so that the point will incline upward as the plow is raised and downward as it is lowered; and a secondary object is to improve the beam-lifting, lowering and locking mechanism.

In the drawings forming part of this specification Figure 1 is a plan of a plow embodying my improvements, the elements not intimately connected with the invention being shown in broken lines. Figs. 2, 3, 4 and 5 are diagrams in elevation, showing parts in section and illustrating the rising and lowering movements of the plow. Figs. 6 and 7 are details in elevation of the means employed to raise and lower the plow, Fig. 6 showing the parts in a plow-depressing position and Fig. 7 showing the parts in the position they occupy when the plow is raised.

The plow 2 is secured to a suitable beam 1, and a bearing bracket 3 on the plow beam is journaled on the swinging bail 4. Bars 5 and 6 constitute the principal parts of the plow frame and the pivot ends of the bail 4 are journaled in brackets attached to the said bars. The rear ends of the frame bars approach each other somewhat closely and extend parallel with each other for a short distance, and a casting 7 is secured between the parallel extensions of the bars. The front end of the casting 7 is slotted to receive a fixed extension 8 of the plow beam and a roller 12, journaled in the slot of the casting, provides a bearing for the under surface 9 of the beam extension. A tilt-dog 13 is pivoted at 14 in the slot of casting 7, behind roller 12 and it has an elongated notch in the front part of its swinging end which forms the rest-shoulder 15 and the hook extension 16. A spring 18 acts on a downward extension of the tilt-dog to hold the upper end of the dog swung forward. The beam extension 8 is slotted vertically in its rear end to admit the tilt-dog 13, a pin 10 traverses the slot of the beam extension in position to engage the rest-shoulder 15 of the hook 16 of the tilt-dog when the conditions are as shown in Fig. 5.

An arm 19 is attached to the bail 4 and a toggle joint consisting of members 20 and 21 connects with the extended end of arm 19. The toggle member 21 is journaled in the pivot bearing 24, shown by a broken line in Figs. 6 and 7, and said pivot bearing is formed in the bracket 35, which is attached to frame bar 6. An extension 22 of toggle member 21 extends over toggle member 20 and a set screw 23 in extension 22 acts as a stop for the toggle when the members are in line, or approximately so, as shown in Fig. 6. A foot lever 26 is pivoted on an extension 25 of toggle member 21 and a slot 27 through the inner end of the lever 26 fits loosely over the pivot of arm 21. A catch 28 projects from the foot lever 26 in position to engage a stop 30 on bracket 35 when the plow is raised; see Figs. 4 and 7. A swivel post 32 projects laterally from bracket 35, below bar 6, a rod 31 extends through the swivel post and connects pivotally at its upper end with a lug 29 on the slotted end of the foot lever 26 and a spring 33 is placed on the rod between the swivel post and a shoulder on the upper end of the rod.

An auxiliary foot lever 34 is rigid with toggle joint member 21 and a spring 36, shown in broken lines in Fig. 1, is used to more or less completely balance the weight of the plow.

When the plow is in operation the conditions are as shown in Fig. 2, or approximately so. In raising the plow, the bail 4 is swung upward, as shown in Fig. 3 lifting the front part of the beam almost directly upward, during the earlier part of the movement, and forcing the extension 8 to ride a slight distance upward and backward on roller 12. This lift of the front part of the beam, while the rear part is comparatively stationary, gives the plow the inclination shown in Fig. 3 and causes it to run readily out of the ground. After the plow has reached the position shown in Fig. 3, farther upward swing of the bail will carry the plow rearward sufficiently to run the extension 8 up the roller fast enough to raise the rear part of the beam approximately as fast as the bail raises the front part, and when the plow is entirely raised the conditions are about as shown in Fig. 4.

As the inclined under surface of the beam extension rides upward and rearward on roller 12, the pin 10 forces the tilt-dog backward, against the action of spring 18, and

when the plow is raised the dog is inclined backward and the pin 10 of the beam extension rests in the elongated notch, all as shown in Fig. 4. As the plow is lowered, the
 5 pin 10 catches on the shoulder 15 of the dog and, resting thereon, is carried forward with the swing of the dog while the bail is lowering the front part of the beam. This gives the
 10 point of the plow a downward inclination, as shown in Fig. 5, and causes the plow to readily enter the ground.

When the plow reaches the position shown in Fig. 5, or thereabout, the end 17 of the hook 16 of the dog, engages the stop-lip 11 of
 15 the beam extension and farther downward motion of the plow carries the pin 10 gradually off the shoulder 15, permitting the rear end of the beam to drop to the position shown in Fig. 2, as the bail completes its downward
 20 swing. The stop lip 17 is farther from the pivot of the tilt dog than is the pin 10 and so the circumferential motion of the swinging end of the dog is delayed, as compared with the motion of the pin, and the pin eventually
 25 rides off the rest shoulder 15.

Apart from forming the stop extension 17 as above described, the hook 16 of the tilt-dog 13 is useful in preventing an excessive upward movement of the rear end of the
 30 frame when, in operation or on exhibition, an unusual weight or force happens to be applied to the front end of the frame tending to force it downward. This is effected by the engagement of the pin 10 with the upper portion of the hook 16, permitting the rear end
 35 of the plow itself to rise a certain distance but holding it against further upward movement when downward pressure happens to be applied to the front end of the plow beam.

When the plow beam is lowered the toggle joint should form a dead center lock, or a close approach to one, so as to hold the plow in the ground. The weight of the plow is partly sustained by the toggle, the pull
 40 lengthwise of the toggle prevents the maintenance in the toggle of an angle beyond a dead center and the jar and wobble of the plow tends to disarrange the lock of the toggle joint; permitting the plow to rise. I
 45 counteract this tendency, and provide a spring-actuated catch to hold the plow raised, by means of the details of construction, set forth more particularly in Figs. 6 and 7.

