

No. 881,243.

W. E. JOHNSON.

PATENTED MAR. 10, 1908.

WHEEL PLOW.

APPLICATION FILED AUG. 26, 1904.

5 SHEETS—SHEET 1.

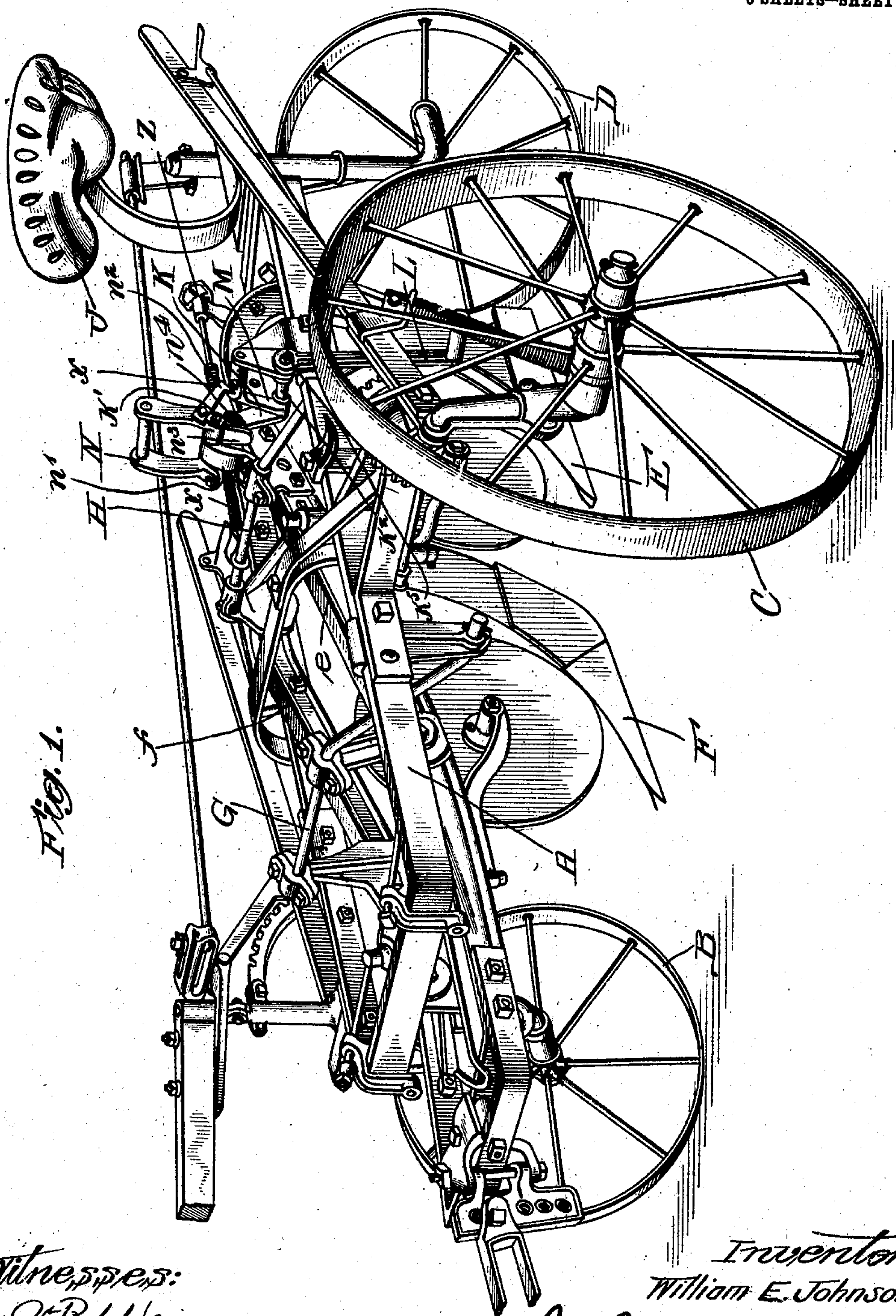


Fig. 1.

