

No. 615,310.

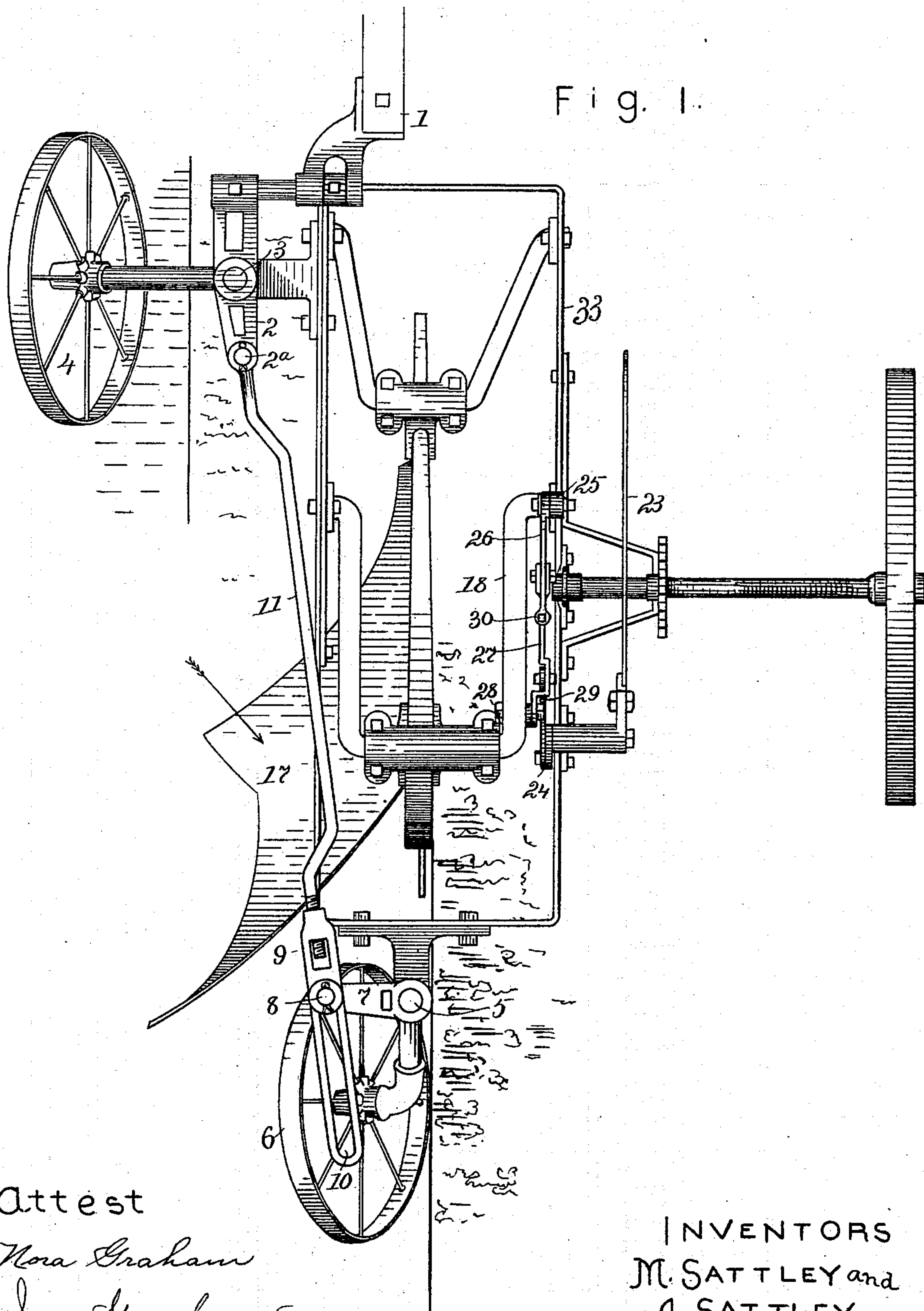
Patented Dec. 6, 1898.

M. & A. SATTLEY.
WHEEL PLOW.

(Application filed June 4, 1898.)

(No Model.)