The foot lever 26 is pivotally connected
 55 with the extension 25 of member 21 of the toggle joint and its slotted end fits over the pivot 24 of said toggle-joint member. While the plow is in the ground the spring 33 presses upward against lug 29 of the foot lever, pressing the lower wall of the slot 27
 60 against the pivot of the toggle joint member and exerting through extension 25 and member 21 a yielding pressure sufficient to hold the toggle members in alinement and thereby
 65 maintain a lock to hold the plow in the

ground. As the plow beam is raised the lug 29 swings between the swivel post 32 and the pivot 24 of the toggle joint, and the spring swings the foot lever until the opposite side of slot 27 comes in contact with the pivot 24.
 70 When the plow is almost raised the catch 28 of foot lever 26 encounters stop 30 of bracket 35, the spring 33 yields to permit the catch to ride over the stop and as the raising of the plow is completed the catch engages the stop
 75 and the spring maintains the engagement.

In lowering the plow, initial pressure on the foot lever 26, exerted while lever 34 is held against motion, overcomes the tension of the spring and disengages the catch 28
 80 from stop 30. Subsequently the two foot levers move together to effect the lowering of the plow.

The roller 12 is employed for the reason that rolling friction is ordinarily lighter than sliding friction, but it is not indispensable to the operation of the plow-tilting mechanism.

What I claim as new and desire to secure by Letters Patent is,—

1. In a plow, the combination with a carrying frame, a plow beam and a plow attached to the beam; of a crank-lift for the beam, extending forward when the plow is lowered, a stiff rearward and upward extension of the beam resting on a fixed bearing in the frame
 90 while the plow is in operation and while it is rising, and means for holding the beam extension raised during a part of the plow-lowering action of the crank-lift, substantially as described.
 100

2. In a plow, the combination with a carrying frame a plow beam and a plow attached to the beam; of a crank-lift for the beam extending approximately horizontally forward when the plow is lowered, a stiff
 105 rearward and upward extension of the beam resting on a fixed bearing in the frame while the plow is in operation and while it is rising and a rocking support adapted to carry the beam extension forward and hold it raised
 110 during a part of the plow-lowering action of the crank-lift.

3. In a plow, the combination with a carrying frame a plow beam and a plow attached to the beam; of a crank-lift for the beam extending approximately horizontally forward when the plow is lowered, a stiff
 115 rearward and upward extension of the beam resting on a fixed bearing in the frame while the plow is in operation and while it is rising
 120 and an upward-extended rock arm adapted to catch the beam extension and carry it forward as the crank-lift lowers the plow toward an operative position.

4. In a plow, the combination with a carrying frame, a plow beam and a plow attached to the beam; of a crank-lift for the plow beam, a stiff rearward and upward extension of the beam normally resting on a
 125 fixed bearing in the frame, a pin in the rear
 130

part of the beam extension and an upward-extended rock arm pivoted in the frame and having a notch in its front edge to engage the pin of the beam extension, substantially as described.

5. In a plow, the combination with a carrying frame, a plow beam and a plow attached to the beam; of a crank-lift for the plow beam, a stiff rearward and upward extension of the beam normally resting on a fixed bearing in the frame, a pin in the rear part of the beam extension, an upward-extended rock arm pivoted in the frame and having a notch in its front edge adapted to engage the pin of the beam extension when the plow is raised, and a spring pressing the upper end of the rock arm forward, substantially as described.

6. In a plow, the combination with a carrying frame, a plow beam and a plow attached to the beam; of a crank-lift for the plow beam, a stiff upward and rearward extension of the beam normally resting on a fixed bearing in the frame, a pin in the rear part of the beam extension, an upward-extended rock arm pivoted in the frame and having a notch in its front edge to engage the pin of the beam extension when the plow is raised, a spring pressing the rock arm toward the pin of the beam extension and a stop to disengage the arm from the pin as the plow approaches its lowest position, substantially as described.

7. In a plow, the combination with a carrying frame, a plow beam and a plow attached to the beam; of a swinging lift for the front part of the plow beam, an incline to raise the rear part of the beam, and a rocking catch to hold the rear part of the beam raised during part of the lowering motion of the front part of the beam substantially as described.

8. In a plow, the combination with a carrying frame, a plow, a plow beam and a beam-

lifting bail; of an arm attached to the bail, a toggle joint journaled at one end on the frame and connected at the other end with the arm of the bail, a depressing lever pivotally connected with an extension of the journaled member of the toggle joint and having a limited amount of swing thereon, and a spring connecting with the depressing lever and pressing lengthwise thereof when the lever is approximately half way between its extreme positions, substantially as described.

9. In a plow, the combination with a carrying frame, a plow, a plow beam and a beam-lifting bail; a toggle joint journaled at one end on the frame and connected at the other end with the bail arm, a depressing lever pivotally connected with an extension of the journaled member of the toggle joint and having a limited amount of swing thereon, a spring connecting with the depressing lever and pressing lengthwise thereof when the lever is about midway between extremes of travel, and a catch on the lift lever adapted to engage a stop on the frame when the bail is raised, substantially as described.

10. In a plow, the combination with a carrying frame, a plow, a plow beam and a beam-lifting bail; of a lift lever rigid with the journaled end of the toggle joint, a depressing lever pivotally connected with an extension of the journaled end of the toggle joint and having a limited amount of swing thereon, a spring connecting with the depressing lever and pressing lengthwise thereof when the said lever is about midway between extremes of travel, and a catch on said depressing lever adapted to engage a stop on the frame when the bail is raised, substantially as described.

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

WILLIAM S. GRAHAM.

Witnesses:

C. H. WASON,
H. E. MAU.