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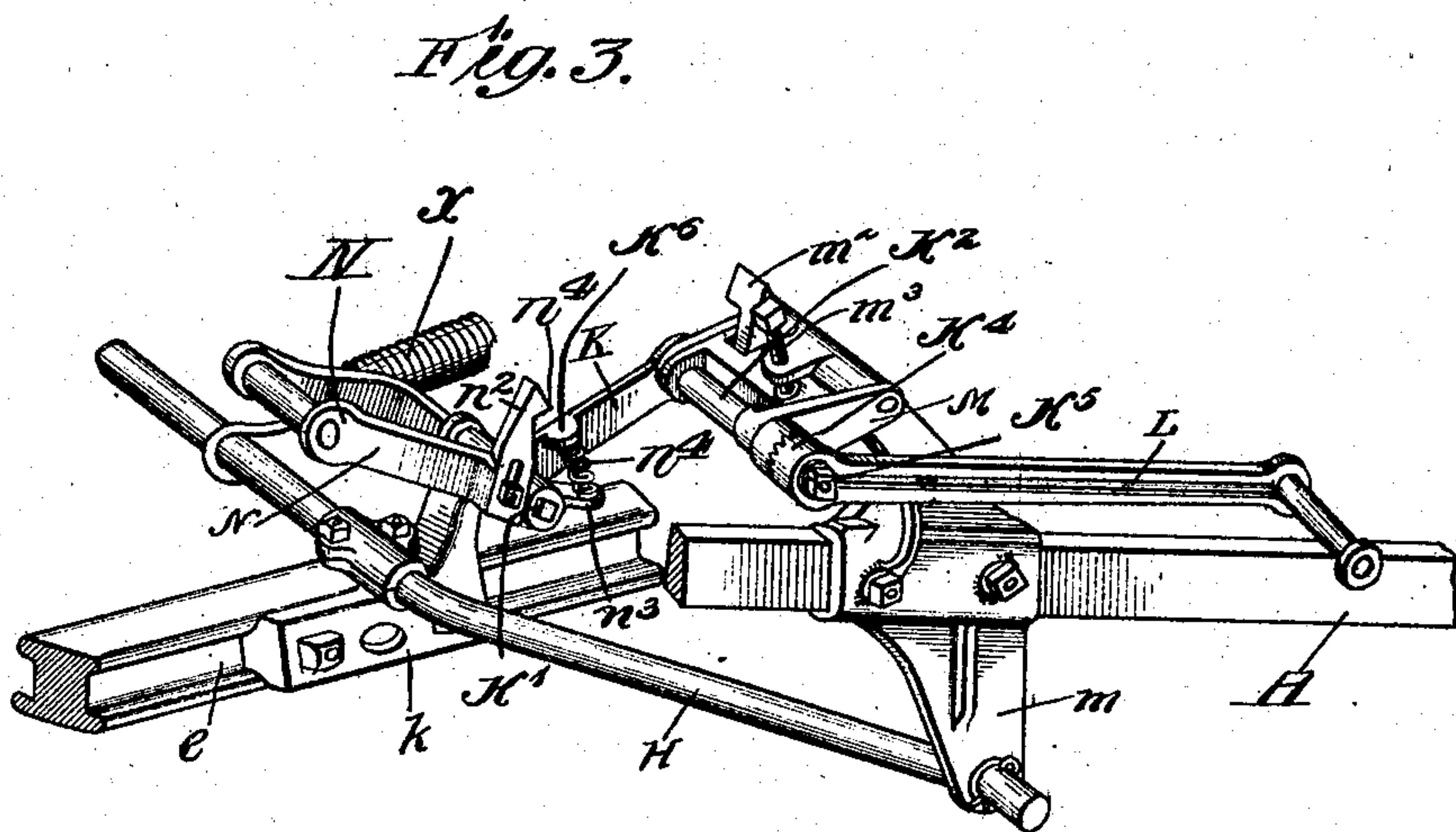
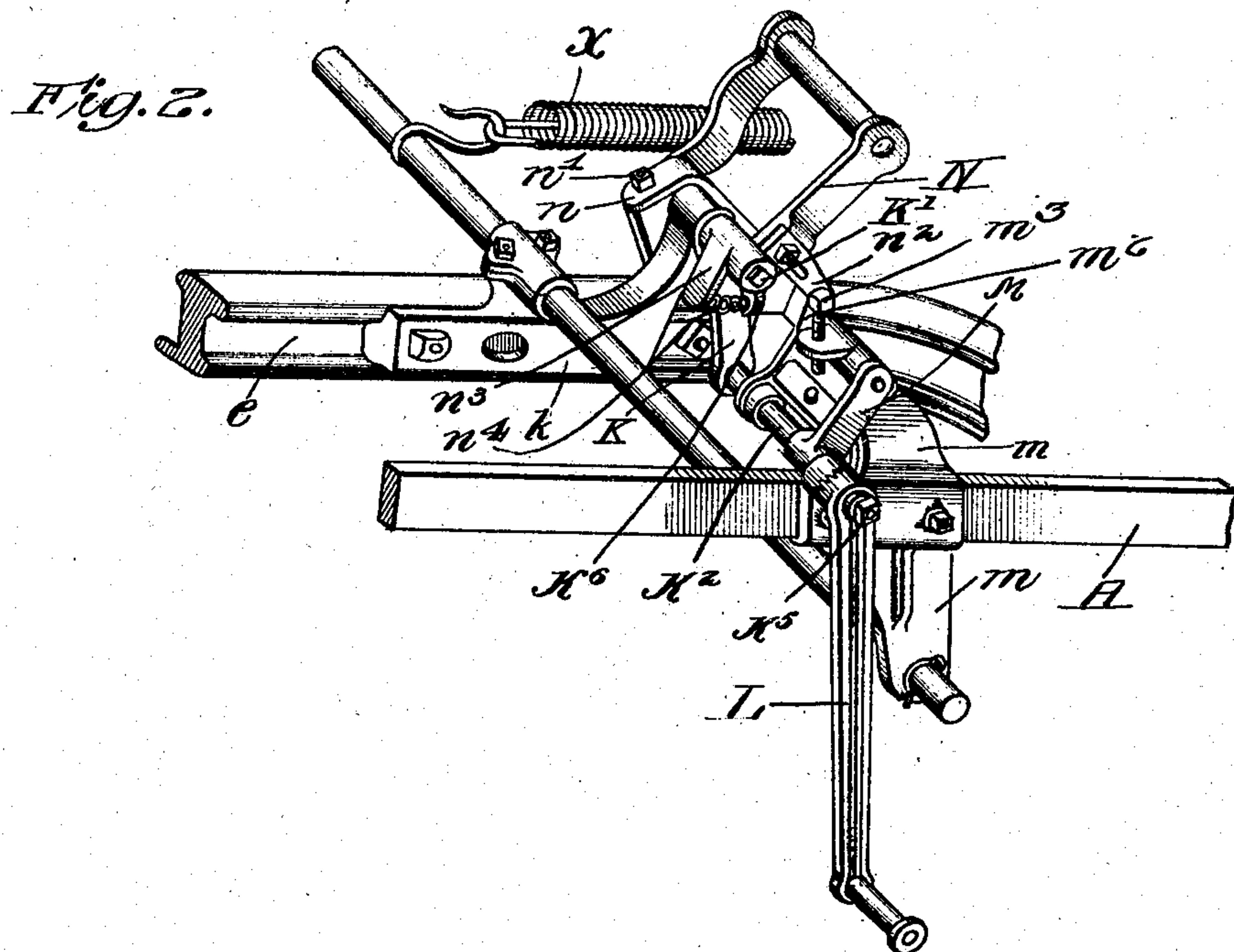
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5 SHEETS—SHEET 2.