4 Sheets—Sheet 1.



Attest

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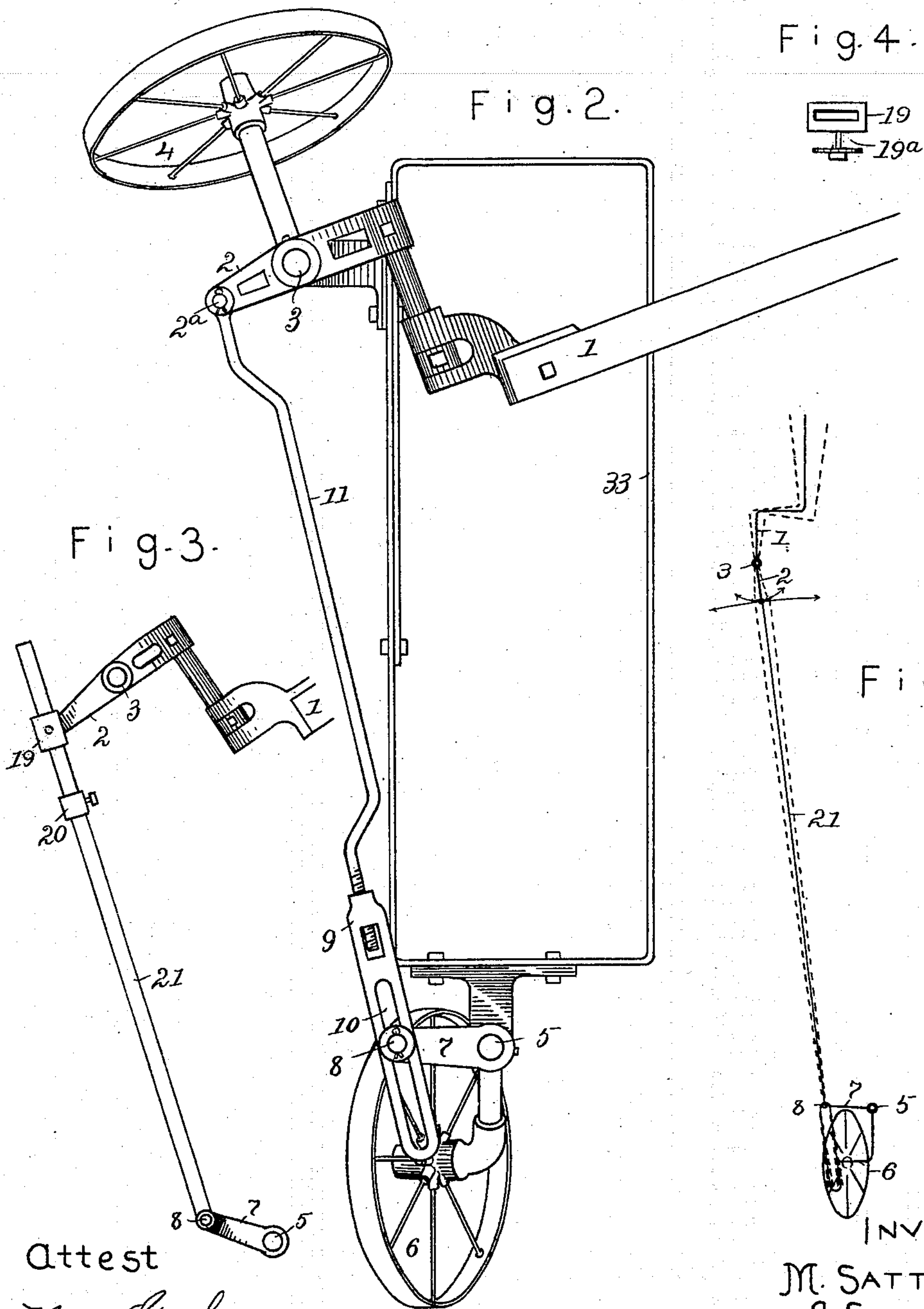
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Fig. 6.

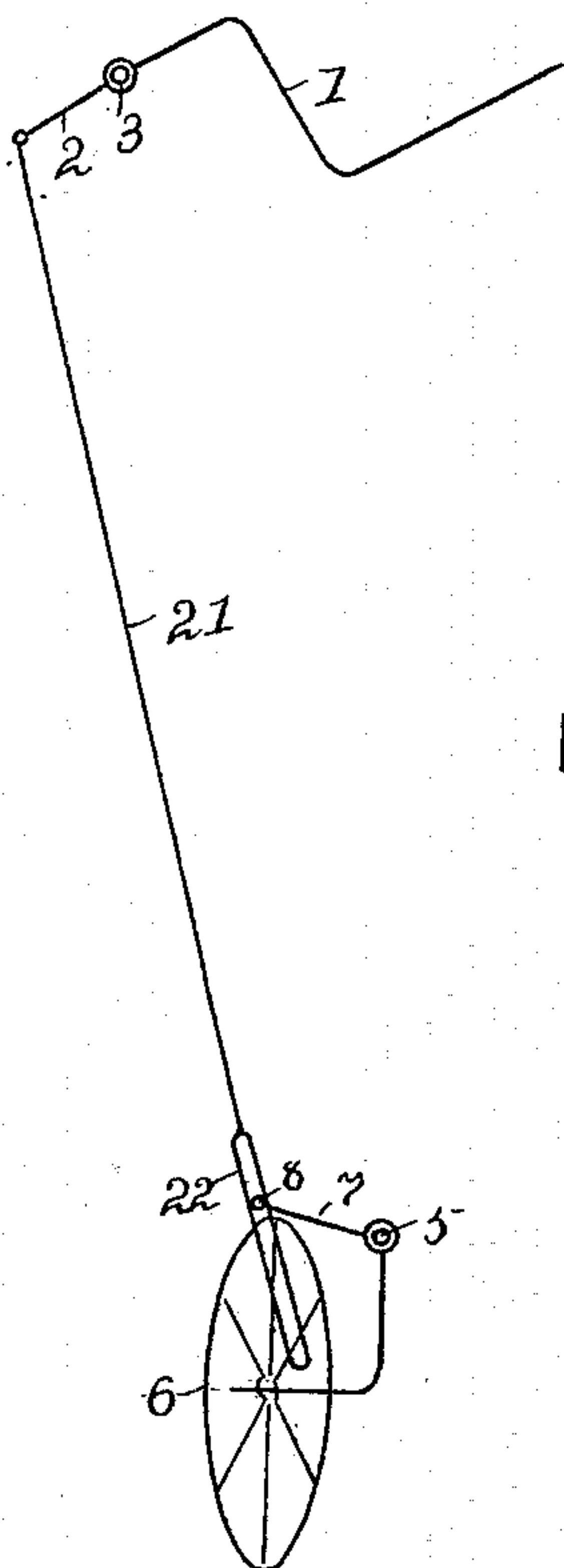


Fig. 8.