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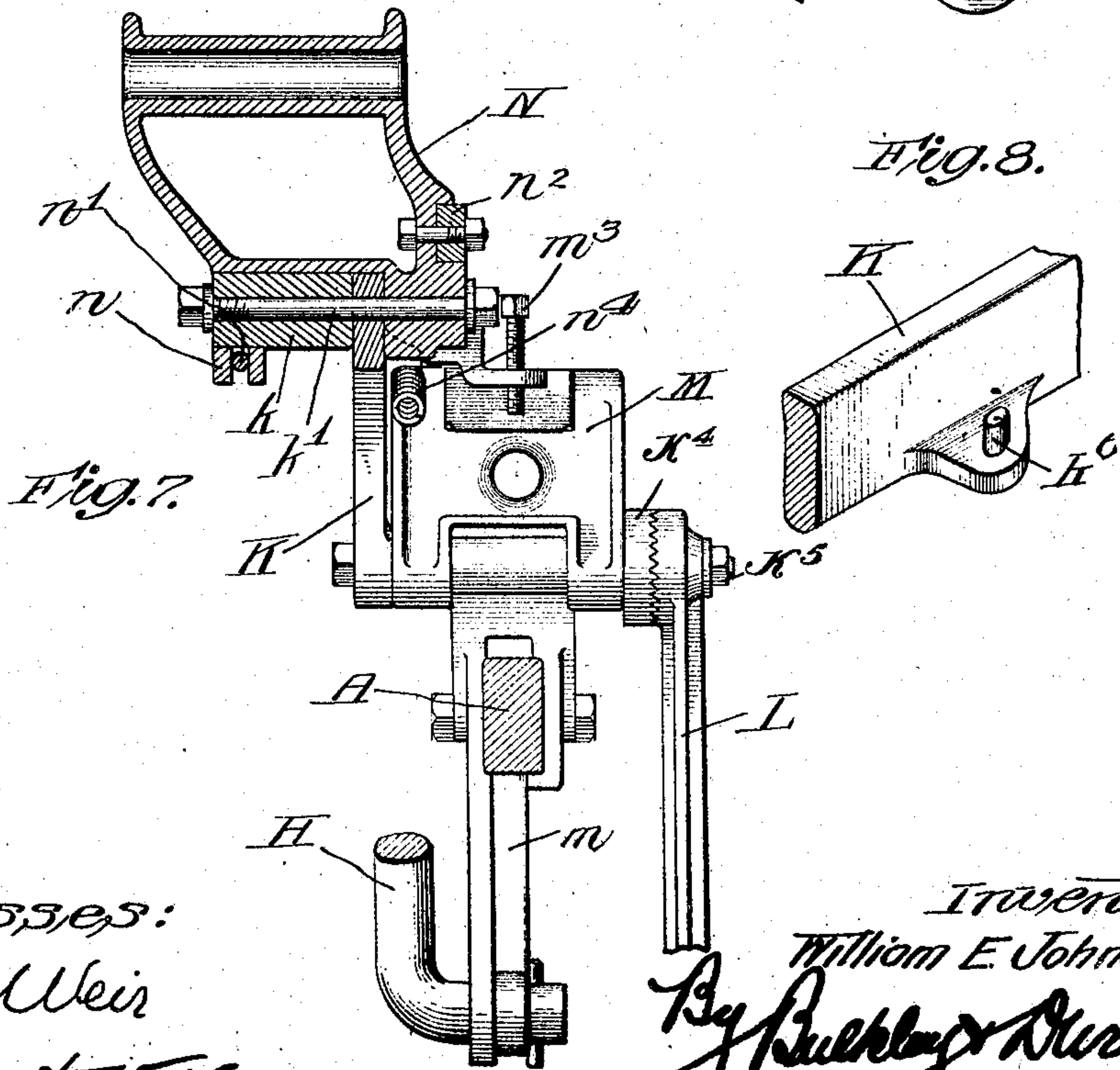
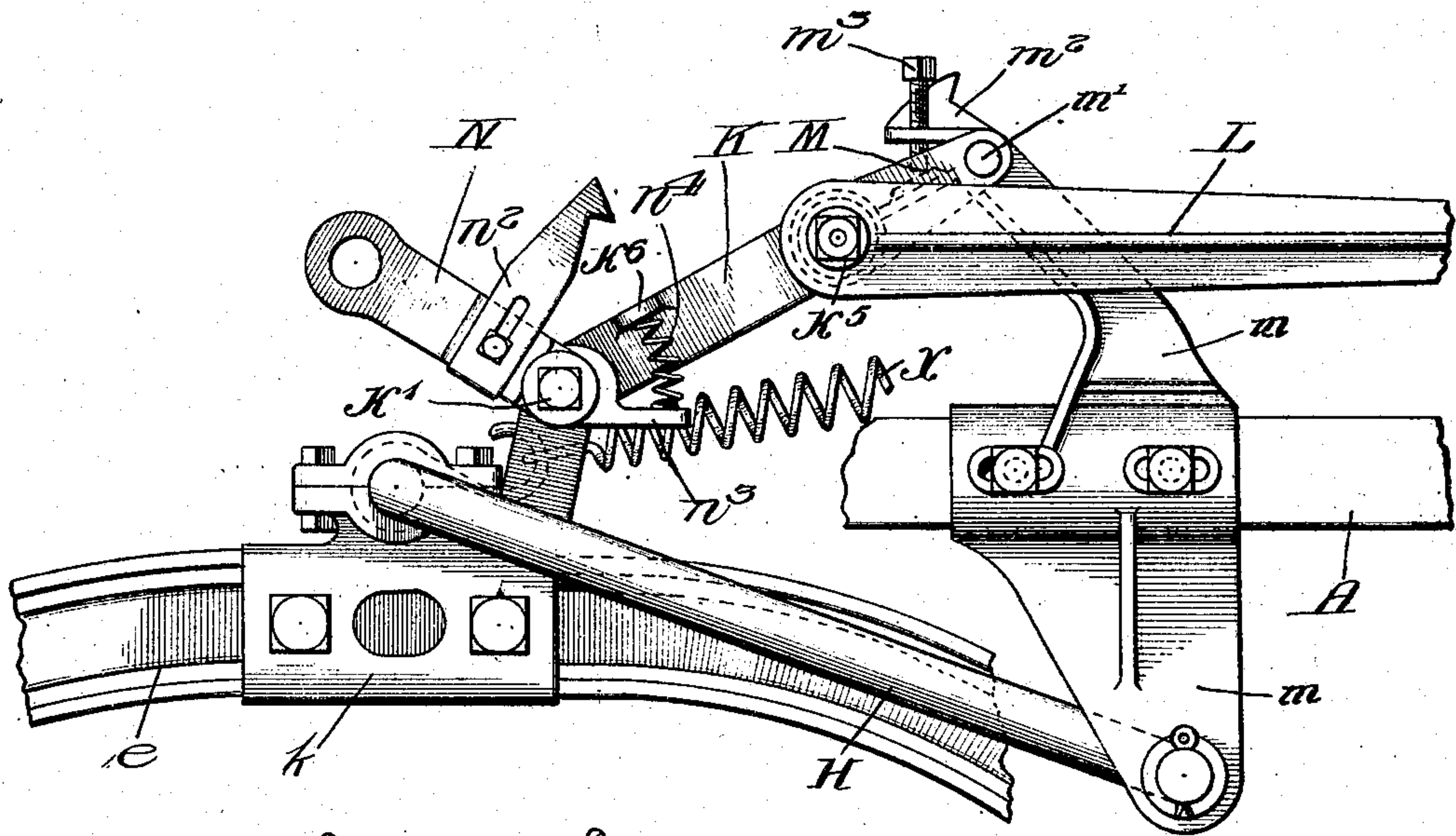
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5 SHEETS—SHEET 4