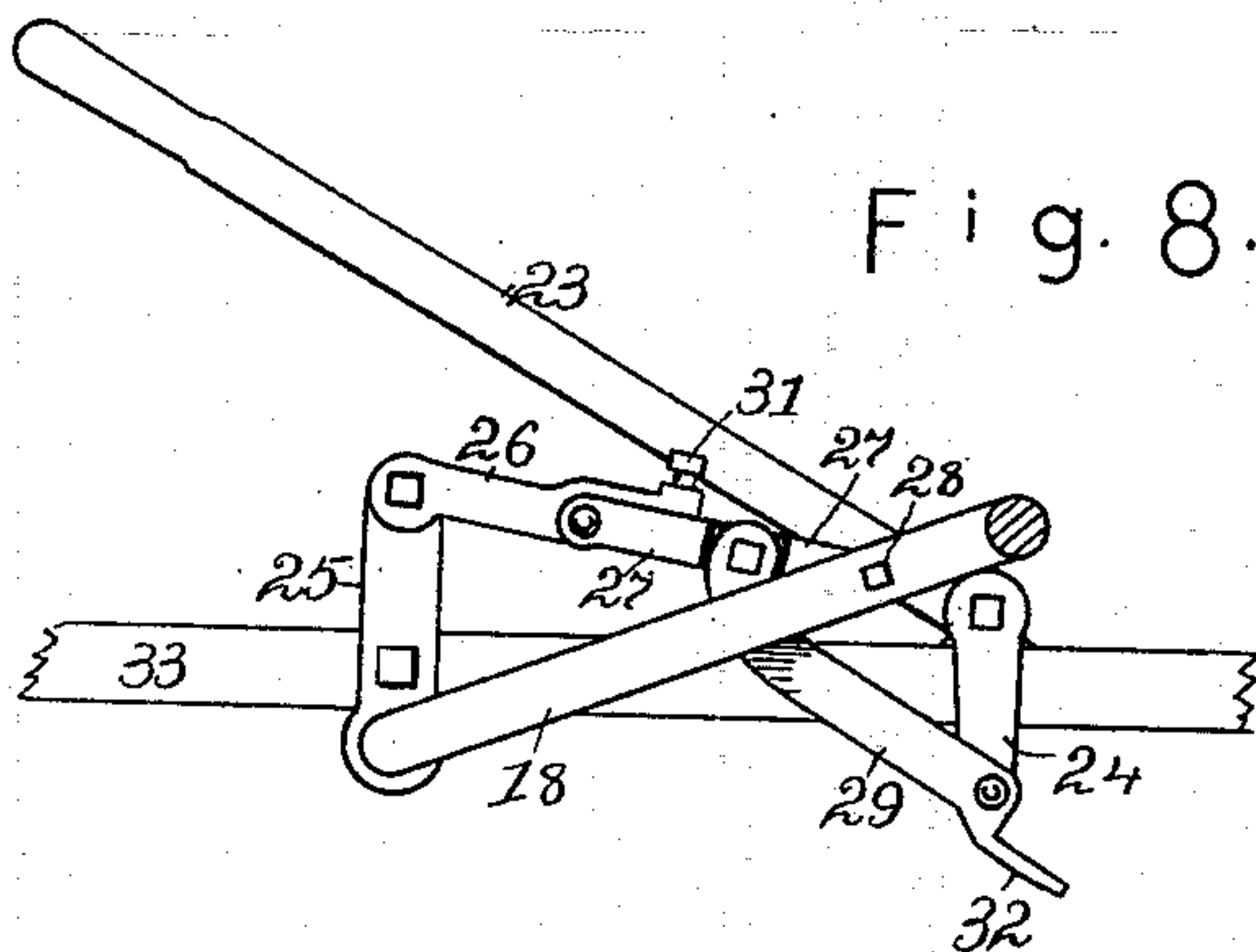


Fig. 7.