Fig. 6.



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UNITED STATES PATENT OFFICE.

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WHEEL-PLOW.

No. 881,243.

Specification of Letters Patent.

Patented March 10, 1908.

Application filed August 26, 1904. Serial No. 222,335.

To all whom it may concern:

Be it known that I, WILLIAM E. JOHNSON, a citizen of the United States of America, and resident of Rock Island, in the county of Rock Island and State of Illinois, have invented a certain new and useful Improvement in Wheel-Plows, of which the following is a specification.

My invention relates to wheel or sulky plows in general, but more particularly to wheel plows of that character in which provision is made for raising and lowering the plow relatively to the supporting wheels, and especially to that type of wheeled or sulky plow in which the raising and lowering of the plow is accomplished through the medium of foot levers, particularly if the plow is of that class in which the plow is supported by a body frame mounted on suitable vehicle wheels.

Generally stated, the object of my invention is the provision, in a wheeled or sulky plow, of any suitable character, of an improved arrangement of foot levers for raising and lowering the plow; and a special object is to provide an improved construction and arrangement whereby the lifting foot lever may be applied directly to the joint or articulation of the toggle connection employed for raising and lowering the plow; and another object is to provide an improved construction and arrangement whereby the depressing foot lever may be applied directly to the point where the said toggle connection is pivotally secured to the plow beam; and a further object is the provision of an improved construction and arrangement whereby the lifting foot lever may be rigid with the lower arm or member of the said toggle connection which connects the body frame with the plow beam; and another object is to provide an improved construction and arrangement whereby the lifting of the plow may be accomplished through the medium of a toggle connection which breaks joint downwardly and rearwardly when the plow rises; and 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 particular character.

To the foregoing and other useful ends my invention consists in the matters hereinafter set forth and claimed.

In the accompanying drawings,—Figure 1 is a perspective of a wheeled sulky plow

having a foot lift arrangement embodying the principles of my invention. Fig. 2 is an enlarged perspective of the said foot-lift arrangement, showing the adjacent portion of the plow beam and the body frame, the two plows being raised from the ground. It will be seen that the plow shown in Fig. 1 is a gang plow, but it will, of course, be understood that one or more or any suitable number of plows may be employed without departing from the spirit of my invention, and that the improved foot-lift arrangement may be employed wherever it may be found applicable. Fig. 3 is a view similar to Fig. 2, but showing the foot lift arrangement in the condition necessary for depressing the plow or plows. Fig. 4 is an enlarged side elevation of the foot lift arrangement in the condition shown in Fig. 2. Fig. 5 is a plan of the parts as shown in Fig. 4. Fig. 6 is an enlarged elevation of the foot lift arrangement in the condition shown in Fig. 3. Fig. 7 is a vertical section on the line 7—7 of Fig. 4. Fig. 8 is a perspective showing a portion of the lower link or arm of the toggle connection. Fig. 9 is a vertical section on the line 9—9 of Fig. 4. Fig. 10 is a detail vertical section on line 10—10 of Fig. 9. Fig. 11 is a detail perspective view of a portion of the depressing foot lever. Fig. 12 is a detail perspective of the hub portion of the lower arm of the toggle connection. Fig. 13 is a perspective of the removable and adjustable locking hook which is attached to the depressing lever. Fig. 14 is a perspective of the upper end portion of the bracket or housing which is secured to the body frame, showing the set screw which is employed as an adjustable stop for the upper link or member of the toggle connection, showing also the hook-shaped lug engaged by the hook carried on the depressing lever, the two mutually engaging hook-like members constituting a locking device for holding the plow or plows in an elevated position.

As my invention consists of a novel foot lift arrangement for raising and lowering one or more plows, in any suitable or desired construction of wheeled or sulky plow, such, for example, as the gang plow shown in Fig. 1, it will not be necessary to fully describe the construction and mode of operation of such a plow.

In a general way, therefore, the plow shown in Fig. 1 comprises a body frame A,

supported by wheels B, C and D. The wheel B consists of a front furrow wheel of any suitable or desired character, while the wheel C may be a landside wheel of any suitable known or approved character; the wheel D may be a caster wheel or rear furrow wheel of any suitable form or character. The rear plow E is carried by the beam *e*, while the plow F is carried by the beam *f*. The two plow beams thus arranged parallel with each other and with one cut longer than the other, are connected with the body frame by means of front and rear bails G and H, whereby the plows may rise and fall in unison. A spring X, having one end connected with the rear bail and its other end connected with a suitable portion of the body frame, assists the driver in raising the plow, it being observed that the middle or forward end portions of the two bails are journaled in bearings secured to the plow beams, and that these portions of the bails swing up and down, but never fall below their axes—that is to say, below the point where their lower or rear ends are journaled in bearings secured to the body frame. Thus, with this construction, the two plows are adapted to be readily raised and lowered relatively to the body frame, in a manner which will be readily understood. Preferably, the seat J is supported at the extreme rear end of the body frame, so that the weight of the rider is carried by the rear furrow wheel, and not at a point over the plows.

As will hereinafter fully appear, it will be seen that the foot-lift arrangement, for raising and lowering the plow, is located at a convenient point in front of the driver's seat. Preferably, as will be observed, the said foot-lift arrangement is applied to the left hand side of the machine, so that it may be operated by the driver's left foot, part of the lifting and lowering connection being applied to the beam *e*, and the remaining portions being applied to the left hand side of the body frame A—that is to say, the landside of the machine.

Referring to Figs. 2 and 3, it will be seen that the lower link or arm K of the toggle connection has one end pivotally connected with the bracket *k* secured to the beam *e*. As illustrated, this pivotal connection is effected through the medium of a bolt *k*¹ which passes through the upper end portion of the said bracket *k*, and also through the end of the link or arm K. It will also be seen that the other end of the arm K is provided with an outwardly extending hub-portion *k*² (see Fig. 9) provided with teeth *k*³ see Fig. 12, at its outer end. These teeth are adapted to be engaged by a similarly formed washer *k*⁴ which in turn is adapted to have a toothed engagement with the end of the lifting lever L. A bolt *k*⁵, which extends through said hub portion *k*², the washer *k*⁴ and the end of the lever L, constitutes the