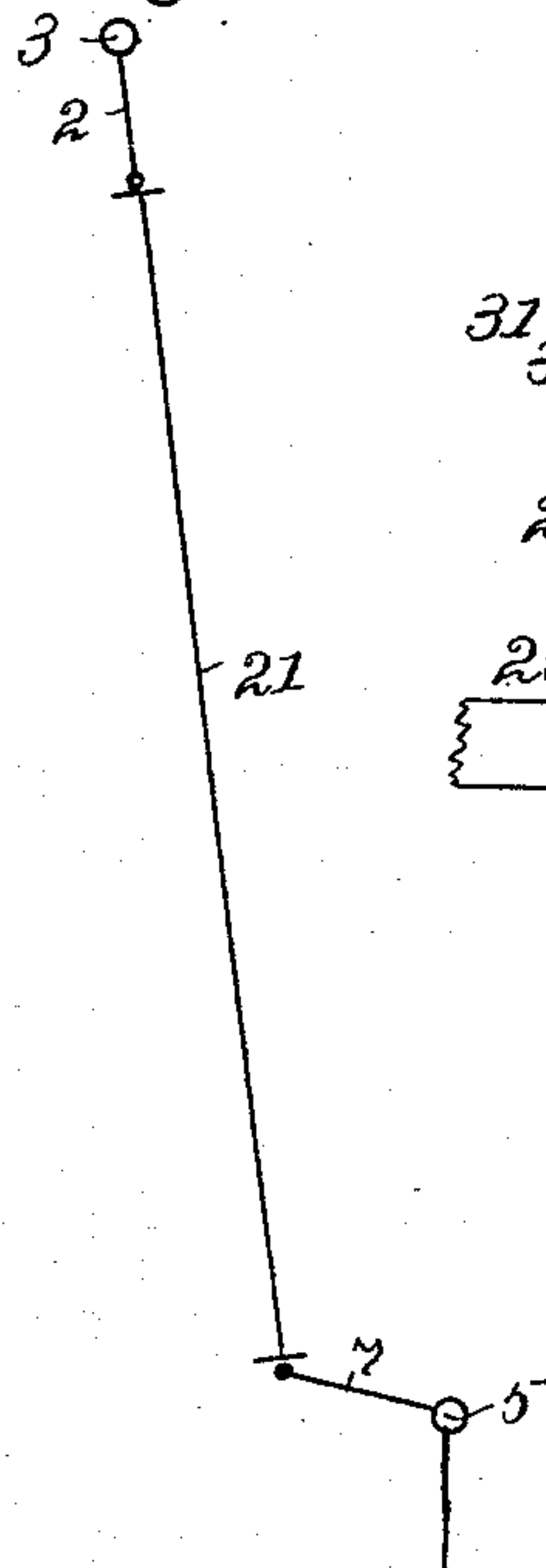
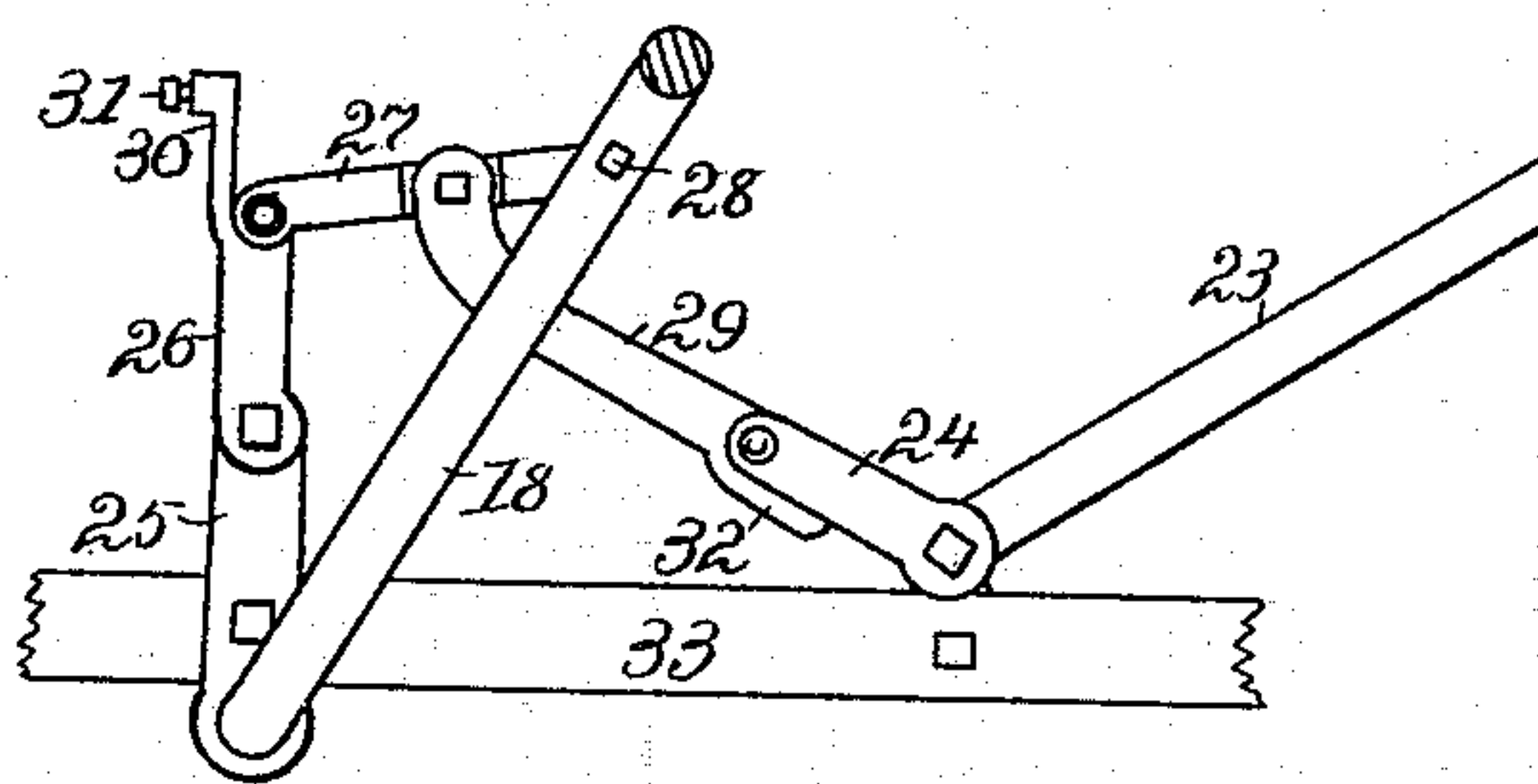


Fig. 9.