means for rigidly connecting the said lifting lever with the arm K. The upper arm or member M of the said toggle connection has one end journaled or pivotally mounted, as shown, upon a cylindric hub portion *k*², while its upper end is pivotally mounted upon the upper end portion of the bracket or housing *m*, which latter is secured in any suitable manner to the body frame. There is a pivot pin or bolt *m*¹, arranged to extend through the said bracket or housing *m* and the upper end portion of the arm M, as shown more clearly in Fig. 9. And at this juncture it will also be seen that the rear bail H is preferably journaled in bearings carried by the said brackets *k* and *m*. With this arrangement, said bails constitute the medium of shifting connection between the plow beams and the body frame, while the toggle connection composed of the arms K and M constitutes a lifting and lowering connection—that is to say, a jointed or toggle-like connection which can be manipulated or operated for the purpose of raising and lowering the plows. Although the lifting lever L is, as stated, applied directly to the joint or articulation of the said toggle connection, and made rigid with the lower arm or member of said connection, it will be seen that the depressing foot lever N is applied directly to the point where the toggle arm K has pivotal connection with the bracket *k*. In this way, the axis of the lifting foot lever L is coincident with the axis of the joint or articulation of the toggle connection, while the axis of the depressing foot lever N is coincident with the axis of the pivotal connection between the plow beam and the said toggle connection. Preferably, the depressing foot lever N is journaled or pivotally mounted upon the cylindric upper portion of the bracket *k*, as shown more clearly in Fig. 7. It will also be seen that the depressing foot lever N also has a portion which is mounted on the bolt *k*¹, whereby the said depressing foot lever has an extended bearing which prevents twisting or injurious straining of the different parts and connections. This is also true of the upper toggle arm M, as it not only has an extended bearing or pivotal connection with the bracket carried by the body frame, but also affords an extended bearing or axis for the lifting foot lever. In other words, all three of the pivots or axes about which the two toggle arms have movement, either relatively to each other or to the brackets to which they are connected, are of sufficient length to prevent the twisting or straining or lateral skewing which might result from the use of shorter axes or pivots.

With the toothed formation of the lever L, and of the washer *k*⁴ of the toggle arm K, and with the bolt *k*⁵ it is evident that the lifting lever can be adjusted and set at different po-

sitions relatively to the toggle arm K. As shown, the depressing foot lever N is made with a U-shaped portion at its outer side, whereby it may be easily adjusted upon the cylindric portion *k* of the bracket K; and this U-shaped portion of the depressing foot lever is then securely held in place upon the bracket by the provision of a removable bearing block *n* and a bolt *n*¹, as illustrated more clearly in Figs. 2 and 7. Said U-shaped portion straddles the portion *k*, and the block *n* fits below said cylindric portion, and between the ends of said U-shaped portion. The bolt *n*¹ passes through the ends of the U-shaped portion, through a notch in the bottom of the block *n*. The upper end portion of the bracket *m* is provided with a hook-shaped lug *m*² and a set screw *m*³, which latter acts as an adjustable stop to limit the upward movement of the toggle arm M. A locking hook *n*² is adjustably secured to the depressing foot lever N, in the manner shown, and is adapted, when the plows are raised relatively to the body frame, to engage the hook-shaped lug or projection *m*². In this way these two hook-shaped elements, one carried by the body frame and the other by the depressing foot lever, constitute mutual engaging devices for automatically locking the plows in their raised positions, and for automatically unlocking the plows when it is desired to lower them. At this juncture it will also be seen that the depressing foot lever is provided with a short arm *n*³, while the lower toggle arm K is provided with an opposing seat *k*⁶; and a spring *n*⁴ is interposed between the arm *n*³ and the seat or projection *k*⁶. With this arrangement, the depressing foot lever is capable of some movement independently of and relatively to the toggle arm K, which movement is just sufficient, it will be seen, to disengage the hook *n*² from the lug *m*² before the foot pressure applied to the said depressing foot lever is communicated positively to the toggle arm K. The lever N moves independently until it takes up enough of the lost motion to compress the springs *n*⁴, and then the arm K begins to move causing it to swing about its lower axis or point of pivotal connection with the plow beam, and thereby raise the joint or articulation of the toggle connection to the point shown in Fig. 3. The set screw *m*³ limits the upward movement of the toggle connection, and determines whether the joint or articulation of such connection is to pass the center, so as to speak, or whether such joint or articulation is to remain slightly below the center line, or directly on the line. It will be readily understood that the operator may adjust the set screw in this respect according to the requirements of any particular case, as may be thought best. If the joint of the toggle connection is permitted to rise above the center line, it is evident that the plows will be locked

rigidly in their depressed or lowered positions, and thus held rigidly in the ground. On the other hand, however, the joint might be stopped before it reaches the center line, thus permitting the plows to rise of their own accord, should they strike obstructions of different kinds. In this connection it will also be understood that the direction of pull and the tension of the spring *X*³ can be regulated or determined in any suitable manner, for example, by a hand wheel nut Z.