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Fig. 11.

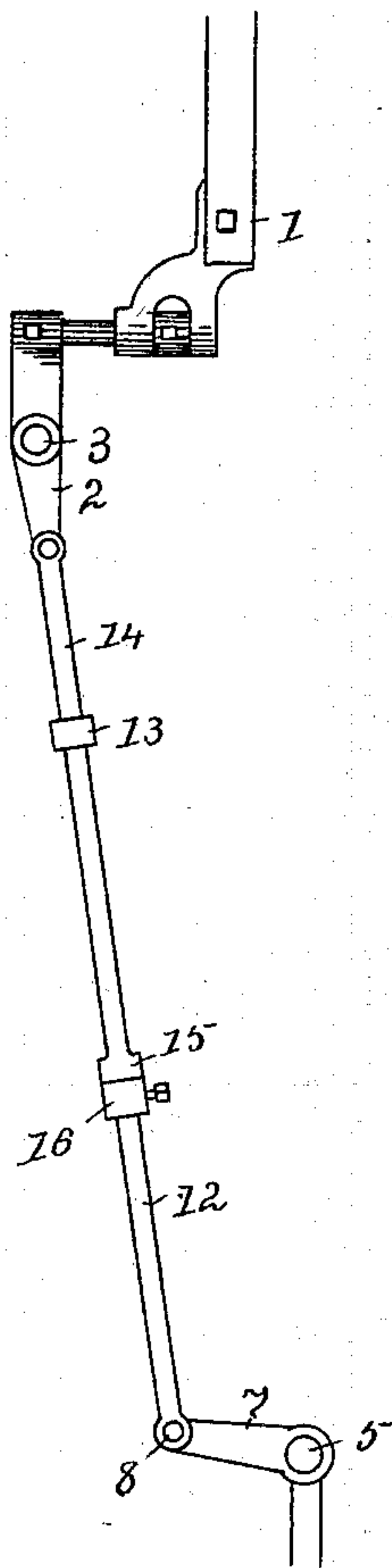


Fig. 10

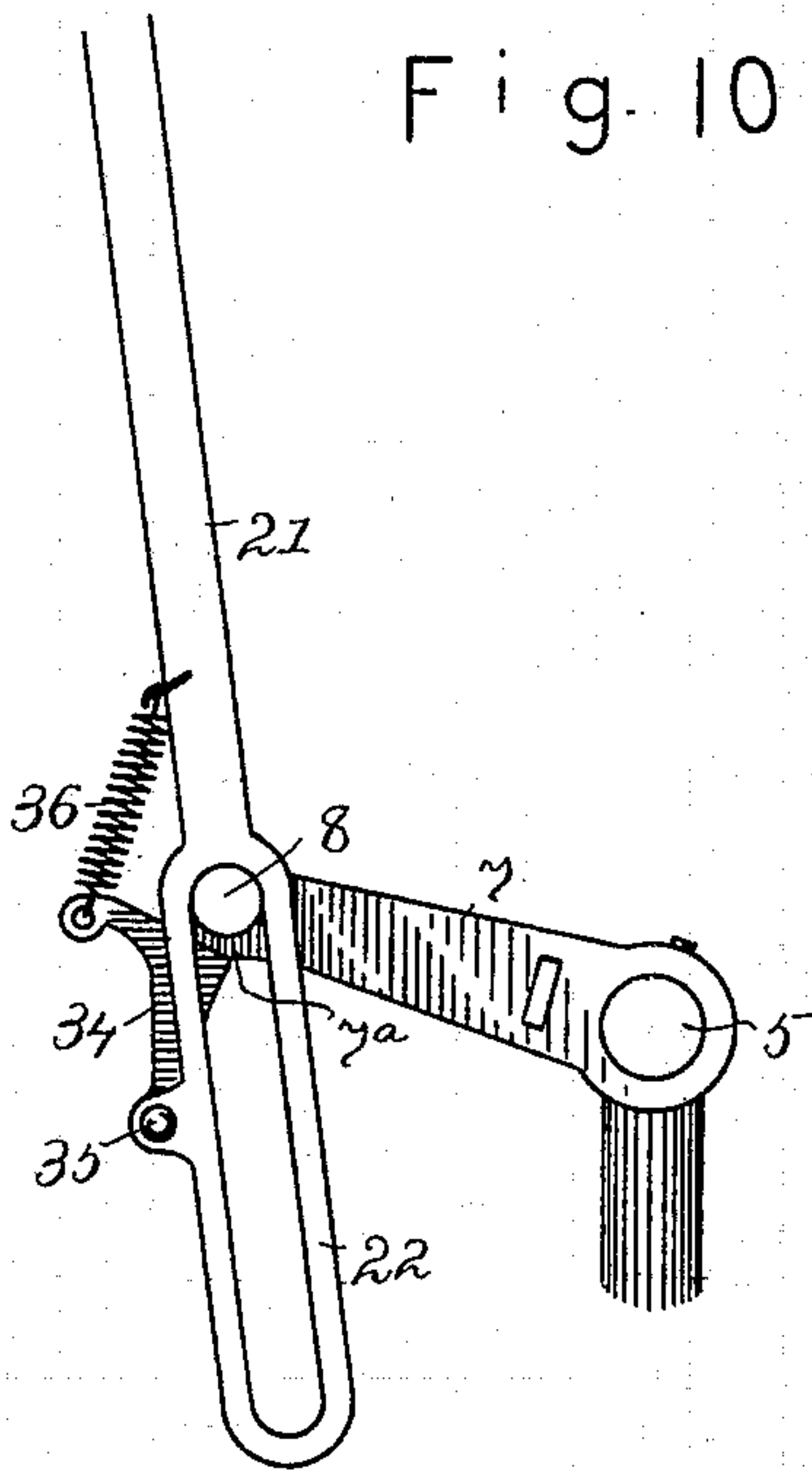
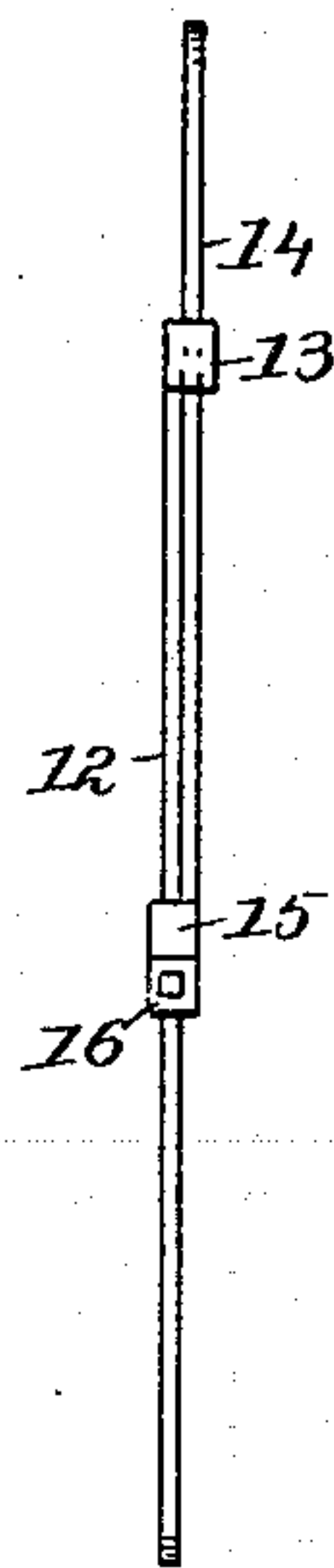


Fig. 12.



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UNITED STATES PATENT OFFICE.

MARSHALL SATTLEY AND ARCHIBALD SATTLEY, OF SPRINGFIELD, ILLINOIS,
ASSIGNORS TO THE SATTLEY MANUFACTURING COMPANY, OF SAME
PLACE.

WHEEL-PLOW.

SPECIFICATION forming part of Letters Patent No. 615,310, dated December 6, 1898.

Application filed June 4, 1898. Serial No. 682,615. (No model.)

To all whom it may concern:

Be it known that we, MARSHALL SATTLEY and ARCHIBALD SATTLEY, of Springfield, in the county of Sangamon and State of Illinois, have invented certain new and useful Improvements in Wheel-Plows, of which the following is a specification.

The invention relates to that class of plows in which a caster-wheel bears against the vertical wall of the furrow and relieves the land-side of the plow from sliding friction; and its principal object is to provide means for controlling the caster-wheel from the tongue while the plow is in operation without interfering with free swing of the tongue and to give entire freedom to the caster-wheel in turning the plow around.

A secondary object of the invention is to provide improved means for raising and lowering the plow.

In providing for controlling the caster-wheel an arm is fixed on the vertical shaft of the caster-wheel and extended sidewise therefrom when the caster-wheel is in operative position. The tongue is pivoted to swing horizontally and provided with a rigid arm that extends toward the swinging end of the caster-wheel arm while plowing, and a strut-brace is set between the arm of the tongue and the arm of the caster-wheel in position to prevent swing of the caster-wheel in response to the inward stress of the plow while the plow is in operation and in condition to be inoperative when the tongue is turned sidewise to an extent in excess of the vibratory motion common to the tongues of wheel-plows.

The natural tendency of an uncontrolled wheel is to swing freely as the plow is turning, to line up behind the plow when plowing begins, and to swing toward the vertical wall of the furrow when the pressure of soil on the moldboard forces the plow inward. The free swings in turning and in lining up preparatory to plowing is desirable, as they give freedom of action to the plow and the tongue; but the swing in response to stress on the moldboard of the plow must be overcome in order that the sliding friction of the land-side may be transferred to the caster-wheel and

converted into much lighter rolling friction. In other words, it is well for the caster-wheel to swing freely at all times except when the plow is moving forward in act of plowing and in backing in a straight line, while it needs to be restrained against swing that will permit the land-side of the plow to bear too strongly against the side of the furrow. This is provided for by the strut-brace that is interposed between the arm of the tongue and the arm of the caster-wheel while the plow is in operative condition and withdrawn or rendered inoperative at all other times.