With a foot-lift arrangement of the foregoing character, I find that the plows are easily manipulated, and are raised and lowered with very little exertion. As will be observed, the foot-lift arrangement, and the connection between the body frame and the long beam *e*, are located immediately in the rear of the rear bail H, which is the point of the heaviest load. When a downward pressure of the foot is applied to the lever L, the toggle joint is at once broken in a downward direction, and with the assistance of the lifting spring the plows are then raised with the least effort possible. Stops of any suitable character can, of course, be located on the body frame to engage the bails or beams, or any other suitable movable parts, and thus limit the downward movement of the plow beams, so that the plows will bottom lightly just before the toggle arms or members have assumed a straight line; and with further pressure on the depressing foot lever, the plow connections will then be forced firmly against said stops; and if at such time the toggle joint is just above the dead center, so to speak, the plows are then rigidly locked in the ground.

In lifting the plows out of the ground, it will be seen that the point of applying the lifting power is an important consideration, and in the present case is located immediately above the load.

What I claim as my invention is:—

1. A wheeled plow comprising a plow and beam, a body frame mounted on wheels, bails connecting the body frame with the plow-beam, a toggle connection between the body frame and the plow-beam, a lifting foot-lever applied directly to the joint or articulation of said toggle connection, and a depressing foot lever applied directly to the point of pivotal connection between the plow-beam and one arm of said toggle connection.

2. A wheeled plow comprising a plow and beam, a body frame mounted on wheels, bails connecting the body frame with the plow beam, a toggle connection between the body frame and plow beam, and a lifting foot lever applied directly to the toggle joint or intermediate point of articulation of said toggle connection, and rigid with one arm thereof.

3. A wheeled plow comprising a plow and beam, a body frame mounted on wheels, a

toggle connection between the body frame and plow beams, and a depressing foot lever mounted on the plow beam and applied directly to the point of pivotal connection between the plow beam and one arm of said toggle connection.

4. In a wheeled plow, a toggle connection for effecting the lifting and lowering of the plow, and a lifting lever for manipulating said toggle connection, said lever being supported by and applied directly to the toggle joint or intermediate point of articulation of said toggle connection and rigid with one arm thereof.

5. In a wheeled plow, a plow and beam, a toggle connection for effecting the lifting and lowering of the plow, and a depressing lever for manipulating said toggle connection, said lever being supported by the plow beam and applied directly to the point of pivotal connection between the plow beam and one arm of the said toggle connection.

6. In a wheeled plow, a toggle connection for lifting and lowering the plow, and a lifting lever rigid with the lower arm of said toggle connection.

7. In a wheeled plow, a toggle connection for lifting and lowering the plow, a locking device for locking the plow in an elevated position, and a depressing lever for operating said locking device and having a yielding lost motion connection with the lower arm of said toggle connection.

8. A wheeled plow comprising a plow and beam, a body frame mounted on wheels, front and rear bails connecting the plow beam with the body frame, a toggle connection located behind the rear bail and connecting the plow beam with the body frame, a driver's seat mounted on the rear end of the body frame and behind the toggle connec-

tion, and lifting and depressing foot levers conveniently operated from said seat for the purpose of manipulating said toggle connection and thereby lifting and lowering the plow.

9. A wheeled plow comprising a relatively short plow beam carrying a plow, a relatively long plow beam carrying a plow, a body frame mounted on wheels, front and rear bails connecting the plow beams with the body frame, a toggle connection located behind the rear bail and connecting the longer plow beam with the body frame, a driver's seat carried by the body frame in the rear of the toggle connection, and lifting and depressing foot levers conveniently operated from said seat and adapted for manipulating said toggle connection for the purpose of lifting and lowering said plows.

10. The combination of a plow beam, a bracket secured to said plow beam, a toggle arm pivotally connected with said bracket, a depressing foot lever also pivotally mounted on said bracket and having a yielding lost motion connection with said toggle arm, a body frame, a second bracket secured to said body frame, another toggle arm pivotally mounted on said second bracket and having a jointed connection with the first-mentioned toggle arm, a bail connecting the two brackets, and a lifting foot lever applied to the joint or articulation between the two toggle arms and rigid with the first-mentioned toggle arm.

Signed by me at Rock Island, Rock Island county, Illinois, this 6th day of August, 1904.

WILLIAM E. JOHNSON

Witnesses:

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