While the caster-wheel is controlled by the tongue, it is desirable that the tongue shall not be affected by the stress of the caster-wheel, and this result is provided for by so disposing the arm of the tongue and the strut-brace that the stress of the caster-wheel arm shall be exerted in a straight line through the strut and the tongue-arm to the pivot of the tongue. This permits ordinary side swing in the tongue without interference from the caster-wheel arm, as the arcs described by the tongue-arm and the end of the strut-brace in contact with such arm are so small and so nearly in the same direction as not to materially affect the deadlock resulting from alignment of pivots.

In the drawings forming part of this specification, Figure 1 is a plan of so much of a three-wheel plow as is needed to explain our improvements. Fig. 2 is a plan of an embodiment of the caster-controlling mechanism, showing the tongue turned to one side to an extent to throw the controller out of operation. Fig. 3 is a plan of a modified form of caster-controller. Fig. 4 is a detail of the mechanism shown in Fig. 3. Fig. 5 is a diagram illustrating the effect or non-effect of moderate side swing of the tongue on the caster-controlling device. Fig. 6 is a diagram introducing a further modification of the caster-controller. Fig. 7 is a diagram showing the caster-controller reduced to its essential elements. Figs. 8 and 9 are details of the plow-raising mechanism, one showing the condition of the parts when the plow is lowered and the other showing the condition of the parts when the plow is raised. Fig. 10 is

a plan showing a device that may be used in the caster-controller to aid in backing the plow. Figs. 11 and 12 show modifications.

Referring to Fig. 7, the arm that partakes of the swing of the tongue is shown at 2 and the pivot thereof at 3. The pivot of the rear caster-wheel is shown at 5, the laterally-extended arm thereon at 7, and the strut-brace at 21. So long as the arm 2 maintains its shown position even approximately it will combine with the strut to form a stiff brace between the swinging end of arm 7 and the pivot-bearing 3; but when the side swing of arm 2 becomes considerable, as in Fig. 6, for instance, the strut is relieved from the restraint of the arm, and the caster-wheel, pivoted at 5, may swing freely independent of the plow-frame or remain relatively stationary while the plow-frame swings. The stress of the plow on the arm 7 tends to swing the arm forward or toward pivot 3, and as the arm 2 and strut-brace form a continuous straight or approximately straight line between the swinging end of arm 7 and pivot 3 the tongue connected with arm 2 may swing freely to a limited extent unrestricted by pressure from the arm of the caster-wheel.

In Figs. 1 and 2 the preferred form of strut-brace is shown, and such brace comprises a casting 9, slotted lengthwise at 10, and a rod 11, pivoted on pin 2^a of arm 2 and threaded to screw into casting 9. The rod is bent, as shown, to give leg room to the driver; but such bend has nothing to do with the action of the strut on the arm of the caster-wheel.

Fig. 3 shows a modified form of strut-brace pivotally connected with the arm of the caster-wheel and extended through a block 19, pivoted on the arm of the tongue, and an adjustable stop-block 20 is fastened onto the strut. A variation of this idea would consist in reversing the connections, putting the pivot-block on the rear arm.

Fig. 11 shows a modification of the strut-brace in which two telescoping members are employed. Member 12 is pivotally connected with pin 8 on arm 7 and extended through a slide-bearing 15 on member 14, while member 14 is pivotally connected with the pin 2^a on arm 2 and extended through slide-bearing 13 on member 12. A stop-block 16 is set adjustably on one of the members to limit the telescoping motion of the strut. (See Fig. 12, where the strut-brace is shown in side elevation.)

Whatever form of strut-brace is employed the operation and conditions are substantially the same. The arm 2 extends toward the swinging end of arm 7 when the tongue is turned straight forward or approximately so, and the strut virtually forms an extension of the arm, preventing the caster-arm from swinging forward beyond a prescribed position and transmitting the thrust of the caster-wheel arm to pivot 3 of the tongue-arm.

The caster-wheel is held from turning to

permit the plow to swing away from the stress of soil on its moldboard, which is in the direction indicated by the arrow in Fig. 1, and so the landside is prevented from bearing excessively against the vertical wall of the furrow. The extent to which the wheel may turn to favor the plow may be regulated by increasing or diminishing the actual length of the strut-brace, and the landside may be held as far from the furrow-wall as may be desired.

Whenever the tongue is swung sharply to the right or left in turning the plow around, the pin 8 moves from contact with the rear wall of the slot of casting 9, leaving the sleeve free to move on bar 13 and permit the rear caster-wheel to turn in any direction the travel of the plow may require. When the plow assumes an operative position, the arm 2 points backward toward arm 7, and when the plow tends to move the arm 7 beyond the position shown in Fig. 1 or any other predetermined position the interposed strut prevents the motion and imparts the stress through arm 2 to shaft 3.

The tongue may be swung to either side to any desired extreme without in the least interfering with free action of the caster-wheel or exerting any pressure whatever on the strut-brace. This may be readily seen from an inspection of Fig. 2, and the result is quite desirable in view of the fact that it is not unusual for rods connecting the tongue with the caster-wheel in the old manner to become bent by extreme swing of the tongue in turning around.

The plow 17 is raised and lowered by swinging a bail upward and downward, and the mechanism used to raise and lower the bail is shown in detail in Figs. 1, 8, and 9. The bail 18 is pivoted at one end in a bracket 25, which is fastened to a side bar 33 of the plow-frame. The bracket extends above the bar of the plow-frame, and to its upper end one member of a toggle-joint is pivotally connected. The toggle-joint consists of members 26 and 27, hinged together and connected one with bracket 25 and the other with the swinging end of bail 18. A hand-lever 23 is pivotally connected to the plow-frame under the swinging end of the bail, and it has a crank-arm 24. A bar 29 connects the swinging end of arm 24 with member 27 of the toggle-joint, both connections being pivotal. When the plow is down, the lever 23 is swung forward, as shown in Fig. 8, and the bail is locked against rising motion by the extended toggle-joint. By swinging the lever backward the toggle-joint lock is broken by upward pressure and the bail is raised to the position shown in Fig. 9, where arm 24 and link 29 form a toggle-joint to hold the bail raised. An extension 30 limits the swing of the toggle-joint composed of members 26 and 27 beyond the position shown in Fig. 8, and a set-screw 31 in the extension provides means for preventing a positive lock of the

bail in a lowered position. By extending the screw beyond the inner surface of extension 30 the toggle-joint may be made to resist the rise of the plow to any desired extent without acting as an unyielding lock. The link 29 has an extension 32, which engages arm 24 when the bail is raised, thereby preventing further motion, and the bail is locked in a raised position by the alinement of the pivots of the raising-arm and link.

It is sometimes desirable to move a plow backward, and to provide for this a yielding bearing may be made to engage a plane surface on the rear caster-wheel shaft or the arm thereon to prevent the caster-wheel from turning on its vertical axis. The resistance to side swing need not be great, and in this instance it is supplied by an arm 34, pivoted at 35 in an extension of the strut-brace and held in contact with a plane surface 7^a or other obstruction on the end of arm 7 by means of a spring 36. The spring will overcome the slight tendency to side swing developed by backward movement of the plow, and it will not offer material resistance to the swing of the caster in plowing or in turning the plow around.

What we claim is—

1. A controller for the rear caster-wheel of a plow, comprising a horizontal arm fixed on the vertical pivot of the caster-wheel and extended sidewise, a horizontal arm extending normally toward the swinging end of the arm of the caster-wheel and a strut-brace normally interposed between the two arms.

2. A controller for the rear caster-wheel of a plow, comprising a horizontal arm fixed on the vertical pivot of the caster-wheel and extended sidewise, a tongue pivoted to swing horizontally and having an arm extending toward the swinging end of the arm of the caster-wheel when the plow is in operative position and a strut-brace interposed between the two arms.

3. A controller for the rear caster-wheel of a plow comprising a horizontal arm fixed on the vertical pivot of the caster-wheel and extended sidewise, a tongue pivoted to swing horizontally and having an arm extending toward the swinging end of the arm of the caster-wheel when the plow is in operative position and an extensible strut-brace interposed between the two arms.

4. A controller for the rear caster-wheel of a plow, comprising a horizontal arm fixed on the vertical pivot of the caster-wheel and extended sidewise, a tongue pivoted to swing horizontally and having an arm extending toward the swinging end of the arm of the caster-wheel when the plow is in operative position and a slotted strut-bar pivoted to one arm and fitted over a pin on the other.

5. A controller for the rear caster-wheel of a plow comprising a horizontal arm fixed on the vertical pivot of the caster-wheel and extended sidewise, a tongue pivoted to swing horizontally, a rod connected with the tongue and slidably mounted on the arm of the caster-wheel, and a stop on the rod bearing yieldingly against the caster-arm to steady the caster-wheel while backing.

6. In plow-raising mechanism the combination of a toggle-joint pivoted at one end to a fixed bearing and at the other end to a movable part, such toggle being extended when the plow is lowered and buckled when it is raised, and a lift-lever connecting with the toggle-joint between the ends thereof.

7. In a plow, the combination with a frame, a beam swung therein and a lift-lever, of a toggle-joint connected at one end with the frame and at the other end with the beam and a second toggle-joint connected at one end with the lift-lever and at the other end with the other toggle-joint, the toggle-joint connected with the frame being extended when the beam is lowered and buckled when it is raised and the toggle-joint connected with the lift-lever being buckled when the beam is lowered and extended when it is raised.

8. In a plow the combination with a frame, a beam swung therein and a lift-lever, of a toggle-joint connected at one end with the frame and at the other end with the beam, and a second toggle-joint connected at one end with the lift-lever and at the other end with the other toggle-joint between the ends thereof.

In testimony whereof we sign our names in the presence of two subscribing witnesses.

MARSHALL SATTLEY.
ARCHIBALD SATTLEY.

Witnesses:

J. H. MATHENY,
MAY JENKINS.